State of New Mexico Nonpoint Source Management Program

2009 Annual Report

New Mexico Environment Department
Surface Water Quality Bureau
Watershed Protection Section

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Nonpoint Source Management Program

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Executive Summary

This annual report to the United States Environmental Protection Agency provides an overview of Clean Water Act (CWA) Section 319(h) Nonpoint Source Management Program related activities conducted in New Mexico in 2009 by the Watershed Protection Section of the New Mexico Environment Department Surface Water Quality Bureau. Polluted runoff, or nonpoint source (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 groundwater. 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 threat to 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: watershed planning, outreach and education, training, 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. These were developed to focus the NPS Management Program's direction and to implement the strategy for resolving NPS pollution problems throughout the state. Milestones achieved in 2009 include: achieving a 319 Success Story on the Rio Cebolla by acheiving water quality improvement through 319 project implementation, quarterly publication of the Watershed Protection Section newsletter *Clearing the Waters*, approving two watershed based planning projects, funding four 319 implementation projects, reporting EA/EIS reviews, reporting CWA section 401 actions and certifications, and numerous outreach activities. Coordination between the U.S. Forest Service and the Watershed Protection Section also continues to be an integral part of the NPS Management Program and has facilitated cooperation on many NPS pollution reduction projects. In addition to these milestones, a thorough revision of the Nonpoint Source Management Program plan was completed and submitted to the EPA, and was subsequently approved on October, 29, 2009.

Load reductions were calculated for all of the 319(h) projects administered by the Watershed Protection Section that concluded in 2009 where BMPs were implemented. The reductions were determined by using specific models designed to calculate reductions based on the BMPs implemented. Load reductions were reported on the four implementation projects which were completed in 2009.

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 2009 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 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 for projects listed in this report is provided by 319(h) grants awarded to NMED by the EPA. Additional activities included are projects implemented by the WPS Wetlands Program, CWA Section 401 activities, N.M. Mining Act activities, other SWQB Clean Water Act related activities, River Ecosystem Restoration Initiative activities, and nonpoint source projects implemented by other natural resource agencies outside of NMED.

NPS pollution entering Middle Ponil Creek.

What is Nonpoint Source Pollution?

Polluted runoff, or nonpoint source (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 groundwater. Atmospheric deposition and hydrologic modification are also sources of nonpoint source pollution."

Clean Water Act Section 319

NPS pollution is the leading cause of water quality degradation in the United States and poses a substantial threat to 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, grant funding is provided to support the following activities: watershed planning, outreach and education, training, implementation of best management practices (BMPs), and monitoring to assess implementation efficacy. 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.

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

Two sections of the CWA prior to the addition of Section 319 that were 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 the Integrated Clean Water Act §303(d)/§305(b) Report.

New Mexico's Nonpoint Source Management Program

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 NPS Management Program planning document. Our ultimate goal is to manage a balanced program that addresses both existing impairments (as listed in the 303(d) list) and prevents future impairments. An important aspect of the NPS Management Program plan is the watershed based plan (WBP) approach as outlined in the guidance provided in the *Nonpoint Source Program and Grants Guidelines for States and Territories* (Fed Reg. Vol 68, No. 205 Sec. III, D a-i). As a result, the NPS Management Plan focuses on the following:

- ◊ Implementing Total Maximum Daily Loads (TMDLs).
- ◊ Building partnerships by identifying and engaging stakeholders.
- ◊ Identifying and partnering with local, state, and federal agencies.
- ◊ Developing WBPs with key stakeholders for coordinating watershed restoration efforts.
- ◊ Implementing BMPs to address NPS pollution based on recommendations of an accepted WBP.

Zuni bowls on Placer Creek to mitigate erosion.

SWQB Program Updates

Watershed Protection Section

Following a year in which the WPS underwent some significant changes including reductions in staff, and workload allocations, 2009 was a year of relative stability in which there was a re-establishment of program foundations and an increase in 319 project funding activities. This includes initiating new planning efforts to update existing watershed plans to meet present EPA guidance while continuing to support on-the-ground projects aimed at reducing NPS pollution in New Mexico. All of the 2009 objectives outlined in the 2008 NPS Annual Report were met and include:

- ◊ A complete revision of the NPS Management Program plan.
- ◊ Initiating four new on-the-ground projects to address the NPS components of temperature TMDLs within each of four watersheds; the Rio de Los Pinos, San Antonio Creek, Bluewater Creek, and Ponil Creek.
- ◊ Expanding an effectiveness monitoring program for new 319(h) funded projects, starting with those listed above.
- ◊ Continued quarterly publication of the WPS newsletter *Clearing the Waters*.
- ◊ Issuing a Request For Proposals (RFP) on March 30, 2009 to select projects to update existing watershed plans relative to EPA's *Nonpoint Source Program and Grants Guidelines for States and Territories* (Fed Reg Vol 68, No 205, October 23, 2003).
- ◊ Issuing a second RFP on March 30, 2009 to select on-the-ground projects with the greatest potential of success under the *National Water Program Guidance Fiscal Year 2008* PAMs WQ-10 and SP-12.
- ◊ Continued development and support of other programs that address NPS pollution, including the Wetlands Program and the River Ecosystem Restoration Initiative.

In addition to the above accomplishments, 16 proposals resulting from the two RFPs were reviewed and nine workplans were developed and submitted to EPA for review. Seven of these projects received final approval by years end, and are in the final stages of contract issuance.

NPS Management Program Plan Update

The prior NPS Management Program plan was completed in 1999 before completion of most TMDLs in New Mexico, the release of EPA's *Nonpoint Source Program and Grants Guidelines for States and Territories* (Fed Reg Vol 68, No 205, October 23, 2003), and the development of the *2006-2011 EPA Strategic Plan*.

The NPS Management Program plan is a required element of the 319 program and critical to the program's success. Revision of New Mexico's NPS Management Program plan began in the fall of 2008.

Guiding this process were the two documents cited above and the *EPA Handbook for Developing Watershed Plans to Restore and Protect our Waters* (March 2008) and the *EPA's National Water Program Guidance Fiscal year 2008* as they apply to the NPS Management Program plan's identification of appropriate BMPs, identification of appropriate programs to implement NPS pollution reduction, and development of the program milestones necessary to demonstrate meeting both short and long term goals. Among the changes in the revised plan are a shift in priorities from addressing NPS pollution issues within large "Category I watersheds" which have 8-digit hydrologic unit codes (HUCs) to more specifically addressing NPS portions of TMDLs. In general, streams with TMDLs may lie within one or two smaller watersheds with 12-digit HUCs. An effectiveness monitoring program was also included. This program will supplement the SWQB's existing monitoring program which is primarily focused on assessment of water quality relative to standards and TMDL development. These changes were critical to assess improvements in water quality and water body restoration under EPA's Performance Activity Measures (PAMs) WQ-10 and SP-12.

A draft 2009 NPS Management Program plan was released for public comment on February 27, 2009. Following a ten week comment period a revised draft was prepared and submitted to New Mexico's Water Quality Control Commission (WQCC) for their review on June 9, 2009 and was subsequently approved by the WQCC on July 14, 2009. The WQCC approved 2009 NPS Management Program plan was submitted to the EPA for review and was approved on October 29, 2009.

NPS Management Program Milestones for 2009

At the core of the NPS Management Program plan there are specific objectives aimed at reducing NPS pollution in New Mexico. The six core objectives are: Watershed-Based Planning, Addressing Water Quality Problems, Water Quality Protection, Education and Outreach, Protect Groundwater Resources, and Interagency Cooperation. Within each objective there are specific activities and milestones to meet the objective. The following table presents activities that were conducted and milestones that were achieved in 2009.

Activities and Milestones	Timeframe	Status
Improve water quality in 3 priority watersheds	2012	1 - Rio Cebolla 319 Success Story
Update WBPs and WQ links on WPS website	Annually	Accomplished
Publish Clearing the Waters newsletter	Quarterly	3 issues published in 2009
Watershed Based Planning	Ongoing	3 projects awarded in 2009
319 Implementation	Ongoing	4 projects funded in 2009
319 Implementation QAPPs written	Ongoing	1 – San Antonio Creek monitoring
Report EA/EIS Reviews	Annually	236 reviews completed
Number of staff trainings	Annually	2
Outreach - schools and water fairs attended	Annually	17
Outreach - site tours/demo projects conducted	Annually	3
Outreach - workshops and info sessions held	Annually	4

The WPS also continues to forge relationships to promote interagency cooperation. To this end, two planning meetings were held with the U.S. Forest Service in 2009. A meeting was held on January 21 and a second meeting was held on November 10 to provide updates on prior NPS pollution and watershed restoration activities conducted by each agency during the year and to provide an update of anticipated activites for the coming year. Another component of the NPS Management Program milestones includes reporting other NPS pollution reduction related activities within the SWQB and those conducted by outside agencies. They are reported throughout this report.

NPS Management Program Problems and Concerns

There were no major problems or concerns implementing New Mexico's NPS Management Program in 2009.

NPS Management Program Activities to Meet Program Objectives for 2010

The WPS has identified the following specific NPS Management Program activites to meet program objectives for 2010.

- ◊ Release a Request For Proposals (RFP) in February 2010 to select projects that will update existing watershed plans relative to EPA's *Nonpoint Source Program and Grants Guidelines for States and Territories* (Fed Reg Vol 68, No 205, October 23, 2003). This activity is directed at completing three watershed plans containing all nine planning elements covering 49 priority watersheds by 2012.

- ◊ Release a second RFP in February 2010 to select on-the-ground projects with the greatest potential of success under the *National Water Program Guidance Fiscal Year 2008* PAMs WQ-10 and SP-12.

- ◊ Complete nominations for 319 Success Stories under PAMs WQ-10 and SP-12 for the Santa Fe and Gallinas rivers.

- ◊ Assist Monitoring and Assessment staff with revising the *State of New Mexico Surface Water Quality 10-Year Monitoring and Assessment Strategy* specifically in the areas of developing a Monitoring and Assessment Strategy for Wetlands and the 319 Effectiveness Monitoring Strategy.

- ◊ Host the New Mexico Watershed Forum in the fall of 2010 to bring together watershed restoration specialists, watershed planners, watershed groups, educators, federal, state and tribal agency representatives, and concerned citizens to discuss such diverse topics as upland watershed health, riparian restoration, and watershed based planning.

- ◊ Continue to develop and support other programs that address NPS pollution, including the Wetlands Program, and the River Ecosystem Restoration Initiative.

Effectiveness Monitoring Program to Evaluate 319 Success

The WPS Effectiveness Monitoring Program was initiated in 2008 with the goal of documenting water quality improvements resulting from 319 funded projects. Following an inventory of past 319 projects it was revealed that a majority of projects did not have adequate baseline data for a quantitative analysis of project efficacy. During this time, an Effectiveness Monitoring Strategy was developed to provide a framework from which to collect the necessary data to demonstrate BMP implementation effectiveness for future 319 projects.

A critical component of the Effectiveness Monitoring Strategy is to assure that an appropriate data collection and monitoring plan is developed for all 319 projects. To this end, the Effectiveness Monitoring coordinator participated as a member of the 319 project selection committee, and monitoring tasks were incorporated into the workplans of all the on-the-ground projects that were funded. In addition, the coordinator and the SWQB QA Officer developed a Quality Assurance Project Plan (QAPP) for the *San Antonio Creek on the Valles Caldera Natural Preserve* 319 project, and will continue to develop QAPPs for future projects that require them.

Four new 319 implementation projects were funded in 2009. For these new projects thermographs were deployed to collect baseline temperature data on the Rio de los Pinos, San Antonio Creek, Middle Ponil Creek, and Bluewater Creek. Additionally, measurements of canopy cover and stream channel dimensions were taken to document changes and support modeling with SSTEMP.

