

State of New Mexico
**NONPOINT SOURCE
MANAGEMENT PROGRAM**



2019 Annual Report

*New Mexico Environment Department
Surface Water Quality Bureau
Watershed Protection Section*



State of New Mexico Nonpoint Source Management Program 2019 Annual Report



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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/



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January 31, 2020

Charles Maguire
Water Division Director
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1445 Ross Ave., Suite 1200
Dallas, Texas 75202

Dear Mr. Maguire:

I am pleased to submit New Mexico's 2019 Nonpoint Source Management Program Annual Report. In this report we document the progress made in meeting the program milestones set forth in our Nonpoint Source Management Program.

The Nonpoint Source Management Program has six core objectives and I would like to briefly highlight our accomplishments made during 2019 for each:

1. Under the watershed-based planning objective, the Upper Pecos Watershed-Based Plan, first developed in 2012, was revised in the reporting period (www.env.nm.gov/surface-water-quality/accepted-wbp). This update primarily adds information on implementation since 2012, information on the 2013 Tres Lagunas and Jaroso Fires, and newly identified projects. The revised document is available for EPA review as a potential condition for approval of future project work plans.
2. In the area of water quality improvement, EPA approved our nomination of Jaramillo Creek as a Nonpoint Source Success Story in March 2019 (www.epa.gov/nps/success-stories-about-restoring-water-bodies-impaired-nonpoint-source-pollution). We are also glad to report that the New Mexico Environment Department (NMED) is supporting five new projects that implement WBPs beginning in 2019, also funded under Section 319.
3. To better protect water quality, The Surface Water Quality Bureau (SWQB) issued conditional Section 401 certification for three projects requiring Section 404 permit coverage and reviewed fifty-five projects covered by Section 404 Nationwide Permits that were certified in 2017. Nonpoint Source Program staff also carried out their responsibilities related to surface water quality protection under the New Mexico Mining Act.
4. Related to education and outreach, four issues of the newsletter *Clearing the Waters* were published in 2019 (www.env.nm.gov/surface-water-quality/newsletters). Our staff also performed outreach and education activities for over 800 members of the public ranging from adult professionals to

family retreats and school groups. The activities focused on water quality and how watersheds function, using both a tabletop water quality demonstration as well as a Rolling Rivers watershed model trailer.


5. In ground water quality protection, NMED's Ground Water Quality Bureau (GWQB) conducted ten water fairs where local residents could have well water tested. GWQB also issued fourteen permits for large septic tank leach field systems and surface disposal sites.

6. Finally, we report promising developments in interagency cooperation and coordination. We began a more concerted and documented effort to attend Soil and Water Conservation District (SWCD) meetings, as a means of fostering greater cooperation with SWCDs in the future. We highlight a Section 319 project implemented by the San Juan SWCD, and report on a new Section 319 project with the Cuba SWCD, with which NMED had not implemented a project since 2007.

NMED also completed the formal public review and state approvals for the newly revised NPS Management Program Plan in 2019. Acting Regional Administrator David W. Gray approved the plan in August 2019. The document outlines New Mexico's plans to reduce nonpoint source pollution and improve water quality in 2019 through 2024 (www.env.nm.gov/surface-water-quality/nps-plan).

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 (505-827-2819) or Abe Franklin of my staff (505-827-2793).

Sincerely,

A handwritten signature in blue ink that reads "Shelly Lemon". The signature is written in a cursive, flowing style.

Shelly Lemon

Bureau Chief
Surface Water Quality Bureau



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Executive Summary

Polluted runoff, or nonpoint source (NPS) pollution, is defined by EPA as “caused by rainfall or snowmelt moving over and through the ground and carrying natural and human-made pollutants into lakes, rivers, streams, wetlands, estuaries, and other coastal waters and ground water. Atmospheric deposition and hydrologic modification are also sources of nonpoint source pollution.” 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 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 United States Environmental Protection Agency (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, 2018 through September 30, 2019.

Towards the objective of **completing watershed-based plans**, the Upper Pecos Watershed-Based Plan, first developed in 2012, was revised. The revision added information on implementation since 2012, the 2013 Tres Lagunas and Jaroso Fires, and newly identified projects.

Towards the objective of **water quality improvement**, EPA finalized approval of the Jaramillo Creek Success Story in March 2019. Six new on-the-ground projects that implement watershed-based plans, funded under Section 319, began. One 319-funded watershed implementation project and six River Stewardship Program projects were completed and are summarized in this report.

In the area of **water quality protection**, staff reviewed fifty-five 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. NMED also served on the advisory board created by the state Forest and Watershed Restoration Act, and recommended funding of seven new projects (including one project with a focus on riparian areas) to begin in FY 2020.

With the objective of **sharing information on surface water quality**, four issues of the *Clearing the Waters* newsletter were published.

New Mexico’s NPS Management Program includes aspects related to **protection of ground water** as well. In 2019, the Ground Water Quality Bureau (GWQB) issued fourteen New, Renewal, or Renewal and Modification Discharge Permits. GWQB also conducted ten water fairs across New Mexico where residents brought approximately 450 well water samples for analysis of common pollutants such as nitrate.

To better **cooperate with other agencies on water quality protection and improvement**, staff from NMED’s Watershed Protection Section attended seventeen soil and water conservation district (SWCD) board meetings, with six different SWCDs. NMED also funded one competitively awarded project with a SWCD. In



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In addition, the Natural Resources Conservation Service, New Mexico Department of Game and Fish, New Mexico State Forestry Division, Bureau of Land Management, and three national forests provided information for the report on their activities related to NPS pollution control in 2019.





Introduction

This annual report to the United States Environmental Protection Agency (EPA) provides an overview of non-point source (NPS) management related activities conducted in New Mexico in federal fiscal year 2019 (October 1, 2018 through September 30, 2019) by the Watershed Protection Section (WPS) of the New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWQB). 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 nonpoint source (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, 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.



Polluted runoff from an improperly managed construction site carries sediment directly into the Gallinas River in Las Vegas, New Mexico. (photo by S. Styer)

What is Nonpoint Source Pollution?

According to information from EPA at <https://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.

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 on August 1, 2019. The plan is available to review at <https://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 2014-2019, and increasing an average of 0.7% 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 and require development of Total Maximum Daily Loads (TMDLs). 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 *2018-2020 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 (57%), primary and secondary contact (28%), wildlife habitat (4%), livestock watering (2%), irrigation (2%), and domestic water supply (1%). Most of these impairments are primarily or entirely caused by NPS pollution.



The majority of NPS pollution in New Mexico's streams is preliminarily attributed to unidentified sources, unmanaged or improperly managed rangeland grazing, on-site treatment systems (e.g., septic systems), drought-related impacts, wildlife other than waterfowl, and loss of riparian habitat. The *2018-2020 Integrated Report* provides probable source summary information only for waters with TMDLs. No lakes in New Mexico have approved TMDLs, so pollutant source summaries for lakes are not provided.

Saladon Creek near Angel Fire is listed as impaired by temperature and E. coli. These conditions were exacerbated by drought in 2018, resulting in a fish kill.
(photo by S. Styer)



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, SWQB has developed a Nonpoint Source Management Program planning document (NPS Management Plan). The current NPS Management Plan was approved in August 2019 and is available at: www.env.nm.gov/surface-water-quality/nps-plan.

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 River Stewardship Program (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.

NMED reports how CWA Section 319(h) funds and state matching funds are used,

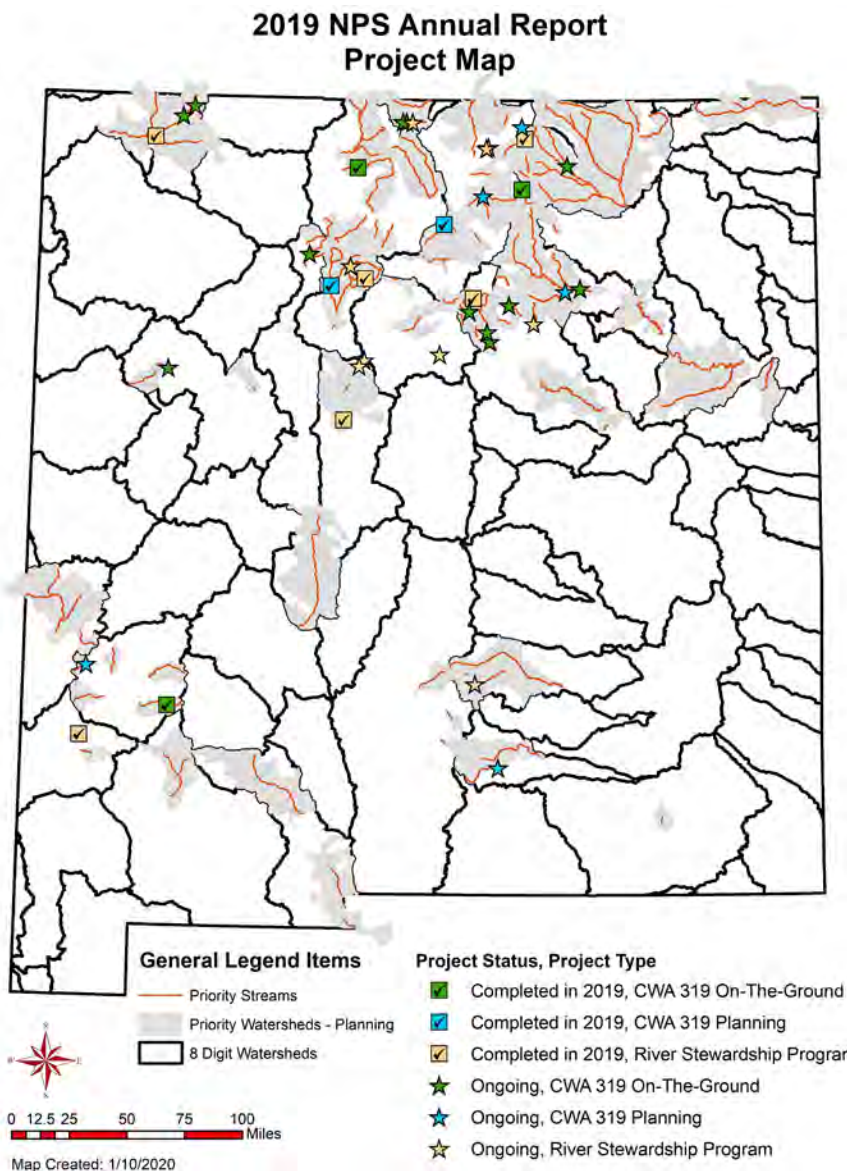


Figure 1: Section 319 and River Stewardship Program projects active in 2019.



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, on page 6.

Five tables below list projects in progress or completed in 2019, 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 2019 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, 10/1/2018 – 9/30/2019.

Grant Number	Project Number	Project Title	Project End Date	Section 319 Funds	State Funds	Summary Report
99610118	19-A	NEW MEXICO NON-POINT SOURCE MANAGEMENT PROGRAM FY 2019	06/30/2019	\$1,151,920	\$60,000	VIEW
99610118	19-B	GROUND WATER QUALITY BUREAU PROGRAMS FY 2019	06/30/2019	\$150,000	\$150,000	VIEW
99610119	20-A	NEW MEXICO NON-POINT SOURCE MANAGEMENT PROGRAM FY 2020	06/30/2020	\$1,174,629	\$0	TBD
99610119	20-B	GROUND WATER QUALITY BUREAU PROGRAMS FY 2020	06/30/2020	\$150,000	\$150,000	TBD

The budgets above are budgeted amounts. Budgeted amounts may be higher than actual amounts spent due to vacancy savings and other reduced costs. EPA had not entered grant number 99610119 into GRTS as of the date of this writing, so summary reports for projects 20-A and 20-B are not yet available.

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, estimat-



ing 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 2019 are listed in Table 2 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, 10/1/2018 – 9/30/2019.

Grant Number	Project Number	Project Title	Project End Date	Section 319 Funds	Local Match	Summary Report
99610117	16-F	Rio Fernando de Taos Watershed Based Plan (Part 2)	05/17/2020	\$49,756	\$13,859	VIEW
99610117	16-G	Watershed-Based Planning within the Upper Agua Chiquita Drainage Basin	06/30/2020	\$63,165	\$42,136	VIEW
99610117	16-H	Upper Pecos Watershed-Based Plan Update and Revision	12/31/2018	\$22,360	\$14,980	VIEW
99610117	16-I	Watershed-Based Plan for the Upper Rio Grande Watershed, Comanche Creek Subwatershed	06/30/2019	\$24,555	\$16,483	VIEW
99610117	16-J	Rio de las Vacas Watershed-Based Plan	05/31/2020	\$8,128	\$0	VIEW
99610118	18-E	Willow Creek Watershed-Based Planning Project	06/30/2021	\$92,865	\$63,059	VIEW
99610118	19-C	Sapello River Watershed Based Plan	06/30/2021	\$132,646	\$88,855	VIEW
99610118	19-G	Rio Embudo Watershed-Based Plan Completion Project	12/19/2019	\$33,182	\$00	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.



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Table 3: Section 319 Watershed Implementation Projects completed or in progress, 10/1/2018 – 9/30/2019.

Grant Number	Project Number	Project Title	Project End Date	Section 319 Funds	Local Match	Summary Report
99610117	16-C	Temperature Reduction and Riparian Habitat Restoration in Upper Cow Creek (Part 2)	06/30/2020	\$220,841	\$168,550	VIEW
99610117	16-D	Rio Nutrias Watershed Based Plan Implementation Phase I (Part 2)	12/31/2019	\$142,348	\$103,698	VIEW
99610117	17-Q	Rio San Antonio Water Quality Improvement Project	06/30/2020	\$57,063	\$5,234	VIEW
99610117	17-R	On-The-Ground Improvement Projects for the Mora River – Upper Canadian Plateau Phase 1A	06/30/2020	\$262,310	\$184,050	VIEW
99610117	17-S	Upper Rio San Antonio Watershed On-The-Ground Restoration to Improve Water Quality	06/30/2020	\$205,575	\$137,060	VIEW
99610117	17-T	Lower Animas Watershed Based Plan Implementation Projects	12/31/2020	\$229,644	\$156,400	VIEW
99610117	17-U	Black Canyon Riparian Enhancement Design	06/30/2019	\$37,434	\$25,630	VIEW
99610118	18-C	Temperature Reduction and Erosion Reduction in Lower Cow Creek	12/31/2021	\$156,017	\$104,200	VIEW
99610118	18-J	On-the-Ground Improvement Projects for the Upper Gallinas River and Porvenir Creek, Phase III	09/30/2021	\$314,858	\$209,950	VIEW
99610118	18-K	Lower Animas Watershed Based Plan Implementation Projects Phase 2	12/31/2020	\$148,450	\$102,000	VIEW



Grant Number	Project Number	Project Title	Project End Date	Section 319 Funds	Local Match	Summary Report
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	\$25,557	\$16,400	VIEW
99610118	19-E	Ninemile Creek Water Quality Improvement Project	09/22/2019	\$0	\$0	VIEW
99610118	19-H	Reynold Draw-Blue-water Creek Riparian Conservation Project	12/31/2020	\$170,454	\$113,650	VIEW
99610118	19-I	North Ponil Restoration Project	06/30/2022	\$130,000	\$87,036	VIEW

River Stewardship Program

A key part of the NPS Management Program is the state-funded River Stewardship Program (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. Table 4 below lists New Mexico’s current and recently completed RSP projects.

Table 4: River Stewardship Program (RSP) projects completed or in progress, 10/1/2018 – 9/30/2019.

Grant Number	State Funding Code	Project Number	Project Title	Project End Date	State Funds	Summary Report
99610117	15-1086	17-D	Animas River Restoration Project	06/30/2019	\$237,000	VIEW
99610117	16A2644	17-E	Enhancing Aquatic Habitat Conditions in the Galisteo Creek in Galisteo, New Mexico	06/30/2020	\$169,942	VIEW



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Grant Number	State Funding Code	Project Number	Project Title	Project End Date	State Funds	Summary Report
99610117	15-1086	17-F	Gila River Floodplain Restoration	06/30/2019	\$149,000	VIEW
99610117	16A2644	17-G	Rewinding the Gallinas River in the City of Las Vegas	06/30/2020	\$315,166	VIEW
99610117	15-1069	17-H	Restoring La Jara Creek from Damage from the Thompson Ridge Fire, Valles Caldera National Preserve	06/30/2019	\$132,000	VIEW
99610117	16A2644	17-I	Constructing Diverse Native Bosque Habitat on Two River Bars at the Pueblo of Santa Ana	06/30/2020	\$133,873	VIEW
99610117	15-1069	17-J	Restoration of Sawmill and Foreman Creeks, Comanche Creek Watershed	06/30/2019	\$195,535	VIEW
99610117	16A2644	17-L	Two Rivers Park Restoration Project	06/30/2020	\$235,621	VIEW
99610117	16A2644	17-M	Bosque del Bernalillo Storm Water Quality and Habitat Enhancement to the Rio Grande Project	06/30/2020	\$139,867	VIEW
99610117	15-1069	17-N	Post-Tres Lagunas Fire and Flooding Restoration Project for Holy Ghost Canyon, Creek, and Tributaries	06/30/2019	\$144,465	VIEW



Grant Number	State Funding Code	Project Number	Project Title	Project End Date	State Funds	Summary Report
99610118	15-1086	18-F	Valle de Oro National Urban Wildlife Refuge Riparian, Wetland, and Water Quality Improvement	06/30/2019	\$114,000	VIEW
99610118	16A2644	18-G	Upper Rio San Antonio Watershed Restoration to Improve Water Quality	06/30/2020	\$246,606	VIEW
99610118	16A2644	18-H	Village of Questa Fishing Park (Reach A) Stream Restoration Project	06/30/2020	\$157,550	VIEW
99610118	16A2644	18-I	Upper San Antonio Canyon Water Quality Improvement Project	09/22/2019	\$47,514	VIEW

Red River Aquatic Habitat Restoration Project

In 2018, the New Mexico Office of Natural Resources Trustee (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	06/30/2021	\$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/nmed_319_and_rsp_project_list.



NPS Management Program Accomplishments in 2019

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 2019 (October 1, 2018 through September 30, 2019). Use of italics below indicates text cited directly from the NPS Management Plan. Non-italics text is used to provide progress for 2019.

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.*

The Upper Pecos Watershed-Based Plan, first developed in 2012, was revised in the reporting period (www.env.nm.gov/surface-water-quality/accepted-wbp). This update primarily adds information on implementation since 2012, information on the 2013 Tres Lagunas and Jaroso Fires, and newly identified projects. The revised document is available for EPA review as a potential condition for approval of future project work plans.

A Solicitation for Applications (SFA) was conducted in 2019 and agreements for two new watershed-based planning projects are routing for approval in early 2020. These two new projects will support achievement of this milestone in future years.

- *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.*

This work is scheduled to begin in 2020 (i.e., after the period covered by this report).



- *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 is under way 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 Association as a component of Project 19-I listed in Table 3 above.

- *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 did not begin until late calendar year 2019 (i.e., after the period covered by this report).

- *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.*

2019 was a relatively wet year with no fires occurring that warranted such a response plan. The Ute Park Fire of June 2018 was a qualifying fire, impacting the Cimarron River. A project is in development that will partially implement the *Ute Park Fire Damage Assessment and Burned Area Emergency Rehabilitation Plan* developed by the New Mexico Department of Homeland Security and Emergency Management in 2018.

- *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 2019 update to Upper Pecos Watershed-Based Plan was completed with a thorough stakeholder involvement process. The watershed does not include any other states, Indian nations, pueblos, or tribes, within the planning area.

