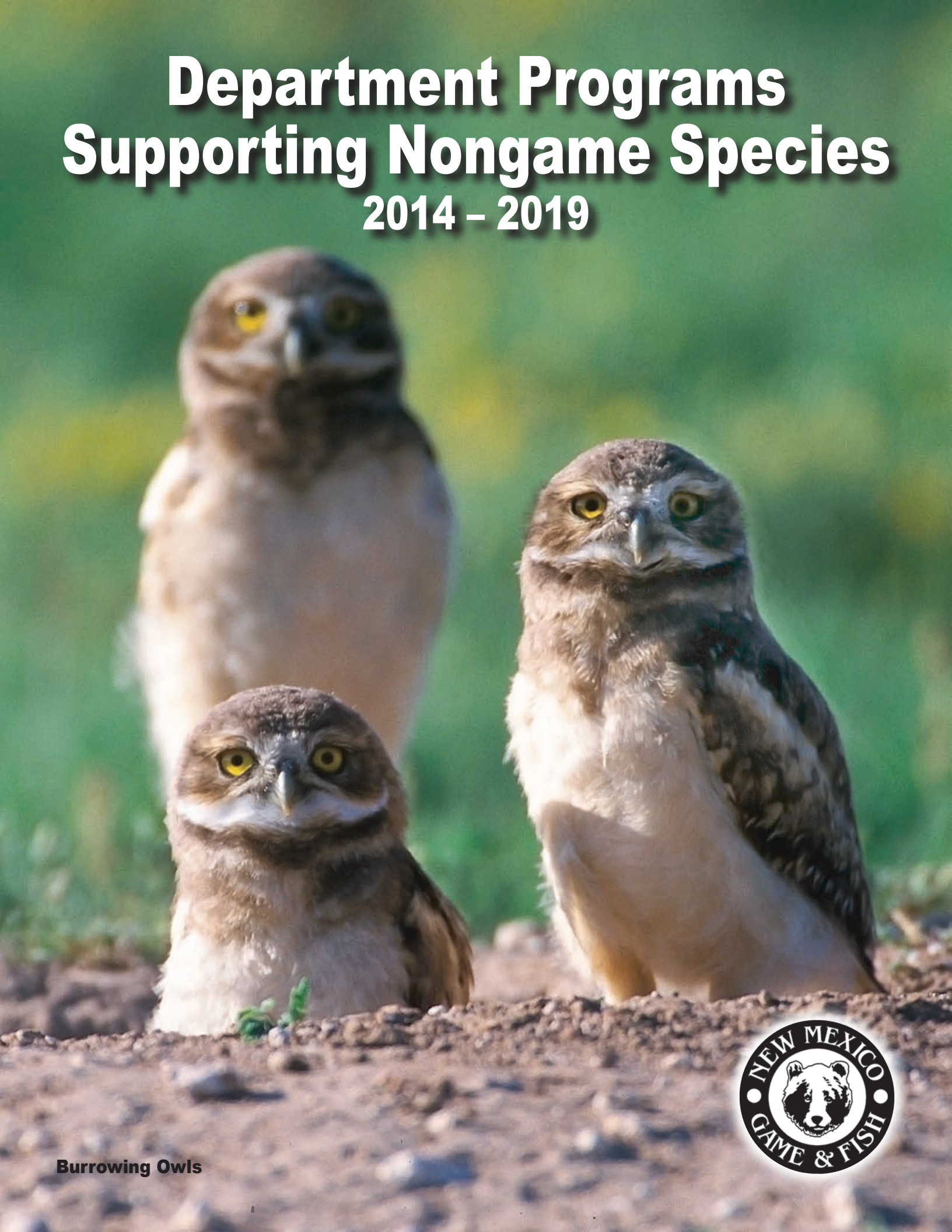
Department Programs Supporting Nongame Species

2014 – 2019



Burrowing Owls

NEW MEXICO GAME & FISH

Gila National Forest Prescribed Burn

Conserving New Mexico's Wildlife

The New Mexico Department of Game and Fish has a variety of programs that are designed to support the conservation and management of nongame species throughout the state. All management divisions in the Department are actively involved in nongame species conservation.

The Share with Wildlife program was created to assist species that do not receive funding from other sources and focuses largely on Species of Greatest Conservation Need. The program has supported a diversity of species including various birds, fish, mammals, invertebrates, reptiles and amphibians. In the past five years, Share with Wildlife has funded 49 projects and distributed over $1,000,000 in support of nongame species.

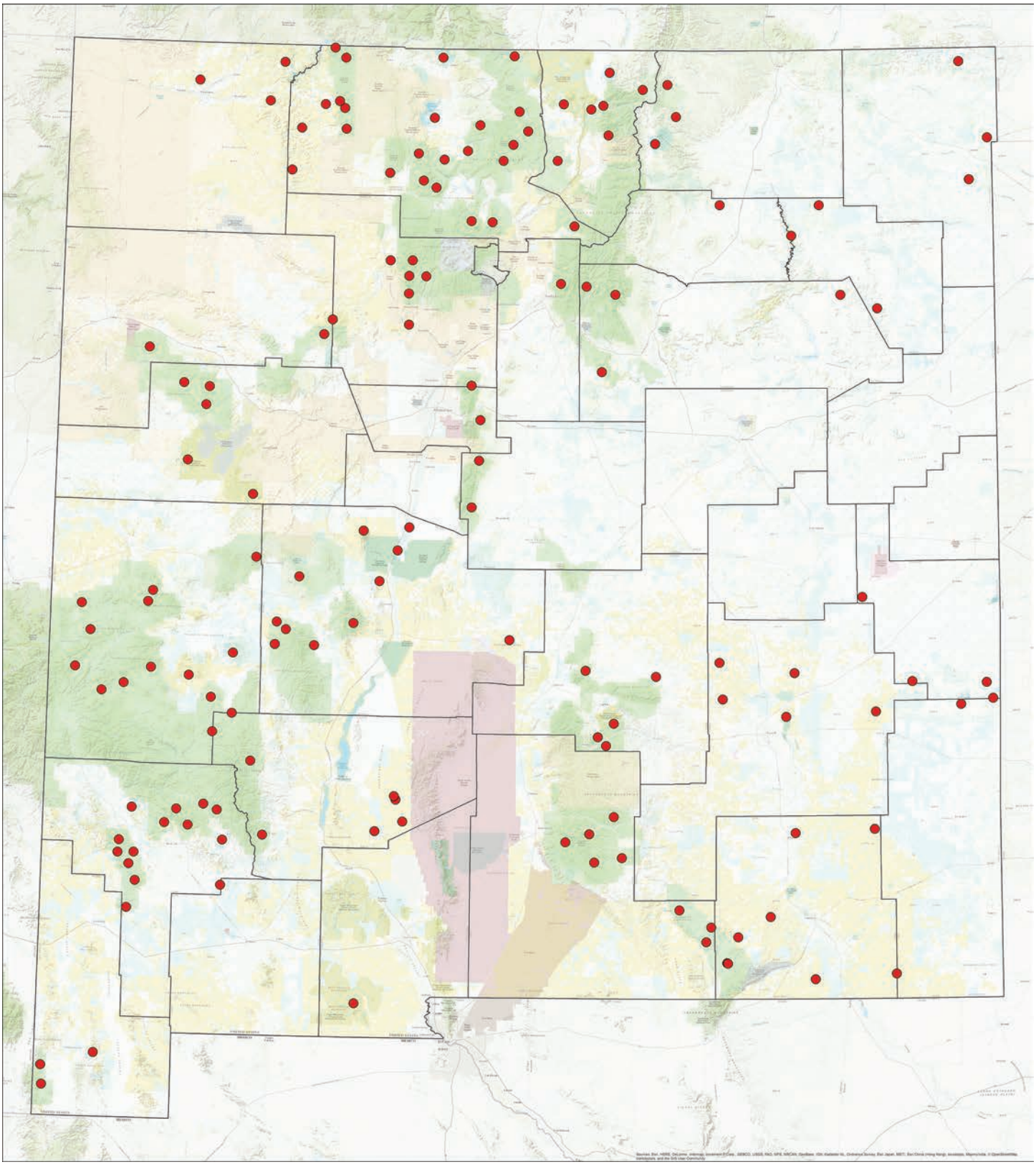
The Department's nongame wildlife biologists work on a number of projects that target either a variety of species, usually from a specific taxonomic group, or one specific nongame species. The Department's species-specific projects since 2014 have focused on approximately 40 song bird and raptor, reptile and amphibian and nongame mammalian species. These projects have included work such as captures, reintroductions, surveys, monitoring, developing and implementing management and recovery plans and conducting and funding research and data collection projects.

