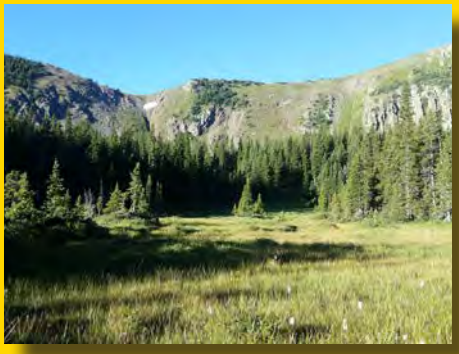
State of New Mexico

NONPOINT SOURCE MANAGEMENT PROGRAM



2018 Annual Report

New Mexico Environment Department
Surface Water Quality Bureau
Watershed Protection Section

State of New Mexico
Nonpoint Source Management Program

2018 Annual Report

Published By:

The New Mexico Environment Department
Surface Water Quality Bureau
Watershed Protection Section
1190 St. Francis Drive
Santa Fe, New Mexico 87502

In cooperation with:

The Natural Resources Conservation Service, New Mexico Department of Game and Fish, New Mexico State Forestry Division, and the Santa Fe National Forest.

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/

NEW MEXICO
ENVIRONMENT DEPARTMENT

Harold Runnels Building
1190 Saint Francis Drive, PO Box 5469
Santa Fe, NM 87502-5469
Telephone (505) 827-2855
www.env.nm.gov

MICHELLE LUJAN GRISHAM
Governor

HOWIE C. MORALES
Lt. Governor

JAMES C. KENNEY
Cabinet Secretary Designate

JENNIFER PRUETT
Deputy Secretary

January 31, 2019

Charles Maguire
Water Division Director
U.S. Environmental Protection Agency, Region 6
1445 Ross Ave., Suite 1200
Dallas, Texas 75202

Dear Mr. Maguire,

I am pleased to submit New Mexico's 2018 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 2018 for each:

1. Under the **watershed-based planning** objective, the Rio Puerco Watershed-Based Plan (WBP) was accepted by EPA in January 2018, and is available at: www.env.nm.gov/surface-water-quality/accepted-wbp. This WBP meets the nine planning elements in the *Nonpoint Source Program and Grants Guidelines for States and Territories*, for select impaired stream reaches in the large Rio Puerco basin.

2. We report the successful completion of three projects funded under Section 319 that **address water quality problems**. We are also glad to report that NMED is supporting four new projects that implement WBPs beginning in 2018, also funded under Section 319.

3. To better **protect water quality**, The Surface Water Quality Bureau issued conditional certification for three individual Section 404 permits and reviewed fifty-seven projects covered by Section 404 Nationwide Permits. 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,** twenty-eight sub-pages within the SWQB part of the NMED web site (www.env.nm.gov/surface-water-quality) were reformatted and updated in 2018 to provide more intuitive access to key information by users. Two

issues of the newsletter *Clearing the Waters* were published in 2018. Additional publications, workshops, and field tours were included in projects completed in 2018.

5. In **ground water quality protection,** the New Mexico Environment Department's Ground Water Quality Bureau conducted nine water fairs where local residents could have well water tested, and issued six permits for large septic tank leachfield systems and surface disposal sites.

6. Finally, we report promising developments in **interagency cooperation** and coordination. The Natural Resources Conservation Service (NRCS) reported additional implementation underway under the National Water Quality Initiative (NWQI) and new effort under the Emergency Watershed Protection (EWP) program in response to the 2018 Ute Park Fire.

NMED also completed the significant writing, review, and interagency communication necessary to update the NPS Management Program Plan in 2018 and expects to submit the Plan to the Regional Administrator in April 2019.

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,

Shelly Lemon

Shelly Lemon

Bureau Chief
Surface Water Quality Bureau

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Executive Summary

This annual report to the United States Environmental Protection Agency (EPA) provides an overview of Clean Water Act (CWA) Section 319 Nonpoint Source Management Program related activities conducted in New Mexico in 2018. 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.

Milestones are an integral part of the NPS Management Program and a requirement under Section 319(b)(2)(c) of the CWA. The milestones for which a specific schedule is provided in the Nonpoint Source Management Program are reported on pages 14-17. Significant achievements include:

- A Request for Grant Applications for comprehensive projects to revise existing Watershed-Based Plans (WBPs) or develop new WBPs was completed, with two new projects approved in June 2018.
- Watershed Protection Section (WPS) provided contract oversight and technical assistance for ongoing watershed-based planning projects. One planning project was completed in 2018.
- The Rio Puerco WBP was accepted by EPA in January 2018, and is available at: www.env.nm.gov/surface-water-quality/accepted-wbp.
- A Success Story nomination for Jaramillo Creek was submitted on August 16, 2018. EPA approved the Success Story on December 20, 2018.
- A Solicitation for Applications for projects that implement WBPs, funded with Section 319 watershed project funds, was released in the first quarter of 2018. Four resulting new projects began in late 2018.
- WPS provided contract oversight and technical assistance for ongoing implementation projects. Three Section 319 implementation projects were completed in 2018.
- State-funded watershed and riparian restoration projects through NMED's River Stewardship Program (RSP) were developed and managed in 2018. Ten RSP projects were completed in 2018, and fourteen newer projects are scheduled to be completed after 2018. The New Mexico Legislature approved $500,000 in funding for RSP during the 2018 legislative session, and a Request for Proposals to select projects was released on December 20, 2018.
- NMED carried out its responsibilities under Section 401 of the Clean Water Act, regarding dredge and fill

permits. NMED certified three individual Section 404 permits and reviewed fifty-seven projects covered by Section 404 permits that have already been certified.

- NMED carried out its duties under the New Mexico Mining Act. Surface Water Quality Bureau staff conducted water quality reviews at active and proposed mining sites, reviewed Mining Act permit applications, inspected mine sites, and ensured that mining activities will not violate surface water quality standards.
- Twenty-eight sub-pages within the SWQB part of the NMED web site were reformatted and updated in 2018 to provide more intuitive access to key information by users.
- In 2018, a draft NPS Management Plan was submitted to EPA for technical review prior to a 60-day public comment period that closed on December 14, 2018.

In addition, the Natural Resources Conservation Service, New Mexico Department of Game and Fish, New Mexico State Forestry Division, and the Santa Fe National Forest provided information for the report on their activities related to NPS pollution control in 2018.

Introduction

This annual report to the United States Environmental Protection Agency (EPA) provides an overview of nonpoint source management related activities conducted in New Mexico in 2018 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). The majority of funding to support the New Mexico Nonpoint Source Management Program was provided through Section 319(h) grants awarded to NMED by the EPA. Activities and projects reported are CWA Section 319 projects, and those implemented by the state-funded River Stewardship Program, the New Mexico Wetlands Program, CWA Section 401 activities, N.M. Mining Act activities, and NPS projects implemented by other natural resource agencies outside of NMED.

What is Nonpoint Source Pollution?

Polluted runoff, or NPS pollution, is defined by the 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."

A few examples of NPS pollution include:

- bacteria and nitrates from aging or out of compliance septic systems;
- sediment and ash from forest and rangeland fires;
- oil, grease and other hydrocarbons from parking lots and roads;
- sediments from poorly designed unpaved roads;
- fertilizers, nutrients and bacteria from agricultural practices; and
- bacteria from pet waste.

Trespass cattle on private property along a small tributary of the East Fork Jemez River near Jemez Falls fouled the water with nutrient and bacterial pollution. New Mexico is a "fence out state," meaning that property owners are generally responsible for fencing cattle out.

Increased water temperature resulting from degraded streambanks, loss of streambank vegetation, and hydromodification is another example of NPS pollution. New Mexico's most common kinds of NPS pollution are temperature, nutrients, and bacteria.

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 states 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.

Minimizing Road & Infrastructure Impacts to Streams: 2 ½ day workshop at San Juan College, Farmington, NM. Natural Channel Design, Inc. and Keystone Restoration Ecology in cooperation with New Mexico Environment Department Surface Water Quality Bureau lead a training workshop integrating road infrastructure and maintenance with successful stream and wetland restoration techniques geared for state, county, tribal engineers, maintenance staff, drainage engineers, district managers, and environmental staff.

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

Two sections of the CWA designed to manage both point sources and NPS are Sections 303 and 305. Under Section 303(d), states are required to list all polluted surface waters in their jurisdiction which do not meet state water quality standards (also known as the "impaired waters" list). Under Section 305(b), states must publish a biennial report on the health of all surface waters. In New Mexico, the 305(b) report includes the 303(d) list and is referred to as the *State of New Mexico CWA §303(d)/§305(b) Integrated Report*.

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 ground water resources.*

As lead agency for the management of NPS pollution, NMED coordinates activities within the state through the SWQB and the Ground Water Quality Bureau (GWQB). In accordance with the CWA, the SWQB has developed a Nonpoint Source Management Program planning document (NPS Management Plan). The current NPS Management Plan was approved in early 2015 and is available at: www.env.nm.gov/surface-water-quality/nps-plan.

Our goal is to manage a balanced program that addresses both existing impairments (as listed in the *303(d)/305(b) Integrated Report*) and prevents future impairments. The focus on existing impairments is directed at impaired waters in three different impairment categories. The large majority of these waters have one or more approved Total Maximum Daily Loads (TMDLs) that set quantitative goals for impairment parameters. The TMDL is the total amount of pollutant a waterbody can assimilate daily and still meet water quality standards. A target value of pollutant load reduction is also provided in most TMDL documents. Most of these streams are within Category 4A in the *303(d)/305(b) Integrated Report.* A smaller number of priority streams are thought to be impaired by low flow conditions rather than excessive pollutants. Twenty such streams are listed in the *2018-2020 303(d)/305(b) Integrated Report* under Category 4C. An additional impairment category (Category 4B) is for streams with sufficient planning completed such that a TMDL is not required. The *2018-2020 303(d)/305(b) Integrated Report* does not list any streams in Category 4B.

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.

The NPS Management Program is supported largely by CWA Section 319(h) 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 2013-2017, and increasing an average of 2.2% each year.

NMED reports how CWA Section 319(h) funds and state matching funds are used, in EPA's Grants Reporting

and Tracking System (GRTS). The funding is allocated to projects. Projects other than statewide projects are depicted in *Figure 1*, below.

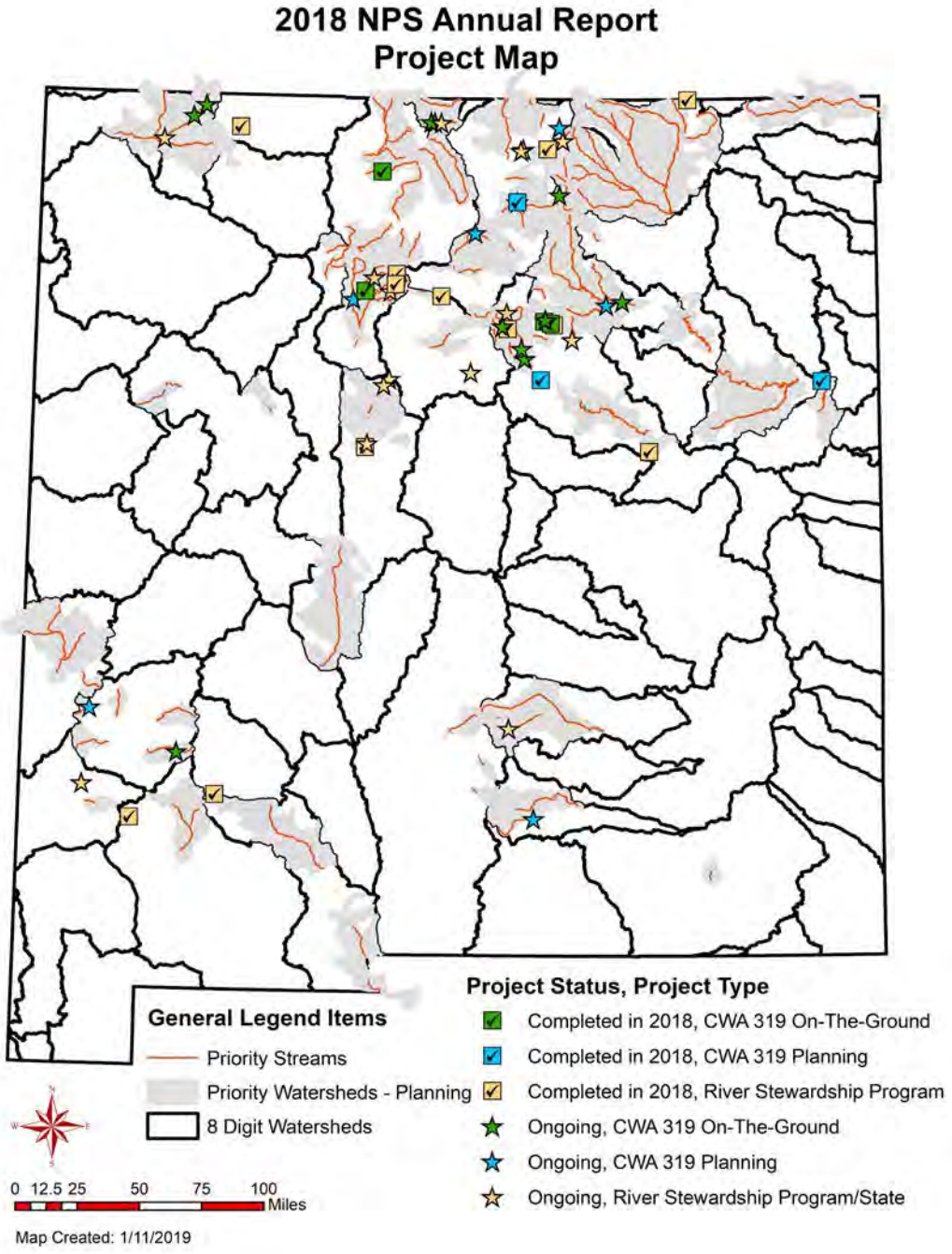

Figure 1: Section 319 and River Stewardship Program projects active in 2018.

Five tables below list projects describing staff activities, Section 319 funded watershed-based planning projects, Section 319 funded implementation projects, and state-funded projects in progress or completed in 2018. 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 GWQB implementing the NPS Management Program statewide in 2018 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 in calendar year 2018.

Grant Number	Project Number	Project Title	Project End Date	Section 319 Funds	State Funds	Summary Report
99610118	18-A	NEW MEXICO NON-POINT SOURCE MANAGEMENT PROGRAM FY 2018	06/30/2018	$914,150	$60,000	VIEW
99610118	18-B	GROUND WATER QUALITY BUREAU PROGRAMS FY 2018	06/30/2018	$105,738	$112,515	VIEW
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

The budgets above for Projects 18-A and 18-B are amounts actually spent, and the budgets for projects 19-A and 19-B are budgeted amounts. Budgeted amounts may be lower due to vacancy savings and other reduced costs.

Watershed-Based Planning Projects

An important component of the NPS Management Program is the watershed-based plan (WBP) approach as outlined in the guidance provided in EPA's *Nonpoint Source Program and Grants Guidelines for States and Territories* (https://www.epa.gov/sites/production/files/2015-09/documents/319-guidelines-fy14.pdf). A WBP expands on the information provided in a TMDL by identifying causes and sources of impairment, recommending management measures, estimating expected load reductions from management measures, providing

methods to measure implementation success, estimating funding needs, and outlining potential education and outreach efforts. NMED supports watershed-based planning through a competitive subgrant process, conducted approximately every other year, and through technical support provided to partner agencies and stakeholder groups interested in water quality. The first such subgrant process was completed in 2018. WBP projects in progress in 2018 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 in 2018.

Grant Number	Project Number	Project Title	Project End Date	Section 319 Funds	Local Match	Summary Report
99610116	14-I	Ute Reservoir Watershed-Based Plan for Water Quality Restoration (Ute Reservoir WBP)	01/31/2018	$66,604	$60,660	VIEW
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	$49,239	$33,295	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	$33,181.88	$0.00	VIEW

Watershed Implementation Projects

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

Table 3: Section 319 Watershed Implementation Projects completed or in progress in 2018.