Additional monitoring was coordinated closely with the SWQB's Monitoring and Assessment Section (MAS) as part of the 2009 Upper Rio Grande survey. The Effectiveness Monitoring coordinator, and other WPS staff assisted with the field work. This provided additional valuable experience with SWQB protocols for thermograph deployment, EMAP Surveys, bacteriological sampling, and water chemistry sampling for lab analysis. As part of this survey, thermographs were deployed on Comanche Creek and Rio de Los Pinos (prior 319 funded project areas), and EMAP surveys were conducted on these two plus the Santa Fe River.

Monitoring on Middle Ponil Creek.

Following the nomination of the Rio Cebolla as a 319 success story in 2008, the Rio Cebolla was recognized by EPA in 2009 as a 319 Success Story under PAMs WQ-10 and SP-12. The Rio Cebolla, which was part of the *Respect the Rio* 319 Project, is now the first 319 Success Story for New Mexico officially recognized by EPA. In a similar effort, data collection began in 2009 on the Santa Fe and Gallinas rivers for future nominations as 319 Success Stories.

Load Reductions for 2009 319(h) Projects

Load reductions were calculated for all of the 319(h) projects administered by the WPS that concluded in 2009 where BMPs were implemented. Two projects utilized specific models that are designed to calculate reductions based on the BMPs implemented. One project utilized actual monitoring data, one project utilized a method adapted from Metcalf and Eddy (1991), and one was a planning project that did not result in a load reduction. The models were developed, approved and utilized by various agencies with expertise on the BMPs addressed by the model. The two models utilized were:

WEPP FuME- The Water Erosion Prediction Project (WEPP) models were developed by the United States Department of Agriculture/Agricultural Research Service at the National Soil Erosion Research Laboratory. They are applicable for examining hillslope erosion processes and producing a simulation of hydrologic and erosion process in small watersheds. WEPP FuME (Fuel Management) provides information on estimated sediment loads resulting from forest thinning, prescribed fire, and wildfire processes. The model distinguishes between low, moderate, and high intensity wildfire. As recommended by the model output, thinning project load reductions were estimated with the assumption that the project would reduce the probability of wildfire. A conservative estimate was calculated by subtracting the load resulting from thinning from the predicted load from a moderate wildfire. A similar approach can be used to estimate the potential benefits of prescribed fire (or prescribed natural fire), which has been shown to improve watershed health including lowering the risk of high intensity wildfire and subsequent erosion.

WEPP Road- WEPP Road provides information on the estimated sediment loads resulting from unpaved roads. Load reductions were calculated for projects where a component of treatment involved removing, or relocating, highly erosive roads away from the receiving water, and projects where runoff was diverted from roads to reduce erosion from the road thereby reducing the sediment load leaving the road.

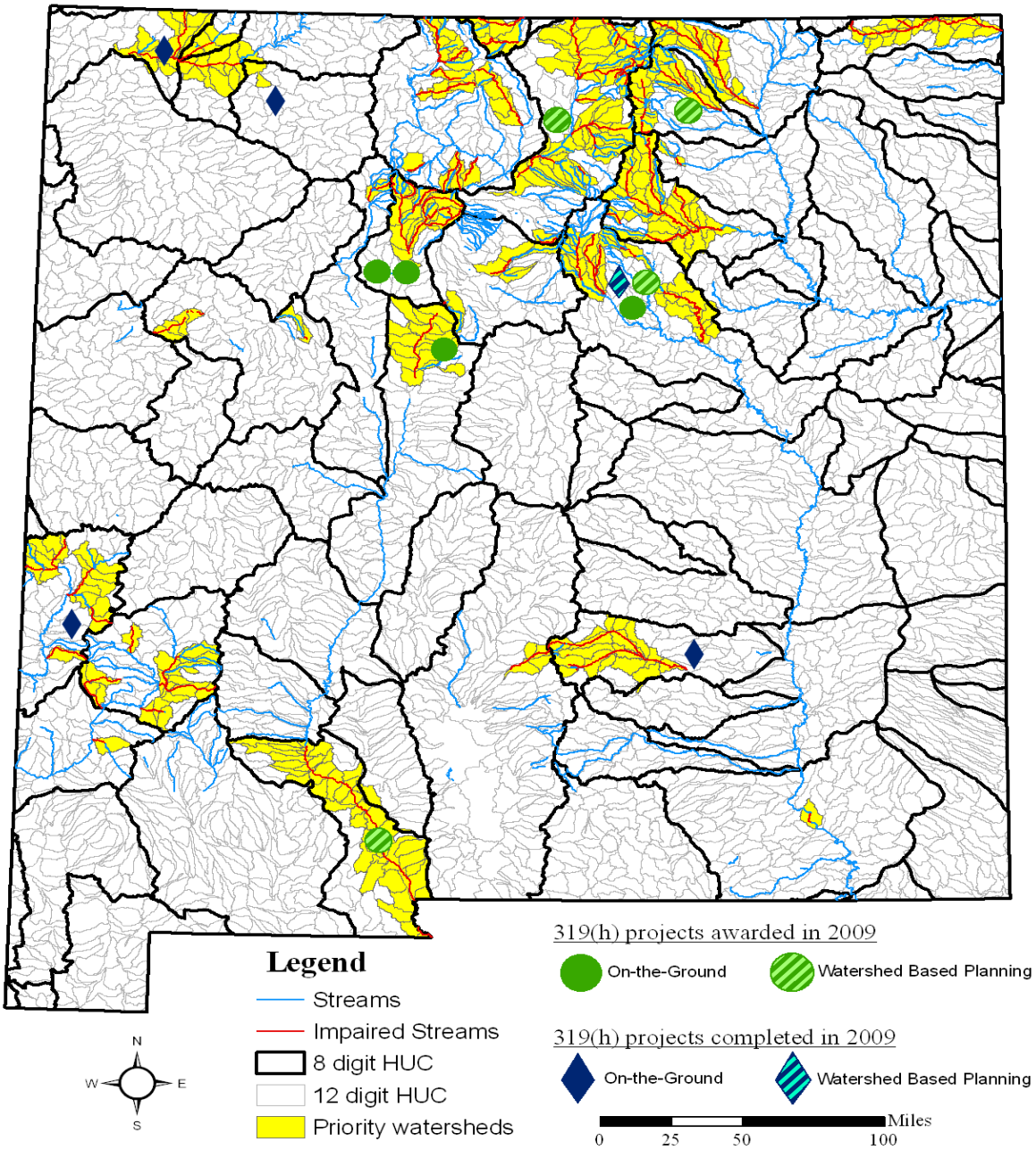
The method adapted from Metcalf and Eddy (*Wastewater Engineering: Treatment, Disposal, Reuse.* 3rd Edition, McGraw-Hill Inc. 1991.) was utilized to estimate the load reduction from BMPs aimed at reducing *E. coli* pollution from entering the waterbody.

The summary table on the following page provides the project name, project number, BMPs implemented, load reduction calculation method used, and an estimate of the load reduction for the receiving water. See the summary reports for individual projects beginning on page 13 for further information on watershed name HUC unit, waterbodies, impairments, and a narrative summary of results.

Load Reduction Estimates for 2009 319(h) Projects

Project Name	Project Number	BMPs Implemented	Load Reduction Determination Method	Estimated Load Reduction
Upper Hondo Restoration Project-Phase II	FY06-B	Road removal Seeding Thinning	WEPP-ROAD WEPP-FuME	73 lbs sediment/day
Reconstruction and Stabilization of the Whitewater Creek Trails #212 and #217	FY06-J	Bank Stabilization Riparian planting Water bars	Field Measurements	81 lbs sediment/day
Upper Pecos Watershed Association Formation Phase II	FY07-I	None	None	Watershed Based Planning Effort
Westwater-Shumway Watershed Riparian and Wetland Enhancement Project	FY07-J	Wetland planting Riparian exclosures Alternate water source installed	(See project report page 15)	3.2x108cfu/day
Road Maintenance Education for Road Crews in Largo Canyon, San Juan Basin Natural Gas Field	FY08-3ULO	Road drainage improvements	WEPP-ROAD	1.2 lbs sediment/day

New Mexico
Watershed Restoration Priorities and Progress



319(h) Project Spotlight - Upper Pecos Watershed Association

Upper Pecos Watershed Association Formation Phase II (FY07-I)

Project Budget: Federal 319(h): $56,758 Match: $126,409 Project Total: $183,167
Watershed: Pecos Headwaters (HUC 13060001)
Sub-Watershed: NA
Impairments: TMDLs for temperature and turbidity.

The project area was located in the Pecos Headwaters watershed (HUC 13060001) in north central New Mexico, and included the main stem of the Pecos River and its tributaries above Interstate Highway 25. The watershed encompasses 350,000 acres extending from the headwaters at the Truchas Peaks at an elevation of approximately 13,000 ft to 6,700 ft where the river crosses under the interstate. The upper reaches of the watershed are located in the Pecos Wilderness of the Santa Fe National Forest while the lower reaches contain several small communities including Cowles and the Village of Pecos. Vegetation zones span from alpine tundra at the upper elevations to juniper savanna at the lower elevations.

The Upper Pecos Watershed Association (UPWA) was formed in 2006 to address NPS pollution in the Pecos Headwaters watershed primarily stemming from high volume recreational use. The watershed has experienced bank destabilization, loss of vegetative ground cover, and solid waste issues stemming from heavy vehicle traffic including RV and ATV use, and heavy foot traffic from camping and fishing activities. Through extensive outreach including fundraising events, river cleanups, and local stakeholder meetings, UPWA has evolved from what essentially could be described as a small "kitchen table group" in 2006 to a 501(c)(3) corporation with a board of directors and hired staff.

Terrero Campground July 22, 2006.

Participating cooperators and agencies for this project included the Tierra Y Montes Soil and Water Conservation District, the U.S. Fish and Wildlife Service, the Pecos National Historical Park, State Senator Phil Griego, the New Mexico Department of Game and Fish, the Santa Fe National Forest, and NMED. In addition to the cooperators, UPWA has a diverse group of involved stakeholders including the Truchas Chapter of Trout Unlimited, New Mexico Trout, the Pecos Business Association, San Miguel County Commissioner Hugh Ley, Mayor Tony Roybal of the Village of Pecos, and numerous individual landowners.

A major outcome of this project was a study commissioned by UPWA entitled *The Impact of Recreational Use on Water Quality in the Pecos.* The results of this study confirmed that recreational use is the primary source of NPS pollution in a large portion of the Upper Pecos Watershed of the Pecos River. While

the Santa Fe National Forest provides six developed campgrounds, and the New Mexico department of Game and Fish provides two, they are not adequate to handle the increased demand during the summer months. This has resulted in unmanaged and dispersed camping especially in the areas around Cowles and Terrero. The findings of this study and a similar study conducted by the New Mexico Department of Game and Fish concluded that the best solution to decrease environmental impacts was to improve management of recreational uses by the formation of a state park.

Denuded streambank at Mora Campground.

Based on the recommendations of the two studies, UPWA formed a coalition that included the U. S. Forest Service, San Miguel County, the Village of Pecos, the Pecos Community Foundation, the Pecos Business Association, Trout Unlimited, New Mexico Trout, and other concerned citizens to advocate for the formation of a new state park. In September 2008, Governor Bill Richardson formally announced his support for the formation of the Pecos Canyon State Park. During the following legislative session in early 2009, a bill was passed authorizing the establishment of the park which Governor Richardson signed in April 2009. The Pecos Canyon State Park will be located on 186 acres in six different locations along 17 miles of Pecos Canyon owned by the New Mexico Game Commission. Through a Joint Powers Agreement, New Mexico State Parks would assume managment responsibilty and oversee the developments and improvements needed to establish the park.