The Department's habitat program supports mulit-year, collaborative, landscape-scale habitat restoration projects that benefit a variety of nongame species. To date, the Department has invested approximately $25 million in these large habitat restoration projects. These efforts have included projects on Department owned properties as well as collaborative efforts with the U.S. Forest Service, Buearu of Land Management and the New Mexico State Forestry Division.

The Department's nongame fisheries biologists work with a variety of nongame native fish species and aquatic invertebrate species. Projects include the inventory and monitoring of native fish species, control of non-native fish species and construction of barriers, research and data collection, repatriation of native species, habitat improvements, stream restoration and participation in recovery and conservation teams.

Habitat Restoration Partnership Projects

2013-2019



Share with Wildlife Program

Program Overview
The mission of the Share with Wildlife program at New Mexico Department of Game and Fish (Department) is to help those species that do not receive funding from any other source. In particular, the program funds projects that involve wildlife-focused research, education, habitat enhancement and rehabilitation activities. The research and habitat enhancement projects funded since 2005 largely focus on Species of Greatest Conservation Need (SGCN), as identified in the Comprehensive Wildlife Conservation Strategy for New Mexico. This document was revised to be the State Wildlife Action Plan for New Mexico in 2016.

The program was initiated by the New Mexico Legislature in 1981. In the past five years, the program has funded 49 projects (some of which ran for multiple years) and distributed over $1,000,000, all in support of New Mexico's wildlife.

Larger Projects Funded
Examples of some of the larger projects (≥$40,000 per project; some running for multiple years) funded through Share with Wildlife in the past five years include: 1) development of statewide population estimates for two species of warbler (red-faced and Grace's), both of which are SGCN; 2) mark-recapture surveys for a turtle SGCN (western river cooter) along the Black River to determine local population size and vital rates (e.g., survival); 3) development of genetic markers for use in future non-invasive environmental DNA surveys for nine aquatic species, including Texas hornshell, Rio Grande chub and Rio Grande sucker; 4) surveys for the Peñasco least chipmunk, which is a candidate for federal listing under the Endangered Species Act, and evaluation of its habitat associations at multiple spatial scales. River Source and the New Mexico Wildlife Center were the two biggest recipients of funding for education and wildlife rehabilitation activities over this time period. River Source focuses on teaching students how to survey metrics of aquatic ecosystems, including wetland health, water quality and beaver sign. In 2019, River Source added in the use of wildlife cameras and drones, as well as a juried SGCN report writing competition, to increase the emphasis on wildlife, especially SGCN. The New Mexico Wildlife Center, based in Española, receives an average of 600-800 injured, sick or otherwise incapacitated animals each year and provides educational programs, including presentations on wildlife habitats, adaptations, conservation and biology, to roughly 5,000 students and adults annually through 2017. They increased their audience target to 10,000 students and adults annually in 2018 and 2019. In 2017, Share with Wildlife also provided partial funding to support a larger instream habitat project on the Rio Costilla being coordinated and executed in the Department's Fisheries Management Division. The primary purpose of the project was to enhance connectivity of, and increased water depth in, overwintering habitat for multiple species of native fish, including the Rio Grande chub and sucker.

Other Projects and Species Supported
Other projects funded during this time period include: 1) surveys to determine the distribution, status, size, vital rates and/or habitat associations of species populations that are of conservation concern in the state; 2) evaluations of life history, phylogenetic relationships and genetic diversity and connectivity; 3) evaluating the presence and/or distribution of various fungal pathogens, as well as natural defenses

Western River Cooter

to one such pathogen; 4) educational programs that teach K-12 students key science concepts and give them experience collecting and analyzing scientific field data; 5) development of educational tools, including native fish posters that the Department and other agencies/entities can use; 6) support for wildlife rehabilitation facilities that help to care for, and heal, sick and injured wildlife.

Species focused on for these smaller projects include: amphibians (Arizona toad, barking frog, boreal chorus frog, boreal toad, northern leopard frog, Sacramento Mountain salamander and western chorus frog); birds (Bendire's thrasher, burrowing owl and white-tailed ptarmigan); fish (Arkansas river shiner, bluehead sucker, central stoneroller, flannelmouth sucker, peppered chub, plains minnow, Rio Grande cutthroat trout, roundnose minnow and suckermouth minnow); invertebrates (Chupadera springsnail and wrinkled marshsnail); mammals (Gunnison's prairie dog, North American river otter and pacific marten); and reptiles (Gila monster and narrow-headed gartersnake). Some projects pertained to a suite of species from a particular taxonomic group, the complete lists of which are too long for inclusion here. For example, some projects dealt with multiple amphibians (e.g., Chiricahua leopard frog, Jemez Mountains salamander, plains leopard frog, Woodhouse's toad, etc.); multiple mammals (e.g., American beaver, American black bear, pale Townsend's big-eared bat, etc.); or multiple raptors (northern harrier, northern goshawk, osprey, peregrine falcon, etc.).

Future Focal Species
There were 12 projects selected for funding in 2019, all of which are underway and will be wrapping up by spring, 2020. The Peñasco least chipmunk project continues and, with co-funding from the Wildlife Management Division, has expanded to include the use of radio transmitters on chipmunks at two sites in the northern Sacramento Mountains. Research on whether nursery-grown plants may be potential vectors for the transmission of novel pathogens, especially novel strains of chytrid fungus and ranavirus, to riparian restoration sites, specifically in the Mimbres and Gila River drainages, is also being supported. Other focal species selected for 2019, and potentially beyond, include: amphibians (boreal chorus frog and northern leopard frog); birds (Bendire's thrasher, gray vireo and pinyon jay); fish (Chihuahua chub, Rio Grande chub, Rio Grande cutthroat trout and Rio Grande sucker); invertebrates (Gila springsnail, New Mexico hot springsnail and various SGCN terrestrial snails); mammals (Arizona montane vole and least shrew); and reptiles (Arizona black rattlesnake).