Grant Number	Project Number	Project Title	Project End Date	Section 319 Funds	Local Match	Summary Report
99610116	14-J	On-The-Ground Improvement Projects for the Upper Gallinas River and Porvenir Creek Phase II	06/30/2018	$230,700	$163,084	VIEW
99610116	15-E	Upper Gallinas River Monitoring	06/01/2018	$42,455	$0	VIEW
99610116	15-T	Jemez National Recreation Area Riparian Protection Project	06/30/2018	$208,524	$0	VIEW
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	$322,633	$228,098	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

Grant Number	Project Number	Project Title	Project End Date	Section 319 Funds	Local Match	Summary Report
99610117	17-T	Lower Animas Watershed Based Plan Implementation Projects	12/31/2020	$229,644	$156,400	VIEW
99610117	17-U	Black Canyon Riparian Enhancement Design	06/30/2019	$37,434	$18,646	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 Creeks, 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
99610118	18-L	Dalton Canyon Creek Water Quality Improvement Project	06/30/2022	$199,561	$133,263	VIEW
99610118	19-E	Ninemile Creek Water Quality Improvement Project	12/31/2021	$186,742	$126,423	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* on the next page lists New Mexico's current and recently completed RSP projects.

Table 4: River Stewardship Program (RSP) projects completed or in progress in 2018.

Grant Number	State Funding Codes	Project Number	Project Title	Project End Date	State Funds	Summary Report
99610116	14-1706	15-F	Gallinas Village River and Floodplain Restoration	06/30/2018	$292,746	VIEW
99610116	14-1706	15-G	Pecos River Dalton Day Use Area River Restoration Project	06/30/2018	$215,086	VIEW
99610116	14-1706	15-H	San Juan River Restoration Project (Part 2)	06/30/2018	$98,966	VIEW
99610116	14-1706	15-I	Track Fire Burn Area Perennial Stream Restoration Project	06/30/2018	$149,990	VIEW
99610116	14-1706	15-J	Middle Percha Creek Silver Fire Rehabilitation Project	06/30/2018	$4,542	VIEW
99610116	14-1706	15-L	Restoring Hydrologic Functioning to the Rito de los Indios, Valles Caldera National Preserve	06/30/2018	$172,000	VIEW
99610116	14-1706	15-M	San Vicente Creek Urban Watershed Restoration Project	06/30/2018	$138,221	VIEW
99610116	14-1706	15-P	Middle Jaramillo Creek Water Quality Improvement and Riparian Restoration Project	06/30/2018	$139,750	VIEW
99610116	14-1706	15-Q	El Rito Creek Habitat Enhancement and Bank Stabilization Project	06/30/2018	$173,835	VIEW

Grant Number	State Funding Codes	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
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

Grant Number	State Funding Codes	Project Number	Project Title	Project End Date	State Funds	Summary Report
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
99610118	14-1706	18-D	South Valley Albuquerque State Trust Land Riparian Project	06/30/2018	$159,975	VIEW
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	06/30/2020	$137,100	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 Codes	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 initiated since 2014 is available at:
https://www.env.nm.gov/nmed_319_and_rsp_project_list.

NPS Management Program Milestones

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 specific objectives aimed at reducing and preventing NPS pollution in New Mexico: Watershed-Based Planning, Addressing Water Quality Problems, Water Quality Protection, Education and Outreach, Protect Ground water Resources, and Interagency Cooperation. Within each objective are specific activities and milestones to meet the objective. 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 following table lists each milestone identified in the NPS Management Plan which has a specific numeric goal and an established time frame, and its status.

Table 6: Status of milestone completion, 2018.

Objective number	Objective Short Name	Milestone (abbreviated)	Schedule	Status
1	Watershed Based Planning	WBPs and related documents are available in an organized web page, which will also provide a WBP submittal process.	2014	This milestone was met in 2015 (www.env.nm.gov/surface-water-quality/wbp/).
1	Watershed Based Planning	A small procurement process is developed to update existing watershed plans.	2015	Milestone met in 2018. A small contract to complete the Embudo Creek WPB (Project 19-G) was approved in December.
1	Watershed Based Planning	New watershed plans meet all nine planning elements, or are accepted by EPA as alternative plans.	2014: 1 plan, 3 watersheds. 2015: 3 additional plans, 9 additional watersheds. 2016: 2 additional plans, 13 additional watersheds. 2018: 1 additional plan, 1 additional watershed.	Milestone met. A WBP for the large Rio Puerco basin (covering 13 priority watersheds) was completed (and accepted by EPA) in January 2018. In 2014 through 2018, seven WBPs covering 74 priority watersheds have been completed.

Objective number	Objective Short Name	Milestone (abbreviated)	Schedule	Status
1	Watershed Based Planning	Existing watershed-based plans are updated.	2016, 2017, and 2018: 2 plans each year are updated, one plan each year is accepted by EPA.	Milestone met. Two WBPs were updated in 2018. These are the Upper Gallinas Watershed-Based Plan and the Upper Pecos Watershed-Based Plan.
2	Addressing Water Quality Problems	Watershed restoration projects described in watershed-based plans or accepted alternative plans are initiated in two priority watersheds per year.	2 watersheds per year, 2014 through 2018.	This milestone was met. Four Section 319 projects that implement WBPs were initiated in 2018, with planned activities in 11 priority watersheds.
2	Addressing Water Quality Problems	Wetlands Action Plans (WAPs) are implemented in at least one priority watershed per year.	1 watershed per year, 2014 through 2018.	Milestone met. The project, "Keyline Design for Restoration of Headwater Slope Wetlands in the Holman Creek Wetlands Complex," a Wetlands Program demonstration project, began in 2018 in the Comanche Creek watershed.
2	Addressing Water Quality Problems	Improve water quality in priority watersheds, meeting EPA performance measures (Success Stories).	2 watersheds annually, 2014 through 2018.	Milestone not met. While EPA approved the NPS Success Story for Jaramillo Creek, this stream lies within just one priority watershed.
3	Water Quality Protection	NMED will fund post-fire actions that reduce sedimentation and protect aquatic habitat.	Any year in which a major and unnaturally intense wildfire occurs in the watershed of a cold or cool water stream.	Milestone not met. A project is in development to reduce the impacts of the Ute Park Fire, but the project has not begun yet.

Objective number	Objective Short Name	Milestone (abbreviated)	Schedule	Status
3	Water Quality Protection	The CWA §303(d)/§305(b) Integrated Report does not indicate an increase in the percentage of assessed stream miles designated as impaired.	The next Integrated Report is scheduled for completion in 2018.	Milestone met. Of 7,734 miles assessed in 2016, 4,069 (53%) were classified as impaired (Category 4 and 5 waters). Of 7,835 miles assessed in 2018, 4,091 (52%) were classified as impaired (Category 4 and 5 waters).
4	Education and Outreach	Clearing the Waters is published quarterly.	Quarterly	Milestone not met. Clearing the Waters was published in fall and winter, 2018.
4	Education and Outreach	Clearing the Waters circulation increases to 2000 by 2018.	2018	Milestone not met. As of the end of 2018, Clearing the Waters circulation was 1,644, showing slight increases each year since 2014.
4	Education and Outreach	The Forest and Watershed Health Program Virtual Library experiences an annual increase in internet hits of at least 10% between 2014 and 2018.	Annually	Milestone was not met. The Virtual Library (www.allaboutwatersheds.org) had 169,521 hits in 2017 and 171,819 hits in 2018 for a 1.4% increase in traffic.
6	Interagency Cooperation	NRCS reports that agricultural BMPs funded under NWQI or other conservation programs have been implemented, with sufficient details to enable WPS to estimate pollutant load reductions.	Annually	Milestone met. WPS staff estimated that one reported NWQI practice, cover cropping of 72.9 acres, might meet approximately 0.2% of the *E. coli* load reduction goal in an approved TMDL.

Objective number	Objective Short Name	Milestone (abbreviated)	Schedule	Status
6	Interagency Cooperation	The NPS Management Program Annual Report is submitted to EPA by January 31 and made available to the public in February.	Annually	Milestone met. The NPS Annual Report was submitted in January 2018.
6	Interagency Cooperation	USACE approves a programmatic agreement with NMDOT to establish the framework for an APRM program.	2015	This milestone was met in 2014.
6	Interagency Cooperation	The MOU between NMED and USFS is renewed.	2017	This milestone was met in 2017.
6	Interagency Cooperation	The grant from DOE that supports the work of the DOE Oversight Bureau is re-issued.	2018	Milestone met - the main grant that supports the DOE Oversight Bureau was extended through 2023, in 2018.
6	Interagency Cooperation	A revised NPS Management Plan is submitted to the EPA Regional Administrator.	2018	Milestone not met. NMED plans to submit a revised NPS Management Plan to EPA in April, 2019.

NPS Management Program Accomplishments in 2018

- A Request for Grant Applications (RFGA) for comprehensive projects to revise existing WBPs or develop new WBPs was completed, with two new projects approved in June 2018. The two new projects are to produce new WBPs for the Sapello River watershed (a tributary of the Mora River) and the Willow Creek watershed (a tributary of the Middle Fork Gila River).

- WPS provided contract oversight and technical assistance for ongoing watershed-based planning projects. Watershed-based planning projects in progress are listed in *Table* 2 above. One planning project was completed in 2018 (Project 14-I, in *Table* 2 above). A summary of this completed project is included in a section below.

- The Rio Puerco WBP was accepted by EPA in January 2018, and is available at: www.env.nm.gov/surface-water-quality/accepted-wbp.

- 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 on August 16, 2018. EPA approved the Success Story on December 20, 2018, and it will be posted at: www.epa.gov/nps/success-stories-about-restoring-water-bodies-impaired-nonpoint-source-pollution.

- A Solicitation for Applications (SFA) for projects that implement WBPs, funded with Section 319 watershed project funds, was released in the first quarter of 2018. Four resulting new projects (Projects 18-J, 18-K, 18-L and 19-E listed in *Table 3*, above) began in late 2018.

- WPS provided contract oversight and technical assistance for ongoing implementation projects. Three Section 319 implementation projects were completed in 2018 (Projects 14-J, 15-E, and 15-T in *Table 3*, above). Summaries of these completed projects are included in a section below.

- State-funded watershed and riparian restoration projects were developed and managed in 2018. Ten RSP projects were completed in 2018, and fourteen newer projects are scheduled to be completed after 2018. The New Mexico Legislature approved $500,000 in funding for RSP during the 2018 legislative session, and a Request for Proposals (RFP) to select projects was released on December 20, 2018.

- NMED carried out its responsibilities under Section 401 of the Clean Water Act, regarding dredge and fill permits. NMED certified three individual Section 404 permits and reviewed fifty-seven projects covered by Section 404 permits that have already been certified.

- NMED carried out its duties under the New Mexico Mining Act. Surface Water Quality Bureau staff conducted water quality reviews at active and proposed mining sites, reviewed Mining Act permit applications, inspected mine sites, and ensured that mining activities will not violate surface water quality standards. A summary with examples is provided in the New Mexico Mining Act Activities section.

- Twenty-eight sub-pages within the SWQB part of the NMED web site (www.env.nm.gov/surface-water-quality) were reformatted and updated in 2018 to provide more intuitive access to key information by users. Examples are a new page providing information on Wetlands Projects (www.env.nm.gov/surface-water-quality/wetlands-projects) and an updated page providing information on RSP (www.env.nm.gov/surface-water-quality/river-stewardship-program).

- In 2018, a draft NPS Management Plan was submitted to EPA for technical review prior to a 60-day public comment period. The public comment period closed on December 14, 2018.

2018 saw extremely dry conditions in the late winter and spring, and more fire activity in late spring and early summer than in any year since 2013. The Ute Park Fire near Cimarron was the largest fire significantly affecting the watershed of a stream with a cold water aquatic life use. Burning mostly in ponderosa pine and dry

mixed conifer, its intensity was outside the natural range of variability for these forest types. The fire affected 36,740 acres located directly along the Cimarron River and in the watersheds of several tributaries draining directly to the Cimarron River.

Additional information on the Ute Park Fire was included in the winter, 2018 issue of *Clearing the Waters* (www.env.nm.gov/surface-water-quality/newsletters), and in sections below.

Interagency Cooperation Highlights

NRCS provided a valuable State Technical Committee meeting on November 29, 2018, with updates on the National Water Quality Initiative (NWQI) and the Emergency Watershed Protection (EWP) program. NRCS also provided information about work implemented in 2018 under NWQI and EWP in the section below, **Additional Management Practices by Non-NMED Agencies**.

NWQI is a cooperative effort by NRCS and EPA, with specific assistance from state water quality programs, to target Environmental Quality Incentives Program (EQIP) funds to water quality improvement. NWQI is further described at: www.nrcs.usda.gov/wps/portal/nrcs/detail/national/water/?cid=stelprdb1047761.

NRCS reported that $350,000 were allocated to NWQI in federal FY 2018, and $177,391 were obligated, relative to approximately $20,000,000 total allocated under EQIP in New Mexico.

The 2017 NPS Annual Report included an update on priority watershed selection under NWQI, and listed the priority watersheds (see www.env.nm.gov/surface-water-quality/nps-annual-reports). Current NWQI watersheds are in the Las Cruces area and in the Animas River watershed in San Juan County. The Arroyo Pecos-Gallinas River watershed (hydrologic unit code, or HUC, 130600010805) was still an NWQI watershed in federal fiscal year 2017, so some NWQI work (43.5 acres of forest stand improvement and 43.5 acres of woody residue treatment) applied for in 2017 was implemented there in 2018.

> WPS staff used the Revised Universal Soil Loss Equation (within the EPA Region 5 model spreadsheet) to estimate pollutant load reductions for establishment of 72.9 acres of cover crop under NWQI in the Alameda Arroyo-Rio Grande watershed (HUC 130301020608, near Las Cruces). 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 2.7 lb/yr, and nitrogen by 5.7 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 1.5×10^{13} colony forming units (CFU) per year of *E. coli* load reduction. This result averages about 4.0×10^{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).

In FY 2018 two watersheds within the Animas River watershed were added to NWQI, and several projects

were planned for FY 2019. The planned projects include cover crop, sprinkler systems (surface, subsurface and micro irrigation), structure for water control, irrigation pipeline, forage and biomass planting, and irrigation water management.

NRCS also reported during the State Technical Committee meeting that funding had already been approved and some implementation had already occurred under the EWP program, to address impacts of the Ute Park Fire. The work that had already occurred was funded under emergency provisions, to protect human life or property. Additional post-fire rehabilitation work is planned under non-emergency provisions of EWP, pending approval of funding.

The Ute Park Fire burned area is entirely on private land (mostly on the Philmont Scout Ranch owned by the Boy Scouts of America), so the funding resources that the Unites States Forest Service (USFS) uses for planning and implementing post-fire rehabilitation on Forest Service system lands are not available. **The New Mexico Department of Homeland Security and Emergency Management** conducted an emergency procurement to hire the environmental consulting firm SWCA to produce a plan for post-fire rehabilitation, called the *Ute Park Fire Damage Assessment and Burned Area Emergency Rehabilitation Plan*. The plan provides sediment load reductions, estimated costs, and programs that could support implementation, and is available for download at www.allaboutwatersheds.org. WPS is working with area cooperators to develop a project to reduce sediment loading after this fire.

WPS staff worked with **New Mexico Department of Game and Fish** (NMDGF) staff in 2018 to develop guidance for culvert sizing and placement. Critically, the guidance will help WPS staff objectively determine whether projects regulated under Section 404 of the Clean Water Act comply with the condition in NMED's Section 401 certification of the Section 404 Nationwide Permits that reads, "culvert design must allow for the passage of fish and other aquatic organisms." NMDGF published the guidelines as described in the section below, **Additional Management Practices by Non-NMED Agencies**.

On February 20 and 21, WPS staff attended a U.S. Department of Interior **Bureau of Land Management** (BLM) Soil, Water, and Air Training Workshop attended by BLM hydrologists and other resource staff from around New Mexico whose duties include water quality protection. BLM staff and others provided presentations related to soil, water, and air. The WPS Program Manager provided a presentation on water quality standards, assessment, and the Nonpoint Source Management Program. This presentation was a refresher for a few BLM staff who have been in their positions for several years, and provided new information to several newer BLM employees. Attending a meeting such as this approximately annually is specified in the Memorandum of Understanding (MOU) between BLM and NMED that outlines cooperation on water quality management.

A coordination meeting was held with the **USFS** on October 30, 2018 between staff from the Carson, Santa Fe, Gila, and Lincoln National Forests, the USFS Regional Office, and SWQB programs. The meeting was conducted in the field and included reviews of planned and completed water quality protection projects in the Rio Guadalupe, Rio Cebolla, and San Antonio Creek watersheds in the Jemez Mountains. The meeting was as

useful for USFS staff from other Forests who were unfamiliar with these projects as it was for NMED staff.

