State of New Mexico

NONPOINT SOURCE MANAGEMENT PROGRAM

2021 Annual Report

New Mexico Environment Department
Surface Water Quality Bureau
Watershed Protection Section

State of New Mexico
Nonpoint Source Management Program

2021 Annual Report

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In cooperation with:

The Natural Resources Conservation Service, New Mexico Department of Game and Fish, New Mexico State Forestry Division, United States Forest Service and Bureau of Land Management.

Copies of this report and other reports are available on the Surface Water Quality Bureau website:
www.env.nm.gov/surface-water-quality/watershed-protection-section/

January 31, 2022

Charles Maguire
Water Division Director
U.S. Environmental Protection Agency, Region 6
1201 Elm Street, Suite 500
Dallas, Texas 75270

Dear Director Maguire:

I am pleased to submit New Mexico's 2021 Nonpoint Source Management Program Annual Report (Report). In this Report we document the progress made in meeting the program milestones set forth in our Nonpoint Source Management Plan.

The Nonpoint Source Management Program has six core objectives, and I would like to briefly highlight our accomplishments made during 2021 for each:

1. Under the watershed-based planning objective, EPA accepted a watershed-based plan for Willow Creek. The plan and EPA's acceptance letter are posted at www.env.nm.gov/surface-water-quality/wbp.

2. In the area of water quality improvement, NMED submitted a NPS Success Story nomination for San Antonio Creek in Valles Caldera National Preserve. The nomination provided compelling evidence that stream temperature decreased as a result of projects there, and EPA has since accepted the nomination. Three new on-the-ground projects that implement watershed-based plans, funded under Section 319, were developed and began. Four such projects were completed and are summarized in this Report.

3. To better protect water quality, two new projects were developed and initiated to address impacts of wildfires in the Rio en Medio and Bear Creek watersheds. Staff reviewed fifty-six projects authorized by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act and confirmed their consistency with the state's existing Section 401 certification of the Nationwide Permits. Staff also conducted document reviews and site visits to ensure surface water quality protection under the New Mexico Mining Act. EPA approved a new *State of New Mexico CWA §303(d)/§305(b) Integrated Report and List* in 2021, and the percentage of stream miles listed as impaired did not change from the previous edition.

4. Related to education and outreach, we organized a Data Sharing Network and held three workshops to share information on water quality data collection and assessment methods at the local and state levels. Four issues of the *Clearing the Waters* newsletter (www.env.nm.gov/surface-water-quality/newsletters) were published. The Surface Water Quality Bureau email list is slowly growing, at about 1,900 addresses at the end of the reporting period.

5. In ground water quality protection, NMED's Ground Water Quality Bureau (GWQB) issued seventeen New, Renewal, or Renewal and Modification Discharge Permits. GWQB also conducted a

water fair in Sandoval County where residents brought approximately sixteen well water samples for analysis of common pollutants such as nitrate.

6. Finally, to better cooperate with other agencies on water quality protection and improvement, staff from NMED's Watershed Protection Section attended nine soil and water conservation district (SWCD) board meetings, with two different SWCDs. Nonpoint source program staff also participated in two important statewide planning efforts: the Climate Action Team (Natural Resource Resilience subgroup) coordinated by the New Mexico Energy, Minerals, and Natural Resources Department, and the 50-Year Water Plan coordinated by the New Mexico Interstate Stream Commission. In addition, several other state and federal agencies provided information for the Report on their activities related to NPS pollution control in 2021.

The COVID-19 pandemic has continued to impact how we do our work, but we feel we have bounced back to some degree and have experienced positive improvements to business processes and modernization of communications because of the pandemic. Travel and field work, so necessary to foster collaboration and ensure success of on-the-ground projects, increased in 2021 but is not back to pre-pandemic levels. We are proud of our accomplishments despite this challenge and look forward to a more productive year as 2022 unfolds.

We thank you for your support of these efforts and look forward to working together to improve water quality and reduce nonpoint source pollution in New Mexico in the future. Should you have any questions about New Mexico's Nonpoint Source Management Program Annual Report please feel free to contact me (505-470-5018) or Abe Franklin of my staff (505-946-8952).

Sincerely,

Shelly Lemon Digitally signed by Shelly Lemon
Date: 2022.01.28 19:51:24 -07'00'

Shelly Lemon, Bureau Chief
Surface Water Quality Bureau

Cc: Kyla Chandler, State and Tribal Grants Project Officer, US EPA Region 6
Rachel Renz, Nonpoint Source Program, US EPA Region 6
John Rhoderick, Acting Director, NMED Water Protection Division
Abe Franklin, Program Manager, NMED Watershed Protection Section

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Executive Summary

Polluted runoff, or nonpoint source (NPS) pollution, is defined by United States Environmental Protection Agency (EPA) as "caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, streams, wetlands, coastal waters and ground waters." NPS pollution is the leading cause of water quality degradation in the United States and poses a substantial problem for the health of New Mexico's rivers, wetlands, lakes and streams.

When Congress amended the Clean Water Act (CWA) in 1987, Section 319 was added to provide federal leadership to assist states, territories and tribes in developing programs that address NPS pollution. Under Section 319, states, territories and tribes receive grant funding to support activities such as: outreach and education, training, watershed-based planning, implementation of best management practices (BMPs), and monitoring to assess implementation efficacy.

This annual report to the EPA is required by Section 319(h)(11) of the Clean Water Act. It provides an overview of Nonpoint Source Management Program related activities conducted in New Mexico from October 1, 2020 through September 30, 2021.

Towards the objective of **completing watershed-based plans**, EPA accepted a watershed-based plan for Willow Creek. This plan and EPA's acceptance letter are posted at www.env.nm.gov/surface-water-quality/wbp.

Towards the objective of **water quality improvement**, NMED submitted a NPS Success Story nomination on September 30 for San Antonio Creek in Valles Caldera National Preserve. The nomination provided compelling evidence that stream temperature decreased as a result of projects there, and EPA has since accepted the nomination. Three new on-the-ground projects that implement watershed-based plans, funded under Section 319, were developed and began. Four such projects were completed and are summarized in this report.

In the area of **water quality protection**, two new projects were developed and initiated to address impacts of wildfires in the Rio en Medio and Bear Creek watersheds. Staff reviewed fifty-six projects authorized by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act, and confirmed their consistency with the state's existing Section 401 certification of the Nationwide Permits. Staff also conducted document reviews and site visits to ensure surface water quality protection under the New Mexico Mining Act. A new *State of New Mexico CWA §303(d)/§305(b) Integrated Report and List* was completed in 2021, and the percentage of stream miles listed as impaired did not change from the previous edition.

With the objective of **sharing information on surface water quality**, a Data Sharing Network was organized and three workshops were held to share information on water quality data collection and assessment methods at the local and state levels. Four issues of the *Clearing the Waters* newsletter were published. The Surface Water Quality Bureau email list is slowly growing, at about 1,900 addresses at the end of the reporting period.

New Mexico's NPS Management Program includes aspects related to **protection of ground water** as well. In 2021, the Ground Water Quality Bureau (GWQB) issued seventeen New, Renewal, or Renewal and Modification Discharge Permits. GWQB also conducted a water fair in Sandoval County where residents brought approximately sixteen well water samples for analysis of common pollutants such as nitrate.

Executive Summary

To better **cooperate with other agencies on water quality protection and improvement**, staff from NMED's Watershed Protection Section attended nine soil and water conservation district (SWCD) board meetings, with two different SWCDs. Nonpoint source program staff also participated in two important statewide planning efforts: the Climate Action Team (Natural Resource Resilience subgroup) coordinated by the Energy, Minerals, and Natural Resources Department, and the 50-Year Water Plan coordinated by the Interstate Stream Commission. In addition, the Natural Resources Conservation Service, New Mexico Department of Game and Fish, New Mexico State Forestry Division, Bureau of Land Management, and five national forests provided information for the report on their activities related to NPS pollution control in 2021.

Introduction

This annual report to the United States Environmental Protection Agency (EPA) provides an overview of nonpoint source (NPS) management related activities conducted in New Mexico in federal fiscal year 2021 (October 1, 2020 through September 30, 2021) by the Watershed Protection Section (WPS) Surface Water Quality Bureau (SWQB) of the New Mexico Environment Department (NMED). The report presents the state's progress in meeting the milestones outlined in the goals and objectives of the New Mexico Nonpoint Source Management Program and provides information on reductions in NPS pollutant loading and improvements to water quality of New Mexico watersheds as required under Section 319(h)(11) of the Clean Water Act (CWA).

Most funding to support the New Mexico Nonpoint Source Management Program was provided through Section 319(h) grants awarded to NMED by EPA. Activities and projects reported are CWA Section 319 projects, and those implemented under the state-funded River Stewardship Program (RSP), the New Mexico Wetlands Program, CWA Section 401 activities, New Mexico Mining Act activities, and NPS projects implemented by other natural resource agencies outside of NMED.

Adair Spring, a hillslope spring, and the perennial flow downhill is a heavily used source during drought providing water for livestock and wildlife.

What is Nonpoint Source Pollution?

According to information from EPA at www.epa.gov/nps,

> NPS pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification. NPS pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters and ground waters.

Nonpoint source pollution can include:

- Excess fertilizers, herbicides and insecticides from agricultural lands and residential areas;
- Oil, grease and toxic chemicals from urban runoff and energy production;
- Sediment from improperly managed construction sites, crop and forest lands, and eroding streambanks;
- Salt from irrigation practices and acid drainage from abandoned mines;
- Bacteria and nutrients from livestock, pet waste and faulty septic systems;
- Atmospheric deposition and hydromodification.

As in most other states, NPS pollution is the leading cause of water quality problems in New Mexico.

Clean Water Act Section 319

NPS pollution is the leading cause of water quality degradation in the United States and poses a substantial problem for the health of New Mexico's rivers, wetlands, lakes, and streams. When Congress amended the CWA in 1987, Section 319 was added to provide federal leadership to assist states, territories and tribes in developing programs that address NPS pollution. Under Section 319, states, territories, and tribes receive grant funding to support the following activities: outreach and education, training, watershed-based planning, implementation of best management practices (BMPs), and monitoring to assess implementation efficacy. At the heart of the Section 319 program in New Mexico is working with stakeholders to seek solutions through collaboration in developing and implementing watershed-based plans that mitigate NPS pollution.

Bank Erosion Hazard Index (BEHI) training at Willow Creek as part of the Willow Creek Watershed-Based Planning project. Locations were chosen to evaluate the stream channel in areas where bank erosion was significant. Identified bank locations will be repeated each year by these trained individuals.

Section 319 contains three main strategies for addressing NPS pollution:

- Requires states to prepare assessment reports of their NPS pollution problems.
- Requires each state to develop a management program to control NPS pollution and improve water quality problems within the state.
- Creates a grant program to fund implementation of the management program for the assessment and control of NPS pollution.

New Mexico's NPS Management Program is described in the *New Mexico Nonpoint Source Management Plan* approved by EPA on August 1, 2019. The plan is available to review at www.env.nm.gov/surface-water-quality/nps-plan.

The NPS Management Program is supported largely by Section 319(h) grant funds. Recent years' funding awarded by EPA for New Mexico's NPS Management Program has been stable, with annual funds averaging $1.9 million in fiscal years 2014-2021, and increasing an average of one percent each year.

Clean Water Act Sections 303(d) and 305(b)

Two sections of the CWA designed to help understand both point sources and nonpoint sources statewide are Sections 303 and 305. Under Section 303(d), states are required to list all polluted surface waters in their jurisdiction which do not meet state water quality standards (also known as the impaired waters list). Under Section 305(b), states must publish a biennial report on the health of all surface waters. In New Mexico, the 305(b) report includes the 303(d) list and is referred to as the *State of New Mexico CWA Section 303(d)/305(b) Integrated Report* (*Integrated Report*, for short). Current and past Integrated Reports are available at www.env.nm.gov/surface-water-quality/303d-305b.

In New Mexico, the most common NPS impairments in streams are caused by (in order of prevalence, based on the *2020-2022 Integrated Report*) temperature, nutrients, *E. coli*, suspended or settleable solids (including turbidity and stream bottom sediments), and aluminum. In lakes and reservoirs, the most common water quality parameters in excess of water quality standards are mercury in fish tissue, polychlorobiphenyls (PCB's) in fish tissue, temperature, eutrophication (nutrient impacts), and dichlorodiphenyl-trichloroethane (DDT) in fish tissue.

These pollutants prevent designated uses from being fully supported in many of New Mexico's waters. Designated uses not fully supported in New Mexico's assessed rivers and streams (with the percentage not supporting in parentheses) include aquatic life uses (45%), primary and secondary contact (14%), wildlife habitat (2%), livestock watering (1%), irrigation (1%), and domestic water supply (1%). Most of these impairments are primarily or entirely caused by NPS pollution.

An abandoned vehicle left upside down in Mangas Creek, Grant County, and leaking gasoline into the flood waters when SWQB WPS staff arrived at the scene.

The majority of NPS pollution in New Mexico's streams is preliminarily attributed to (in order of prevalence) unidentified sources, unmanaged or improperly managed rangeland grazing, road and bridge runoff, on-site treatment systems (e.g., septic systems), streambank modifications and destabilization, waterfowl, wildlife other than waterfowl, and drought. The *2020-2022 Integrated Report* provides probable source summary information only for waters with Total Maximum Daily Loads (TMDL). No lakes in New Mexico had approved TMDLs when the *2020-2022 Integrated Report* was prepared, so pollutant source summaries for lakes are not provided.

New Mexico's Nonpoint Source Management Program

The overall, long-term goal of New Mexico's NPS Management Program is:

> *To implement an adaptive watershed-based restoration and protection program with the active assistance of stakeholders, for all watersheds within New Mexico, to meet and maintain water quality standards and designated uses of surface water, and to protect ground water resources.*

As lead agency for the management of NPS pollution, NMED coordinates activities within the state through the SWQB and the Ground Water Quality Bureau (GWQB). In accordance with the CWA, the SWQB has developed a Nonpoint Source Management Program planning document (NPS Management Plan). The current NPS Management Plan was approved by EPA in August 2019 and is available at: www.env.nm.gov/surface-water-quality/watershed-protection-section.

The NPS Management Program includes activities carried out by NMED staff to meet the objectives of the program and directs funding to support watershed-based planning projects, watershed-implementation projects, and RSP projects. The NPS Management Program also relies on established resource protection programs, national and state NPS pollution prevention programs, and activities of other land management and resource protection agencies to address NPS pollution. New Mexico identifies programs and activities that will facilitate the achievement of surface water quality standards, using a voluntary approach to implement water quality improvements.

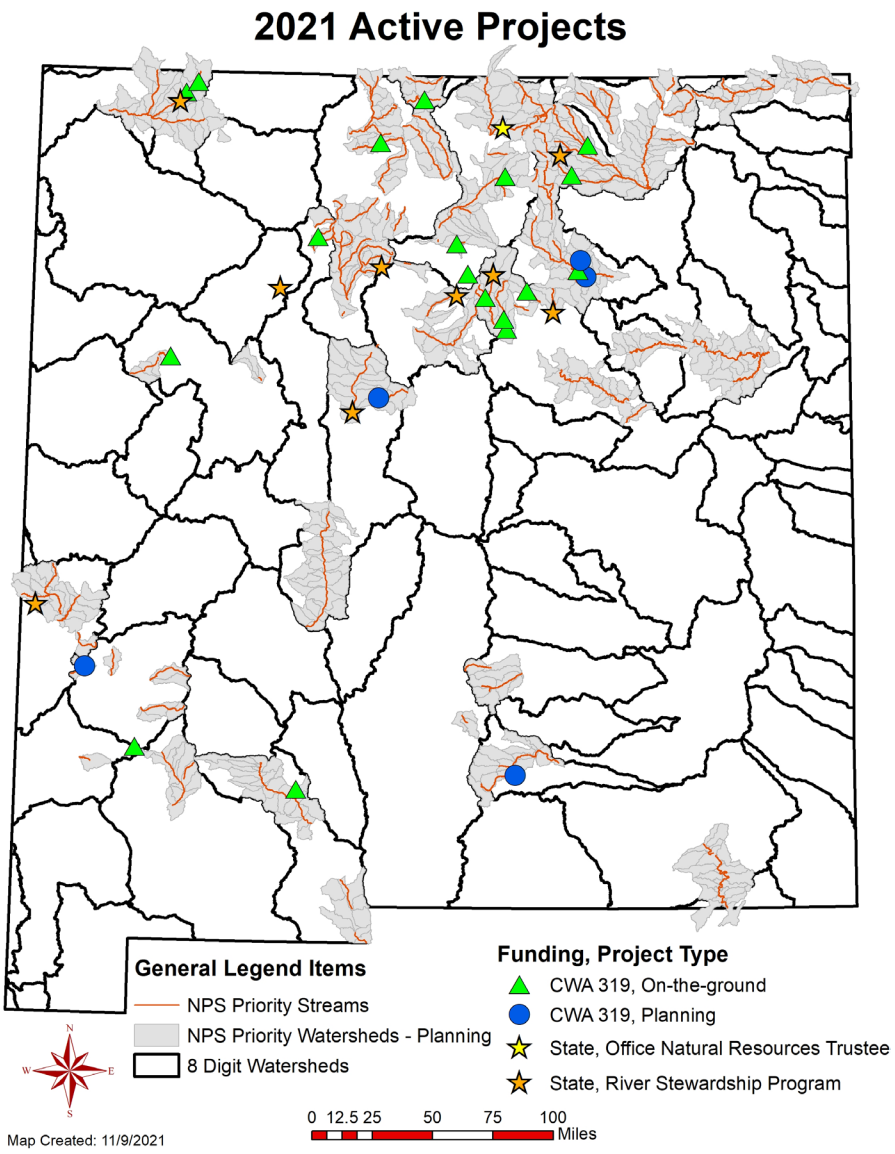

Figure 1: Section 319 and River Stewardship Program projects active in 2021.

NMED reports how CWA Section 319(h) funds and state matching funds are used, in EPA's Grants Reporting and Tracking System (GRTS). The funding is allocated to projects. Projects other than statewide projects are depicted in Figure 1, above.

Five tables below list projects in progress or completed in 2021, including staff activities, Section 319 funded watershed-based planning projects, Section 319 funded implementation projects, and state-funded projects. The tables include links to GRTS for more detailed information for each project. The available information includes contact information for project managers, project work plans, and (for completed projects) final project reports.

Staff Activities

Activities carried out by NMED staff in SWQB and the GWQB implementing the NPS Management Program statewide in 2021 are represented as projects in the following table. More information about work done under these projects is presented in sections below.

Table 1: Projects represented in GRTS describing staff activities, 10/1/2020 – 9/30/2021.

Grant Number	Project Number	Project Title	Project End Date	Section 319 Funds	State Funds	Summary Report
99610119	21-A	NEW MEXICO NON-POINT SOURCE MANAGEMENT PROGRAM FY 2021	06/30/2021	$950,173	$0	VIEW
99610119	21-B	GROUND WATER QUALITY BUREAU PROGRAMS FY 2021	06/30/2021	$133,365	$134,565	VIEW
99610119	22-A	NEW MEXICO NON-POINT SOURCE MANAGEMENT PROGRAM FY 2022	06/30/2022	$1,174,379	$0	VIEW
99610119	22-B	GROUND WATER QUALITY BUREAU PROGRAMS FY 2022	06/30/2022	$150,000	$150,000	VIEW

The budgets above for Projects 21-A and 21-B are actual funds spent. The budgets for Projects 22-A and 22-B are the projected expenditures (amounts in a work plan approved by EPA). Actual amounts that will be spent on Projects 22-A and 22-B may be lower due to vacancy savings and other reduced costs.

Watershed-Based Planning Projects

An important component of the NPS Management Program is the watershed-based plan (WBP) approach as outlined in the guidance provided in EPA's *Nonpoint Source Program and Grants Guidelines for States and Territories* (www.epa.gov/nps/319-grant-current-guidance). A WBP expands on the information provided in

a TMDL by identifying causes and sources of impairment, recommending management measures, estimating expected load reductions from management measures, providing methods to measure implementation success, estimating funding needs, and outlining potential education and outreach efforts. NMED supports watershed-based planning through a competitive subgrant process, conducted approximately every other year, and through technical support provided to partner agencies and stakeholder groups interested in water quality. WBP projects completed or in progress in 2021 are listed in Table 2 below. Project 16-G below is described in greater detail in the **NPS Management Program Problems and Concerns** section below. Completed WBPs and more information on watershed-based planning are available at www.env.nm.gov/surface-water-quality/wbp.

Table 2: Watershed-based planning projects completed or in progress, 10/1/2020 – 9/30/2021.

Grant Number	Project Number	Project Title	Project End Date	Section 319 Funds	Local Match	Summary Report
99610117	16-G	Watershed-Based Planning within the Upper Agua Chiquita Drainage Basin	11/28/2020	$37,960	$20,825	VIEW
99610118	18-E	Willow Creek Watershed-Based Planning Project	06/30/2021	$90,608	$65,022	VIEW
99610118	19-C	Sapello River Watershed-Based Plan	05/31/2022	$132,646	$88,855	VIEW
99610119	20-D	Upper Tijeras Creek Watershed-Based Plan	12/31/2021	$53,369	$65,826	VIEW
99610119	20-E	Wolf Creek Update to the Watershed-Based Plan for the Mora River – Upper Canadian Plateau	12/31/2022	$75,577	$55,562	VIEW

Watershed Implementation Projects

Through a combination of funding programs, partnerships, and education and outreach activities, New Mexico encourages interested parties to implement WBPs to control or reduce the degree of water quality impairments. The following table lists New Mexico's current and recently completed Section 319 watershed implementation projects.

Projects denoted by "Part 1," "Part 2," or "Part 3" indicate a single project funded by more than one Section 319 grant from EPA to NMED. Projects with "Phase" in their titles were developed and funded separately (under separate sub-grant agreements) from earlier projects completed in the same area. Project 19-D below is described in greater detail in the **NPS Management Program Problems and Concerns** section below.

Table 3: Section 319 Watershed Implementation Projects completed or in progress, 10/1/2020 – 9/30/2021.

Grant Number	Project Number	Project Title	Project End Date	Section 319 Funds	Local Match	Summary Report
99610117	17-T	Lower Animas Watershed-Based Plan Implementation Projects	12/31/2020	$229,644	$156,415	VIEW
99610117	17-W	Stream Restoration on the Upper Rio San Antonio	06/30/2021	$100,738	$0	VIEW
99610117	17-Y	Restoring the Rio Quemado Riverine Wetland on Los Potreros Open Space, in Chimayo, NM (Part 1)	06/30/2021	$15,179	$25,175	VIEW
99610117	17-Z	Watershed Project Implementation for the Mora River-Upper Canadian Plateau Phase 1B (Part 1)	06/30/2021	$3,167	$56,536	VIEW
99610117	17-AA	Rincon Arroyo Watershed Stabilization Project to Reduce *E. coli* loading to the Rio Grande (Part 1)	06/30/2021	$17,608	$5,978	VIEW
99610117	17-AB	Temperature and Erosion Reduction in Lower Cow Creek – Phase II (Part 1)	06/30/2021	$14,065	$29,242	VIEW
99610117	17-AC	Post Fire rehabilitation of the Bear Creek Watershed (Part 1)	06/30/2021	$7,503	$2,273	VIEW
99610117	17-AD	Post Fire Rehabilitation of the Rio en Medio (Part 1)	06/30/2021	$86,841	$33,430	VIEW
99610118	18-C	Temperature Reduction and Erosion Reduction in Lower Cow Creek	12/31/2021	$156,017	$104,200	VIEW

Table 3: continued

Grant Number	Project Number	Project Title	Project End Date	Section 319 Funds	Local Match	Summary Report
99610118	18-J	On-the-Ground Improvement Projects for the Upper Gallinas River and Porvenir Creek, Phase III	06/30/2022	$314,858	$209,950	VIEW
99610118	18-K	Lower Animas Watershed Based Plan Implementation Projects Phase 2	12/31/2021	$148,450	$102,000	VIEW
99610118	18-L	Dalton Canyon Creek Water Quality Improvement Project	06/30/2022	$199,561	$133,263	VIEW
99610118	19-D	Upper Rio Puerco Sediment and Turbidity Reduction Road Maintenance Workshops	05/31/2021	$0	$0	VIEW
99610118	19-H	Reynold Draw-Bluewater Creek Riparian Conservation Project	12/31/2020	$ 168,130	$120,745	VIEW
99610118	19-I	North Ponil Restoration Project (Part 1)	06/30/2022	$130,000	$87,036	VIEW
99610118	19-M	Watershed Project Implementation for the Mora River-Upper Canadian Plateau Phase 1B (Part 2)	06/30/2022	$62,703	$41,802	VIEW
99610118	19-N	Rincon Arroyo Watershed Stabilization Project to Reduce *E. coli* loading to the Rio Grande (Part 2)	06/30/2022	$189,700	$126,467	VIEW
99610118	19-O	Temperature and Erosion Reduction in Lower Cow Creek – Phase II (Part 2)	06/30/2022	$136,126	$90,751	VIEW

Table 3: continued

Grant Number	Project Number	Project Title	Project End Date	Section 319 Funds	Local Match	Summary Report
99610119	20-C	North Ponil Restoration Project (Part 2)	09/30/2023	$51,366	$34,390	VIEW
99610119	20-O	Reducing Fecal Waste in the Rio Fernando de Taos	12/31/2022	$47,891	$33,262	VIEW
99610119	20-P	Post Fire rehabilitation of the Bear Creek Watershed (Part 2)	12/31/2022	$146,439	$65,042	VIEW
99610119	20-Q	Restoring the Rio Quemado Riverine Wetland on Los Potreros Open Space, in Chimayo, NM (Part 2)	12/31/2023	$143,718	$81,097	VIEW
99610119	20-R	Watershed Project Implementation for the Mora River – Upper Canadian Plateau Phase IB (Part 3)	06/30/2023	$230,324	$103,710	VIEW
99610119	21-C	Rincon Arroyo Watershed Stabilization Project to Reduce *E. coli* loading to the Rio Grande (Part 3)	06/30/2023	$189,744	$132,256	VIEW
99610119	21-D	Temperature and Erosion Reduction in Lower Cow Creek – Phase II (Part 3)	06/30/2023	$64,343	$23,219	VIEW
99610119	21-E	Post Fire Rehabilitation of the Rio en Medio (Part 2)	12/31/2022	$85,847	$63,473	VIEW
99610119	21-F	Bonito Meadow Stream and Wetland Restoration Project, Phase 1	06/30/2024	$227,824	$194,227	VIEW
99610119	21-G	Bluewater Creek Riparian Improvement Project	12/31/2022	$189,300	$126,200	VIEW
99610119	21-H	Rio Nutrias Watershed-Based Plan Implementation Phase II	09/30/2023	$219,377	$310,950	VIEW

River Stewardship Program

A key part of the NPS Management Program is the state-funded RSP. The goal of RSP is to fund projects that enhance the health of rivers by addressing the root causes of poor water quality and stream habitat. In most recent years the New Mexico Legislature has appropriated capital outlay funds for RSP to design and construct projects that improve surface water quality or river habitat statewide and to provide state matching funds required by the terms of any federal grant under the Clean Water Act. Annual funding has ranged from $500,000 to $2,300,000. The Legislature appropriated $1,250,000 in funds for state fiscal year 2021 and $1,500,000 for FY 2022, and reauthorized $252,613 in older unspent funds (now designated as FY 2021 funds) which are available to support new RSP projects. In 2021, a Request for Proposals (RFP) was released and several new RSP projects are in development under the RFP. Table 4 below lists New Mexico's current and recently completed RSP projects.

Project 20-K below was amended in 2021 to increase the amount of work done in a larger project area, with the support of $149,784 in additional funds from the Office of Natural Resources Trustee (ONRT). These funds are being contributed as a result of a Natural Resources Damage Assessment and Restoration (NRDAR) settlement between ONRT and Fronk Oil, to address natural resource damages resulting from a 2016 tanker truck accident which resulted in petroleum products entering the Cimarron River. NMED and ONRT entered into a Memorandum of Agreement (MOA) to outline how these funds would be spent, and NMED and the Cimarron Watershed Alliance amended their contract for this project to add the additional work and funds.

Table 4: River Stewardship Program (RSP) projects completed or in progress, 10/1/2020 – 9/30/2021.

Grant Number	State Funding Code	Project Number	Project Title	Project End Date	State Funds	Summary Report
99610119	A19D2428	20-F	Adair Spring Restoration	06/30/2023	$57,848	VIEW
99610119	A19D2428	20-G	Riparian Restoration in Torreon Wash Watershed	06/30/2023	$174,113	VIEW
99610119	A19D2428	20-H	Valle de Oro National Wildlife Refuge Unit 2 Wetland Development and Water Quality Improvement Project	06/30/2023	$160,000	VIEW
99610119	A19D2428	20-I	Animas River Habitat Enhancement and Bank Stabilization Project	06/30/2023	$138,324	VIEW
99610119	A19D2428	20-J	Wetland and Stream Restoration of Lower Jaramillo Creek	06/30/2023	$227,493	VIEW

Table 4: continued

Grant Number	State Funding Code	Project Number	Project Title	Project End Date	State Funds	Summary Report
99610119	A18C2273 & TRN-ONRTCIM	20-K	Restoration of Trout Habitat on the Cimarron River	01/31/2023	$454,066	VIEW
99610119	A18C2273	20-L	Rewinding the Gallinas River in the City of Las Vegas – Phase II	06/30/2022	$457,494	VIEW
99610119	A19D2428	20-M	Santa Fe River – East Alameda Rain Garden and Camino Escondido Zuni Bowls	06/30/2023	$167,342	VIEW
99610119	A19D2428	20-N	Pecos River Cowles Restoration Project	06/30/2023	$281,119	VIEW

Red River Aquatic Habitat Restoration Project

In 2018, the New Mexico ONRT and NMED signed a Memorandum of Agreement for WPS to manage an aquatic habitat restoration project on the Red River within the municipal limits of the Village of Questa. EPA and ONRT authorized the costs of this project to be reported as match to Section 319 grants. The project's basic information is represented in the following short table:

Table 5: Red River Aquatic Habitat Restoration Project.