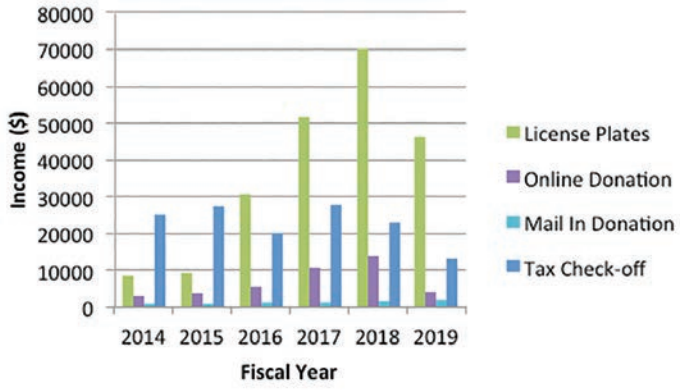
Funding Mechanisms and Initiatives
Share with Wildlife depends on tax-deductible donations from the public. The program matches these donations with federal funds from U.S. Fish and Wildlife Service's (USFWS's) State Wildlife Grants program to maximize its support of New Mexico's wildlife. But it is the donations (i.e., state money) that make this program possible. All donations go directly to supporting wildlife; no donated funds are spent on program administration.

Members of the public can donate to Share with Wildlife in several ways. These include: 1) purchase and registration of a Share with Wildlife license plate through MVD (three designs currently available: quail, mule deer and Rio Grande cutthroat trout); 2) donation of a portion of their state tax refund to the Share with Wildlife tax check-off; 3) mail in donation (check); 4) any dollar amount over $2 through the Department's Online Licensing System.

In the past few years, two new Share with Wildlife license plate designs have been released, both of which have been quite popular. License plate sales were roughly five times greater in FY 2017 (after the release of the mule deer design) compared to FY 2015. Adding the ability to donate any dollar amount (rather than only a $10 donation) through the Online Licensing System is also a relatively new feature. The amount raised through online donations almost doubled between FY 2016 (prior to this new feature being implemented) and FY 2017 (feature implemented for the 2017 draw). Revenue for FY 2018 was almost a third higher than in FY 2017.

In future, we plan to make it possible to donate to Share with Wildlife directly via a separate PayPal page that does not require a log-in. We've also discussed a variety of other possible promotional approaches for the program, including: 1) putting information about the program on signs at one or more Wildlife Management Areas (WMAs); 2) adding the ability to donate to the program on the Department's Pocket Ranger © mobile application; and 3) developing a package (e.g., a Conservation Pass) that includes a donation to Share with Wildlife and targets wildlife watchers.

Funding Trends 2014 - Present
The following graph shows state funding streams to the Share with Wildlife program per fiscal year broken out by category (green = license plates; purple = online donations; turquoise = mail in donations; blue = tax check-off donations). Numbers for fiscal year 2019 are only available through Feb. 28, 2019 for license plates and online donations and March 31, 2019 for tax check-off. Mail in donations are reported for calendar rather than fiscal year and are only available through July 29, 2019 for calendar year 2019.



Wildlife Management Division

Nongame Birds

White-tailed Ptarmigan (state endangered, SGCN, federally petitioned)
The Department completed a recovery plan for ptarmigan in 2017 and initiated field studies (2016-2018) focused on habitat occupancy, population size assessment and conservation genetics. A companion Share with Wildlife project mapped and quantified distribution of winter and early spring habitat, which may be an important limiting determinant of breeding population sizes in New Mexico. Focal survey areas for occupancy and population size estimation include the Pecos and Wheeler Peak Wilderness Areas and the Culebra Range. After extensive survey efforts, ptarmigan populations at all three sites were found to be very low. In 2018, we encountered only 6 adult ptarmigan (5 males, 1 female) and no evidence of successful reproduction. Ptarmigan surveys conducted in 2016 and 2017 yielded slightly higher numbers of adults, but the overall dataset indicates that ptarmigan populations in New Mexico are not liable to persist without augmentation.

Bendire's Thrasher (SGCN)
A contract with Bird's Eye View GIS was funded for a study titled "Identifying potential current distribution for Bendire's thrasher." The main goal of this project was to produce a predictive model that illustrated the potential current distribution of Bendire's thrasher, a SGCN and potential future range shifts.

White-Tailed Ptarmigan

The Department funded a research project that investigated Bendire's thrasher habitat needs in 2015 and 2016. This supported a graduate student to complete a statewide Bendire's thrasher survey and habitat use study. A total of 82 transects were surveyed throughout the western half of New Mexico. This resulted in better knowledge of Bendire's thrasher distribution in New Mexico and habitat needs.

Painted Redstart

A second graduate student was funded by the Department to conduct Bendire's thrasher research to build on information obtained by the first student. Data will help management efforts by providing increased information on nest survival, juvenile condition, fledging survival and movements in relation to land management.

The Department contracted Envirological Services, Inc. to complete Bendire's thrasher surveys in New Mexico in 2018 to estimate distribution, density, population size and determine habitat relationships as part of a collaborative range-wide survey effort throughout New Mexico, Arizona, California, Nevada and Utah. Continuing collaborative range-wide work seeks to increase knowledge about Bendire's thrashers and suitable structural components of nesting habitat.

Southern Wings Program
The Department has contributed to avian conservation of shared priority species in Mexico through the Association of Fish and Wildlife Agencies' Southern Wings Program. The ongoing project will benefit more than 28 grassland bird species and support biologists in Chihuahua. These biologists are working on sustainable grazing network property enrollments, protection and restoration of private and communal grasslands and monitoring the effectiveness of the efforts.

Mexican spotted owl (federally threatened, SGCN)
Surveys were conducted at Urraca WMA. This project followed established protocols to ensure that any Mexican spotted owls (MSO) were identified and given proper consideration to ensure they and their habitats were not disturbed during any habitat improvement projects scheduled for this location. Several staff members attended the USFWS MSO survey protocol training and completed field training hours in 2019 to obtain Section 10 Certification; this will allow staff members to complete MSO surveys for future Department habitat projects and ensure that the species is protected.

Multi-species surveys
General avian surveys and inventories were conducted on Department WMAs to inform avian occupancy status, habitat use and potential management considerations (e.g., Rio Chama, Red Rock and Urraca). Ongoing surveys will be used to determine wintering grassland SGCN use of Prairie-chicken Areas, and to determine flammulated owl occupancy at Urraca and Colin-Neblett WMAs.

The Department contracted with Bird Conservancy of the Rockies to implement Integrated Monitoring for Bird Conservation Regions (IMBCR) within the Playa Lakes Joint Venture project area in eastern New Mexico. This broad-scale bird monitoring and survey program provides information useful to management of SGCN birds in New Mexico. This work also includes vegetation monitoring that enables examination of bird habitat use and preferences.