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.*

The temperature impairment for Jaramillo Creek on the Valles Caldera National Preserve was



removed in 2016, following changes in management and completion of water quality improvement projects. A Success Story nomination for Jaramillo Creek was submitted in August 2018, and EPA finalized approval of the Success Story in March 2019. It is posted on the NPS Success Stories web page at www.epa.gov/nps/success-stories-about-restoring-water-bodies-impaired-nonpoint-source-pollution.

- *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.*

A SFA for projects that implement WBPs, funded with Section 319 watershed project funds, was released in the first quarter of 2018. Six resulting new projects (Projects 18-J, 18-K, 18-L, 19-D, 19-H, and 19-I listed in Table 3, above) began in 2019 as a result.

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

This work began in late calendar year 2019 (i.e., after the period covered by this report).

- *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 2019, and Summaries of River Stewardship Program Projects Completed in 2019**, below.

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

The CWSRF 2020 Project Priority List (available at www.env.nm.gov/construction-programs/cpb-forms-and-documents) includes several projects that address nonpoint source pollution (although controlling point source pollution is also a goal of some of these projects). The best examples are the Southern Sandoval County Arroyo Flood Control Authority's Lateral Erosion Envelope (property acquisition for stormwater management and surface water protection) and the City of Farmington's stormwater management and green infrastructure project, which are tentatively slated to be funded. CPB also received applications for five projects for removal or replacement of underground petroleum storage tanks (newly eligible for funding as specified in the 2019 NPS Management Plan), but none of the projects were funded due to financial constraints on the part of the funding applicants.

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.*

NMED did not begin this effort until after September 30, 2019.

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

NMED responded to several complaints or reports of disposal of refuse in watercourses in 2019. Some examples follow. The Elephant Butte Irrigation District required a dumper to remove a large amount of manure from an irrigation ditch. NMED was copied on the enforcement letter in case further actions were necessary. The dumper complied. Doña Ana County responded to complaints of horse manure in a wash. NMED received a complaint from the same person and coordinated a response with the County Code Enforcement officer. NMED staff visited a site in Chaparral where a person was reportedly disassembling automobiles and draining fluids near a wash, and found no evidence to support the report. NMED received a complaint of manure being dumped in a gully draining to the Pecos River near Arroyo Chico. NMED staff contacted the party doing the dumping, they agreed to clean up the waste, and did so. NMED followed up on a complaint that the City of Socorro was discharging waste into surface waters, and concluded that no discharge of waste into surface water had occurred. NMED staff responded to a complaint of cement being dumped where it may enter a storm drain, then reviewed the construction project, talked with the project manager, and concluded no discharge of concrete waste occurred.

- *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.*

A project is in development to reduce sediment loading to the Cimarron River from the Ute Park Fire burn area. This fire occurred in June 2018, so the intended deadline for this project to start is June 2020.

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

The purpose of Section 401 is to ensure that discharges of dredged or fill material into waters of the United States permitted or authorized by the U.S. Army Corps of Engineers (the Corps) under Section 404 comply with State water quality standards. In 2017, SWQB certified the Section 404 Nationwide Permits (NWPs) and included among conditions that NMED have the opportunity to review the projects for consistency with other certification conditions (e.g., conditions requiring BMPs). A new Section 401 certification is required for new individual Section 404 permits or when new Regional General Permits (RGPs) or other permits are developed. An individual Section 401 certification is also required for any project in an Out-



standing National Resource Water (ONRW) unless covered by NWP 27 for aquatic habitat restoration.

As part of the Section 401 certification and review process, NMED consults with the Corps and applicants in the development of permit conditions and processing procedures for situations specific to New Mexico. The majority of Section 401 work in 2019 was in reviewing projects covered by NWPs. In 2019, WPS staff reviewed fifty-five projects and confirmed their consistency with the state's Section 401 certification of the NWPs.

During 2019, the Corps authorized one project under the RGP for emergency actions (RGP NM-12-01) which NMED certified in 2017, for the City of Española to construct a low water crossing. The Corps authorized maintenance activities by Southern Sandoval County Arroyo Flood Control Authority (SSCAFCA) and the Albuquerque Metropolitan Arroyo Flood Control Authority under a Letter of Permission procedure (LOP NM-1) which NMED certified in 2015. The Corps authorized four utility line maintenance projects (by the Transwestern Pipeline Company and the New Mexico Gas Company) under RGP NM-16-01 which NMED certified in 2016. The Corps reissued RGP NM-14-01 in 2019, for stream stabilization and water quality improvement projects in urban ephemeral channels within the state of New Mexico. NMED certified this permit, and the Corps authorized SSCAFCA's Federal Emergency Management Agency (FEMA) funded Lomitas Negras flood control and bank protection project under this permit. NMED also issued Section 401 certification for two projects within ONRWs covered by NWP-14 for linear transportation projects. These are described in greater detail below.

Acting under an Executive Order in 2019 to promote energy infrastructure and economic growth, EPA proposed a new CWA Section 401 Rule (Proposed Rule). The New Mexico Environment Department provided 10 comments to EPA regarding the Proposed Rule. NMED found that the Proposed Rule conflicts with the intent of the CWA and has significant legal and policy implications for states' authority to protect water quality within their borders. NMED asked EPA to preserve existing state authority and respect the principles of cooperative federalism. Among the major concerns, the Proposed Rule would only allow Section 401 certifications to apply to the discharge itself instead of the activity as a whole (think about the physical structure of a dam as the discharge itself compared to the potential water quality impacts the dam may cause downstream as the activity as a whole), requires states to identify less stringent conditions, allows federal agencies to determine how much time is needed to certify projects even when insufficient data and information is provided by applicants, and allows the federal agency to unilaterally reject or veto a state's certification condition.

- *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 2019.

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



Three small projects requiring Section 404 permit coverage in ONRWs were implemented in 2019. One was a culvert replacement over North Ponil Creek in the Valle Vidal Unit of the Carson National Forest, and the another was a hardened low water crossing of Vidal Creek (also within the Valle Vidal Unit). Because neither project was authorized under Nationwide Permit 27 for aquatic habitat restoration, NMED considered each for individual Section 401 water quality certification. Despite that both projects were considered to be linear transportation projects, both were expected to reduce impacts to water quality, and NMED certified these projects under Section 401. NMED also reviewed an aquatic habitat restoration project on Vidal Creek, and confirmed that the project was consistent with the previous state Section 401 certification of Nationwide Permit 27.

- *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 requests for comments on 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 the reporting period, WPS staff participated in several meetings and workshops conducted by the Forest Service as part of the public process for developing new Forest Plans. Comment periods began for three Environmental Impact Statements (EISs) for Forest Plans for the Cibola, Santa Fe, and Carson National Forests, towards the end of the reporting period.

NMED submitted comments on the draft Resource Management Plan (RMP) to the Carlsbad Field Office of the Bureau of Land Management, that included a comment prepared by WPS staff. NMED participation in forest planning and submittal of comments on the Carlsbad area RMP are both in support of EIS development which will affect land management decisions over large portions of New Mexico with important water resources for decades.

NMED submitted comments on sixty-four additional projects that included comments prepared by SWQB staff. 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.

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

The State 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 funding annually to the Energy, Minerals and Natural Resources Department (EMNRD), Forestry Division (New Mexico State Forestry) for the purpose of restoring forests and watersheds in the state of New Mexico and establishes a Forest and Watershed Advisory Board (Board) to evaluate and recommend projects. When projects have been selected and approved, New Mexico State Forestry will administer, implement, and report on the projects.



Funding for the FAWRA is provided through two funds in the Land Grant Permanent Fund, the Rio Grande Income Fund and the New Mexico Irrigation Works Construction Fund, deposited into the Forest Land Protection Revolving Fund. These funds are to be distributed annually in the amount of \$2 million.

The Secretary of Environment or the Secretary's Designee is one member of the eleven-member FAWRA board. Secretary Kenney designated Water Division Director Rebecca Roose as NMED's representative on the board, and Director Roose and WPS staff participated in subsequent technical reviews and meetings leading to the approval of seven new projects to begin in state fiscal year 2020. One of these is a large planning project for forest restoration, one is small economic development planning project, four are forest restoration projects, and one is a riparian restoration project. The riparian project is to accelerate recovery of Santa Clara Creek on Santa Clara Pueblo following the 2011 Las Conchas Fire.

More information about FAWRA is available at www.emnrd.state.nm.us/SFD/FAWRA.html. 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.*

This work is scheduled for 2020 and 2022 (i.e., after the period covered by this report).

- *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.*

WAPs are an eligible type of plan (a WBP alternative) in the SFA scheduled for release in early 2020.

- *The NMED Construction Programs Bureau will provide a summary of activities related to the use of the CWSRF 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.*

This work is scheduled to begin after 2019.

- *Watershed groups will address water quality problems as indicated by verification items listed above, accurately drawing on information resources for which the SWQB is responsible.*

Streams in the upper Pecos were sampled by SWQB in 2010, and several changes were made to the stream reaches listed as impaired after the original Upper Pecos WBP was completed in 2012. The updated Upper Pecos WBP noted in above correctly cited the 2018-2020 *State of New Mexico Clean Water Act 303(d)/305(b) Integrated Report*.

The six new watershed implementation projects that began in 2019 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.*

The goal of maintaining the SWQB email list above 2,000 addresses was not quite attained. On October 1, 2019 the list had 1,706 addresses. On December 31, 2018 the list had 1,644 addresses, and had shown slight increases each year since 2014.

- *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 10, 2018, December 21, 2018, April 5, 2019, and August 26, 2019. The distribution for each issue included approximately 1,700 on the SWQB email list plus another sixty-five mailed hard copies.

- *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 performed outreach & education activities for over 800 members of the public ranging from adult professionals to family retreats and school groups. The activities focused on water quality and how watersheds function, using both a tabletop water quality demonstration as well as a Rolling Rivers watershed model trailer. In addition, staff created two Rio Grande specific watershed and water quality classroom activities to supplement the outreach demonstrations once students return to the classroom. These were distributed to six teachers with over 150 students, and the feedback from teachers has been highly positive. SWQB staff also



attended the annual Santa Fe and Rio Rancho Water Fairs, presenting information to several classes of fourth grade students at each event.

WPS staff produced a brochure on watershed-based planning in the Embudo Creek watershed, to support the planning project nearing completion there (Project 19-G). The brochure has primarily been distributed at meetings for that project.

Additional outreach and education activities were conducted as part of the Wetlands Program, summarized in a separate section below.

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 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 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. In 2019, GWQB issued fourteen 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 2019, GWQB conducted ten water fairs, receiving approximately 450 water samples. Water fairs were conducted in the following communities: Chama, Lovington, Santa Rosa, Socorro, Doña Ana county (Las Cruces and Anthony), Ghost Ranch, Farmington, Cerrillos, Taos and Colfax County (Taos and Angel Fire), and Grant County (Silver City and Mimbres).

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 Understanding (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 is scheduled after the October 1, 2018 – September 30, 2019 reporting period.

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

This milestone is also scheduled after the October 1, 2018 – September 30, 2019 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.*

NMED reviewed several BLM projects as part of the federal consistency review summarized under Objective 3, above. The most notable example was a review of the draft Resource Management Plan (RMP) for the area managed by the Carlsbad Field Office of the Bureau of Land Management, which directly affects water quality in the Black, Delaware, and Pecos rivers. This review included comments submitted on a draft EIS for the RMP, and the RMP will affect land management decisions over a large portion of southeastern New Mexico for decades.

The BLM submitted summaries of activities related to water quality management and non-point 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.*

In the State Technical Committee meeting hosted by NRCS on November 14, 2019, NRCS staff reported that \$398,382 in NWQI funds were obligated in federal fiscal year 2019, compared with \$177,391 in FY 2018.

NRCS provided a description of recent work implemented under NWQI, in the section **Additional Management Practices by Non-NMED Agencies** below. 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 establishment of 72 acres of cover crop under NWQI in the Alameda Arroyo-Rio Grande watershed (HUC 130301020608). The cover crop was assumed to be present in four months per year when the acres would otherwise be fallow, on a 0.5% slope 400 feet long. Cover cropping reduced sediment loading by approximately 1.6 tons per year, phosphorus by 2.8 lb/yr, and nitrogen by 5.5 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 1.4×10^{13} colony forming units (CFU) per year of *E. coli* load reduction. This result averages about 3.9×10^{10} CFU per day, compared with a load reduction goal in the TMDL of 2.5×10^{13} CFU per day at moderately high flows (around 826 cubic feet per second, based on data from 1965-2005).

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.*

Work on this task did not commence until after the reporting period.

- *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.*

In 2019, SWQB attended 17 SWCD board meetings, with six different SWCDs. Eight of these meetings were with four of the eight SWCDs whose jurisdictions, because they contain most of New Mexico's assessed stream miles, are identified as priorities in the NPS Management Plan.

The San Juan SWCD is implementing two Section 319 funded projects (Projects 17-T and 18-K) listed in Table 3 above. Beginning with these projects, the San Juan Watershed Group coordinator is an employee of the San Juan SWCD, whereas previously this work was done by a contractor. The Lower Animas River Watershed Based Plan Implementation Projects (Proj-



ect 17-T) is furthest along towards completion. A highlight of this project was the Rainwater Harvesting, Low-Impact Development & Green Infrastructure workshop held on May 29-30, 2019. Thirty-nine people attended day one of the workshop, and approximately half of the attendees attended the second day of the workshop, in which the group traveled to the San Juan Nursery to construct a demonstration low-impact development project.

For another profile of a project implemented by a SWCD, see the summary of the Gila River Floodplain Restoration River Stewardship project on page 28.



Workshop attendees pose for a photo after designing and constructing a demonstration project.

- *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.*

In March 2019, an agreement with Cuba SWCD was approved to implement the Upper Rio Puerco Sediment and Turbidity Reduction Maintenance Workshops (Project 19-D in Table 3). Cuba SWCD is acting as fiscal agent for the Rio Puerco Management Committee (RPMC), a watershed group first formed in 1996 and permanently reauthorized by Congress in the 2019 federal public lands package. This project includes two roads education workshops to be held in 2020 within the Rio Puerco basin. One workshop is slated for the Cuba area, and the other is tentatively slated for the Bluewater Heritage Ranch near Grants. The previous agreement which NMED had with Cuba SWCD was for the Rio Puerco Grade Stabilization and Stream-bank Protection Project (Project 03-I) completed in 2007. Cuba SWCD is one of the eight SWCDs identified as a priority for collaboration in the NPS Management Plan.

- *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.

The State Water Plan was adopted by the New Mexico Interstate Stream Commission in December 2018 (www.ose.state.nm.us/Planning/swp.php). The effort to produce the plan, including incorporation of water quality program information provided by NMED, occurred prior to the period covered by this report. No other significant statewide planning activities related to water resources (other than those carried out by NMED) occurred in the October 1, 2018 – September 30, 2019 reporting period.

- *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 2018 NPS Annual Report was submitted to EPA on January 31, 2019. 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.*



On April 9, 2019, the New Mexico Water Quality Control Commission approved the current NPS Management Plan. EPA approved the plan on August 1, 2019. It is available at www.env.nm.gov/surface-water-quality/nps-plan. 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. EPA set a deadline of February 29, 2020 for reporting calendar year 2019 load reductions. Information reported by NMED for calendar year 2018 is available on line at <https://tinyurl.com/NM-2018-Load-Reductions> and for calendar year 2019 <https://tinyurl.com/NM-2019-Load-Reductions>, and will be complete at the end of February.



Summaries of Section 319 Projects Completed in 2019

Upper Pecos Watershed-Based Plan Update and Revision (16-H)

Project cost: \$22,360 (FY 2016 Section 319 funds), \$14,980 (Match)

The Upper Pecos Watershed Based Plan was accepted by EPA in December 2012 and was the second plan in New Mexico accepted by EPA. Since its creation, there have been a myriad of activities within the watershed that were both part of the original plan (in the form of restoration projects and outreach activities) and unplanned events like large scale wildfires and some land use changes. The goals of the project were to analyze what has transpired since the plan was accepted and revise the plan to document project successes and new opportunities for watershed improvement. The Upper Pecos Watershed Association is working with their collaborators, Pathfinder Environmental, Keystone Restoration Inc., and the Pecos Business Association to update the plan and inform the community through education and outreach. UPWA has held several stakeholder meetings to discuss the current state of the watershed with area residents, recreational groups, sportsmans groups, federal and state agencies and others who live, work, recreate and utilize the watershed's resources. Pathfinder Environmental and Keystone Restoration Inc. have studied the impact of several major wildfires that have occurred since 2012 including the Tres Lagunas and Jaroso fires. The plan revision includes an additional 23 stream segments that were not included in the first WBP including Glorieta and Macho creeks, in addition to post-fire treatments for watersheds that were severely burned in 2012. The revised WBP is available at www.env.nm.gov/surface-water-quality/accepted-wbp/.



*Tres Lagunas fire smoke column as seen from downtown Santa Fe in June 2013.
Photo credit: Greg MacGregor and courtesy of NM Department of Cultural Affairs.*



Black Canyon Riparian Enhancement Design Project (17-U)

Project cost: \$37,433 (FY 2017 EPA 319 Funds), \$25,630 (Match)



Black Canyon Creek with staff from Natural Channel Design installing a stream cross-section survey. Black Canyon Creek is a Gila Trout recovery stream considered impaired by NMED due to excessive temperature loading.

Black Canyon Creek is a tributary of the Gila River in southwest New Mexico. The creek is listed as impaired due to stream temperatures that exceed water quality standard for (high quality cold water aquatic life.) Black Canyon Creek has also been designated by the US Fish and Wildlife Service as a recovery stream for the federally threatened Gila trout. This project improved the existing EPA accepted watershed-based plan by surveying 3.5 miles of upper Black Canyon Creek to assess stream improvement potential and to develop a riparian enhancement plan including specific bioengineering treatments, treatment locations and cost estimates. NMED's contractor Natural Channel Design spent 1.5 years on the design including installation of 5 temperature data loggers, 20 stream cross sections, longitudinal profiles, and vegetation canopy estimation. From this assessment they developed design drawings which included 96 treatments over 3 miles of stream. Recommended treatments range from basic willow planting to instream structures including rock and log barbs, brush revetments, and rock weirs. The watershed assessment and design documents form the foundation for environmental compliance to begin restoration work at Black Canyon. The Gila National Forest and the SWQB are collaborating on NEPA and Wilderness Act review with the goal of initiating project work in Black Canyon in 2020.



Summaries of River Stewardship Program Projects Completed in 2019

Animas River Restoration Project (17-D)

Project cost: \$221,303.38 (FY 2015 River Stewardship Program funds)

This project was implemented on the Animas River (San Juan River to Estes Arroyo) at Berg Park in the City of Farmington. This assessment unit is currently impaired due to high levels of *E. coli*, nutrients and temperature. A geomorphic assessment of the river in 2013 indicated an over-wide river channel (120-150 ft) when compared with an upstream stable reach of the river (100 ft channel width). This same assessment found several locations where active river bank erosion was occurring. A qualitative assessment of riparian vegetation showed a mature cottonwood community next to the river, a moderate quantity of mature Russian olive, and a lack of riparian shrubs and facultative species such as willow. An overwide channel contributes to excessively shallow flows in the late summer and fall, which is more likely to heat up and lead to temperature impairments. The City of Farmington implemented the project and provided project management working with Riverbend Engineering, LLC on design and Andamo Sanchez Excavating & Trucking, Inc. on construction. In total, the project removed approximately 2 acres of Russian olive, planted over 750 willows, built 5 cross-vane structures with excavated scour holes, installed 8 large rock deflectors to protect eroding banks, installed an additional 41 habitat and bank stabilization rocks, deepened low flow channels, and created gravel bars (approximately 1,400 cubic yards).