Land and resource management planning (also known as forest planning) continues in New Mexico. Forest plans set major goals for each national forest over an expected time frame of fifteen or more years. The current forest plans were all developed in the 1980s. The Cibola, Santa Fe, Carson, and Gila National Forests are now all at approximately the same stage of forest plan development. Each is making final edits to their forest plans based on comments received on preliminary draft plans during public comment periods conducted in 2016 and 2017 and from additional outreach conducted in 2018. In 2019, these four Forests plan to release final forest plans along with draft Environmental Impact Statements that analyze the impacts expected from implementing the plans and several alternatives. The Lincoln National Forest completed their assessment of current conditions and resources on the Forest in 2018 and may release the final forest plan along with a draft Environmental Impact Statement in 2019 or 2020.

Each of these forest plan revisions will comply with the 2012 Planning Rule, which requires components for the maintenance and restoration of the ecological integrity of aquatic ecosystems and watersheds, water quality, and water resources in the plan area, including lakes, streams, wetlands, and sources of drinking water.

The NMED **Construction Programs Bureau** (CPB) completed an annual report for 2018, available at www.env.nm.gov/construction-programs/reports. The report includes a tabular list of projects in progress, some of which may address NPS pollution through centralization of wastewater treatment or upgrading of decentralized wastewater treatment. For example, although it is not classified as an NPS project, the Village of Corrales project "CWSRF 070" includes among its goals to replace failing septic systems. This project is located near a portion of the Rio Grande with *E. coli* impairment and a completed TMDL. CPB is developing a project with the Village of Cimarron to identify remediation options to address impacts of the Ute Park Fire on their drinking water system (project "4783-PG"). CPB is also the primary NMED bureau responsible for management of Water Trust Board projects, including those in the watershed restoration and management category, and a brief status of each of these projects is provided in their annual report.

The Clean Water State Revolving Fund (CWSRF) program accepts funding applications annually. Eligible projects include publicly or privately-owned projects that implement NPS management programs. CPB encourages entities to apply for NPS projects, and in 2018 requested review by WPS of several applications to determine whether the proposed projects would implement the NPS Management Program. No NPS project applications were submitted in 2018.

CPB staff and **Petroleum Storage Tank Bureau** (PSTB) staff approached SWQB regarding replacement and remediation of failing or aged petroleum storage tanks as a potential new component of the NPS Management Program. PSTB staff pointed out that the 2014 amendments to the Clean Water Act emphasize that CWSRF funds may be used for implementing components of state NPS Management Programs, and provided Maine as an example state that has included petroleum storage tank remediation as a component of their NPS Management Program. This feedback along with related public comments received on the draft revised NPS Management Program are under consideration.

NPS Management Program Objectives for 2019

The WPS has identified the following activities from the 2014 NPS Management Plan to meet program objectives in 2019.

- A Request for Applications (RFA) for projects to revise existing WBPs or develop new WBPs will be released in Spring 2019 with new projects planned to start in late 2019.
- WPS will continue to provide oversight and technical assistance for seven 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 2019. 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 a draft WBP for Embudo Creek to EPA, by September 30, 2019. A small professional services contract (Project 19-G in *Table 2*) with Ecotone Landscape Planning, LLC was approved in late 2018 to complete this WBP based on a draft WBP and other existing data and information.
- WPS plans to submit a draft WBP for Comanche Creek to EPA, by September 30, 2019. This WBP is being developed under Project 16-I in *Table 2*.
- WPS will continue to develop three additional projects that implement WBPs, funded with Section 319 watershed project funds, under the SFA that was released in 2018. Pending adequate funding and approvals, these projects will begin in July 2019.
- WPS will continue to provide oversight and technical assistance for ongoing implementation projects. Two Section 319 implementation projects are scheduled to be complete in 2019 (*Table 3*, above). These are "Rio Nutrias Watershed Based Plan Implementation Phase I" (Project 16-D) and "Black Canyon Riparian Enhancement Design" (Project 17-U).
- State-funded watershed and riparian restoration projects will be developed and managed in 2019. Six ongoing RSP projects will be complete by June 30, 2019 and eight projects are scheduled to be completed in 2020 (see *Table 4*, above).
- An RFP for new projects funded with FY 2019 RSP funds will be completed in 2019. If the New Mexico Legislature passes FY 2020 funding for RSP (during the 2019 legislative session), the RFP will be used to allocate those funds as well.
- At least one NPS Success Story nomination will be submitted before September 1, 2019.
- NMED will continue to carry out its responsibilities under Section 401 of the Clean Water Act, regarding

dredge and fill permits.

- NMED will continue to carry out its duties under the New Mexico Mining Act. Surface Water Quality Bureau staff will conduct water quality reviews at active and proposed mining sites, review Mining Act permit applications, inspect mine sites, and ensure that mining activities will not violate surface water quality standards.

- In April 2019, a revised NPS Management Plan, describing NPS pollution control activities in New Mexico in 2019 through 2024, will be submitted to the EPA Regional Administrator for formal EPA review. Updates on this process are available at www.env.nm.gov/surface-water-quality/nps-plan.

- NMED will submit a grant application for Section 319 funding to implement the state's NPS Management Program in state fiscal years 2020 and 2021 (i.e., July 1 2019 – June 30 2021), by April 30 2019. The grant application will include a work plan that implements new elements identified in the 2019 NPS Management Plan.

NPS Management Program Problems and Concerns

Recent NPS Annual Reports described internal challenges with procurement. Contract development through RFPs, small procurements, and contract amendments continued to be challenging in 2018. For example, the RSP RFP was first submitted for internal review on July 20 2018, and was revised several times between July 20 and November 26 before being sent to the State Purchasing Division (SPD) for their review. SPD released the RFP on December 20, 2018.

The sub-grant process used to select and develop the two watershed-based planning projects and the four Section 319 implementation projects that began in 2018 was markedly more efficient and simpler. The new process eliminated the need for some of the procedural steps and requirements for RFPs and contracts and permitted more effort and attention to be applied towards the details of proposed projects. The sub-grant process developed by NMED follows examples of many other states for their NPS Management Programs, as well as several other programs in New Mexico (generally, with pass-through federal funding).

One watershed-based planning project completed in 2018, the Ute Reservoir Watershed-Based Plan (Project 14-I), did not result in an EPA-accepted watershed-based plan. The main reason given was that stakeholders were unwilling to acknowledge that their properties or ranching operations contribute pollutant loading to the Canadian River. This project is discussed in greater detail in its final report, available through the link in *Table 2* (above). Project officers for several other WBP projects report that their projects are behind schedule, for a variety of reasons. The technical challenges of pollutant load reduction modeling are among them. The Agua Chiquita Watershed-Based Plan project (Project 16-G) is experiencing delays stemming from multiple interrelated projects planned in the watershed by the Lincoln National Forest. SWQB staff are contemplating other approaches to completing WBPs described in the draft revised NPS Management Plan (www.env.nm.gov/surface-water-quality/nps-plan).

Federal awards occurring later in the year may continue to cause NMED's senior financial managers to hesi-

tate when asked to approve obligation of funds not yet awarded. For example, the initial award of Section 319 funds for state fiscal year 2018 was not made until April 17, near the end of the state fiscal year. A subsequent award and the long-term record of the program helped allay those concerns in the remainder of 2018. The uncertainty in the federal budget noted in the NPS Annual Report for 2017 did not result in additional delays in approval of new projects as was the concern one year ago.

NMED sent letters requesting information for the **Additional Management Practices by Non-NMED Agencies** section (below) to USFS, BLM, NRCS, NMDGF, and the state Energy, Minerals and Natural Resources Department (EMNRD) in late October and early November, 2018. Responses were received from one national forest (of five in New Mexico), NRCS, NMDGF, and the Forestry Division of EMNRD. Although agencies are given plenty of time to respond, NMED sometimes receives responses to these requests in late December or early January. The federal government shutdown which began in late December resulted in fewer responses to these requests than usual.

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 will set a deadline of February 28, 2019 for reporting 2018 load reductions. Information reported by NMED for calendar year 2018 will be available on line at https://tinyurl.com/NM-2018-Load-Reductions, and will be complete after mid-February.

Effectiveness Monitoring of NPS Pollution Controls

As in previous years, the primary Effectiveness Monitoring activities for 2018 included stream temperature monitoring, sonde deployments, and statistical analyses to determine the effects of restoration projects on water quality. Additional activities included outreach presentations, proposal evaluations, and workshops.

Stream temperature monitoring continued using the upstream/downstream before/after study design, with intermediate stations to bracket tributaries and better isolate the effects of restoration work. The Onset Hobo Water Temp Pro V2 loggers recorded stream temperatures at 15-minute intervals at 58 stations on 10 streams (*Table 1*). Forty new Hobo loggers replaced the older units which had limited battery life. The deployment period to capture the summer temperature regime starts in late May and early June and extends to late October and early November. Visits to most sites during August and September allowed for an intermediate upload with the waterproof shuttle, and inspection of the loggers, which is important to prevent data loss due to burial in sediment or exposure to air.

New stream temperature stations provided baseline data this year on several streams: three on La Jara Creek for planned restoration work on the Valles Caldera National Preserve, and two on Holman Creek, a tributary to Comanche Creek, which is slated for a Keyline Design wetlands restoration project.

Also this year, the Effectiveness Monitoring program added two new In-Situ Aqua Troll 600 sondes to replace our older units that had become unreliable. Deployments of these brand new sondes added to the post-implementation data set on the Rio de las Vacas, as they recorded field parameters, including dissolved oxygen, pH, conductivity, and turbidity.

Table 6: Streams Selected for Effectiveness Monitoring in 2018.

Waterbody	2018 Comments
Comanche Creek	Temperature monitoring continued in 2018, both as post-implementation and new baseline for the heavy equipment work to raise riffles and increase pool habitat this year.
Rio de los Pinos	Temperature monitoring continued following new rock structures in the Game and Fish property.
Bluewater Creek	De-listed for nutrients. Canopy cover increased dramatically from 4 to 57 percent. ANCOVA indicates temperature reduction across the full range, with a mean reduction of 1.6°C. Success Story nomination accepted and published on EPA website.
San Antonio Creek	Post-implementation temperature monitoring continued at all locations in 2018. The artesian well that feeds and cools the headwaters was capped and flow from it was reduced but not eliminated.
Redondo Creek	Temperature monitoring continued. The area continues to recover from the Thompson Ridge Fire of 2013 and subsequent debris flow in the project reach.
Rito Peñas Negras	Temperature monitoring continued on the upper and lower reaches by SWQB staff in conjunction with cooperator WildEarth Guardians, who also continued geomorphic and vegetation monitoring. Cattle were observed inside several exclosures.
Jaramillo Creek	Temperature de-listing based on the recent years of Effectiveness Monitoring data contributed to an official EPA Success Story that was completed in December. Monitoring continued at all stations in 2018.
Cow Creek	SWQB collected temperature data at the downstream sites (Project 18-C), while cooperators from the Upper Pecos Watershed Association collected data at the upstream sites (Project 16-C). Rehabilitation of the camping area on Santa Fe National Forest (Project 16-C) was completed in 2018.
Rio de las Vacas	Temperature monitoring continued on the Lower and Middle Vacas. Deployed sondes to measure field parameters during the fall index period on the Middle Vacas.
La Jara Creek	New temperature stations established at three sites to collect baseline data for upcoming RSP restoration project.

Results from preliminary data analysis are consistent with the general trend observed in past years, where peak summer temperatures in many streams have improved but still exceed the standard of 20°C for coldwater aquatic life in many cases. However, the projects are expected to have beneficial effects which will continue to increase as vegetation grows over the years. Data collection and analysis will continue to account for the lag time.

A highlight near the end of the year was the completion of the Jaramillo Creek Success Story on the Valles Caldera National Preserve. Following a period of review and analysis, EPA Headquarters accepted the nomination on December 20th, just in time to fulfill the goal of at least one Success Story per year. Jaramillo Creek saw several 319 and River Stewards projects, including "plug and pond" work by the Amigos de Valles Caldera, and fencing and planting by the WildEarth Guardians, all of which helped Jaramillo Creek meet temperature standards and get off the 303(d) list of impaired waters. Skewness in the Jaramillo Creek temperature data distribution hampered the statistical analysis and could not be rectified with the usual log transformations. Of many previous analyses, this was the first time that skewness precluded the use of analysis of covariance (ANCOVA). If this problem persists in future analyses we would need to employ non-parametric methods which we currently are not equipped to perform. While it would have strengthened the case for success to have this analysis, the Success Story proceeded nevertheless based on the de-listing.

Figure 1: A monitoring location on Jaramillo Creek just downstream of a fenced exclosure that was also planted with native vegetation.

This year the Effectiveness Monitoring coordinator trained several cooperators on the ANCOVA method using Excel (Grabow, Spooner, et al. 1998). Staff from Cimarron Watershed Alliance and Hermit's Peak Watershed Alliance came to the SWQB office for one-on-one training covering data collection, validation, and analysis which seems more efficient and effective than the larger group sessions.

The Effectiveness Monitoring Coordinator also participated again this year on the evaluation committee to select projects for 319 funding. This was the ninth year in a row serving on the committee, and the coordinator is the only member that participates each year. New this year: The Effectiveness Monitoring Coordinator also arranged for the committee members to visit the proposed field sites and meet with the project proponents to gain first-hand knowledge for a more informed review process.

Additional highlights in 2018 include:

- Presenting a poster on Bluewater Creek at the EPA National Nonpoint Source Workshop in Colorado Springs CO;
- Assisting MASS with water quality sampling on Comanche Creek for the Upper Rio Grande survey;
- Managing RSP and 319 Projects on Jaramillo Creek and Gallinas River to completion;
- Touring project areas with visiting EPA staff;
- Representing SWQB at the post-fire watershed rehabilitation workshop conducted by Santa Clara Pueblo.

We look forward to more informative Effectiveness Monitoring results and Success Stories in 2019.

Summaries for 319(h) Projects Completed in 2018

Ute Reservoir Watershed-Based Plan for Water Quality Restoration (Ute Reservoir WBP) (14-I)

Project cost: $66,604 (Section 319 funds), $60,660 (Match)

Ute Reservoir is a key part of eastern New Mexico's water future.

This project developed a draft WBP for the Ute Reservoir watershed, excluding the watershed of the Canadian River upstream of Conchas Dam. At the time this project was implemented, the Canadian River between Conchas Dam and Ute Reservoir had an impairment listing for *E. coli* with a corresponding TMDL that is still in effect. A principal tributary of the Canadian River in this project area, Pajarito Creek, had impairment listings and corresponding TMDLs for plant nutrients and *E. coli.* Ute Reservoir had impairments (but no TMDLs) for aluminum, mercury in fish tissue, and polychlorobiphenyls (PCBs) in fish tissue. In 2018 these impairment listings changed somewhat, with the Canadian River now listed as impaired only by temperature, Pajarito Creek listed for temperature and nutrients, and Ute Reservoir listed for mercury and PCBs. Listing history aside, maintaining reservoir capacity and water quality for future municipal water supplies are key concerns of several eastern New Mexico communities and the Eastern New Mexico Water Utility Authority (ENMWUA), which provided matching funds for this project. The Canadian River Soil and Water Conservation District implemented this project by serving as fiscal sponsor and arranging the services of Jack Chatfield who coordinated stakeholder meetings. ENMWUA supported the project through their technical contractor NV5 of Tucson, Arizona. Mark Murphy of NV5 drafted the WBP, which is available on-line at www.env.nm.gov/surface-water-quality/draft-wbp. EPA reviewed the draft WBP and found that it needs additional information describing management measures, such as location information. EPA's review letter is also available on the web site above.

On-The-Ground Improvement Projects for the Upper Gallinas River and Porvenir Creek Phase II (14-J)

Project cost: $230,700 (FY 2014 Section 319 funds), $163,084 (Match)

The Hermit's Peak Watershed Alliance (HPWA) developed this project addressing the temperature water quality impairment in the Gallinas River and Porvenir Creek located in the Upper Gallinas Watershed, in northeastern New Mexico. The project area included dispersed residential ownership with a higher population density centering in the unincorporated village of Gallinas. Improvement of the overall watershed condition included; land management measures which compromised river and watershed health were addressed by developing Riparian Sensitive Grazing Plans and assisting landowners with watershed friendly river front landscaping, and restoration activities occurred in degraded areas by improving road crossings and road drainage, and constructed stream channel enhancements. Through this funding, HPWA developed and submitted an addendum to the 2012 Updated Watershed Based Plan for the Upper Gallinas River addressing National Forest lands within the Santa Fe National Forest in the Upper Gallinas Watershed that had not been included in the original plan. A copy is available on-line at www.env.nm.gov/surface-water-quality/accepted-wbp/.