Grant Number	State Funding Code	Project Number	Project Title	Project End Date	State Funds	Summary Report
99610118	SWQONRRRIV	19-F	Red River Aquatic Habitat Restoration Project	06/30/2023	$1,211,974	VIEW

A more comprehensive listing of Section 319, RSP, and other state-funded projects is available at: www.env.nm.gov/surface-water-quality/watershed-protection-section.

This project list contains links to project pages with detailed information including project work plans and (for completed projects) final reports.

NPS Management Program Accomplishments in 2021

NMED seeks to meet the long-term goal of the NPS Management Program with specific actions described in the NPS Management Plan taken over approximately a five-year period. The NPS Management Plan includes at its core six objectives aimed at reducing and preventing NPS pollution in New Mexico: **1) Complete WBPs to Enable Effective Implementation, 2) Improve Water Quality, 3) Protect Water Quality, 4) Share Information on Surface Water Quality, 5) Protect Ground Water Quality, and 6) Cooperate with other Agencies on Water Quality Protection and Improvement**. With each objective is a list of activities necessary to achieve the objective and verification milestones used to evaluate whether objectives have been attained. Milestones are an integral part of the NPS Management Program and a requirement under Section 319(b)(2)(c) of the Clean Water Act. The six program objectives and corresponding milestones from the NPS Management Plan are listed below, along with reports of progress made in federal fiscal year 2021 (October 1, 2020 through September 30, 2021). Use of italics below indicates text cited directly from the NPS Management Plan. Non-italics text is used to provide progress for 2021.

Objective 1 – Complete WBPs to Enable Effective Implementation

To produce WBPs that meet all nine elements identified in the **Nonpoint Source Program and Grants Guidelines for States and Territories*, and acceptable alternatives to WBPs, for an average of three priority watersheds per year.***

Objective 1 Verification Milestones and Reports of Progress

- *In 2019 through 2023, at least one WBP per year, covering at least one priority watershed each, will be supplemented, updated, or completed, and accepted by the EPA as meeting the nine elements of WBPs.*

  EPA accepted one WBP as meeting the requirements of the Nonpoint Source Program and Grants Guidelines for States and Territories in 2021. The WBP is for Willow Creek in the larger Gila River basin, and covers one priority watershed. This plan and EPA's acceptance letter are available at www.env.nm.gov/surface-water-quality/wbp.

  A Solicitation for Applications (SFA) for new WBP projects began in 2021 and only one project application was received. The application was being evaluated at the end of the reporting period. That only one application was received is discussed further in the **NPS Management Program Problems and Concerns** section below.

- *Development of an index to use Recovery Potential Screening (RPS) to prioritize watershed-based planning projects will be reported in the NPS Annual Report for 2020. (Recovery Potential Screening is described in depth at www.epa.gov/rps.)*

  A report of NMED's use of RPS was provided in the earlier NPS Annual Report for 2020.

- *One or more streams are included within assessment category 5-alternative, as a result of cooperative WBP completion by WPS, MASS, and stakeholders, by 2022.*

  Early work began in 2019 to develop a WBP for American Creek, within the Cimarron River watershed, for impairments identified there during the 2016-2017 Upper Canadian water quality survey. The WBP is primarily an in-house project carried out by SWQB staff, with support from the Cimarron Watershed Alliance as a component of Project 19-I listed in Table 3 above.

  NMED staff drafted a WBP for American Creek, a tributary of the Cimarron River, in 2021. The watershed is comprised of private property owned by three ranches and public land managed by the New Mexico Department of Game and Fish. NMED staff reached out to all owners and managers of land in the watershed to outline the effort, visited some of their properties, sought review of the draft WBP from all of them, and received comments from all of them. If successful, the WBP will outline the most effective means of reducing loading of aluminum and *E. coli* so that American Creek can meet its water quality standards. NMED plans to complete this WBP in early calendar year 2022.

- *An inventory of watersheds covered by WAPs and an associated GIS coverage (posted on the SWQB mapper web site at https://gis.web.env.nm.gov/oem/?map=swqb) is completed, to update the list of priority watersheds for implementation, in 2019.*

  This work was completed in an earlier reporting period. The result is available to review in the Surface Water Quality Bureau mapper linked above, in a new group called "Wetland Action Plans."

- *A post-fire response plan or project work plan that qualifies as a WBP alternative will be submitted to EPA within two years of any major wildfire occurring in the watershed of one or more streams with a coldwater or cool water aquatic life designated use and a fire severity that falls outside the natural range of variability for the affected forest types.*

  The fire season in 2021 was relatively unimpactful, with a few large fires in the Gila and Lincoln National Forests that were fairly normal for the forests where they burned.

  NMED completed contracting for post-fire rehabilitation projects to address some impacts from the Medio Fire (near Santa Fe) and Tadpole Fire (near Silver City), which both burned in 2020. The work plans for these projects contain the planning elements required for EPA to have approved them. Both projects began in March 2021, and are listed in Table 3 above.

- *Watershed plans include information from major land owners and land management agencies, and all states, Indian nations, pueblos, and tribes, within their planning areas.*

  The WBP completed in 2021 was completed thorough a stakeholder involvement process that involved the main public lands management agency, area residents, and user groups (most notably fly fishers). The watershed covered by this plan is not near any other states, Indian nations, pueblos, or tribes.

Objective 2 – Improve Water Quality

Effective watershed-based NPS restoration programs are implemented, using multiple funding sources, in identified priority watersheds at an average of three new watersheds per year.

Objective 2 Verification Milestones and Reports of Progress

- *Water quality conditions are improved in one priority watershed annually in 2019 through 2023 because of projects or improvements in land management funded or encouraged by New Mexico's NPS Management Program. Some actions leading to this water quality improvement likely will have been initiated before 2019.*

  NMED's Effectiveness Monitoring coordinator completed an analysis of temperature data from San Antonio Creek in the Valles Caldera National Preserve and concluded that water quality improved as a result of a series of projects conducted there and management changes instituted by the Preserve. He drafted a NPS Success Story nomination and submitted it to EPA on September 30, and EPA headquarters accepted it on October 20. It is now posted on EPA's NPS Success Stories web page.

  Type 1 NPS Success Stories require an official impairment delisting associated with NPS projects or improved watershed management, and Type 2 Success Stories are for "waters that show progress toward achieving water quality goals," and can be based on evidence of water quality improvement without a de-listing. The San Antonio Creek Success Story would be a Type 2 Success Story.

  The Effectiveness Monitoring Coordinator is considering Cold Springs Creek in southern New Mexico as a potential Type 1 Success Story, based on mine reclamation and a draft delisting for cadmium following assessment of water quality data collected in 2020.

  More information about NPS Success Stories, including New Mexico's past NPS Success Stories, is available at www.epa.gov/nps/success-stories-about-restoring-water-bodies-impaired-nonpoint-source-pollution.

  Table 6: Stream assessment units and highlights of WPS Effectiveness Monitoring in 2021 to determine the effects of restoration projects on water quality, primarily stream temperature unless otherwise indicated.

Assessment Unit	Notes
Bluewater Creek (Perennial prt R San Jose to Bluewater Rsvr)	Continued baseline bracketing of the new project on Bluewater Heritage ranch downstream of reservoir, and canopy cover monitoring including densiometer EMAP method training for cooperators. Re-started post-restoration monitoring at two sites on state land upstream of reservoir to follow up on the trend of improvement from prior Success Story.

Table 6: continued

Assessment Unit	Notes
Comanche Creek (Costilla Creek to headwaters)	Rio Grande Cutthroat trout re-introduction area, continued monitoring at eight previous sites following the recent deepening of pools which is expected to have significant effects.
Holman Creek (Comanche Creek to headwaters)	Monitoring the effects of the Keyline design Wetlands project on two subwatersheds.
Jaramillo Creek (East Fork Jemez to headwaters)	Follow up on potential temperature improvements after good vegetation growth, to follow up on trend of improvement identified in Success Story.
La Jara Creek (East Fork Jemez to headwaters)	Post-implementation monitoring at three sites: above, middle, and below restoration reach.
Rio de las Vacas (Rio Cebolla to Clear Creek)	Continued post-treatment monitoring following mixed results for vegetation growth.
Rito Penas Negras (Rio de las Vacas to headwaters)	Continued post-treatment monitoring following mixed results for vegetation growth.
Rio de los Pinos (New Mexico reaches)	Post-implementation monitoring after more recent installation of rock structures in the state land.
San Antonio Creek (VCNP bnd to headwaters)	Post-implementation monitoring in support of 2021 Success Story nomination.
Redondo Creek (Sulphur Creek to VCNP bnd)	Post-implementation monitoring following refurbishing and expansion of exclosures.

- *Begin implementation of watershed restoration projects described in WBPs or WBP alternatives to reduce NPS pollutant loads within two priority watersheds per year in 2019-2023.*

  This milestone was met again in 2021. A Solicitation for Applications (SFA) for projects that implement WBPs, funded with Section 319 watershed project funds, was released in November 2020. Three new projects (Projects 21-F, 21-G, and 21-H listed in Table 3, above) began in June 2021 as a result. One of the new projects (21-F) implements a WBP and a Wetlands Action Plan, which according to the NPS Management Plan is a WBP alternative.

- *Report on the use of RPS to prioritize watershed implementation projects in the NPS Annual Report for 2020.*

  WPS used RPS in the SFA that was conducted in 2020, and reported on this in the NPS Annual Report for 2020.

- *Water quality improvements are documented in each NPS Management Program Annual Report.*

  Water quality improvements are documented in the sections **NPS Pollutant Load Reduction Reporting**, **Summaries of Section 319 Projects Completed in 2021**, and **Summaries of River Stewardship Program Projects Completed in 2021**, below.

- *The NMED Construction Programs Bureau provides a summary of activities related to use of the Clean Water SRF to protect or improve water quality for each NPS Management Program Annual Report.*

  The Clean Water State Revolving Fund (SRF) FY 2021 Intended Use Plan (IUP) available at www.env.nm.gov/construction-programs/cpb-forms-and-documents-2 lists five projects intended for funding, and three or four of them have relatively strong nonpoint source pollution reduction aspects. For example, a project with the Village of Eagle Nest for sewage lagoon remediation would "return the lagoon that is adjacent to Eagle Nest Lake back to its natural habitat." This project can be expected to reduce nutrient loading to Eagle Nest Lake, which is currently listed in the *Integrated Report* as impaired by nutrients. The Quemado Mutual Domestic Water Consumers Association would be awarded funding to "address problems with the existing lagoon system, including relocating to outside of the floodplain." This lagoon system is near the Rio Grande del Rancho, which is currently listed in the Integrated Report as impaired by dissolved oxygen, temperature, specific conductance, and *E. coli.* In addition to the projects listed in the FY 2021 IUP, The City of Anthony amended loan agreement CWSRF 067 for additional funding for the Adams Park & South Anthony Arroyo Multi-purpose Regional Flood Control Facility. This project addresses multiple issues including sediment buildup, trash deposits, and oil separation. Additionally, the City of Santa Fe acted on a FY 2020 application for stormwater management with the Santa Fe Riverbank Stabilization project. This project came about after *E. coli*, and elevated levels of aluminum, nitrogen, and phosphorus, as well as heavy sediment, were identified within the Santa Fe River.

  A priority ranking system for point source and NPS projects is also available at the link above. The criteria make clear that NPS projects are eligible for funding. The Construction Programs Bureau receives fewer applications specifically for NPS projects than for traditional eligibilities, but the numbers are increasing. As New Mexico experiences increased flooding and fire events, more communities are becoming aware of the need to be proactive in this arena. Fundamentally, the SRF is a loan program and NPS projects do not typically have a dedicated revenue stream to pay for projects, resulting in fewer funded projects.

Objective 3 – Protect Water Quality

The quality of surface water resources is maintained through coordinated activities, permitting programs, and technical assistance provided to assist cooperating agencies and landowners with efforts to understand water quality and protect surface waters from NPS pollution.

Objective 3 Verification Milestones and Reports of Progress

- *NMED will document procedures for SWQB to enforce regulations at 20.6.2 NMAC pertaining to refuse in a watercourse in 2019.*

  In the previous reporting period (2020), NMED staff developed a draft Standard Operating Procedure (SOP) for responding to complaints related to surface water quality, including complaints of refuse disposed in watercourses. The SOP is rather complex, in part because relevant regulations are not limited to those at 20.6.2 NMAC. Also, several situations occur where state regulations not specific to surface water quality, or local regulations, apply and other parts of NMED or local agencies often should be consulted in developing appropriate responses to complaints. The SOP includes multiple processes that would be better addressed in separate dedicated SOPs. The SOP is currently in revision and review by the Point Source Regulation Section staff in the Surface Water Quality Bureau, and a serviceable version may be complete in 2022.

- *The NPS Annual Report will include a summary of actions taken to prevent and abate disposal of refuse in watercourses.*

  SWQB was contacted by a Santa Fe County resident that was concerned about a neighbor's dumping of goat manure in an arroyo adjacent to their property. SWQB visited the site and determined that the dump site was not located in a watercourse and recommended that the concerned property owner contact Santa Fe County that has an ordinance that pertains to manure.

  SWQB was contacted by a resident in Arroyo Hondo that had concerns of an upstream neighbor that was utilizing various materials to divert Lobo Creek. The SWQB provided New Mexico water rights guidance to the concerned resident. The SWQB also informed the U.S. Army Corps of Engineers (the Corps) of the possible unauthorized diversion in Lobo Creek which initiated a site visit to the property that had been allegedly diverting water from the creek. The Corps determined there was no violation because the water was seeping from a hillside and was not considered jurisdictional.

  The Village of Ruidoso notified NMED and the Corps of large concrete debris in the Rio Ruidoso from the failure of a slurry wall. NMED and the Corps met on site in August and the Corps issued a notice of violation. This was resolved with removal of the debris after this reporting period.

  SWQB received a phone call from a concerned person regarding a potential spill involving fertilizer pellets impacting the Animas River. SWQB quickly coordinated with NMED's Drinking Water Bureau for them to coordinate with the local water utility in case water intake valves would need to be temporarily closed. SWQB also coordinated with the San Juan SWCD staff who had fortuitously been on the Animas River that day sampling water quality. It turned out that the suspected "fertilizer pellets" were actually just organic matter and organic debris (small leaf litter, twigs, etc.) from a large storm event the night before.

  Following a concern first reported in the 2020 Annual Report, SWQB staff collected water quality samples in 2021 from Frolic Creek. Frolic Creek is a small tributary to Moreno Creek just above Eagle Nest Lake and is potentially impacted by the Klondyke Mine. Results from

the sampling are still pending quality assurance and quality checks, however preliminary results indicate pH values within the normal range – a good first indicator of water quality with respect to dissolved metals and acid mine drainage which can be a concern at unreclaimed mines.

SWQB received a phone call from a property owner in La Mesilla (near Española) who was concerned about old cars, furniture, appliances, dead trees, and a septic system on a neighbor's property close to an acequia. SWQB coordinated with NMED Environmental Health Bureau to resolve the septic concern and the Solid Waste Bureau regarding the proper disposal of old items.

SWQB staff made a site visit to Ranchos de Taos to address a concern involving the disposal of green waste. No green waste was observed in the Rio Grande del Rancho. SWQB also followed up with Taos County to assist with outreach with respect to the County's composting and mulching plan which may help property owners manage their green waste.

SWQB responded to a concern regarding an algae bloom on a small pond connected to Coyote Creek by an acequia in Guadalupita. Portions of Coyote Creek at Guadalupita are impaired due to nutrients which can contribute to algae blooms. The Coyote Creek watershed is a planning priority for non-point source management and the development of a WBP. The site visit and follow-up email provided an opportunity for outreach and engagement regarding potential future projects.

SWQB was contacted regarding an asphalt disposal site in Las Vegas. SWQB staff coordinated with GWQB staff and SWB staff before visiting the property of concern. Solid Waste Rules include reclaimed asphalt as a type of clean fill which must be covered with 2 feet of clean earth and not be placed in a watercourse or adversely impact the environment. Although a full review of compliance was not undertaken, the site did not represent disposal of refuse in a watercourse and no compliance issues were evident.

SWQB received a phone call from a property management company in Santa Fe asking how to dispose of "pond muck" that had accumulated in their stormwater ponds. The City was able to provide guidance and SWQB was able to clarify that the material cannot be disposed of in the arroyo due to potential stormwater contaminants that may have accumulated and be present in the pond muck.

SWQB received a phone call of concern regarding grazing above Sitting Bull Falls in Eddy County. Past water quality improvement in Sitting Bull Creek is one of New Mexico's NPS Success Stories (https://www.epa.gov/nps/success-stories-about-restoring-water-bodies-impaired-nonpoint-source-pollution). The 2006 and 2016 SWQB water quality surveys and assessments determined that all designated uses were in full support. SWQB is monitoring Sitting Bull Creek again in 2021-2022.

A property owner on Mangas Creek reported that a vehicle had been left upside down in the creek, leaking gasoline. SWQB staff visited the site and confirmed that the Grant County Sheriff's Department would have the vehicle impounded.

The Point Source Regulation Section responded to a complaint of construction debris in an arroyo in Santa Fe. A driller had not kept their cuttings and other materials on site. Well-drilling regulations were applicable to this problem. SWQB coordinated with the Office of the State Engineer for the clean-up of the site.

- *Within two years of any major wildfire occurring in the watershed of one or more streams with a coldwater or cool water aquatic life designated use, with severity outside the natural range of variability for the affected forest types, NMED will fund post-fire actions that reduce sedimentation and protect aquatic habitat, with support of Section 319 watershed project funds.*

  This milestone was met in 2021. NMED developed projects to address the Medio Fire (in the Rio en Medio watershed in Santa Fe County) and the Tadpole Fire (in the Bear Creek watershed in Grant County). These fires occurred in 2020, and the projects began in March 2021. More information is available on each project through the summary links provided for Projects 20-P and 21-E in Table 3 above.

- *A summary of CWA Section 401 certification activity will be reported annually in the NPS Management Program Annual Report.*

  The purpose of CWA Section 401 is to ensure that federally issued permits and licenses, including CWA Section 404 permits authorized by the Corps for the discharge of dredged or fill material into waters of the United States, comply with State water quality standards. The Corps generally issues three kinds of permits in New Mexico: Standard Individual Permits (IPs), Nationwide Permits (NWPs), and Regional General Permits (RGPs). The most commonly used permit is the NWP which covers a wide range of activities that generally have no more than minimal individual and cumulative adverse environmental effects. SWQB ensures that these permits comply with State water quality standards by either granting certification with or without conditions, denying certification which prohibits the federal permit or license from being issued, or waiving certification which allows the permit or license to be issued without comment. The NWPs and RGPs must be re-issued every 5 years along with re-issued 401 certifications.

  Most of the Section 401 work in 2021 (aside from participating in all of the rule making processes and staying up on all of the rule changes) was in reviewing projects covered by NWPs. In 2021, WPS staff reviewed fifty-six projects (up five from 2020) and confirmed their consistency with the state's Section 401 certification of the 2017 NWPs. Several projects under existing Letters of Permission (LOPs) and RGPs were also reviewed by WPS staff. There were no Individual Permits in 2021. SWQB re-issued the Water Quality Certification for RGP 16-01 Utility Line Maintenance in 2021. Other notable CWA events in 2021 included the Corps' decision to "decline to rely on" SWQB's 401 certification of the 2020/2021 NWPs, changes to the definition of Waters of the U.S. (WOTUS), changes to the 401 Rule, and changes to the Corps' Regional Conditions. Read on for more details.

  On February 12, 2021 the Corps notified SWQB that they would "decline to rely on" the 401 certification that SWQB issued for the 2020/2021 NWPs. The reason for this decision was the inclusion of a reopener statement which said "NMED reserves the right to amend or revoke

this conditional CWA Section 401 Certification for the Nationwide Permits, if necessary, to ensure compliance with the State's water quality standards and water quality management plan." Past 401 certifications included this language; However, the new 401 Rule (more on that below) said that certifying authorities could not unilaterally modify a certification after it is issued, and therefore the Corps declined to rely on it (effectively rejecting it). This decision means that SWQB is now required to issue separate, individual 401 certifications for projects covered by the 2020/2021 NWPs rather than use the single, "blanket" 401 certification that was intended to cover all projects covered by the NWPs. Fortunately, the Corps went forward with issuing only 16 NWPs in early 2021. These NWPs are mostly energy-related, and are not commonly used. NMED's 2017 water quality certification for the other NWPs remains in effect until the spring of 2022.

Certifying authorities were provided the opportunity to "reconsider" certifying 41 NWPs that the Corps did not reissue in 2021. SWQB revised and re-issued the 2020/2021 water quality cert on October 14, 2021. SWQB removed the reopener statement and made other minor revisions. SWQB has not heard back on the status of this certification, mainly because the 401 Rule was vacated one week later on October 21st.

On August 30, 2021, the U.S. District Court for the District Court of Arizona in Pasqua Yaqui Tribe v EPA remanded and vacated the Navigable Waters Protection Rule (NWPR). The NWPR had redefined WOTUS to exclude ephemeral water bodies which greatly shrunk the number of federally protected waters, particularly in semi-arid states like New Mexico where ephemeral arroyos are prominent. The District Court found "fundamental, substantive flaws that cannot be cured without revising or replacing the NWPR's definition" and accordingly remanded and vacated the rule. The EPA and the Corps had already announced their intent to revise the WOTUS definition on June 9, 2021. The ruling means EPA and the Corps revert to implementing the 1986 regulation along with guidance from two Supreme Court Decisions, Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers (SWANCC), and Rapanos v. United States (Rapanos) in 2001 and 2006, respectively. New Mexico had been party to a different lawsuit filed by a coalition of 16 other states asking for a preliminary injunction of the NWPR.

On October 21, 2021, a U.S. District Court vacated EPA's Section 401 Rule. The rule had greatly reduced the authority of certifying agencies to certify federal licenses and permits. The judge wrote, "the rule's inconsistency with the purpose of the statute it interprets... supports vacatur." New Mexico was a plaintiff in the case along with a coalition of 21 attorneys general, Native American tribes, and environmental groups. The authority of states and tribes to certify federal licenses and permits is provided under Section 401 of the Clean Water Act. The EPA, on May 27, 2021 had already announced its intent to revise the Section 401 Rule "to strengthen the authority of states and Tribes to protect their vital water resources." The 1971 401 Rule returns and remains in effect until the rule is revised.

Perhaps relatively minor in comparison to other changes in the CWA world, there were substantive changes to the Corps' 2021 Regional Conditions where the Corps removed conditions that previously required applicants with certain projects to coordinate with state agencies.

Projects in intermittent and perennial streams, under the 2017 Regional Conditions, had been required to notify NMED of their projects so that NMED could "confirm" that the proposed project was consistent with the 401 certification. Removing this condition has not yet had a real affect since the 2020 401 certification was "declined" and the 2017 Regional Conditions still apply to the 2017 NWPs and the 2017 water quality certification, but it could affect future agency coordination. The Corps also removed a Regional Condition that required applicants of projects located in "Special Status Waters" to coordinate with the New Mexico Department of Game and Fish (NMDGF).

- *A summary of activities related to the New Mexico Mining Act will be reported annually in the NPS Management Program Annual Report.*

  A separate section below summarizes the Mining Act activities carried out under the NPS Management Program in 2021.

- *A summary of significant developments related to ONRWs will be provided in the NPS Management Program Annual Report.*

  At least three wildfires burned in watersheds with ONRWs in 2021. These were on lands managed by the United States Forest Service (USFS). While fire is a natural disturbance process in southwestern forests, USFS often considers some aspect of a larger fire event to constitute an emergency (e.g. when human life or infrastructure are threatened) and initiates suppression activity.

  The Antidegradation Policy in New Mexico's water quality standards at 20.6.4.8 NMAC allows for short term water quality degradation in ONRWs "[w]here an emergency response action that may result in temporary and short-term degradation to an ONRW is necessary to mitigate an immediate threat to public health or safety…" In these situations, 20.6.4.8 NMAC requires "the discharger [to] notify the department of the emergency response action in writing within seven days of initiation of the action" and "within 30 days of initiation of the emergency response action, the discharger shall provide a summary of the action taken."

Figure 2: The Rincon Fire on June 16, 2021, Santa Fe National Forest

On May 27, the Gila National Forest provided a notification of actions planned to suppress the Johnson Fire, which on May 25 had grown to 7,300 acres in the watersheds of several ONRWs in the Gila Wilderness. A subsequent report submitted on August 16 indicated that hand-construction of firelines, helicopter water drops, construction of twenty-two helicopter landing spots (helispots), and improvement of two existing helispots had been implemented to facilitate suppression of the fire, which had grown to 88,918 acres on July 23. The Gila National Forest cited Minimum Impact Suppression Tactics Guidelines to describe BMPs used to minimize impacts from these actions, including removing flagging from access trails, restoring firelines with dug out soil and duff, and placing dirt water bars about every fifty feet on firelines.

On June 24, the Santa Fe National Forest provided a notification of potential water and fire retardant drops planned to suppress the Rincon Fire, which burned in the watersheds of four ONRWs in the Pecos Headwaters and Sapello River watersheds. Ultimately, this fire burned fewer than 1,000 acres, and the Santa Fe National Forest did not report on suppression activities later.

A third fire, the Three Rivers Fire, burned around 6,000 acres in the watershed of Three Rivers Creek, an ONRW in a rugged part of the White Mountain Wilderness in the Lincoln National Forest. The Lincoln National Forest did not notify NMED of this fire or report on any emergency response actions that may have been taken.

No projects requiring Section 404 permit coverage in ONRWs were implemented in 2021.

Figure 3:
View downstream in the upper Three Rivers watershed, May 16, 2021, following the Three Rivers Fire, Lincoln National Forest

- *A summary of federal consistency review under NEPA will be reported annually in the NPS Management Program Annual Report.*

NMED's environmental review coordinator in the Office of the Secretary receives most re-

quests for comments on National Environmental Policy Act (NEPA) documents, forwards them to the NMED bureaus, and applicable bureaus usually prepare comments. The coordinator compiles the comments and submits them to the requesting agency.

In federal fiscal year 2021, NMED submitted comments on approximately 31 projects. SWQB contributed to approximately 23 of these comment letters. Most of the SWQB comments were standard statements informing project proponents of the need to comply with Sections 402 and 404 of the Clean Water Act, and providing more background to assist them in doing so. Some SWQB comments also provide a summary of applicable water quality standards. WPS contributed project-specific recommendations relevant to nonpoint source pollution control to six of the SWQB comments. Apparently no NEPA documents were developed for permitted grazing in the watersheds of high quality coldwater, coldwater, and coolwater streams in the reporting period.

WPS also provided substantial early input to several projects. Some projects funded by Section 319 or the River Stewardship Program require NEPA clearance, and NEPA processes proceeded accordingly in 2021. The Gila National Forest began the NEPA process for a restoration project in the Black Canyon watershed described in a WBP, and the three northern national forests completed a blanket Environmental Assessment for Riparian, Aquatic, and Wetland Restoration.

- *A summary of activities related to forest restoration will be reported annually in the NPS Management Program Annual Report.*

  NMED continued to participate in the state Forest and Watershed Restoration Act (FAWRA) program managed by New Mexico State Forestry. No new projects with a riparian or wetland focus were developed in 2021, but several projects which may prevent water quality degradation were authorized. More information about FAWRA, including a list of projects selected for FY 2021 funding, is available at www.emnrd.nm.gov/sfd/forest-and-watershed-restoration-act-fawra. Additional effort by the Forestry Division in the area of forest restoration is summarized below in the section, Additional Management Measures Implemented by Non-NMED Agencies.

- *The biennial State of New Mexico CWA §303(d)/§305(b) Integrated Report and List will provide summaries of water quality survey activity, analysis, and conclusions in 2020 and 2022. The NPS Annual Report for these years will provide the percentage of assessed stream miles or watersheds designated as impaired, for comparison with previous years.*

  The 2020-2022 *Integrated Report* was completed in the reporting period. It was approved by the New Mexico Water Quality Control Commission (WQCC) on December 18, 2020 and by EPA on January 22, 2021.

  Of 7,835 miles of streams with assessment status provided in the 2018-2020 *Integrated Report*, 4,091 (52%) were classified as impaired (Category 4 and 5 waters). Of 8,657 miles of streams with assessment status provided in the 2020-2022 *Integrated Report*, 4,525 (52%) are classified as impaired. The main reason the number of stream miles reported increased is that

the earlier report was based on National Hydrography Dataset (NHD) Medium Resolution surface drainage network and waterbodies, and the more recent report is based on NHD Plus High Resolution data.

Current and previous versions of the *Integrated Report* are available at www.env.nm.gov/surface-water-quality/303d-305b/.

- *A summary of activities and accomplishments under the Wetlands Program will be provided in each NPS Management Program Annual Report.*

  This summary is within the Wetlands Program section below.