Multiple USGS breeding bird surveys were completed each year. These surveys are often the only source of information for multiple SGCN bird species in certain parts of New Mexico.

The Department's nongame ornithologist assisted with a forest management prescription for Rio Chama WMA, giving input on how to best steer management actions to benefit nongame bird species. SGCN focal bird species included black-throated gray warbler, juniper titmouse, vesper sparrow and Williamson's sapsucker.

Nongame bird habitat management recommendations were developed for the Double E Ranch WMA. Avian SGCNs that were considered when making these recommendations included Bell's vireo (state listed), common black hawk (state listed), elf owl and painted redstart.

Western yellow-billed cuckoo (federally threatened, SGCN) and southwestern willow flycatcher (federally and state endangered, SGCN)
Surveys were conducted to inform the Mimbres River habitat improvement project. These surveys ensured that any individuals of these species would be detected and protected during habitat management actions. Surveys also were conducted within potentially suitable southwestern willow flycatcher habitat at Bernardo WMA to ensure that the species would be protected during habitat improvement projects.

Peregrine Falcon (state threatened, SGCN)
Data and species status were evaluated for this state listed species. A status report contracted through New Mexico State University was received in 2019; this report will help the Department determine if it is appropriate to recommend delisting the species to the State Game Commission.

Bell's vireo (state threatened, SGCN)
Surveys were conducted in 2019 (in cooperation with the Bureau of Reclamation) on the Rio Grande as the first phase of a broader multi-year program intended to elucidate distribution and abundance during the nesting season. These data, along with other information, are being gathered in preparation for writing a recovery plan for this species.

Bell's Vireo

Lesser Prairie-Chicken

Lesser Prairie-chicken (federally petitioned, SGCN)
Personnel were involved with the development and implementation of the lesser prairie-chicken Range Wide Conservation Plan in conjunction with the Western Association of Fish and Wildlife Agencies, Texas Parks and Wildlife; Oklahoma Department of Wildlife Conservation; Kansas Department of Wildlife, Parks, and Tourism and Colorado Parks and Wildlife. Personnel also continued cooperating with multiple state, federal and NGOs on various aspects of lesser prairie-chicken conservation and ecology including grazing management, prescribed fire, mesquite control, research and working with energy developers on habitat mitigation and siting issues. Personnel also continued management of the 30 state owned Lesser Prairie-chicken Areas including conducting annual population surveys, conversion of roads and oil and gas well pads back to grassland, mesquite control and infrastructure removal.

Gray Vireo (state threatened, SGCN)
The Department supported a graduate student studying gray vireos at the Sevilleta National Wildlife Refuge. Research objectives included adult survival, productivity, nest success, fledgling survival and habitat selection, which will fill critical information gaps and inform habitat conservation and management plans.

Long-billed Curlew (SGCN)
The nongame avian biologist collaborated with biologists from the USFWS and Boise State University to conduct long-billed curlew surveys, captures, satellite transmitter deployment and monitoring. This project will fulfill critical information needs regarding migration routes, overwintering locations, important breeding areas, nesting efforts and habitat use in New Mexico.

Virginia's Warbler (SGCN)
A multi-year Virginia's warbler research project was initiated at the Rio Chama WMA. Research methods included surveys, mist-netting, capture, marking, re-sighting, territory mapping and quantitative habitat data collection that will contribute to knowledge of an understudied species and inform habitat management practices.

Future Nongame Bird Priorities
The Department continued Bendire's thrasher research and monitoring, concentrated efforts to better understand habitat needs for pinyon-juniper birds with a focus on SGCNs, including pinyon jays and continues efforts to restore playa and associated shortgrass prairie habitat in eastern New Mexico to benefit priority avian species, including multiple SGCNs. These areas are of high value to numerous avian species and are used across the full annual cycle by resident, breeding, migrant and overwintering birds.

The Department continued implementation of recovery actions for white-tailed ptarmigan, including a translocation of birds from Colorado to restore the nearly extinct population of ptarmigan in the Pecos Wilderness Area and complete a recovery plan for Bell's vireo.

Reptiles and Amphibians

Jemez Mountains Salamander (federally endangered, state endangered, SGCN)
The Department funded work to develop ways to survey for this very rare species of salamander, endemic to the Jemez Mountains. Currently the only means to find the animal is to pull apart old, rotted Douglas Fir logs and survey the wet interior of the log, thus destroying the habitat. Researchers from University of Rhode Island are using different cover materials, including "artificial logs" in an attempt to draw the salamanders to the surface where they may be detected.

Sacramento Mountains Salamander (state threatened, SGCN)
The Department herpetologist coordinated with the U.S. Forest Service (USFS) to resume long-term monitoring of this endemic species of salamander, found only in the Capitan, White and Sacramento Mountains of south-central New Mexico. The monitoring will go toward understanding how the species is responding to changing climate conditions such as extended drought and will inform land managers how best to improve the high-elevation forest habitat it prefers. While several large fires have impacted its habitat, the populations of this species appear to be stable at this time.

Chiricahua Leopard Frog (federally threatened, SGCN)
The Department continues to fund recovery efforts toward this federally-listed frog from southwestern New Mexico. Efforts include disease testing, captive rearing and translocation of tadpoles and frogs to restore populations, eradication of non-native species that threaten recovery and habitat restoration. Recent habitat improvement projects by the Department to benefit fish, such as along the Mimbres River, have also benefited this species. While this species of leopard frog exhibited significant declines over recent decades, the federal recovery program is showing great promise toward the return of the Chiricahua leopard Frog.

Chiricahua Leopard Frog

Snapping Turtle

Snapping Turtle
The Department has begun coordinating observations and data collection on this common species of turtle, found in many parts of the state. Monitoring has begun due to the potential for this population to decline from increased interest in collecting the species. In addition, apparent releases of pet turtles have resulted in populations of the snapping turtle in parts of the state where it is not native, such as in northwestern New Mexico. The Department is encouraging collection of samples for disease testing, which is an additional concern when turtles are released as unwanted pets.

Western River Cooter (state threatened, SGCN, federally petitioned)
The Department continues to fund research into the population status of this turtle, found only in southeastern New Mexico in the Pecos River drainage. Researchers from Eastern New Mexico University, first funded under the Department Share with Wildlife Program and currently through the Department's Wildlife Management Division, have studied localities in the Black River, a tributary of the Pecos River, developing extensive life history and demographic data on the turtles there. A new population was confirmed near Roswell, although contrary to expectations no turtles have been found at Bitter Lake National Wildlife Refuge, also near Roswell.

Barking Frog (SGCN)
The Department is continuing a volunteer monitoring program in southeastern and south-central New Mexico. Volunteers from the public and from land management agencies conducted auditory surveys in 2017 following intensive rains. The barking frog was detected most often at the Bitter Lakes National Wildlife Refuge near Roswell. Other sites have been found near Artesia and in the vicinity of the Organ Mountains near Las Cruces. This work will help determine the ongoing status of this desert frog and follows the recommendations from previous research efforts.