UPWA has also spent a considerable amount of effort pursuing additional funding. As a result of these efforts, UPWA was awarded a $350,000 River Ecosystems Restoration Initiative grant from the State of New Mexico in September 2008. The project will restore a reach of the Pecos River from Lisboa Springs Fish Hatchery to Monastery Lake. Restoration includes removal of an old gabion weir, and narrowing the channel to reduce temperature. Phase I of this project was completed in the fall of 2009, and the next phase is expected to commence in 2010.

UPWA continues to keep its enthusiasm and momentum to work toward protecting the Pecos Headwaters watershed. They recently began a “Riverkeeper” program to increase environmental stewardship and awareness in the watershed. Modeled after the Adopt-a-Highway program, an individual, business or organization can “adopt” a small reach of the Pecos River or one of its tributaries. The program includes a sign placed along the selected stream reach with the individual’s or organization’s name and a commitment to monitor the river for litter and other detrimental impacts.

Project Summaries for WPS 2008 319(h) Projects

Rio Hondo Restoration Project-Phase II (FY06-B)

Project Budget: Federal 319(h): $339,577 Match: $246,770 Project Total: $586,347
Watershed: Rio Hondo (HUC 13060008)
Sub-Watershed: Rio Ruidoso (HUC 130600080103)
Impairments: TMDLs for bacteria, nutrients, temperature, and turbidity.

Project Summary:

The project consisted of two separate components addressing erosion in the headwaters of the Rio Ruidoso and potential erosion that could result from wildfire. The first component involved the removal of 4,500 ft. of road at the Ski Apache Ski Area followed by a reconstruction and stabilization of the channel adjacent to the road. After the road was removed, the channel was reshaped and 146 rock structures were installed utilizing 3,027 cubic yards of material. The second component involved thinning 521 acres of ponderosa pine forest directly upstream of the village of Ruidoso.

Cross vanes in the headwaters of the Rio Ruidoso at Ski Apache.

Project Outcome:

Despite an extreme flood event July 26-27, 2008 that deposited 9 inches of rain at Ski Apache, the channel restoration project held together fairly well. A post-flood survey determined that approximately 50% of the structures at Ski Apache remained. Major repair was conducted on the damaged sections, and the site was stabilized by the end of 2008. Ski Apache continued stabilizing the site in the spring and summer of 2009 by repairing damaged sections and minor seeding of adjacent upland areas.

Reconstruction and Stabilization of the Whitewater Creek Trails #212 and #207 (FY06-J)

Project Budget: Federal 319(h): $40,873 Match: $36,670 Project Total: $77,543
Watershed: San Francisco River Basin (HUC 15040004)
Sub-Watershed: Whitewater Creek (HUC 150400040607)
Impairments: TMDL for turbidity.

Project Summary:

The project addressed specific erosion, trail stabilization and NPS pollution sources along the Whitewater Creek riparian corridor identified by the local Gila National Forest (GNF) Glenwood Ranger District staff. Over the course of four seasons, volunteers conducted general trail maintenance, constructed and repaired water bars, installed small culverts, hardened water crossings, and planted numerous riparian woody species for improved erosion control. In addition, a small bridge and retaining wall were repaired at the Catwalk Recreation Area, and a contractor-built large gabion erosion control structure was installed in a side tributary that was identified as a significant contributor to sediment loading in Whitewater Creek.

Project Outcome:

The project directly affected 15 miles of stream corridor. The turbidity TMDL for Whitewater Creek converted the turbidity load to total suspended sediment and determined that the load amounted to 1,625 lbs/day. The TMDL indicated a target load of 626 lbs/day which would require a load reduction of approximately 61%. Load reduction for this project was originally estimated by the GNF at a modest 5% which equals approximately 81 lbs/day. The turbidity measurements from 1998 that prompted development of the TMDL ranged from 11.4 to 13.2 NTU. Monitoring of turbidity by the GNF in 2009 ranged from 0.8 to 5.94 NTU. These measurements indicate the modest reduction in load estimated by the GNF was met.

Westwater-Shumway Watershed Riparian and Wetland Enhancement Project (FY07-J)

Project Budget: Federal 319(h): $14,427 Match: $9,618 Project Total: $24,045
Watershed: Middle San Juan (HUC 14080105)
Sub-Watershed: Westwater Arroyo, Outlet Shumway Arroyo (HUC 14081050403)
Impairments: TMDL for *E. coli.*

Project Summary:

Westwater Arroyo is a small ephemeral tributary to Shumway Arroyo that flows into the middle San Juan River near the San Juan Generating Station. The watershed is very arid (receiving less than ten inches of precipitation per year), sparsely vegetated, located at an elevation near 5000 feet, and no permanent residents live in the vicinity of the project area. Data collected during a storm event in 2002 in Westwater and Shumway arroyos indicated severe surface drainage of fecal coliform and *E. coli* bacteria.

The project focused on improving grazing and rangeland management, and riparian habitat restoration. Best management practices that were implemented include: three livestock exclosures to protect riparian areas and associated wetlands, the installation of a livestock drinker outside one of the exclosures, removal of tamarisk from riparian and wetland areas, revegetating wetland areas with native wetland vegetation, and the installation of fiber logs at road crossings and drinker locations for sediment control.

Project Outcome:

To estimate the load reduction resulting from the project, the deposition of *E. coli* bacteria per cow, which is estimated to be 1.97 x 10^{12} cfu/year (Metcalf and Eddy. 1991. *Wastewater Engineering: Treatment, Disposal, Reuse.* 3rd Edition, McGraw-Hill Inc.), was multiplied by the total number of cows (150), multiplied by the percentage of the range unit now included in riparian exclosures (0.075%), multiplied by the portion of the year cows are in the range unit (0.5 year), resulting in an estimated load reduction of 1.1 x 10^{11} cfu/year. This is also equal to 3.0 x 10^{8} cfu/day, which is about 0.002% of the target load reduction in the TMDL.

Road Maintenance Education for road Crews in Largo Canyon, San Juan Basin Natural Gas Field (FY08-3/ULO)

Project Budget: Federal 319(h): $28,313 Match: $47,263 Project Total: $75,576
Watershed: Largo Canyon (HUC 14080103)
Sub-Watershed: Blanco Canyon - Cañon Largo (HUC 140801030611).
Impairments: TMDL for sediment.

Project Summary:

The focus of the project was education. The three main goals of the project were to expand an existing stakeholders group, conduct two road education workshops, and establish success criteria for BMPs related to roads. A portion of the budget was to be used for BMP implementation in addition to that conducted during the workshops.

During a workshop on proper road drainage techniques, three rolling dips and two low water crossings were constructed. The rolling dips interrupted the flow of water along the road, diverting it to adjacent uplands, and effectively reducing the length of road accumulating runoff during precipi-

Workshop describing road drainage techniques.

tation events. One low water crossing maintained the grade of a small arroyo channel, preventing an additional headcut from initiating there. Another low water crossing, built on an alluvial fan, prevented the road from capturing the flow of an arroyo, so that the function of the alluvial fan as a sediment deposition feature was restored.

The confluence of Largo Canyon and the San Juan River.

Project Outcome

WEPP Road was used to estimate the sediment load reduction for four of the structures that were installed at the first workshop. For the fifth structure (a low water crossing), a volumetric estimate was made based on headcut prevention. The total estimated sediment load reduction is 423.81 lb/year. This number is difficult to compare to the sediment TMDL in the San Juan River, because the TMDL is expressed in terms of percent fines. While this load reduction is undoubtedly minor compared with the sediment load delivered to the San Juan River, it is conservative in that the future application of the demonstrated techniques is not taken into account. The workshops were well-attended by a large percentage of the supervisors and equipment operators who design, build, and maintain, the roads in the San Juan Basin natural gas field.

Project Spotlight - Multiple Partnerships for Restoration

Historically the Middle Pecos River was a wide, sediment-laden, braided/meandering river with a diversity of habitats, ranging from low-velocity backwaters to swift main channel settings. These habitats were maintained by natural flooding, which moved sediments between the channel and the floodplain. This dynamic relationship sculpted a wide channel, moved sediment from the floodplain back into the channel, and formed new floodplains with channel sediment. The native biology of the Pecos took many life cycle cues from the hydrology and sediment mobility associated with an active floodplain. Like many rivers in the Western United States, the Pecos River's historic functions have been disrupted in order to ensure water supply and safety within a feast-or-famine hydrologic regime. The construction of upstream reservoirs allowed greater control of natural upstream flows to meet agricultural and interstate compact obligations as well as provided flood protection for downstream communities.

Bitter Lake National Wildlife Refuge is located near Roswell, NM and is an ideal location for river restoration. The refuge is situated between areas of fairly good and poor riparian habitat. North of the refuge, many of the historic floodplain functions of the river remain intact, and the riparian community is diverse and rich in native biodiversity because of the semi-active channel-floodplain interface. There is some of the best habitat in eastern New Mexico for a variety of species including: the federally listed Pecos bluntnose shiner, rare migratory birds such as the yellow billed cuckoo, unique amphibians such as the Spiney Soft Shelled Turtle, and diverse native riparian plant communities. Despite this rich habitat, this reach of the river is prone to drying up since agricultural return flow is the primary source of base flow. Below the rufuge downstream to Carlsbad, the river has been channelized, is incised, and as a result, lacks a functioning floodplain. Perennial flows along this reach of the Pecos River begin at Bitter Lake National Wildlife Refuge. By restoring habitat at the refuge, upstream habitat in the north may be extended downstream into a portion of the river that is always wet.

The overall objectives of the project include: restoring basic river functions, improving habitat for the Pecos bluntnose shiner; attracting more birds, mammals, reptiles, amphibians and fish; removing 100 acres of invasive non-native plants, reducing flood risk for downstream properties, and reducing fire risks. In addition, the project should enhance recreational opportunities on the Refuge.

The restoration of the Pecos River at the Bitter Lake National Wildlife Refuge consists of three phases: *Phase I: Reconnection of Oxbow 4 in Reach 4;* which is designed to re-connect an oxbow lake and improve 1.5 miles of riparian

Plugging the Pecos River prior to re-connecting Oxbow 4.

habitat, *Phase II: Repairing Floodplain Connectivity in Reaches 2 and 3;* which includes removing tamarisk and floodplain levees, lowering floodplains, re-connecting historic river sections, and establishing native plants along six miles of the river, and *Phase III: Restoration of the Pecos River on the North Tract of the Ref*uge; which will complete salt cedar removal and improve river function on the Middle Tract of the Refuge, and continue these activities on the Northern Tract of the Refuge restoring 4 miles of riparian habitat. The Bureau of Reclamation is charged with implementing Phase I as part of mitigation for Pecos River reservoir operations. The US Fish and Wildlife Service, in partnership with the World Wildlife Fund and the NM Interstate Stream Commission, received a River Ecosystem Restoration Initiative grant in 2007 from the New Mexico Environment Department for Phase II. The Refuge received stimulus money in 2009 for completing Phase III. Phases I and II began construction in February of 2009. Phase I was completed in the summer of 2009 by redirecting the river into Oxbow 4. It is anticipated that Phase II will be completed by the summer of 2010.

The Pecos River flowing through Oxbow 4.

Multiple partners contributed to the success of this project and include: The US Bureau of Reclamation, the New Mexico Interstate Stream Commission, the World Wildlife Fund, the New Mexico Department of Game and Fish, and the New Mexico Environment Department. Additional support for the project includes the Carlsbad Irrigation District, and the Chaves County Commission.