- *At least one project outlined in a WAP supported with Section 319 watershed project funds will begin by 2021.*

  This milestone was met in 2020, and again in 2021. This year, a new project called the "Bonito Meadow Stream and Wetland Restoration Project, Phase 1" Project 21-F in Table 3, above began, in June 2021. It implements both the Cimarron River WBP and the Cimarron Watershed WAP. The project is listed as Project 21-F (with a link to more information) in Table 3 above.

  WAPs were an eligible type of plan (a WBP alternative) in the SFA carried out in 2021.

- *The NMED Construction Programs Bureau will provide a summary of activities related to the use of the Clean Water SRF to protect or improve water quality for each NPS Management Program Annual Report.*

  This information is reported above under **Objective 2 (Improve Water Quality)**.

Objective 4 – Share Information on Surface Water Quality

General public awareness of NPS pollution and water quality is increased and maintained through an effective education and outreach program using strategically selected educational resources available throughout the State.

Objective 4 Verification Milestones and Reports of Progress

- *SWQB will organize a data sharing network to solicit external data, meeting data quality standards, that will be assessed in the State of New Mexico CWA §303(d)/§305(b) Integrated Report and List for 2022-2024. The data collected by non-NMED partners will be submitted in 2021.*

  A Data Sharing Network organized in 2020 was invited to attend Data Sharing Network workshops in 2021. Three workshops were conducted via Webex, on January 20, January 26, and February 2, with an average of thirty-one people attending each. The agenda was the same for each workshop, and included the following main topics:

Topic	Presenter
SWQB Section 303(d) / 305(b) Integrated Report and Assessment Process	Heidi Henderson, SWQB
Quality Assurance Requirements and Resources	Miguel Montoya, SWQB
Using Citizen Science to Impact the 303(d) List Development	Shannon Romeling, Amigos Bravos
New Mexico Water Data Initiative	Stacy Timmons, New Mexico Bureau of Geology and Mineral Resources
San Juan and Animas Rivers Bacteria and Nutrients Monitoring	Melissa May and Alyssa Richmond, San Juan Soil and Water Conservation District / San Juan Watershed Group
Has water quality changed?	Daniel Guevara
Opportunities to submit data (schedule for the next 303(d) / 305(b) Integrated Report)	Heidi Henderson

Resources such as presentations and guidance documents were provided to all attendees after the workshops, at https://cloud.env.nm.gov/water/?r=7549&k=98cfe2b2a2.

SWQB then issued a "call for data," advertised via the main SWQB email list and the Data Sharing Network list. Ten external (non-NMED) organizations submitted data, and seven of these had participated in the Data Sharing Network. Three of the seven were used in the draft 2022-2024 *Integrated Report*. Several remaining submittals may be used in the 2024-2026 *Integrated Report*, pending resolution of details in the submittals.

- *Watershed groups will address water quality problems as indicated by verification items listed above [related to WBP completion and implementation], accurately drawing on information resources for which the SWQB is responsible.*

  Milestone was met. The WBP completed in 2021 accurately summarizes the listing status, TMDLs, and water quality data available for the Willow Creek watersheds. Also, the three new watershed implementation projects that began in 2021 were based on applications submitted by various stakeholders including watershed groups, in which the applicants correctly cited the current *Integrated Report*, TMDLs, WBPs, and other program information resources maintained by SWQB.

- *The SWQB email list, used for various surface water quality informational purposes (including distribution of Clearing the Waters), is maintained above 2,000.*

  Milestone not met. Near the beginning of the reporting period, the list had 1,802 addresses. At

the end of the reporting period, the list had increased to 1,897 addresses. Although this email list still falls short of the goal of 2,000 addresses, it has shown slight increases each year since 2014. People can add themselves to the list by clicking a button at the bottom of the main bureau web page, which links to https://public.govdelivery.com/accounts/NMED/subscriber/new?topic_id=NMED_4.

- *Clearing the Waters will be published quarterly with an email circulation of at least 2,000.*

  Clearing the Waters (www.env.nm.gov/surface-water-quality/newsletters) was published on October 26 2020, February 12 2021, April 30 2021, and August 12 2021. The anchor articles for each issue were:

  - On-the-Ground Improvement Projects for the Mora River-Upper Canadian Plateau
  - Wildlife-Friendly Fencing and Stream Restoration
  - The Unique Hydrology and Management Challenges in Karst Wetlands
  - Post-fire Watershed Stabilization Projects

  The distribution for each issue included approximately 1,850 on the SWQB email list.

- *Educational opportunities provided for the public and private sector, and completed small publication projects, will be reported in the NPS Management Program Annual Report.*

  WPS staff provided very few outreach and education activities in 2021, mainly because of the COVID-19 pandemic. Staff have attended plenty of on-line meetings for other reasons, but outreach is generally more effective in person and COVID safety guidelines for state employees greatly reduced both the opportunities (i.e., there were fewer events) and NMED attendance or participation.

  A WPS staff member attended a "STEM Showdown" event for high school students, in the field at Rio Mora National Wildlife Refuge, to discuss her Science, Technology, Engineering, and Mathematics (STEM) career path and careers like hers at NMED for watershed protection. The goal of the 15 STEM Showdown events were to increase interest in STEM fields of study or careers in northern New Mexico middle and high school students, and to demonstrate other New Mexicans in STEM fields.

  WPS Wetlands Program staff gave a presentation "Wetland Restoration Techniques for Carbon Sequestering Headwater Slope Wetlands" via Zoom to graduate students at Highlands University on April 7, 2021.

  Wetlands Program staff also shared a table with the Quivira Coalition at the Santa Rosa County Fair on July 31, 2021, where they provided information (e.g. discussion, pamphlets, maps) on wetlands conservation and the Santa Rosa WAP in development. Through this engagement they obtained historical data that was previously unknown and increased the number of local stakeholders engaged in the project.

  No small publication projects were completed during the year. Existing literature (brochures, etc.) was typically provided via email or other electronic means rather than in a printed format.

Objective 5 – Protect Ground Water Quality

The quality of ground water resources is maintained through the water fair and water-quality outreach program along with permitting and compliance assistance for large capacity septic tank leachfields with efforts to understand water quality and protect ground water from NPS pollution.

Objective 5 Verification Milestones and Reports of Progress

- *The GWQB will report to EPA-Region 6 in the Semi-Annual Report summarizing GWQB activities conducted under the CWA Section 319 grant for the New Mexico Water Fair and Water Quality Outreach Program and Permitting and Compliance for Large-capacity Septic Tank Leachfields.*

  The Ground Water Quality Bureau (GWQB) works to protect ground water quality from NPS pollution attributed to large capacity septic tank and leachfield systems (septic systems) and septage disposal facilities, sludge disposal facilities, and land farms (surface disposal facilities). Technical personnel in GWQB review state Discharge Permit applications, prepare and issue Discharge Permits, perform compliance assistance activities for permittees, and enforce Discharge Permit requirements for septic systems and surface disposal facilities. From October 1, 2020 through September, 30, 2021, GWQB issued seventeen New, Renewal, or Renewal and Modification Discharge Permits.

  Residents of New Mexico primarily rely on ground water for drinking water, and in some locations ground water is the only available source of drinking water. Since many communities are concentrated in river valleys where ground water is shallow, their drinking water supplies are susceptible to contamination from NPS pollution. To identify possible NPS water quality problems in rural New Mexico communities, GWQB conducts free testing of domestic wells ("Water Fairs") throughout the state. In 2021, GWQB conducted one water fair, receiving approximately 16 water samples. The Water fair was conducted in Sandoval county. Water Fairs were curtailed after mid-March of 2020 because of COVID-19 precautions and this was the first one back with more to follow.

  The GWQB is up-to-date in semi-annual reporting to EPA in GRTS.

Objective 6 – Cooperate with other Agencies on Water Quality Protection and Improvement

With assistance provided by the WPS and other SWQB programs, federal and State agencies in New Mexico actively manage a variety of natural resources to protect and restore water quality.

Objective 6 Verification Milestones and Reports of Progress

- *A Memorandum of Agreement (MOA) to allow NMED to fund on-the-ground restoration projects on United States Forest Service (USFS) managed land will be drafted and under review by NMED and USFS by December 2019. The MOA will be signed and effective by December 2020.*

This milestone was not met. WPS completed a revised draft MOA in the previous reporting period. The draft agreement underwent several revisions during this reporting period and was still in review by NMED administrative staff and the Forest Service at the end of the reporting period.

- *The Memorandum of Understanding (MOU) between NMED and the Southwestern Region of the USFS, scheduled to expire in 2022, will be renewed.*

  This milestone is scheduled after the October 1, 2020 – September 30, 2021 reporting period.

- *The MOU between NMED and the BLM New Mexico State Office, which does not have a termination date, will be reviewed and revised if appropriate, and implemented. The resulting activities will be reported in the NPS Annual Report.*

  The BLM submitted summaries of activities related to water quality management and nonpoint source pollution control in the section **Additional Management Practices by Non-NMED Agencies** below.

- *The grant from the DOE that currently supports the work of the DOE Oversight Bureau will be re-issued in 2023.*

  This milestone is scheduled after the reporting period for this report.

- *The summary of activities and accomplishments under the Wetlands Program provided in each NPS Management Program Annual Report will include a description of the Wetlands Roundtable meetings.*

  See the **Wetlands Program** section below for a description of the Wetlands Roundtable meetings.

- *For each year starting in 2019 and through 2023, NRCS will report that agricultural BMPs funded under NWQI or other conservation programs have been implemented during the calendar year and will provide sufficient details to enable WPS staff to estimate pollutant load reductions for water quality impairments identified by the State.*

  NRCS staff reported during a State Technical Committee meeting on August 26, 2021 and in subsequent communication that $157,649 in NWQI funds were obligated in federal fiscal year 2021, compared with $989,346 obligated in 2020, and $398,382 in 2019. Contracts obligated prior to federal FY 21 had practices planned and implemented in FY 21 totaling $456,348.

  NRCS currently identifies two types of NWQI watersheds: implementation watersheds and planning watersheds. Three watersheds draining to the Animas River are classified as implementation watersheds. These are Tucker Canyon – Animas River (140801041003), Estes Arroyo – Animas River (140801041004), and Flora Vista – Animas River (140801041005). Two watersheds draining to the Rio Grande in Doña Ana County are classified as planning watersheds. These are the Picacho Drian – Rio Grande (130301020608) and Vado Arroyo – Rio Grande (130301020803) watersheds.

NRCS provided a description of recent work implemented under NWQI, in the section **Additional Management Practices by Non-NMED Agencies** below. The work was implemented in the Picacho Drain and Vado Arroyo watersheds noted above, using funds obligated in previous fiscal years. Funds were obligated in FY 2021 for work to be done in FY 2022 or later, in the Animas River watershed.

Most of the work reported by NRCS reduces pollutant loading to surface water by reducing runoff and erosion. WPS staff used the Revised Universal Soil Loss Equation (within the EPA Region 5 model spreadsheet) to estimate pollutant load reductions for a set of practices implemented in 16.2 acres of pecan orchard in the Picacho Drain – Rio Grande watershed. The practices include installation of a sprinkler system (to replace flood irrigation), no-till cover crop establishment, nutrient management, and irrigation water management. The cover crop and its residue and attendant benefits were assumed to be present in twelve months per year when the acres were previously relatively barren and susceptible to erosion from flood irrigation, overwatering, and precipitation. The practices were assumed to be implemented on a 0.5% slope 400 feet long. The practices reduced sediment loading by approximately 1.3 tons per year, phosphorus by 2 lb/yr, and nitrogen by 4 lb/yr. Soil is typically made up of about 1% viable bacteria. If 0.1% of those bacteria are *E. coli* (which have a mass of about 1×10^{-12} gram each), then the sediment load reduction equates to approximately 1.2×10^{13} colony forming units (CFU) per year of *E. coli* load reduction. This result averages about 3.2×10^{10} CFU per day, about 0.1% of the load reduction goal in the TMDL of 2.5×10^{13} CFU per day at moderately high flows (around 534 cubic feet per second, based on data from 1966-2006).

Additional coordination would result in more accurate estimates of pollutant load reductions, for additional practices

- *The NPS Annual Reports for 2019 through 2023 will include information about the Farm Service Agency's (FSA's) riparian buffer sub-program within the Conservation Reserve Program (CRP) and report on any efforts to coordinate on future projects.*

  Once in August and again during the preparation of this report, NMED reached out to FSA to make progress on this item. The New Mexico FSA CRP Program Specialist is the same person now as during the preparation of the NPS Management Plan. She clarified that the "sub-program" is actually a Conservation Practice, CP-22, Riparian Buffers, under Continuous CRP. In New Mexico, there are currently 420 acres enrolled in Continuous CRP in New Mexico under this practice. The locations of the enrolled acres are not public information because it is considered Personally Identifiable Information and like many programs administered by USDA require a Freedom of Information Action request. The CRP Program Specialist also expressed interest in knowing more about New Mexico's water resources and where in New Mexico future efforts to recruit applicants would be appropriate. Two action items were identified for 2022: 1) NMED will request number of enrolled CRP acres under CP-22 per 12-digit HUC; and 2) NMED will plan a meeting with FSA to review NPS Management Program priority watersheds for watershed-based planning and implementation. From this information exchange and discussion, additional actions may be identified to include CRP in watershed-based plans (under WBP element d, which includes "sources and authorities that will be relied upon to

implement this plan") and for FSA to target new areas for outreach.

A fact sheet for CP-22 is available at www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/FactSheets/2015/CRPProgramsandInitiatives/Practice_CP22_Riparian_Buffer.pdf.

- *SWQB attendance at SWCD meetings will increase, and each year starting in 2019 the NPS Annual Report will include at least one profile of a project intended to protect or improve water quality implemented by an SWCD or SWCD clients.*

  SWQB attended nine SWCD board meetings, with two different SWCDs, in 2021. This compares with six meetings of three SWCDs in 2020. Both SWCDs are among the eight whose jurisdictions, because they contain most of New Mexico's assessed stream miles, are identified as priorities in the NPS Management Plan.

- *By 2022, NMED will fund at least one competitively awarded water quality or aquatic habitat improvement project with an SWCD with which NMED has not had an agreement within the previous ten years.*

  This milestone was apparently met in 2019, with the approval of a project with Cuba SWCD (see the 2019 NPS Annual Report for details). However, as described in the **NPS Management Program Problems and Concerns** section below, Cuba SWCD did not implement the project, so this milestone has effectively *not* been met.

  A project with Ciudad SWCD approved in January 2020 did not qualify for meeting this milestone because NMED had funded an earlier project with Ciudad SWCD in 2013-2016. One of the eight SWCDs listed as a priority in the NPS Management Plan submitted an application for funding in 2021, for a project that was not funded. WPS will reach out to this SWCD in 2022 to provide feedback on their application and increase their chances of success in the future.

- *Statewide planning efforts related to water resources will give serious consideration to water quality protection and restoration and convey accurate summaries of information generated by SWQB programs.*

  WPS staff continue to contribute to the Climate Action Team (CAT) as part of the Natural Resource Resilience (NRR) subgroup. The Climate Change Task Force was initiated by Gov. Michelle Lujan Grisham's 2019 Executive Order and has ten interagency Climate Action Teams responsible for proposing, planning, and implementing strategies to reduce greenhouse gas emissions and enhance New Mexico's ability to adapt to climate change (www.climateaction.state.nm.us). In 2020, goals were set to reduce the impacts of fire on water quality and increase resiliency to climate change. Ahead of the curve, SWQB has been involved with reducing wildfire risks to water quality going back to at least 2000 (see the 2000 NPS Annual Report here: www.env.nm.gov/surface-water-quality/nps-annual-reports and the Gallinas Watershed Riparian Enhancement Project), so this milestone was readily met in 2020 with the funding of two new post-fire restoration projects which are discussed elsewhere in this report (see projects 20-P and 21-E in Table 3, above). Additional CAT goals and actions SWQB is working on include collaborating across state agencies on topics that include floodplain man-

agement, low impact development, watershed and wetland planning and restoration projects that address increasing resiliency, monitoring water quality for trends associated with climate changes such as increasing surface water temperatures, reforestation, and looking to the future with the state's 50-Year Water Plan. For a final highlight, a Climate Risk Map for New Mexico (https://nmclimaterisk.org/) was also made available this year with contributions from many state agencies and support from the University of New Mexico.

WPS staff are also participating in the New Mexico Interstate Stream Commission's collaborative planning effort to develop a 50-Year Water Plan as directed by Governor Lujan Grisham. The 50-Year Water Plan will address how New Mexico will provide flexibility in managing water resources and infrastructure into the future as the state adapts to extreme weather conditions instigated by a changing climate. NMED staff participated in a watershed and habitat subgroup to develop a resiliency matrix for communities and the general public to assess the resiliency of their watershed and habitats to climate change, and ultimately inform the development of adaptation strategies for the 50-Year Water Plan. Further, NMED staff participated in webinars, forums, and other subgroups to provide additional information on the anticipated impacts to surface water quality and resiliency strategies for successful restoration projects in a changing climate. The 50-Year Water Plan is scheduled to be complete in 2022.

- *The NPS Management Program Annual Report will be submitted to EPA by January 31 and will be made available to the public by early February, each year.*

  The 2020 NPS Annual Report was submitted to EPA on January 29, 2021. It is available to the public at www.env.nm.gov/surface-water-quality/nps-annual-reports/.

- *A revised plan describing the New Mexico NPS Management Program will be submitted by the Governor of New Mexico, or by the Governor's designee, to the EPA Regional Administrator, in 2024. The plan will reflect input and review by implementing agencies and organizations.*

  Effort on a new NPS Management Plan is scheduled to commence in 2022.

NPS Pollutant Load Reduction Reporting

Section 319(h)(11) of the Clean Water Act requires each state to report to EPA on an annual basis "reductions in nonpoint source pollutant loading," as a component of the Nonpoint Source Management Program Annual Report. EPA and NMED use GRTS to implement this reporting requirement. Pollutant load reduction estimates reported by NMED for January 1, 2021 through December 31, 2021 are available on line at https://tinyurl.com/NM-2021-Load-Reductions. This reporting will be complete by March 31, 2022, the deadline set by EPA.

Summaries of Section 319 Projects Completed in 2021

Lower Animas Watershed Based Plan Implementation Projects (17-T)

Project Cost $229,644 (Section 319 funds) and $156,414.55 (matching funds)

The headwaters of the Animas River originate in southwestern Colorado in the San Juan Mountains. In New Mexico, the lower Animas river flows through the towns of Aztec, Flora Vista and Farmington before its confluence with the San Juan River in Farmington. Water quality issues over the years have included nutrients, *E. coli,* temperature and turbidity and a recent new listing in 2020 for total dissolved lead. Work on this project was conducted by the San Juan Soil and Water Conservation District (SJ SWCD) and was the first 319 funded project to be completed since the Lower Animas Watershed Based Plan was approved by the EPA in 2016.

This project consisted of the following components:

Knowlton Arroyo stabilization at the Lower Animas Irrigation Ditch Siphon Crossing – A sediment fence was installed to reduce bank erosion and a headcut was stabilized using two cross-vane type structures in order to reduce sediment loading and to protect the ditch crossing which is one of three drinking water sources for the City of Aztec as well a major irrigation source for the community.

Ranchman's-Terrel Diversion Improvement and Riparian Restoration – prior to this project, each year a bulldozer was used to create a cobble push-up dam to back up water to the diversion headgate which contributed to a reoccurring disturbance to the channel and riparian area. This project provided the design and the materials for an improved, permanent rock cross-vane structure. The SJ SWCD leveraged additional funding from the USBOR and The Nature Conservancy to comply with NEPA and for construction costs. The SJ SWCD also coordinated funds from the USFWS to install a PIT-Tag monitoring system for endangered fish at the new diversion and additional NRCS funds were used to improve the headgate. Furthermore, County and SJ SWCD funds were used to remove invasive plants and replant native riparian vegetation in the project area.

Photo left; Construction phase at the Ranchman's-Terrel Diversion Improvement and Riparian Restoration site.

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Lower Animas Watershed Based Plan Implementation Projects (17-T)

Photo above; First year after completion of the Bandy Ranch Riparian Fence, Filter Strip, and Streambank Stabilization.

Bandy Ranch Riparian Fence, Filter Strip, and Streambank Stabilization – this project component constructed a riparian filter strip between an agricultural field and the Animas River to help capture and reduce nutrient runoff. A livestock exclusion fence was also installed to help restore the streambank while at the same time the fence did not compromise the cattle's main source of water. Forty cottonwood poles were planted with over 70% survival rate after the first year.

Four Corners Equine Rescue Manure Management – 45-50 horses are kept at this 5-acre horse rescue that is within 500 feet of the Animas River. This project successfully constructed two impervious dry stack waste storage facilities and reduced bare ground in animal walkways by elevating them with woodchips.

Low-Impact Development, Green Infrastructure, and Water Harvesting – 39 attendees learned how to improve stormwater management by creating a vegetated basin adjacent to a road that would routinely pond with water during the summer monsoon season.

Additional Completed Project with Match Funding – the SJ SWCD also helped 5 different landowners with exclusion fencing, pasture improvements, and soil conservation projects that helped support riparian buffers, soil retention, and protect water quality.

Photo right; Four Corners Equine Rescue Manure Management in action.

Stream Restoration on the Upper Rio San Antonio (17-W)

Project cost: $100,738 (Section 319 funds)

The Rio San Antonio is located in Rio Arriba County and the Carson National Forest and flows east out of the volcanic subalpine forests of the Southern Rockies. The river runs into San Antonio Mountain and turns north to join with the Rio de Los Pinos and ultimately the Rio Grande in Colorado before flowing south back into New Mexico. The Rio San Antonio (Montoya Canyon to headwaters) is currently listed as impaired due to elevated surface water temperatures, *E. coli*, and total recoverable aluminum. The Total Maximum Daily Load (TMDL) for the Rio San Antonio lists probable sources of impairment which include rangeland grazing, flow modification, removal of riparian vegetation and streambank destabilization. A 2017 stream assessment conducted by WildEarth Guardians concluded that the health of the system had been severely jeopardized by the removal of beaver. Google Earth Imagery from 2016 shows a robust complex of beaver dams which was reduced some time shortly after to a single beaver pond when the 2017 assessment was made. Functioning beaver ponds help slow water velocities, store and filter sediment and nutrients, build fertile floodplains, attenuate flooding, increase hyporheic flow, and support riparian vegetation.

Stream restoration work was carried out by Rio Grande Return and included:

- 2 riparian exclosures totaling 4 acres
- More than 1,000 willow whips and 50 cottonwood poles planted within the exclosures
- 1 headcut stabilized with a rock grade control structure
- 20 post-assisted log structures (PALS) along 1.5 miles of stream
- 10 beaver dam analogues (BDAs) along the same 1.5 miles of stream

Photo above; Rio San Antonio post-assisted log structures from 2020.

Photo right; Rio San Antonio beaver dam analogue from 2020.

In time, the riparian exclosures will allow willows and cottonwoods to grow above the grazing and browsing height of cattle and elk, providing increased shade and lower temperatures for Rio Grande Cutthroat Trout. Utilizing Low-Tech Process-Based restoration techniques such as BDAs and PALs will support natural stream processes by increasing structural complexity of the Rio San Antonio.

Willow Creek Watershed-Based Planning Project (18-E)

Project cost: $90,608 (Section 319 funds), $65,022 (Match)

Natural Channel Design, Inc. (NCD) developed a WBP for the Willow Creek Watershed to identify solutions to the stream's water quality problems. Presently, Willow Creek (Gilita Creek to headwaters) does not meet its water quality standards for total recoverable aluminum and stream temperature. The Willow Creek watershed, which includes Willow Creek and Little Turkey Creek, is located high in the Mogollon Mountains in the headwaters of the Gila River and is home to the threatened Gila trout (*Oncorhynchus gilae*). Willow Creek's water quality standards are designated as high quality coldwater aquatic habitat.

The 2006 Bear Fire and 2012 Whitewater-Baldy Fire burned over most of the watershed. Post-fire runoff has caused an increase in erosion leading to increased sediment, and therefore aluminum, in the creek. These wildfires combined with post-fire flooding have also significantly reduced canopy cover in the riparian zone which likely is the major factor in the stream temperature problem. A stream assessment of Willow Creek and its tributaries was conducted which included measurements of stream geomorphology, bank erosion, channel stability, and canopy cover.

The assessment found that the average site canopy cover measurements range from 0 to 93% with an overall watershed average canopy cover of 26%. Temperature probes found that stream temperatures exceeded both

Table 5. SSTEMP results for vegetation density changes needed to meet temperature standards.

	SSTEMP Vegetation Density Results				
	Current Estimate of Vegetation Density (%)	Vegetation Density (%) Required to Reduce Temp. below 73°F	% Change from Current	Vegetation Density (%) Required to Reduce Temp. below 68°F	% Change from Current
Upper Willow Creek	10	30	***+20***	55	***+45***
South Fork Willow Creek	10	10	***0***	35	***+25***
Willow Creek at TC Confluence*	75	na		na	
West Fork Little Turkey Creek	10	30	***+20***	65	***+55***
East Fork Little Turkey Creek	10	35	***+25***	60	***+50***
Little Turkey Creek	10	20	***+10***	70	***+60***
Lower Willow Creek	25	45	***+20***	95	***+70***

* at this location, the model estimates that the stream temperature would not exceed 68°F

Table 5 taken from Willow Creek WBP, NCD used Stream Segment Temperature Model (SSTEMP) which demonstrates how channel geometry, discharge, orientation, and shading affect the temperature of a stream reach and aids understanding in how changes in these variables may reduce the thermal load of the creek. The model estimates that both temperature standards can be met by increasing vegetative cover.

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Willow Creek Watershed-Based Planning Project (18-E)

the maximum temperature criterion for cold water streams of 73°F and the "4T3" criterion of 68°F at least once during the 2017 and 2018 recording period.

For the bank erosion assessment, the stream channels were evaluated using the Bank Erosion Hazard Index (BEHI) and by estimating Near-Bank Stress (NBS). Approximately 4.2 miles of streambanks in the Willow Creek Watershed have a BEHI value of High, Very High, or Extreme indicating areas with significant bank erosion. The BEHI and NBS data were used in the Bank Assessment model to predict streambank erosion rates. The model predicts that the total bank erosion in the Willow Creek Watershed is 11,845 tons/year. The model also estimates that if all the eroding banks with a BEHI greater than moderate were repaired to a moderate level, bank erosion would be reduced by 6,089 tons/year. This would result in 104 tons/year reduction in aluminum loading to the stream.

A range of canopy cover from 0 to 93% across six cross sections.
Photo above; XS 15 has 0% canopy cover.
Photo below; XS 8 has 92.5% canopy cover.

Stream temperature modeling estimates that both temperature criteria can be met by increasing vegetative cover. The model shows that lower Willow Creek will require the largest increase in vegetative density followed by lower Little Turkey Creek to meet standards. The model estimates that the maximum temperature standard can be met by increasing vegetative density to 45% (a 20% increase) for lower Willow Creek and increasing to 20% (10% increase) for lower Little Turkey Creek. A much larger increase, as much as a 70% increase, is needed to meet the 4T3 standard. More than 15 proposed practices that are aimed at reducing bank erosion and stream temperatures in the Willow Creek Watershed were described. The practices utilize native materials and focus on maintaining stable stream dimensions and floodplain access to reduce shear stress. Temperature reductions will primarily be accomplished by planting willows which will increase shading. Many of the proposed practices also reduce aluminum loading and improve fish habitat.

Reynold Draw-Bluewater Creek Riparian Conservation Project (19-H)

Project cost: $168,130 (Section 319 funds) and $120,745 (local match)

Bluewater Creek flows out of the Zuni Mountains in Cibola County. It is impounded at Bluewater Lake, then picks up flow from springs as it flows through Bluewater Canyon below the reservoir. Where the canyon opens up, Bluewater Creek enters the Bluewater Heritage Ranch, and about a mile downstream of the ranch boundary the creek is diverted to irrigate private lands downstream of there. In dry times, the creek does not quite reach this diversion point. This project focused on the upper reaches of Bluewater Creek within the Bluewater Heritage Ranch.

Example pole planting at Bluewater Heritage Ranch.

The perennial portions of Bluewater Creek below Bluewater Reservoir do not meet their coldwater aquatic life designated use because of excessive nutrients and temperature. TMDLs were developed for these parameters, and the area is covered in the Rio Puerco WBP. Bluewater Creek on the Bluewater Heritage Ranch represents the final reaches of perennial water with truly aquatic habitat including beaver dams, riparian and wetland plant species, fish, and other riparian-dependent wildlife. Bank erosion, sediment and nutrients from the watershed, and lack of shade from an absence of larger cottonwoods contribute to the water quality problems. The Nielson Family Limited Partnership, which owns the Bluewater Heritage Ranch, implemented this project to address some of these issues.