Stream Channel Enhancement - Pre-treatment.

Stream Channel Enhancement - Post-treatment. To restore healthy instream conditions important to reducing stream temperature, improving oxygenation and improving overall stream health. at this project site 7 boulder and log instream structures were installed (cross vanes, log jams, and j-hooks). All structures created deep water areas, step pools, riffles, narrowed stream width and anchored streambanks. A considerable effort also occurred to remove debris and reshape part of the channel that had been significantly degraded by a dam installed illegally by a previous landowner.

Upper Gallinas River Monitoring (15-E)

Project cost: $42,455 (FY 2014 Section 319 funds), $0 (Match-NWQI priority watershed monitoring project)

Monitoring location near a rock structure on the Gallinas River above Las Vegas, NM 2015.

The Hermit's Peak Watershed Alliance continued this monitoring project to document the effects of restoration on stream temperature, flow, canopy cover, and geomorphology on the Gallinas River between the Las Vegas Diversion and the USFS boundary in San Miguel County (HUC 1306000108). This reach was not meeting standards for the designated use of high quality cold water aquatic life due to temperature impairment, with probable sources of loss of riparian habitat and rangeland grazing. After a TMDL was completed in 2005 and a WBP in 2012, HPWA began restoration work which was completed in 2014. The Arroyo Pecos-Gallinas River watershed (hydrologic unit code or HUC 130600010805) has been designated a priority watershed by NRCS for implementation of agricultural conservation practices to improve water quality, under NWQI. This designation provided the basis for water quality monitoring which began in 2011 and continued with this project.

Jemez National Recreation Area Riparian Protection Project (15-T)

Project cost: $208,524 (FY 2014 Section 319 funds)

Fencing is installed along critical habitat and wetlands in the Jemez Mountains. The fence will prevent off-road vehicles and cows from impacting the riparian area.

This project was funded through a Memorandum of Agreement with the US Forest Service (USFS) to protect riparian area in critical habitat and restore fences at recreation areas along the Rio Cebolla in the Jemez Mountains. This waterbody is temperature and sediment impaired, and both impairments are believed to be exacerbated by the presence of off-road-vehicles and cattle grazing. Since the listing of the New Mexico meadow jumping mouse as a federally endangered species the riparian area along this stream was designated as critical habitat. The project tasks selected were prioritized by the USFS as necessary projects that were already cleared under the National Environmental Policy Act. USFS teams and a local contractor, Urban Trucking, completed the work in the summer of 2018.

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 will be 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.

Summaries for the New Mexico River Stewardship Program Projects Completed in 2018

Gallinas Village River and Floodplain Restoration (15-F)

Project cost: $292,746 (FY 2014 River Stewardship Program funds), $35,542 (Local Match)

Post treatment: project designs included channel narrowing and new cobble bar; the beaver dam that established shortly afterward was a natural bonus.

This project area was a desirable choice for river and floodplain restoration since it is one of very few remaining areas on the Upper Gallinas River that was in public ownership and had no existing infrastructure to impede design concepts. In 2013 through a city resolution, the City Of Las Vegas and Hermit's Peak Watershed Alliance (HPWA) embarked on a collaborative effort to create projects to restore the health of the Gallinas watershed. City Council agreed to work with HPWA to improve this project site at Gallinas Village and manage it for river and watershed health. It also provides an excellent demonstration site to showcase the process and benefits of river and floodplain restoration.

The Upper Gallinas River is the primary source of water for the City of Las Vegas and surrounding communities. Water quality of the Upper Gallinas River is compromised as indicated by its listing as temperature impaired. The water quality impairment is also indicative of larger issues related to degraded conditions in the Gallinas River and its watershed as a whole; namely degraded riparian vegetation, degraded stream channel morphology, lack of floodplain access, and a loss of wetlands. The restoration methods employed in this Gallinas Village River and Floodplain Restoration Project consist of stream bank enhancement and plantings, excavation of a floodplain swale to allow river water to more easily spill onto the floodplain, and restoration of native vegetation to the historic floodplain.

Pecos River Dalton Day Use Area River Restoration Project (15-G)

Project cost: $215,086 (FY 2014 River Stewardship Program funds)

Pre-construction view looking downstream.

Post-consturction repeat photo showing narrowed channel, stream structures and pool formation.

The Pecos River at the south end of Santa Fe National Forest (SFNF) Dalton Day Use Area was heavily impacted by sediment and ash deposits from two years of post-Tres Lagunas Fire run-off and the estimated 100-year flood of September 13, 2013. Significant deposits of fine sediment occurred in the stream. Banks were eroded, widening the river channel, thus reducing water depth. Most of the river's channel through the project area was shallow and wide, lacking good trout habitat. The Upper Pecos Watershed Association (UPWA) collaborated with project partners including the Pecos Ranger District of the SFNF, the Pecos Business Association, Riverbend Engineering and Pathfinder Environmental.

The project construction consisted of placing bio-engineered bank protection in the form of large trees buried in the bank with root wads exposed to push river water back toward the middle of the channel near the upper end of the project area to reduce flow energy in the floodplain during future floods. A series of rock weirs and plunge pools were constructed to create self-scouring pools that maintain water flow in the middle of the channel. The excavated material from the pools was spread along the bank to create gravel bars in order to reduce the overall width of the channel and restore the bank. A rock gabion at the upstream end of the project area was removed to allow floodwaters to naturally spread out into the floodplain during flood events. Riparian vegetation was planted in bare areas.

The stream restoration project has attracted a high volume of visitors to the site. The UPWA has worked in partnership with the Pecos Ranger District to install two portable toilets and provide weekly clean-up of the day use area.Volunteers from UPWA and the Pecos Business Association stepped in to help defray some of the maintenance time and costs because the Forest was unable to handle the increased maintenance needs.

San Juan River Restoration Project (Parts 1 & 2) (13-G & 15-H)

Project cost: $331,940 (FY 2013 & 2015 River Stewardship Program funds)

This project was conducted along 4 miles of riverbank on the San Juan River (Cañon Largo to the Navajo Reservoir) assessment unit, just below the Navajo Dam. Restoration work was completed at the Pumphouse Day Use Area, Hammond Diversion, Taylor Pond, Munoz Waterfowl Park, Cottonwood Campground, and Texas Hole – covering a combination of land managed by the Bureau of Land Management, Bureau of Reclamation, New Mexico State Parks, and privately-owned land. The primary threats to water quality in this segment are catastrophic wildfire, lack of stream shading, and degradation of riparian areas. All three of these concerns are exacerbated by the high density of non-native invasive trees (Russian olive and salt cedar). Downstream of the project area, the San Juan River is impaired due to *E. coli* and sedimentation. With these funds, the San Juan Soil and Water Conservation District and their subcontractors improved riparian conditions benefiting water quality by removing over 200 acres of Russian olive and salt cedar (74 acres using mechanical equipment and 134 acres using a herbicide), and revegetating 258 acres with native grasses, planting 6,000 willow stakes and 700 cottonwood poles.

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Munoz Waterfowl Park
The Munoz site is recovering very well. As shown in the North transect picture, a stand of solid tamarisk i.e. salt cedar was replaced by bare mulch and Canada thistle in 2015, and is now nearly solid willows.

Track Fire Burn Area Perennial Stream Restoration Project (15-I)

Project cost: $149,990 (FY 2015 River Stewardship Program funds)

Segerstrom Creek upstream of Lake Maloya. An example cross-vane is visible in the foreground, and a stabilized bank is visible in the background.

This project was implemented on Segerstrom Creek upstream of Lake Maloya, on land owned by the City of Raton, in Colfax County. Lake Maloya and Segerstrom Creek are key parts of the water supply for Raton, and Segerstrom Creek had been badly affected by the 2011 Track Fire. The United States Geological Survey estimated a probability greater than 80 percent that a debris flow in Segerstrom Creek with a volume greater than 100,000 cubic meters would occur as a result of the fire. The City of Raton responded quickly (with support from the Water Trust Fund) by installing sediment detention basins in tributary canyons and allowing Lake Dorothy (a second reservoir upstream of Lake Maloya) to function as a sediment detention basin. This project supplemented the earlier work by stabilizing 2,600 feet of Segerstrom Creek, further reducing sediment loading to Lake Maloya and improving riparian habitat. Twenty-five rock and log structures, ten rock cross-vanes, and one rock sill were constructed. Additionally, channel and bank shaping, floodplain excavation, riffle hardening with medium cobble, and replanting with riparian vegetation were conducted as part of the project.

Middle Percha Creek Silver Fire Rehabilitation Project (15-J)

Project cost: $4,542 (FY 2014 River Stewardship Program funds)

Middle Percha Creek drains the east side of the Black Range and after merging with the other tributaries to form Percha Creek flows to the Rio Grande. After the Silver Fire, Middle Percha Creek experienced a large flood event in the fall of 2013. That event placed significant amounts of debris along the Creek and homes within the community of Kingston were flooded. There was substantial damage caused by ash flows from the burn scar and excessive sediment was deposited throughout the home owners' properties and orchards in Kingston. The accumulation of debris along Middle Percha has led to a loss of diversity in the vegetative community, and thus a less healthy and diverse habitat for fish and wildlife in this area. Due to sedimentation, the water quality in the stream has been diminished and aquatic invertebrate habitat has been negatively impacted. All of this has led to a less than healthy riparian area. The Sierra Soil and Water Conservation District (Sierra SWCD), in cooperation with the Gila National Forest designed post-fire treatments to address some of the watershed instability in Middle Percha Creek above the town of Kingston.

In the summer of 2016, a contractor selected by the Sierra SWCD installed fourteen sediment control structures on small ephemeral tributaries of Middle Percha Creek. The locations were chosen with input from the Sierra SWCD, Gila National Forest hydrologist and soil scientist, the Black Range Ranger District biologist and staff from the Surface Water Quality Bureau. In August 2016, approximately 2 acres of high-severity burn-scar were reseeded using native species selected by the Gila National Forest. Follow-up inspections in 2017 showed that the sediment retention structures were functioning as designed with most of them at capacity and sequestering sediment higher in the watershed and preventing it from being mobilized into Percha Creek. Germination and establishment from the reseeding was also good with the 2 acres showing good recruitment of both seeded species and other than were recolonizing the site naturally.

Middle Percha Creek.

Restoring Hydrologic Functioning to the Rito de los Indios, Valles Caldera National Preserve (15-L)

Project cost: $172,000 (FY 2015 River Stewardship Program funds)

This project was implemented by WildEarth Guardians (Contractor) and the National Park Service (land manager) on Rito de Los Indios, located on the north side of Valles Caldera National Preserve. The Rito de Los Indios sub-watershed suffered from a high-intensity burn during the 2011 Las Conchas Fire. Post-fire flooding caused erosion and debris flows. The project goal was to improve stream channel form and function and reduce sediment loading. Sedimentation was reduced by the capture of sediment in plug and pond wetland restoration structures in three tributaries of Rito de los Indios and La Garita Creek. Overflow from the plug and pond structures flows across re-invigorated wetlands with robust wetland vegetation, which also removes sediment. The machine-built plug and pond structures were augmented by other machine and hand-built structures that stop erosion and spread water over wetlands. Volunteers from Albuquerque Wildlife Federation assisted with volunteer work. A total of 132 structures were built by machinery and volunteers, including: one rock dams, rock arch dams, Zuni bowls, contour swales, constructed channels, rolling dip road drains, and porous fill road crossings. The project work positively impacts 8.7 miles of creek and 40 wetland acres.

La Garita Creek, a tributary to San Antonio Creek included in this project. Volunteers building rock structures to spread water and arrest erosion.

San Vicente Creek Urban Watershed Restoration Project (15-M)

Project cost: $138,221 (FY 2014 River Stewardship Program funds)

Urban Treatment – Stream Dynamics Inc. removed approximately 100 sq. ft. of existing impermeable concrete apron at this project site. Curb cuts and multiple water harvesting basins planted with native species were designed and constructed in this right-of-way to intercept stormwater runoff.

San Vicente Creek is a stream located in the heart of downtown Silver City, NM in Grant County. It is located within the Mimbres Basin watershed. This urban project was conceived by Stream Dynamics, Inc., in cooperation with the Town of Silver City, to include a two-treatment approach to reduce sediment, nutrients and *E. coli* from directly entering the stream. An urban treatment component included designing and constructing a combination of 80 water harvesting projects consisting of armored water basins with plantings, curb cuts, French drains and rolling dips on Town of Silver City parks, right-of-way and open spaces and a riparian treatment focused on invasive tree removal, planting of native species and bank stabilization.

Middle Jaramillo Creek Water Quality Improvement and Riparian Restoration Project (15-P)

Project cost: $139,750 (FY 2014 River Stewardship Program funds) Local Match: $145,500

During this project from 2015-2018, the WildEarth Guardians planted and protected riparian vegetation on Middle Jaramillo Creek within the Valles Caldera National Preserve in Sandoval County, NM (SWQB assessment unit AU: NM-2106.A_12 East Fork Jemez to headwaters, in the East Fork Jemez River Basin HUC 130202020203). The primary land uses in the valley were livestock grazing and recreational use, which are the probable sources for temperature and turbidity impairments due to a lack of riparian vegetation and absence of shade. This project expanded the restoration area of previous 319 projects nearby, and collectively resulted in an official EPA Nonpoint Source Success Story following the removal of the temperature impairment from the 303(d) list.

Jaramillo Creek has become a viable trout stream again, as demonstrated by this small brown trout caught in 2016.

El Rito Creek Habitat Enhancement and Bank Stabilization Project (15-Q)

Project cost: $173,835 (FY 2015 River Stewardship Program funds)

El Rito Creek, near Santa Rosa New Mexico. Example of a bank stabilization (toe rock) structure tied into a cross vane. Note wetland vegetation associated with a spring at left of photo and riparian woody vegetation colonizing streambank behind structure on the left.

The project site is located in the village of Santa Rosa, in Guadalupe County NM. El Rito Creek is a tributary of the Pecos River (Assessment Unit ID, NM-9000.A_050, Water Quality Standards Reference 20.6.4.212) and is assigned coldwater aquatic life use. The *2012-2014 State of New Mexico §303(d)/§305(b) Integrated Report* indicated that these and primary contact uses were not supported due to total ammonia and *E. coli*. This urban reach of El Rito Creek was characterized as having little fish holding habitat, high streambank erodibility, and poor recreational access due to invasive Russian olives and salt cedar trees. Basin Hydrology was tasked with completing habitat improvement work that began in 2016 by a previous contractor. The project included constructing a series of bankfull/flood plain benches to improve floodplain connectivity and to reduce near bank stress/bank erosion. Cross-vanes and j-hooks were installed to enhance aquatic habitat and to provide grade control. Large woody debris (LWD) was used to provide bank and in-channel structural diversity for fish habitat. LWD consisted of tree boles (root wads), large tree boles without a root fan, and large diameter limbs. Toe rock, sod mats, and seeding were employed to stabilize structures and/or to accelerate bank revegetation.

South Valley Albuquerque State Trust Land Riparian Project (18-D)

Project cost: $159,975 (FY 2015 River Stewardship Program funds)

This project was implemented by WildEarth Guardians (Contractor) and the NM State Land Office (land manager) along both banks of the Rio Grande, south of the Valle de Oro National Wildlife Refuge. The area is an important wildlife corridor and provides habitat to a diverse assemblage of amphibian, reptile, mammal and bird communities. It also provides recreational opportunities for people in an urban area, including hiking and wildlife viewing. The encroachment of non-native trees and shrubs (salt cedar, Russian olive, and Siberian elm) had significantly degraded the native riparian habitat and posed a fire threat and potential sediment loading into the river. The goal of the project was to restore the riparian area to create representative historic riparian communities typical of the Rio Grande corridor. Establishing native vegetation helped stabilize the soils and improve wildlife habitat. Non-native woody vegetation was removed from 16 acres using an extractor and hand cutting. Removed vegetation was mechanically chipped and spread on 16 acres. Stumps were piled and left onsite for wildlife habitat. Native vegetation was planted on 25 acres, including 800 cottonwood poles, 400 Gooding's willow poles, and 15,000 coyote willow poles. Poles were planted in holes that were mechanically augered to the water table, and individual exclosure fences were installed around the cottonwood poles that were planted close the river to protect the trees from beaver predation.

Rio Grande on the South Valley Albuquerque State Trust Land. View looking southeast at newly planted willows in an area that was previously choked with Russian olive.