Wetlands Program

A federal grant totaling $386,847 in federal assistance was awarded through the FY09 EPA Wetlands Protection Development Grant Program authorized by CWA Section 104(b)(3). The project funds are for the *Mapping and Classification for Wetlands Protection, Northeastern New Mexico Highlands and Plains* project. The project proposes to map and classify wetlands in the Canadian River watershed in northeastern New Mexico as part of our landscape level 1 monitoring and assessment strategy. The project will utilize the "landscape position, landform, waterflow path and waterbody type" (LLWW) mapping classification and descriptors for landscape-level assessment tailored to arid region wetlands and will map approximately 5800 square miles (~100 7.5 minute quadrangles). A New Mexico Wetland Mapping Consortium will also be formed to help plan and fund future mapping projects throughout the State.

A grant for $10,000 to complete a pilot project for EPA Region 6 was also awarded. Outreach is a critical component of this project. Completed activities include creating a brochure entitled *Jewels of the Southwest* about wetlands in the Galisteo Watershed, and installing interpretive signs for the El Dorado Community Preserve. These funds will also be used to complete a stakeholder-driven Wetlands Action Plan for the Galisteo Watershed.

Projects Completed in 2009

Two projects funded under CWA Section 104(b)(3) Wetlands Program Development Grants were successfully completed this year, the *Stewart Meadows Wetlands Waterfowl Habitat Partnership* project and the *Restoring Wetlands and Training Wetlands Specialists on Cedro Creek* project.

Restoring Wetlands and Training Wetlands Specialists on Cedro Creek addressed impacts from poorly designed road construction utilizing a combination of activities including: on-the-ground implementation, training seminars, outreach, and volunteer engagement. Many of the on-the-ground restoration techniques that were employed have been proven especially effective for improving wetland, riparian and stream habitat in ephemeral and interrupted streams in arid landscapes. This project facilitated improvements on 17 acres of wetland and riparian habitat and included 1,286 volunteer hours from diverse community groups. In addition, the project utilized and trained 34 seminar participants through the completion of a nine-day training course entitled "Restoration Methods for Riparian, Wetland and Ciénega Ecosystems". Another 56 participants participated in two technical seminars outlining BMPs aimed at protecting wetlands during road construction and maintenance activites.

Outdoor classroom for the Cedro Creek Project

The *Stewart Meadows Wetlands Waterfowl Habitat Improvement Partnership* project was developed with the goal of creating and improving wetland habitat for migratory waterfowl. It is located on the Rio San Antonio near Tres Piedras, in Rio Arriba County, NM. In partnership with the Carson National Forest, the Stewart Meadows project restored 300 acres of floodplain wetland, provided outreach to local schools and the public, and created a Wetlands Action Plan for the Conejos Watershed. The original Federal award was $100,000 and the final match amount was $94,054.09.

The Stewart Meadows Wetlands on the Rio San Antonio floodplain.

The SWQB Wetlands program is also currently developing and implementing methods for the rapid assessment of New Mexico's wetlands with a focus on the Upper Rio Grande watershed as the project area. The Rapid Assessment for New Mexico Wetlands - Upper Rio Grande Phase 2 project includes data collection, refinement of the process, and analysis of the data. In 2009, data were collected concurrently with the Upper Rio Grande water quality survey conducted by the Monitoring and Assessment Section. The information from this effort will be compiled and analyzed in 2010.

For further information visit the New Mexico Wetlands Progam on the SWQB website: www.state.nm.us/SWQB/wetlands.

Monitoring and Assessment Program

Water Quality Surveys

The Monitoring and Assessment Section conducted two primary water quality surveys in 2009 collecting water quality monitoring data from 60 stream assessment units and 6 lake assessment units covering 589 stream miles and 130 lake acres. The watersheds surveyed included the Upper Rio Grande (463 miles, 121.4 acres) and the Mimbres (126 miles, 8.6 acres).

Hydrology Determination Protocol

A Hydrology Workgroup was established by the SWQB in February 2008 to develop a protocol for differentiating between perennial, intermittent, and ephemeral streams in New Mexico. The workgroup developed a methodology similar to the system developed by the North Carolina Division of Water Quality (NCDWQ, 2005) to evaluate the hydrology, biology, and geomorphology of stream features such that a determination of ephemeral, intermittent, or perennial can be made.

To further develop and test the hydrology determination method, the SWQB collected data in 2008 that were used to develop a Preliminary Draft Protocol which was subsequently field tested in 2009. This effort consisted of analyzing data collected from a total of 50 sites across a range of hydrological and ecological conditions to verify which field indicators are most useful in differentiating hydrologic systems in New Mexico. The resultant Hydrology Protocol was released for public comment in August 2009. The SWQB received comments from 16 organizations and expects to incorporate the comments, as appropriate, into the protocol and complete the Final Draft Hydrology Protocol for the Determination of Perennial, Intermittent, and Ephemeral Waters sometime in early 2010.

North Carolina Division of Water Quality (NCDWQ). 2005. Identification methods for the origins of intermittent and perennial streams. Version 3.1. North Carolina Department of Environment and Natural Resources, Division of Water Quality. Raleigh, NC.

Nutrient Assessment Protocols

Given the pervasiveness and severity of nutrient-related problems, the SWQB recognized the need to accurately monitor and assess nutrient impairment within the state's surface waters. In 2004, the SWQB, with assistance from the EPA and the US Geological Survey, developed a Nutrient Assessment Protocol for Wadeable Streams using a percentile-based approach. The protocol has been employed state-wide through SWQB's rotational watershed surveys, water quality assessments for the CWA §303d/§305b Integrated List, TMDL documents, and newly revised NPDES permits. Once the threshold values have been thoroughly tested, they will be evaluated, refined, and proposed for adoption into the New Mexico Water Quality Standards as appropriate.

During 2009, the SWQB completed compilation of nutrient and diatom data for lakes and reservoirs with the goal of drafting a Nutrient Assessment Protocol for Lakes and Reservoirs by the end of the year. In contrast to EPA's percentile-based approach for deriving criteria, New Mexico has sought an effects-based approach for lakes that more closely links water quality targets with attainment of specific designated uses. A preliminary analysis of the correlation between cause and response variables suggests that a suite of indicators

will be useful in determining nutrient impairment of New Mexico lakes and reservoirs. Indicators to be evaluated include transparency (secchi depth), causal variables (total nitrogen and total phosphorus), and algal metrics (chlorophyll a and percent cyanophytes). Ultimately, the SWQB plans to supplement and improve the preliminary threshold values with additional information on use attainment from New Mexico's lakes and reservoirs in order to relate numeric targets to specific uses.

Similar to the lakes analysis, the SWQB is utilizing an effects-based approach for rivers. As a result, the SWQB has focused its data compilation on sites in which dissolved oxygen, chlorophyll a, total phosphorus, total Kjeldahl nitrogen, and nitrate plus nitrite (or subsets of these variables) were monitored. The SWQB is in the process of analyzing the correlation between cause and response variables, specifically evaluating threshold values for total phosphorus and total nitrogen, and possibly chlorophyll a concentration and diurnal dissolved oxygen fluctuation. The SWQB anticipates completion of a draft Nutrient Assessment Protocol for Rivers in the spring of 2010.

NM Water Quality Standards Program

Triennial Review

The NMED initiated the current Triennial Review of the state's surface water quality standards in August 2008 with the publication of a discussion draft of proposed amendments which include: refinements to the definitions of ephemeral, intermittent and perennial waters; addition of a coolwater aquatic life use and a narrative criterion to protect biological integrity; addition of radionuclide criteria for the Rio Grande for monitoring and reporting purposes; revisions to the protections for unclassified waters; clarification of designated contact (recreation) uses; updates to the human health criteria; and revisions to use attainability analysis requirements. The WQCC conducted the Triennial Review hearing in December 2009, and is expected to deliberate and take action on the proposals in 2010.

Outstanding National Resource Waters

Outstanding National Resource Waters (ONRWs) are waters that receive special protection under New Mexico's water quality standards and the federal Clean Water Act. Waters eligible for ONRW designation include waters in a national or state park, wildlife refuges, wilderness areas, special trout waters, waters with exceptional recreational or ecological significance, and high quality waters that are not significantly modified by human activities. The WQCC designated New Mexico's first ONRWs in 2005 and 2006. They are:

- The Rio Santa Barbara (west, middle and east forks) within the Pecos Wilderness; and
- The surface waters within the U.S. Forest Service Valle Vidal Special Management Unit.

On Earth Day 2008 Governor Bill Richardson announced the state's intention to seek the state's third ONRW designation. The department held 21 meetings in 2008 and 2009 to solicit comments and answer questions regarding proposed ONRW designations. The department's most recent ONRW proposal incorporates and addresses stakeholder comments, and is focused specifically on waters located in wilderness areas within national forests. A WQCC hearing on the proposal is anticipated to be held in the summer of 2010.

CWA §303(d)/§305(b) Integrated Report and TMDLs

In 1996 the Forest Guardians and the Southwest Environmental Center sued the EPA for not establishing TMDLs for polluted waters in New Mexico. On July 3, 1997 a consent decree was entered in which the EPA agreed to establish TMDLs in certain waters in New Mexico by 2006. New Mexico has acheived this goal and the consent decree was dismissed on April 21, 2009.

In 2009, the SWQB developed and received approval from EPA Region 6 for 29 TMDLs in the Dry Cimarron and Jemez watersheds. Additionally, a number of impairments were delisted during the Jemez Watershed TMDL development process. These changes are reflected in the Draft 2010-2012 CWA §303(d)/§305(b) Integrated Report. The SWQB also developed 5 TMDLs for the Middle Rio Grande watershed and plans to present the Middle Rio Grande TMDLs to the WQCC in January 2010.

The 2008-2010 State of New Mexico CWA §303(d)/§305(b) Integrated Report was approved by the EPA in February 2009. The SWQB released the Draft 2010-2012 State of New Mexico CWA §303(d)/§305(b) Integrated Report for a 60-day public comment period on December 17, 2009. The SWQB anticipates presenting the Final Draft 2010-2012 CWA §303(d)/§305(b) Integrated Report to the WQCC in April 2010.

River Ecosystem Restoration Initiative

The River Ecosystem Restoration Initiative (RERI) is an opportunity to protect and restore river ecosystems across the state. The RERI complements the NMED's Clean Water Act 319(h) and Wetlands programs that have the goals of improving water quality and restoring wetlands, and aligns directly with NMED's performance goal of addressing impaired stream miles through watershed restoration projects to improve surface water quality. The initiative engages a diverse set of stakeholders whom in many cases were previously or are currently funded by CWA 319(h) funds. These stakeholders include conservation organizations, watershed groups, and multiple agency partners (NM Energy, Minerals and Natural Resources Department, NM Interstate Stream Commission, NM Department of Agriculture, NM Department of Game and Fish, New Mexico State University, and the US Army Corps of Engineers).

The initiative was originally funded in the amount of $2.5 million through a capital outlay bill during the FY2007 state legislative session and $2.8 million through a severance tax bond bill during the FY2008 state legislative session. In order to award the funds, NMED issued Requests for Proposals (RFP) in May of 2007, 2008 and 2009. The RFPs requested proposals for projects that restore in-stream ecosystem function and watershed health to major river basins. Major criteria for project selection included: the project has a clear objective and measurable outcomes, is sustainable, is supported by scientific studies, is collaborative, maximizes the conservation of biological diversity, is supported by stakeholders, and includes monitoring and long-term maintenance plans.

Unfortunately, due to state budget shortfalls as a result of the current recession, Governor Richardson froze all capital outlay projects that were not under contract in October 2009. The SWQB has applied for an exception to the freeze to the Department of Finance and Administration and is awaiting a response. While future funding of RERI projects remains uncertain, this funding has provided approximately $5 million for 24 restoration projects across the state that are currently moving forward.

CWA Section 401 Certification Activities

Staff continue to process water quality certifications under Section 401 of the CWA. The purpose of the 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 (Corps) comply with state water quality standards.