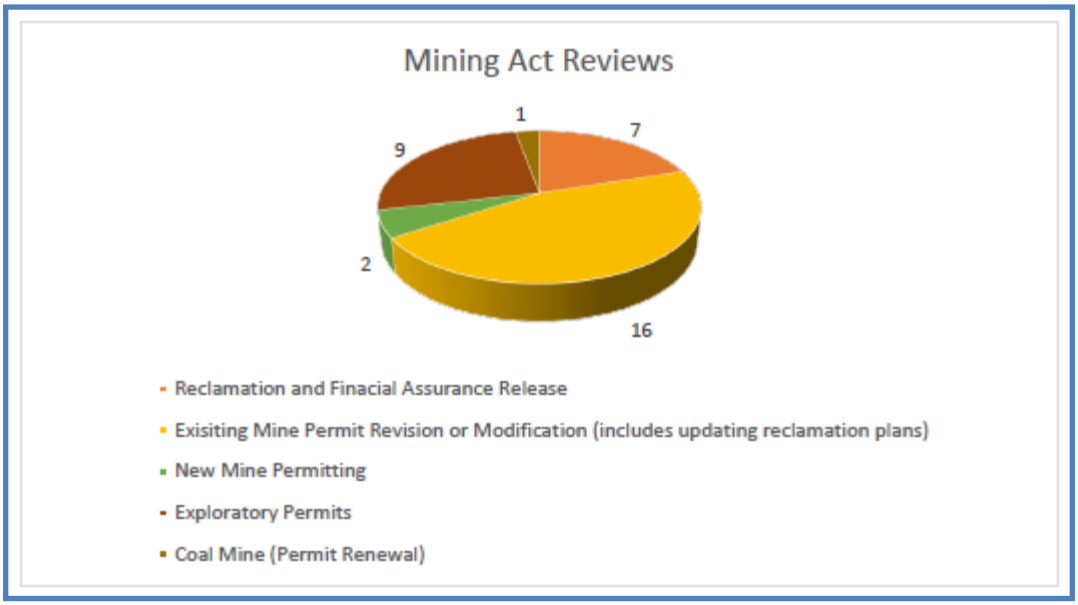
NANISE Native Plants and Education planted 200 narrowleaf cottonwood poles and 100 Gooding's willows for the Nielson Family Limited Partnership and protected them by surrounding each planting with a wire cage approximately three feet in diameter secured by three t-posts and baling wire. Just under half of the plantings survived the extremely dry and warm conditions of 2020. Rangeland Hands addressed drainage and erosion issues on 6.33 miles of ranch road with road relocation out of valley bottoms, grade stabilization near stream crossings, and drainage work such as installation of rolling dips. RiverSource set up a network of photo monitoring stations using the Picture Post method developed at Oklahoma State University, and collected drone video. The final report, accessible via a link in Table 3 above, includes links to photo monitoring data and several drone videos. One video that gives a good sense of the project area and some of the completed work is at https://youtube/U-JgP3SraDA.

Example rolling dip. Rolling dips direct flow off of low-standard rural roads, reducing erosion of the road's surface and reducing delivery of sediment and nutrients to adjacent landscapes.

New Mexico Mining Act

The New Mexico Mining Act obligates the New Mexico Environment Department (NMED) to review and comment on various applications associated with non-coal mining in New Mexico. Proposed actions range from recreational mining (such as panning for gold) to large mine and mill operations. For minimum-impact exploration applications or modifications of existing exploration permits, NMED is provided an opportunity for formal comment. For new mining operations, NMED is responsible to "certify that water quality standards are expected to be met" and to determine that the proposed post-mining closeout plan will "achieve compliance with all applicable air, water quality and other environmental standards if carried out as described." For modification of existing operations, NMED has the opportunity to concur with proposed permit changes.

NMED has a Mining-Act team that includes representatives from SWQB, GWQB, and the Air Quality Bureau (AQB) to review mining applications and otherwise support the work of the New Mexico Mining and Minerals Division (MMD) of the Energy, Minerals, and Natural Resources Department (EMNRD). This work involves reviewing applications, site inspections, hydrologic interpretations, and evaluating water quality standards against proposed mining activities. SWQB discusses Best Management Practices (BMPs) and other mitigation measures with MMD in an effort to implement mining plans that prevent or minimize environmental risks. The team's written comments often include conditions necessary to ensure compliance with both state and federal environmental standards. The team also participates in meetings and reviews documents in collaboration with EMNRD, New Mexico Department of Game and Fish (NMDGF), USFS, New Mexico State Land Office (SLO), the Corps, EPA, and others.



During the October 1, 2020 to September 30, 2021 reporting period, SWQB staff reviewed and submitted comments on thirty-five Mining Act submissions from MMD. The majority of mining permit activity this year was for revisions or modifications to existing permits.

In Northern New Mexico, SWQB staff reviewed mining permits related to four humate mining operations that primarily included a request for the release of financial assurance associated with restoring the topography, but also included modifications for exploration and expansion. Humate is a highly organic substance from which humic acids can be extracted and used as a soil amendment in agriculture. SWQB staff reviewed six mine permit modifications that involved updates or revisions to the Closure/Closeout Plan (two of which also included requests for release of financial assurance and several revised cost estimates for cleanup). These mines include the Saint Anthony Uranium Mine, Cunningham Hill Mine, Section 12 Uranium Mine, Old Stope Uranium Mine, Mt Taylor Uranium Mine, and El Cajete Mine. The estimated cleanup costs for the Old Stope Uranium Mine is $89 million and the upper end of the cost estimate for the Saint Anthony Uranium Mine is $113 million. Conventional uranium mining at the Old Stope mine area ceased in 1985 and recovery of uranium through ion exchange removal of recirculated mine water ceased in 2002. The Saint Anthony Uranium Mine was operated by United Nuclear Corporation between 1975 and 1981 and is currently owned by General Electric. The Tijeras Mine and Mill, a limestone quarry and cement manufacturing facility owned by GCC Rio Grande Inc, submitted two permit modification requests that were reviewed by SWQB; one was for expanded exploration and the other to increase the design limits by 210 acres. SWQB also reviewed an amended Hydrogeologic Resources Report for the proposed Terrero Exploration Project. SWQB continues to stay involved with the Roca Honda Uranium mine which includes an application for a new mine which was first submitted to EMNRD in 2009. Since then the project has expanded and the project is still undergoing environmental review under NEPA with the USFS as the lead agency since a portion of the proposed mine is on lands managed by the USFS. The Roca Honda project is currently on hold due to the COVID-19 crisis and economic uncertainty.

Ambrosia Lake can be seen behind the large steel shaft headframe of the Section 12 Mine. The headframe is still being scheduled to be removed. Photo taken October 13, 2021 by Alan Klatt

There was an increase in minimal impact exploration permits in southern New Mexico this year. To qualify for minimum impact status, total disturbance from exploration activities including road building, drill sites, and

lay down areas must remain under 5 acres. The six exploration permit requests targeted precious metals including gold, silver and copper, and without exception were located in areas of past exploration or abandoned mines including a project proponent near Magdalena that was interested in analyzing a reclaimed tailing pile for salable material that was not extracted during the initial mining effort. This is the second request to reenter reclaimed mine waste properties, the first being the Peru Hill tailings in Luna County which was highlighted in the 2020 annual report. That mine has received a mining permit and began reprocessing reclaimed tailings material in 2021. Other notable exploration projects included silver exploration near the small mountain town of Mogollon, population about 20. Town residents were concerned about the potential impacts to their drinking water due to exploratory drilling very near, and upslope from town. In coordination with the GWQB and MMD, SWQB staff from the Silver City field office sampled well water at three residences prior to the exploration project commencing. Repeat well sampling will occur in 2022 while the drilling is underway.

Photo above; Staff from the Silver City field office sample well water in the town of Mogollon in response to residents' concern for water pollution resulting from an exploratory drilling project near town. Photo courtesy of David Ennis, MMD.

Photo right; Core drilling at the Summa Silver minimum impact exploration site near Mogollon, NM. The drill rig is capable of direction drilling so numerous bore holes can be drilled at each pad. This reduces ground disturbance and reclamation costs. The drill rig also utilizes a "closed-loop" fluid system which captures produced water eliminating the need for an adjacent "mud pit" near the drill pad. Residents in the town of Mogollon were concerned about drilling activities impacting their water supply so NMED and MMD arranged for well sampling in the town.

At the opposite end of the disturbance scale, southern New Mexico is home to several large and nationally significant open pit copper mines producing millions of pounds of copper per year and placing New Mexico as the third highest copper producing state in 2020. The Tyrone Mine south of Silver City submitted several Mining Act permit requests for changes to their existing mine operations and to expand the current mine footprint to the south. The SWQB continues to track developments at this mine as proposed mine expansion would necessitate a new pit lake located partially on public lands. During the reporting period, SWQB worked with the mine operator to determine applicable water quality standards for the future pit lake. With water quality standards for the pit lake, the operator is able to estimate reclamation costs at mine closure and the state requires financial assurance bonding to guarantee adequate funds to complete mine reclamation in the event the operator abandons the mine prior to closure and reclamation.

Post-reclamation of the Lloist limestone kiln and loading facility near Hanover, NM, in September 2021. Lloist Inc. mined limestone at a nearby quarry and processed the material at this location. In 2021 they removed all the remaining buildings and equipment, regraded the 20 acre site, spread topsoil, and drill-seeded the area with native seed. The site remains under permit with MMD for an additional 12 years or until revegetation success can be demonstrated for several consecutive years.

Wetlands Program

Funding Awarded to the Wetlands Program in 2021

In 2021, EPA Region 6 awarded funding to NMED for two new Wetlands Program Development projects. The federal grants total $740,349.00 in federal assistance awarded through the FY21-22 EPA Wetlands Program Development Grant Program authorized by CWA Section 104(b)(3). These projects advance the development of our statewide wetlands program and are consistent with the 2019 Wetlands Program Plan for New Mexico.

"Understanding Depressional Wetlands and Mineral Soil Flats Wetlands in New Mexico."

Depressional wetlands and mineral soil flats wetlands are poorly understood in New Mexico and the southwest but are common and numerous throughout the state. The NMED SWQB Wetlands Program proposes to use New Mexico's mapping and classification products, conduct preliminary research and collect field data to locate suites of similar depressional wetlands and mineral soil flats wetlands and characterize them by geology, vegetation, soils and hydrology. A Technical Advisory Committee (TAC) will be established to provide expertise and guidance. Two Regional Wetlands Action Plans (WAP) will be developed representing selected depressional wetlands or mineral soil flats wetlands that have similar characteristics. A second goal is to evaluate New Mexico Rapid Assessment Method (NMRAM) for Playa Wetlands to validate the monitoring method for supporting wetland narrative standards for Playas of the Southern High Plains (SHP).

Tasks include:

- Administration and reporting,
- Literature search, geodatabase creation and establishing a TAC,
- Conducting two Pilot Studies, QAPP development and data collection at 25 depressional
- Wetlands and mineral soil flats sites,
- Updating Surface Water Quality Information Database (SQUID) wetlands database and data entry,
- Understanding Depressional Wetlands and Mineral Soil Flats Wetlands Technical Guide,
- Evaluate NMRAM for Playas of SHP for narrative standards development,
- Two Regional WAPs,
- Project outreach, Story Map and four Wetlands Roundtables,
- Attending EPA trainings /conferences.

Final products include:

- Characterization of suites of depressional and mineral soil flats wetlands statewide,
- Technical Guide and a Story Map that describes these wetlands,
- Two regional WAPs,
- Standards development for playa wetlands,
- Four New Mexico Wetlands Roundtables,
- Updated SQUID wetlands database.

"Integrating Linear Features and Mapping and Classification Data Gaps in New Mexico Wilderness ONRWs."

The goals of this project are to map and classify federal wilderness and specially designated area wetlands, to identify Outstanding National Resource Waters (ONRWs) for nomination and to continue to create a baseline wetlands data layer for New Mexico. A review of all state wetlands mapping data in Northern New Mexico will also be conducted to edge map and revise wetlands mapping and classification covering ~ 30,000 square miles for consistency with current mapping standards in the project area, and to complete areas with incomplete data. Wetland mapping will employ the Cowardin, Western Riparian, landscape position, landform, water flow path and waterbody type (LLWW) and hydrogeomorphic (HGM) classifications, and wetland functions will be assigned to different wetland types. Assessment Units will be assigned to wetland classified segments for water quality standards, and quality assurance. A Technical Advisory Committee (TAC) will be created to provide local and technical expertise, and pre- and post-mapping field reviews will verify wetland mapping units and designations. The interactive maps and metadata will be available on SWQB Wetlands website, as well as a story map, and the project final report. Transfer of mapping products and technology will include presentations to watershed groups, agencies, tribes, consortiums and at New Mexico Wetland Roundtables.

Wetlands Roundtables

The SWQB Wetlands Roundtables continued in Fall 2020 and Spring 2021 remotely as Webex Webinars since restrictions for in-person group meetings were still in place due to COVID-19. The SWQB Wetlands Program conducted two very successful Wetlands Roundtables in the Fall of 2020 and two more in the Spring of 2021 and both the Northern and Southern Wetlands Roundtables exceeded expectations in remote participant attendance. The New Mexico Wetlands Roundtables are conducted four times each year, twice as the Northern Wetlands Roundtables and twice as the Southern Wetlands Roundtables, as part of a Wetlands Program Development Grant from EPA Region 6 to foster partnerships and collaboration for the restoration and protection of wetlands and riparian resources in New Mexico.

The SWQB Wetlands Program conducted two successful virtual Wetlands Roundtables this fall. Parts of both the meetings focused on the new Waters of the US (WOTUS) rule that went in effect June 22, 2020, and its significance to protection of waters and wetlands in New Mexico. The Northern Wetlands Roundtable was conducted November 24, 2020, with more than 128 attendees participating in the meeting. Lori Beth Tanner and Tom Nystrom from EPA Region 6 gave an update on regulatory enforcement in New Mexico and gave examples of what waters are jurisdictional and what waters are not under the new WOTUS rule. Trent Botkin (NMDOT) provided examples of how the new rule affected mitigation wetlands, and waters upstream of bridges and other transportation infrastructure. Also, US Army Corps of Engineers gave an update on how they are implementing the new WOTUS rule. Other presentations included, "The Market Value of Mitigation Credits in the Western US" by Bill Coleman, and "Little Water Canyon-A Natural Area in the Zuni Mountains" by Jim McGrath. A.T Cole, southern New Mexico rancher, presented compelling evidence of our climate crises and how it is affecting New Mexico. Cristina Selby, an independent conservation photographer and writer, gave a presentation on Cienega wetlands in New Mexico and as a bonus provided access to her new movie "Saving Beauty" about cienega wetlands in the Santa Rosa area and how they are working to save Pecos sunflower habitat as a great benefit to the community.

Figure 1. Above; Burro Cienega restoration before and after photos by A.T. Cole shows how he is combatting the climate crisis on his ranch in the Burro Mountains by storing and conserving water in functioning wetlands, at the Northern Wetlands Roundtable on November 24, 2020.

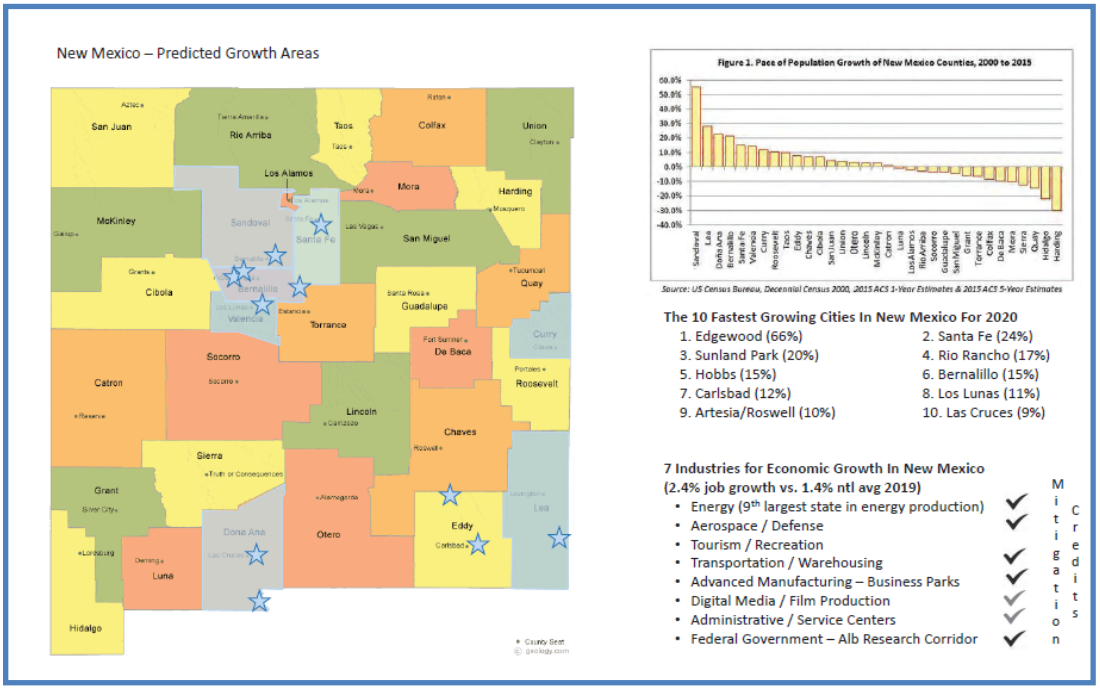


Figure 2. Bill Coleman provided evidence for high land values for mitigation credit for restored and preserved wetlands and what industries might require mitigation, at the Northern Wetlands Roundtable on November 24, 2020.

The Southern Wetlands Roundtable is normally conducted in southern New Mexico and focuses on wetland and water quality issues. The Southern Wetlands Roundtable Webex webinar was conducted on December 10, 2020 and was successful in attracting many new participants that normally cannot travel but have a keen interest in the topics presented. Over 125 participants attended the virtual meeting. Shelly Lemon (SWQB Bureau Chief) gave an update on how NMED is responding to the new WOTUS rule and an update was also provided

by the US Army Corps of Engineers. Three presentations focused on wetland and stream restoration, one focusing on new techniques, such as 'sod bowls' and 'sod berms' replacing rock structures in fens and slope wetlands. Two presentations "Wills Canyon Headcut and Anan Stream Restoration Projects" and "Luna Restoration Project," highlighted wetlands restoration on the Lincoln National Forest and the Gila National Forest, respectively. The Roundtable was rounded out by a presentation on Candidate Conservation Agreements for the federally endangered Texas Hornshell Mussel found in a small stretch of the Black River in southeastern New Mexico, and a call for volunteer groups to participate in training and data collection opportunities in 2021 for using the New Mexico Rapid Assessment Method (NMRAM) developed by the SWQB Wetlands Program in cooperation with Natural Heritage New Mexico of the University of New Mexico.

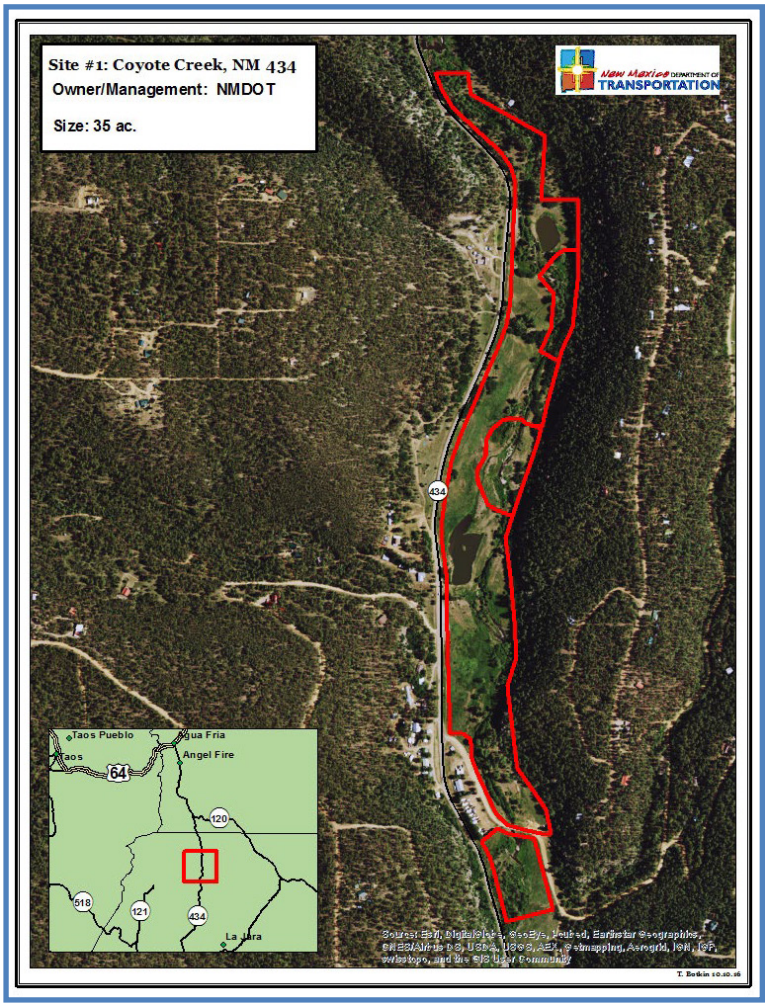


Figure 3. Above; NMDOT Wetland Mitigation Site on Coyote Creek with critical habitat for the NM Meadow Jumping Mouse and SW Willow Flycatcher. This wetland mitigation site may no longer be protected under the 2020 WOTUS rule because the floodplain is supported by groundwater hydrologic connection. The main channel is incised and no longer provides a surface water connection. (Presentation by Trent Botkin (NMDOT) at the Northern Wetlands Roundtable November 24, 2020.

In the Spring of 2021, the Wetlands Program conducted 2 more successful Wetlands Roundtables. The Northern Wetlands Roundtable was held on March 24, 2021, with 138 attendees at various times during the presentations. The Southern Wetlands Roundtable was conducted on April 8, 2021 and had over 130 attendees.

At the Spring 2021 Northern Wetlands Roundtable, important issues and ideas were considered by our excellent presenters. Kai-t L.V. Blue Sky a wildlife biologist from Santo Domingo Pueblo and instructor at Santa Fe Indian School presented "*Traditional Ecological Knowledge, a Means for Restoring Ecosystems*," followed by "*New Mexico Conservation Information System: Overview of Wildlife-Related Components*," by Virginia Seamster, NMDGF. Jim Blackburn presented remotely from Rice University on his Team's efforts to address climate change with new ideas in "*Climate, Money and Ecology: Opportunities for New Thinking*." A variety of restoration considerations and approaches were presented in three presentations, "*Post-Fire Disturbance and Preserving Wetlands*," by Alan Klatt, NMED, "*Proyecto Embudo de Agua Sagrada: A Watershed-Based Plan for the Lower Embudo River Watershed*," by Jan-Willem Jansens, Ecotone Landscape Planning, and

"*The Rio Grande Bosque Restoration Project: a retrospective*," by Ross Coleman, Hydra Aquatic, Retired. Forrest Luna gave the USACE regulatory update including updates on WOTUS.

On April 8, 2021, the New Mexico Southern Wetlands Roundtable was conducted remotely by Webex webinar with over 130 participants in attendance. The morning was occupied by excellent presentations that engaged the audience and included "The Role of Beaver in Riparian Restoration" by Meaghan Conway (NMDGF) and Bryan Bird (Defenders of Wildlife), "The Unique Hydrology and Management Challenges in Karst Wetlands" by George Veni (National Cave and Karst Institute), and "Gila Diversion Draft Environmental Impact Statement versus Truth and Scientific Integrity" by Norm Gaum (P.E. and former director of the Interstate Stream Commission). The presentation on karst wetlands was part of a larger effort to celebrate the "International Year of Caves and Karst." The afternoon session presentations were just as engaging and informative. Lewis Land (National Cave and Karst Institute) presented the "Challenges of Tracing Karst Groundwater Flowpaths to

Figure 4. Above; Proposed projects and successful restoration efforts were highlighted in the presentation "Luna Restoration Project," by Carolyn Koury, hydrologist for the Gila National Forest, at the Southern Wetlands Roundtable on December 10, 2020.

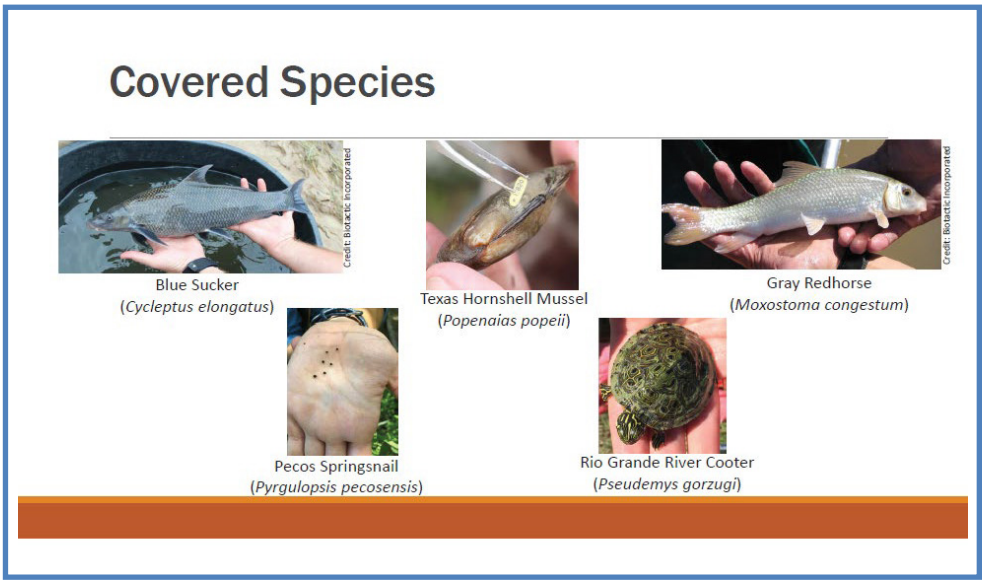


Figure 5. Ryan Schmidt of CEHMM, gave a presentation about Candidate Conservation Agreements to voluntarily reduce or eliminate threats to species listed as endangered by the state or USFWS, and to ensure adequate conservation measures to benefit the species and reduce threats, at the Southern Wetlands Roundtable December 10, 2020. Species covered by these agreements in the Black River Watershed are shown above.

Desert Spring-fed Wetlands in the Black River Watershed," and Connie Maxwell presented "Watershed Restoration in the Hatch and Mesilla Valleys." A regulatory update was provided by Reid Riley (US Army Corps of Engineers) and Dylan Wilder (USFWS) ended the day with an excellent presentation about "New Mexico Meadow Jumping Mouse Habitat Restoration at Bosque del Apache National Wildlife Refuge."

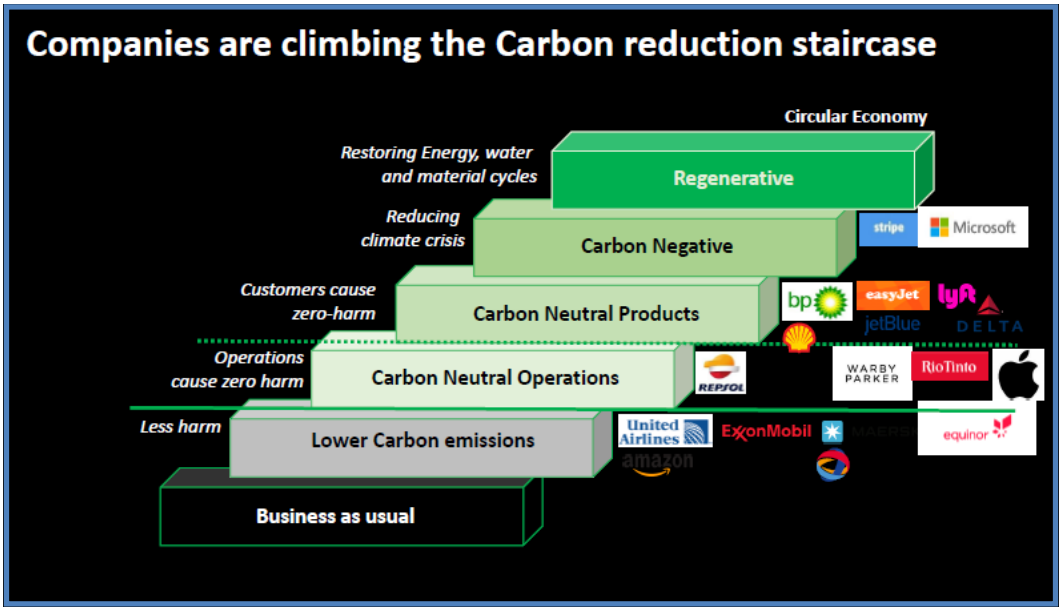
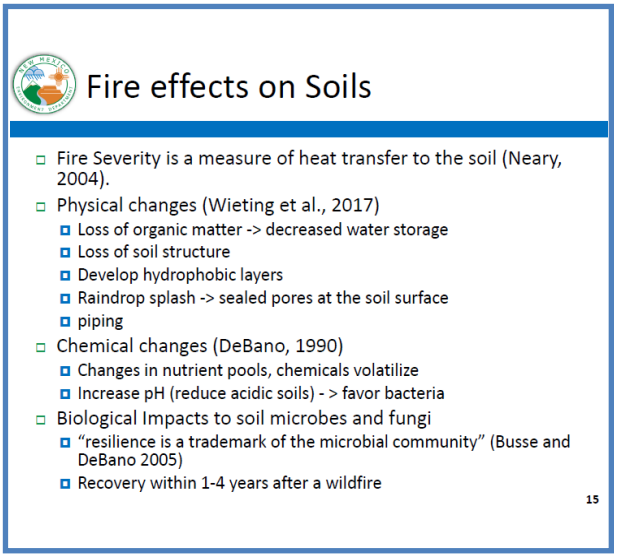
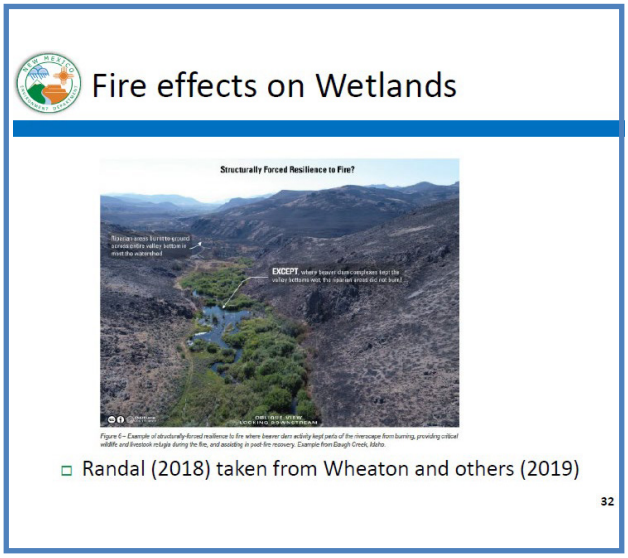


Figure 6. Jim Blackburn provides backround information and new solutions to create markets for carbon storage in soils at the Northern Wetlands Roundtable on March 24, 2021.