Looking upstream, the channel width has been reduced below the rock cross-vane which provides a deeper pool with cooler water temperatures for fish habitat. The cross-vane also directs flow away from the eroding bank which reduces sedimentation and improves water quality.



Photo above taken during the City of Farmington's Comcast Cares volunteer willow planting day.





Gila River Floodplain Restoration (17-F)

Project cost: \$149,000 (FY 2015 River Stewardship Program funds), \$15,240 (Match)

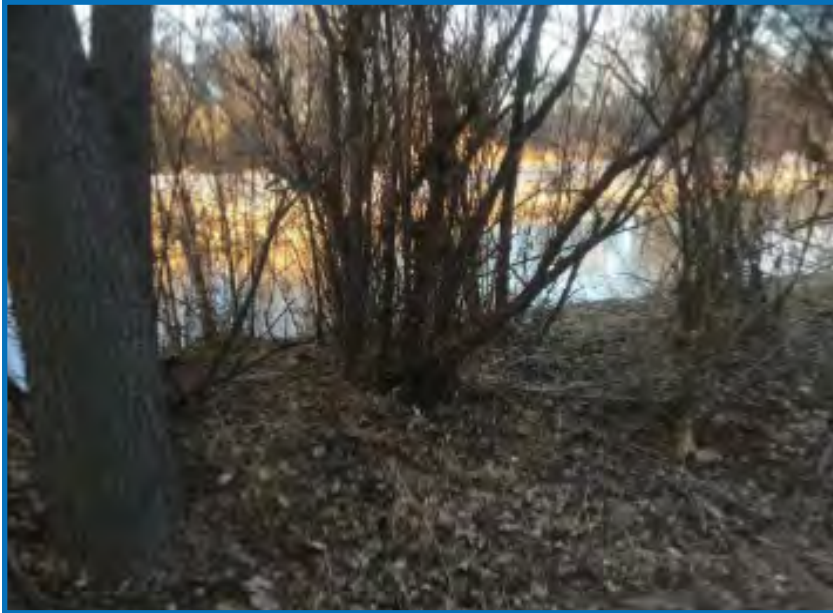


Photo above shows pre-treatment: Large stands of salt cedar along the banks of the Gila River, just upstream of Duck Creek.



Post treatment at same photo point: Only one small sprout re-emerged following removal of the large salt cedar stand. It was flagged and re-treated by the subcontractor. Photos by Martha Cooper, TNC

This project took place along the banks of Duck Creek and floodplain areas of the Upper Gila River near the towns of Cliff and Gila in southwestern New Mexico. It was implemented by Grant Soil and Water Conservation District (Grant SWCD) with assistance from The Nature Conservancy (TNC) who along with Ellen Soles, scientist and area expert, provided mapping skill and developed the monitoring protocols.

Due to a nearly intact natural flow regime, the Gila River in the Cliff-Gila Valley provides high-quality habitat for a number of rare and declining riparian obligate and aquatic species. TNC and Grant SWCD consulted with the U.S. Fish and Wildlife Service for guidance of federally listed species and important wildlife habitats in the project area. The main objective of the project was to take proactive steps to protect and enhance existing native plant communities which predominate on the Gila River floodplain and the stream corridor ecosystem by reducing non-native vegetation abundance and subsequently improving wildlife habitat. Over time, bird diversity, insects, fruits, and seeds are expected to increase in this area. Ultimately, a total of 39 acres of non-native Russian olive (*Elaeagnus angustifolia*) and salt cedar (*Tamarix* spp.) were removed and treated with approved herbicide in the Cliff-Gila valley.



Restoring La Jara Creek from Damage from the Thompson Ridge Fire, Valles Caldera National Preserve (17-H)

Project cost: \$154,200 (FY 2015 River Stewardship Program funds)

The project was implemented on Valles Caldera National Preserve, managed by the National Park System. La Jara Creek is a tributary to the East Fork Jemez River. The forested headwaters of La Jara Creek were burned by the 2013 Thompson Ridge Fire. Post-fire flooding caused erosion in the La Jara Creek channel, and deposited ash and sediment into an old stock pond. Wetlands along the lower reach of La Jara Creek had previously been drained and channeling by historic grazing practices and roads, and this had reduced the historic extent of wetland acreage. Los Amigos de Valles Caldera implemented a project that stabilized the 1,300 feet of creek, excavated 350 cubic yards of sediment from the pond, and spread water to re-wet approximately 204 acres of wetlands. A total of 214 structures were excavated or constructed from rocks, logs and sod to control erosion and expand wetlands, including: contour swales, excavator plugs, plug and ponds, worm ditches, media lunas, and one-rock dams.



Subcontractor Keystone Restoration Ecology creating an excavator plug that will re-direct and spread water from the channel into historic wetlands.



Subcontractor Keystone Restoration Ecology used heavy machinery to build structures, Valles Caldera National Preserve assisted with project permitting and monitoring, and approximately 26 Albuquerque Wildlife Federation volunteers built rock structures and dug worm ditches during a weekend workshop.

Albuquerque Wildlife Federation volunteers building a rock rundown structure that stabilizes the channel and spreads water into adjacent wetlands.



Restoration of Sawmill and Foreman Creeks, Comanche Creek Watershed (17-J) Project cost: \$195,535 (FY 2014 River Stewardship Program funds)

The project was implemented along Sawmill and Foreman Creeks, tributaries to Comanche Creek in the Valle Vidal Unit of Carson National Forest, Taos County. Stream channels were incised and slope wetlands were eroded, which caused a loss of wetland habitat and the ability to store and cool water before releasing it as baseflow to Comanche Creek (which is impaired for temperature). The primary goal of the project was to restore and maintain in-stream, riparian, and slope wetland ecosystem functions. Quivira Coalition accomplished this goal by stabilizing 72 acres of slope wetlands and aggrading three miles of channels in three tributaries to Sawmill Creek and all of Foreman Creek. Large headcuts were treated to stabilize eroding slope wetlands. Channel aggradation structures were installed in multiple small channels through the wetlands. Many other restoration structures were constructed to guide water over drying wetland surfaces. A total of 174 log, rock and sod structures were installed by subcontractors and volunteers, including: one-rock dams, log step-falls, Zuni bowls, worm ditches, rock run-downs, log mats, contour swales, log flow-splitters, tree slash, and sod harvesting. This resulted in restored floodplain for wetlands, reduced stream bank erosion and sedimentation, and abatement of channel down-cutting and wet meadow head-cuts along riparian corridors. The project directly addressed ecosystem decline by successfully implementing proven, effective, cost-efficient, low-impact restoration techniques that reinstated natural creek length, reduced erosion, and will over time preserve and expand wetland acreage. Project partners included the Carson National Forest, subcontractors Rangeland Hands, Reineke Construction, Terrasophia and Zeedyk Ecological Consultants, and approximately 60 volunteers affiliated with Quivira Coalition, Trout Unlimited, Valle Vidal Grazing Association and Philmont Scout Ranch.



Foreman Creek with multiple log step-fall structures and one-rock dams to stabilize eroding wetlands.



Volunteer conducting pre-implementation monitoring in Foreman Creek. In the foreground is a head cut that was later treated with a log step-fall structure.



Post-Tres Lagunas Fire and Flooding Restoration Project for Holy Ghost Canyon, Creek, and Tributaries Restoration Project (17-N)

Project cost: \$144,465 (FY 2015 River Stewardship Program funds)

This project is in the Holy Ghost watershed near the town of Pecos on public lands managed by the Santa Fe National Forest in San Miguel County. The Holy Ghost Creek watershed was severely burned in the 2013 Tres Lagunas Fire. The resulting flooding that followed the fire caused several tributaries to deeply erode creating five-foot deep incisions and mobilizing countless tons of sediment into Holy Ghost Creek. The incoming sediment from the tributaries filled pools and reduced available trout habitat. The Upper Pecos Watershed Association with their subcontractors Keystone Restoration Ecology and Pathfinder Environmental worked with the Forest Service to implement post-fire stabilization of the tributaries and bring Holy Ghost Creek back to pre-disturbance condition. Construction was completed in April 2019 and included installation of over 47 log and rock structures in four tributaries and three reaches of Holy Ghost Creek. Additionally, hundreds of willow and cottonwood cuttings and transplants were installed along the streambank and in tributaries to provide soil and streambank stability and habitat value. All materials including plants, logs and rocks were sourced locally near the project area so the finished project blends seamlessly into the surrounding landscape.



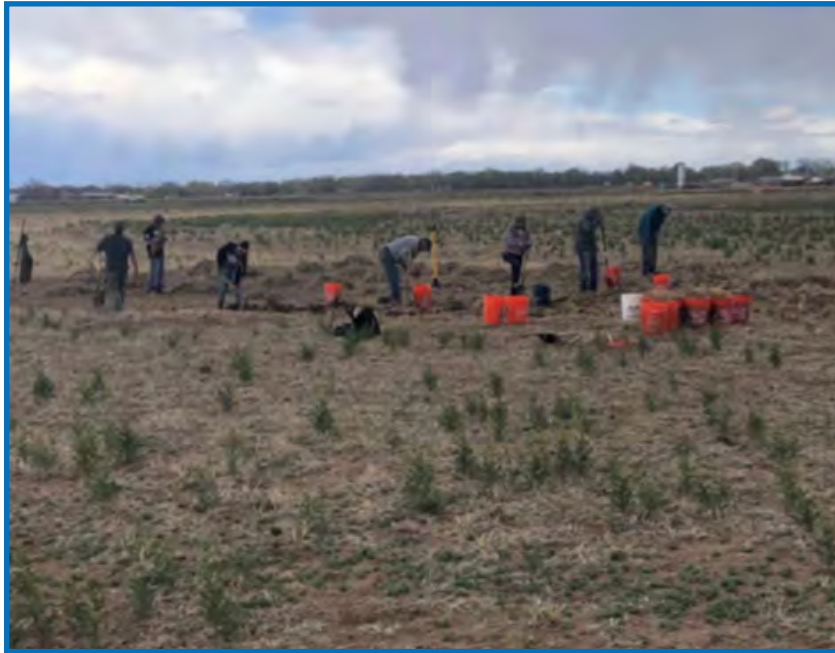
Holy Ghost Creek in the Upper Pecos River Watershed. Staff from the Santa Fe National Forest, Keystone Restoration Ecology, and Upper Pecos Watershed Association discuss project features. The tributary on the left was stabilized with log and rock run-downs and planted with native woody riparian species. In Holy Ghost Creek rock structures stabilize streambanks, create pools and trout habitat, and reduce width-to-depth ratios.



Valle de Oro National Urban Wildlife Refuge Riparian, Wetland, and Water Quality Improvement Project (18-F)

Project cost: \$114,000.00 (FY 2015 River Stewardship Program funds)

The Valle de Oro National Wildlife Refuge (NWR) is located south of Albuquerque in south central Bernalillo County (Hydrologic Unit Code 130202030306) adjacent to the Rio Grande. The project goal was to re-



establish native riparian and wetland vegetation in an area all previously used for a dairy operation. Storm water runoff is the primary cause of surface water pollution. According to an analysis completed by the U.S. Fish and Wildlife Service for the site, natural hydrologic features had been altered for urban development and agricultural purposes. This disruption increased storm water runoff into the Rio Grande as a consequence. Rio Grande Return, and their partners (including the NWR) planted wetland and riparian vegetation. The plants will stabilize soils, provide wildlife habitat, and improve water quality in storm water runoff events. In total, the project helped create about 58 acres of wetland and riparian habitat to benefit water quality, wildlife

habitat and recreational opportunities for the surrounding community. About 1,000 cottonwood and Gooding's willow, 15,000 coyote willow, 16,600 salt grass plugs, and 400 other container plants were planted.

Photo above, looking north, the crew planting salt grass plugs harvested from the Bosque del Apache Wildlife Refuge in August 2018.

Photo to right, Photopoint 9 Unit 5. Fall 2019.



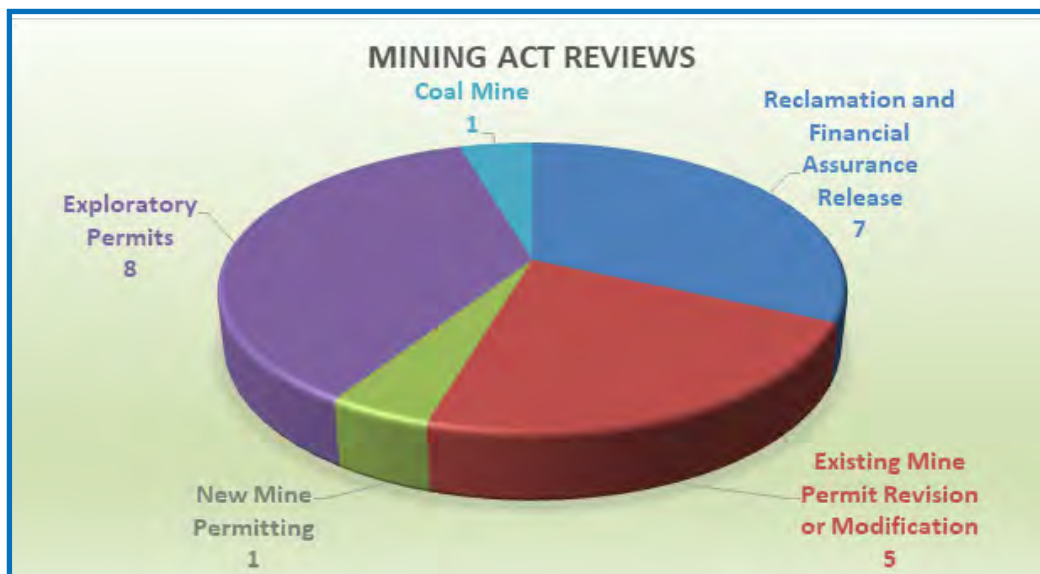


New Mexico Mining Act

Under the New Mexico Mining Act, NMED reviews and comments on 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 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 an informal Mining Act team that includes representatives from the Surface Water Quality Bureau (SWQB), Ground Water Quality Bureau (GWQB), and the Air Quality Bureau (AQB) who 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. The SWQB discusses 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 state and federal environmental standards. The team also participates in meetings and reviews documents in collaboration with EMNRD, the Forest Service, the New Mexico State Land Office, the Corps, EPA, and others.

In 2019, SWQB staff reviewed and submitted comments on twenty-two Mining Act submissions from MMD. Eight of these were for exploration permits, while the others comprised a mix of existing mine permit revisions or modifications, inspections and release of financial assurance (FA) for reclamation, a coal mine permit renewal, and comments for a new mine that has yet to become operational.





In Northern New Mexico, SWQB staff reviewed three humate-related mining permits in 2019, all located in McKinley and Sandoval Counties (the Brie 1 Mine, Eagle Mesa Mine, and the Ojo Encino Mine). Humate is a highly organic substance from which humic acids can be extracted and used as a soil amendment in agriculture. All three permit modification requests were for the release of FA that is held by EMNRD until reclamation success is achieved. SWQB recommended additional information following the original permit application to help support and document the reclamation efforts. In the southern half of the state SWQB supported FA release following successful reclamation of two silica operations and one copper exploration permit. It did not support FA release on one copper exploration permit due to extensive hillslope erosion and poor vegetative cover. Fully reclaimed mine sites protect waters of the state by preventing sediment that may contain heavy metals or other contaminants to downgradient water bodies.



Reclamation efforts at the Eagle Mesa Mine were significantly set back this year, at no direct fault of the mine operator, due to their purchased seed mix being contaminated with halogeton, a poisonous noxious weed. The operator is removing all of the halogeton and re-seeding with an uncontaminated seed mix.

SWQB staff reviewed three mining permits for projects working towards the reclamation of old uranium mines (Old Stope Leach Mine, Section 12 Mine, and the St Anthony Mine). These mines are in the process of finalizing their Closeout/Reclamation Plans. SWQB provided comments to strengthen the reclamation plans with respect to improving protections for surface water during and following reclamation.

SWQB staff provided comments on the Closeout/Reclamation Plan for the Tijeras Mine in Bernalillo County.



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The Tijeras Mine and Mill is a limestone quarry and cement manufacturing plant that has been in operation since 1959 and is expected to continue operation for another 70 years under current production levels. SWQB comments pertaining to the restoration and design of engineered channels were incorporated into the final Closeout/Reclamation.

SWQB continued reviewing the Baseline Data Report for the new proposed Roca Honda Uranium Mine near Grants, New Mexico and recommended additional surveying of the Rio San Jose to document the environmental condition prior to mining. The mine operation is proposing to pipe and discharge treated groundwater into the Rio San Jose. The applicant is currently collecting additional data.

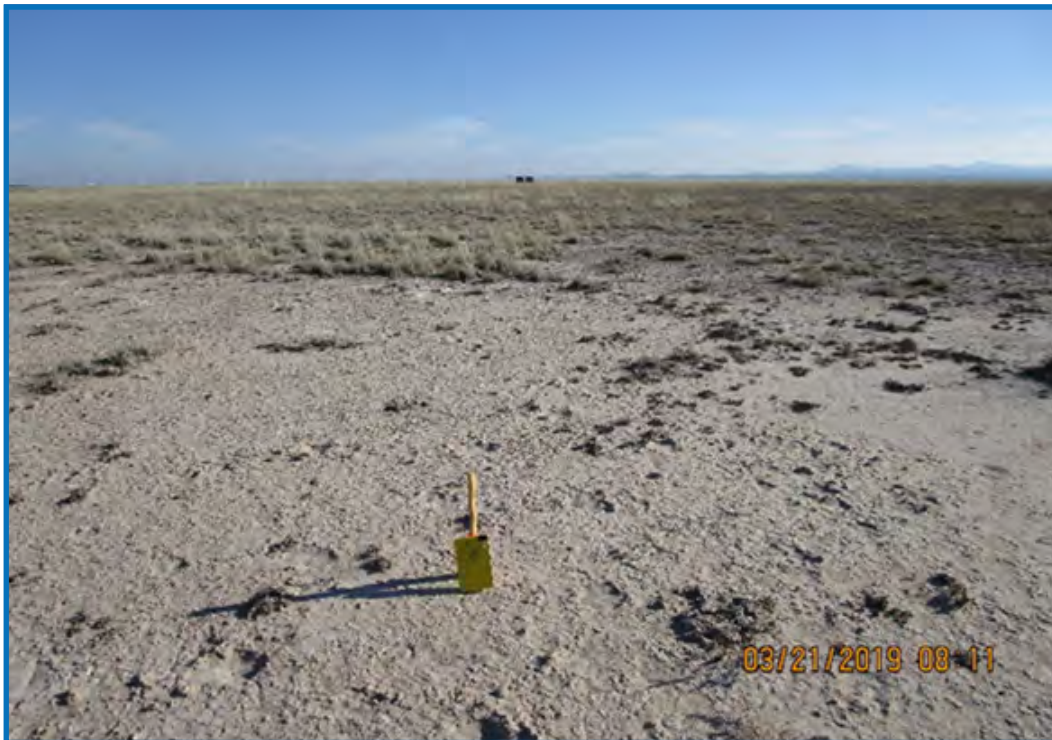
Southern New Mexico saw the majority of new mine exploration permitting where seven exploration applications were reviewed for an array of mineral types ranging from lithium extraction in a desert playa to more conventional copper, silver and gold exploration. In northern New Mexico, one exploration application was reviewed for the new proposed Terrero Exploration Mine in the Santa Fe National Forest. Among many recommended BMPs, SWQB strongly recommended that the exploration drilling process utilize a closed-system to contain and properly dispose of all drilling fluids as the most secure way to ensure drilling additives do not adversely affect natural waterways.