In response to the Corps Section 404 reissue of nationwide permits on March 19, 2007, a Conditional 401 Water Quality Certification for discharges to ephemeral surface water was issued by NMED on March 29, 2007 which is available from the NMED SWQB WPS's web site. A project-specific 401 Water Quality Certification must be obtained for permitted discharges to any intermittent surface water, perennial surface water or wetlands defined in 20.6.4.7 NMAC, and to any ONRW designated in 20.6.4.9 NMAC that are authorized by nationwide permits. Projects authorized by individual 404 permits also require a project-specific 401 Water Quality Certification. The certifications include a list of conditions to be met by the applicant to ensure that the project is: consistent with state law, complies with the state water quality standards, implements the Water Quality Management Plan (including TMDLs, the Continuing Planning Process, and the Antidegradation Policy Implementation Plan).

Bank stabilization on the Pecos River.

CWA Section 404/401 Water Quality Certifications and Actions:	
Certifications	
Nationwide Permits Certified	100
(those in ephemerals)	24
Individual Permits Certified	3
Certifications in Progress	22
Total	125
Other Actions	
No Permit Necessary	17
Wthdrawn	1
Enforcement Action	6
Consultation	2
Total	26

Certification duties are assigned to six staff in the Santa Fe, Silver City, Las Cruces, and Las Vegas Offices with corresponding geographic assignments. Of the six staff, one position continues to be jointly funded between NMED and the New Mexico Department of Transportation (NMDOT) and acts as a main point of contact for 401 Water Quality Certification relating to NMDOT transportation projects. Staff duties related to the 401 Water Quality Certifications include, but are not limited to, coordination, consultation, inspection, and outreach.

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 exploration applications or modification 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 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 an opportunity to concur with proposed permit changes. In general, NMED has 20 days from receipt of an application to respond.

NMED has an informal team that includes representatives from the SWQB, GWQB, and the Air Quality Bureau to review mining applications and otherwise support the work of the New Mexico Mining and Minerals Division. This work involves review of applications, local site conditions (generally including site visits), and applicable environmental standards. The SWQB discusses BMPs and other activities with the applicant in an effort to negotiate mining plans that prevent or minimize environmental risks. NMED's written responses often include conditions necessary to ensure compliance with environmental standards.

San Vicente Creek Mill Site, Silver City.

Beyond permitting actions, the NMED team participates in public meetings and meetings with the permitted community including on-site reviews, participates in emergency planning activities, and reviews documents in support of the work of the New Mexico Mining and Minerals Division, the US Army Corps of Engineers, the Nuclear Regulatory Commission, and others. In 2009, the SWQB reviewed and commented on over 70 mining notices, applications, restoration plans, hydrologic reports, monitoring plans, and activity reports.

Polluted runoff from mine tailings.

NMDOT/NMED Activities

A workgroup was formed in 2009 consisting of the NMDOT, NMED, Federal Highway Administration, U.S. Army Corps of Engineers, and U.S. Fish and Wildlife Service. The group meets quarterly to discuss such diverse issues as: CWA Section 401/404 regulations and permitted projects, Endangered Species Act consultation procedures, NEPA consultation procedures, NMDOT and FHWA funding protocols, funds available for wildlife species and their habitats, and Economic Stimulus projects

NMDOT/NMED Task Force

The NMDOT/NMED Task Force was created to provide better communication between both departments regarding environmental concerns related to the NMDOT construction and maintenance activities. A meeting of the Task Force was held on March 18, 2009.

NMDOT Recycling Program

NMDOT continues to develop innovative uses for tire bales through the ongoing "Standards for Tire-Bale Erosion Control and Bank Stabilization Projects: Engineering Validation of Existing Practices and Implementation" research project. The design is finalized, permits have been obtained, and the project will be field tested in spring 2010.

NMDOT Training

The Wetlands Training Institute conducted the "Basic Wetland Delineation" course in Santa Fe on June 15-19, 2009. NMDOT will sponsor a second training entitled "Planning Hydrology, Vegetation, and Soils for Constructed Wetlands" on June 14-18, 2010.

Mitigation, Restoration and Enhancement Projects

- NMDOT has restored 1000 feet of Placer Creek, located upstream from Hopewell Lake off of US 64. Completed and fenced in September 2009, treatments to achieve wetland restoration include: installation of bed control features to arrest head cutting, rock weirs to raise bed elevation and stabilize riffles, in stream structures to create meandering, stabilize stream banks, raise the ground water table and increase the floodplain. The project will be monitored for five years.
- Discussions are ongoing with the Cimarron Watershed Alliance regarding a compensatory wetlands restoration resulting from a bridge replacement on State Highway 58 over Ponil Creek.
- The Santa Fe County Open Space and Trails Program in cooperation with NMDOT and the SWQB are working with the Earthworks Institute to enhance an existing wetland adjacent to Arroyo Hondo.
- In Taos county, NMDOT has installed one beaver deceiver and five flow through devices to prevent water from rising above the road causing hazardous driving conditions while not disrupting existing beaver dams.

Ground Water Quality Bureau Update

Permitting and Compliance Assistance for Large Capacity Septic Tank/Leachfields

The purpose of this program is to protect ground water quality from NPS pollution attributed to large capacity septic tank/leachfield systems (septic systems). Technical personnel of the Ground Water Quality Bureau (GWQB) review Discharge Permit applications, develop Ground Water Discharge Permits, perform compliance assistance activities, and enforce Discharge Permit requirements for large capacity septic tank/leachfield systems. A review of ground water quality data collected from sites having septic systems shows that they contaminate ground water approximately 50% of the time. It is therefore critical to make sure that the sites are discharging pursuant to their Discharge Permits so that ground water quality is monitored, and if contamination is detected, corrective action can be triggered.

New Mexico Water Fair and Water-Quality Outreach Program

Approximately 90% of the population of New Mexico relies on ground water as its drinking water supply. In many 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 and cesspools. 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 unmanageable.

To identify possible NPS water quality problems in rural New Mexico communities, NMED has conducted free testing of domestic wells ("water fairs") throughout the state for over 10 years. The Water Fair Program reaches domestic well owners and educates them about water quality issues and how they can help preserve or improve water quality in their communities. During the last few years, these activities have been carried out as an EPA-funded Water Fair Program. This program has proven to be very popular with the general public and continues to provide NMED with valuable information on ground water quality in rural communities. NMED continues to receive numerous requests for water fairs from community organizations, NMED Field Offices, 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 program is also a great outreach tool providing a visible and highly appreciated service to the community.

Projects Completed by Non-NMED Agencies

The following land management agencies completed various projects in New Mexico (see tables on pages 28-45) that ultimately contribute to the reduction of nonpoint source 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.

Watersheds containing non-NMED project work affecting water quality

Watershed Name	8-digit HUC
Animas	14080104
Animas Valley	15040003
Arroyo Chico	13020205
Arroyo del Macho	13060005
Blanco Canyon	14080103
Caballo	13030101
Canadian Headwaters	11080001
Carrizo Wash	15020003
Chaco	14080106
Cimarron	11080002
Cloverdale	15080303
Conejos	13010005
Delaware	13070002
El Paso-Las Cruces	13030102
Elephant Butte Reservoir	13020211
Jemez	13020202
Jornada del Muerto	13020210
Landreth/Monument Draw	13070007
Mimbres	13030202
Pecos Headwaters	13060001

Watershed Name	8-digit HUC
Plains of San Agustin	13020208
Purgatoire	11020010
Rio Chama	13020102
Rio Grande-Albuquerque	13020203
Rio Grande-Santa Fe	13020201
Rio Hondo	13060008
Rio Penasco	13060010
Rio Puerco	13020204
San Francisco	15040004
San Simon	15040006
Upper Gila	15040001
Tularosa Valley	13050003
Upper Gila-Mangas	15040002
Upper Pecos	13060003
Upper Pecos-Black	13060011
Upper Pecos-Long Arroyo	13060007
Upper San Juan	14080101
Upper Rio Grande	13020101
Western Estancia	13050001
Zuni	15020004

Bureau of Land Management Projects:

Carlsbad Field Office

Watersheds	Project Description	Watershed Benefits
Delaware Upper Pecos-Black	Salt cedar control – removed salt cedar from 3,932 acres along Black, Delaware, and Pecos Rivers; along Cottonwood Draw; and around Alkali Lake.	Increase herbaceous ground cover. Increase water yield. Decrease sheet flow and erosion.
Delaware	Headcut stabilization – installed two gully plug/diversion fence erosion control projects.	Increase herbaceous ground cover. Decrease erosion.
Upper Pecos-Black	Oil Field reclamation – reclamation and reseeding on 135.6 acres of drill pad/pit, borrow pit, and lease roads.	Decrease erosion from road prism. Increase herbaceous ground cover.
Upper Pecos-Black	Wildfire Stabilization – repaired 3.5 miles pasture fence, six dirt tanks, and replaced 6 miles water ppl, to remove cattle distribution from burned area of Rocky Fire.	Increase herbaceous ground cover Decrease sheet flow and erosion.
Upper Pecos-Black Landreth-Monument Draws Lea Plateau	Brush Control – 21,398 acres of mesquite; 21,080 acres of creosote/tarbush/catclaw; 3,012 acres of juniper.	Decrease sheet flow and erosion. Increase water yield. Increase herbaceous ground cover.
Upper Pecos-Black	Prescribed Fire – treated 10,000 acres to remove brush and desert succulents.	Reduce brush overstory. Decrease erosion. Increase herbaceous ground cover.
Upper San Juan (La Manga Watershed)	Drill pad reclamation Road maintenance (215 miles) Road closure (78 miles)	Decrease erosion. Improve road drainage.

Farmington Field Office

Watersheds	Project Description	Watershed Benefits
Animas Blanco Canyon	Closed and reseeded 10 miles of road. Maintain approximately 1,000 miles of road.	Reduce erosion and sedimentation to waters in the San Juan Basin.
Animas Upper San Juan Blanco Canyon	Approved approximately 400 Applications of Permit to Drill (APD) with Best Management Practices resulting in about 600 new silt traps constructed.	Reduced runoff, soil erosion, sedimentation, and increased water infiltration.
Blanco Canyon Chaco	Thin sagebrush and young pinon/juniper trees with Dixie Harrow and seed 290 acres	Reduced runoff, soil erosion, and sedimentation. Increase in herbaceous vegetation growth and water infiltration.

Farmington Field Office continued

Watersheds	Project Description	Watershed Benefits
Blanco Canyon	Construct silt fences in Blanco Wash	Protection and restoration of riparian vegetation, and reduction in sediment transport.
Upper San Juan	Construct 15 check dams within La Manga Watershed	Reduced runoff, soil erosion, and sedimentation. Increase in herbaceous vegetation growth and water infiltration.
Upper San Juan Chaco Blanco Canyon	Thin sagebrush chemically on approximately 77,000 acres of sagebrush/grassland	Reduce runoff, soil erosion, and sedimentation. Increase water infiltration and herbaceous plant growth.

Rio Puerco Field Office

Watersheds	Project Description	Watershed Benefits
Arroyo Chico (Headwaters Torreon Wash)	Improve the drainage properties of 15 miles of rural dirt roads by creating rolling dips. Navajo Youth projects to stabilize headcuts and small gullies with approx. 200 small rock structures.	Reduce runoff, erosion, and sedimentation. Stop headward and channel erosion, slow runoff, reduce sedimentation.
Plains of San Agustin (Sugarloaf Canyon) Upper Gila (Railroad Canyon, Beaver Creek)	Prescribed burn on 72,950 acres of range and forest land.	Increase herbaceous ground cover. Decrease risk of extreme wildfire and associated erosion
Rio Puerco Arroyo Chico	Treated 68 acres of saltcedar in riparian stream corridors. Treated 535 Acres of weeds	Increase desirable herbaceous cover in riparian and upland zones.
Rio Puerco (La Canada de la Lena) Zuni (Atarque Canyon) Arroyo Chico (Outlet Arroyo Chico)	Stabilized four meander bends of the Rio Puerco. Conducted thinning of 2210 acres of pinyon-juniper forest.	Eliminated sediment input (mass failures of the arroyo walls) into the active channel. Increase herbaceous ground cover Reduce erosion and sedimentation.
Rio Puerco (San Isidro Wash)	Drill pad reclamation on 20 acres	Establish vegetation and decrease erosion.