Boreal Toad (state endangered, SGCN)
The Department continues to coordinate with the Colorado Parks and Wildlife Division to repatriate tadpoles at a site in Rio Arriba County. To date, no breeding has been detected. The Department also provided scientific input toward a multi-state conservation plan for the southern Rocky Mountain population of this toad and provided the U.S. Fish and Wildlife Service information toward a Species Status Assessment as part of the Service's review of the species for federal-listing. In 2017 the USFWS determined listing was not warranted.

Dunes Sagebrush Lizard

Dunes Sagebrush Lizard (state endangered, SGCN)
The Department continued to provide scientific comment and implement a long-term monitoring program for the dunes sagebrush lizard for conservation agreement permit holders in New Mexico and Texas. The Department also coordinated with conservation programs for both the lizard and Lesser Prairie Chicken, whose distribution overlaps that of the lizard, to protect and improve habitat.

Big Bend Slider (SGCN)
The Department collected genetic data for this species, found in south-central New Mexico, and testing has determined that it is hybridizing with non-native red-eared sliders that have been released as unwanted pets. The Department continues to work with other agencies to educate the public about the threat of released red-eared sliders, and monitoring will continue to determine the rate of hybridization within the very limited populations of the Big Bend Slider.

Gila Monster (state endangered, SGCN)
The Department completed a recovery plan for Gila Monster in 2017, and funded a Share with Wildlife research project focused on ecological niche modeling and investigations of selected aspects of Gila Monster distribution and habitat suitability.

Northern Mexican and Narrow-headed Gartersnakes (both federally threatened and SGCN)
The Department continues to coordinate with the Arizona Department of Game and Fish and other agencies for these two federally-listed species of gartersnake, found in southwestern New Mexico. Surveys to determine the narrow-headed gartersnake current status, that may then be used toward habitat improvement are funded by the Department. The surveys also help determine removal of non-native species that threaten its existence, such as bullfrogs and crayfish.

Narrow-Headed Gartersnake

Smooth Green Snake

Smooth green snake (SGCN)
The Department has begun a monitoring program for this small, highly cryptic species, in south-central New Mexico, working in conjunction with the USFS. Currently the project is in development to work with citizens to identify potential populations through observations, followed by more intensive monitoring for demographic data on the species by trained biologists with the Department and the USFS.

Western Massasauga (federally petitioned, SGCN)
This small rattlesnake that favors shortgrass prairies is under review for listing by the USFWS, and the Department continues to provide the Service with scientific comment on this process. The Department also funded a study by Texas A & M University examining the potential impact of climate change and how habitat may be improved to benefit this species. The Department recently established a program for Department biologists, law enforcement officers and contractors to report observations of this highly cryptic snake. This will help identify populations that will benefit from habitat improvements.

Mammals

Black-footed Ferret (federally endangered, SGCN)
In 2018, the Department, the USFWS and a private landowner, participated in the release of eight ferrets on a black-tailed prairie dog colony on a private ranch in eastern Mora County. At present, this is the only active ferret release site in New Mexico. Management of plague, a disease that impacts both prairie dogs and ferrets, was implemented on this site in 2018 using a new vaccine bait that inoculates prairie dogs against this pathogen. The Department also continues to solicit reports of sightings of this species from the public and

Black-Footed Ferret

Northern River Otter

frequently communicates with individuals who report seeing ferrets; in all such cases where physical evidence was available, the animal in question was a Long-tailed Weasel. No naturally-occurring ferret populations are known to exist anywhere within its former range.

Northern River Otter (SGCN)
The species was reintroduced in the Rio Grande in 2008-2010 with the release of 33 animals and has also become established in the San Juan River via past reintroductions in Colorado. The Department, in partnership with the New Mexico River Otter Working Group, continues to track both populations by soliciting and compiling reports from agency biologists and the public and has documented expansion of the range and reproduction in the upper Rio Grande. A genetics study of the Rio Grande population completed in 2019 estimated 83-100 otters are present in this drainage. Due to low genetic diversity in this small population, augmentation with additional animals from outside of the Rio Grande basin would promote greater viability. An analysis of the diet of Rio Grande otters is currently underway.

Black-tailed Prairie Dog (SGCN)
The Department continues to participate in the multi-state Prairie Dog Conservation Team and assist in efforts to compile GIS data on the distribution of black-tailed prairie dog in New Mexico to be used in a range-wide occupancy study. The Department also continues to maintain information on the distribution and status of populations of both black-tailed and Gunnison's prairie dog species in New Mexico and address issues related to their conservation, in part through the New Mexico Prairie Dog Working Group.

Black-Tailed Prairie Dog

Gunnison's Prairie Dog (SGCN)
The Department worked with the USFWS to compile information on the status of this species in New Mexico for the development of a 12-month finding on populations that were previously petitioned for Endangered Species Act (ESA) listing. Through the New Mexico Prairie Dog Working Group, chaired by the nongame mammal biologist, the Department exchanged information on conservation issues and reintroduction efforts for this species. The Department funded three research projects on this species: the effects of climate on a reintroduced population at the Sevilleta NWR, dispersal behavior in a montane population in the Jemez Mountains and a repeat of the occupancy modeling survey of the species in New Mexico, which is conducted every six years.

Pacific Marten (state threatened, SGCN)
The Department continues to compile all available information on this species in New Mexico, including reports from the public. A study, using camera traps throughout its New Mexico range to assess population distribution and status, is currently being developed.

Jaguar (federally endangered with critical habitat, SGCN)
The Department participated in the USFWS-led Jaguar Recovery Team in the development of a federal recovery plan for the species which was finalized in 2018. All available information on the species in New Mexico was compiled to assist the USFWS during the recovery plan process. Although the Department collects and reviews all reports of jaguar in the state, none were received in this period.

Canada Lynx (federally threatened)
The Department participated in the development of the Species Status Assessment for this federally listed species which likely occurs only marginally in northern New Mexico. The Department evaluates reports of this species received from the public; however, all such reports received during this time period were of bobcats or had insufficient information to be identified to species.

Lesser Long-nosed Bat (state threatened, SGCN)
This species was recently removed from the list of Federal Endangered species. The Department participated in the development of the Species Status Assessment and a Post-delisting Monitoring Plan for this bat which occurs in southwestern New Mexico.

Bat Research and Management
The Department funded a research project to assess bat use of highway bridges in New Mexico to better inform New Mexico Department of Transportation's bridge demolition, replacement and maintenance projects. The Department continues to work with other bat researchers, via the New Mexico Bat Working Group, in the development of a response plan, hibernacula survey and related research projects in anticipation of White-nose Syndrome, or the fungus causing this deadly disease of North American bats, being confirmed in New Mexico.

Penasco Least Chipmunk (state endangered, federally petitioned, SGCN)
The Department provided information to the USFWS during their assessment of this species when it was federally petitioned for listing and subsequently during preparation of a Species Status Assessment. The Department recently funded a genomics study to assess subspecies status, genomic diversity and range stability within the context of range-wide least chipmunk demographic history. A Department-funded study of this animal's distribution, habitat use and activity patterns is ongoing in the White Mountains.

New Mexico Meadow Jumping Mouse

New Mexico Meadow Jumping Mouse (federal endangered with critical habitat, state endangered, SGCN)
The Department assisted the USFWS in compiling new information for an update of the federal Species Status Assessment. The Department funded and assisted in a survey of the species on Department land (Casa Colorada), where it had been previously documented but apparently no longer occurs. The Department also funded the development of a draft survey protocol for use in determining the presence of suitable habitat and in conducting live-capture surveys of the species and the development of materials to be used in training courses for land managers and others who may be surveying for or managing lands occupied by the species.