Part of the old historic mining rail at Jones Hill, the location of the new proposed Terrero Exploration project in the Santa Fe National Forest. These historic areas are being excluded from the proposed exploration drilling project.



SWQB staff reviewed and commented on the request to renew the mining permit for the San Juan Coal Mine. SWQB reviewed past Clean Water Act permit compliance reports and provided comments to EMNRD regarding the maintenance of stormwater infrastructure for large storm events.



Site of a proposed lithium exploration project within the Lordsburg Playa in southwestern New Mexico. Brackish water underlying the playa would be pumped to the surface and processed to extract lithium.





Wetlands Program

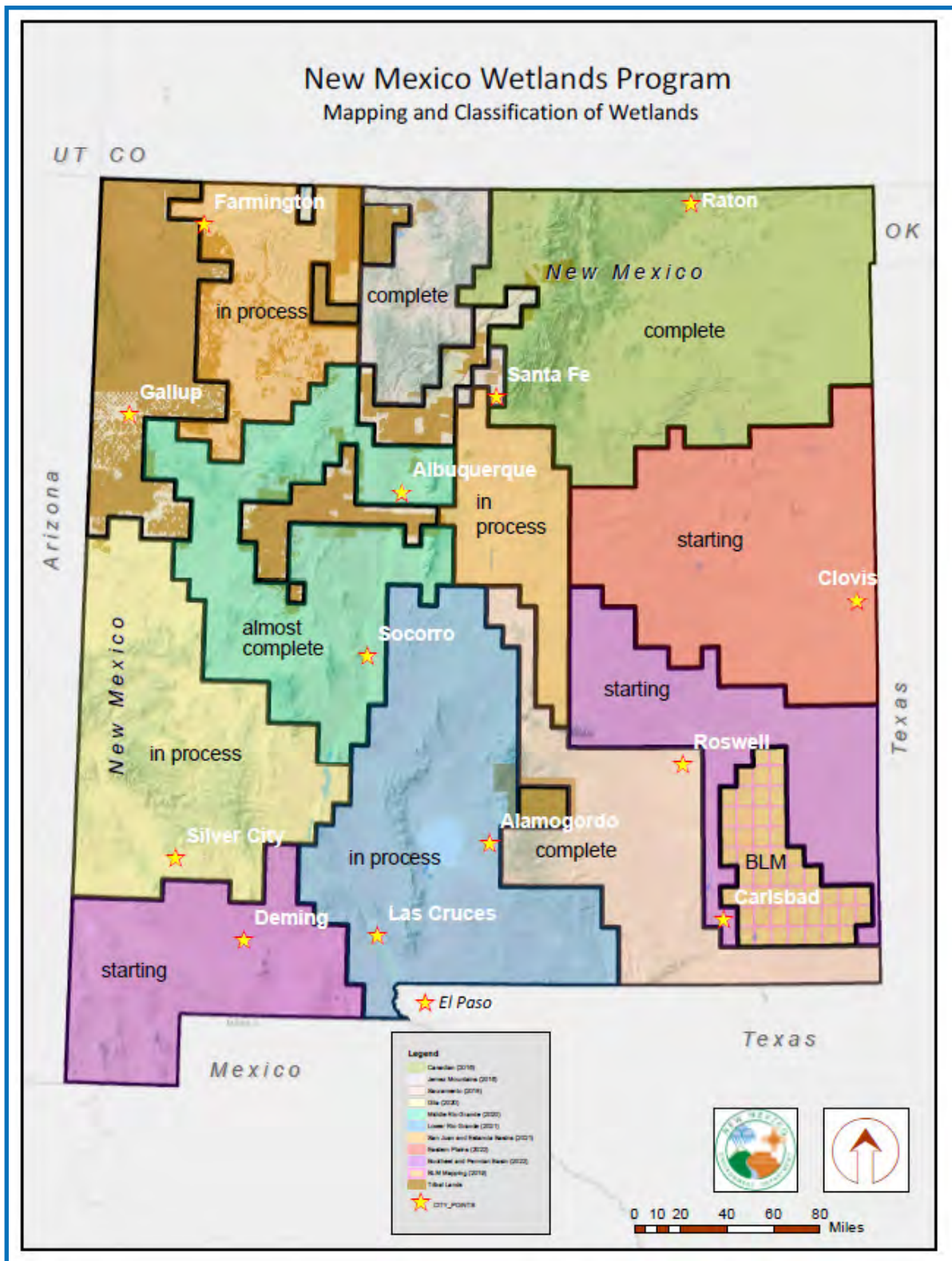
Wetlands Program Plan Update

EPA approved the 2019 update of the New Mexico Wetlands Program Plan on April 9, 2019. The Plan lays out a pathway to continue program development for the next five years. Through this updated 5-year Wetlands Program Plan we hope to continue progress towards a comprehensive and sustainable Wetlands Program for New Mexico. The plan is available at <https://www.env.nm.gov/surface-water-quality/wetlands>.

Funding Awarded to the Wetlands Program in 2019

Two new Wetlands Program Development projects were awarded funding by EPA Region 6 in 2019. The federal grants for these projects total \$709,212 in federal assistance awarded through the FY19-20 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 our approved 10-year Wetlands Assessment and Monitoring Strategy and 2019 Wetlands Program Plan.

1) Mapping and Classification of Wetlands in the Bootheel and Permian Basin, New Mexico. This project will map and classify wetlands in the Bootheel and Permian Basin of New Mexico as part of our efforts to update mapping of all New Mexico's wetlands. Wetlands in the project areas include southwestern New Mexico (Bootheel) including the Florida and Burro Mountains and the Lordsburg Playa and contiguous areas, and Southeastern New Mexico (Permian Basin) including the perennial Pecos River, associated riverine wetlands, intermittent or ephemeral creeks, playa lakes, and spring-fed slope wetlands (i.e. cienegas). Diverse flora and fauna rely on these wetlands, including 90 federal or state threatened or endangered species (e.g. Jaguar, Mexican long-nosed bat, Chiricahua leopard frog, Piping plover, Least tern, Pecos bluntnose shiner). Project tasks include conducting a literature search, acquiring imagery, assembling a geodatabase, pre- and post-mapping field reviews, performing Cowardin classification (i.e. National Wetland Inventory or NWI) wetland mapping and applying the landscape position, landform, water flow path and waterbody type (LLWW) classification for the project area, assigning wetland functions to different wetland types, assigning hydrogeomorphic (HGM) wetland subclasses, and wetlands classified segments for water quality standards. Outreach and technical transfer of results and products to agencies and other user groups will be conducted throughout the project. A Technical Advisory Committee will be established to provide guidance and expertise. Transfer of mapping products and technology will include presentations to watershed groups, agencies, Tribes and consortiums, and the creation of a story map and five map books, and copies of the final report and interactive maps posted on the NMED Wetlands website. This project will designate classified wetland segments and identify wetland functions (proposed designated uses) for developing wetland water quality standards. Products will include wetlands mapping and classification covering ~14,160 square miles (~236 quadrangles) for areas of southern New Mexico where little wetlands information or mapping is currently available and adjoining previous and ongoing mapping efforts.



Status of wetlands mapping in New Mexico.



2) Mapping and Classification of Wetlands in the Eastern Plains of New Mexico.

This project will map and classify wetlands in the Eastern Plains (east central) of New Mexico as part of our efforts to update mapping of all New Mexico's wetlands. Wetlands in the project areas include playas of the Southern High Plains, Santa Rosa cienega wetlands, riverine wetlands, and intermittent or ephemeral creeks. Diverse flora and fauna rely on these wetlands, including 44 federal or state threatened or endangered species and migrating and wintering waterfowl along the Central Flyway. Project tasks include conducting a literature search, acquiring imagery, assembling a geodatabase, pre- and post-mapping field reviews, performing NWI wetland mapping and applying the landscape position, landform, water flow path and waterbody type (LLWW) classification for the project area, assigning wetland functions to different wetland types, assigning hydrogeomorphic (HGM) wetland subclasses, and wetlands classified segments for water quality standards. Outreach and technical transfer of results and products to agencies and other user groups will be conducted throughout the project. A Technical Advisory Committee will be established to provide guidance and expertise. Transfer of mapping products and technology will include presentations to watershed groups, agencies, Tribes and consortiums, and the creation of a story map and five map books, and copies of the final report and interactive maps posted on the NMED Wetlands website. This project will designate classified wetland segments and identify wetland functions (proposed designated uses) for developing wetland water quality standards. Products will include wetlands mapping and classification covering ~12,600 square miles for areas of eastern New Mexico where little wetlands information or mapping is currently available and adjoining previous and ongoing mapping efforts.

Wetlands Roundtables

The Wetlands Program hosted two Wetlands Roundtable meetings in the fall of 2018 and two in the spring of 2019.

More than 91 participants attended the Northern Wetlands Roundtable held in Santa Fe on December 11, 2018. Nine presentations included "Climate Trends and New Mexico's Seasonal Outlook," "Wetland Review, Climate Change and Resiliency," "Multi-Forest NEPA Clearance for Wetlands Restoration," "Rio Grande Water Fund: Stream, Wetlands and Riparian Program Update," "Share With Wildlife Projects," "Curry County Playa Conservation Program," "Playa Lakes in Rio Grande del Norte National Monument," "A Water Fight in Galisteo's OK Corral" and an update by the Corps of Engineers as well as lively discussions among the attendees about the new Waters of the US rule announcement and the resiliency of New Mexico's water resources and the changing climate.

The Southern Wetlands Roundtable was held in Las Cruces City Hall on November 7, 2018 with 23 participants attending. Presentation topics included an update by the Corps of Engineers and presentations on "Climate Trends and Southern New Mexico's Seasonal Outlook," "Gila River, Water Development: Environmental and Other Values," "Natural Climate Solution: Wetlands and an Update on the Pitchfork Ranch Restoration," "The Gila River as an Ecological Reference Standard for other Rivers of the Southwest," "Piloting



Private Wetland Restoration Lower Rio Grande,” and discussions among the participants about the future of the Gila River, climate change and planning the future of springs and cienegas.



The logos of 73 charter signatories of the Rio Grande Water Fund as presented by Collin Haffey in “Rio Grande Water Fund: Stream, Wetlands and Riparian Program Update,” December 11, 2018 Northern Wetlands Roundtable.

The Southern Wetlands Roundtable was held in Las Cruces City Hall on November 7, 2018 with 23 participants attending. Presentation topics included an update by the Corps of Engineers and presentations on “Climate Trends and Southern New Mexico’s Seasonal Outlook,” “Gila River, Water Development: Environmental and Other Values,” “Natural Climate Solution: Wetlands and an Update on the Pitchfork Ranch Restoration,” “The Gila River as an Ecological Reference Standard for other Rivers of the Southwest,” “Piloting Private Wetland Restoration Lower Rio Grande,” and discussions among the participants about the future of the Gila River, climate change and planning the future of springs and cienegas.

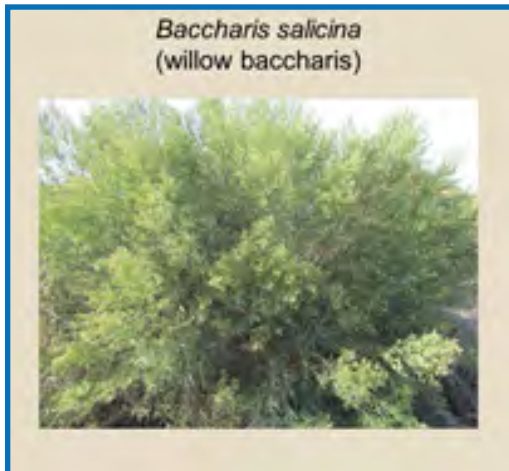
The Upper Pecos Watershed Association and Santa Fe Fly Fishing School co-sponsored both fall 2018 Roundtables and Tetra Tech, Inc. also co-sponsored the Northern Wetlands Roundtable.

More than 67 participants attended the Northern Wetlands Roundtable held in Santa Fe on April 1, 2019. Pre-



sensation topics included “Restoration and Construction Updates at the Valle de Oro National Wildlife Refuge,” “The San Juan Project,” and “*Pluchea odorata* and Other Native Shrubs for Restoration and Pollinator Habitat after *Tamarix* Treatment.” A regulatory update by the Corps of Engineers and presentations on “The Clean Water Act, State of the Rule,” and “Access to Hydrologic and Geologic Information and Data for New Mexico,” fostered lively roundtable discussions among the participants.

Winter pole planting on 30-acre Bardwell property as part of 2013-2105 NRCS WHIP Riparian Restoration Project, from “Piloting Private Wetland Restoration Lower Rio Grande” by Beth Bardwell, Southern Wetlands Roundtable, November 7, 2018.

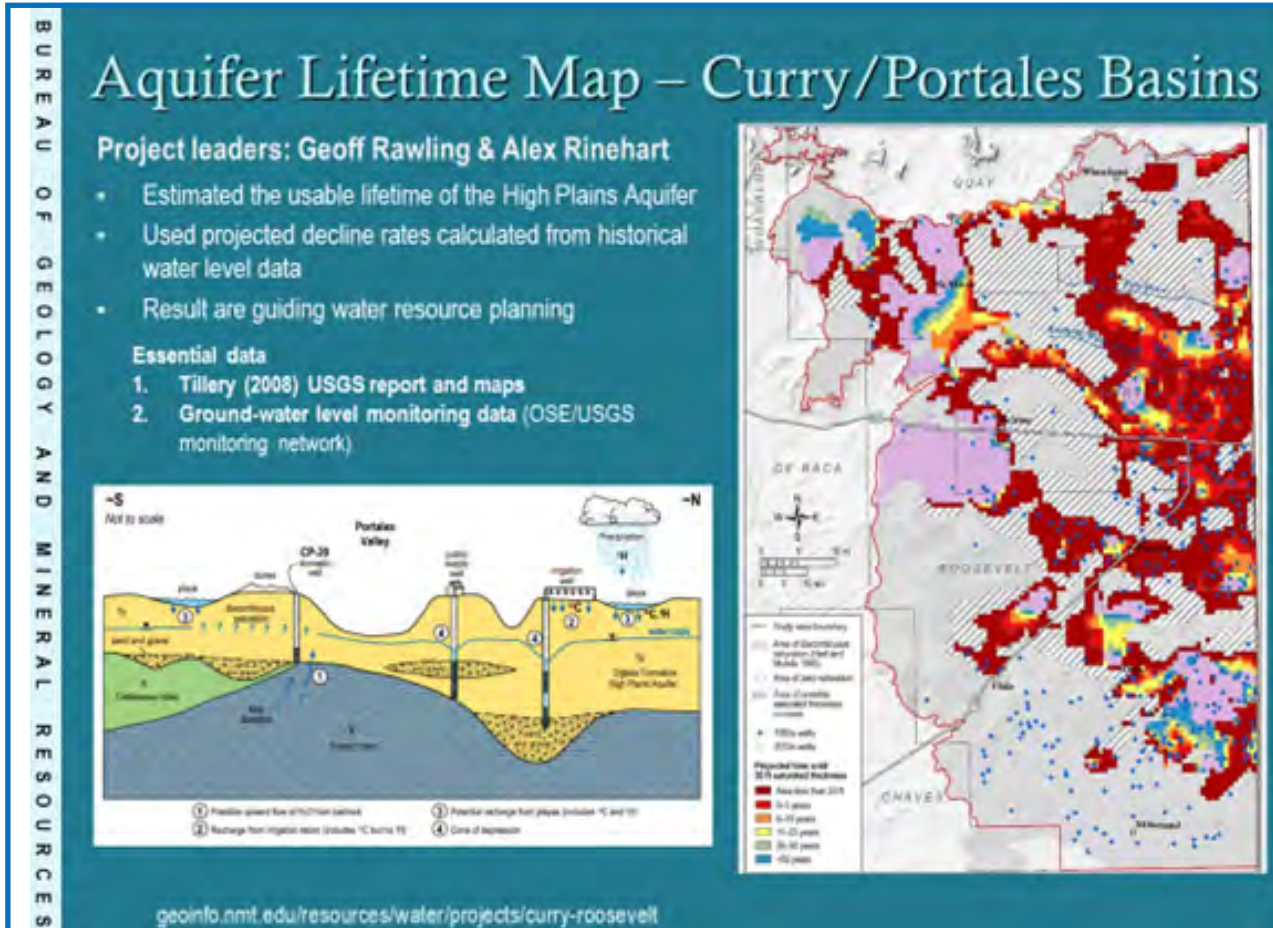


Baccharis salicina
(willow baccharis)

Two native plant species used for restoration after Tamarix removal at the ponds at Holloman Air Force Base in southern New Mexico from the presentation by Michael Freeling, “Pluchea odorata and Other Native Shrubs for Restoration and Pollinator Habitat after Tamarix Treatment.” at the Northern Wetlands Roundtable, April 1, 2019.