Figures 7 and 8. Alan Klatt provided an informative talk about the effects of fire on Wetlands and streams at the Northern Wetlands Roundtable March 24, 2021.

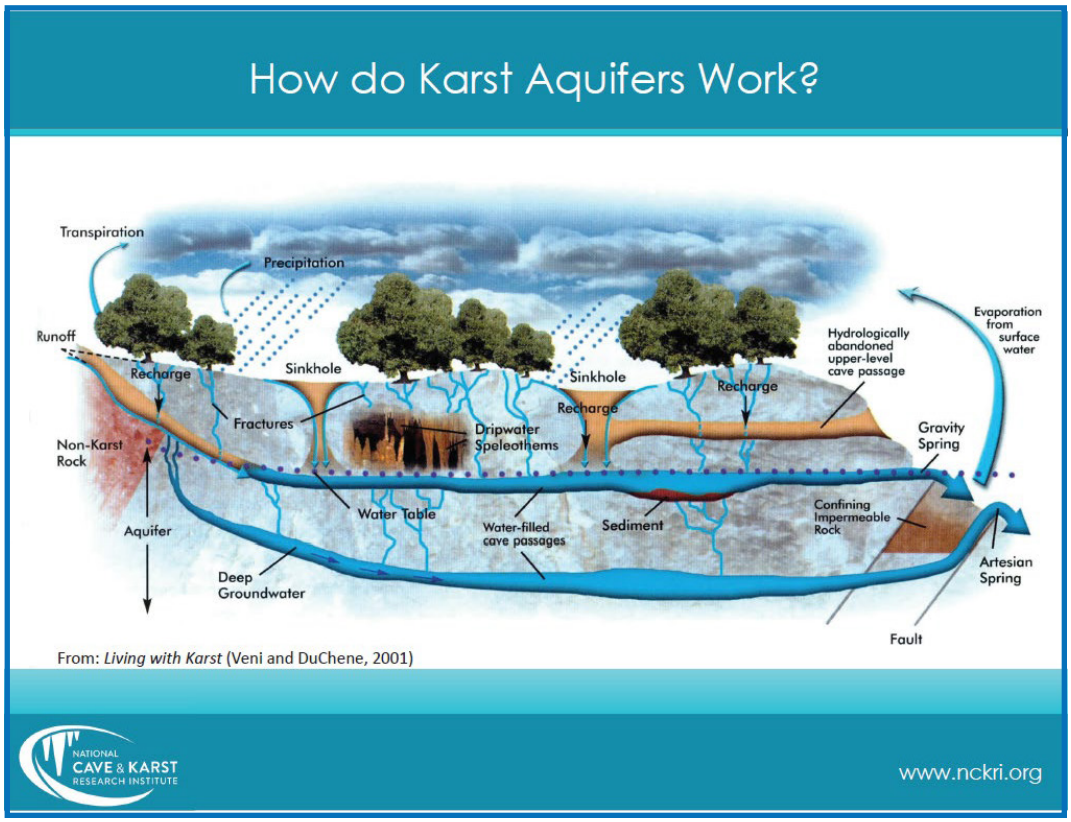


Figure 9.
Right; George Veni gave an enlightening presentation about karst wetlands, how they work, and the challenges of managing these unique wetlands, at the Southern Wetlands Roundtable on April 8, 2021.

Figure 10.
Below; Norm Gaum explained the water development history and the potential impacts of proposed diversions as part of the Arizona Water Settlement Act at the Southern Wetlands Roundtable on April 8, 2021.

Figure 11.
Above; Dylan Wilder explained the characteristics and habitat of the Meadow Jumping Mouse that make it unique and rare at the Southern Wetlands Roundtable on April 8, 2021.

Wetland Projects Completed in 2021

Five Wetlands Program projects funded under CWA Section 104(b)(3) Wetlands Program Development Grants were completed this year.

Rapid Assessment of Wetlands for Confined Valleys, and USACE NMRAM Phase 2, New Mexico
Project Cost: $403,117 WPDG Federal Funds, $207,935 Final Match amount

An innovative rapid assessment method (NMRAM) for riverine wetlands located in montane confined valleys in New Mexico, and continued development and refinement of the USACE NMRAM Regulatory Module (NMRAM Reg) were the goals of this project. The highest priority of the SWQB Wetlands Program is to develop methods for assessment that lead to protection and provide a benchmark for restoration of the State's wetlands resources. NMRAM refines reference standard conditions for each subclass, describes the extent and quantity of the targeted wetland type within a reference domain, and identifies the stressors that are causing wetland decline. These data provide justification for preventing or eliminating stressors that will ultimately lead to increases in wetland quality. The assessment tool, NMRAM Reg evaluates the effects of regulated activities on wetlands and provides more accurate comparison of proposed wetland mitigation.

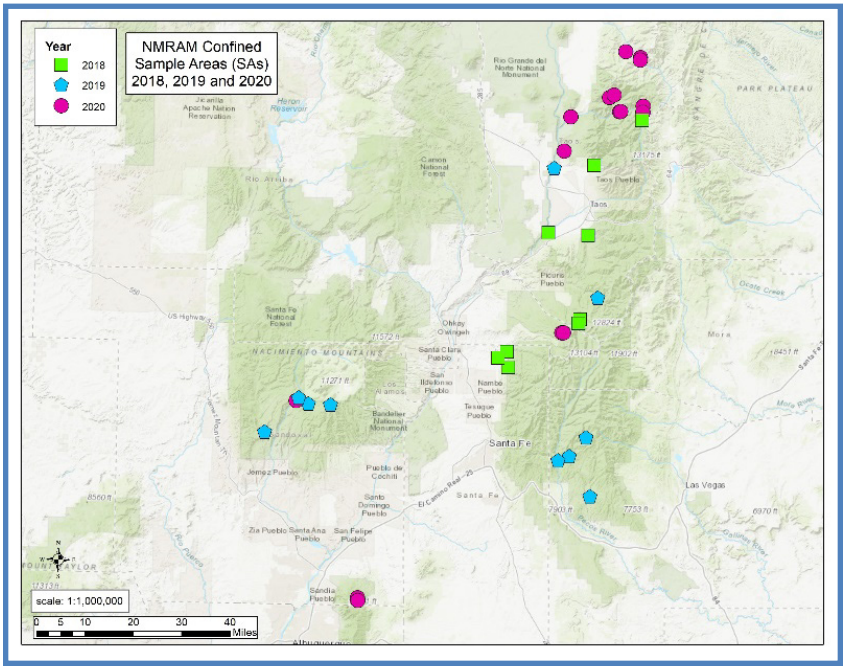


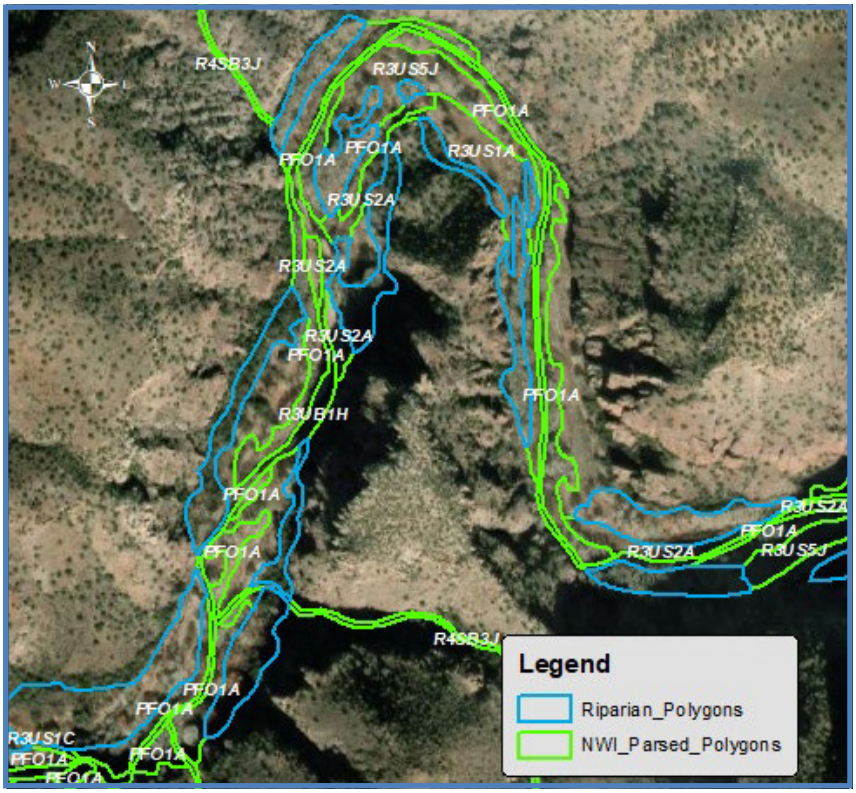
Figure 12. Metric development data collection sites in confined valley wetlands in 2018, 2019 and 2020.

In collaboration with the University of New Mexico, Natural Heritage New Mexico a geodatabase was developed for the Rio Grande and Canadian Watersheds from remote imagery and other sources and 54 sites were identified as belonging to the Confined Riverine Wetlands Subclass. A Pilot Study was conducted to verify attributes of the subclass. The 54 sites were provided a preliminary ranking based on potential condition and then 34 of these sites were sampled by a collaborative technical team composed of SWQB Wetlands Program and UNM staff during 2019 and 2020 field seasons. After each data collection season, data were analyzed, and metrics were developed for the NMRAM. The NMRAM for Confined Valley Riverine Wetlands includes 10 metrics for assessment of which six are unique to this assessment method. A Field Guide with interactive datasheets developed by TEKSystems, Inc., were created for rapid data collection. Two Advisory Committee meetings were conducted to obtain input from potential users and experts in confined valley wetlands. An end-user 3-day training was conducted to test and refine the final metrics. The NMRAM Manual that provides the rationale for all NMRAM versions was updated and revised as part of this project.

In addition to the development of the NMRAM for Confined Valley Riverine Wetlands, work was conducted in conjunction with the Albuquerque District of the Corps of Engineers and UNM Natural Heritage on the regulatory version of NMRAM for United States Department of the Army Corps of Engineers' (USACE) use. After comments from USACE and their research branch (ERDC) on its utility and application to Before and After Mitigation Implementation (BAMI) procedures, updates and edits were made to develop Version 1.2 of the Field Guide and interactive data collection worksheets. Classroom training was conducted for both USACE and SWQB staff to evaluate the final version of the metrics and provide input.

Figure 13. Bobcat Creek confined valley wetland near Red River.
Photo by Davena Crosley

Mapping and Classification of Wetlands, Southwestern New Mexico
Project Cost: $279,218 WPDG Federal Funds, $100,347 Final Match amount



In cooperation Saint Mary's University of Minnesota Geospatial Services, this project mapped and classified wetlands in the Gila Region, including the Gila and San Francisco Rivers, most of the Gila National Forest, and some riparian areas along the Lower Rio Grande. The project covered approximately 12,000 square miles, (~204 quadrangles) as part of the effort to complete updated mapping on all of New Mexico's wetlands.

Once the mapping data had been synthesized, four classification systems were applied to provide comprehensive data analysis and application to various mapping uses, similarly as described above under the project "Mapping and Classification of Wetlands in the Middle Rio Grande Basin."

Data were shared and presentations were given to watershed groups and agencies. A Technical Advisory Committee (TAC) was established specific to this project, and two TAC meetings were conducted. Work continued on a New Mexico wetlands mapping Story Map that informs about the project and the statewide wetland maps. The interactive mapping products will be posted on the NMED Wetlands Program website for general use. This project provides the beneficiaries with a comprehensive framework to launch further monitoring, assessment and analyses for future education, conservation, and restoration efforts.

Mapping and Classification of Wetlands in the Middle Rio Grande Basin
Project Cost: $403,117 WPDG Federal Funds

In cooperation Saint Mary's University of Minnesota Geospatial Services, this project mapped and classified wetlands in the Rio Grande Basin, including the Rio Puerco Watershed, most of the Cibola National Forest lands and the riparian areas along the Middle Rio Grande. The project covered approximately 7,000 square miles, (~116 quadrangles) as part of the effort to complete updated mapping on all of New Mexico's wetlands.

Once the mapping data had been synthesized, four classification systems were applied to provide comprehensive data analysis and application to various mapping uses. The initial mapping was performed in accordance with the National Wetlands Inventory (NWI) protocols using the *Classification of Wetlands and Deepwater Habitats of the United States*, (Cowardin et al. 1979), and System for Classification of Riparian Areas in the Western United States (USFWS 2009) classifications for inclusion of the mapped areas on the US Fish and Wildlife Service NWI Wetlands Mapper.

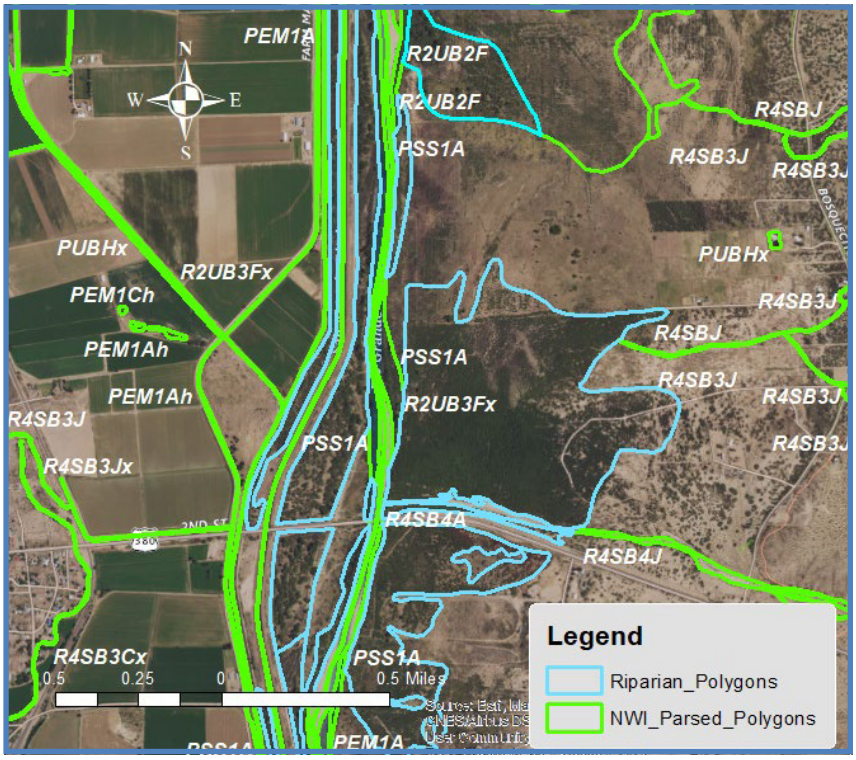


Figure 14. Screen shot of wetlands mapping and classification along Rio Grande east of Socorro, NM using "Classification of Wetlands and Deepwater Habitats of the US."

In addition, the wetlands were coded in accordance with the landscape position, landform, waterflow path, and waterbody types (LLWW) mapping classification developed by Ralph Tiner (2003) and included descriptors for arid lands wetlands. The LLWW provides some of the necessary information for assigning the wetlands to hydrogeomorphic (HGM) subclasses (Brinson 1993) for New Mexico Rapid Assessment of Wetlands (NMRAM) development. The HGM classification was applied to all wetlands mapped. Wetlands functional modeling was applied using twelve wetland functions specific to New Mexico, to assign to each wet-

land based on their ability to provide each function. As part of this project SWQB designated draft classified wetland segments as a next step toward developing Wetland Water Quality Standards. The mapping scale is 1:12,000 with a minimum mapping resolution of at least one-quarter acre and is compliant with the National Wetlands Mapping Standard. Pre- and post-mapping field reviews were used to certify that the data were correct according to these standards.

Data were shared and presentations were given to watershed groups and agencies. A Technical Advisory Committee (TAC) was established, and two TAC meetings were conducted. Work was initiated to create a New Mexico wetlands mapping Story Map that informs about the project and the statewide wetland maps. The interactive mapping products will be posted on the NMED Wetlands Program website for general use. This project provides the beneficiaries with a comprehensive framework to launch further monitoring, assessment and analyses for future education, conservation, and restoration efforts.

Wetlands Standards, Wetlands Action Plans, and Improved Non- Regulatory Program Elements for New Mexico

Project Cost: $254,686 WPDG Federal Funds, $165,199 Final Match amount

This project achieved key capacity-building activities of the New Mexico Wetlands Program Plan for a comprehensive wetlands program.

Progress on water quality standards for New Mexico wetlands was made by developing a draft narrative standard and designated uses for Playas of the Southern High Plains, a large subclass of isolated wetlands in eastern New Mexico. A protocol was also developed for assigning Assessment Units to wetlands that appear on the statewide Wetlands Mapper. Assessment Units provide the framework for incorporating wetlands data into the SQUID. Wetland data are currently entered into the Wetlands SQUID temporary database with the goal of integrating the two databases so that watershed data from wetlands, lakes and streams can be obtained from one database.

Figure 15. Playa of the Southern High Plains.

Three Wetlands Action Plans were created under this project: "*Wetlands Action Plan for Arid Land Cieñegas"* prepared by Bob Sivinski, "*Black River Wetlands Action Plan*," prepared by CEHMM, and the "*Santa Rosa Wetlands Action Plan*" prepared by Quivira Coalition. Our non-regulatory Program process was also improved by working as a partner in the Rio Grande Water Fund, a consortium of 73 Charter Signatories (including NMED) that work to improve the upper watershed of the Rio Grande in New Mexico to make it more resilient to catastrophic fire and climate change and for water quality benefits.

Two significant trainings were conducted: A three-day training for Wetlands Restoration Crew Leaders that included safety protocols, organizing and managing volunteers, building restoration structures, and techniques for harvesting and planting woody and herbaceous wetland and riparian vegetation. The second training of-

fered was for two Roads Workshops for the protection of wetlands, floodplains and water quality. Local, state and tribal transportation personnel were targeted for the workshops that took place in Farmington and Clovis.

The use of NMRAM data collection for riverine wetlands was expanded by conducting an "All Hands" NMRAM planning and data collection effort, and the New Mexico Wetlands Program Plan was updated in 2017, 2019 and 2021. Technical transfer and outreach were performed as part of each task, with presentations to watershed groups and at conferences, and improved Wetlands Program webpages.

Figure 16. Photo above, Crew Leader Training building restoration structures at Rio Mora Wildlife Refuge, Mora County.

Figure 17. Photo left, Lang Cieñega, Hidalgo County.

Keyline Design for Restoration of Headwater Slope Wetlands in the Holman Creek Wetlands Complex
Project Cost: $310,899 WPDG Federal Funds, $163,757 Final Match Amount

This project developed, tested, and documented innovative restoration techniques that utilized keyline planning and design principles originally created for enhancing agricultural production by optimizing the use of available water resources. Keyline Design principles use a guiding framework to understand ecosystem drivers and influence those that can be changed. Design concepts focus on redistributing and spreading available water using a series of treatments called a "Treatment Train."

The Quivira Coalition was contracted to implement restoration and planning. The Quivira Coalition subcontracted to Ecotone, LLC to help with the project. The Carson National Forest was instrumental in all stages of this project. The project was initiated with a design charette of restoration professionals to analyze current restoration techniques for application to Keyline interactive/interdependent treatment design concept. Site planning and preparations were implemented by Reineke Construction and restoration was implemented through construction days and volunteer workshops in 2018 and 2019. The first weekend field restoration workshop was held in August 2018 with 42 volunteers and contractors constructing many restoration structures. A second weekend field restoration workshop was conducted in 2019 at Holman Creek Wetlands Complex to demonstrate the innovative planning and design techniques. 37 restoration structures were installed

by volunteers during this second event. The project was also presented in a half-day classroom workshop at the 2019 Quivira Coalition Regenerate Conference. Participation at the three events included more than 200 volunteers and hundreds of volunteer hours. A Technical Guide, *Applying Keyline Design Principles to Slope Wetland Restoration in a Headwater Ecosystem* (2019), was published and distributed to volunteers and the New Mexico wetlands community.

Figure 18. A schematic overlay from the Technical Guide shows on a treatment train in Middle Holman Creek. Water is continually spread from the main channel to wetland surfaces to enhance infiltration and storage. Blue arrow indicates flow direction. Green polygon is a fen. Log icons indicate locations of restoration structures.

Pre-treatment and post-treatment monitoring was conducted at Holman Creek by SWQB staff. Wetlands Program staff discussions with USGS Albuquerque Water Science Center on the possibility of project collaboration to collect geochemistry, groundwater, and surveying data led to the installation of 10 groundwater monitoring wells as part of the project monitoring design.

Over the years, many restoration professionals contributed to the conceptual toolbox for restoration of wetlands and water quality improvements in the Comanche Creek Watershed. The application and testing of traditional Keyline Design concepts builds upon information and innovation of these restoration techniques by providing a method for combining treatments to maximize the use of surface and groundwater to restore wetlands.

Figure 19. Logs were hauled via horse drawn trailer for log structures during the August 2019 volunteer workshop in the upper East drainage. One of the project challenges was getting the materials to the building sites. Horses could easily handle the terrain and the volunteers enjoyed watching them transport the logs.

Although developed for agricultural application, Keyline Design Principals can be modified and used effectively for wetland restoration to spread water to dewatered slopes and diminished wetlands. The restoration specialists who lent their existing knowledge and willingness to think innovatively to the project include Mollie Walton, Jan-Willem Jansens, Michael Gatlin, Jeffrey Adams, Mark Reineke, Margie Tatro, and Bill Zeedyk. Craig Sponholtz introduced the idea to explore Keyline Design application to the wetlands in the Holman Creek Watershed.

NPS Management Program Problems and Concerns

The problem discussed in the 2019 and 2020 NPS Annual Reports (in which an NMED contractor disclosed allegations of fraud associated with their contracts with the State of New Mexico) continued to have minor repercussions in 2021. Several projects were lined up to use the remaining funds in grant 996101-17, and these projects (with EPA approval) were to be funded with more recent grants after June 30, 2021. This resulted in budgeting challenges. Several cooperators who had estimated their state fiscal year 2021 (July 1, 2020 – June 30, 2021) expenses in spring 2020 faced relatively normal project delays that resulted in costs being shifted to state fiscal year 2022, with the consequence that approximately $269,000 (representing about 7% of the grant) were returned to EPA unutilized.

The project, "Upper Rio Puerco Sediment and Turbidity Reduction Road Maintenance Workshops" (Project 19-D listed in Table 3 above) terminated with no work completed, and no costs incurred. A Program Coordinator at the Cuba Soil and Water Conservation District had informed NMED in July 2020 that their board voted to terminate the project, and that written notice was forthcoming. NMED did not receive written notice, and held some hope that the project could be salvaged. Cuba SWCD had noted the reason for termination was that the coordinator of the Rio Puerco Management Committee (RPMC) resigned. Cuba SWCD relied on that individual to manage the project. The BLM had notified stakeholders that henceforth RPMC would be managed under the Federal Advisory Committee Act (FACA), and the group essentially disbanded while BLM began the process of reassembling the group under FACA. BLM requested nominations for the RPMC, and NMED submitted a nomination in December 2020. NMED had hoped that the committee would convene in time to resurrect the project. However, informal communications from BLM indicated that too few nominations were submitted to form a committee, and a new call for nominations has not been released.

The cancellation of a relatively small project in the Rio Puerco basin is a minor problem relative to the long hiatus and possible permanent end of the RPMC. The RPMC had been formed under Public Law 104-333 in 1996, and has been reauthorized by various acts of Congress to the present. Public Law 104-333 specified that NMED be represented on the committee. According to the BLM's call for RPMC nominations,

> Public Law 104-333 and P.L. 116-9 require the Rio Puerco Management Committee to advise the Secretary of the Interior, acting through the Director of the BLM, on the development and implementation of the Rio Puerco Management Program. The Committee will serve as a forum for information about activities that may affect or further the development and implementation of best management practices, identify objectives, and develop alternative watershed management plans for the Rio Puerco Drainage Basin. The Secretary of the Interior will appoint council members to three-year terms.

Project 16-G, "Watershed-Based Planning within the Upper Agua Chiquita Drainage Basin," was expected to result in a WBP for the upper Agua Chiquita watershed, in an area with some private land and more land managed by the Lincoln National Forest, where Agua Chiquita Creek is impaired by turbidity (and has a TMDL for total suspended solids). The contractor repeatedly fell behind relative to the schedule outlined in the work plan, but also was not paid promptly on at least one occasion when NMED had not processed a contract extension properly to allow a purchase order to be created in a new fiscal year. Later in the project term,

the contractor may have elected to stop incurring expenses while waiting on a second contract term extension and subsequent purchase order to be approved. By the time the purchase order was approved the contractor was once again too far behind schedule to complete the project, and elected to terminate the project via letter dated October 28, 2020, citing "a 3.5 month unanticipated delay in acquiring the Purchase Order." This project failed due to a combination of administrative errors within NMED and the contractor not implementing the project on the schedule described in the contract. In the end, the project produced a draft WBP and cost $37,960 in Section 319 funds (with $20,825 in match reported). More careful project selection and improved administrative processes may prevent a similar incident in the future.

NMED received only one project application during the SFA for new watershed-based planning projects. The SFA had been advertised via the SWQB email list with approximately 1,850 email addresses, and informally through professional networks. During future SFAs, Additional outreach will be carried out including notices in *Clearing the Waters* and in partner publications, a follow-up email to the SWQB email list, and WPS staff will send additional targeted notifications and encouragement to cooperators.

The COVID-19 pandemic continues to impact how work is done in NMED in beneficial, neutral, and harmful ways. The capacity and acceptance to host and attend meetings virtually has reduced costs of travel and made it easier for more people to attend meetings. The quality of communication that occurs in virtual meetings is not as high as in-person meetings however. In larger meetings, participants often do other work (multi-task), drawing their attention from the topics at hand. Even in smaller meetings, people may not be as expressive or open as in person. With less need to travel for meetings, there are also fewer opportunities to visit project sites or inspect Section 404 project sites, Mining Act regulated activity, or meet with cooperators in the field while traveling. Nonpoint source program staff increased the amount of field work they did in 2021 (relative to 2020) to about 50% of pre-pandemic levels as a result. Administrative processes such as document routing and hiring are now taking approximately the same amount of time as pre-pandemic.

Two items related to watershed-based planning listed in the section **NPS Management Program Objectives for 2022** (below) were carried over from a similar section in the 2020 NPS Annual Report. Our intent was to complete these items in 2020 or 2021, but they were not completed for a variety of reasons. The Escudilla Landscape Watershed Restoration Action Plan (Escudilla WRAP) is still not accepted as a WBP because staff have prioritized other work. The WRAP and EPA's comments are available at www.env.nm.gov/surface-water-quality/wbp. Various components of the Escudilla WRAP are already being implemented with funding sources other than Section 319 funding, and availability of Section 319 funding does not seem to limit implementation. NMED staff involvement in developing the WRAP in 2018 on components such as including water quality goals and pollutant load reduction estimates have helped this document serve its purpose as though it were a WBP. The modifications to the WRAP that would lead to its acceptance as a WBP are minor in that they would not substantively impact how implementation is carried out. For example, EPA wanted a stronger outreach component to be included during the implementation phase of the WRAP. The WRAP was developed under a NEPA process that included extensive stakeholder input but does not describe outreach or education as a form of implementation. Not described in the WRAP are the steps that the Gila National Forest takes to reach out to impacted stakeholders before a WRAP component (e.g., installation of a livestock watering facility, or closure of a road) is carried out. As the primary implementers of the WRAP, Forest Service staff new to their positions may need to be trained regarding objectives of the WRAP and related NEPA that

is already complete. The WRAP may be edited to describe these efforts, but the edits won't change actual practices. Considering that the WRAP is an official Forest Service document attached to an environmental impact statement (developed under a lengthy and expensive NEPA process), any edits will result in creation of a second unofficial document, very similar to the WRAP, that is less likely to be used as a primary reference by implementers. Despite these concerns, NMED is committed to completing edits to the WRAP as necessary or to provide an addendum addressing EPA's concerns, in 2022, to meet a milestone related to watershed-based planning and to establish eligibility of implementation using Section 319 funds.

The second item related to watershed-based planning is the completion of the American Creek WBP as a TMDL alternative. This process has taken more time than initially projected because of the need to involve landowners and conduct site visits in the watershed, which were not practical until 2021, and the time required to develop load reduction estimates from management measures, which depended largely on the results of the stakeholder involvement and site visits. Staff are committed to completing this WBP in early calendar year 2022.