Wetlands Program

Funding Awarded to the Wetlands Program in 2018

One new Wetlands Program Development project and one partial project were awarded funding by EPA Region 6 in 2018. The federal grants for these projects total $750,697.00 in federal assistance awarded through the FY17-18 EPA Wetlands Program Development Grant Program authorized by Clean Water Act 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 2017 Wetlands Program Plan.

1) Mapping and Classification of Wetlands in the Lower Rio Grande Basin, New Mexico. This project was partially funded in 2017. A grant award amendment in 2018 increased federal funding for this project so that this project is now fully funded. This project will map and classify wetlands in south central New Mexico as part of our efforts to update mapping of all New Mexico's wetlands. The project area includes the Lower Rio Grande Basin, the San Andres and Organ Mountains and contiguous areas. Project tasks include conducting a literature search, acquiring imagery, assembling a geodatabase, pre- and post-mapping field reviews, performing Cowardin classification (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 six 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 13,500 square miles (~225 quadrangles) for areas of southern New Mexico where little wetlands information or mapping is currently available and adjoining previous and ongoing mapping efforts. Functional correlation, HGM subclass assignments, classified segments, presentations and interactive mapping resources are additional products.

2) New Mexico Rapid Assessment Method for Slope Wetlands, and USACE NMRAM Phase New Mexico. *This 4-year project will further develop and validate our Rapid Assessment of New Mexico Wetlands (NMRAM) and increase its applicability to headwater slope wetlands in the Upper Rio Grande, Chama, and Canadian watersheds and the Jemez Mountains in North Central New Mexico. This project will continue refinement of a Regulatory Module NMRAM (NMRAM Reg.) for the US Army Corps of Engineers (USACE). The tasks for this project are to 1) complete data collection and analysis to refine our subclass descriptions and regional models, 2) publish a new NMRAM Manual Module, a Field Guide, and electronic data collection worksheets for headwater slope wetlands, 3) continue to test and refine the NMRAM Reg., 4) continue coordination of the NM Northern*

and Southern Wetlands Roundtables, 5) conduct NMRAM trainings and outreach, and 6) continue integration and improve functionality of SQUID web-based database for wetlands data. Final products will include 1) data, assessment and stressor identification for headwater slope wetlands subclass, 2) aerial extent of the subclass and selection of 40 reference wetland sites, 3)refined subclass definition for the Rio Grande, Chama and Canadian Watersheds, and Jemez Mountains reference domain, 4) validation and refinement of metrics, indices and protocols for wetlands assessment, 5) NMRAM Module, Field Guide and electronic datasheets for headwater slope wetlands and updated NMRAM Reg. 6) trained end-users for NMRAM and NMRAM Reg. methods, 7) updated SQUID database, and 8) technical transfer through demonstrations, training, presentations and meetings.

Wetlands Roundtables

In 2018, the Wetlands Program hosted four Wetlands Roundtables, two in the winter (early 2018) and two in the fall.

The SWQB Wetlands Program conducted 2 successful Wetlands Roundtables in January 2018 and both the Northern and Southern Wetlands Roundtables were co-sponsored by the Upper Pecos Watershed Association, Santa Fe Fly Fishing School and River Bend Ranch.

More than 86 participants attended the Northern Wetlands Roundtable in Santa Fe on January 18, 2018. Presentation topics included an update by the Corps of Engineers and presentations on "Wetland Restoration and the Recovery of Endangered Plants," "The Plug and Pond Treatment: Restoring Sheet Flow to High Elevation Slope Wetlands in New Mexico," "Springs Inventory on the Cibola National Forest," "US Bureau of Reclamation Wetland/Habitat Projects and Advanced Credit Mitigation," "Habitat Restoration and Management of Native and Non-native Trees in Southwestern Riparian Ecosystems," and "Candelaria Farm Preserve Management Plan, Albuquerque." Roundtable discussions among the participants included slope wetland restoration methods, and groundwater dependent systems such as that at Santa Rosa Cienega and Cibola National Forest springs.

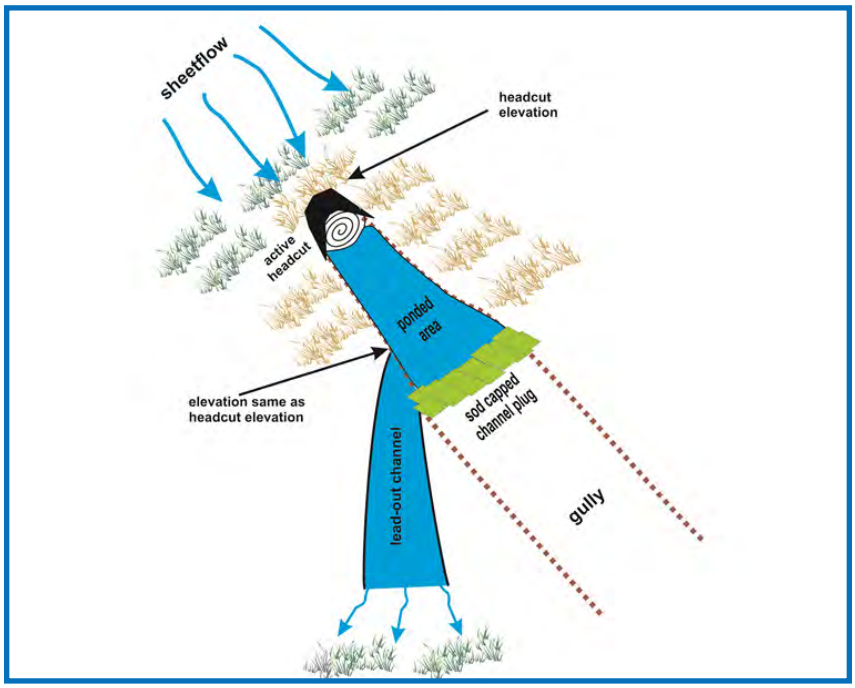


Figure 1.
Plug and Pond structure diagram used to control a headcut in a gully in the presentation by Bill Zeedyk, "The Plug and Pond Treatment: Restoring Sheet Flow to High Elevation Slope Wetlands in New Mexico" at the Northern Wetlands Roundtable, January 18, 2018.

Figure 2. The New Mexico endangered Great Plains lady's tresses and Pecos sunflower from the presentation by Daniela Roth, "Wetland Restoration and the Recovery of Endangered Plants" at the Northern Wetlands Roundtable, January 18, 2018.

The Southern Wetlands Roundtable was held at Las Cruces City Hall on January 23, 2018 with 27 participants attending. Presentations included "Acequias and Wetland Hydrology," "Spatial Variability and Stream Temperatures in Black Canyon," "Restoring Playas in Eastern New Mexico," "The Knowns and Unknowns of Playas in New Mexico," "New Mexico Non-Point Source Program Update," "Effectiveness Monitoring Success Stories with ANCOVA," and an update by the Corps of Engineers as well as lively discussions among the attendees.

Figure 3. John Moeny (SWQB Silver City) deploying thermal data loggers in deep pools at Aspen Canyon and Bonner Canyon to characterize Gila Trout habitat, from "Spatial Variability and Stream Temperatures in Black Canyon," presentation by John at the Southern Wetlands Roundtable, January 23, 2018.

The SWQB Wetlands Program also conducted 2 successful Wetlands Roundtables in Fall 2018. Again, the Upper Pecos Watershed Association and Santa Fe Fly Fishing School co-sponsored both Roundtables and Tetra Tech, Inc. also co-sponsored the Northern Wetlands Roundtable.

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.

Figure 4. 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.

Figure 5. 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.

Wetland Projects Completed in 2018.

No Wetlands Program projects funded under CWA Section 104(b)(3) Wetlands Program Development Grants were completed this year.

Technical Documents Completed by the Wetlands Program in 2018.

The Wetlands Program released two new technical documents this year as deliverables for ongoing Wetlands Program Development Grants. These include:

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 (WAP) 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 pri-

vate 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.

Muldavin, E.H., E.R. Milford, and M.M. McGraw 2017. *New Mexico Rapid Assessment Method: Playa Wetlands Field Guide. Version 1.2*. New Mexico Environment Department, Surface Water Quality Bureau, Santa Fe, New Mexico. (www.env.nm.gov/surface-water-quality/wetlands-rapid-assessment-methods).

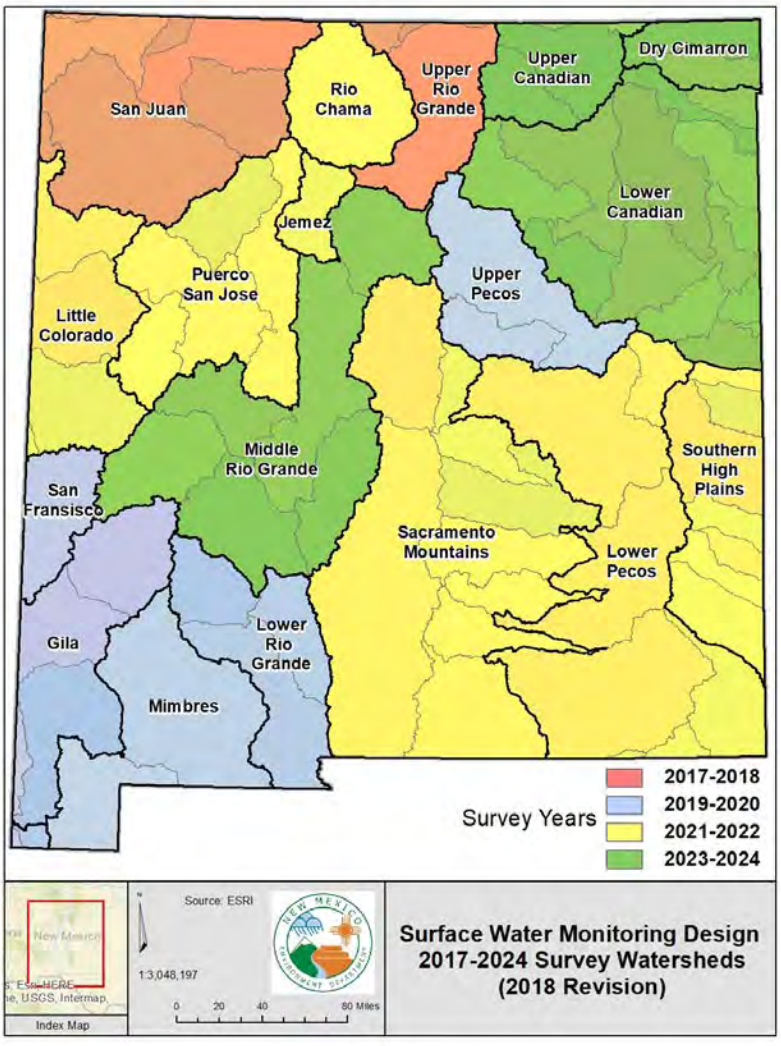
This New Mexico Rapid Assessment Method (NMRAM) Field Guide provides procedures for conducting a rapid ecological assessment of playa wetlands in the Southern High Plains of eastern New Mexico. The NMRAM Field Guide for Playa Wetlands provides specific protocols and datasheets for evaluating ten playa wetland ecological condition metrics using a combination of GIS-based measurements and field surveys, completing a set of stressor checklists, annotating field maps and taking documentary photographs to complete an NMRAM for Playa Wetlands Assessment package. In addition to details on metric measurements, appendices are provided that include the data collection worksheets, a plant species list with wetland indicator status, soil sampling guidelines, and a glossary of terms.

Other Water Quality Protection Programs

Monitoring, Assessment and Standards Program

Water Quality Surveys

Similar to many states, the SWQB utilizes a targeted, rotational watershed approach to ambient water quality monitoring. Beginning in 2015, the SWQB began implementing two-year monitoring surveys. 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. In 2018, the two-year water quality survey in the Upper Rio Grande and San Juan watersheds was completed. The 2019-2020 water quality survey will focus on the Upper Pecos River, Lower Rio Grande, San Francisco River, Gila River and Mimbres River watersheds. The survey includes sampling at 138 monitoring locations within 131 stream assessment units and 29 lake assessment units covering 1874 stream miles and 11,908 lake acres. In addition, 30 monitoring sites per year will be 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.



Eight Year Survey Plan

Following completion of the survey, a report summarizing the data collected will be available from the SWQB website (Summer 2021).

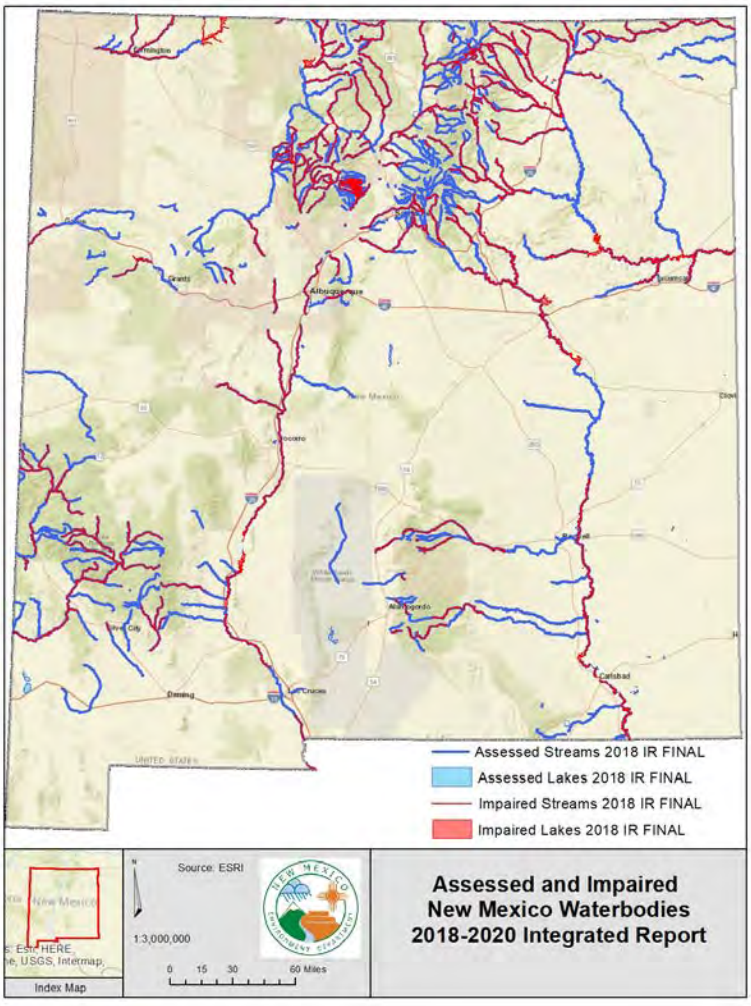
Clean Water Act §303(d)/§305(b) Integrated Report Update

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 (IR)*.

According to the 2018-2020 IR, nearly 4,091 out of 7,825 categorized stream miles (52%) have identified impairments where water quality does not support applicable designated uses. Approximately 58,687 out of 89,042 (66%), categorized publicly-owned lake, reservoir, or playa acres do not fully support applicable designated uses. Using available data assessed against current designated, existing, or attainable uses utilizing established assessment protocols, the department has found that temperature, nutrient-eutrophication, and *E. coli* are the three most common causes of river and stream water quality impairments based on stream mileage in New Mexico. NPS pollution such as agriculture/grazing, road/bridge runoff, on-site treatment systems (i.e., septic tanks) and loss of riparian habitat are the leading probable sources of impairment in New Mexico's rivers and streams. The three most common causes of water quality impairments in lakes and reservoirs based on acreage are mercury in fish tissue, PCBs in fish tissue, and temperature. The State has issued fish consumption advisories for several fish species in 26 lakes and reservoirs and three (3) rivers due to elevated concentrations of various contaminants, including mercury, dichlorodiphenyltrichloroethane (DDT), and polychlorinated biphenyls (PCBs).

The 2018-2020 IR and supporting documentsare available at: www.env.nm.gov/surface-water-quality/2018-2020-ir.

The state is currently preparing the draft 2020-2022 IR. SWQB's Comprehensive Assessment and Listing Methodology (CALM) will be reviewed and revised as needed spring 2019 to improve designated use impairment determinations, and is available at: www.env.nm.gov/surface-water-quality/calm.



Assessed Streams, 2016-2018 IR

Water Quality Standards Update-Triennial Review

The federal Clean Water Act (CWA) related regulations in 40 C.F.R. Part 131 and the provisions in the New Mexico Water Quality Act (Chapter 74, Article 6 NMSA 1978) require the State to develop, review, revise and adopt water quality standards (WQS) that protect public health or welfare, enhance the quality of water, and serve the purposes of the CWA. New Mexico's Standards for Interstate and Intrastate Surface Waters (20.6.4 NMAC) establish WQS that consist of designated uses for surface waters of the State, the water quality criteria necessary to protect the uses, and an antidegradation policy to protect the water quality.