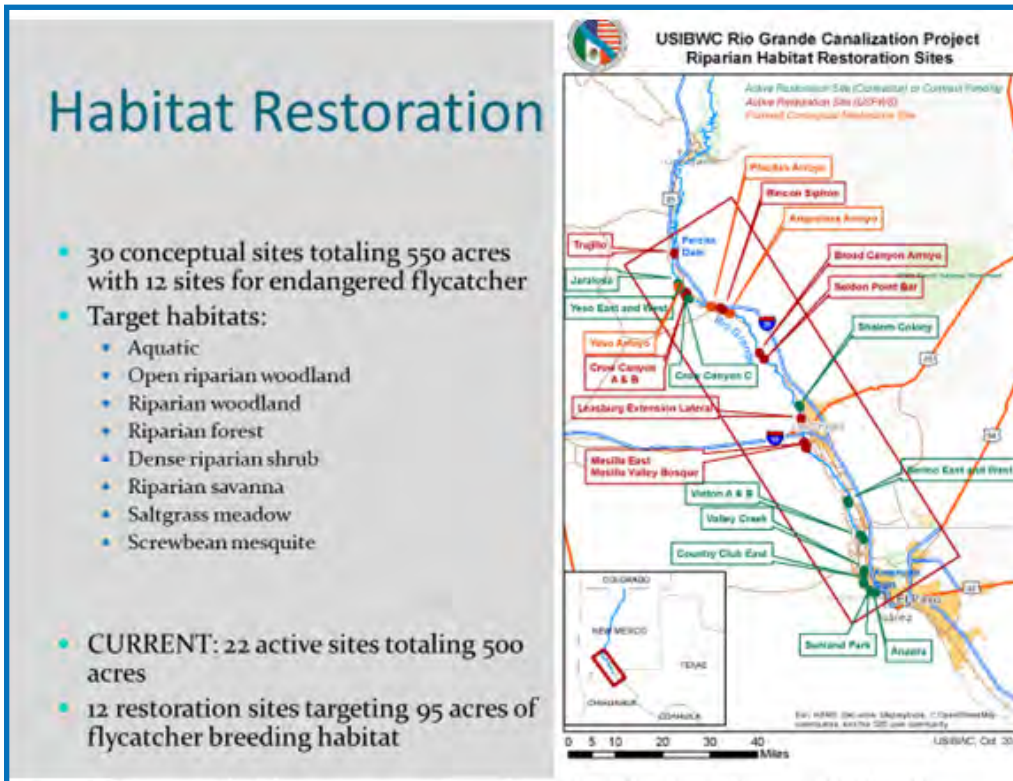


Pluchea - southwest Lagoon: 1 yr after Tamarix removal

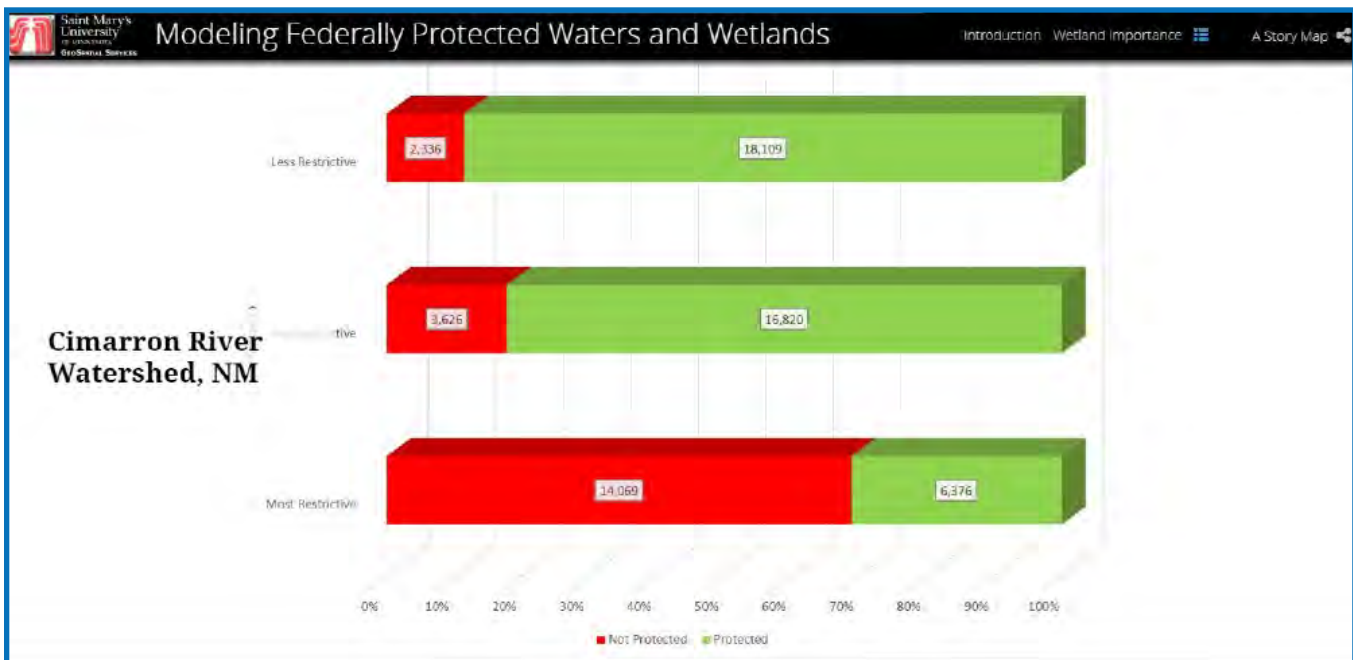


Recent Publication using data managed by the Hydrogeology Program at the New Mexico Bureau of Geology and Mineral Resources. The presentation “Access to Hydrologic and Geologic Information and Data for New Mexico,” emphasized the utility of the new state Water Data Act and the need for accessibility to agencies’ data statewide at the Northern Wetlands Roundtable, April 1, 2019.

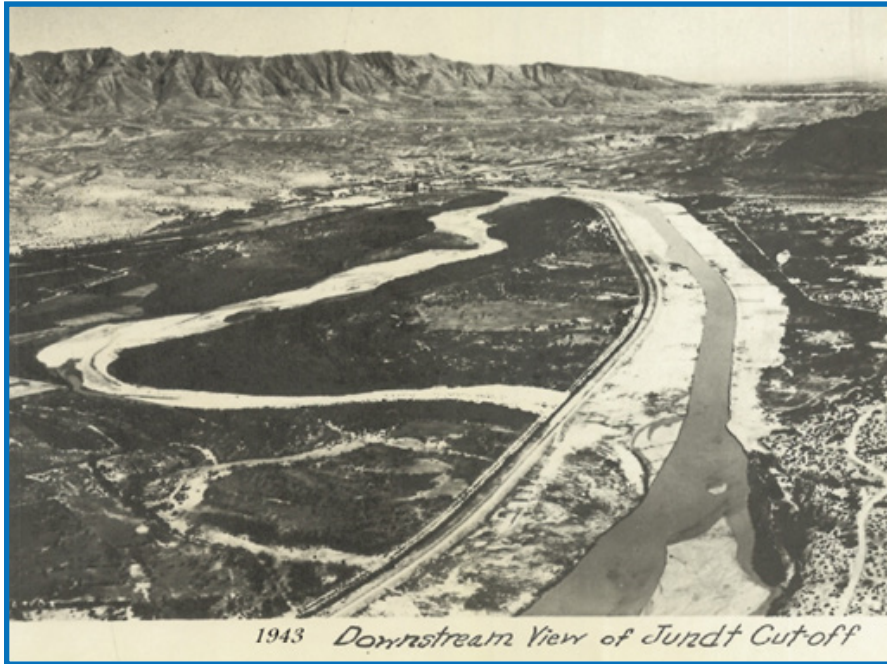
The Southern Wetlands Roundtable was held at Las Cruces City Hall on March 12, 2019 with 36 participants attending. Presentations included “A Conceptual Approach to Restoring Native Rio Grande Fishes,” “Riparian and Aquatic Habitat Restoration in the Lower Rio Grande,” and the roll-out of the “Arid-Land Spring Cienega Wetlands Action Plan.” Presentations about wildlife that use wetlands for at least part of their life requirements included “Wolf Ecology and Wetlands Impacts,” “USFWS New Mexico Waterfowl Management Plan,” and “BLM Soils and Springs Data.” An update by the Corps of Engineers coupled with a presentation on “Modeling the new WOTUS Rule effects on New Mexico Wetlands” by Saint Mary’s University of Minnesota Geospatial Services as well as “Approved Permittee Responsible Mitigation System” by the New Mexico Department of Transportation, provided ideas for lively discussions among the attendees.



Current habitat recovery sites along the Rio Grande provided in the presentation on “Riparian and Aquatic Habitat Restoration in the Lower Rio Grande,” at the Southern Wetlands Roundtable in Las Cruces on March 12, 2019.



The bar graphs show the loss of federally protected waters and wetlands under the proposed 2019 Waters of the United States new rule. These data were part of “Modeling the New WOTUS Rule Effects on New Mexico Wetlands” presentation at the Southern Wetlands Roundtable on March 12, 2019.



Historic channelization photo of the Rio Grande in 1943, from the presentation on “Riparian and Aquatic Habitat Restoration in the Lower Rio Grande,” at the Southern Wetlands Roundtable in Las Cruces on March 12, 2019. Channelization was constructed along 105 miles of the lower Rio Grande in New Mexico to facilitate deliveries under the 1906 Convention with Mexico.

Technical Documents Completed by the Wetlands Program in 2019

The Wetlands Program released one new technical document this year (in December 2018) as a deliverable for a Wetlands Program Development Grant:

Sivinski, R.C. 2018, Wetlands Action Plan, Arid-land Spring Ciénegas of New Mexico. New Mexico Environment Department, Surface Water Quality Bureau, Wetlands Program, Santa Fe, New Mexico. (www.env.nm.gov/surface-water-quality/wap).

Arid-land spring ciénegas are among the most rare and endangered ecosystems of the American Southwest. Arid-land spring ciénegas are wet meadows and marshes that are supported by springs and groundwater seeps in arid and semi-arid regions, and generally occur at elevations below 2,000 m (6,562 ft). They are biologically and economically important as productive wetland habitats for plants and animals in an otherwise arid landscape. This Wetlands Action Plan provides guidance for protection and restoration of arid-land spring ciénegas, and emphasizes ecological integrity, water quality benefits, and habitat conservation for threatened and endangered plant and animal species that occur in arid-land spring ciénegas. This plan is written for private landowners, local governments, community partnerships, state and local institutions, and conservation groups who are involved in the preservation, conservation, and restoration of arid-land spring ciénegas.

Four Wetland Projects Completed in 2019

Four Wetlands Program projects funded under CWA Section 104(b)(3) Wetlands Program Development Grants were completed this year. The Final Reports for each of these projects can be found at <https://www.env.nm.gov/surface-water-quality/wetlands-projects/>.



Three New Mexico Wetlands Rapid Assessment Method (NMRAM) projects were completed this year. These projects include:

- *New Mexico Rapid Assessment Method for Lowland Riverine Wetlands, Rio Grande/Lower Pecos Watersheds and Regulatory Module for USACE*, Assistance Agreement No. CD-00F736-01-0A (FY 2013)
- *New Mexico Rapid Assessment for the Canadian, and Developing Designated Uses for Montane Riverine Wetlands in New Mexico*, Assistance Agreement No. CD #00F736-01-0B (FY 2014)
- *Inventory and Rapid Assessment of Southern New Mexico Springs*, Assistance Agreement No. #00F736-01-0C (FY2014)

These Projects were designed to expand rapid assessment methods for subclasses of New Mexico wetlands. The NMRAM project for Lowland Riverine Wetlands expanded our reference set by providing data from 34 lowland riverine wetlands in the Middle Rio Grande and Lower Pecos that are impacted and threatened by groundwater extraction, channels confined by flood control or irrigation, agricultural nutrients, livestock grazing, floodplain development, and urbanization. The final products included the most recent Version 2.1 of the Lowland Riverine Field Guide and data collection worksheets. Most of the rapid assessment metrics from previous Version 1.1 that was developed in the Gila Watershed were revised and one new metric (Groundwater Index) was designed and tested as part of this project. In addition, a different approach to stressors resulted in a new stressor checklist that emphasizes processes within the watershed rather than a stressor footprint.

The NMRAM project for the Montane Riverine Wetland subclass tested and refined fourteen selected metrics for NMRAM Montane Riverine Wetlands at 40 Montane Riverine Wetlands Sample Areas (SAs) in the upper Canadian and Dry Cimarron Watersheds to ensure metric sensitivity and applicability in



*Unconfined Lowland Riverine Wetlands on the Rio Grande, Fall 2018.
(photo by K. Menetrey)*

a rapid assessment scenario. The stressor checklist was also updated. The project also provided one 3-day NMRAM Montane Riverine Wetlands training, and two Botany Booster trainings. A crosswalk relating metrics to wetland functions and a report on ten reference sites (both relevant to water quality standards develop-



ment) were also completed under this project.



*Montane Riverine Wetlands on the Mora River; Rio Mora National Wildlife Refuge, winter 2017.
(photo by E. Sawyer)*

The final NMRAM project completed this year was designed to expand rapid assessment methods for New Mexico springs. All wetland types in New Mexico, including springs, are considered “waters of the state” (20.6.4 NMAC) and subject to both water quality protection and regulations. Springs have long been identified on topographic maps but are not well characterized as far as basic attributes or condition. The rapid assessment metrics that were developed evolved from a handful of existing spring rapid assessment protocols but were tailored to the specific needs of field staff who will need to conduct assessments of springs rapidly (under one day in the field). The final products are the Field Guide and Manual for the NMRAM for Springs Ecosystems in Southwestern New Mexico, based on data collected from 68 springs in Ecoregion 23 (Arizona/New Mexico Mountains).



The new Field Guides for each of these NMRAM projects can be found at <https://www.env.nm.gov/surface-water-quality/wetlands-rapid-assessment-methods/>.

Faywood Cienega-- a type of Helocrene (pool forming) spring that is highly isolated from other nearby springs. (photo by J. Moeny)



One New Mexico Mapping and Classification of Wetlands project was completed this year.

- *Fire and Water: The Interplay Between Wetlands and Fire Management: Mapping and Classification for Wetlands Protection Sacramento Mountains Region, New Mexico, Assistance Agreement No. CD #00F906-01-0 (FY 2014).*

This project mapped and identified wetland resources in the Sacramento Mountains area (approximately 135 quadrangles in the Arizona/New Mexico Mountains ecoregion) and developed a landscape level functional assessment model. The wetlands were mapped and classified using the Cowardin Classification for inclusion in the National Wetlands Inventory. The wetlands were also further classified using the Landscape Position, Landform, Water Flow Path, and Waterbody Type (LLWW) classification system (also known as NWI+), and Hydrogeomorphic (HGM) wetland subclasses were identified and mapped for the area. The NWI and LLWW classifications allowed the modeling of a landscape level functional assessment for these data. The System for Mapping Riparian Areas in the Western United States Classification (aka Western Riparian Classification) was also used for mapping distinctly riparian areas not included in wetland mapping. From the mapping, a method was developed for identifying wetlands water quality classified segments for future wetlands standards development.



*Bluff Springs spring brook, Lincoln National Forest, September 2014.
(photo by M. McGee)*



NPS Management Program Problems and Concerns

In early May 2019, a NMED Contractor disclosed to NMED that one staff member, recently terminated from employment, and one of their subcontractors who worked closely with that employee, had been implicated in serious allegations of fraud associated with State of New Mexico contracts. The Contractor hired a forensic accounting firm to examine financial records related to their projects with NMED and other agencies and submitted the firm's report to federal authorities on or around May 14.

At the time, NMED had four projects under four agreements directly with this organization and four additional agreements in which this organization was identified as a subcontractor on the project. On May 8, NMED issued stop work orders on their four projects and ordered the four other cooperators to stop work on the tasks that had been subcontracted to this organization. The directly affected projects were Project 16-J (a planning project in Table 2 above), Projects 17-Q and 19-E (319-funded watershed implementation projects in Table 3 above), and Project 18-I (a River Stewardship Program project in Table 4 above). The other affected projects were Project 17-S (a 319-funded watershed implementation project) and Projects 17-E, 18-F, and 18-G (RSP projects).

Ultimately, the first group of four projects were terminated in September 2019, with no work occurring on these projects after May 8. Among the second group of projects, the primary contractor for Project 17-S (Upper Rio San Antonio Watershed On-the-Ground Restoration to Improve Water Quality) notified NMED that they have discontinued work on the project because they were heavily reliant on work to be conducted by the subcontractor in question. Project 18-G (Upper Rio San Antonio Watershed Restoration to Improve Water Quality RSP) is slated to be complete in June 2020 with some modifications (a shift from riparian work to upland work) not requiring a contract amendment. Project 18-F (Valle de Oro National Urban Wildlife Refuge Riparian, Wetland, and Water Quality Improvement RSP) was completed in June 2019 with some incomplete work and unutilized funds resulting from the stop work order. Project 17-E (Enhancing Aquatic Habitat Conditions in the Galisteo Creek in Galisteo, New Mexico RSP) will be completed essentially as planned in June 2020.

The funds remaining in the incomplete, terminated projects total about \$770,000, from three funding sources. EPA approved extension of one of the funding sources (319 grant under assistance agreement 996101-17) for one year (until June 30, 2021) to accommodate development and implementation of replacement projects. NMED requested extension of another funding source (RSP funds under state funding code 16A2644) until June 30, 2021, pending approval by the New Mexico Legislature. The remaining funding source (319 grant under assistance agreement 996101-18) will terminate on June 30, 2022.

WPS staff are working with cooperators (primarily the Santa Fe and Carson National Forests) developing projects to utilize these remaining funds but as of January 2020 have not progressed to the procurement portion of project development. Procurement will likely be based on the price agreement for ecological restoration projects developed by the New Mexico Department of Game and Fish, which is available for use by all state agencies.



Procurement remains an organizational challenge for NMED and the other agencies with which NMED must work on procurement. For example, the early stages of procurement for the Elk Run Erosion Prevention Project (Project 17-V in Table 3), including drafting a scope of work and request for quotes, determining that the services are general rather than professional, offering the scope of work to a central nonprofit authority under the State Use Act, and obtaining quotes from vendors, began in May, 2019. NMED began internal review of a draft contract on August 13, 2019, and the contract was not approved until November 26, 2019. The complexity and time required for this process is daunting relative to the time available for utilizing remaining funds described in the above paragraphs.

Eight items listed in the section **NPS Management Program Objectives for 2019** from the 2018 NPS Annual Report were carried over to the section below, **NPS Management Program Objectives for 2020**. Our intent was to complete these items in 2019, but they weren't completed for a variety of reasons. The WPS program manager and team supervisors will follow up more diligently over the course of 2020 to ensure that more of these items are completed in 2020.

NPS Management Program Objectives for 2020

The WPS has identified the following activities from the 2019 NPS Management Plan to meet program objectives in 2020.

- NMED senior management identified project management training among needs for the department, and such training may be provided in 2020 to staff responsible for contracts and agreements. Project management training may assist staff with streamlining procurement, developing clear scopes of work, keeping projects on track, and providing project oversight. This training may also include fraud prevention and awareness aspects at the different stages of project development and implementation.
- A Request for Applications (RFA) for projects to revise existing WBPs or develop new WBPs released in 2019 will be completed in 2020, and two new planning projects will begin.
- WPS will continue to provide oversight and technical assistance for eight ongoing watershed-based planning projects listed in Table 2 above.
- WPS staff will adapt the Escudilla Landscape Watershed Restoration Action Plan (WRAP), a Forest Service document, into a WBP in 2020. EPA reviewed this plan in 2018 and recommended specific changes to meet the nine WBP elements. The WRAP and EPA's comments are available at www.env.nm.gov/surface-water-quality/draft-wbp.
- WPS plans to submit four draft WBPs developed through Projects 16-F, 16-G, 16-I, and 19-G listed in Table 2 (above) to EPA for review in 2020.
- WPS will continue to provide oversight and technical assistance for ongoing implementation proj-



ects. Two Section 319 implementation projects are scheduled to be complete in 2020 (Table 3, above). These are “Temperature Reduction and Riparian Habitat Restoration in Upper Cow Creek (Part 2)” (Project 16-C) and the “On-The-Ground Improvement Projects for the Mora River – Upper Canadian Plateau Phase 1A” (Project 17-R).

As noted above, the contractor for the project “Upper Rio San Antonio Watershed On-The-Ground Restoration to Improve Water Quality” (Project 17-S) notified NMED that they will not complete the project. NMED plans to formally terminate that contract in 2020.

- State-funded watershed and riparian restoration projects will be developed and managed in 2020. Seven RSP projects will be complete by June 30, 2020 (see Table 4, above). A new group of RSP projects is expected to begin in 2020, under a Request for Proposals nearing completion.
- Recovery Potential Screening (RPS) will be explored for use in prioritizing watersheds for new watershed-based planning and watershed implementation projects.
- An inventory of watersheds covered by Wetlands Action Plans (WAPs) and an associated GIS coverage (posted on the SWQB mapper web site at <https://gis.web.env.nm.gov/oem/?map=swqb>) will be completed, to update the list of priority watersheds for implementation.
- A project to address post-fire impacts to the Cimarron River from the 2018 Ute Park Fire will be further developed in 2020.
- At least one NPS Success Story nomination will be submitted before July 1, 2020.
- WPS will develop additional projects that implement WBPs, funded with Section 319 watershed project funds, under a new SFA to be released in 2020. Pending adequate funding and approvals, these projects will begin in July 2020.
- NMED will document procedures for SWQB to enforce regulations at 20.6.2 NMAC pertaining to refuse in a watercourse in 2020.
- NMED will continue to carry out its responsibilities under Section 401 of the Clean Water Act, regarding dredge and fill permits.
- The *2020-2022 State of New Mexico CWA §303(d)/§305(b) Integrated Report and List* will be completed under the Section 106 program, and the NPS Annual Report for 2020 will provide the percentage of assessed stream miles or watersheds designated as impaired, for comparison with previous years.
- 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.