NPS Management Program Objectives for 2022

The WPS has identified the following activities from the 2019 NPS Management Plan to meet program objectives in 2022.

- A Solicitation for Applications (SFA) for projects to revise existing WBPs or develop new WBPs that was released in 2021 will be completed in 2022, with one new planning projects to begin in approximately July 2022.
- WPS will continue to provide oversight and technical assistance for three ongoing watershed-based planning projects listed in Table 2 above. Two of the three (Projects 19-C for the Sapello River and 20-D for upper Tijeras Creek) will be completed in 2022.
- NMED plans to complete the American Creek WBP, for example by adding pollutant load reduction estimates for management measures, and submit the WBP to EPA for review in early calendar year 2022. TMDLs have not been developed specifically for American Creek, and NMED also plans to submit the WBP to EPA as an alternative to TMDLs for the two impairment parameters aluminum and *E.coli*.
- NMED will continue to work with key stakeholders on completing a WBP for the Rio Ruidoso watershed, as a primarily in-house effort.
- WPS staff will adapt the Escudilla WRAP, a Forest Service document, into a WBP in 2022. EPA reviewed this plan in 2018 and recommended specific changes to meet the nine WBP elements. NMED and EPA staff revived this topic in 2021, with a discussion about EPA's comments on the WRAP and how they may be addressed. The WRAP and EPA's comments are available at www.env.nm.gov/surface-water-quality/wbp.
- WPS will continue to provide oversight and technical assistance for ongoing implementation projects. Four Section 319 implementation projects are scheduled to be complete in 2022. These are "Tempera-

ture Reduction and Erosion Reduction in Lower Cow Creek" (Project 18-C), "On-the-Ground Improvement Projects for the Upper Gallinas River and Porvenir Creek, Phase III" (Project 18-J, which was extended into 2022), "Lower Animas Watershed Based Plan Implementation Projects Phase 2" (18-K, also extended into 2022), and "Dalton Canyon Creek Water Quality Improvement Project" (18-L). Several other projects listed in Table 3 above that apparently will end in 2022 will be continued under other grants (i.e., projects denoted as "Part 1" or "Part 2" will continue as "Part 2" or "Part 3").

- State-funded watershed and riparian restoration projects will be developed and managed in 2022. One RSP project is scheduled to be completed in 2022 (Project 20-F, "Adair Spring Restoration"). Eight other existing RSP projects listed in Table 4 above will continue into 2023. An RFP underway will be completed in 2022, with approximately twelve new RSP projects beginning. A new RFP will also be developed and released in 2022, to identify and develop projects for funding with additional expected RSP funds.
- At least one NPS Success Story nomination will be submitted before July 1, 2022.
- WPS will develop additional projects that implement WBPs, funded with Section 319 watershed project funds, under a new SFA to be released in late 2022. Pending adequate funding and approvals, these projects will begin in July 2023.
- NMED will continue to carry out its responsibilities under Section 401 of the Clean Water Act, regarding dredge and fill permits.
- NMED will continue to carry out its duties under the New Mexico Mining Act. Surface Water Quality Bureau staff will conduct water quality reviews at active and proposed mining sites, review Mining Act permit applications, inspect mine sites, and ensure that mining activities will not violate surface water quality standards.
- NMED will continue to work with USFS to develop a programmatic MOA to allow NMED to fund WBP implementation projects on USFS-managed land, with the goal of the MOA being signed and effective by December 2021.
- WPS staff will reach out to the Farm Service Agency (FSA) to request number of acres enrolled under CP-22 in each 12-digit HUC, and WPS will plan a meeting with FSA to discuss the NPS Management Program including priorities for watershed-based planning and water quality improvement.
- WPS staff will attend SWCD meetings, with a focus on the priority SWCDs listed in the NPS Management Plan (Colfax, Tierra y Montes, Taos, East Rio Arriba, Cuba, Santa Fe – Pojoaque, Grant, and San Francisco), with the purpose of informing SWCD staff and cooperators of NPS program goals and opportunities, and to seek opportunities to collaborate on water quality projects.
- The WPS program manager will invite one or more SWCDs to submit summaries of projects intended to protect or improve water quality to be included in the NPS Annual Report for 2022.
- NMED will develop a schedule and public involvement plan for revising the NPS Management Program Plan, and announce its intention to revise the plan, in 2022. The revision itself will occur over the following year (2023).

Additional Management Practices by Non-NMED Agencies

The following land management agencies implemented various projects and best management practices in New Mexico that ultimately contribute to the reduction of NPS pollutants in surface waters. The most common NPS issues being addressed are excessive erosion, sedimentation, encroachment of exotic vegetation, streambank instability, excessive nutrients, and excessive water temperature. The following summaries were submitted by the agencies and included here with minimal editing.

The Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) provided the following summary of projects implemented in calendar year 2021. Several watersheds highlighted below are priority watersheds under the National Water Quality Initiative (NWQI). More information on NWQI is provided above under, **Objective 6, Cooperate with other Agencies on Water Quality Protection and Improvement,** on page 30.

Picacho Drain – Rio Grande (NRCS NM Team 9)

In program year 2021 under the NWQI watershed, NRCS worked with a producer to install a concrete ditch lining to improve water efficiency when irrigating. These lined ditches assisted with decreased sediments, nutrient, bacteria and pesticide runoff. Additionally, the producer installed structures for water control in the form of three high flow turnouts and 76" of slide gates. These water control structures were installed to control stage, discharge, distribution and/or delivery in an irrigation or drainage system. With the installation of this system through the NRCS NWQI Watershed funding, NRCS has assisted the producer financially with $25,643.45 to better manage the water application.

Lined Ditches and Structures for Water Control installed through the NWQI.

Picacho Drain – Rio Grande (NRCS NM Team 9)

In program year 2021 under the NWQI watershed, NRCS worked with a producer to install an irrigation sprinkler system to improve the efficiency of water application. This sprinkler system has helped to control the amount of water applied to each field efficiently and with less water use. It also has reduced the amount of sediment runoff from flood irrigation application which improves water quality. Producer completed the installation of 16.2 acres of solid set sprinklers. Producer also completed a cover crop, nutrient management, no till, and irrigation water management practices in 2021 on 16.2 acres that will assist with improving soil health, reducing soil loss (seasonal erosion) and improving soil carbon (add organic matter, improve water infiltration, soil aeration and tilth). With the installation of this system through the NRCS NWQI Watershed funding, NRCS has assisted the producer financially with $80,378.86 to better manage the water application and reduce sediment and nutrient run off.

Solid set sprinklers, moisture probes and cover crop installed through the NWQI.

Cover crop production Spring 2021.

Vado Arroyo – Rio Grande (NRCS NM Team 9)

In program year 2021 under the NWQI watershed, NRCS worked with a producer to install an irrigation sprinkler system to improve the efficiency of water application. This sprinkler system has helped to control the amount of water applied to each field efficiently and with less water use. It also has reduced the amount of sediment runoff from flood irrigation application which improves water quality. Producer completed the installation of 95.3 acres of solid set sprinklers. With the installation of this system through the NRCS NWQI Watershed funding, NRCS has assisted the producer financially with $350,326.61 to better manage the water application and reduce sediment and nutrient run off.

Tierra y Montes Soil and Water Conservation District

Arawaka Channel Restoration Project

The Arawaka Channel Restoration Project is located on an unnamed tributary to the Pecos River in Ribera, about 30 miles south of Las Vegas, NM. Arawaka is a non-profit organization that focuses on self-healing and returning mother nature back to its natural state. Their mission statement is "to promote a better relationship between human beings and our mother earth, so that future generations will inherit the earth in better condition than we have it now." The cofounder of Arawaka has worked with Tierra Y Montes Soil and Water Conservation District (SWCD) through its Erosion Cost-Share Assistance Program installing erosion control structures and reseeding efforts to mitigate erosion issues in the upland portion of the property. The next step was to treat the channel that this upland area drains into. The area is a fine sandy loam, and a sandy loam mix so the area is prone to erosion problems. The design of this project was discussed with local renowned erosion control specialists, including Bill Zeedyk and Steve Reichert. Gerald Romero and Arcenio "AJ" Lujan were instrumental in the design, implementation and funding portion of the process. Maceo Martinet, Partners for Fish and Wildlife, and USFWS was instrumental in ensuring the success of this project. Not only did USFWS serve as the source of funding for this project, but Maceo also participated in the implementation and design portions of this project.

The intent of this project is to use proven upland, wetland, and riparian erosion control and incised stream channel restoration techniques. When complete, this project will repair, improve, and stabilize the potential of the steam channel, riparian area, flood plain and upland areas, as well as raise the channel bed, induce meandering, and increase the riparian and floodplain width and the moisture holding capacity of the adjacent soils. In the lower reach, native grasses, shrubs and pollinator species will be reintroduced. Wildlife exclusion structures will be built to protect critical revegetation efforts from grazing by wildlife at least during the establishment phase.

The project focused on the following:

- Installation of structures that slow the flow of water to give more time to infiltrate, i.e. large filter dams, one rock dams, and rock Zuni bowls.
- Streambank protection and stability through native vegetation reseeding, revitalization and management, and wildlife exclusion structures to protect planted vegetation.
- Re-introduction of native grass species (Blue Grama, Indian Ricegrass, Western Wheatgrass, Sideoats Grama, Galleta, Buffalograss, Alkali Sacaton, Sheep Fescue and Little Bluestem, etc.)
- Re-introduction of native shrubs and tree species (False Indigo, Privet, Choke Cherry, Willow, Plum and Wolfberry, etc.)
- Establish/improve wetland habitat for Federal Trust Species, including migratory waterfowl, New Mexico Meadow Jumping Mouse, Monarch butterfly, various amphibian species and avian species.
- Establish a variety of pollinator plants to encourage bees, butterflies and other beneficial insects to frequent the area.
- Include a workshop to assist in installation of smaller structures, planting of vegetation and seeding.
- Redirect excessive flows to reconnect potential wetland area and use excess water in the flood plain to water some native planted plants.

Arawaka Channel Restoration Project

After considerable planning, implementation of the project began on August 9, 2021 and included the installation of nineteen erosion control structures including one rock dams, filter dams, zuni bowls and juniper wicker and boulder structures. The implementation was conducted utilizing a local contractor being guided through the installation by Steve Reichert, Gerald Romero and Arcenio "AJ" Lujan.

Revegetation efforts were conducted immediately after construction to mitigate the disturbed areas resulting from the implementation effort. The remaining planting and revegetation efforts will continue in the Spring of 2022.

Beneficial results were seen almost immediately as several large precipitation events occurred soon after implementation and the project area responded positively to the flows that occurred. All structures slowed water flow and allowed sediment to deposit behind the structures. The overall velocity of flow was greatly reduced throughout the entire reach and it allowed some of the flows to access the floodplain within the channel. The reduction in velocity also allowed some of the water to infiltrate the soil, reconnecting the process of recharging the groundwater table. The reseeded areas responded almost immediately as well, having a soil that was more saturated and maintained soil moisture for longer periods of time. The project transformed the channel from a degrading state to a state that will trend in a positive direction in many reaches. The end result of the project shall be a system that retains soil moisture for longer periods of time, increases the possibility of wetland vegetation, increases wildlife habitat, and produces cleaner higher quality water as it exits the property.

Grant Soil and Water Conservation District

Upper Mimbres Forest Restoration

A recently completed project in the Upper Mimbres watershed on the Gila National Forest focused on thinning trees with an eye toward fire protection and overall forest restoration. Thinning ponderosa pines encourages fewer, larger, healthier trees that are more resilient to infestations of bark beetles — a problem across the West.

Forest Service staff, Grant County officials, a field representative from U.S. Sen. Tom Udall's office; and the Southwestern New Mexico Audubon Society's listen to the Forest Service extol the many benefits of the Collaborative Forest Restoration Program tree thinning project in the Gila National Forest. Photo by Geoffrey Plant

The Nature Conservancy received an initial Collaborative Forest Restoration Program (CFRP) grant for planning the project from 2012 through 2014; when the Upper Mimbres Environmental Analysis was finished, the Grant Soil and Water Conservation District (SWCD) was awarded an implementation grant beginning in January 2018. The grant was for $315,000 and required a 25 percent match in funds from contractor and the Nature Conservancy.

The four-year project resulted in tangible restoration benefits: a total of 232 acres were treated by contractors. Thinning reduced fuels from 50 tons per acre down to 15 tons in treated parts of the 1,500-acre project area and reduced fuels by half in other treated parts of the project area — something that will give homes on the edge of the Gila Forest in the Gatton's Park development (the wildland urban interface) a better chance of protection during a wildfire.

Martha Cooper, Gila program manager for the Nature Conservancy, originally brought the idea of applying for a federal grant to reduce wildfire fuels to the Grant SWCD. Dusty Hunt, a supervisor with Grant SWCD, said the District "appreciated the opportunity to collaborate on the project and get work done on the ground." Hunt explained that conservation projects like the CFRP also help the District access base funding to support their operation. For this project, the District administered the project, providing benefits to a variety of stakeholders including residents, logging businesses, Grant County government, the Gila National Forest, and firefighters. Field trips to the project site occurred annually, bringing people together to see work on the ground and share ecological monitoring data. The Nature Conservancy provides monitoring of the project. "Monitoring of the CRFP was introduced to reduce conflict by bringing stakeholders together to see what treatments look like and to understand the size of trees being cut," Cooper said.

The Grant SWCD has since applied for, and received, another CFRP grant for restoration in the Burro Mountains (Silver City Ranger District, Gila National Forest), working with Jornada Resource Conservation & Development. This indicates that one of the objectives of the Upper Mimbres CFRP, to build the capacity to collaborate, was met.

New Mexico Department of Game and Fish

Rio Chama Aquatic Habitat Project

The New Mexico Department of Game and Fish partnered with the U.S. Army Corps of Engineers, Bureau of Land Management, Santa Fe National Forest, Carson National Forest, New Mexico State Land Office, Trout Unlimited, and National Fish and Wildlife Foundation to improve fish habitat and riparian health along two miles of the Rio Chama below the Abiquiu Dam. The purpose of the project was to improve instream habitat for resident and stocked trout species (e.g., rainbow trout and brown trout) and native fish species (e.g., Rio Grande chub and Rio Grande sucker). Flows in this reach of the Rio Chama are controlled by Abiquiu Dam operations and vary seasonally. Extremely low flows during the winter months limited overwintering habitat required by these fish species. River channel morphology lacked complexity and refugia for these fish species during high summer flow periods. The project utilized several rock and large woody debris structures and channel shaping to increase habitat complexity and connectivity. The project also focused on improving riparian habitat to increase functionality and overall health the of the river corridor by grading adjacent flood plain areas and planting native riparian trees, grasses, and sedges.

Rio Chama aquatic habitat improvements.

Removal of invasive vegetation on Socorro-Escondida WMA.

Socorro-Escondida Wildlife Management Area (WMA)

The Department cooperated with New Mexico State Forestry and Save our Bosque Task Force to remove 89 acres of invasive tamarisk and Russian Olive. This project used Forestry and Watershed Restoration Act Funds with a focus on reducing the risk of bosque wildfires and restoring native habitat. Along with these efforts, the entire WMA was fenced to exclude trespass livestock grazing, which has hindered recovery and long-term viability of riparian habitats on the WMA. Habitat restoration and fencing improvement are expected to help reduce nonpoint source pollution, benefitting the nearby Rio Grande.

Pecos River Diversion Dam Replacement

The Department replaced an existing diversion dam on the Pecos River approximately one mile upstream of the Lisboa Springs Fish Hatchery. The diversion dam replacement included the installation of large boulders and rip rap to control erosion and stabilize banks. A fish ladder was also built to improve connectivity in the upper Pecos River for native fish. Approximately 900 square feet of soil fill was removed upstream of the diversion dam to help realign the channel.

Photo above left; Old diversion dam structure.

Photo above right; New diversion dam structure.

La Joya Wildlife Management Area

The Department continued its efforts to restore floodplain grasslands on the WMA by masticating 130 acres of invasive tamarisk and 100 acres of dead Russian olive. Follow-up herbicide treatments were applied to 270 acres of regrowth tamarisk removed in the past. Recovery of native alkali sacaton and inland salt grass have begun to occur and is meeting expectations. Staff managed 300 acres of wetland habitat on the WMA. Total wetland acres were reduced due to water limitations. Staff working with Ducks Unlimited completed preliminary (30%) construction plans for enhancement of 700 acres of existing wetlands on the WMA. Final design is planned for 2022. Work is set to begin in 2023. Habitat restoration and wetland improvement activities are all expected to help reduce nonpoint source pollution, benefitting the nearby Rio Grande.

La Joya Wildlife Management Area wetlands.

Bernardo Wildlife Management Area

The Department continued its efforts to restore floodplain grasslands on the WMA by masticating an additional 20 acres of invasive tamarisk. Follow-up herbicide treatments were applied to 530 acres of regrowth tamarisk removed in the past. Recovery of native alkali sacaton and inland salt grass have exceeded expectations in these areas. Department staff and contractors also continued riparian restoration efforts by planting 2,000 cottonwood poles, 500 Goodding's willows, and 200 coyote willows. Six hundred cages and two 5-acre exclosures were installed to protect plantings. Staff maintained 200 acres of wetland habitat on the WMA during the winter months. Total wetlands area was reduced due to water limitations. Staff working with Ducks Unlimited completed final construction plans for enhancement of 800 acres of existing wetlands on the WMA. Work set to begin in 2022 will include upgrading infrastructure, design, and management of these wetlands. Habitat restoration and wetland improvement activities are all expected to help reduce nonpoint source pollution, benefitting the nearby Rio Grande.

Wetland enhancement plan for Bernardo WMA.

River Ranch Wildlife Management Area

The Department contracted the installation of water gaps and upgraded fencing to exclude trespass livestock from the WMA. Staff also worked with neighboring ranchers to remove and keep trespass cattle off of the property. Exceptional riparian recovery has occurred along the Mimbres River within the WMA. Livestock exclusion efforts are expected to help reduce nonpoint source pollution in the Mimbres River.

River Ranch WMA fence upgrades.

Fenton Lake Wildlife Management Area

The Department contracted replacement and repair of the WMA's entire boundary fence to prevent livestock trespass from adjacent U.S. Forest Service and private lands. This extensive fence project will prevent damage of critical habitat for Mexican Spotted Owl, Jemez Mountains Salamander, and New Mexico Meadow Jumping Mouse on the WMA. Livestock exclusion efforts are expected to help reduce nonpoint source pollution by reducing erosion and associated pollution of Fenton Lake and the Rio Cebolla.

Edward Sargent Wildlife Management Area

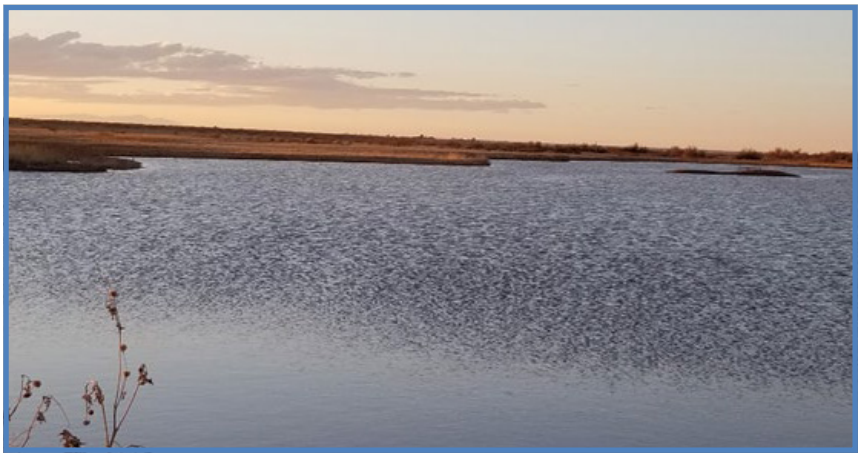
The Department maintained five exclosure fences around approximately 30 acres of riparian habitat along the The Department maintained five exclosure fences around approximately 30 acres of riparian habitat along the Rio Chamita on the Edward Sargent WMA to decrease browsing pressure and increase herbaceous ground cover and regrowth of riparian vegetation. This project builds on 15 acres that were exclosed last year. The Department also maintained 30 Beaver Dam Analog (BDA) and Post-Assisted Log Structures (PALS) within the original 15-acre exclosure this year. Staff and contractors began planning additional exclosures and in-stream structures along the lower Nabor Creek on the WMA. Department staff along with The Nature Conservancy began planning prescribed fire activities with the goal of preventing catastrophic wildfire. In-stream and riparian improvements, along with planned fire mitigation activities, are expected to help reduce nonpoint source pollution in the nearby Rio Chama and its tributaries.

Spring runoff post-implementation of Beaver Dam Analogs and Post-Assisted Log Structures.

Edward Sargent Wildlife Management Area prescribed burn planning.

W.S. Huey Wildlife Management Area

The Department continued to maintain approximately 150 acres of wetlands on the WMA. Staff maintained past riparian plantings and planted an additional 1,050 cottonwoods, 200 coyote willows, and 300 Goodding's willows. All plantings were caged. Staff continued to hydroseed and drill seed approximately 100 acres adjacent to wetlands and the Pecos River to reduce erosion. Habitat restoration and wetland management activities are expected to help reduce nonpoint source pollution, benefitting the nearby Pecos River.



W.S. Huey WMA wetland management area.

Tucumcari Lake Wildlife Management Area

The Department began planning improvements to restore the historic salt lake on Tucumcari Lake WMA. This project is a cooperative endeavor between the Department, the City of Tucumcari, Quay County, Arch-Hurley Conservancy District, Mesalands Community College, Audubon New Mexico, Ducks Unlimited, and Rio Grande Return. Initial work included mastication and removal of 510 acres of invasive tamarisk. Removal of tamarisk allowed collection of elevation data by Ducks Unlimited to begin wetland improvement planning. All parties involved conducted a wetland review to set the course for management planning that included supplying water to the wetland. Planning will continue into next year with a hope for construction within the next two years. Habitat restoration and wetland management activities are expected to help reduce nonpoint source pollution by filtering runoff from adjacent developed areas before it enters Tucumcari Lake.

Tamarisk removal on Tucumcari Lake WMA.

Colin Neblett Wildlife Management Area

The Department continued to monitor erosion, recovery, and effectiveness of erosion-management features put in place after the Ute Park Wildfire. Staff cooperated with NMED in their efforts to create the American Creek Watershed Water Quality Plan, which includes WMA lands. Fire recovery and planning efforts are expected to help reduce nonpoint source pollution by reducing erosion and associated pollution of the nearby Cimarron River and American Creek.

Double E Wildlife Management Area

The Department contracted the installation of three water gaps and fencing upgrades to exclude trespass livestock from the WMA. Staff also worked with neighboring ranchers to remove and keep trespass cattle off of the property. Exceptional riparian recovery has occurred along Bear Creek within the WMA. Livestock exclusion efforts are expected to help reduce nonpoint source pollution in Bear Creek, a tributary to the Gila River.


Double E Wildlife Management Area fence upgrades and riparian recovery.

Marquez Wildlife Management Area

The Department contracted the repair and maintenance for 12 miles of road and 35 erosion management features on the WMA. This work will help significantly reduce erosion and generation of nonpoint source pollution across the WMA.


Marquez Wildlife Management Area erosion management features.

Canadian River Riparian Habitat Restoration

The New Mexico Department of Game and Fish collaborated with the State Land Office and livestock leasees to replant approximately two river miles along the Canadian River near the Alamita Canyon Ranch. Efforts focused on planting native riparian vegetation (willow, cottonwood, and shrubs) in an area where significant tamarisk eradication was previously conducted and included the installation of exclosure fencing around the plantings. The plantings will provide additional shade to the stream, stabilize streambanks, reduce erosion and sedimentation, contribute woody debris and nutrients to the river, and help maintain in-stream habitats for native fish.

Replanted native riparian vegetation along the Canadian River.

American Creek and El Rito Canyon Ponderosa Pine Restoration

The Department continued a collaboration with Carson National Forest wildlife, fire, and fuels staff to implement an additional 1,700 acres of thinning and slash pullback to create shovel ready burn-blocks in an effort to restore ponderosa pine forest on the Tres Piedras Ranger District.

Pacheco Canyon Mixed Conifer Restoration

The Department continued a collaboration with Santa Fe National Forest fire and fuels staff to implement an additional 400 acres of a cut and pile forest thinning treatment in an effort to create functional prescribed fire burn units. Previous fire-line efforts interacted with the Medio wildfire to help moderate fire severity and slowed the spread of the fire, thereby mitigating negative impacts to the watershed, including the potential for increased erosion post-fire.

San Antonio Creek Restoration

The Department collaborated with Santa Fe National Forest hydrology and watershed staff to implement Beaver Dam Analog installation, repair livestock exclosure fencing, and install additional erosion control structures to mitigate and reverse impacts to wildlife and aquatic habitats and the watershed.

San Antonio Creek

Comanche Creek Watershed Improvements

The Department continued a collaboration with Carson National Forest hydrology and watershed staff to improve wetland habitat as part of a large-scale watershed restoration effort. The Department installed hundreds of wetland structures (e.g., log jams, rock erosion control structures, sod and floodplain benches, sod plugs) and excavated flood channels within upper Vidal Creek to stabilize banks and slope wetlands and encourage floodplain connectivity. These structures improve wetland habitat condition, increase soil water storage, and decrease erosion, thereby reducing nonpoint source pollution.

Upper Vidal Creek.

Stewart Meadows Pipe Fence Enclosure

The Department collaborated with the Carson National Forest Tres Piedras Ranger District and local permittees to install approximately six miles of pipe fence and new water gaps around Stewart Meadows. The pipe fence replaced an old wooden fence that was previously permeable to trespass livestock. These structures will provide significant protection to the Rio San Antonio, which runs down through the middle of the area, and are expected to greatly reduce nonpoint source pollution to that system. Additional planning efforts are underway to develop ideas to enhance the habitat and function of this newly protected area.

Stewart Meadows

Share with Wildlife Projects

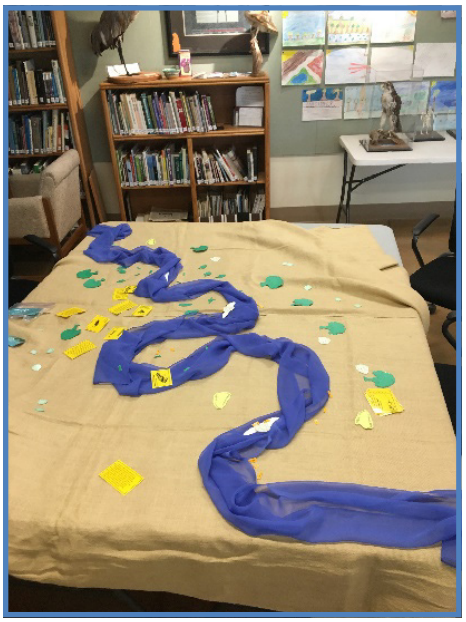
Aquatic habitat connectivity assessment for the Santa Fe National Forest

This project focused on determining whether stream crossings, especially culverts, are impacting the connectivity of habitat for Species of Greatest Conservation Need (SGCN) associated with aquatic and riparian habitats. It entailed development of a digital datasheet, which includes basic water and riparian habitat quality assessments, and pilot testing along perennial streams within the Santa Fe National Forest. Results helped identify structures that may be impeding connectivity and areas where habitat connectivity may be enhanced through alteration, maintenance, or complete replacement of structures. There was one structure on the Rio Cebolla that was identified as needing more immediate management action to improve aquatic habitat connectivity. The contractors developed a story map that provides a good summary of the collected data and relevant SGCN.

Photo above; Data collection using digital datasheet.

Bosque Education Guide and New Mexico STEM Ready! Science Standards

This project is in progress of updating six natural history-related lessons from the extant Bosque Education Guide to better align with the New Mexico STEM Ready! Science Standards. The guide, which has been presented to approximately 2,200 teachers since its creation, provides an extensive environmental education curriculum regarding New Mexico's riparian and aquatic habitats. The natural history activities focused on for this project help students learn about: adaptations and anatomical structures of arthropods; crane migrations and threats sandhill cranes face from loss of wetland habitats; mapping patterns of bird biodiversity and the importance of riparian areas for these species; the web of life in the bosque; the impacts of invasive species and process for developing a management plan to address one of several invasive riparian plants; and collecting data on what others know (and testing what they know) about the bosque through the development of, and analysis of data from, a survey. Updating the guide will help keep these well-designed, hands on activities relevant and as useful as possible for New Mexico educators.



Model of the middle Rio Grande used for some Bosque Education Guide classroom lessons.

Additional information on Share with Wildlife Projects is available at http://www.wildlife.state.nm.us/conservation/share-with-wildlife/.

New Mexico Forestry Division

New Mexico's forests need proper forest management to help improve overall health, reduce insect and disease risk, reduce the impact of fires, and improve watershed and habitat health. Through careful resource management, community engagement, and productive collaborations, New Mexico Forestry Division is able to promote healthy, sustainable forests and watersheds. The primary activities undertaken by the Forestry Division to achieve these goals are watershed restoration projects, forest thinning, prescribed burning, and permitting of commercial timber sales. In Federal Fiscal Year 2021, the Forestry Division accomplished 14,629 acres of watershed restoration / thinning projects in NPS Priority Watersheds (see Table 1).