While the WQS may be revised as needed, the CWA at 33 U.S.C. §1313(c)(l), and the water quality standards rules at 20.6.4.1 O(A) NMAC also require the State to initiate a comprehensive review and consequential update of the WQS rules from time to time, or at least every three years, in a process known as the Triennial Review.

The SWQB began identifying priorities for the most-recent Triennial Review in 2012 and initiated the 2013 Triennial Review with an informal scoping phase for public feedback during April and May of 2013 to identify priorities for potential changes to the WQS. Proposals for changes were developed into a discussion draft which was noticed for public review and comment during April and May of 2014.

Throughout the 2013 Triennial Review process, SWQB met and worked with groups when requested to discuss their concerns. The SWQB presented its 2013 Triennial Review proposals to the Water Quality Control Commission (WQCC) in public hearings held on October 13-16, 2015. The WQCC granted approval of the proposals at the September 13, 2016 Commission meeting and issued a Statement of Reasons and Final Order for the proposed amendments to the Standards for Interstate and Intrastate Waters, 20.6.4 NMAC on January 10, 2017. The Standards, as approved, were published and became effective for State purposes on March 2, 2017. Subsequently, the SWQB submitted the WQCC-approved standards to the EPA on March 14, 2017 for final approval under CWA Section 303(c). EPA issued a Technical Support Document (TSD) on August 11, 2017 providing support and comment on the proposed changes and approved most provisions for CWA purposes. The WQCC responded to clarify and assert positions regarding the elements noted in the TSD. Scoping for the next Triennial Review is scheduled to begin January 2019.

Use Attainability Analyses and Aquatic Life Use Changes

A Use Attainability Analysis (UAA) is a regulatory tool established in the water quality standards (20.6.4.15 NMAC) in which a multi-faceted approach is used to evaluate the environmental and/or economic factors affecting the attainment of a use for a waterbody. The application of the UAA process is allowed under certain conditions as stipulated in the state's standards and in federal regulations (40 CFR 131.10(g)). SWQB has subsequently developed another tool, the Hydrology Protocol (HP), a technical procedure in the Water Quality Management Plan (WQMP) which is a required Clean Water Act document approved by WQCC and EPA. The HP may be used to distinguish between ephemeral, intermittent and perennial streams and rivers in New Mexico. It also generates documentation of the attainable aquatic life uses supported by those waters

as a result of the flow regime. The UAA process alone or in combination with the HP has been applied to support aquatic life use refinements and revisions to the WQS. Such refinements as allowed under the CWA and the WQS are important because they help assure that appropriate water quality standards are applied to a waterbody.

The SWQB has been working on several new UAAs, some are being proposed by the Bureau while a few are being proposed by outside entities or in collaboration with the SWQB. The SWQB has concluded its investigations for portions of Tecolote Creek in San Miguel County and Dog Canyon Creek in Otero County. The UAAs demonstrate that a coolwater aquatic life use is the most protective aquatic life use that is naturally attainable in these waters. Following WQCC approval, Dog Canyon and Tecolote became effective for state purposes on February 14, 2018. EPA approved Tecolote for CWA purposes in September 2018. The Village of Ruidoso/City of Ruidoso Downs Joint Use Board (JUB) completed a UAA assessing dissolved oxygen and temperature criteria on the Rio Ruidoso and Rio Hondo. The UAA is currently under review. The SWQB has participated in public discussions, meetings with the JUB and will continue assisting with the technical and administrative requirements as the UAA development progresses. The SWQB has approved a workplan for an HP UAA from Sandia National Labs focused on portions of Tijeras Arroyo. An HP UAA for various stream reaches and subwatersheds on Lee Ranch Mine property was completed and is currently under review by SWQB and EPA prior to beginning the hearing process. The Hydrology Protocol is being conducted on various stream reaches in and around Los Alamos National Laboratory (LANL) on the Pajarito Plateau to determine natural flow regimes and evaluate the attainable uses supported by these waters. LANL submitted a workplan regarding an ALU temperature UAA for Sandia Canyon. The SWQB scoping Canadian River watershed ALU temperature UAAs and identified data needs for standards revision in the Gila River and San Francisco River watersheds.

Other Standards Updates

The SWQB Monitoring, Assessment and Standards Section records potential water quality standards issues in a tracking spreadsheet. This information is considered and updated during every CWA Section 305(b)/303(d) listing cycle and during survey planning. Data needs for standards changes and the availability of critical data are evaluated and additional data collections are scheduled, as identified. The data for candidate standards changes are compiled and used in the development of documents to support recommended revisions. Depending on the timing, petitions for standards revisions can be incorporated as part of a Triennial Review or be presented at hearings before the WQCC as an independent standards revision (i.e., revisions between Triennial Reviews). The SWQB has identified a need to develop UAA workplan guidance to assist third parties in planning proposed standards revisions.

In addition, SWQB has been working closely with EPA to develop a temporary standard implementation plan. The focus of this project is to develop nutrient temporary standard proposals for five demonstration facilities in New Mexico that are discharging into nutrient-impaired waters. This is a collaborative effort with the affected NPDES permittees, EPA Region 6, EPA Headquarters and a contractor, TetraTech. A goal of this effort is to develop a guidance document that describes a stepwise approach for developing a temporary water quality standard and associated milestones, including: (1) determining eligibility for a temporary standard;

(2) if eligible, justifying the temporary standard based on 40 CFR 131.10(g) – for example, in the demonstration projects, by evaluating whether the cost to implement the technology that could meet standards would cause substantial and widespread economic and social impact to the community; and (3) determining the highest attainable condition and term of the temporary standard. The project was initiated in June 2016 and a conceptual model was completed in February 2017. TetraTech has completed working on the substantial and widespread analysis for two demonstration facilities. Public notification and hearing for the first demonstration facility are scheduled for 2019. TetraTech will focus on the other three demonstration facilities, which are expected to be completed sequentially throughout 2019.

Visit the SWQB Standards web page for updates, at www.env.nm.gov/surface-water-quality/wqs/.

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 2018, the SWQB developed dissolved aluminum TMDL withdrawal actions for Whitewater Creek, the Rio Puerco, and the Rio Chamita and aluminum TMDL updates for the Jemez River and Middle Rio Grande.

Both aluminum TMDL withdrawals and aluminum TMDL updates were approved by the WQCC on March 13, 2018 and EPA on April 27, 2018. A public meeting was held in Las Vegas on June 12, 2018 for the Tecolote Creek temperature TMDL. WQCC approval was received for the Tecolote Creek TMDL on August 15, 2018 and EPA approval was received on September 13, 2018. SWQB continues work on aluminum, *E.coli*, plant nutrients, temperature, and turbidity TMDLs for the Canadian watershed and staff also began work on TMDL-alternative documents for the Cimarron and Santa Fe River watersheds in 2018.

Updates to the List of TMDLs and links to approved and pending TMDLs are available from the NMED SWQB TMDL web pages at: www.env.nm.gov/swqb/TMDL/List.

Tecolote Creek at San Geronimo, New Mexico.

Outreach and Education

2018 Outreach and Education activities:

- SWQB staff presented surface water information at a booth during the legislative session at the Round House in Santa Fe NM.
- The Incredible Journey was presented to students at the 2018 Energy and Water Fair in Gallup. Staff also presented to fourth-graders at this year's Santa Fe Water Festival and Rio Rancho Water Festival.
- Technical assistance was provided to San Ildefonso Pueblo and EPA regarding a monitoring QAPP.
- Assisted Pojoaque Pueblo Environment Department and EPA with ATTAINS development and submittals.
- Information was given to the State of Arizona regarding temporary standards (water quality standard variances).
- SWQB staff assisted with the STEM Santa Fe Expanding Your Horizons Conference for Young Girls of Santa and Northern New Mexico at the Santa Fe Community College.
- SWQB staff responded to an inquiry from Oklahoma regarding criteria for human health-organism only criteria and an inquiry from Colorado on state adopted MCL-based criteria.
- Twenty-eight sub-pages within the SWQB part of the NMED web site (www.env.nm.gov/surface-water-quality) were reformatted and updated in 2018 to provide more intuitive access to key information by users. Examples are a new page providing information on Wetlands Projects (www.env.nm.gov/surface-water-quality/wetlands-projects) and an updated page providing information on RSP (www.env.nm.gov/surface-water-quality/river-stewardship-program).

Winner of student poster contest.

SWQB staff presenting at the Rio Rancho Children's Water Festival

Ground Water Quality Bureau

Permitting and Compliance Assistance for Large Capacity Septic Tank Leachfields and Surface Disposal Facilities

Under Objective 5 of New Mexico's NPS Management Plan, the Ground Water Quality Bureau (GWQB) works to protect ground water quality from NPS pollution attributed to large capacity septic tank and leachfield systems (septic systems) and septage disposal facilities, sludge disposal facilities, and landfarms (surface disposal facilities). All surface disposal facilities and facilities discharging greater than 5,000 gallons per day of domestic wastewater to septic systems are required to obtain and maintain individual Discharge Permits through GWQB. Each Discharge Permit includes conditions and requirements intended to preserve, protect, and improve New Mexico's ground water quality for present and future generations.

Technical personnel in GWQB review Discharge Permit application, prepare and issue Discharge Permits, perform compliance assistance activities for permittees, and enforce Discharge Permit requirements for septic systems and surface disposal facilities. Throughout the permitting and compliance assistance process, GWQB staff provide outreach materials, assistance forms, and direct communication with permittees to aid them in meeting the requirements of their Discharge Permits. In addition, technical personnel perform routine site inspections to ensure that septic systems and surface disposal facilities are discharging pursuant to their Discharge Permits. Through these activities, GWQB can monitor discharges to ground water and require corrective action if contamination is detected. GWQB permitting and compliance activities for septic systems and surface disposal facilities support the goal of this project by aiding in the protection of ground water from these nonpoint sources that have potential to discharge nitrogen compounds, metals, and organic compounds. In 2018, GWQB Issued six New, Renewal, or Renewal and Modification Discharge Permits.

New Mexico Water Fair and Water-Quality Outreach Program

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, predominantly household septic tank/leachfield systems, cesspools and inappropriate agricultural practices. However, the extent and severity of potential contamination of drinking water supplies in rural communities of New Mexico is largely unknown. Most homeowners do not test their domestic well water for contaminants, because they are unaware of potential contamination or find the cost associated with water testing prohibitive.

To identify possible NPS water quality problems in rural New Mexico communities, GWQB has conducted free testing of domestic wells ("Water Fairs") throughout the state for over 10 years. The Water Fair Program reaches out to domestic well owners to help educate them about water quality issues and how they can help preserve or improve water quality in their communities. During the last several years, these activities have been carried out through EPA funding. The Water Fair Program has proven to be very popular with the general public, providing a visible and highly appreciated service with valuable information on ground water quality

in rural communities. NMED receives numerous request for water fairs from community organizations, NMED Field Offices, and other State, County, and City agencies, and private citizens. The Water Fair Program continues to be an important tool for identifying possible NPS water quality problems.

The Water Fair Program is also a great outreach tool. Water quality outreach events include the demonstration of a ground water simulation model (ant farm). The model is a hands-on visual aid that takes difficult ground water concepts and makes them understandable for all ages. Ground water demonstrations are often conducted in schools, community centers or state fair exhibits. Through the Water Fair Program, many families in rural New Mexico have become more knowledgeable about water quality, potential for contamination, and pollution prevention. In 2018, GWQB conducted 9 water fairs, receiving approximately 325 water samples. Overall, the amount of water fairs conducted and the level of public participation in 2018 proved to be successful.

To learn more about the Water Fair Program, visit www.env.nm.gov/gwqb/water-fairs/.

Flyer for Edgewood Water Fair held July 21, 2018.

CWA Section 401 Certification Activities

NMED staff continue to process water quality certifications under Section 401 of the federal CWA. The purpose of the Section 401 water quality certification is to ensure that Section 404 "Discharge of Dredge or Fill" permits issued or authorized by the U.S. Army Corps of Engineers (USACE) comply with state water quality standards. Since April 2012, the SWQB has issued informal confirmation of Nationwide Permits (NWP) activities, and formal 401 Certification is generally required only for 404 individual permits or when new permits are developed.

New Mexico 401 Water Quality Certification was issued for three Individual CWA §404 Permits and 47 actions covered by NWP were confirmed. Six actions covered by Regional General Permits and one USACE action for which the CWA §404(b)(1) process was completed were also confirmed and/or certified. Inspections were conducted on approximately 90% of all permitted activities. Six 404/401-related complaints were also investigated during this reporting period.

CWA Section 401 Water Quality Certification Activities 2018	
Confirmations	
Corps Authorizations under NWPs	47
Corps Authorizations under LOP NM-1	0
Corps Authorizations under LOP NM-2	0
Corps Authorizations under Emergency RGP	6
Total	53
Other Actions	
Enforcement	6
USACE 404(b)(3) Actions Certified	1
Individual Permits Certified	3
Total	10

The three individual §404 permits certified included a long-term flood protection project on the Rio Grande near Albuquerque, a river relocation action on the Rio Grande within the Bosque del Apache National Wildlife Refuge, and a bank stabilization project on the Rio Grande near Bernalillo New Mexico.

25 confirmations of NWPs, were associated with River/Wetland Restoration activities, NWP 27. Linear Transportation projects, NWP 14, accounted for 10 of the NWP confirmations, and Utility Line Activities, NWP 12, were the next most frequent activity with five actions confirmed. Maintenance, NWP 3, Bank stabilization NWP 13, Recreational Facilities NWP 42, and Stormwater Management Facilities NWP 43, made up the remaining NWP actions confirmed.

41 joint inspections of proposed or completed actions were conducted in 2018. These inspections were conducted by members of the SWQB WPS in coordination with representatives from the USACE.

Six complaints were investigated during this reporting period. Complaints typically reveal CWA §404 violations or unpermitted activities. WPS staff coordinated with the USACE and the SWQB Point Source section, when applicable, to resolve these complaints.

2018 Highlights:

• The ongoing effort to refine the definition for Waters of the United States (WOTUS) introduced some uncertainty in 2018. However, a strong working relationship exists between the USACE and the WPS and this helped avoid confusion due to any jurisdictional ambiguities.

• Staff worked closely with the USACE and Taos County in support of a new land use ordinance that expands wetland protection. The WPS and the USACE conducted numerous meetings, inspections, and wetland delineations as part of this effort.

• WPS staff initiated a 401 optimization effort in 2018, including fish passage guidance, written procedures, and an electronic filing system

USACE, USFS, NMED and contractor tour recently completed project of Forest Road 150 bridge over Black Canyon Creek in the Gila National Forest. April 2018.

New Mexico Mining Act Activities

The New Mexico Mining Act (19 NMAC 10) obligates NMED to review and comment on various applications associated with non-coal mining in New Mexico. Proposed actions range from recreational mining (such as panning for gold) to large mine and mill operations. For minimum-impact exploration application or modifications of existing exploration permits, NMED is provided an opportunity for formal comment. For new mining operations, NMED is responsible to "certify that water quality standards are expected to be met" and to determine that the proposed post-mining Closeout Plan will "achieve compliance with all applicable air, water quality and other environmental standards if carried out as described." For modification of existing operations, NMED has the opportunity to concur with proposed permit changes. Comment periods are typically twenty days from receipt of an application.

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) to review mining applications and otherwise support the work of the New Mexico Mining and Minerals Division (MMD) of Energy, Mining 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 Best Management Practices (BMPs) and other mitigation measures with MMD in an effort to implement mining plans that prevent or minimize environmental risks. The team's written comments often include conditions necessary to ensure compliance with both state and federal environmental standards. The team also participates in meetings and reviews documents in collaboration with EMNRD, New Mexico Department of Game and Fish, New Mexico State Lands Office (SLO), United States Forest Service (USFS), United States Army Corps of Engineers (USACE), United States Environment Protection Agency (USEPA), and others.

Figure 1. MMD, GWQB and permit applicant at the site of an exploratory copper mine near Lordsburg in Luna County.

In 2018, staff from the SWQB reviewed numerous mining notices, applications, close-out plans, operations plans, monitoring plans, reclamation plans and requests for release of financial assurance or bonding money held by the state as a guarantee for mine-site reclamation. The SWQB also reviewed permit applications and

associated documents for exploratory drilling programs, proposed new mining activities, and modification of existing mining activities. The following is a summary example of some of mining permit activities that occurred in 2018.