- SWQB will organize a data sharing network to solicit external data for assessment 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.
- NMED will work with USFS further 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 2020.
- WPS staff will reach out to the Farm Service Agency (FSA) to request information about FSA's riparian buffer sub-program within CRP and report on any efforts to coordinate on future projects.
- WPS staff will continue to increase attendance at SWCD meetings, with a focus on the priority SWCDs listed in the NPS Management Plan, 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 2020.

Monitoring, Assessment, and Standards Program

Water Quality Surveys

The SWQB utilizes an eight-year rotational watershed approach to ambient water quality monitoring that divides the state into four major groups of watersheds with each group sampled over a two-year period. The multi-year approach allows for additional sampling events and long-term instrument data collection and provides an opportunity for a mid-survey assessment to tailor data collection in the second year of monitoring. In addition, the survey can more effectively capture seasonal and annual variability in water quality and mitigate the influence of extreme hydrologic events, such as drought or flood, occurring in one year of the survey.

The sampling design includes both targeted monitoring to address data needs for specific waterbodies and probabilistic monitoring to determine overall watershed condition. The Monitoring Team completed the first year of the 2019-2020 survey for the Upper Pecos River, Gila River, San Francisco River, Mimbres River, and Lower Rio Grande watersheds. The survey includes sampling at 138 monitoring locations within 131 stream assessment units and 29 lake assessment units covering 1,874 stream miles and 11,908 lake acres. Also, thirty monitoring sites in the Upper Pecos River Watershed were randomly selected from a sampling frame consisting of wadeable, perennial streams in the survey area. A field sampling plan describing the survey design is available from the SWQB website at www.env.nm.gov/surface-water-quality/water-quality-monitoring.

Following completion of the 2019-2020 survey, a report summarizing the data collected will be available from the SWQB website (Summer 2022).



Clean Water Act §303(d)/ §305(b) Integrated Report Update

As required by the CWA, every two years the state evaluates the data it has collected, as well as readily available water quality data, to determine if state water quality standards are met and associated designated uses are achieved. Those waters which exceed water quality standards are “impaired” for the associated use and are identified in the *State of New Mexico CWA §303(d)/ §305(b) Integrated Report*.

The SWQB released the 2019 Comprehensive Assessment and Listing Methodology (CALM) for a 30-day public comment period on June 26. Public comments were received and incorporated as appropriate and the final CALM was posted online on September 10. The state also solicited chemical, physical, biological, and bacteriological data for all surface waters of the state during this time period. Data submitted was reviewed by the SWQB QA/QC Officer and will be utilized during the assessment process as appropriate. The state is currently preparing the 2020-2022 Integrated Report that will focus on data collected during the 2017-2018 SWQB water quality surveys of the Upper Rio Grande and San Juan River watersheds. The CALM and Integrated Report documents are available online at: <https://www.env.nm.gov/surface-water-quality/303d-305b/>.

TMDL Update

Under §303(d)(1) of the Clean Water Act, states are required to identify waters of the state that are not meeting their designated uses as established in 20.6.4 NMAC. A Total Maximum Daily Load (TMDL) is required for each pollutant identified in an impaired water body. The TMDL is designed to establish the assimilative capacity of a water body to a pollutant and still support its designated uses. The TMDL document also serves as an implementation plan to reduce the pollutant loading and restore the water body to its designated uses.

In 2019, the SWQB developed aluminum, *E.coli*, plant nutrient, and temperature TMDLs for the Canadian River watershed based on the 2015-2016 water quality survey of the Dry Cimarron River as well as the upper and lower Canadian River watersheds. This area included watersheds of major tributaries such as the Mora and Cimarron Rivers. The 30-day public comment period for the Canadian River Watershed TMDLs began on June 5 and a public meeting was hosted in Raton on June 13. WQCC approval was received on August 13 and EPA approval was received on September 18. The SWQB continues to work on TMDL-alternatives for waterbodies in the Cimarron River watershed, beginning with American Creek in addition to Canadian lake TMDLs and TMDLs in the Jemez and Chama River watersheds.

EPA entered into a Consent Decree and Settlement Agreement (SA) in 1996 and 1997, respectively, regarding TMDLs in New Mexico. NMED completed the Consent Decree requirements in 2007 and it was officially dismissed in April 2009. With the recent EPA approval of the 2019 Canadian River Watershed TMDLs, NMED has now also completed the SA requirements. The SWQB received the SA closure letter from EPA on October 25. All TMDL documents and Consent Decree/SA information is available online at: <https://www.env.nm.gov/surface-water-quality/tmdl/>.





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 2019. 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 22.

Rio Grande River Watershed

In FY 2019 NRCS continued its efforts in the Achenback and Alameda Watershed of the Rio Grande River in Southern New Mexico.

Achenback Canyon Watershed

Micro Jet Sprinklers were installed on 112.7 acres in the Achenback Canyon Rio Grande Watershed. These sprinklers assisted with decreased nutrient, bacteria and pesticide runoff. Along with the water quality benefits and increased irrigation efficiencies, additional practices (i.e. cover crop) previously installed and 16.2 planned acres not yet installed will assist with improving soil health, reducing soil loss (seasonal erosion) and improving soil carbon (add organic matter, improve water infiltration, soil aeration and tith).



Row of micro jet sprinklers in a pecan field implemented through NWQI.



Cover Crop previously implemented through NWQI in the Achenback Watershed.

Alameda Arroyo Watershed

In the Alameda Watershed NRCS assisted with 72 acres of cover crop, 4,272 feet of concrete ditch lining, 40 structures for water control and 1,140 ft. of pipeline. The practices contributed to the improved conveyance and management of the amount of irrigation water to meet consumptive use crop need and to reduce nutrient leaching below the root zones. Decreased bacteria, sediment and pesticide runoff were also water quality benefits gained from the practices. Along with the water quality benefits and increased irrigation efficiencies, these practices aided cover crop plantings within NWQI contract or previously installed, improving soil health, reducing soil loss (seasonal erosion) and improving soil carbon (add organic matter, improve water infiltration, soil aeration and tilth). With this new system, well water with excessive salts will be mixed with surface Elephant Butte Irrigation District water reducing excessive salts back in ground water.

Cover crops planted in Alameda Arroyo Rio Grande Watershed as part of NWQI.





Picture shows concrete ditch with a structure for water control also implemented through NWQI.



Gallinas Watershed

In FY 2019 a total of 130 acres of Forest Stand Improvement and 130 acres of Woody Residue Treatment were completed within the Gallinas Watershed. The primary focus of the work was to reduce wildfire hazard risk within the Gallinas Watershed specifically around the primary water source for the City of Las Vegas around Bradner Dam. The focus is to create a fuel break and thin/woody residue treatment of surrounding forest around Bradner Dam to protect the city of Las Vegas primary water source. The area has received prior treatments to include: Forest Stand Improvement, Woody Residue Treatment, Fuel Break and Grade Stabilization Structures “rock and brush dams.”



Photos above and to right are of post Forest Stand Improvement areas within the Gallinas Watershed.





Rock and brush dam built in previous year.



Animas River Watersheds

In FY 2018 two watersheds within the Animas River watershed were added to NWQI. Several projects were planned in the Tucker Canyon and Estes Arroyo watersheds with planned implementation beginning in FY 2019.

Tucker Watershed

1.7 acres of cover crop and forage/biomass planting has been implemented in the Tucker watershed to date. These practices have helped in the management and control of irrigation water applied to pastures. The conservation practices have helped in reducing the sediment runoff and return keeping nutrients on the fields and out of the surface water of the Animas River. The installation of side roll sprinklers is in progress which will add



to the increased control of water application. There are plans to implement 6 more acres of cover crop, forage/biomass planting, and side roll sprinklers in the spring and summer of 2020.

Picture shows cover crops planted through NWQI.



Forage and biomass planted in the Tucker Watershed through NWQI.

Estes Watershed

Irrigation pipeline was installed to replace field-notched ditch for reduced water erosion and sediment runoff. This pipeline has led to better control of the irrigation water applied, which is reducing sediment and nutrient runoff from uncontrolled water application and keeping these elements out of surface water. Future practices include land smoothing, which will increase the water and sediment control, and forage/biomass plantings which will lesson irrigation induced erosion and provide a buffer to catch sediment before it enters the Animas River.

In the Estes Watershed irrigation field ditch is converted to irrigation pipeline.



Emergency Watershed Protection Program (EWPP)

The EWP Program helps landowners, operators, and individuals implement emergency recovery measures to relieve imminent hazards to life or property created by a natural disaster that causes a sudden impairment of a watershed. Assistance must be through eligible project sponsors.

In FY 2019 New Mexico continued the efforts of the natural disaster where EWP was requested by an eligible sponsor.



Ute Park Fire Success Stories

The Ute Park Fire started in June of 2018. The fire remained on private and state land. NRCS identified several locations for sediment basins as well as areas for contour tree felling or mastication along with critical area planting. In other areas debris removal, wattles and a diversion were constructed to protect property (structures) from hazards created by the fire.

Planned practices for the EWP Ute Park Fire project were completed in FY 2019. The chart to right shows the practices, completed amounts and units for each project installed. The primary focus of the work was to protect life and property including reducing sediment movement and restore the burned watershed.

Practice	Completed	Unit
Mastication	575	ac.
Contour Tree Felling	35	ac.
Re-Seeding	742	ac.
Wattles	3,650	ln. ft.
Debris Removal (Burned Structures)	7	ea.
Debris Removal (Only Burned Trees Around Structures)	3	ac.
Grade Stabilization Structure (Trash Rack)	3	ea.
Sediment Basins	17,022	cu. Yds.
Sediment Diversions	2,896.2	cu. Yds.
Silt Fences	71	Ea.



Photo shows the exposed soil after the burn



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Photo shows area that was masticated and reseeded. Grass mix consisted of native grasses.

Burned trees upstream endanger structures downstream.



Burned trees/debris upstream was removed.



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Photo above shows a structure in danger of being overcome with debris and sediment. Photo below shows diversion constructed to protect the structure from debris and sediment. The debris upstream was removed offsite and the diversion was reseeded. Picture shows the amount of sediment that has been diverted from the structure.





New Mexico Department of Game and Fish

Canadian River Riparian Habitat Restoration

The New Mexico Department of Game and Fish (Department) collaborated with the U.S. Forest Service to restore approximately 54 acres (6.75 river miles) along the Canadian River within the Kiowa National Grasslands. Efforts focused on planting native riparian vegetation (willow, cottonwood, and native shrubs) in an area of intense salt cedar eradication. These plantings 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.



Comanche Creek Watershed Improvements

The Department collaborated with U.S. Forest Service and several non-profit organizations to improve wetland habitat as part of a large-scale watershed restoration effort. The Department installed wetland structures (e.g., log jams, rock erosion control structures, sod and floodplain benches, excavated flood channels) within the Comanche Creek Watershed to stabilize banks, slope wetlands, and encourage floodplain connectivity. These structures improve wetland habitat condition, increase soil water storage, and decrease erosion.

Rio Chamita Riparian Habitat Enhancements and Stream Improvements

The Department installed fencing along 15 acres of riparian habitat along the Rio Chamita (a tributary of the Rio Chama) on Edward Sergeant Wildlife Management Area (WMA) to decrease browsing pressure and increase herbaceous ground cover and regrowth of riparian vegetation. The Department also created fire breaks to prevent catastrophic wildfire, and improved roads by repairing headcuts and installing check dams to redirect runoff away from streams and arroyos. These improvements will reduce erosion and prevent sediment from entering the Rio Chamita.

Rio Chama Erosion Control Improvements

The Department created fire breaks to prevent catastrophic wildfire, and improved roads by raising road elevation, repairing headcuts, and installing soil check dams to redirect runoff away from streams and arroyos on the Rio Chama WMA. These improvements will reduce erosion and prevent sediment from entering the Rio Chama.



Bear Creek Riparian Habitat Enhancements

The Department completed maintenance on 3 miles of fencing along Bear Creek on Double E WMA near Silver City. This fencing excludes livestock to decrease browsing pressure, promote health of riparian vegetation and growth of herbaceous groundcover, and protect habitat for loach minnow and Chiricahua leopard frog.

Cimarron River Improvements on Colin Neblett Wildlife Area

The Department installed log check structures designed to control erosion within the Ute Park Fire burn scar. These structures reduce the amount of post-fire ash and sediment entering the Cimarron River.

Pecos River Infrastructure Improvements and Wetland Restoration on WS Huey WMA

The Department replaced a derelict low water crossing with a raised crossing to reduce pollution from vehicles contacting flowing water and improve aquatic habitat for Pecos bluntnose shiner. The Department also performed maintenance on groundwater pipes and improved water delivery infrastructure to enhance 90 acres of shallow wetlands and backwater herbaceous vegetation. The Department removed 60 acres of salt cedar and replanted 55 acres with native woody vegetation, and reseeded 5 acres of oxbow wetlands. The Department created an additional 50-acre seasonal moist soil wetland pond fed by groundwater.

Mimbres River Riparian Habitat Enhancements

The Department replaced 1 mile of fencing along the Mimbres River at River Ranch WMA. This fencing will exclude livestock to protect and promote growth of riparian vegetation.

Rio Grande Watershed Riparian Habitat Restoration

The Department improved riparian habitat on Bernardo WMA by removing 500 acres of salt cedar, restoring floodplain grasslands with native sacaton and salt grass, and replanting 30 acres with native cottonwood trees, Gooding's willow and coyote willow. Salt cedar removal also allowed access to water for restoring 5 acres of wetland habitat, and current plans include an additional 200 acres of wetland restoration over the next 5 years. The Department also removed 250 acres of salt cedar and Russian olive on La Joya WMA, and is currently in the planning stages of restoring an additional 600 acres of wetlands.

Wet Meadow Improvements at Bluebird Mesa WMA

The Department performed maintenance on recently installed erosion control structures. Rock and soil check dams direct water to the arroyo to saturate soils, which will enhance wet meadow habitat, increase groundwater quality, and reduce erosion.

Share with Wildlife Projects

Evaluation of the risk of novel pathogen transmission via riparian restoration on the Mimbres River

This project will assess the risk of introducing novel pathogen strains of chytrid fungus and ranavirus into the Mimbres and Gila rivers through nursery-grown plants used in riparian habitat restoration. Use of nursery-



grown plants is not currently allowed by U.S. Fish and Wildlife Service in these focal drainages, but no data currently exists on the level of risk of pathogen spread associated with the use of such plants. Researchers are collecting environmental DNA (eDNA) samples in both drainages and at plant nurseries to analyze presence and identify focal pathogen strains.



Collecting water sample for eDNA analysis at nursery.

Distribution of the amphibian chytrid fungus *Batrachochytrium dendrobatidis* in New Mexico

Researchers leading this project gathered occurrence and distribution data for chytrid fungus across New Mexico. They provided geospatial data and maps highlighting both potential areas of concern and data gaps regarding the distribution of this potentially deadly amphibian disease.

Establishing viable imperiled springsnail refuge populations

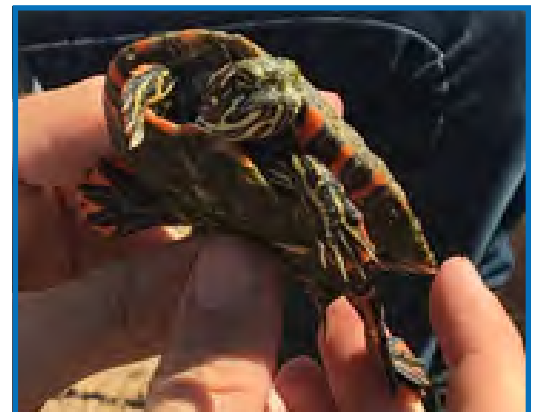
This project assists imperiled springsnail species in New Mexico by developing husbandry techniques for establishing viable refuge populations at the Albuquerque BioPark Aquatic Conservation Facility. The project includes collection of physio-chemical parameters of natural spring habitat to inform desirable conditions for captive habitat for two springsnail species found in springs adjacent to the Gila River.



Springsnail habitat near the Gila River.

Surveys for western river cooter (*Pseudemys gorzugi*) in the Pecos River drainage and its tributaries

This project entailed surveys for the western river cooter, a species of turtle currently under review by the U.S. Fish and Wildlife Service to determine for federal listing as threatened or endangered. The turtle's habitat is believed to be declining due to pollution and human alterations of river flow (e.g., dam and canal development). These surveys provided valuable information on a newly recorded population of this species in Chaves County, female reproductive status, and built upon a multi-year dataset of turtle demographics. This project also documented changes in water level and turbidity among survey years.



Western river cooter hatchling.



Bosque Ecosystem Monitoring Program (BEMP) fauna, floodplains, and fieldwork

This project incorporates of state Species of Greatest Conservation Need into the BEMP curriculum, a citizen science program teaching students about ecosystem function, and emphasizing environmental education and stewardship of the Rio Grande bosque. The monitoring program includes tracking key indicators of environmental change in the Middle Rio Grande riparian ecosystem and classroom-based activities help students visualize changes in the function of the Rio Grande over the past 2,000 years.

Creating the next generation of riparian habitat stewards

This project increases awareness of the need for healthy riparian habitat and good land management along rivers for the benefit of wildlife. Youth develop stewardship knowledge and ethics and regarding riparian areas through repeat field experiences involving hands-on data collection, research on Species of Greatest Conservation Need, and presentation of findings.

Connecting students to wildlife and habitats in New Mexico



This education project exposes elementary and high school students to environmental science and river ecology concepts. They learn how to monitor water quality and formulate scientific hypotheses based on data. The project features benthic macroinvertebrates and their relationship to water quality. Students collect data using water quality probes following Standard Operating Procedures from the New Mexico Environment Department's Surface Water Quality Bureau.

Additional information regarding the Department's activities is available within the agency's annual reports, available at <http://www.wildlife.state.nm.us/home/publications/>. Additional information on Share with Wildlife Projects is available at <http://www.wildlife.state.nm.us/conservation/share-with-wildlife/>.

Testing the river water phosphorous content.





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 State Forestry 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. A total of 17,448 acres were accomplished by the Division and projects have occurred throughout the state in 2018, as shown in Figure 1. The Forestry Division accomplished 4,844 acres of watershed restoration/thinning projects as shown in Table 1, 10,312 acres of prescribed burning as shown in Table 2, and 2,292 Acres of timber sales as shown in Table 3.

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 wild-



land 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 Health Office

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.