Using BMP's to address NPS pollution

The New Mexico Forestry Division's forest resource management programs involve the application of both regulatory and voluntary silvicultural BMPs on State and private forest lands in New Mexico. Through the federally supported Cooperative Forestry Assistance Program, the New Mexico Forestry Division provides technical forest resource management assistance to landowners and recommends application of NPS pollution BMPs in all silvicultural activities. Types of technical assistance range from reforestation to harvesting of mature timber. This assistance is designed to meet a wide range of landowner management objectives. In conjunction with these programs, the New Mexico Forestry Division has technical responsibility for application of forestry practices in federally funded landowner cost share programs that includes the Forest Health Improvement Program (FHI), which specifically addresses forest health issues and forest management planning, as well as various thinning programs that address wildfire threats to communities and watersheds.

The New Mexico Forestry Division has regulatory authority over all harvesting of commercial forest products where more than 25 acres are harvested from an individual private ownership in a calendar year. Harvesting is conducted under a permit issued by the New Mexico Forestry Division. As a requirement of the permit application, a harvest plan defining what will be reserved after harvest and how steep slopes will be treated to minimize soil erosion, as well as minimizing any potential impacts to stream courses, must be prepared. In addition, regulations require that all roads, skid trails, and landings be water barred and reseeded. Following completion of harvesting activities, New Mexico Forestry Division personnel complete a silvicultural water pollution-NPS assessment to determine the types of BMPs applied.

The Forestry Division provides technical assistance to partner agencies and organizations on matters related to forestry, wildland fire and watershed health. Some partnerships are formalized through legal agreements. A Cooperative Agreement between the Division and the Natural Resources Conservation Service (NRCS) provides for a shared staff position to serve as the New Mexico NRCS' State Forester, and the Division's District staff serve as Technical Service Providers to NRCS Field Offices, Area Offices, and cooperators. Agreements with the Bureau of Land Management (BLM) and the Southwestern Region of the USDA Forest Service enables the Division and BLM and USFS to collaboratively develop cross-jurisdictional, landscape-scale forest and woodland restoration treatments for improving forest health and resilience and decreasing wildland fire threat to forests, woodlands and watersheds. In other cases, partnerships are formed to implement grant-funded activities that promote watershed health and water quality.

The Division also partners with other state agencies to support common state objectives, such as managing the New Mexico Forest and Watershed Management Coordinating Group (Coordinating Group).

Forest and Watershed Health Office

The Forestry Division established the Forest and Watershed Health Office (FWHO) to facilitate and coordinate implementation of the New Mexico Forest and Watershed Health Plan. The Plan contains twenty recommendations for state-level actions needed to achieve ecological restoration across New Mexico's landscapes. FWHO coordinates with other entities to improve the efficiency and effectiveness of mutual efforts to protect and restore New Mexico's landscapes. The Forest and Watershed Health Coordinator chairs the Coordinating Group, whose members represent 20 agencies and organizations and the private sector. The Coordinating Group informs and advises the FWHO and makes recommendations to the State Forester in its role as the Watershed Management Subcommittee. The FWHO, together with other Division staff, the Coordinating Group and its task teams, implement action items recommended in the Plan. FWHO contributes to watershed health and water quality directly through collaborative project planning, oversight, and implementation and through grant writing to fund such projects. FWHO participates in state and regional groups and advisory bodies involved in natural resource policy, legislative analysis, grant development and proposal evaluation, outreach and education, and strategic planning, which pave the way to more and better work getting done on the ground.

Forest and Watershed Restoration Act

The Forest and Watershed Restoration Act (FAWRA) was created by House Bill 266 and signed into law by Governor Michelle Lujan Grisham on March 15, 2019. FAWRA allocates $ 2 million annually to the Energy, Minerals and Natural Resources Department, Forestry Division with the purpose of restoring forests and watersheds in the state of New Mexico and establishes a Forest and Watershed Advisory Board to evaluate and recommend projects. The objectives of FAWRA are to prioritize and fund large-scale forest and watershed restoration projects on any lands in the state that:

- increase the adaptability and resilience to recurring drought and extreme weather events of the State's forests and watersheds;
- protect above and below ground water sources;
- reduce the risk of wildfire, including plans for watershed conservation;
- restore burned areas and thin forests;
- include related economic or workforce development projects or a wildlife conservation or a habitat improvement project.

The recurring funding provided by FAWRA gives the State the opportunity to better manage its forests and watersheds, and better protect its water resources.

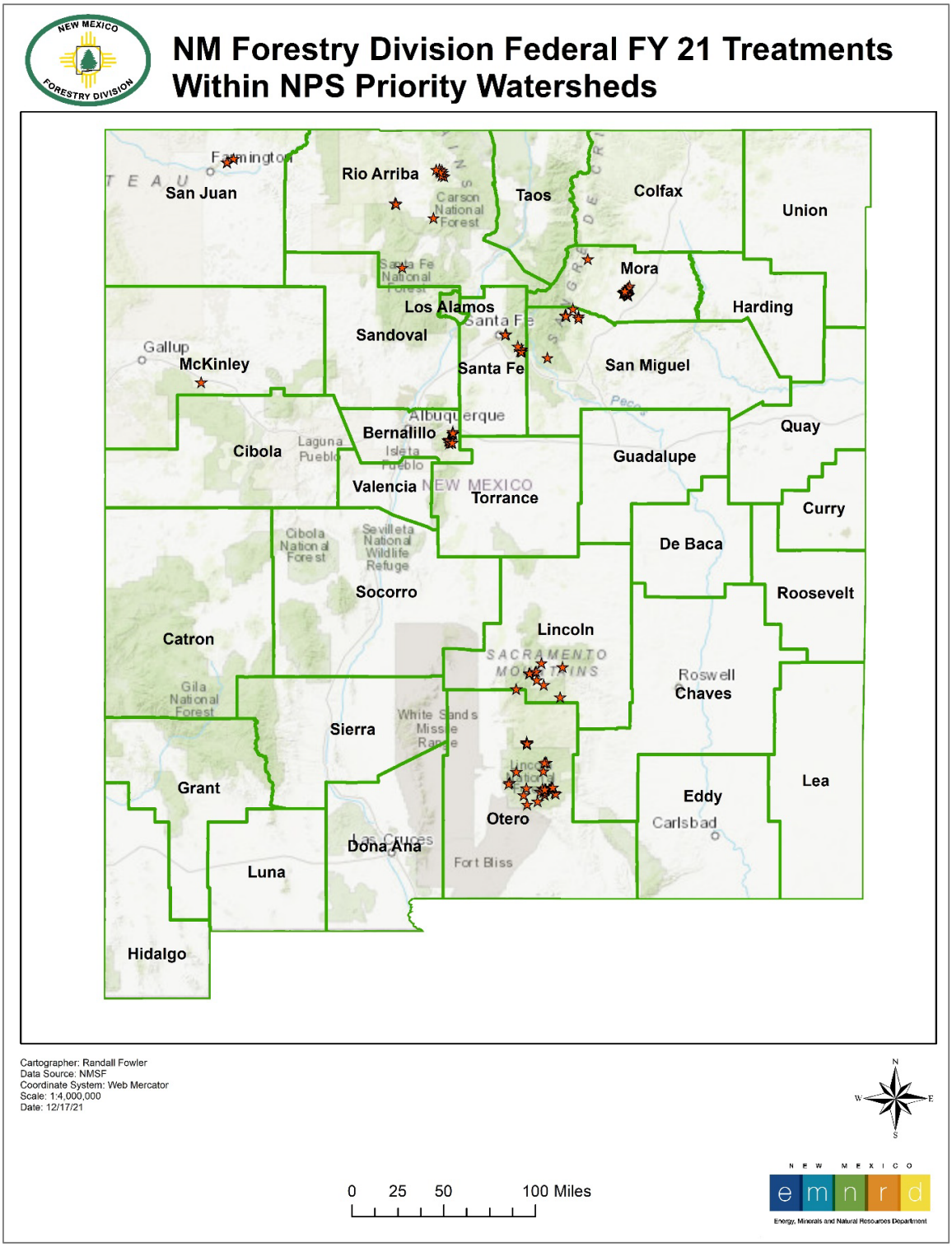


Figure 1. Map of Projects Conducted by New Mexico State Forestry in 2021

Table 1: New Mexico State Forestry Watershed Restoration Projects Accomplished in 2021

2021 New Mexico State Forestry Watershed Restoration Projects				
Project	**Location**	**Completed Acres**	**Watershed**	**Description**
20 San Juan Basin WUI	Near La Plata	15	Cottonwood Arroyo-La Plata River	Mastication
20 San Juan Basin WUI	Near Aztec	5	Flora Vista Arroyo-Animas River	Mastication
20 San Juan Basin WUI	Near Flora Vista	16	City of Farmington-Animas River	Mastication
2018 Canjilon Watershed Improvement Project	near Canjillon	453	Martinez Canyon-Canjilon Creek	Thinning
2018 Cebolla/Canjilon HazFuel Reduction on NFL	near Canjillon	24	Lopez Canyon-Canjilon Creek	Mastication
2019 Tierra y Montes Capulin NFL	Near Pendaries Village	18	Headwaters Manuelitas Creek	Chipping
Aztec Springs 2017-2018	Near Santa Fe	23	Headwaters Santa Fe River	Thinning
Bryan George FHI	Near Pecos	6	Apache Creek	Tree felling/removal
Cedro 2 Watershed Restoration Project	Near Tijeras	258	Upper Tijeras Arroyo	Thinning
Chilicoote South	Near Timberon	40	Perk Canyon-Cuervo Creek	Mastication
Ciudad SWCD Open Space Restoration	Near Tijeras	143	Juan Tomas Canyon	Thinning
Claunch-Pinto Box Canyon Restoration	Near Manzano State Park	45	Upper Arroyo de Manzano	Thinning
Coleman NFL South Sacramento Restoration	Near Mayhill	26	James Canyon	Mastication

2021 New Mexico State Forestry Watershed Restoration Project				
Project	**Location**	**Completed Acres**	**Watershed**	**Description**
Coyote Creek State Park Hazardous Fuels Reduction	Coyote Creek State Park	35	Middle Coyote Creek	Thinning
Forest Health Initiative	Near Tierra Monte	3	Rito Cebolla	Chipping
FY21 FMartinez med thin	Near Coyote	21	Headwaters Rio Puerco	Thinning
Glorieta NRCS Joint Chiefs	Near Glorieta	164	Glorieta Creek	Thinning
Haz Fuels/Claunch Pinto/Southern Manzanos	Near Mountainair	199	Deer Canyon - Abo Arroyo	Chipping
Red Cabin No Name Spring #1	Near Ruidoso	11,000	Water Hole Canyon	Lop and scatter
TCasados EQIP2020	Near El Vado Lake State Park	68	Outlet Arroyo del Puerto Chiquito	Thinning
Turkey Mountain Watershed Restoration Project	Turkey Mountain	2067	Arroyo Tierra Blanca	Thinning
		Total = 14,629 acres		

United States Forest Service

Carson National Forest

During fiscal year (FY) 2021, the Carson National Forest (CNF) implemented projects that made progress towards meeting and maintaining state water quality standards as well as activities that contributed to non-point source management.

Vidal Creek Restoration Project

Comanche Creek Watershed (130201010102)
In cooperation with NM Department of Game and Fish restoration of stream and wetland areas of Vidal Creek was implemented. Approximately 155 structures were constructed (sod plugs and benches, rock and log run-downs, earth channel plugs, constructed riffles, and contour swales) to reduce stream channel erosion, head cutting, increase floodplain access, and enhance slope wetland conditions.

Cabresto Creek Wetland Restoration Project

Cabresto Creek (130201010302)
Chevron Environmental Management Company, Chevron Mining, Inc. implemented restoration activities in a section of Cabresto Creek headwaters in the Midnight Meadows area of the CNF These activities we completed as part of compensatory mitigations requirements for impacts to waters of the U. S. (WOTUS) associated with remediation activities for the CMI Questa Mine (Mine) required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. This project focused on implementing activities to arrest erosion due to headcuts and restoring wetlands. Various structures comprised of natural materials (rock and log) such as log mats, log spreaders, Zuni bowls, log step falls, media luna, one rock dams, and rock plugs were constructed. In addition, approximately 1,100 feet of protective fence was installed to minimize damage from grazing ungulates.

Midnight Meadows Wetland Stabilization/Bitter Creek Channel Reinstatement Project

Upper Red River (130201010301)
In cooperation with Amigos Bravos a volunteer work weekend was held to continue restoration of the Midnight Meadows wetlands area of upper Bitter Creek. This work is part of a Participating Agreement (20-PA-11030200-068) between Amigos Bravos and the USDA Forest Service, CNF. Work performed included repair and maintenance of existing wetland exclosures and construction of hand- built rock structures (one-rock dams, Zuni bowls). Approximately 40 volunteers and Forest Service staff participated in this work weekend.

Ring Drainage Restoration Project

Headwaters North Ponil Creek (1108000202)
In cooperation with Albuquerque Wildlife Federation a volunteer work weekend was held to continue restoration of the Ring Drainage wetlands area on the east side of the Valle Vidal. This work is part of an ongoing collaboration with Albuquerque Wildlife Federation and the CNF. Work performed included repair and maintenance of existing wetland exclosures, construction of hand- built rock structures (one-rock dams, Zuni bowls), and construction of corner braces and H braces for a protective exclosure fence. When complete the exclosure fence will protect approximately 75 acres of wetlands. Approximately 35 volunteers and Forest Service participated in this work weekend.

United States Forest Service

Cibola National Forest and National Grasslands

The Cibola National Forest and National Grasslands (CNFNG) implemented several projects that improved nonpoint source management during the fiscal year 2021. The fiscal year started on October 1, 2020 and ended on September 30, 2021. These projects included road work, vegetation treatments including prescribed burning and thinning, and reforestation. Additionally, the Forest has completed planning for a landscape scale restoration projects in the Zuni Mountains as well additional work in Mills Canyon, including an improved aquatic crossing on the Canadian River. Photos from these areas can be seen at this website, https://www.flickr.com/photos/cibola_nfg/ .

Road Improvements and Re-route

Subwatershed: Arroyo Montosa (HUC 130202090602)

Reconstructed road crossing on unnamed tributary of Arroyo Montosa

Work was completed on Forest Road 10 in the Gallinas Mountains on the Magdalena Ranger District. Portions of the road were re-routed to prevent erosion and stream channel instability in addition to road access. Road improvements included improvement to road drainage, culvert replacement, and road surfacing. Culverts were replaced with larger sizes to accommodate increased flows expected from climate changes as well as addressing current conditions. Road surfacing included graveling in key locations to prevent sediment from mobilizing, in addition to protecting the road. The result of the road improvement activities has reduced sedimentation and improved stream stability in the Arroyo Montosa subwatershed.

Canadian River Riparian Restoration

Subwatershed: Canon Vercere-Canadian River (HUC 110800030505)

1. Completed improved crossing at Mills Canyon to provide aquatic organism passage.
2. Continued maintenance of Salt Cedar Control and Replanting (part of the Canadian River Riparian Restoration Project (CRRRP).

The project area is in Mills Canyon along the Canadian River, south of the confluence with Cimarron River and north of the confluence with the Mora River. The Canadian River provides habitat for a variety of wildlife and fish species in this area. In 2021, activities included continued maintenance of salt cedar removal and an improved crossing on the Canadian Rivers was built.

In FY21, continued maintenance of salt cedar treatments occurred at Mills Canyon in partnership with the

Canadian River Riparian Restoration Project. The Canadian River Riparian Restoration Project (CRRRP) is a collaboration of eight Soil and Water Conservation Districts in northeastern New Mexico (https://www.nmacd.org/programs). The CRRRP's goal is to restore the watershed of the Canadian River, both on the main stem and on its tributaries, to a healthy productive state that will provide native habitat for a variety of wildlife and improve water for communities, agriculture, and recreation throughout the course of the watershed. This activity allows for the riparian area along the Canadian River to recover. Riparian and upland plantings were also monitored to assess the success of riparian plants and additional needs.

Canadian River in Mills Canyon showing area of removal of salt cedar along banks.

In addition, the low water crossing at Mills Canyon across the Canadian River was reconstructed to allow for aquatic passage and improve river functions. This crossing was deteriorating and a source of sediment for the downstream reaches. The small fish that live in the Canadian River were unable to move across this structure during low flows, resulting in changes to their habitat and populations. An improved design was implemented in FY21 as shown in the before and after photos below.

Low water crossing (looking upstream) in Mills Canyon, Canadian River before and after construction of the improved crossing completed in FY21 to provide passage for aquatic organisms.

Vegetation Treatments (prescribed fire and thinning)

Subwatersheds:

Prescribed Fire: Durfee Canyon (HUC 130202080103) – 1075 acres
Prescribed Fire: Nogal Canyon – Rio Grande (HUC 130202110502) 910 acres
Prescribed Fire: Cuervo Canyon – Rio Grande (HUC 130202110503) 890 acres
Prescribed Fire: Limestone Canyon – Alamosa Creek (HUC 130202110601) 490 acres
Prescribed Fire: Mesteno Draw (HUC 130500011001) 290 acres
Prescribed Fire: Upper Arroyo de Manzano (HUC 130500011002) 170 acres
Prescribed Fire: Wolf Wells (HUC 130202080101) 170 acres
Prescribed Fire: Canon Barranco – Abo Arroyo (HUC 130202030501) 125 acres
Thinning: Upper Rio Nutria (HUC 150200040201) – 2500 acres
Thinning: Upper Arroyo de Manzano (HUC 130500011002) 525 acres
Thinning: Upper Tijeras Arroyo (HUC 130202030201) – 285 acres
Thinning: Canon del Camino – Rio Puerco (HUC 130202040403) 265 acres
Thinning: Lobo Creek (HUC 130202070305) 205 acres
Thinning: Arroyo Seccion (HUC 130202050702) 150 acres
Thinning: Middle Rio Nutria (HUC 150200040203) 140 acres
Thinning: Outlet San Pedro Creek (HUC 130202010502) 125 acres
Thinning: Upper San Mateo Creek (HUC 130202070301) 100 acres

Vegetation treatments such as prescribed fire and thinning occurred across the Cibola NF&NG in FY21 as restoration activities continue to be planned and implemented. In areas where tree densities are out of the range of variability, these treatments reduce the risk of uncharacteristic fire with high intensity effects. High intensity fire effects include high sedimentation rates, turbidity, erosion, and streambank erosion. Vegetation treatments reduce the potential for these effects and improves overall watershed condition.

Prescribed fire was implemented to improve watershed condition, increase resiliency to wildfire, and improve ground cover. These benefits are expected to lead to improve-

Prescribed fire on the Cibola National Forest

ments in water quality by reducing sediment inputs over the long term and improving riparian condition. Watershed condition in affected watersheds will be reassessed to determine the extent of improvement using the Watershed Condition Framework, a method used by the USDA Forest Service (https://arcg.is/1LKDWv).

Reforestation – Doghead Fire (2016)

Subwatershed: Milbourn Draw (HUC 130500011103) – 165 acres

One hundred sixty-five acres of trees were planted in the Doghead Fire area in the Manzano Mountains to assist in the restoration of these lands from the effects of wildfire. As these trees grow, they will provide canopy cover and reduce the impact of rainfall and runoff, thereby improving downstream water quality and protecting beneficial uses.

Newly planted ponderosa pines in the Doghead Fire area

Gila National Forest

The Gila National Forest implemented projects in fiscal year 2021 that were designed to improve water quality, water quantity, soil conditions, riparian conditions, and to reduce the risk of high intensity wildland fire. The following information highlights some of these projects as well as provides updates on future projects.

Road Improvements and Re-route

21 miles of roads were decommissioned in the 6th code watersheds of Big Canyon-San Francisco River and Outlet Centerfire Creek. These roads are located within the Luna Restoration Project area and essential projects listed within the Escudilla Watershed Restoration Action Plan. In addition, 9.5 miles of heavy road maintenance and drainage improvements were completed in Big Canyon-San Francisco River watershed and 5 miles are currently in progress in the Outlet Centerfire Creek watershed. One road crossing was realigned at the Head of Ditch campground that crosses the San Francisco River. This work was completed to accommodate the planned redesign and construction of the Head of Ditch diversion for the Luna Ditch Commission. Road improvements like these reduces sediment inputs in the drainage networks and provides for improvements to water quality in the San Francisco River and Centerfire Creek which are both currently on the NM 303d list of impaired waterbodies.

Head of Ditch/ San Francisco River.

Vegetation Treatments (prescribed fire and thinning)

The Forest successfully completed ignitions of 5 prescribed fires that were partially funded by the NM Department of Game and Fish. These 5 burns primarily addressed habitat enhancement and wildlife management; however secondary benefits included the reduction of hazardous fuels which reduce risk to watersheds. Resource objectives for all 5 fires included: reducing available fuel loads; reducing ladder fuels and stand density; reducing conifer encroachment of meadows and adjacent grasslands; increasing the diversity and production of herbaceous vegetation; and protection of infrastructure. Treatments within the project areas continue the Forest Service's efforts to reintroduce fire at the landscape scale to reduce stand density and reduce the probability of a large-scale stand replacing wildfire events.

Indian Peaks Rx - Units 15/17 on the Black Range Ranger District was located approximately 80 miles northwest of T or C, NM. 10,873 acres were burned at the cost of $180,000. The burn units are a continuation of landscape prescribed burning and mechanical treatments that have been carried out across the Indian Peaks area since 1998. The units have seen some mechanical treatment to protect 9 miles of El Paso Electric powerlines that provide power to El Paso and Southwest Texas. Vegetation conditions in the treatment units were unnaturally dense due to over 50 years of fire suppression. Current stand conditions consist of ponderosa pine and pinyon juniper, with a thick understory of small-diameter seedlings that have been encroaching on adjacent grasslands. A combination of thinning and fire has helped restore these grasslands and increased the diversity and production of the herbaceous vegetation.

Indian Peaks Rx

Collins Park (Moraga Unit 5) Rx was located within the Collin's Park area, on the Reserve Ranger District. The burn was approximately 21 miles southeast of Reserve, NM. 2,667 acres were burned at a cost of $30,000. The Collins Park Project Area is located east of the Village of Reserve, NM. The burn encompassed three NEPA decisions which allowed for broadcast burning under low to moderate fire intensities with similar objectives. These NEPA projects include: Upper Moraga Canyon Pronghorn Corridor Landscape Project CE, Salt Lick CE, and Burro EA. Several thinning projects have taken place within the area leaving slash that has been lopped and scattered throughout the units. The Continental Divide (CDT Trail) runs through the northern units of the project area. Several units within the Collins Park Rx project area have been previously thinned in partnership with the Rocky Mountain Elk Foundation, NM State Forestry and the NM Department of Game and Fish. These thinning and burning units are a continuation of landscape prescribed burning and mechanical treatments that have been carried out across the Collin's Park area since 2010.

Collins Park Rx

L-T East Rx was located near the G.O.S. subdivision between Lincoln Canyon and North Star Mesa (Forest Road 150), on the Wilderness Ranger District. The project area was approximately 7 miles east of Lake Roberts, NM. 2,787 acres were burned at the cost of $65,000. The burn unit is a part of the larger, Upper Mimbres

Watershed Landscape Project. The L-T East Burn unit has had multiple phases of treatment completed in partnership with NM Dept. of Game and Fish Habitat Stamp Program as well as Rocky Mountain Elk Foundation. The project area consists of areas that have been mechanically treated, areas that have been Rx burned in the past, and areas where this Rx fire was the first treatment entry. L-T Prescribed fire showed really good results towards meeting objectives within the unit. Fire severity across most of the unit was low to moderate, creating a mosaic pattern across the landscape. In the P/J woodland the burning conditions allowed the fire to burn with enough intensity that significant torching occurred.

Bar Six Rx was located on the Silver City Ranger District. The burn site is located approximately 18 miles southwest of Silver City, NM, near Mangas Valley and southwest of the Flying A/Oak Grove subdivision. 4,800 acres were burned at a cost of $39,000. This unit had previously been funded, in partnership with NM Department of Game and Fish. The Bar 6 area has had mechanical/hand thinning projects implemented along the southern boundary and western boundaries, at various times from 2011-2017. Approximately 1,200 acres of the project area has been thinned. Of the 1,200 thinned acres, 650 acres have already been burned leaving approximately 550 acres of thinning slash in the project area. The southwest corner of the unit was treated with fire in April of 2015 (Unit 1: 650 acres).

Bar 6 Rx

Sawmill Rx was located on the Silver City Ranger District. The project is located approximately 17 miles west and south of Silver City, NM. The project is in the Burro Mountains, near the Mangas Valley and directly south of the Oak Grove subdivision. 1,800 acres burned at a cost of $27,400. The project is adjacent to the Bar Six Rx and thinning project and the Willow fuelwood unit. Parts of the unit were previously thinned in 2010 and the entire unit burned in 2012. Backing and lower intensity firing operations were carried out in ponderosa pine to prevent unnecessary mortality; conversely, more intense firing tactics were used in pinon-juniper-oak mixes to achieve a mosaic effect and disrupt vegetation continuity. Due to the drought, fine fuel loading was reduced and negatively affected desired fire intensities in pinon-juniper oak mixes.

Sawmill Rx

Planning Activities

Willow Creek – This stream supports a recovery population of Gila trout and is listed under the CWA Section 303d due to excessive temperature loading and aluminum. Multiple wildfires and ungulate use have led to head-cutting, channel widening and shallow water depths with open canopy throughout the creek. The Whitewater Baldy Complex Fire in 2012 burned at high severity across much of the watershed within and above the project area. The channel type was historically a series of riffles and pools with a cobble substrate. The objective of this project is to restore stream morphology in Willow Creek and to reverse water quality temperature impairments. The project consists of utilizing enhancements made of native sourced materials that improve riparian and stream conditions for Gila trout by increasing riparian cover and improving the geomorphic stability of the stream. NMED funded Natural Channel Design in 2019/20 to prepare a Watershed Based Plan. The National Fish and Wildlife Foundation has provided initial funding to begin the project in 2022. Additional funding is being sought from NM River Stewardship funding (Trout Unlimited application), Water Trust Board Funding (San Francisco Soil and Water Conservation District application), and NM Department of Game and Fish.

Tularosa River/National Forest System Road 233 – The Tularosa River is listed under the CWA Section 303d due to excessive temperature and turbidity. The existing structure at the Tularosa River crossing has an approximate 4 ft. vertical elevation change between the low-water ford and the downstream channel bottom. This drop is preventing loach minnow and other species from accessing upstream habitat beyond NFSR 233 and has degraded critical habitat below the crossing. The design and construction of an improved road-stream crossing structure and limited stream restoration is funded with $605,000 with Federal Lands Transportation Program funds made available to the Forest Service under the Fixing America's Surface Transportation Act.

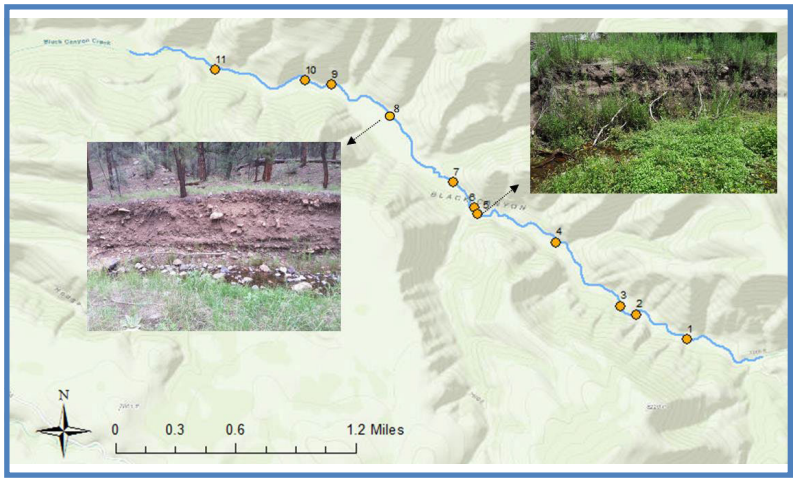
Tularosa River crossing

A Forest Service Enterprise Team completed the survey and conceptual design for wetland restoration Central Federal Lands Highway Division is delivering the project on behalf of the U.S. Forest Service. The structure will be replaced with an articulated concrete block structure to provide roughness on the surface. Several engineered riffles will be installed to bring the stream up to grade with the structure and provide passage below the crossing. Species benefitted include Loach Minnow, Desert

Sucker, Sonora Sucker, Speckled Dace, Chiricahua Leopard frog, and Narrow-headed Gartersnake. This will provide access for approximately 15 miles of upstream habitat. Wetland/stream restoration below the crossing is planned to be completed in tandem with the crossing construction and is estimated to cost $365,000. The Forest is currently pursuing additional partners to secure this funding.

Cherry Creek Wetland Restoration – In 2014, the Signal Fire severely burned the upper watershed of Cherry Creek resulting in extensive watershed instability for 3 years following the fire. Stormwater flows from the steep upper elevation watershed were concentrated and released in a valley bottom wetland which initiated several headcuts and 4 feet of channel incision in the wetland. The damage to Cherry Creek initiated in 2014 was accelerated following the 2020 Tadpole Fire with existing headcuts growing, the channel widening and additional loss of wetland vegetation. Proposed restoration treatments will fill the gully with soil and vegetation from nearby and realign the channel to flow as sheet flow across the wet meadow surface. One rock dams, J-hook vanes and small sod plugs will be used to restore discontinuous gullies in the channel and re-connect the channel of Cherry Creek to its floodplain. This will raise the water table and sub-irrigate streambank vegetation that will resist erosion and shade the stream channel. Water quality improvements will result from reduced sediment and nutrient loading from headcuts and unstable streambanks within the Cherry Creek floodplain. Work is funded and contracted by NMED through Post-fire funding.