White-sided Jackrabbit (state threatened, SGCN)
The Department provided information to the USFWS for their assessment of this species during its review for possible federal listing.

Organ Mountains Chipmunk (state threatened, SGCN)
The Department is presently supporting research on the distribution, habitat requirements and activity patterns of this subspecies to inform future management actions that will protect it in its limited range in the Organ Mountains.

Least Shrew (state threatened, SGCN)
The Department continues to conduct surveys for this species in the High Plains and Pecos River Valley of eastern New Mexico to better understand its distribution and habitat needs. Findings to date indicate that least shrews may be broadly distributed across the northeastern High Plains and appear to be associated with a variety of habitat types and soil moisture conditions. By contrast, least shrew populations in the Pecos River valley appear to be confined to remnant ancient wetland sites, and may be taxonomically distinct from shrews occupying the Plains. This information will be used in the development of a state recovery plan for this shrew.

Comanche Point and Comanche Creek at its confluence with the Rio Costilla in the Valle Vidal.

Habitat Restoration

The Department supports multi-year, collaborative, landscape-scale habitat restoration projects throughout the state with non-federal funds from various sources that are matched with Pittman-Robertson federal aid funds through the Wildlife & Sportfish Restoration Program of the USFWS. To date, the Department has invested approximately $25 million into this effort.

Wetland/Riparian Habitat Restoration Projects

Valle Vidal Wetlands and Watershed Restoration
The Department is collaborating with the USFS, Coca-Cola, Trout Unlimited and others to support significant watershed-scale wetland restoration in the Comanche Creek Watershed in northern New Mexico. Work is focused on reducing active degradation of streambanks and slope wetlands, reestablishing floodplain connectivity and raising water tables within wetlands and former wetlands in this 27,430 acre watershed. To date, the Department has supported $75,000 for restoration analysis and design, and committed over $1 million for project implementation. Department funds (federal Pittman-Robertson dollars through the Wildlife and Sportfish Restoration Program) are being matched to over $140,000 of non-federal funds supplied by Coca-Cola.

Ladd S Gordon Wildlife Management Complex Habitat and Watershed Restoration
The Department is in the midst of a multi-year wetland, moist soil, riparian and agricultural restoration effort on the Bernardo and La Joya parcels of the Complex. Projects on Bernardo WMA include the refurbishment of several miles of concrete irrigation ditches, the improvement of public access and wildlife viewing opportunities, the enhancement of over 125 acres of seasonal wetlands, the removal of over 500 acres of invasive riparian vegetation and the planting of hundreds of native trees and shrubs. Projects on La Joya WMA include the removal of invasive riparian vegetation and the restoration of over a thousand acres of ponding habitat for waterfowl. The Department is also partnering with Ducks Unlimited, Audubon New Mexico and Rio Grande Return to abstract existing water rights, define underlying hydrological processes and design future wetland improvements on both properties.

Huey WMA Moist Soil Unit and Riparian Restoration
The Department has embarked on a multi-year wetland, moist soil and riparian restoration effort on the Huey WMA. Over 4 miles of the Pecos River flow through the property, and riparian and wetland habitats have been severely degraded from the disassociation of the river from adjacent floodplains. Restoration work will include the creation of a 70 acre moist soil unit with high flow connections to the Pecos River, the reconnection of a five acre oxbow lake and the restoration of up to 4 miles of riparian habitat on the property. To date, the Department has secured $2 million of state and federal funds for this effort. Engineering and design work is ongoing. This effort should result in improved habitat for the Pecos bluntnose shiner, Pecos pupfish, Rio Grande cooter, southwestern willow flycatcher and many other species of game and nongame wildlife. In addition, the Department plans to use these efforts on Huey WMA as a model and learning space for other landowners and groups interested in wetland and riparian restoration in SE New Mexico.

Canadian River Riparian Restoration
In collaboration with the USFS, the Department is building upon past habitat improvement efforts within Mills Canyon along the Canadian River on the Kiowa National Grasslands. As a necessary first step in this process, the Department has funded an assessment of current habitat conditions within Mills Canyon. This assessment will identify current conditions and delineate areas with opportunities to restore and enhance native riparian and side-canyon habitats. Additionally, the assessment will evaluate opportunities to enhance river-floodplain connections to support processes that maintain riparian habitats for associated wildlife species, restore off-channel aquatic habitats that also benefit terrestrial species, increase wildlife diversity and increase potential for water storage and drought resistance. The Department has committed $700,000 to date for implementation of restoration activities resulting from these assessment and design efforts.

Bluebird WMA Slope Wetlands Restoration
The Department completed a wetland enhancement and erosion control project on Bluebird WMA in the Jemez Mountains. This project used a variety of treatments and practices to restore slope wetlands on the property and improve road drainage characteristics to reduce erosion and associated sedimentation. These treatments should stabilize ongoing erosional processes, trap sediment, spread and hold water, build wet soils and promote important plant communities for the benefit of wildlife such as songbirds, wild turkey and other game and nongame species. This project is also providing educational field day opportunities for Department staff from various Divisions and volunteers from interested conservation groups.

Edward Sargent WMA Riparian Resiliency Survey and Restoration
In July 2017, an interdisciplinary team of Department staff surveyed the perennial stream systems of the Edward Sargent WMA near Chama in Rio Arriba County. The survey method utilized, the Proper Functioning Condition method, was collaboratively developed by the Bureau of Land Management (BLM), the USFWS, and the Natural Resources Conservation Service. This qualitative assessment allows

Edward Sargent Wildlife Management Area

land managers to quickly identify the condition and functionality of the physical processes of a riparian system and determine its state of resiliency. Findings from this survey will allow Department staff to prioritize and design restoration treatments and locations on Rio Chamita, Sixto Creek and Nabor Creeks within the Edward Sargent WMA. Stream restoration work commenced at the beginning of FY20.

USFS Wetland and Riparian Restoration NEPA Analysis
The Department is collaborating with the USFS and The Nature Conservancy to help support the development of a NEPA document to authorize restoration activities within riparian and wetland habitats across the Carson, Cibola, and Santa Fe National Forests in northern and central New Mexico. This effort will streamline compliance and regulatory efforts, develop design criteria for restoration activities, and build implementation guidance to include a consistent set of evaluation and prioritization criteria. In addition to support for this planning effort, the Department has also committed significant resources to implement future riparian/wetland projects identified and analyzed as part of the NEPA process.

River Ranch, Double E, and Red Rock WMAs Stream Enhancement/Conservation
The Department is designing and implementing projects to conserve riparian and stream habitats of the Gila River, Mimbres River, and Bear Creek on the Red Rock, River Ranch and Double E WMAs, respectfully. These projects will include fencing to exclude livestock grazing within riparian areas, selective thinning to reduce the threat of catastrophic wildfire, and invasive species control. These areas provide important habitat for species such as the Chiricahua leopard frog, loach minnow, Gila topminnow, southwestern willow flycatcher and the yellow-billed cuckoo.