Roswell Field Office

Watersheds	Project Description	Watershed Benefits
Arroyo Del Macho	Creosote chemical treatment (2,430 acres)	Reduce runoff, erosion, sedimentation. Improve water infiltration and retention in soil. Increase herbaceous plant growth and understory vegetation. Reduce sediment yield to Pecos River.

Roswell Field Office continued

Watersheds	Project Description	Watershed Benefits
Rio Hondo (Rio Bonito River)	Juniper thinning (1,047 acres), retreat salt cedar (8 acres), Install erosion control structures for headcut stabilization.	Reduce runoff, erosion, sedimentation. Improve water infiltration and retention in soil. Increase herbaceous plant growth and understory vegetation. Reduce sediment yield to Rio Bonito River.
Upper Pecos (Pecos River)	Salt Cedar removal (531 acres), Retreat Salt Cedar (600 acres), treat African rue (20 acres).	Reduce runoff, erosion, sedimentation. Improve water infiltration and retention in soil. Increase herbaceous plant growth and understory vegetation. Reduce sediment yield to Pecos River.
Upper Pecos-Long Arroyo (Pecos River)	Retreat Salt Cedar (400 acres), mesquite chemical treatment (1,402), creosote chemical treatment, African rue treatment (130 acres).	Reduce runoff, erosion, sedimentation. Improve water infiltration and retention in soil. Increase herbaceous plant growth and understory vegetation. Reduce sediment yield to Pecos River.

Socorro Field Office

Watersheds	Project Description	Watershed Benefits
Jornada del Muerto	Vegetation Treatment control of sand Sage 3,500 acres and juniper 1400 acres	Decrease wind erosion and sediment loads. Increase herbaceous plant growth, density and diversity, and increase water infiltration.
Rio Grande-Albuquerque	Prescribed burn 2,000 acres	Increase herbaceous ground cover. Decrease erosion.
Rio Puerco	Ojo Saladito Watershed improvement Project. Construction of 85 earthen structures.	Reduce downstream sediment loads and reduce erosion. Stabilize head cuts and channel down cutting. Trap sediments and decrease water velocities.
Tularosa Valley	Prescribed burn on 5,000 acres in Piñon and Juniper	Reduce runoff, soil erosion, and sedimentation. Increase water infiltration. Increase herbaceous plant growth and biodiversity.
Tularosa Valley	Thinning of 150 acres of Juniper	Reduce runoff, soil erosion, and sedimentation. Increase water infiltration. Increase herbaceous plant growth and biodiversity.

Taos Field Office

Watersheds	Project Description	Watershed Benefits
Pecos Headwaters	Thinned 125 acres of PJ Plant community	Increase herbaceous ground cover to reduce soil exposed to water erosion.

Taos Field Office continued

Watersheds	Project Description	Watershed Benefits
Rio Grande-Santa Fe (Santa Fe River in La Ceineguilla)	45 acres non-native vegetation removed on Santa Fe River.	Reduce sedimentation and turbidity.
Upper Rio Grande (CO border to Red River)	Prescribed burn on 500 acres sagebrush	Increase herbaceous ground cover to reduce soil exposed to water erosion.
Upper Rio Grande (CO border to Red River)	Prescribed burn on 500 acres sagebrush/ PJ plant community.	Increase herbaceous ground cover to reduce soil exposed to water erosion.
Upper Rio Grande (between Pilar, NM and Rio Pueblo de Taos)	5 acres non-native vegetation removal in riparian zone.	Decrease risk of extreme wildfire and associated erosion. Reestablishment of native species. Streambank stabilization and improved wildlife habitat.
Upper Rio Grande	6 sites monitored on Rio Grande, Rio Embudo and Agua Caliente	Assess impairments to temperature, pH, turbidity, conductivity, nitrate and phosphorus.
Upper Rio Grande (from CO to Ri0o Pueblo de Taos	6 facilities developed or maintained for livestock water sources	Reduce sedimentation, turbidity and temperature impairments associated with concentrated livestock operation.

New Mexico State Forestry Division

Watersheds	Project Description	Watershed Benefits
Canadian Headwaters (Underwood Lakes)	Timber Harvests (435 ac) in Ponderosa/Mixed Conifer Forests Waterbarring and seeding of critical areas.	Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. Increase water infiltration.
Canadian Headwaters (Potato Canyon)	Timber Harvests (440 ac) in Ponderosa/Mixed Conifer Forests Waterbarring and seeding of critical areas.	Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. Increase water infiltration.
Canadian Headwaters (Cemetery Canyon)	Timber Harvests (1209 ac) in Ponderosa/Mixed Conifer Forests Waterbarring and seeding of critical areas.	Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. Increase water infiltration.
Canadian Headwaters (Tub Canyon)	Timber Harvests (714 ac) in Ponderosa/Mixed Conifer Forests Waterbarring and seeding of critical areas.	Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. Increase water infiltration.
Canadian Headwaters (McCuen Canyon)	Timber Harvests (185 ac) in Ponderosa/Mixed Conifer Forests Waterbarring and seeding of critical areas.	Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. Increase water infiltration.

New Mexico State Forestry Division *continued*

Watersheds	Project Description	Watershed Benefits
Canadian Headwaters (Commissary Canyon)	Timber Harvests (143 ac) in Ponderosa/Mixed Conifer Forests Waterbarring and seeding of critical areas.	Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. Increase water infiltration.
Cimarron (South Fork Urraca Creek.)	Timber Harvests (161 ac) in Ponderosa/Mixed Conifer Forests Waterbarring and seeding of critical areas.	Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. Increase water infiltration.
Plains of San Agustin (just south of Datil)	Timber Harvests (551 ac) in Pinyon-Juniper Forests Waterbarring and seeding of critical areas.	Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. Increase water infiltration.
Purgatoire (Lorencito Canyon)	Timber Harvests (427 ac) in Ponderosa/Mixed Conifer Forests Waterbarring and seeding of critical areas.	Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. Increase water infiltration.
Rio Chama (Tierra Amarilla creek)	Timber Harvests (275 ac) in Ponderosa/Mixed Conifer Forests. Waterbarring and seeding of critical areas.	Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. Increase water infiltration.
Upper Rio Grande (Costilla Creek)	Timber Harvests (214 ac) in Ponderosa/Mixed Conifer Forests Waterbarring and seeding of critical areas.	Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. Increase water infiltration.
Western Estancia (near Torreon)	Timber Harvests (94 ac) in Ponderosa/Mixed Conifer Forests Waterbarring and seeding of critical areas.	Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. Increase water infiltration.
Western Estancia (near Torreon)	Timber Harvests (80 ac) in Ponderosa/Mixed Conifer Forests Waterbarring and seeding of critical areas.	Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. Increase water infiltration.
Zuni (Upper Rio Nutria)	Timber Harvests (280 ac) in Ponderosa/Mixed Conifer Forests Waterbarring and seeding of critical areas.	Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. Increase water infiltration.

BLM's Open Space Pilot Project

In an effort to minimize surface disturbance from development and installation of natural gas wells, a pilot project was established in January 2008 covering 5,670 acres (nine sections) in the center of the San Juan Basin. The Open Space Pilot Project (OSPP) is a partnership of the BLM (Farmington Field Office), ConocoPhillips (San Juan Basin Unit) and Devil's Spring Ranch. The objectives of the project vary and overlap from partner to partner, but primary objectives are to: 1) Preserve open space by drilling new wells from existing well pads (twinning); 2) Improve existing roads to return water to the landscape in a beneficial way; and, 3) Establish sustainable vegetative cover and soil structures to repair and stabilize surface damage.

The first objective was accomplished by the fall of 2008 after extensive planning by ConocoPhillips and Devil's Spring Ranch and approval from the BLM and New Mexico Oil Conservation Division. Forty out of the 44 future wells to be drilled will be twinned, or about 90%. Out of the 99 existing wells within the Project boundaries, only 9 are twinned, or 10%. Each twinned well saves the construction of a new road and pipeline as well as the new well pad. To date, 12 of the 44 twinned wells have been drilled with the remaining wells to be drilled within approximately two years.

To acheive the second objective, 8.2 miles of existing road have been improved since the project started. These roads allow the water to return to the landscape in a beneficial way. A variety of methods are employed depending on the situation and may include: the elimination of bar ditches, crowning and in-sloped surfaces, the addition of rolling dips, and sandstone surfacing and out-sloped surfaces. As each new well is drilled, the existing road is improved back to it's first major intersection. ConocoPhillips is able to allocate the cost of road improvement to each well as it is drilled and achieve a safer road surface that is longer lasting and easier to maintain. When OSPP is complete, most of the 23 miles of roads will have been upgraded.

To acheive the third objective, BLM has supplied seed, fencing materials and other supplies. Livestock were utilized to incorporate seed into the soil via hoof action and to fertilize the small plots through short term grazing. Additional work will proceed in the spring of 2010. Devil's Spring Ranch has partially funded an OSPP Trust at Holistic Management International (HMI) and BLM has contributed Mitigation Funds to the Trust. HMI has hired Frank Aragona of AgroInnovations as consultant and accepted the OSPP as a focus project for their 2010 calendar calling it, "Holistic Management Remediation on Oil & Gas Drilling Sites."

Soil and Water Conservation District (SWCD) Projects:

Grant SWCD

Watersheds	Project Description	Watershed Benefits
Upper Gila Upper Gila-Mangas	NMISC Paired Watershed Study: Two watersheds continue to be studied for soil moisture and alluvial groundwater response to tree and brush thinning treatments.	Decrease risk of catastrophic wildfire Prevent erosion
Upper Gila Mimbres	EMNRD Wildland Urban Interface and Hazardous Fuels Reduction: Private landowners in Grant County thinned approximately 304 acres in 2009.	Decrease risk of catastrophic wildfire Decrease erosion

Sierra SWCD

Watersheds	Project Description	Watershed Benefits
Caballo	Ponderosa/Pinon/juniper thinning(146.13 acres)	Increase herbaceous ground cover. Increase water yield. Decrease erosion.
Caballo	Brush Management (creosote treatment 1,196 acres)	Increase herbaceous ground cover. Increase water yield. Decrease erosion.
El Paso-Las Cruces	Brush Management (creosote treatment approx. 16,000 acres)	Increase herbaceous ground cover. Increase water yield. Decrease erosion
Elephant Butte Reservoir	Brush Management (creosote treatment 6,446.4 acres)	Increase herbaceous ground cover. Increase water yield. Decrease erosion.
Rio Grande-Albuquerque	Salt Cedar Removal (455.4 acres) and revegetation. with Gooding's Willows, Rio Grande Cotton Woods, Fourwing Saltbush, Wolfberry, and Giant Sacaton	Increase herbaceous ground cover. Increase water yield. Decrease erosion.

US Forest Service Projects:

Carson National Forest

Watersheds	Project Description	Watershed Benefits
Blanco Canyon (Ciruelas Canyon-Arroyo Companero)	1 mile of new road constructed with 6 new culverts; Fiero Mesa. Re-routed and repaired 1000 feet of FR 314 along Carrizo Canyon. Constructed 3 water tanks.	Reduce runoff, erosion, sedimentation and improved drainage.