Black Canyon Stream Restoration – Black Canyon Creek supports a recovery population of Gila trout and is listed under the CWA Section 303d due to excessive temperature loading. Multiple wildfires and ungulate use within the drainage have led to channel widening and shallowing with open canopy throughout the creek. The objective of this project is to restore stream morphology in Black Canyon and to reverse water quality temperature impairments. The project consists of utilizing enhancements made of native sourced materials that improve riparian and stream conditions for Gila trout by increasing riparian cover and improving the geomorphic stability of the stream. Structures proposed include: Rock Barbs, Mini rock weirs, Willow Fascines, Rock or Log deflectors, Log overhangs, Boulder Clusters, Crossover logs, and Brush Revetment. The Forest is currently working on NEPA. NMED funded both the Watershed Based Plan and conceptual design/restoration plan. Bat Conservation International is working with the Forest as a partner and has submitted a proposal for 2022 River Stewardship monies.



Erosion control locations

Lincoln National Forest

The Lincoln National Forest implemented several riparian/wetland restoration projects that are in various phases of completion in fiscal year 2021. Below is a list with a short summary.

Smokey Bear Ranger District

Anan Creek Restoration – most of this was completed during fiscal year (FY) 2020 with the rest being most completed in FY 2021. There is still one more small task to complete. This project consisted mainly of installing by hand one-rock dams along about 2 miles of stream. About 5 acres of dry meadow were treated by installing a few media lunas. The road near the downsteam end of the project area was closed off to vehicular travel. This stream flows directly into Bonito Lake, which is a water supply source for the City of Alamogordo. Bonito Lake has not been used for Alamogordo's water supply since the Little Bear Fire of 2012 but is anticipated to be used again in the next few years.

Big Bear Creek Riparian and Aspen Restoration – this project consists of both stream restoration with an aspen regeneration component. During FY 2021, about ½ mile of stream was treated with beaver dam analogues and one rock dams. All features were installed by hand. Another ½ mile of stream restoration will occur during FY 2022. Approximately 8 acres of conifer species were removed via chainsaw and lopped and scattered within the aspen stand. Future work includes direct treatment of aspen, which may include cutting, girdling, having their roots ripped, or burning via prescribed fire to stimulate suckering and new aspen generation. Aspen stands will be fenced with ~8ft high fencing that prevents elk from browsing on saplings in order to ensure successful stand regeneration. A fencing contract is in place and is anticipated to occur in FY 2022 but fencing material has been difficult to obtain so the timing of this part of the project is still tenuous.

Above; Beaver Dam Analogues on Big Bear Creek show a lot of buildup of sediment upstream of the structures only six weeks after installation.
Left; Constructing Beaver Dam Analogues on Public Lands Day at Big Bear Creek.

Benado Gap – A pipe fence was installed around about 400 acres of dry wet/dry meadow to prevent vehicular traffic from continuing to create new ruts in the meadow, which enlarged during heavy rains.

Grindstone Wetland Fencing – About 4 acres of a constructed wetland will be fenced during FY 2022. This small wetland was constructed a few years ago and since then the number of feral horses have increased dramatically and have not only caused damage to the plant species but have caused compaction of the wetland soils and have utilized the water that is intended for wildlife. The reason for constructed this fence is to keep out the feral horses.

Eagle Creek Restoration – This stream restoration will include installing erosion control structures (one rock dams, etc) along the stream as well as fencing selected portions of the stream and adjacent riparian areas and planting riparian species. This project includes about 9 miles of perennial and intermittent stream channel implementation and is planned to begin in FY 2022. Work may continue for 5-10 years into the future depending on funding and other resource availability. The Lincoln NF and the Village of Ruidoso has partnered to implement treatments on both Forest and Village Land. This is part of the Joint Chief Funding that the Lincoln National Forest was awarded that includes a larger area where a number of fuels projects will be occurring over the next couple years. The name of this project is the "Sierra Blanca Restoration Project"

Philadelphia Canyon Stream Restoration – a decision has recently been signed to implement stream channel restoration treatments on about one mile of stream that flows into the Rio Bonito below Bonito Lake. Work is presently scheduled to begin in FY 2022 but may not be implemented until 2023 due to other workloads and the large number of riparian projects presently being worked on.

Other activities within the Smokey Bear Ranger District included; The Skinner Brazel and Skinner RCPP fuels treatment projects treated ~312 acres, Perk Grindstone included 491 acres of mastication, 198 acres of reforestation planting, and four culverts installed.

Guadalupe Ranger District

Last Chance Creek Sitting Bull Creek Stream Restoration – During FY 2022 planning and implementation will begin for restoration activities along sections of these two streams. Another project is in the works to remove Himalayan Blackberry along the upper portions of Sitting Bull Creek and to construct a permanent fence in this area to exclude trespass livestock.

Sacramento Ranger District

Sacramento Lake Restoration – This proposed project involves installing permanent fences around about 5 wetland areas of various sizes to more efficiently keep livestock out of these areas. About 33 around Sacramento Lake itself is planned for implementation in FY 2022 with planning to occur during FY 2022 that will involve installing permanent fence around four other wet meadows and doing active restoration withing the meadows as well as along the stream channels. Implementation for most of this project will probably not begin until at least FY 2023.

South Sacramento Watershed Restoration Activities Phase I – This project is located along about 3 miles of ephemeral stream channel and the adjacent side valley drainages along the upper part of Agua Chiquita Creek.

This will include a large number of erosion control structures (one rock dams, zuni bowl, etc.) along this intermittent section of channel. Implementation began in August and September and has continued into the first three months of FY 2022 (Oct.-December). Work will continue throughout FY 2022 but may not be completed until FY 2023.

Other activities within the Sacramento Ranger District included; 361 acres of prescribed burn, 32 acres of mastication as part of Westside Mastication project, and 8 culverts installed.

Photo right;
Flooding along upper Agua Chiquita in early July 2021 before implementation began.

Photo left;
A few small structures on a side valley drainage adjacent to Agua Chiquita Creek (December 2021).

Santa Fe Forest

During fiscal year (FY) 2021, the Santa Fe National Forest (SFNF) implemented projects that made progress towards meeting and maintaining state water quality standards as well as activities that contributed to non-point source management.

Post Fire Stream Stabilization - Medio Fire

The SFNF and the New Mexico Environment Department – Surface Water Quality Bureau implemented a post fire stabilization and erosion mitigation project within areas of Rio en Medio, a small stream in Santa Fe County, that was affected by the 2020 Medio Fire. The purpose of the project was to install structures that would function to stabilize channel grade, reduce potential incision and reduce sediment delivery from post-fire flows. Stream restoration techniques included log vanes, one rock dams and other Natural Channel Design methods using natural materials found on-site such as downed logs and boulders. Maintenance of these structures was completed in September 2021 in order to repair and replace structures that were impacted during the monsoon season. Keystone Restoration Ecology and volunteers from the Albuquerque Wildlife Federation were key partners that contributed to the successful implementation of this project.

Rio Cebolla/San Antonio Creek Maintenance

The SFNF continued to build upon restoration activities within Rio Cebolla and San Antonio Creek. Structure maintenance and repair was the main focus during FY 2021. Eight beaver dam analogues (BDA) were repaired along Rio Cebolla while approximately two miles of in-stream structures were maintained along San Antonio Creek. BDAs alter the timing and magnitude of water delivery. These structures can increase channel-floodplain connectivity by influencing the frequency, duration and extent of overbank flows. Increased overbank flow can recharge ground water and raise the water table, providing the water resources necessary to promote riparian expansion, attenuate peak flows and increase baseflow.

Riparian Invasive Species Treatment

The SFNF continued to treat invasive species within priority areas of the Jemez River System including: Rio Cebolla, the East Fork Jemez River and the Jemez River. Invasive species that were treated included bull thistle, Canada thistle, musk thistle, oxeye daisy, Russian olive and salt cedar. Invasive species often have devasting effects to riparian and aquatic ecosystems including altering ecological processes and native species composition. Invasive species may also change streambank morphology, cause soil quality impairment, and increase erosion and sedimentation, thereby reducing water quality. The Pueblo of Jemez, Conservation Legacy and SFNF personnel contributed to accomplishing over 100 acres of riparian invasive species treatments in FY21.
Use the following link to learn more about invasive species throughout the Forest Service's Southwestern Region; https://www.fs.usda.gov/main/r3/forest-grasslandhealth/invasivespecies.

Range Infrastructure –Upland Wells

Two upland wells were completed late in FY21 to support livestock management operations on the Jemez Ranger District. These wells are intended to provide reliable upland sources of water for livestock and reduce pressure on important riparian ecosystems. Collaboration between the SFNF, forest permittees, Trout Unlimited, and the Nature Conservancy led to the successful implementation of these wells above San Antonio Creek.

Northern New Mexico Riparian, Aquatic, and Wetland Restoration Project (NNM-RAWR)

A Decision Notice and Finding of No Significant Impact for the NNM-RAWR was completed in July 2021 and implementation is expected to begin in FY22. The purpose of this project is to maintain or enhance watershed and range health by restoring riparian, wetland, and associated upland and aquatic habitats and promote species recovery and diversity while allowing for sustainable human uses, such as grazing, hunting and fishing. For more information please visit - https://www.fs.usda.gov/project/?project=56975

Springs and Groundwater Dependent Ecosystems Inventory

The SFNF employed two teams from the Forest Service Enterprise Program (FSEP) to inventory and assess springs and groundwater dependent ecosystems (GDE) across four ranger districts during FY21. Two FSEP teams consisting of hydrologists, watershed specialists and biologists spent four weeks collecting data at over 100 sites within eight key watersheds on the SFNF. Springs and GDEs function as keystone ecosystems with

extraordinarily rich biodiversity. These systems serve vital roles in the overall health of local aquatic, riparian and terrestrial ecosystems.

Accurate information of springs and GDEs is necessary for project planning, design and implementation of watershed restoration. This inventory and assessment will facilitate priority planning and project development under the NNM-RAWR Project. Use the following link to access the United States Forest Service GDE: Level 1 Inventory Field Guide; https://www.fs.fed.us/geology/GDE_Level_I_FG_final_March2012_rev1_printing.pdf.

Forest Thinning Operations

Approximately 700 acres of commercial timber harvest occurred within the Southwest Jemez Mountain Landscape Restoration Project area during FY21. Forest thinning operations assist in restoration of ecosystem structure and function and increase resilience to undesirable, large-scale disturbances such as uncharacteristically severe wildfire and insect outbreaks. Best Management Practices (BMPs) are prescribed for forest thinning operations on the SFNF to control nonpoint source pollution. Several BMP evaluations were completed during FY21 which focused on ground based skidding and harvesting operations. These evaluations found that BMPs were mostly effective for controlling nonpoint source pollution within the selected cutting units.

Use the following link to access more information on the National Best Management Practices for Water Quality Management on National Forest System Lands; https://www.fs.fed.us/naturalresources/watershed/bmp.shtml.

Planning Activities

A number of proposed projects are in the planning stage that address improvement of watershed conditions and treatments to mitigate the risk for catastrophic wildfire. A list of proposed actions for the SFNF can be found at: https://www.fs.fed.us/sopa/forest-level.php?110310.

Santa Fe Mountains Landscape Resiliency Project (SFMLRP)

The SFMLRP has been ongoing since late FY 19. The project is located within the Greater Santa Fe Fireshed where the landscape is at great risk of large, high-severity wildfire and post-fire flooding and debris flow. The purpose of the project is to improve ecosystem resilience of a priority landscape to future disturbances including wildfire, climate change, and insect outbreaks by restoring forest structure and composition and reducing the risk of catastrophic wildfire. The project focuses on mechanical and manual vegetation thinning treatments, use of prescribed fire, riparian restoration and the closure of 1.5 miles of national forest system roads. Following a 30-day public comment period that closed on October 29th, 2021 a decision for this project is expected in FY22. For more information please visit - https://www.fs.usda.gov/project/?project=55088.

Bureau of Land Management (BLM)

Las Cruces District Office (Las Cruces, NM)

Watershed	Project Description	Water Quality Benefits
Caballo 13030101 Percha Creek 130301010303	Cattle Exclosure Fence Maintenance and Reconstruction	• Reduced impacts of cattle within the perennial stream and riparian area • Improved riparian vegetation • Improved aquatic and wildlife habitat
Tularosa 13050003 Crawford-Three Rivers 130500031104	Cattle Exclosure Fence Maintenance and Reconstruction Non-Native Plant Species Treatment (Salt Cedar and Russian Olive)	• Reduced impacts of cattle within the perennial stream and riparian area • Improved riparian vegetation • Improved aquatic and wildlife habitat
Tularosa 13050003 Middle Tularosa Creek 130500031206	Cattle Exclosure Fence Maintenance and Reconstruction Non-Native Plant Species Treatment (Salt Cedar and Russian Olive)	• Reduced impacts of cattle within the perennial stream and riparian area • Improved riparian vegetation • Improved aquatic and wildlife habitat
Tularosa 13050003 Crawford-Three Rivers 130500031104	Installed (3) Beaver Dam Analogues (BDA) Modified rock-bowl structures at outflow of wetland.	• Increased stabilization of spring and wetland complex • Reduced sediment loss • Eliminattion of head-cut and reduction of down-cutting • Increased flood protection and resiliency of the wetland.
Lower Rio Grande-El Paso 13030102 Headwaters Rincon Arroyo 130301020304	Installed rock erosion structures for earthen stock tank	• Reduced stormwater velocity • Reduced erosion and sediment transport to the Rio Grande

Rio Puerco Field Office

Watershed	Project Description	Water Quality Benefits
Rio Puerco 13020204 (Arroyo de Los Pinos – Rio Puerco, 130202040202)	Earthen Dam Reconstruction and Clean-Out (6 dams).	• Reduce downstream sedimentation. • Restore/Improve wetland habitat. • Decrease downstream bed and bank erosion by moderation of peak flows. • Prevent upstream expansion of gully erosion. • Improve livestock distribution.
Arroyo Chico 13020205 (Arroyo Chico-Torreon Wash, 130202050705)	Fence Maintenance and Reconstruction (1 Fence).	• Reduced impacts of cattle within the stream and riparian area • Improved riparian vegetation • Improved aquatic and wildlife habitat
Rio Puerco 13020204 (Guadalupe Canoyon-Rio Puerco, 130202050705) (Arroyo Chico-Torreon Wash, 130202050705) (La Canada de La Lena -Rio Puerco, 130202040204)	Earthen Dam Reconstruction and Clean-Out (1 dam). *This project exists on the nexus of three different HUC-12 intersections, therefore all three have been listed*	• Reduce downstream sedimentation. • Restore/Improve wetland habitat. • Decrease downstream bed and bank erosion by moderation of peak flows. • Prevent upstream expansion of gully erosion. • Improve livestock distribution.
Arroyo Chico 13020205 (Arroyo Seccion, 130202050702)	Maintain and Improve 2 check dams and 1 dam.	• Reduce downstream sedimentation. • Restore/Improve wetland habitat. • Decrease downstream bed and bank erosion by moderation of peak flows. • Prevent upstream expansion of gully erosion. • Improve livestock distribution.

Carlsbad Field Office (CFO)

The BLM Carlsbad Field Office (CFO) has completed multiple activities that reduce nonpoint source pollution in the fiscal year 2021 including water resources, riparian, brush treatments, and fire and fuels.The CFO also actively works with the oil and gas industry to mitigate nonpoint source pollution due to industry projects.

Fuels and Fire Program:

During the 2021 fiscal year, only 32 acres were able to be treated by prescribed fire due to lack of fuel loading. These treatments occurred on the Black River (20 acres) and Conoco Lake (12 acres).

In March of this year, the Cottonwood Day Use Area along the Black River experienced a brush fire. This wildfire had started in an area that had a burn plan in place, so it was allowed to burn to achieve management objectives for a total of 148 acres treated.

Photo above; Jimmy Faust monitors prescribed fire at Conoco Lake.
Photo below; Chemical treatment being applied with backpack sprayer.

A total of 2,544 acres of weeds were chemically treated this year. Tebuthiuron was used on 1,944 of those acres in the Indian Basin west of Carlsbad in Eddy County. The other 600 acres occurred on the Woodland Allotment to treat Juniper regeneration. An additional 175 acres on the Woodland Allotment were treated via mechanical mastication. Other chemical treatments done in the field office were done by aerial application for creosote (22,000 acres) and mesquite (13,054 acres).

Watershed:

Proper Functioning Condition (PFC) monitoring was performed on 5 reaches this year for a total of 7.76 miles assessed on the Delaware and Black Rivers. Both rivers are areas where recreation activities are common. They also are habitat for a variety of fish and bird species including the River Cooter and Texas Hornshell Mussel which is listed under the Endangered Species Act.

Black River Reaches:

o Baby Cottonwood: PFC with an upward trend.

o Rope Swing: PFC with a static trend.

Delaware River Reaches:

o Stateline: Functioning at Risk (FAR) with a static trend.

o Downstream of Dam: FAR with an upward trend.

o Pipeline Crossing: PFC with an upward trend.

Photo above; Baby Cottonwood Reach on the Black River. Photo left; Dam Reach on the Delaware River.

In early March the Outdoor Recreation Planner organized with local companies to plant trees at the Cottonwood Day Use Area. Near the river's edge and an established grove of trees, a skid steer was used to auger holes to saturated soil, and clippings from a cottonwood tree in the area was placed in these holes. Near the parking lot, one gallon cottonwood seedlings were planted and with the help of a local rancher were irrigated regularly. Unfortunately, a few weeks later a brush fire destroyed the trees planted near the river along with an established grove of trees.

Rope Swing Reach on Black River.

For the CFO National Public Lands Day (NPLD) was a 4-day event with multiple projects happening throughout the week. Of all these events two were done help with nonpoint source solution. Another tree planting happened on the Pecos River near Six Mile Dam. Earl Conway from New Mexico Bass Nation in coordination with CFO staff harvested willow poles and then planted them along the banks of the river with the help of the public and local companies.

Further south, on the Black River erosion control structures were installed. Over 40 tons of material was delivered to the project area, and due to archeological, botany, and soil resource concerns everything was done by hand. CFO staff with the help of the public installed 7 check dams in 2 ravines near the river.

Photo above; Skid steer auguring holes for cottonwood poles.

Photo left; The one-gallon cottonwood seedlings being irrigated for the first time.

Completed check dams near the Black River.

Taos Field Office

The BLM Taos Field Office (TFO) conducted multiple activities that reduce nonpoint source pollution in fiscal year 2021 including fire, forestry, fisheries and wildlife, and water resources.

Aquatic Habitat Management and Wildlife:

Lotic AIM: Assessment, Inventory and Monitoring

The Aquatic Habitat Management Program conducts Lotic AIM surveys are conducted on the streams and rivers following the National Aquatic Monitoring Framework. The first round of surveys covering Farmington District was completed in 2016-2017 and the second round began in 2021 and continue into 2022. The second survey round begins trend analysis. The AIM protocol includes standardized water quality parameters, watershed function and instream habitat quality, biodiversity and riparian habitat quality, and ecological processes. In 2016-2017, 80 sites were surveyed in both the Farmington and Taos Field Offices. 2021-2022 surveys will collect data at the same survey sites as 2016-2017 to track changes in land health. These surveys are important in determining where non-point source pollution mitigation is needed throughout the field office.

Proper Functioning Condition surveys are conducted yearly on our perennial waters on a rotating basis throughout the field office for both lentic and lotic systems. The combination of PFC and Aquatic AIM allows for both qualitative and quantitative analysis.

Photo left and below; Santa Fe Lotic Assessment, Inventory and Monitoring

Rio Chama Wild and Scenic River Riparian Restoration Project

Fencing was constructed around riparian areas along the Rio Chama to allow for coyote willow (*Salix exigua*), narrow leaf cottonwood (*Populus angustifolia*), Fremont cottonwood (*Populus fremontii*), and boxelder (*Acer*

negundo) recruitment. The fencing excludes trespass livestock and beaver from depleting the riparian vegetation allowing for growth and improving riparian functionality and land health. The fencing consists of 4" x 4" 12 gauge woven or welded wire with metal U or T line posts and 3.5" wooden line posts. Five-inch wooden double H and single H braces were installed at corners and line distances greater than 660 feet.

The first phase of the project will be to remove single tree fences and fence larger areas to provide protection from beaver and trespass cattle. Phase II will be planting of native riparian vegetation where needed where natural recruitment is lacking beginning in 2023.

The fenced areas will provide increased riparian vegetation that will increase the filtering of non-point source pollutants such as nutrients, sediments, and other pollutants. The increased riparian vegetation will also help with streambank stability reducing erosion.

Photo above and below; Rio Chama restoration project.
Photo below; Close up view showing fenced area, notice illegal roads that will be fenced to prevent erosion.

Anderson Ranch Wetlands Study

The Anderson Ranch property and study area, located in Taos county, north-central New Mexico, was transferred from Chevron Mining, Inc. (CMI) to the Bureau of Land Management (BLM) as part of the Natural Resource Damage Assessment Restoration (NRDAR) court-ordered settlement. The study area supports both freshwater emergent wetlands and freshwater ponds and is an important wetland in mitigating non-point source pollution. The settlement states that CMI will provide the land and a monetary settlement to support the restoration of the wetlands on the property.

To best manage the study area, the BLM requires an understanding of potential effects of climate variability and groundwater withdrawals to the wetland function. This study provides an initial hydrologic characterization of the study area, which included collection of groundwater-level and aqueous-chemistry data, completion of a vegetation survey, literature review, and data analysis. The data compiled, collected, and analyzed as part of this study indicate that the wetlands within the study area are groundwater fed and that the water maintaining the wetlands is modern. Surface-water levels in the pond and groundwater levels in the surrounding wetland fluctuate seasonally. The hydraulic gradient in the study area is from northeast to southwest. Evapotranspiration is a main driver of water demand within the study area. Thirty species of vegetation were identified in the August 2016 vegetation survey performed in the study area and there was a greater coverage of hydrophytes than non-hydrophytes.

Water Quality

In 2021 the Aquatic Habitat Management (AHM) program monitored water quality including pH, turbidity, water temperature, conductivity, total dissolved solids, dissolved oxygen, phosphorus, and salinity. Water quality is tested at eleven sites starting at the Colorado State line to Velarde including six sites along the Rio Grande, two sites on the Rio Embudo, one site on each of the Rio Pueblo de Taos, Rio Hondo, and Red River. The parameters are important to determine if there are increases in non-point source pollution as well as aquatic ecological health.

Thermographs

Thermographs are deployed at 15 sites including Agua Caliente, Rio San Antonio, Rio de las Trampas, Mora River, Santa Fe River, Santa Cruz River, five sites on the Rio Grande, two sites on the Chama, and two sites on the Rio Embudo. Thermographs are important to monitor for potential non-point source pollution that can contribute to higher temperatures such as erosion, runoff, deforestation and other man-made influences. Previously the thermographs recorded water temperature every hour throughout the year to monitor temperature changes in our waterways.

Springs and Seeps Inventory and Surveys

The Aquatic Habitat Management (AHM) program surveyed 26 springs and seeps in 2021 including georeferencing, directions and

access, photos of the spring source (below) and microhabitat array, spring type, and spring influenced land area. These level 1 spring surveys help identify springs that require rehabilitation moving forward. Rehabilitation of springs and seeps is important to control erosion and filter non-point source pollutants, improving water quality; filter sediment and aid floodplain development; and improve floodwater retention and ground water recharge. Information on springs and seeps can be found at https://springsdata.org/.

Proper Functioning Condition Analysis

The Taos Field Office Aquatic Resource Management team completed two proper functioning condition surveys that included 2 miles of Lobo Canyon and 1.5 miles of the Rio Grande near Buckman. Buckman was determined to be in Proper Functioning Condition (PFC) and Lobo Canyon was determined to be Non Functional (NF), which allows us to determine what rehabilitation measures are needed to bring the creek up to Functioning At Risk (FAR) and ultimately PFC.

Forestry and Fire Program:

In 2021 the Fire/Forestry programs completed 56 acres of thinning in the Copper Hill area of the Taos Field Office. 792 acres of prescribed burning was conducted at Cerro de la Olla, Cerro Montoso and Wind Mountain. These projects are important for long term erosion control reducing non-point source pollution.

Terrestrial AIM

The Terrestrial Assessment, Inventory, and Monitoring (AIM) program at the Bureau of Land Management Taos Field Office began in 2014. The AIM program uses standardized protocols and a statistically valid sample design to collect quantitative data on land health and natural resources on public lands across the nation. Data is used to help inform land management decisions on the local, regional, and national levels. As 2020 marked the end of a five-year sampling period, in 2021, established plots were revisited to measure trends in land health, natural resource conditions, and responses to management over time. In the 2021 field season, 76 AIM plots were sampled on BLM lands in the Taos Field Office area, 47 revisits and 29 newly established plots. Additional plots were established this year as allotment plots to monitor grazing and inform range per-

mit renewal for the Taos Field office. Since the program's implementation, a total of 525 AIM plots have been completed in the Taos Field Office including 326 plots in the Rio Grande del Norte National Monument. Over 100 AIM plots have been established in past and potential vegetation treatment areas to monitor land health in response to different treatment techniques. More information about the AIM program including both terrestrial and aquatic can be found at: https://aim.landscapetoolbox.org/.

Terrestrial AIM crew members sighting a transect line used for standard AIM data collection.

Roswell Field Office

The BLM Roswell Field Office (RFO) has undertaken several activities such as water resources, riparian, fisheries and wildlife, and fire and fuels work to reduce nonpoint source pollution. The fuels treatments, watershed vegetation treatments, and riparian vegetation treatments were completed with the help from our partners Upper Hondo Soil Water Conservation District and the Chaves Soil Water Conservation District and the New Mexico Association of Conservation Districts through assistance agreements.

Fuels and Fire Program:

Thinning of 620 acres of Pinyon and Juniper on Fort Stanton Snowy River Cave National Conservation to increase herbaceous ground cover, decrease erosion, and improve watershed health and function.

The Roswell Field Office fire crew performed prescribed burns of 1,500 acres Pinyon and Juniper on Fort Stanton Snowy River Cave National Conservation area to decrease risk of extreme wildfire and associated erosion. Prescribed burn of 6,000 acres grass, brush, and salt cedar on public lands in Chaves County NM.

Watershed/Riparian Habitat:

Chemical treatment of 50 acres of noxious weeds and thistles on Fort Stanton Snowy River Cave NCA on Salado Creek and uplands, chemical treatment of 90 acres of saltcedar, Russian Olive, and Siberian Elm and noxious weeds on the Rio Bonito, and chemical treatment of 400 acres of Pinyon and Juniper on Fort Stanton Snowy River Cave NCA and the Rio Bonito Acquired Lands Tracts 2, 3, and 4 on the Rio Bonito and uplands to decrease erosion, increase herbaceous ground cover and improve aquatic and riparian habitat.

Chemical treatments on 23,000 acres of mesquite and chemical treatments on 850 acres of African Rue on uplands on BLM public land in Chaves County to decrease erosion and increase herbaceous ground cover.

Chemical treatment of salt cedar, Russian Olive and Siberian Elm on 10 miles of stream/riparian habitat miles of the Rio Bonito and the Salado Creek on the Fort Stanton Snowy River Cave National Conservation and the Rio Bonito Acquired Lands to decrease erosion, increase herbaceous ground cover and improve aquatic and riparian habitat.

Stream/Riparian/Fisheries/Water Resources:

Roswell Field Office wildlife staff and office staff with partner New Mexico Game and Fish staff planted 149 Cottonwood trees on one mile on the riparian area of the Pecos River to decrease surface runoff and erosion and improve riparian and aquatic habitat.

Photo left; Bobcat augers holes to plant cut Cottonwood tree poles down below the groundwater table on the banks of the Pecos River.

Photo below; RFO staff Wildlife biologists Danica Cooke and RFO staff intern Stephanie Erickson construct protective game wire fencing around planted Cottonwood tree poles for protection from deer and beaver damage.

Proper Functioning Condition was performed on 4 acres of wetlands and springs on Comanche Spring, Escondida Spring, and Garnsey Spring and on two reaches for at total of 4 miles of stream/riparian miles assessed on the Pecos River. The wetlands and springs and the Pecos River were determined to be functioning properly. A river that is functioning properly will improve floodwater retention, improve groundwater recharge, capture sediments and aid floodplain development, develop root masses that stabilize streambanks against erosion, and dissipate stream energy associated high waterflow, which reduces erosion and improves water quality.

A Proper Functioning Condition Inventory Lentic site at Garnsey Spring.

A Proper Functioning Condition Inventory Lotic site at the Pecos River Overflow Wetlands.

The Hydrology and Operations staff Constructed and installed 10 check dams on upland arroyos and planted native grass seeds on exposed banks on the Fort Stanton Snowy River Cave NCA to stabilize headcuts and gullies and to decrease erosion and nonpoint pollution, and silt and sedimentation to the Rio Bonito with Pecos District Operations Staff.

Photo right; RFO Staff Equipment Operator Philip Hogwood operating a backhoe installing a rip rap rock checkdam into an arroyo.

Photo below; Hydrology and operations staff Installed Check Dams and planted native grass seeds on an upland drainage on Fort Stanton Snowy River Cave National Conservation Area.