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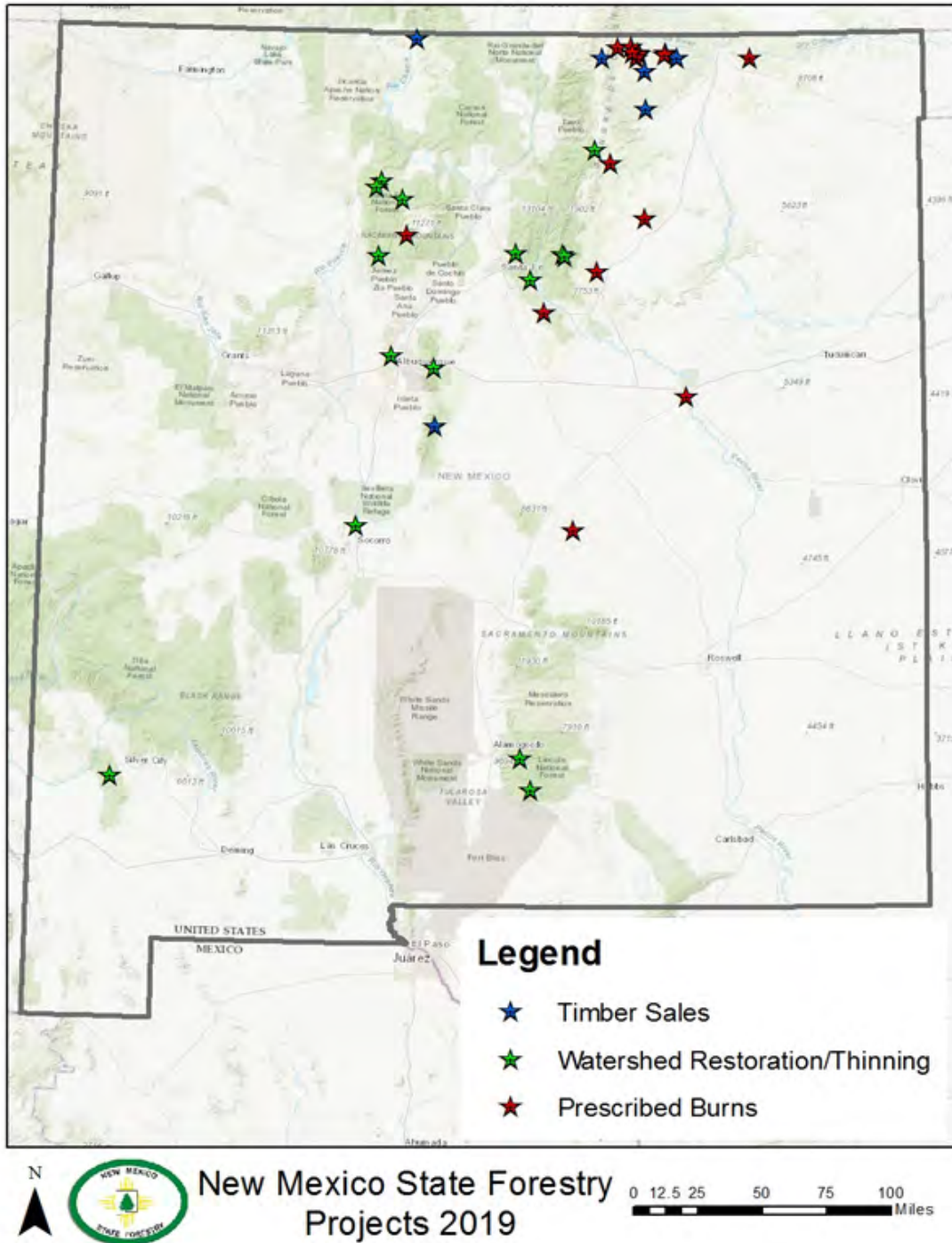


Figure 1. Map of Projects Conducted by New Mexico State Forestry in 2019.



Table 1: New Mexico State Forestry Watershed Restoration Projects Accomplished in 2019

2019 New Mexico State Forestry Watershed Restoration Projects					
Project	Location	Status	Completed Acres	Watershed	Description
Bosque School Corrales	Corrales	Completed	26	Rio Grande-Albuquerque (City of Paradise Hills-Rio Grande)	Salt Cedar and Russian Olive removal
Burro 3 Collins Park Cox Canyon Bench Restoration	USFS Silver City RD	Completed	1,401	Upper Gila-Mangas (Ash spring Canyon-Mangas Creek)	Ponderosa, pinon and juniper thinning, piling and mastication
Cedro Watershed Restoration Project	USFS Sandia RD	Completed	215	Rio Grande-Albuquerque (Tijera Arroyo)	Ponderosa, pinon and juniper thinning, piling and mastication
Central Rio Grande Bosque	Socorro	Completed	694	Rio Grande-Albuquerque (Puertecito del Lemitar-Rio Grande)	Salt Cedar and Russian Olive removal
Cordova Watershed Restoration Project	USFS Coyote RD	Completed	39	Rio Chama (Rio Puerco)	Ponderosa, pinon and juniper thinning, piling and mastication
Gallinas 3-A Watershed Restoration Project	USFS - Pecos RD	Completed	173	Pecos Headwaters (Porvenir-Canyon-Gallinas Creek)	Ponderosa pine, white fir, Douglas fir thinning, piling and mastication
Invasive Species Control at Leonora Curtin Wetland Preserve	Leonora Curtin Wetland Preserve	Completed	12	Rio Grande-Santa Fe (Cienega River)	Salt Cedar and Russian Olive removal
Joaquin Watershed Restoration Project	USFS Cuba RD	Completed	709	Jemez (Rio Guadalupe)	Ponderosa pine, white fir, Douglas fir thinning, piling and mastication
La Cueva Fuelbreak Block E	La Cueva	Completed	59	Pecos Headwaters (Cow Creek-Pecos River)	Ponderosa, pinon and juniper thinning, piling and mastication



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2019 New Mexico State Forestry Watershed Restoration Projects					
Project	Location	Status	Completed Acres	Watershed	Description
Mescalero Apache Tribe Watershed Restoration Project III	Mescalero Apache Tribe	Completed	288	Rio Penasco (Upper Rio Penasco)	Ponderosa pine thinning, mastication
Ojitos Watershed Restoration Project	USFS Cuba RD	Completed	741	Jemez (Outlet Rio de Las Vacas)	Ponderosa pine, white fir, Douglas fir thinning, piling and mastication
Circle Cross	USFS Sacramento RD	Ongoing	120	Salt Basin (Arkansas Canyon-Sacramento River)	Ponderosa pine, white fir, Douglas fir thinning, piling and mastication
Gallinas Phase 4	USFS - Pecos RD	Ongoing	50	Pecos Headwaters (Porvenir-Canyon-Gallinas Creek)	Ponderosa pine, white fir, Douglas fir thinning, piling and mastication
Hyde Park Thinning	Hyde Memorial State Park	Ongoing	72	Upper Rio Grande (Headwaters Rio Tesuque)	Ponderosa pine, limber pine, white fir, Douglas fir, Engelmann spruce thinning and piling
Mesa del Camino Watershed Restoration Project	USFS Coyote RD	Ongoing	122	Rio Chama (Rio Puerco)	Ponderosa pine thinning, mastication
Upper Coyote Creek	New Mexico State land - South of Angel Fire	Ongoing	123	Mora (Upper Coyote Creek)	Ponderosa pine, white fir, Douglas fir thinning, piling and mastication
		TOTAL	4,844		



Table 2: New Mexico State Forestry Prescribed Burning Accomplished in 2019

2019 New Mexico State Forestry Prescribed Burning					
Project	Location	Status	Completed Acres	Watershed	Description
Banco Bonito	Valles Caldera	Complete	320	Jemez (East Fork Jemez River)	Prescribed Burn
Bartlett	Vermejo Park Ranch	Complete	100	Canadian Headwaters (Headwaters Caliente Canyon)	Pile Burn
Bernal	Vermejo Park Ranch	Complete	100	Canadian Headwaters (Leandro Creek)	Pile Burn
Caliente	Vermejo Park Ranch	Complete	200	Canadian Headwaters (Headwaters Caliente Canyon)	Prescribed Burn
Canada Del Oso Ranch	Mora County	Complete	300	Upper Canadian (LeFebres Creek)	Pile Burn
Deadhorse	Vermejo Park Ranch	Complete	25	Canadian Headwaters (York Canyon-Vermejo River)	Pile Burn
East Rowe Mesa	Rowe Mesa	Complete	198	Pecos Headwaters (Barbero Canyon)	Prescribed Burn
Fort Union Ranch	Mora County	Complete	25	Mora (Arroyo Needam)	Pile Burn
Ranch HQ	Vermejo Park Ranch	Complete	100	Canadian Headwaters (York Canyon-Vermejo River)	Pile Burn



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2019 New Mexico State Forestry Prescribed Burning					
Project	Location	Status	Completed Acres	Watershed	Description
Morada de Santana	San Miguel County	Complete	30	Pecos Headwaters (Arroyo Pecos-Gallinas River)	Pile Burn
Ranney Ranch	Lincoln County	Complete	67	Gallo Arroyo (Bonita Canyon-Gallo Canyon)	Prescribed Burn
Santa Rosa Cienega	Santa Rosa	Complete	230	Pecos Headwaters (Puerto Creek-Pecos River)	Prescribed Burn
Stubbfield	Vermejo Park Ranch	Complete	600	Canadian Headwaters (York Canyon-Vermejo River)	Prescribed Burn
Sulfur Springs	Vermejo Park Ranch	Complete	4000	Canadian Headwaters (York Canyon-Vermejo River)	Prescribed Burn
TO Ranch East	Colfax County	Complete	4000	Canadian Headwaters (Headwaters Una de Gato Creek)	Prescribed Burn
VPR-1	Vermejo Park Ranch	Complete	17	Canadian Headwaters (York Canyon-Vermejo River)	Pile Burn
		TOTAL	10,312		



Table 3. New Mexico State Forestry Timber Sale Accomplishments in 2019

2019 New Mexico State Forestry Timber Sales					
Project	Location	Status	Completed Acres	Watershed	Description
Van Bremmer	Vermejo Park Ranch	Completed	922	Canadian Headwaters (Headwaters Van Bremmer Creek)	Timber Sale
Crow 1	Vermejo Park Ranch	Completed	905	Canadian Headwaters (Crow Canyon)	Timber Sale
Allen Creek	Vermejo Park Ranch	Completed	131	Upper Rio Grande (Comanche Creek-Costillo Creek)	Timber Sale
Chase 1	Philmont Scout Ranch	Completed	277	Cimarron (Ponil Creek)	Timber Sale
Sam Vigil	Manzano Mountains	Completed	50	Western Estancia (Torreo Draw)	Timber Sale
Rancho del Oso Pardo	Rancho del Oso Pardo	Completed	7	Rio Chama (Rio Chamita-Rio Chama)	Timber Sale
		TOTAL	2,292		



United States Forest Service

Cibola National Forest

Canadian River Native Replanting after Salt Cedar Control Activities (part of the Canadian River Riparian Restoration Project (CRRRP))

Canadian River (Mora River to Cimarron River) NM-2305.A_100

Watershed: Arroyo Pierda Lumbre - Canadian River, (HUC 1108000305)

Subwatershed: Canon Vercere-Canadian River (HUC 110800030505)

Impairments: Category 1: All designated uses are supported.

Project Summary

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. Treatment of salt cedar has been ongoing in this reach of river through the Canadian River Riparian Restoration Project (<http://www.nmacd.org/riparian-restoration>) as shown in figure 1. The Canadian River Riparian Restoration Project (CRRRP) is a collaboration of eight Soil and Water Conservation Districts in northeastern New Mexico. 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 project is a multi-phase, multi-year, multi-partnered watershed-scale effort. The Kiowa Rita Blanca Ranger District of the Cibola National Forest and National Grasslands and eight Soil and Water Conservation Districts have partnered to complete work under this project.

The work completed in 2019 included follow-up treatments after the removal of salt cedar through herbicides and mastication. These follow-up treatments included riparian plantings, upland planting, and upland seeding to restore native vegetation in the floodplain and adjacent uplands. From March through June 2019, over 50,000



Figure 1. Salt Cedar Removal (Before (above) and After (right)) in Mills Canyon, Canadian River.

coyote willows and about 800 Plains Cottonwood saplings were planted in 21 acres where salt cedar was removed (figure 2). 750 potted shrubs, which included New Mexico Olive, Netleaf Hack-



berry, Chokecherry, False Indigo Bush, Winterfat, Skunk-bush Sumac, Apache Plume, and Mountain Mahogany were also planted. From December 2018 through January 2019, shrub species were planted on 31 acres in the adjacent uplands to



address erosion and habitat concerns. Species included netleaf hackberry, winterfat, mountain mahogany, skunkbush sumac, sand sage, apache plume, woods rose, and four-wing saltbush. As these plants mature, they will provide shade and vegetative cover to improve riparian conditions along the Canadian River in Mills Canyon. In turn, this will lead to improvements in water quality, including temperature as the riparian area reestablishes.



Figure 2. Willow and cottonwood planting along the Canadian River in Mills Canyon after salt cedar removal.

Cibola National Forest

Sawyer Prescribed Fire – upper Bluewater Creek

Bluewater Creek (Bluewater Creek (Perennial part - Bluewater Reservoir to headwaters)

AU ID: NM-2107.A_01

Watershed: Bluewater Creek (HUC 1302020702)

Subwatershed: Ojo Redondo-Bluewater Creek (HUC 130202070205)

Impairments: Temperature

Project Summary

Prescribed fire was implemented in the upper Bluewater Creek watershed on 3,825 acres, to improve watershed condition, increase resiliency to wildfire, and improve ground cover. These benefits are expected to lead to improvements in water quality by reducing sediment inputs to Bluewater Creek over the long term and



improving riparian condition. Riparian condition is expected to improve where the prescribed fire creates small openings to encourage the growth of riparian plants. Most riparian plants such as willows in the Zuni Mountains require sun to establish, so these opening provide areas where new growth can occur.

Figure 3. Sawyer prescribed fire in Bluewater Creek Watershed



Gila National Forest

Gila River Fence – Water Gap Construction

- Project Budget:** Federal (USFS): \$3,500
- Watershed:** Blue Creek – Upper Gila River
- Subwatershed:** Bear Canyon – Upper Gila River
- Impairments:** The Gila River is listed as impaired for both nutrients and temperature.

Project Summary

The Gila River Fence water gap is located on the Silver City Ranger District of the Gila National Forest south and west of Silver City, NM. The existing Gila River fence on the upstream end of the Big Burros Unit boundary of the Gila National Forest has continually washed out during moderate and high stream flow events. The washout of the fence would allow livestock unimpeded access to the Gila River and its riparian corridor on the Forest. The fence was mended following washouts, but was prone to repeated damage and failure. The Silver City Ranger District developed a new water gap fence design that was implemented in 2019.

Project Outcome

The new water gap river fence was completed in summer 2019 as a cooperative project between both the Forest Service and the adjacent private landowner.



Side view of Gila River water gap functioning following November storm.

The private landowner provided the equipment for drilling post holes and to stretch the cable across the river. Other construction materials were provided by the Forest Service. The fence was anchored on the streambanks by drilling into large boulders. The new river crossing utilizes a floatable and breakaway design. During moderate flows, the crossing will float and allow water and floatable debris to pass through. In larger events, any damage to the crossing will be easily replaceable by adding new wooden slats. The new river fence received its first test in a November 2019 storm over Thanksgiving weekend and functioned as intended.



August 2019

Top photo: Looking upstream at the new Gila River water gap.

Bottom photo: Side view of recently completed Gila River water gap.





Gila National Forest

Royal John Mine Reclamation

Project Budget: Federal (USFS): \$1,225,000
Watershed: Lampbright Draw – Mimbres River
Subwatershed: Gavilan Arroyo – Mimbres River
Impairments: Cold Spring Creek is listed as impaired for both dissolved lead and dissolved cadmium.

Project Summary

Project Summary: The Royal John mine site is located east of San Lorenzo, New Mexico on the Silver City Ranger District of the Gila National Forest. Past lead and zinc mining activities left an estimated 90,000 cubic yards of tailings and waste rock material along the upper reaches of Cold Springs Creek. The approximately 2,080-acre Site contains numerous adits, open cuts, and piles of waste rock associated with the historical mining operations. A mill was also operated on the Site that created the tailing piles alongside Cold Springs Creek. The land on the Site is National Forest System land with the exception of a twenty-acre patented mining claim that is privately owned.

Two tailings areas are present at the Site. The Mill Tailings are present on along the banks of Cold Springs Creek near the remnants of



2018 - Downstream Tailings with elevated levels of lead along Cold Springs Creek before cleanup.



2018 - Waste piles at the West Cut of Royal John Mine before cleanup.

the historical mill. These tailings are mostly on National Forest System land but extend downstream onto the patented mining claim. The Downstream Tailings are located about three quarters of a mile downstream of the old mill location and are entirely on National Forest System land. These tailings extend approximately one quarter of a mile along a perennial section of Cold Springs Creek. The tailings were partially vegetated, but some areas were bare and showed signs of recent erosion directly into the stream. The downstream end of the pile appeared to have had a dam across the creek at one time, but had been breached by the creek several decades ago resulting in the release of a portion of the tailings in the past. Tailings could be observed in the stream bank on both sides of the creek at this location. This section of the creek bed flows water most of the year. Lead concentrations in the tailings represented a potential threat to human health.



Sediment samples from Cold Springs Creek indicate that migration of lead and other contaminants from the waste rock and tailings to on-site drainages are being carried downstream, thereby degrading water and sediment quality. Surface water samples from Cold Springs Creek showed the presence of lead in six of the samples ranging from 0.00243 mg/L to 0.0110 mg/L. The higher levels of lead exceed NMED surface water quality standards for aquatic life.

Environmental cleanup was proposed for the site which included constructing an on-site consolidation cell on National Forest System land; excavation and removal of waste rock and tailings; and containment of the waste rock and tailings at the consolidation cell. The overall goal of a removal action at the Site is to minimize the risk that contaminants of concern pose to human health and/or the environment. Primary objectives included;

1. Reduce the potential for human and ecological exposure (through inhalation, ingestion, and dermal contact) to chemicals of concern; (COCs) in waste materials and surface water.
2. Reduce potential migration of waste materials to the surrounding environment via surface run off, erosion, and wind dispersion.
3. Protect the beneficial uses and water quality objectives for the surface water of Cold Springs Creek and downstream receiving waters.

Project Outcome

The Forest Service hired Engineering Remediation Resources Group, Inc. (ERRG) as the contractor to perform Phase I of the environmental cleanup of the Royal John Mine and Mill, with work beginning March 25, 2019. The contractor created access road and constructed the Royal John Repository with the topsoil being stripped and placed in stockpiles for use in restoration. The underlying clay loam was also stripped and stockpiled for future use as a cap material. A new temporary road was constructed to allow access to the downstream tailings piles located along Cold Springs Creek. These tailings had previously been piped from the old Royal John Mill during the late 1920s and contained lead levels that averaged about 7,000 mg/kg. Silt fences were erected along the edge of the stream to prevent the tailings from washing into the creek during construction. The old road across private land was used to access the upper portions of the mine. The contractor removed waste rock from the site using three 50-ton articulated dump trucks to transport material which was loaded using a track mounted excavator. A water truck wetted down the roads and sprayed water on each dump truck load to prevent dust and eliminate possible migration of lead into the air while hauling the contaminated material to the repository.

The work included removal of contaminated waste rock from the Mill Adit area that was accessible from the existing road system that contained elevated levels of lead. This waste rock was partially wet due to seepage from the mine adit making it a possible source of the lead that was leaching into the ground-



2019 - Removal of contaminated waste rock at New Cut.



water. This water would then seep out on the banks of Cold Springs Creek and contaminate the surface water. The cover design of the repository where the waste material was disposed of required a minimum of three feet of silty clay soil with six inches of topsoil to encourage vegetative growth. A two-rail steel fence was built around the perimeter of the repository to keep out vehicles and cattle. Disturbed areas were seeded with native grasses.



2019 - Construction of repository at Cowboy Flat



2019 - Loading waste rock containing elevated levels of lead at West Cut.

cubic yards of waste rock containing elevated levels of lead were removed from adjacent hillsides at New Cut, West Cut, the Mill Adit and Skull Creek. The waste material was placed in the Cowboy Flat Repository where the potential for human and ecological exposure to this hazardous material is minimized. The repository will be inspected on an annual basis to make sure that the cap remains intact and revegetation is successful to ensure there is no migration of waste material. Cold Springs Creek will be periodically sampled to monitor expected improvements in water quality.