SWQB reviewed and commented on a corrective action plan for the Summit Mine located in far west Grant County. The gold and silver mine, which is currently on standby status and not active, received a 1" rain event during the spring of 2018 which caused a portion of the waste-rock stockpile to subside and slump. The toe of the waste-rock slope was pushed from the permitted mine boundary onto an adjacent section of BLM administered lands, and nearly into an adjacent intermittent creek. SWQB continues to provide comment as the plan is approved and corrective action is implemented to shore up the waste-rock pile and prevent material from entering the creek.

Figure 2. Samples of flourite found near the Spar Hill flourite exploration mine close to Silver City in Grant County.

In January 2018, SWQB along with NM Department of Game and Fish, staff from MMD and the Gila National Forest inspected a proposed minimum impact exploration permit in the Burro Mountains of Grant County. The applicant seeks to prospect for museum quality fluorite crystals. Specimens from the nearby area are of exceptional quality and featured at the Gem and Mineral Museum at the New Mexico Institute of Mining and Technology.

New Mexico is the nation's second largest producer of refined copper with an output of nearly 192,000 tons in 2017. The Chino copper mine in Grant County is the state's largest open pit facility. New Mexico Mining Act rules stipulate that existing mines must update their closure Closeout Plans every 10 years. These plans detail how a mine will move from active mining to reclamation to post-mining-land-use while guaranteeing long term environmental protection. SWQB reviewed and provided substantive comment for Chino's CCP submitted in 2018.

SWQB inspected the Deming Jigging Plant on several occasions in 2018. This facility located in Luna County was a manganese processing facility opened to support World War II efforts and continued operations until 2003. The site was reclaimed in 2005 resulting in the removal of all buildings, regrading of tailing stockpiles, placement of 1 foot of cover material, and reseeding. Inspections by

Figure 3. Members of the Mining Act team from GWQB inspecting tailing exposure at the Deming Jigging Plant near Deming. Note the Mimbres River channel adjacent to the tailings.

SWQB, GWQB and MMD revealed poor establishment of vegetative cover leading to wind erosion and tailing exposure. The operator submitted a corrective action plan which was reviewed and improved by SWQB comments. The corrective action plan was implemented in the summer of 2018 and subsequent inspections demonstrate improvement in site conditions. The applicant has requested termination of their groundwater discharge permit, and approval of their post-mining-land-use modification to "Industrial." If approved, the site may be released from bonding and their mine permit terminated pending final inspection by NMED, MMD and NMDGF in the next 3 years.

SWQB reviewed 2 minimal impact exploration permits in northern New Mexico. One was for precious metals near Golden in Santa Fe County and the other was for humate near Torreon in McKinley County. Humate is a highly organic substance from which humic acids can be extracted and used as a soil amendment in agriculture. For both permits, SWQB recommended a list of BMPs designed to minimize potential impacts to arroyos and waters of the state including minimum setbacks, proper road maintenance, and preparing and implementing a Stormwater Pollution Prevention Plan (SWPPP).

Figure 4. A view looking south at the successful revegetation and reclamation efforts at the U.S. Hill Mine with the Pecos Wilderness in the background.
Photo taken May 16, 2018.

SWQB reviewed an updated Closeout Plan for the Tijeras Mine and Mill in Bernalillo County. The Tijeras Mine and Mill is a cement manufacturing and limestone quarry that has been in operation since 1959. The current operator projects sufficient reserves to continue current production levels for at least the next 70 years. The Closeout Plan outlines channel restoration dimensions for Corral Canyon and Apachitos Canyon that will restore these waterways to their approximate original configurations once active mining operations cease. SWQB provided comments that included a list of natural channel design parameters such as channel slope, channel sinuosity, particle-size distribution, and riparian canopy that should be taken into account in order to ensure that the designed channel will be stable and will allow for water quality standards to be achieved.

SWQB attended a site visit with New Mexico Department of Game and Fish and the New Mexico Energy, Minerals and Natural Resources Department to the U.S. Hill Mine near Vadito in Taos County. Reclamation work was completed in 2007 for the 50-acre mica mine that closed in 2004. The contour furrows designed to slow surface runoff and reduce erosion were functioning properly and the hillslopes were well covered with vegetation which will protect water quality in the watershed from accelerated sedimentation.

SWQB reviewed a Supplemental Investigations Work Plan for the St. Anthony Uranium Mine that will be used to update the Reclamation and Closeout Plan. The St. Anthony Mine was an open pit and underground uranium mine near Seboyeta in Cibola County that operated from 1975 to 1981 and is currently undergoing abatement. For part of this review, SWQB evaluated water quality data collected by the operator during four sampling events in 2004. Uranium concentrations increased substantially from upstream to downstream of the ore-bearing materials during each sampling event, ranging from 2X to almost 50X the upstream concentration. The final Closeout Plan should include stabilizing the piles of ore-bearing materials, stabilizing Arroyo del Valle, and appropriate setbacks for the ore-bearing materials from the arroyo to ensure that surface water quality standards will be met upon closeout.

SWQB reviewed a Baseline Data Report that was part of the Permit Approval Requirements for a proposed new uranium mine in McKinley County near San Mateo. The purpose of the Baseline Data Report is to describe current environmental conditions. Among multiple comments, SWQB recommended that repeat water quality sampling be conducted over at least three seasons as required under the New Mexico Administrative Code. Proposed mine dewatering and subsequent discharges to waters of the U.S., which are included as waters of the state of New Mexico, will be covered under a National Pollutant Discharge Elimination System (NPDES) permit and will be treated to meet New Mexico surface water quality standards and effluent limitations set by the U.S. Environmental Protection Agency.

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 stability, 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 (NRCS)

The Natural Resources Conservation Service (NRCS) provided the following summary of projects implemented in calendar year 2018. Several watersheds highlighted below are priority watersheds under the National Water Quality Initiative (NWQI). More information on NWQI is provided above in the section, **Interagency Cooperation Highlights,** on page 19.

Lower Rio Grande Watershed

In FY 2018 NRCS continued its efforts in the Anthony Wash, Achenback, Mossman Arroyo and Alameda Watershed of the Rio Grande in Southern New Mexico. 171.1 Acres of irrigation water management, 1,711 feet of concrete ditch lining, three structures for water control, and 0.4 acres of cover crop were implemented in the Anthony Wash. 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 (EBID) water reducing excessive salts back in ground water.

Pictures of Cover Crops planted in the Anthony Wash as part of NWQI

Micro Jet Sprinklers were installed on 92.9 acres in the Achenback 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 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 tilth).

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

The Mossman Arroyo saw 3,623 feet of irrigation pipeline and one waste transfer installed. The practices in this watershed were planned to decrease airborne dispersal of *E. coli* as well as decrease nutrient, bacteria and pesticide runoff. These practices will assist with diluting flushing operations expanding on the applicant's comprehensive nutrient management plan.

In the Alameda Watershed, NRCS assisted with 3,975 feet of concrete ditch lining, 1,224 feet of irrigation pipeline, 72.9 acres of cover crops, and 40 structures for water control. All practices could contribute to decreased nutrient, bacteria, pesticide or sediment runoff as well as airborne dispersal of *E. coli*. Along with the water quality benefits and increased irrigation efficiencies, these practices (i.e. cover crop) assisted with improving soil health, reducing soil loss (seasonal erosion) and improving soil carbon (adding organic matter and improving water infiltration, soil aeration, and tilth). With this new system, well water with excessive salts will be mixed with surface EBID water reducing excessive salts back in ground water.

Practices associated with waste transfer planned and implemented in accordance with the NWQI.

Top picture shows cover crops planted through the NWQI. Bottom picture shows concrete ditch with a structure for water control also implemented though NWQI.

Gallinas Watershed

In FY 2018 a total of 43.5 acres of Forest Stand Improvement and 43.5 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 Fuel Break has been nearly completed and runs along the western edge of the Bradner Dam watershed area. The area has received prior treatments to include: Forest Stand Improvement, Woody Residue Treatment, Fuel Break and Grade Stabilization Structures "rock and brush dams."

All photos are of post Forest Stand Improvement areas within the Gallinas Watershed.

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 date beginning in FY 2019. The planned projects include cover crop, sprinkler systems (surface, subsurface and micro irrigation), structure for water control, irrigation pipeline, forage and biomass planting, and irrigation water management. All the projects and practices planned can contribute to decreased nutrient, bacteria or sediment runoff and/or decrease sediment, surface or pesticide runoff.

Emergency Watershed Protection (EWP) Program
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 2018 New Mexico had two natural disasters where EWP was requested by an eligible sponsor.

Ute Park Fire
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 will be constructed to protect property (structures) from hazards created by the fire. All projects are in the planned stage with a projected implementation date in early 2019.

The pictures above show structures threatened by debris created by the fire.

Ute Park Flood

The Ute Park Wildfire burned the upper reaches of the watershed directly above Ute Park which has changed the dynamics of the watershed. Heavy rains deposited debris (mostly consisting of rock and logs). This debris was deposited in locations where future flood events could redeposit the debris and harm life and property if not removed. Our engineers have completed a rough estimate of 400 tons of rock deposits along with several tons of other debris. Immediate temporary measures consisting of debris removal and jersey barriers were implemented through EWP to protect life and property.

The pictures above show the debris, mostly consisting of rock, which was deposited during a rain event in the town of Ute Park.

Success Stories

Though the Ute Park projects have not been implemented, NRCS has seen some success on prior EWP projects.

The Dog Head Fire burned across the Manzano Mountains in June of 2016. Following this fire NRCS along with the eligible sponsors (East Torrance and Edgewood SWCDs) implemented several projects similar to those planned on the Ute Park Fire EWP. The pictures below show some of the success the projects had over the years.

Location where contour tree felling project was planned.

Post treament area of contour tree felling along with critical area planting of native range grasses. Trees were placed in a staggard method to slow the run off and collect sediment.

Mastication along with critical area planting was completed to protect the culturally sensitive area. Wattles were also placed in area to control erosion. Picture was taken following treatment therefore grasses had not yet germinated.

Countour tree felling where sediment was collected and range grasses established.

A culturally sensitive area that was threatened by the fire.

New Mexico Department of Game and Fish (NMDGF) Summary of Activities

Rio Costilla habitat improvements

The NMDGF improved four miles of the Rio Costilla in north-central New Mexico via channel shaping, pool development, and installation of large woody debris. This project will provide critical overwinter fish habitat during low-flow periods associated with Costilla Dam operations.

San Juan River habitat improvements

Improvements to the tailwater reach of the San Juan River were implemented in the Simon Canyon area. Activities included off-channel and instream habitat manipulations to improve sediment transport, enhance fish habitat, and improve boater access at high-use locations. The project included channel-floodplain reconnection and terrestrial habitat improvement on 15 acres adjacent to the river.

Mimbres River riparian improvements

Installed riparian plantings (cottonwood and willow poles) along the Mimbres River preserve in southwestern New Mexico. Plantings will provide additional shade to the stream, stabilize streambanks, contribute woody debris and nutrients to the channel, and help maintain constructed in-stream habitats for native fish.

Willow plantings along the Mimbres River.

Prescribed fire for wildlife habitat and watershed restoration

NMDGF implemented a prescribed pile burn on the Colin Neblett Wildlife Management Area in northeastern New Mexico. Fifty-four acres were burned by controlled ignition of over 1,000 wood and slash piles. This treatment will improve wildlife habitat and reduce the threat of catastrophic wildfire.

Large-scale forest restoration in Otero County, New Mexico

NMDGF is collaborating with the Sacramento Ranger District on the Lincoln National Forest to develop a wildlife habitat and watershed improvement project across 125,000 acres of forested land in south-central New Mexico. The Department hired a third-party contractor to work with the US Forest Service to analyze the project under the National Environmental Policy Act. Once completed, this analysis will provide necessary compliance for forest thinning and prescribed fire treatments to improve wildlife habitat and reduce the threat of catastrophic wildfire.

Los Ojos Fish Hatchery improvements

NMDGF completed improvements to the Los Ojos Fish Hatchery in north-central New Mexico to ensure compliance with Clean Water Act requirements. Installed two large particulate vaults and combined hatchery outfalls into one location. This project will assist with meeting nutrient discharge limits set by the Environmental Protection Agency under the Clean Water Act while ensuring hatchery production is maintained over time.

New particulate retention vaults installed at the Los Ojos Fish Hatchery.

Stream crossing guidelines

The Ecological and Environmental Planning Division produced updated *Bridge and Culvert Construction Guidelines for Stream, Riparian, and Wetland Habitats*. These guidelines provide recommended design strategies for maintaining aquatic connectivity and habitat quality when installing, maintaining, or replacing culverts and bridges. They also summarize how improperly designed stream crossings can adversely affect fish, wildlife, and their habitats, as well as the importance of stream connectivity for maintaining populations of aquatic organisms.


HABITAT HANDBOOK

ABOUT

The New Mexico Department of Game and Fish (NMDGF) Habitat Handbooks provide conservation measures to minimize impacts of land use and development projects on wildlife and wildlife habitats. This Habitat Handbook addresses stream crossing designs for aquatic life movement. For more information on this topic, please call 505-476-8160.

ERT for NM

The Environmental Review Tool (ERT) for New Mexico is a web-based system that quickly screens land use and development projects for potential impacts to wildlife and wildlife habitats. The ERT provides best management practices and guidance to mitigate these impacts. Evaluate your project with the ERT at: https://nmert.org/

EEP DIVISION

The Ecological and Environmental Planning Division coordinates the Department's environmental review process, and works with community, private sector, state and federal government, nongovernmental organizations, and other project proponents to protect and enhance wildlife habitats. The Division implements the Share with Wildlife program and maintains BISON-M, a database of New Mexico's wildlife species. It also participates in the development and application of wildlife-related information management and planning tools.

CONTACT

NM Department of Game and Fish
One Wildlife Way
Santa Fe, NM 87507
505-476-8000
www.wildlife.state.nm.us

Bridge and Culvert Construction Guidelines for Stream, Riparian, and Wetland Habitats

2018

Rio Grande cutthroat trout

Note: these guidelines were partially adapted and condensed from *STREAM SIMULATION, An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings*, a publication of the USDA Forest Service Stream-Simulation Working Group (2008). Any reference of the following material should also credit the original document.

Rivers and streams are important conduits for fish and wildlife. Animals move through stream corridors to access food, shelter, mates, nesting areas, or other resources. Some movements are seasonal and are linked to the reproductive biology of the species. During the breeding season, animals move to find mates and suitable breeding habitat. For example, fish often migrate to spawning areas that have higher productivity and fewer predators, such as floodplains and headwater streams. In these areas, recently hatched fish benefit from additional resources and decreased predation pressure. Semi-aquatic and terrestrial wildlife species also use streams as travel corridors, including muskrats, otters, beavers, frogs, turtles, snakes, and migratory birds. In developed areas, rivers and streams may be the only available movement corridors for wildlife.

Animal movements are critical for maintaining aquatic and riparian wildlife populations. Barriers to movement can block the exchange of individuals among populations, eliminating gene flow and the ability of "source" populations to support smaller populations nearby. Barriers can also reduce or eliminate access to important spawning areas, nursery habitat for juvenile fish, foraging areas, refuge from predators, deep water refuges, or other seasonal habitats. Restricted access to these vital habitats can cause wildlife population declines or even local extirpations.

These guidelines are part of the Department's Habitat Handbook, available online at www.wildlife.state.nm.us/download/conservation/habitat-handbook/project-guidelines/feature/Bridge-and-Culvert-Construction-Guidelines-for-Stream-Wetland-and-Riparian-Habitats-2018.pdf.

Education

NMDGF's Share with Wildlife program funded an education project entitled Creating the Next Generation of Riparian Habitat Stewards that will increase awareness of the need for healthy riparian habitat and good land management along rivers for the benefit of wildlife. Youth will develop stewardship ethics and knowledge about riparian areas through repeat field experiences involving hands-on data collection, research on Species of Greatest Conservation Need, and sharing their findings in public presentations at other schools in New Mexico.

Additional information regarding NMDGF's activities is available within the agency's annual reports, available at www.wildlife.state.nm.us/home/publications.