Carson National Forest continued

Watersheds	Project Description	Watershed Benefits
Cimarron	Prescribed Fire/Fuel Reduction: Questa RD: 2700 acres	Reduce hazardous fuel loads. Increase herbaceous ground cover. Decrease risk of stand replacement fire and associated watershed impacts.
Conejos	Road Maintenance and Improvement: Tres Piedras RD: 90 miles	Reduce sediment generation and delivery to surface waters. Improve road drainage.
Conejos	Road Maintenance (30 miles)	Improve road drainage. Decrease surface erosion.
Rio Chama	Road Maintenance and Improvement: Canjilon RD: 105 miles El Rito RD: 123 miles	Reduce sediment generation and delivery to surface waters. Improve road drainage.
Rio Chama	Vegetation Management and Improvement: Canjilon RD: 602 acres El Rito RD: 237 acres	Reduce sediment generation and delivery to surface waters. Increase herbaceous ground cover.
Rio Chama	Planted 198 acres of ponderosa pine seedlings in Pine Canyon Complex burned area.	Reduce soil erosion and sedimentation.
Rio Chama (Headwaters El Rito)	1 Spring Development Up-On-The Hill Spring on San Gabriel Allotment.	Improve water holding capacity and reduce sedimentation. Improve cattle distribution.
Rio Chama	Vegetation Treatment (100 acres thinning in Ensenada & 246 acres Agua Caballos Project) Ensenada: 100 acres thinning (Chacon CFRP Grant) Agua/Caballos: 28 ac commercial logging 90 ac fuelwood blocks Highway 115 Corridor Project (Canjilon) 60 fuelwood	Improve water holding capacity and reduce sedimentation.
Rio Chama	16336 Acres of Grazing land rested from domestic livestock grazing	Allow grass and forage a growing season with reduced demand from grazing animals.
Rio Chama	125 Acres of green fuel wood on 115 Corridor Project	Reduce fire hazard and improve access into Canjilon Community during an emergency.
Rio Chama	Dry Lakes Prescribed Burn (500 acres within Ponderosa Pine/oak brush).	Reduce sedimentation, soil erosion and head cutting within the watershed by increasing production of herbage ground cover.

Carson National Forest continued

Watersheds	Project Description	Watershed Benefits
Upper Rio Grande	Road Maintenance and Improvement: Questa RD: 80 miles Camino Real RD: 115 miles	Reduce sediment generation and delivery to surface waters. Improve road drainage.
Upper Rio Grande (Upper Red River)	Stormwater Pollution Prevention Plan (NPDES) for Red River Ski Area Chair Lift Replacement	Decrease/prevent water pollution related to construction activities. Replace vegetative ground cover disturbed during construction. Decrease erosion and sediment delivery to impaired stream (Red River).
Upper Rio Grande (Headwaters Arroyo Hondo)	Stormwater Pollution Prevention Plan (NPDES) for Taos Ski Valley Summer Operations and Improvements	Decrease/prevent water pollution related to construction activities. Replace vegetative ground cover disturbed during construction. Protect water quality of Non-impaired stream (Rio Hondo).
Upper Rio Grande	Prescribed Fire/Fuel Reduction: Camino Real RD: 263 acres	Reduce hazardous fuel loads. Increase herbaceous ground cover. Decrease risk of stand replacement fire and associated watershed impacts.
Upper Rio Grande	Road Obliteration : Questa RD: 5 miles	Reduce sediment generation and delivery to surface waters. Restore land to productive state.
Upper Rio Grande (La Junta Canyon-Rio Pueblo)	Loring Spring Redevelopment - Reconstruct spring development to remove trough from riparian area, provide return flow to riparian-wetland and fence source water area (~ ½ ac)	Protect source water quality to Raton Canyon (tributary to impaired Rio Pueblo-Picuris) and improve riparian-wetland functional condition at source water area.
Upper Rio Grande (La Junta Canyon-Rio Pueblo)	Agua Sarca Spring Redevelopment - Reconstruct spring development to remove trough from riparian area, provide return flow to riparian-wetland and fence source water area (~ ½ ac)	Protect source water quality to Agua Sarca Canyon (tributary to impaired Rio Pueblo-Picuris) and improve riparian-wetland functional condition at source water area.
Upper Rio Grande (Headwaters Rio Fernando de Taos)	Rio Fernando de Taos Headcut Stabilization – riparian planting and fencing at 4 headcuts which would influence about 2 miles of impaired stream	Continuation of headcut stabilization that was begun in 2008; protection of remaining riparian areas upstream of headcuts, enhancement of riparian area around headcuts which help improve water quality and late season flow.
Upper Rio Grande	Closed ~ 3.5 miles of existing road in the Capulin area. Reinforced road closures on FR 438 (2.5 miles), FR 437 (4 miles), FR 161 (3 miles) and NM Hwy 518 (0.5 mile)	Reduce erosion. Reduce sediment generation and delivery to surface waters. Improve drainage.

Carson National Forest continued

Watersheds	Project Description	Watershed Benefits
Upper Rio Grande	Improved trail damage and tread by directing recreational use to established trails. 40.6 miles of trails were maintained which included improved drainage structures.	Reduce erosion. Reduce sediment generation and delivery to surface waters. Improve drainage.
Upper Rio Grande	Continued the implementation of vegetative treatments and fuel reduction activities. Approximately 510 acres were thinned.	Reduce hazardous fuel loads. Reduce erosion. Reduce sediment generation and delivery to surface waters.
Upper Rio Grande (Upper Red River)	Red River Mining District – CERCLA Project. Approximately 5,000 cubic yards of waste rock was removed from Big Five Mine and placed in the Bitter Creek Consolidation Cell.	Eliminate heavy metals from entering pathways of concern (i.e. soil and surface water).
Upper San Juan	Road Maintenance and Improvement: Jicarilla RD: 225 miles	Reduce sediment generation and delivery to surface waters. Improve road drainage.
Upper San Juan	Prescribed Fire/Fuel Reduction: Jicarilla RD: 1133 acres	Reduce hazardous fuel loads. Increase herbaceous ground cover. Decrease risk of stand replacement fire and associated watershed impacts.
Upper San Juan (Vaqueros Drainage)	Spot surface .5 mile of FR 310. 1 mile of road sandstone surfaced. 3 new culverts installed. Prescribe burned 1100 ac. Gathered about 8 horses.	Reduce runoff, erosion, sedimentation and improved drainage.
Upper San Juan (Carracas Canyon)	Inspected cross drainage structures on Energen Pipeline. Gathered approximately 55 wild horses.	Reduce runoff, erosion.
Upper San Juan (Bancos Drainage)	Gathered about 20 wild horses. Spot surfaced about 0.5 mile of FR 310. Quintana PJ Thinning 50 ac. Thinned 50 ac of Ponderosa pine.	Reduce runoff, erosion.
Upper San Juan (Cabresto Canyon)	Constructed small check dam-like structures with dead pinon-juniper and rocks. Gathered about 25 wild horses. 100% seeded a 100 acre wildfire and rehabbed all lines.	Reduce runoff, erosion.

Cibola National Forest

Watersheds	Project Description	Watershed Benefits
Western Estancia (Torreon Draw)	Novillo Canyon Tank Rehabilitation Project - Restore earthen livestock watering tank affected by the Big Spring Fire of 2008. Lower the existing spillway, clear debris and dead trees from the spillway. Reseed and restore banks around tank.	Improve sediment control and drainage. Restore banks of in-stream tank.
Western Estancia (Arroyo del Cuervo) (Upper Arroyo de Manzano)	Mazano Wildfire Restoration Work – revegetation, reconstruction of drainage structures, restoration of drainage features	Reduce sediment from wildfire effects. Restore drainage patterns. Reduce road runoff effects.

Coronado National Forest

Watersheds	Project Description	Watershed Benefits
Animas Valley (Horse Camp Draw-Animas Creek)	Juniper Basin Allotment - Environmental Assessment for new permit and management plan with BMPs	Increase herbaceous vegetation. Reduce erosion and sedimentation. Improve animal distribution and forage use and reduce dependence of grazing animals on riparian areas.
Cloverdale (Cloverdale Creek) (Diablo)	Pasco Resource Benefit Fire Cloverdale Prescribed Burn	5,097 acres of watershed resources protected by reducing risk of extreme wildfire and associated erosion. 2,500 acres of watershed resources protected by reducing risk of extreme wildfire and associated erosion.
San Simon River (Deer Creek-San Simon Valley)	Deer Creek and Skull Canyon Allotments – Environmental Assessment for new permit and management plan with BMPs	Increase herbaceous vegetation. Reduce erosion and sedimentation. Improve animal distribution and forage use and reduce dependence of grazing animals on riparian areas.
San Simon River (Skeleton Canyon) (Deer Creek-San Simon Valley) Animas Valley (Horse Camp Draw-Animas Creek) (Whitmire Creek)	Skeleton Resource Benefit Fire	8,000 acres of watershed resources protected by reducing risk of extreme wildfire and associated erosion.

Gila National Forest

Watersheds	Project Description	Watershed Benefits
Carrizo Wash (Mangas Creek)	Mangas Work Center Exclosure (maintained) 3 Acres	Decrease sediment into Mangas Creek
Carrizo Wash (Sawmill Canyon) (Largo Canyon)	Trail maintenance 13 miles	Reduce runoff, erosion, sedimentation. Improve bank stability.
Mimbres (Little McKnight)	Prescribed fires 8,100 acres (L T & Little McKnight). Rockheader maintenance (2)	Improved herbaceous ground cover resulting in stabilized soils and reduced erosion. Decreased sediment to stream
Mimbres (Alamocito Canyon)	Rockheader cleaned: 1	Decrease sediment from entering stream system.
San Francisco (Centerfire Creek)	Stock Tank cleaning and maintenance (John Tank, Deadman 1 & 2 Tanks) Resource Benefit Fires (Willy, Joshua, Porcupine Fires) 602 acres Road drainage improvement in SA Canyon, and Forest Roads 4017A & 4129Y Trail maintenance 12 miles Dirt stock tanks cleaned: 4	Decrease sediment from entering Centerfire Creek Decrease risk of extreme wildfire and associated erosion. Decrease sediment into SA Creek, tributary to Centerfire Creek Reduce runoff, erosion, sedimentation.
San Francisco (Whitewater Creek) (Pueblo Creek) (Vigil Canyon)	Trail maintenance watershed wide (Backcountry Horseman, Southwest Conservation Corp, TEP, The Wellness Coalition) 65 miles Little Whitewater Wildland Fire Use Fire - 295 acres. Alma Flats reseed 3 acres. Vigil Spring fenced exclosure 3 acres. Catwalk – 660 ft. bank stabilization and planting 60 trees; repair trail; low water crossing removed; self-contained pit toilet removed. Road maintenance – 3 miles Little Whitewater Road CAT-CO48.	Reduce runoff, erosion, sedimentation. Improve bank stability Reduce bank trampling at spring. Improve herbaceous ground cover. Reduction of hazardous fuels. Restore stream channel integrity.
San Francisco (Deep Creek)	Trail maintenance 7.5 miles Flying T Spring #21 (Glenwood / Reserve R.D.s). PJ removal/watershed treatment: 83 acres. Dirt stock tanks cleaned: 3	Reduce runoff, erosion, sedimentation. Improve bank stability. Decrease risk of extreme wildfire and associated erosion.