A final inspection of the project was made on August 20, 2019 and all work was completed the following week. A total of 24,476 cubic yards of mill tailings containing elevated levels of lead were removed from the stream of Cold Springs Creek. An additional 22,070

Gila National Forest Monitoring of West Fork Gila River Bank Stabilization Riparian Planting

- Project Budget:** Central Federal Lands and USFS
- Watershed:** West Fork Gila River
- Subwatershed:** Outlet West Fork Gila River
- Impairments:** The West Fork Gila River is currently impaired for temperature.

Project Summary

In 2015, The Federal Highway Administration, Central Federal Lands Highway Division (CFL), in cooperation with the New Mexico Department of Transportation, implemented emergency stream stabilization



measures along the West Fork of the Gila River adjacent to NM State Highway 15. This project was issued a Section 404 Nationwide Permit No. 13 and Section 401 Water Quality Certification. The bank stabilization project involved the installation of longitudinal riprap slope protection and the installation of five bendway weirs. The relict channel of the West Fork of the Gila River had been naturally filled with sediment and debris due to the upcanyon fires. Prior to constructing the bank stabilization measures, the relic channel was to be dredged, and a temporary diversion structure was installed to divert the flow of water back to the relict channel. Upon construction completion, the temporary diversion structure was to be removed and the temporary impacts within the overbreak channel were to be recontoured to mimic pre-construction conditions.

Following project implementation, NMED conducted a compliance inspection at the project site, and noted items that were out of compliance with the approved permit for the project. CFL received a Notice of Non-Compliance as the dredge and fill material amounts exceeded the Pre-Construction Notification proposal and the project was not constructed in accordance with the submitted PCN authorized design. CFL proposed treatments to address these deviations which were implemented in Spring 2016. These treatments included riparian plantings of narrowleaf cottonwoods, coyote willow and bluestem willow. Personnel from CFL and the Gila National Forest conducted the riparian plantings and have partnered in monitoring planting success from 2016 through 2019.

Project Outcome

In March 2016, CFL and Gila National Forest employees succeeded in planting approximately 1500 riparian woody plants. 45 bluestem pots and 25 narrowleaf whips were transplanted after being rooted by a local Silver City nursery (Lone Mountain Natives). The additional hundreds of willows were cut on site as whips. This work took place over a week period with the use of a loaned backhoe from the nearby Cliff Dwellings National Monument. The Project required five years of monitoring which has occurred since 2016. In 2017, approximately 200 additional willow whips were planted to replace some that had washed out during a spring high flow event. Overall, the riparian plantings have been extremely successful. In 2019, the many photopoints were hard to locate due to the amount of vegetation that sprouted, in addition to the plantings. The Forest Service has recommended to CFL than an additional year of monitoring is not necessary due to the current success of the plantings.



Top photo - 2018 Overview of Site.

Bottom photo - 2019 Overview of Site





Lincoln National Forest

During fiscal year 2019, the Lincoln National Forest implemented a number of projects that contributed to nonpoint source management. These projects included prescribed burning, thinning, road work, and riparian improvements. Additionally, the Forest has completed planning for several in-stream restoration projects and several landscape scale restoration projects.

Road and Trail Work

19 culverts were installed along the Westside Road on the Sacramento Ranger District. These culverts help mitigate the impacts of excess sediment from the road being delivered downslope and into stream channels. Four of these are in the Alamo Canyon Watershed, a municipal supply watershed for the city of Alamogordo. Total cost for these culverts was \$47,500.

Additionally, work has been ongoing for three large culverts along Bonito Creek in the Rio Bonito Watershed, also a municipal supply watershed for the City of Alamogordo. Two of these culverts are located along Bonito Creek, which is three miles upstream of Bonito Lake. Bonito Lake is owned by the City of Alamogordo and was severely impacted by flooding and increased sediment loads after the Little Bear Fire of 2012. It has not been used for municipal supply water since the fire. It is currently being dredged and cleaned for future use. Another nearby culvert is being installed along Big Bear Creek, a tributary to the Rio Bonito, which flows into the Rio Bonito only one mile upstream of the previously mentioned culverts. All three of these culverts will serve as aquatic organism passages for trout in the Rio Bonito.



Re-route of new road and culvert to be installed along Bonito Creek.

As part of the Burned Area Emergency Response (BAER) effort for the Pine Lodge Fire, 17 sites were treated on three different roads. These treatments included constructing rolling dips, armoring and grading dips, and armoring water crossings. Total costs for these treatments were \$35,500. Additionally, several roads were gated and closed, signs were installed, and inspections for flood events were undertaken.

South Fork Riparian Restoration Project

The South Fork Riparian Restoration project on the Smokey Bear Ranger District entailed four different components: 1) re-routing 1/3 mile of trail away from the stream; 2) removing hazard trees from around the area of the new trail; 3) treating non-native invasive plants along 3/4 mile of Bonito Creek, and 4) planting riparian vegetation along 3/4 mile of Bonito Creek. These activities contributed to improving water quality by decreasing sediment input into South Fork Bonito Creek, which joins Bonito Creek mainstem which flows into Bonito Lake. As



mentioned previously, this is in a municipal supply watershed, supplying water for the city of Alamogordo.

Curtis Canyon

In 2002, the Peñasco Fire burned approximately 16,000 acres on the Sacramento Ranger District, including many acres in Curtis Canyon. As part of the BAER effort, structures were built to mitigate post-fire flooding impacts. Vast amounts of erosion control fabric were laid down. This erosion control fabric was not the kind that broke down over time. It was determined that this fabric had outlived its purpose and was impeding vegetation regrowth and infiltration of water into the soil. During the fall of 2018, much of this fabric was removed and grass seed was planted where the fabric had been. Additionally, 103 acres of ponderosa pine, Douglas-fir, and Southwestern white pine were planted in Curtis Canyon.

Large amounts of erosion control fabric in Curtis Canyon was removed .

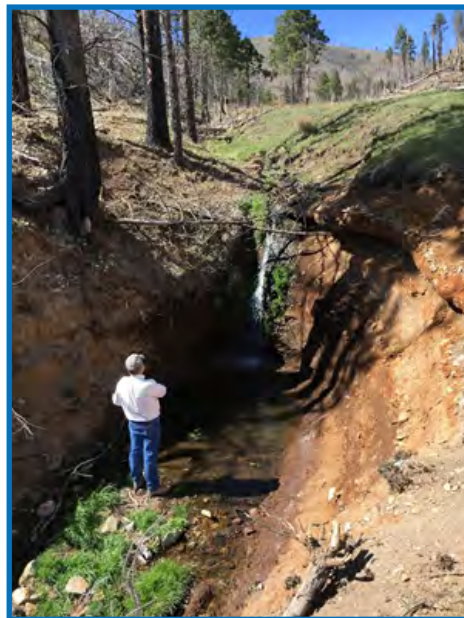
Acres of Watershed Treated

fire, wildfire, tree planting, and rangeland vegetation enhancement. All these activities have contributed to long-term soil health and improved water quality.

In fiscal year 2019, the Lincoln National Forest treated 34,280 acres by means of mechanical thinning, prescribed fire, managed

Planning Activities

Planning activities have included completing NEPA for stream and riparian restoration for Anan Creek and Big Bear Creek. NEPA decisions have been signed for treatments to occur in approximately two miles of Anan Creek and one mile of Big Bear Creek. Treatments will include installing one-rock dams, beaver-dam analogues, Zuni Bowls, and other stream and wetland restoration structures to restore floodplain connectivity and proper hydrologic function. In the Big Bear Creek



Anan Creek restoration to begin in fiscal year 2020; headcut repair and other grade control treatments to arrest further channelization will be implemented in these areas.



project, protection of existing aspen and regeneration of new aspen is an additional component. Implementation is scheduled to occur in fiscal years 2020 and 2021. Both streams are in the Bonito Creek Watershed.



Big Bear Creek restoration and aspen regeneration project to be started in fiscal year 2020. Beaver dam analogs will be installed in areas such as these having gentle slopes and wide floodplains.

South Sacramento Restoration Project

The Lincoln National Forest has been working on the Environmental Impact Statement for this 140,000-acre project since 2017. This project entails large-scale fuels and vegetation treatments in the Sacramento Mountains and implementation is scheduled to begin in fiscal year 2020. Treatments include vegetation thinning and use of prescribed and managed fire. Other treatments that have been scoped and analyzed but no longer a part of this project are also scheduled to begin in fiscal year 2020. These include herbicide applications, upland erosion control, range improvements via water developments, road and trail improvements, meadow restoration, and aspen restoration. These activities will contribute to improved water quality either directly or indirectly. The NEPA for this project is presently being prepared as an EIS and a draft version has gone out for public comment.

Smokey Bear North Restoration Project

This project, on the northern portion of the Lincoln National Forest, proposes to treat ponderosa pine, piñon/juniper woodland, piñon/juniper grassland, shrubland, and grassland habitats. Other components of this project include watershed restoration treatments, road improvements, range and wildlife improvements, mine closures, and rehabilitation of disturbed sites after implementation. The size of this proposed project is about 130,000 acres and is going forward as an environmental assessment. It is still in draft form as of this writing.



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 Re- construction	<ul style="list-style-type: none"> • 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 Re- construction	<ul style="list-style-type: none"> • Reduced impacts of cattle within the perennial stream and riparian area • Improved riparian vegetation • Improved aquatic and wildlife habitat
Lower Rio Grande- El Paso 13030102 Headwaters Rincon Arroyo 130301020304	Repaired breaching earthen stock tank	<ul style="list-style-type: none"> • Reduced stormwater velocity • Reduced erosion and sediment transport to the Rio Grande
Lower Rio Grande- El Paso 13030102 Headwaters Rincon Arroyo 130301020304	Repaired breaching earthen stock tank	<ul style="list-style-type: none"> • Reduced stormwater velocity • Reduced erosion and sediment transport to the Rio Grande

Rio Puerco Field Office (Albuquerque, NM)

Watershed	Project Description	Water Quality Benefits
Jemez 13020202 Rio Puerco 13020204	Reconstructed two (2) breached earthen dams; maintained two (2) other earthen dams. Reconstructed one (1) breached earthen dam.	<ul style="list-style-type: none"> • Catch and store sediment • Moderation of peak flows • Restore/Improve wetland habitat • Decrease erosion • Prevent upstream expansion of gully erosion • Reduce downstream sedimentation



Rio Puerco Field Office (continued)

Watershed	Project Description	Water Quality Benefits
North Plains 13020206	Ponderosa and juniper thinning (with lop and scatter slash treatment). Two thousand (2000) acres thinned. Rock check dam maintenance (10 check dams).	<ul style="list-style-type: none"> • Increase herbaceous ground cover. • Decrease erosion. • Increase bank storage. • Stabilize stream banks to reduce erosion.

Carlsbad Field Office

Wildlife Biology Program

Delaware River Water Gap Project:

Contracted maintenance and repair of two water gaps on the Delaware River. Involved putting in all new concreted braces, tee-posts, and barbed wire. This project will help facilitate the seasonal livestock grazing agreement along the river and minimize impacts to riparian habitat.

Hydrology Program

Playa Wetland Fencing Projects:

Internal BLM-BPSS funds were used to repair and build fence around playas and wildlife exclosure areas. The purpose of these projects was to minimize invasive plant species being brought in by livestock and reduce hoof impacts to playa bottoms from livestock. In addition, these playas serve as a habitat and resting locations for waterfowl and terrestrial wildlife. The list of exclosures repaired is as follows:

- Kit Grove
- Lone Tree Tank
- School Sec Playa
- China Tank



2019 - China Tank playa exclosure.

Native Tree Plantings

30 Cottonwood Trees were planted along the Delaware River and the Black River.

Jersey Barriers

Internal BLM-BPSS funds were used to purchase concrete barriers to detour off road vehicle use. The previ-



2019 - Ladder Hole recreational parking area – Black River, New Mexico.

ous pipe rail fence was cut or pulled out by public users in order to drive vehicles to the edge of Black River near Ladder Hole. The parking area is only 50 yards from the river’s edge and made up of fine gypsum soil. This project was designed to eliminate vehicle induced sediment input in the Black River.

National Public Lands Day

Over 700 burlap bags filled with mulch were placed along and within gullies to reduce upland sediment input to the Black River and riparian habitat. It was a 3-day event in which volunteers from oil and gas companies helped fill bags with mulch, load trailers, lay out the bags on the



landscape and stake them down. The event was covered in the Carlsbad Current Argus News Paper <https://www.currentargus.com/story/news/local/2019/09/27/blm-oil-and-gas-restore-carlsbad-public-land/3788127002/>.

Range Program

In FY19 upland and riparian brush control treatments were completed to improve watershed health and function. These are summarized below.

Fall Creosote/Catclaw Treatments, using 0.75 lb ai/ac Spike 20P (tebuthiuron) aerially applied

- 9,676 acres of public land treated

Spring Mesquite Treatments, using 28 oz ai/ac Sendero (Aminopyralid and Clopyralid) and 16 oz ai/ac Remedy Ultra (Triclopyr) aerially applied

- 6,588 acres of public land treated



Salt Cedar Treatments using crop oil and 0.2 lb ae/ac Remedy Ultra (Triclopyr) basal bark treatment, ground application

- 875 acres along the Pecos River
- 300 acres along the Delaware River

Fire Program

A request for information was sent out to fire personnel but none responded.



Roswell Field Office

Fuels and Fire Program

Thinning of 1,012 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.

Prescribed burn of 703 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 1,415 acres mixed grassland and mesquite on Sand Ranch to decrease risk of extreme wildfire and associated erosion.

Prescribed burn of 300 acres Pinyon and Juniper on North Lincoln to decrease risk of extreme wildfire and associated erosion.

Watershed

Fort Stanton Snowy River Cave NCA on Salado Creek and uplands: 93 acres chemical treatment of thistles.

Fort Stanton Snowy River Cave NCA Tract 1 on Rio Bonito and uplands: 140 acres treated noxious weeds, salt cedar, russian olive, and siberian elm.

Rio Bonito Acquired Lands Tract 2 Rio Bonito river and uplands: 70 acres treated noxious weeds, salt cedar, russian olive, and siberian elm.

Rio Bonito Acquired Lands Tract 3 Rio Bonito river and uplands: 110 acres treated noxious weeds, salt cedar, russian olive, and siberian elm.

Rio Bonito Acquired Lands Tract 4 Rio Bonito river and uplands: 105 acres treated noxious weeds, salt cedar, russian olive, and siberian elm.

Mesquite Chemical treatments on 14,000 acres on uplands on BLM public land in Chaves County.

African Rue Chemical Treatments on 600 acres on uplands on BLM public land in Chaves County.

Saltcedar Chemical Treatments with Basal Bark Remedy Ultra and Basal Oil on 300 acres on uplands on the Pecos River and the BLM Overflow Wetlands.

Stream/Riparian/Fisheries/Water Resources

Salt Chemical Treatments with Basal Bark Remedy Ultra and Basal Oil on 2 miles of stream/riparian treatment of the Pecos River and Overflow Wetlands.



Cottonwood tree plantings on the fisheries restoration project on the Rio Bonito.

Constructed and installed 40 check dams on upland drainages on the Rio Bonito to stabilize headcuts and gullies and to decrease nonpoint pollution, and silt and sedimentation to the Rio Bonito with BLM funds and working with a NCCC crew.



Installing check dams on upland drainages, headcuts, and gullies near the Rio Bonito.

Saltcedar, Russian Olive, and Siberian Elm treatments on 4 miles of stream/riparian treatment miles of the Rio Bonito.

Installation of fisheries structures and plantings of cottonwood trees, coyotes willows, coyote willow wattles, goodings willow, and native grass seeds on 2 miles of the Rio Bonito on the Rio Bonito Acquired Lands.

Performed Proper Functioning Condition inventory on 2 acres of wetland and spring acres on Lloyds Spring and inventory of 4 miles of stream/riparian miles on the Pecos River.



Proper functioning Condition inventory site at Lloyds Spring with water table monitoring piezometer.

Performed dam maintenance on Government Spring irrigation dam and installed and re-enforced a dam berm and chemically treated woody vegetation such as saltcedar to reduce flooding, decrease erosion, and increase herbaceous ground cover.

Water Quality

The Fisheries, Riparian, and Water Resources Program monitors water quality of rivers and springs which includes water temperature, pH, conductivity, total dissolved solids, dissolved oxygen, salinity, water levels and water flow measurements.



Environmental Education

The BLM Roswell Field Office Fisheries, Riparian, and Water Resources Program participated in several science and environmental education events and discussed aquatic, riparian, fisheries and water resources and habitats and ways that the BLM decreases or mitigates silt and sedimentation and nonpoint pollution to rivers and streams.

Water Table used at Roswell High School Science and Career Fair event to discuss with students the stream system and the processes of erosion and deposition and how different components of the system interact when different conditions are applied to a stream system and discuss mitigation used for nonpoint source pollution.



Taos Field Office

Terrestrial AIM

The Terrestrial Assessment, Inventory, and Monitoring (AIM) program at the BLM 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 analyzed and used to inform land management decisions on the local, regional, and national levels. During the 2019 field season, 73 AIM plots were sampled on BLM lands in the Taos Field Office area. Since the program's implementation, a total of 411 AIM plots have been completed. 277 of these plots, are in the Rio Grande del Norte National Monument. Over 100 AIM plots have been established in past or possible 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 member digging a soil pit for characterization and ecological site identification.

Wildlife

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 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.



Anderson wetland.

Fisheries, Riparian, and Water Resources

Water Quality

The Fisheries, Riparian, and Water Resources Program monitors 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 Rio 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. Thermographs record water temperature every hour throughout the year to monitor temperature changes in our waterways.

Springs and Seeps Inventory and Surveys

The Fisheries, Riparian, and Water Resources Program surveyed 46 springs and seeps in 2018 including map-



ping locations, computing area, flow rate, microhabitat characteristics, geomorphology, water quality, riparian flora and cover, invertebrates, and vertebrates. Proper functioning condition of springs and seeps are important to control erosion and filter pollutants, improve 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/>

Environmental Education

The BLM Taos Field Office Fisheries, Riparian and Water Resources Program participates in multiple environmental education outreach programs discussing aquatic and riparian habitats and the relationships with mitigating non-point source pollution.



Collecting water quality and aquatic invertebrates at a spring.

Envirothon

The Envirothon is a competition for high school aged students that covers five topic areas: aquatic ecology, soils and land use, forestry, wildlife, and a current environmental issue. The Taos Field Office participates yearly as mentors to the students in preparation for the State and National competitions. The Envirothon is a vital program to guide the next generation of aquatic biologists and natural resource managers. (www.envirothon.org).

Taos Soil Water Conservation District Science Conservation Youth Camp

The conservation youth camp is an interactive program for junior high students. Over the course of two days the students participate in science lessons at eight stations that include aquatic ecology, wildlife, forestry, soils, avian biology, rangeland management, weather, and botany. The Fisheries, Riparian, and Water Resources Program contributes as the aquatic ecologist and wildlife biologist instructors.



Taos Charter School Science Program

The Fisheries, Riparian, and Water Resources Program works with the Taos Charter School Science Department to teach 7th and 8th graders aquatic field biology methods. The areas discussed in detail are water chemistry, aquatic invertebrate monitoring, fish habitat measurements, fish population inventory and monitoring, riparian zone biology, watershed analysis, and climate change.

Environmental education