New Mexico State Forestry Division

New Mexico's forests are in need of 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 include: watershed restoration projects, forest thinning, prescribed burning, and timber sales. A total of 9,075 acres were accomplished by the Division and projects have occurred throughout the state in 2018, as shown in Figure 1. The Forestry Division accomplished 3,934 acres of watershed restoration/thinning projects as shown in Table 1, 2,327 acres of prescribed burning as shown in Table 2, and 2,814 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 include 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. A Financial Assistance Agreement with the Bureau of Land Management (BLM) enables the Division and BLM

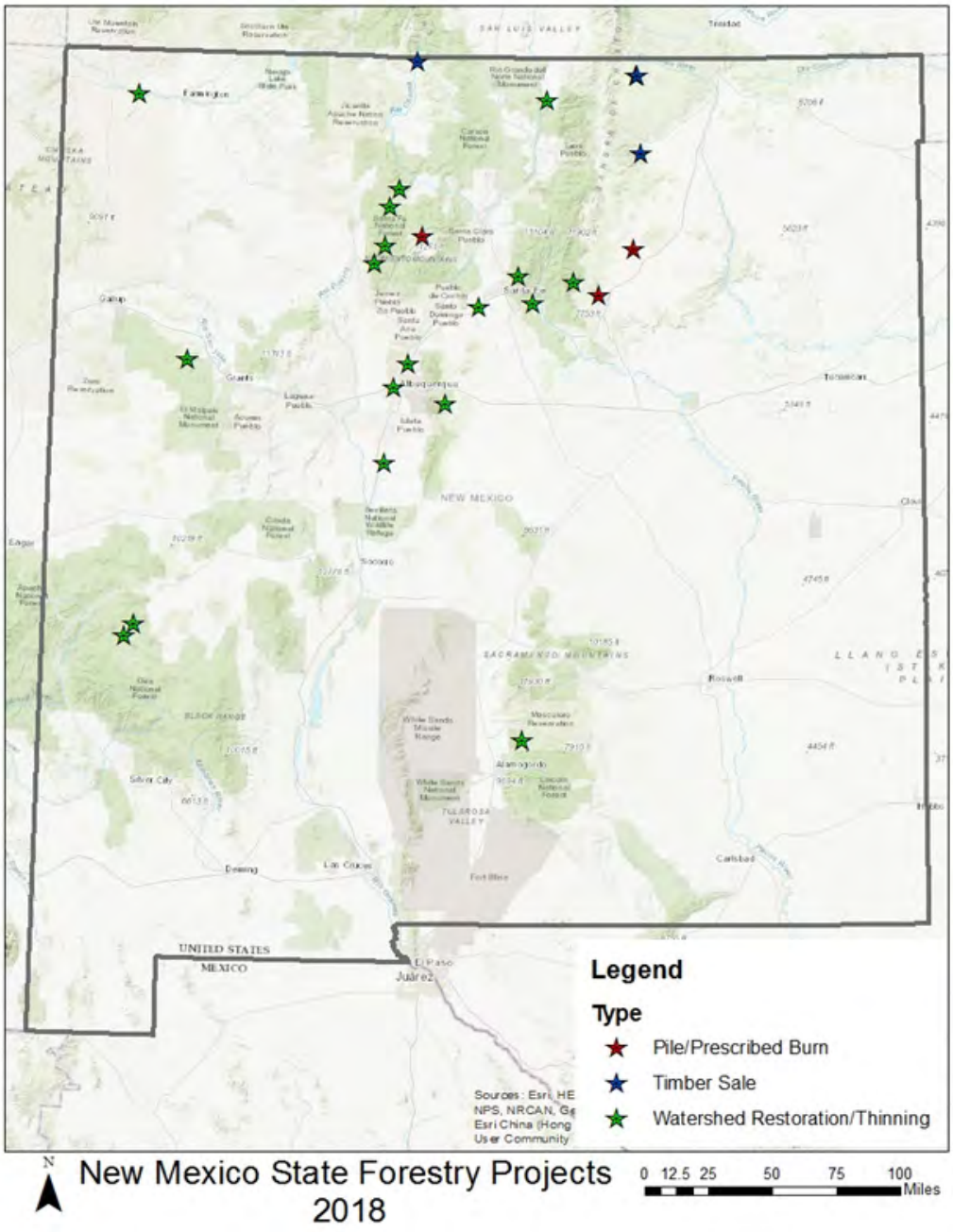


Figure 1. Map of Projects Conducted by New Mexico State Forestry in 2018.

to collaboratively develop cross-jurisdictional, landscape-scale forest and woodland restoration treatments for improving forest health and resilience and decreasing wildland fire threat to forests, woodlands and watersheds. In other cases, partnerships are formed to implement grant-funded activities that promote watershed health and water quality. The Division also partners with sister agencies to support common state objectives,

such as managing the Watershed Health and Management Subcommittee for the Office of the State Engineer's Drought Task Force.

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.

Table 1: New Mexico State Forestry Watershed Restoration Projects Accomplished in 2018

2018 New Mexico State Forestry Watershed Restoration Projects					
Project	**Location**	**Status**	**Completed Acres**	**Watershed**	**Description**
2018 Bosque Maintenance	Sandoval County	Ongoing	75	Rio Grande-Albuquerque (Town of Corrales)	Salt Cedar and Russian Olive removal
Burro 3 Collins Park Cox Canyon Bench Restoration	USFS Reserve RD	Ongoing	1401	San Francisco (Headwaters North Fork Negrito Creek)	Ponderosa, pinon and juniper thinning, piling and mastication
Burro Phase 2 Collins Park Grass-lands Restoration	USFS Reserve RD	Completed	181	San Francisco (La Jolla Canyon)	Ponderosa, pinon and juniper thinning, piling and mastication
Cedro Watershed Restoration Project	USFS Sandia RD	Ongoing	89	Rio Grande-Albuquerque (Tije-ra Arroyo)	Ponderosa, pinon and juniper thinning, piling and mastication

Project	Location	Status	Completed Acres	Watershed	Description
Central Rio Grande Bosque	Middle Rio Grande Conservation District	Completed	63	Rio Grande-Albuquerque (Ar-royo de la Parida-Rio Grande)	Salt Cedar and Russian Olive removal
Cerro Watershed Restoration Project	BLM Taos	Completed	179	Upper Rio Grande (Red River - Rio Grande)	Ponderosa, pinon and juniper thinning and piling
Cordova Watershed Restoration Project	USFS Coyote RD	Ongoing	206	Rio Chama (Rio Puerco)	Ponderosa, pinon and juniper thinning, piling and mastication
Gallinas III Watershed Restoration Project	USFS Pecos-Las Vegas RD	Completed	21	Pecos Headwaters (Headwaters Gallinas River)	Ponderosa pine thinning, chip-ping, piling
Hyde Park Thinning	Hyde Memorial State Park	Ongoing	79	Upper Rio Grande (Headwaters Rio Tesuque)	Ponderosa pine, limber pine, white fir, douglas fir, engelman spruce thinning and piling
Invasive Species Control at Leo-nora Curtin Wetland Preserve	Leonora Curtin Wet-land Preserve	Ongoing	88	Rio Grande-Santa Fe (Cienega River)	Salt Cedar and Russian Olive removal
Joaquin Watershed Restoration Project	USFS Jemez RD	Completed	693	Jemez (Rio Guadelupe)	Ponderosa pine thinning, and piling
La Cueva Fuelbreak Block E	La Cueva	Ongoing	74	Pecos Headwaters (Cow Creek-Pecos River)	Ponderosa, pinon and juniper thinning, piling and mastication
Mesa del Camino Watershed Restoration Project	USFS Coyote RD	Ongoing	217	Rio Chama (Rio Puerco)	Ponderosa pine thinning, masti-cation

Project	Location	Status	Completed Acres	Watershed	Description
Mescalero Apache Tribe Water-shed Restoration Project III	Mescalero Apache Tribe	Ongoing	367	Rio Penasco (Upper Rio Penas-co)	Ponderosa pine thinning, masti-cation
Ojitos Watershed Restoration Project	USFS Cuba RD	Ongoing	90	Jemez (Outlet Rio de Las Vacas)	Ponderosa pine, white fir, doug-las fir thinning, piling and masti-cation
Salitre Mesa Watershed Restora-tion Project	USFS Mt. Taylor RD	Completed	63	Rio San Jose (Bluewater Creek)	Ponderosa, pinon and juniper thinning, piling and mastication
San Juan Riparian	Mixed Ownership	Completed	55	Middle San Juan (Ojo Amarillo Canyon)	Salt Cedar and Russian Olive removal
Valencia County Bosque Restora-tion	Valencia County Bosque Restoration	Completed	4	Rio Grande-Albuquerque (Can-on Monte Largo-Rio Grande)	Salt Cedar and Russian Olive removal
		TOTAL	3945		

Table 2: New Mexico State Forestry Prescribed Burning Accomplished in 2018

2018 New Mexico State Forestry Prescribed Burning					
Project	**Location**	**Status**	**Completed Acres**	**Watershed**	**Description**
Fort Union Ranch	Fort Union Ranch	Completed	25	Mora (Outlet Wolf Creek)	Pile Burn
Santa Anna Morada	Las Vegas	Completed	30	Pecos Headwaters (Arroyo Pecos-Gallinas River)	Pile Burn

Project	Location	Status	Completed Acres	Watershed	Description
Valle San Antonio RX	Valles Caldera National Preserve	Completed	1050	Jemez (Headwaters San Antonio Creek)	Prescribed burn
Vermejo Park Ranch RX	Vermejo Park	Completed	1222	Canadian Headwaters (York Canyon-Vermejo River)	Prescribed burn
		TOTAL	2327		

Table 3. New Mexico State Forestry Timber Sale Accomplishments in 2018

2018 New Mexico State Forestry Timber Sales					
Project	**Location**	**Status**	**Completed Acres**	**Watershed**	**Description**
Philmont Scout Ranch	Philmont Scout Ranch	Completed	985	Mora (Outlet Wolf Creek)	Timber Sale
Rancho del Oso Pardo	Rancho del Oso Pardo	Completed	120	Pecos Headwaters (Arroyo Pecos-Gallinas River)	Timber Sale
Vermejo Park Ranch	Vermejo Park	Completed	1709	Canadian Headwaters (York Canyon-Vermejo River)	Timber Sale
		TOTAL	2814		

Santa Fe National Forest

Protecting the Rio Guadalupe with Burned Area Emergency Response (BAER) Treatments Following the 2018 Venado Fire

Project Budget: Federal (USFS): $137,591
Watershed: Rio Guadalupe (HUC 1302020201)
Subwatershed: Rio Guadalupe (130202020107)
Impairments: The Rio Guadalupe is listed as impaired for sediment, siltation, nutrients, and specific conductivity.

Project Summary

Between July 20, 2018 and mid-September 2018, the Venado Fire burned approximately 3,500 acres. Though fire is a natural event, the increased erosion and runoff from burned areas during even moderate storms may degrade water quality resources. To help mitigate impacts to water quality, as well as protect the safety of people, the integrity of infrastructure, and other cultural and natural resources, the Forest Service convenes interdisciplinary BAER Teams to evaluate risks and recommend emergency treatments to mitigate these risks. The Venado BAER Team Assessment rated the Joaquin Canyon drainage, which is tributary to Rio Guadalupe to be of particular concern. Much of the small and steep Joaquin Canyon drainage burned at high severity resulting in a loss of vegetative cover and alteration of the soil structure; the changed condition will greatly increase runoff following storm events from this small drainage. Because Joaquin Canyon flows into Rio Guadalupe and there is an undersized culvert where Joaquin Canyon crosses Forest Road #376 near the outlet of the tributary at Rio Guadalupe, the potential for impacts to water quality, fisheries resources, and downstream water quality is high. The BAER Team recommended a suite of treatments geared toward improving the drainage capacity of Forest Roads #376 and #488 (#488 is a closed road that travels up the Joaquin Canyon drainage) to accommodate post-fire flows. The concerns of the BAER Team regarding drainage capacity along FR #376 were validated following two storm events – one in early October ending on October 8 and the second storm ending on October 23. The excess runoff and debris from the first storm filled the inlet basin behind the culvert and other drainage structure along FS Road #376 and the more intense storm on October 23 created enough runoff and erosion that the existing culvert was not able to carry the flow and the structure under the road partially undermined and failed at the outlet. Several hundred cubic meters of sediment reached the Rio Guadalupe downstream of the culvert failure; however, the Forest Road #376 did not fail (i.e., the massive elevated roadway over the culvert remained intact).

Project Outcome:

The following activities related to water quality protection were implemented for this project:

Replacement of the Existing Culvert at Joaquin Canyon. The existing 48” Culvert is being replaced with a 90” diameter culvert and additional riprap at the inlet and outlet will be installed. The culvert capacity is

nearly double and should accommodate future post-fire flows. The work was scheduled to be completed by December 24, 2018.

Forest Road #376 Drainage Maintenance. All culverts, ditches, and drainage features are maintained by the Forest's Road Crew following storm events. Maintenance of the drainage features reduces the potential for Forest Road #376 to fail by ensuring maximum capacity of existing drainage features. The removal of debris and sediment from channels reduces the amount of material that could travel downstream to impact the water quality of Rio Guadalupe.

Figure 1. Outlet View of the existing culvert at Joaquin Canyon crossing with Forest Road #376. During the BAER Assessment in August 2018.

Figure 2. View below culvert outlet of debris and failed section of pipe that blew out.

Santa Fe National Forest

Integrating Actions to Improve Water Quality on the Rio Cebolla and Rio Guadalupe

Project Budget:	Roadside Fencing: Federal 319(h): $128,000 USFS non-319: $15,040 Project Total: $143,040
Project Budget:	Beaver Dam Analogs: Federal (USFS): $60,300 Match (in-kind): $8,770
Watershed:	Rio Guadalupe (HUC 1302020201)
Subwatershed(s):	Outlet Rio Cebolla (130202020104) and Rio Guadalupe (130202020107)
Impairments:	The Rio Cebolla tributary to the Rio Guadalupe is listed as impaired for exceedances of sediment/siltation and temperature. The Rio Guadalupe is listed as impaired for sediment, siltation, nutrients, and specific conductivity.

Project Summary

The project area includes approximately two miles of the Rio Cebolla to the confluence with Rio de Las Vacas to where they flow into Rio Guadalupe and then downstream for nearly 8 stream miles. Rio Grande Chub as well as populations of Rio Grande Sucker occupy the stream habitat in the site. The riparian areas along the Rio Cebolla provide habitat for the Endangered New Mexico Meadow Jumping Mouse. Extensive recreational use of the area as well as cattle grazing create impacts to water quality. Forest Road #376 parallels the riparian area of the streams and serves as one of the most popular spots on the Forest for dispersed camping with an average spring, summer, and fall visitation in the 100's each weekend, and into the 1000's on holiday weekends. The combined effect of cattle use and human use in the riparian areas increases sedimentation, nutrient runoff, and temperature because of vegetation removal and erosion along the numerous unauthorized motorized routes reaching the streams. The Forest developed a multi-project plan to improve water quality including reducing motorized access through the riparian areas, excluding cattle from portions of the riparian area that provides habitat for the New Mexico Meadow Jumping Mouse, and improve in-stream habitat. Fencing exclosures including an administrative closure in 2014 were the first actions completed.

Project Outcome:

The following activities were implemented and completed on this project:

Motorized vehicle closure adjacent to stream corridor. Constructed 3 miles of fencing between established dispersed recreation sites and the riparian areas adjacent to the streams. Figures 1 and 2 follow. The fence appears to be effective at reducing motorized access along the streams without eliminating a large number of dispersed sites.

I**nstream Habitat Improvement**. 35 Beaver Dam Analogs (BDAs) were constructed within the Rio Cebolla channel to improve water quality, increase stream and floodplain hydrologic connectivity, and limit continued down-cutting. BDA construction consist of installing multiple wooden fence posts across the channel perpendicular to flow with willow branches woven between the posts. BDAs are permeable to flow, but they slow

the streamflow enough to backwater stretches of channel which allow for sediment accumulation to raise the channel bed and allow for hydrologic connection between the channel and floodplain. Initial results show that structures are effective at improving floodplain connectivity and improving survival of riparian vegetation, including willows that were planted adjacent to the channel. *Figures 3* and *4* follow.

Figure 1. View of the vehicle exclusion fence from a dispersed camping site along the Rio Cebolla.

Figure 2. View of the vehicle exclusion fence from along Forest Road #376.

Figure 3. Constructing Beaver Dam Analogs in the Rio Cebolla.

Figure 4. Completed and functioning Beaver Dam Analog in the Rio Cebolla several months after installation.

Editor's note – some of the activities described in this project summary are part of the Jemez National Recreation Area Riparian Protection Project (NMED Project 15-T), described on page 31 of this report.


NEW MEXICO
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