Upland Habitat Restoration Projects

Collaborative Forest Restoration
The Department is continuing to focus on forest restoration throughout New Mexico, recognizing the considerable influence forest habitat types have on maintaining species health and diversity in the desert southwest. As part of this effort, the Department has partnered with New Mexico State Forestry, the USFS, the BLM, the New Mexico State Land Office and others to support forest thinning and prescribed fire activities across hundreds of thousands of acres of forest throughout the state. Projects are designed to return low-intensity fire-to-fire adapted forests, promote diversity in stand structure and improve wildlife habitat and watershed health. Intentions are to safely reduce fire fuel loads within treatment areas, furthering wildlife habitat benefit by increasing forest and watershed resiliency to large-scale, high-intensity wildfire, drought and insect infestation.

The Department is working with the Lincoln National Forest to develop a 140,000 acre forest and watershed restoration landscape in the southern Sacramento Mountains in southern New Mexico in collaboration with the Lincoln National Forest. Restoration efforts with the USFS on the Santa Fe National Forest are also underway to support tens of thousands of acres of select thinning and prescribed fire activities in the Jemez, Sangre de Cristo and southern San Juan Mountains.

In the Carson National Forest, the Department is funding the necessary archeological clearances that will clear the way for over 200,000 acres of forest restoration treatments on USFS lands in north-central New Mexico, and implementing over 3,500 acres of forest thinning treatments in the next two years. Habitat restoration with prescribed fire is being funded in the Gila National Forest for thousands of acres

River Ranch Wildlife Management Area

of thinning and over 100,000 acres of prescribed fire activities to enhance wildlife habitat and reduce the threat of catastrophic wildfire.

The Department is working with the Cibola National Forest to build cross-boundary landscape-scale restoration landscapes in the Mount Taylor, San Mateo, Magdalena and Zuni Mountains in west-central New Mexico. Through selective thinning contracts and prescribed fire operations, these partnerships are striving to return low intensity fire to tens of thousands of acres of fire adapted vegetation communities. The BLM Rio Puerco District Office and Socorro Field Office have partnered with the Department to implement 3,500 acres of forest thinning restoration.

Partnering with New Mexico State Forestry, the Department is leveraging resources and funding sources to restore approximately 20,000 acres of frequent fire forests across land ownerships throughout the state. The Department also continues to implement forest restoration treatments across thousands of acres on the Sargent, Rio Chama, Colin Neblett and Urraca WMAs.

Lesser Prairie Chicken Habitat Restoration Initiative
The Department is working with partners including the BLM, New Mexico State Land Office, National Resource Conservation Service and Center of Excellence for Hazardous Materials Management to develop an analysis to prioritize areas for mesquite removal in critical lesser prairie-chicken habitat in southeastern New Mexico. This analysis will help to guide the efficient use of resources to gain regulatory compliance and implement on the ground mesquite removal treatments.

Department Involvement in Prescribed Fire Activities Statewide
The Department continues to increase our involvement in the use of prescribed fire across land ownership types in New Mexico to restore wildlife habitat and reduce the threat of catastrophic wildfire. In 2018, the Department implemented the first ever prescribed pile burn on State Game Commission owned lands in New Mexico. Fifty-four acres of property were burned through the controlled ignition of approximately 1,100 wood and slash piles on the Colin Neblett WMA in northeastern New Mexico. The prescribed burn was an initial entry to begin the treatment of 600 acres of the WMA that were mechanically thinned in 2016 to improve wildlife habitat and reduce the threat of catastrophic wildfire. In addition, the Department partnered with the New Mexico State Land office, New Mexico State Forestry, the Forest Guild and others to use prescribed fire on approximately 15,000 acres of important wildlife habitat in the spring of 2019 across the Luera Mountains. The Department is looking forward to utilizing prescribed fire into the future as a naturally adapted management tool to improve wildlife habitat, reduce wildfire potential and tie the Department to the broader land restoration community throughout New Mexico.

Fisheries Management Division

Roundtail Chub

Native Fish

Participation in Recovery and Conservation Teams for Native Fish
The Department is a member of, or party to, eight native fish Recovery or Conservation Teams that encompass 14 native fish species, of which six are federally listed under the ESA (Chihuahua chub, Colorado pikeminnow, Gila topminnow, loach Minnow, razorback sucker and spikedace). Teams for other species (bluehead sucker, flannelmouth sucker, Pecos pupfish, Rio Grande chub, Rio Grande sucker, roundtail chub and White Sands pupfish) aim to ensure their long-term viability so that ESA listing is not warranted. All of these teams bring together diverse stakeholders, including federal and state agencies, local governments, NGOs and private interests, whose combined expertise represent the most advanced knowledge for each species and its best chance for effective conservation.

Inventories and Monitoring of Native Fishes
The Department leads, or assists with, annual monitoring of over 20 species of native fishes throughout all major river basins in the state and conducts more than 25 surveys for native nongame fish species every year. Annual monitoring for native fishes is conducted to track the health of species such as desert sucker, longfin dace, Sonora sucker in the Gila River Basin, Rio Grande chub and Rio Grande sucker in the Rio Grande and Canadian River basins and White Sands pupfish in the Tularosa River Basin. In order to assess progress toward recovery, federally listed species such as Colorado pikeminnow and razorback sucker in the San Juan River Basin, Pecos gambusia in the Pecos River Basin and Chihuahua chub in the Mimbres River Basin are monitored annually. In addition, inventories of less commonly sampled streams are conducted on a rotational basis. Recently such surveys have been completed in the Middle and East forks of the Gila River, Turkey Creek and Mule Creek in the Gila River Basin.

Pecos Pupfish Hybridization Study
A study to assess the degree of hybridization between native Pecos pupfish and non-native sheepshead minnow in the Pecos River was completed in 2016. No evidence of hybridization between the two species was observed in the two populations studied. Lack of hybridization highlighted the importance of the Pecos pupfish populations at Bitter Lake National Wildlife Refuge and Bottomless Lakes State Park and the continued need to prevent Sheepshead minnow from invading these strongholds. The demonstrated genetic differences between Pecos pupfish populations in Bitter Lake National Wildlife Refuge and Bottomless Lakes State Park will also help the Department to better manage the species.

Protecting Pecos Pupfish in the BLM Overflow Wetlands
In 2019 the Department completed planning, design, environmental compliance and construction of two fish barriers designed to prevent non-native sheepshead minnow from colonizing Pecos pupfish habitat in the BLM Overflow Wetland Complex near Roswell. sheepshead minnow hybridize with Pecos pupfish and prevention of its establishment is important to the persistence of Pecos pupfish.

Repatriation of Native Fish in the Gila River Basin
The Department continues efforts to establish new populations of native fish in the Gila River basin. There are ongoing repatriation projects for federally listed loach minnow and spikedace and state listed roundtail chub in Little Creek, Saliz Canyon, Mule Creek and the San Francisco River. In order to keep captive native fish populations genetically diverse for stocking, wild spikedace and loach minnow are collected periodically and transferred to hatcheries to supplement hatchery brood stock. Successful repatriation efforts help to meet recovery plan goals and create resiliency to stochastic events.

Control of Non-native Fishes in the West Fork Gila River
The Department leads annual efforts to mitigate threats to federally listed species via control of predatory non-native fishes in the Heart Bar WMA reach of the West Fork Gila River. Removals target species such as flathead catfish, yellow bullhead, smallmouth bass, rainbow trout and common carp. Non-native removal is conducted for the benefit of loach minnow, spikedace and roundtail chub. This work has demonstrated positive results including increases in native fish throughout the reach.

Study of the Effects of Fire on Gila Basin Fishes
A study funded by the Department to assess the effects of wildfire on native and non-native species in the Gila River basin was completed in 2015. The study found that native fish in some areas of the basin were more resilient to wildfire disturbances while some non-natives, especially non-native trout, were more sensitive to wildfires. Results from the study will benefit the Department's management of native fishes such as the federally listed loach minnow and spikedace.

Loach Minnow

Gray Redhorse

Repatriation of Chihuahua Chub in the Mimbres River
Chihuahua chub is federally listed and the Mimbres River is the only place it is found in the United States. The Department has been working to repatriate Chihuahua chub in the Mimbres River since they were eliminated from significant portions of the river basin as a result of the 2013 Silver Fire. Natural reproduction and expansion of their distribution has been recently documented. In order to keep captive native fish populations genetically diverse for stocking, Chihuahua chub are collected periodically and transferred to a federal hatchery to supplement hatchery brood stock.

Blue Sucker and Gray Redhorse Movements in the Black River
In 2015 the Department completed an assessment of blue sucker and gray redhorse movements in the Black River. Each species were found to exhibit different movement patterns; however, movements of both species indicated the need for large interconnected stream reaches. The study found that some road crossings within the Black River may be limiting movements of the species and providing better passage at road crossings may be beneficial for both species. In order to determine the influence of these road crossings on gray redhorse, the Department is currently funding a genetic analysis to determine how the crossings may be effecting movement and genetic diversity within the river.

Repatriation of Gray Redhorse to the Delaware River
Gray redhorse, a state listed species, was extirpated from the Delaware River until the Department began an effort to reestablish them in 2012. Multiple stockings over the ensuing years appear to have successfully reestablished the species. Wild young-of-year gray redhorse have been observed in the river every year from 2016 to 2018. This species is an important host fish for an early life-stage of the federally listed Texas hornshell which has also been reintroduced to the Delaware River.

Research into the Genetics of Canadian River Fishes
In order to gain information on the population health of the federally listed Arkansas river shiner and the state listed peppered chub, the Department has been funding genetic monitoring of both species since 2015. The monitoring provides annual population estimates and tracks genetic diversity of each species. Both metrics are important in detecting changes in the populations. Results from this study aid in managing both species and will likely aid in the federal listing decision for peppered chub.

Research on the Food Web Interactions of Colorado Pikeminnow
Two studies completed in 2014 investigated the food web in the San Juan River and specifically the diet of the federally listed Colorado pikeminnow. Results indicated that channel catfish does not compete with Colorado pikeminnow as much as previously thought and that Colorado pikeminnow eat less fish than expected, a potential reason for their slow recovery in the San Juan River. Information from these two studies has been beneficial in guiding management decisions aimed at recovery of the species.

Native Fish Habitat Restoration

Habitat Improvement in the Mimbres River
In 2016 and 2017 habitat improvements for the federally listed Chihuahua chub were completed in 2.5 miles of the Mimbres River on New Mexico State Game Commission and The Nature Conservancy owned properties. These properties also provide habitat for the federally listed Chiricahua leopard frog and the Rio Grande sucker, which also benefited from this project. Chihuahua chub numbers have increased by as much as 1000% at some sites since the work was completed.

Habitat Improvement in the Rio Costilla
Habitat improvements on approximately 4 miles of the Rio Costilla were completed in 2017. These improvements were designed to benefit the native fish community including Rio Grande chub and Rio Grande sucker, both of which are currently petitioned for ESA listing.

Planning and Design of New Habitat Projects
A number of projects to improve habitat and provide refuges for imperiled native fish are currently underway. These projects, designed to benefit roundtail chub, Gila topminnow and Chihuahua chub, are funded for the design and planning phases.

Replacement of the Lisboa Springs Hatchery Diversion Dam
The historic diversion dam upstream of Lisboa Springs Hatchery is dilapidated (originally constructed in the 1930s) and currently inhibits fish passage for a variety of species including Rio Grande chub. Engineering designs and environmental compliance is nearly complete with construction of the new diversion dam anticipated in winter 2019. In addition to the inclusion of a fish ladder to reconnect aquatic habitat, the new design includes large boulders and riprap to stabilize streambanks and provide additional habitat for aquatic species.

Chihuahua Chub

Texas Hornshell Mussel

Aquatic Invertebrates

Monitoring of Aquatic Invertebrates
The Department leads, or participates in, annual monitoring for several native invertebrates including Socorro isopod, Alamosa springsnail, Chupadera springsnail, Koster's springsnail, Roswell springsnail, Gammarus desperatus and Texas hornshell mussel. Koster's springsnail, Roswell springsnail and Gammarus desperatus are sympatric on Bitter Lake National Wildlife Refuge and monitoring for these species occurs at the same time. These monitoring projects also take place on private lands. As such, the Department works diligently to develop and foster positive mutually beneficial relationships with landowners.

Repatriation Efforts for Imperiled Aquatic Invertebrates
Efforts to reintroduce the federally listed Texas hornshell mussel to the Delaware River began in 2010 after shells were discovered there. Compliance was completed with assistance from BLM and suitable habitat was identified. Sixty mussels were translocated in 2012; however, a flood scoured the habitat, making it unsuitable. Efforts were reinitiated in 2015. As of July 2019, 93 adults and innumerable larval mussels have been translocated from the Black River. These efforts have led to the development of novel techniques to repatriate native mussels as well as partnerships for advancing captive rearing technology.

Research Projects for Aquatic Invertebrates
The Department currently participates in, or funds, a number of aquatic invertebrate research projects. These projects include: genetic studies of Texas hornshell and host fishes, a taxonomic study of an endemic peaclam and research to determine the feasibility of holding and rearing springsnails in captivity. The results of these projects provide a basis for management actions.

Future Native Fish and Aquatic Invertebrate Priorities
The Department will work on the dvelopment of a Range-wide Conservation Strategy for Rio Grande chub to include monitoring of extant populations, investigations of population genetics and repatriation to native waters and development of a Range-wide Conservation Strategy for Rio Grande sucker to include monitoring of extant populations, investigations of population genetics and repatriation to native waters. The Department will also work towards repatriation and monitoring of Texas hornshell in the Delaware River, repatriation and monitoring of loach minnow, spikedace, roundtail chub and Chihuahua chub in appropriate basins and construction of off channel refuges for Chihuahua chub, roundtail chub and Gila topminnow. The Department will participate in species recovery and conservation teams including development of federal recovery plans and investigate the need to repatriate blue sucker to native waters in New Mexico.

Conserving New Mexico's Wildlife for Future Generations

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Black-footed ferret

Red-faced Warbler

Arid land ribbon snake