Gila National Forest continued

Watersheds	Project Description	Watershed Benefits
San Francisco (Negrito Creek)	Trail maintenance 9 miles Divide Trail #15 (SCC – TEP) PJ removal/watershed treatment: 256 acres	Reduce runoff, erosion, sedimentation. Improve bank stability Decrease risk of extreme wildfire and associated erosion.
Upper Gila (Corduroy Canyon)	Prescribed burn on approx. 6,300 acres of ponderosa pine and pinyon-juniper.	Decrease risk of extreme wildfire and associated erosion.
Upper Gila (Gilita Creek)	Trail maintenance 6 miles Gilita Trail #157 (TWC) Dirt stock tank cleaned: 1	Reduce runoff, erosion, sedimentation. Improve bank stability.
Upper Gila (Mogollon Creek)	Trail maintenance 0.6 miles	Reduce runoff, erosion, sedimentation. Improve bank stability.
Upper Gila (Sapillo Creek)	Maintenance and continuance of Solar Bees at Lake Roberts (70 acres) Purple loosestrife removal at Lake Roberts (1 acre) Sheep Corral Road thinning (150 Acres) Signal Peak Road thinning (150 acres)	Increase dissolved oxygen, increased pH, improved water temperatures Reduction of noxious weeds within lake Decrease risk of extreme wildfire and associated erosion.
Upper Gila (Black Canyon) (Diamond Creek) (Tom Moore Canyon)	Resource Benefit Fires 33,505 acres Temperature Remediation project; planting of native riparian vegetation and erosion control structures Salt Cedar removal on East Fork Gila River (1,240 acres)	Decrease risk of extreme wildfire and associated erosion. Reduced sedimentation and erosion. Increased riparian vegetation along stream corridor. Noxious plant removal from perennial river system and associated riparian area.
Upper Gila (Cub Creek) (White Creek)	Resource Benefit Fires 140 acres	Decrease risk of extreme wildfire and associated erosion.
Upper Gila (O Bar O Canyon)	Dirt stock tanks cleaned: 1	Decrease sediment from entering stream system.
Upper Gila-Mangas (Mangas Creek)	Willow Rx Burn (1900 Acres) Keese Canyon Browse pruning (300 acres)	Decrease risk of extreme wildfire and associated erosion.

Lincoln National Forest

Watersheds	Project Description	Watershed Benefits
Rio Hondo (Rio Ruidoso)	Fuels reduction project Thinning, mastication, and timber sale of 3745 acres.	Increase herbaceous ground cover. Decrease erosion.
Rio Hondo (Rio Ruidoso)	Fuels reduction project Broadcast burn of 2887 acres.	Decrease risk of extreme wildfire and associated erosion.
Rio Hondo (Bonito Creek) (North Capitan) (Eagle Creek)	755 acres Invasive weed treatment	Improve herbaceous groundcover and riparian vegetation.
Rio Hondo (Hale Lake)	120 acres Invasive weed treatment	Improve herbaceous groundcover and riparian vegetation.
Rio Penasco (Aqua Chiquita) (Upper Rio Penasco) (Elk Canyon)	Drainage improvements on 13 miles of road by creating or repairing water bars, cleaning cattle guards, and placing over size rock (French drain). Improved soil erosion by placing gravel on steep slopes and highly erosive sections of road.	Improve drainage. Decrease erosion.
Rio Penasco (Perk Canyon)	225 acres Invasive weed treatment	Improve herbaceous groundcover and riparian vegetation.
Rio Peñasco	Build bridge across eroded stream	Stabilize stream banks to reduce erosion. Improve riparian veg. to reduce erosion.
Rio Peñasco	Reroute sections of eroded trail. (Approximately 4 miles)	Decrease erosion by moving trail to better location. Improve trail drainage. Restore old trail to natural conditions.
Tularosa Valley (La Luz)	Fuels reduction project Broadcast burn of 700 acres.	Decrease risk of extreme wildfire and associated erosion.
Tularosa Valley (Nogal Canyon)	60 acres Invasive weed treatment	Improve herbaceous groundcover and riparian vegetation.
Upper Pecos (Dark Canyon)	Water bar construction for 20 miles of trails	Improve trail drainage. Decrease erosion.
Upper Pecos (Rio Penasco)	Fuels reduction project Thinning, mastication, and timber sale of 1840 acres.	Increase herbaceous ground cover. Decrease erosion.
Upper Pecos (Rio Penasco)	Fuels reduction project Broadcast burn of 1544 acres.	Decrease risk of extreme wildfire and associated erosion.
Upper Pecos (Dark Canyon)	Fuels reduction project Broadcast burn of 5000 acres.	Decrease risk of extreme wildfire and associated erosion.

Santa Fe National Forest

Watersheds	Project Description	Watershed Benefits
Jemez (Rito Penas Negras) (Rio de las Vacas) (Clear Creek)	Maintain 6 Miles of Riparian Fencing (353 acres of riparian habitat)	Improve water quality. Watershed improvement. Protect/Manage riparian areas.
Jemez (Rito Penas Negras)	Bell Lawrence Fence (2.5 Miles)	Reduce trespass from adjacent allotment. Improve water quality.
Jemez	Invasive weed management (70 acres)	Provide additional groundcover in place of Musk thistle to reduce runoff, erosion, and sedimentation. Increase herbaceous groundcover.
Pecos Headwaters	Gallinas WUI thinning for fuel reduction (650 acres)	Increase of herbaceous ground cover and infiltration. Reduce runoff, erosion, sedimentation. Watershed improvement and forest health. Reduced fire risk.
Pecos Headwaters	Invasive weed management (70acres)	Provide additional groundcover in place of Musk thistle to reduce runoff, erosion, and sedimentation. Increase herbaceous groundcover.
Pecos Headwaters	Road maintenance using Best Management Practices (20 miles).	Decrease erosion. Improve road drainage.
Pecos Headwaters Rio Grande- Santa Fe	Barbero Allotment EQIP grassland maintenance (250 acres)	Increase of herbaceous ground cover and infiltration. Reduce erosion, runoff and sedimentation. Watershed improvement and forest health.
Rio Chama	Polvadera Creek Riparian Project o 25 acres JUMO thinning. o ½ mile riparian fencing.	Improve water quality and quantity (particularly temperature exceedances). Improve riparian habitat. Improve RGCT habitat.
Rio Chama (Canonos Creek) (Celicia) (Chihuahuenos Creek) (Coyote Creek) (Rio Capulin)	Maintenance on 6 miles of riparian fencing along the Mesa del Medio, Jarosa and Gallina River Allotments.	Reduce livestock impact along riparian areas. Improve water quality.

Santa Fe National Forest continued

Watersheds	Project Description	Watershed Benefits
Rio Chama	Invasive weed management (70 acres)	Target treatment to upper watersheds in an effort to reduce seed transport in along lower drainages. Provide additional groundcover in place of Musk thistle to reduce runoff, erosion, and sedimentation. Increase herbaceous groundcover. Participants in Rio Arriba Co. Cooperative Weed Management Area (RACWMA). Held weed workshop for local communities to inform public on weed identification and (RACWMA) and (NRCS) services available to private land owners.
Rio Chama	Improved 5 Spring Developments on the Mesa Alta and Mesa Poleo Allotments	Improve livestock distribution. Protect spring from livestock and wildlife impacts and pipe water to offsite water drinker.
Rio Chama	Mesa del CaminoThinning (60 Acres).	Watershed improvement and forest health. Reduced fire risk. Decrease erosion.
Rio Chama	Sage Flats Tank (EQIP)	Improve livestock distribution.
Rio Chama	West 112 Sage Mowing (155 acres)	Increase of herbaceous ground cover and infiltration. Reduce erosion, runoff and sedimentation. Watershed improvement.
Rio Puerco	Cuba Mesa Thinning (50 Acres).	Watershed improvement and forest health. Reduced fire risk. Decrease erosion.
Upper Rio Grande	Invasive weed management (30acres)	Remove bull thistle to favor native herbaceous groundcover.
Upper Rio Grande	FR 306 Road Maintenance (4 miles)	Reduce runoff from road surface.

State-wide Projects (not reported by watersheds)

Natural Resources Conservation Service:

Agricultural Water Enhancement Program (NEW PROGRAM) http://www.nrcs.usda.gov/programs/awep/
The Agricultural Water Enhancement Program (AWEP) is a voluntary conservation initiative that provides financial and technical assistance to agricultural producers to implement agricultural water enhancement activities on agricultural land for the purposes of conserving surface and ground water and improving water quality. The Agricultural Water Enhancement Program (AWEP) replaces the former Ground and Surface Water Conservation (GSWC) component of the EQIP (Environmental Quality Incentives Program). AWEP proposals approved for funding in FY 2009 in New Mexico included:

- Pueblo of Jemez
- Ft. Sumner Irrigation District
- Pueblo of Sandia
- Deming SWCD - Black Range RC&D
- Pueblo of Santa Ana

Cooperative Conservation Partnership Initiative (NEW PROGRAM)
http://www.nrcs.usda.gov/programs/ccpi/index.html
The Cooperative Conservation Partnership Initiative (CCPI) is another national initiative in the 2008 Farm Bill which encourages a partnership approach to implementing EQIP, WHIP (Wildlife Habitat Incentives Program) and CSP (Conservation Stewardship Program). EQIP-CCPI proposals approved for funding in FY 2009 in New Mexico included:

- Pueblo of Cochiti
- Deming SWCD-Black Range RC&D
- New Mexico Association of Conservation Districts
- Adelante RC&D (implementing temperature TMDL on Rio de los Pinos along with 319 and RERI)

Comprehensive Nutrient Management Plans
Comprehensive Nutrient Management Plans were developed by the NRCS field offices in Roswell (4), Portales (1), Deming (1), and Socorro (1). Funding is continuing to be available for manure management through the Farm Bill Environmental Quality Incentives Program for animal feeding operations. The interagency New Mexico CNMP Workshop was held for dairy producers, planners, and consultants. Dairy waste storage facilities were installed in Chaves (7), Dona Ana (1), Eddy (6), and Roosevelt (1) counties.

Nutrient and Salinity Management
The certification program and training course on Nutrient and Pest Management have been in effect since 2001 for NRCS and CES employees, other agencies, private consultants, and producers. Over 200 participants have been trained since 2001. Nutrient management practices, including salinity management (in acres), were applied to utilize resources efficiently and reduce nutrient runoff and leaching from cropland in Chaves (3632), Curry (8349), De Baca (1795), Dona Ana (1222), Eddy (1007), Hidalgo (325), Lea (2660), Luna (45), Otero (85), Quay (2511), Rio Arriba (134), Roosevelt (756), San Juan (29), Sandoval (38), Santa Fe (9), Torrance (1128), and Valencia (319) counties. Integrated nutrient management guides were developed for planners and producers.

Conservation Buffers, Cover, and Crop Rotation

Conservation buffers, cover, and crop rotations reduce sediment losses, runoff, and wind erosion. Stream bank and shoreline protection (640 ft), field borders (67 ac) and windbreaks/shelterbelts (71247 ft) were applied in New Mexico, chiefly in Curry, Grant, Hidalgo, Luna, Otero, Quay, San Miguel, Union, and Valencia counties. Herbaceous wind barriers planned in New Mexico totaled 35,227 ft. Windbreak establishment training was provided for planners and partners across the state. Conservation cover (in acres) was applied in Curry (39751), De Baca (527), Guadalupe (859), Lea (3475), Quay (49020), Roosevelt (5249), and Union (1170) counties. Conservation crop rotation was applied across the state on 74,811 acres.

Irrigation Water Management

Irrigation water management practices applied, which reduce runoff and leaching, included acres applied in the following counties: Chaves (11), Cibola (2), Curry (8668), De Baca (2687), Dona Ana (968), Eddy (3243), Grant (40), Hidalgo (402), Lea (4948), Luna (934), McKinley (3), Mora (3), Otero (97), Quay (3506), Rio Arriba (138), Roosevelt (4944), San Juan (105), Sandoval (62), Santa Fe (60), Sierra (155), Socorro (255), Taos (32), Torrance (1391), and Valencia (331).

Irrigation land leveling was applied on 2731 acres. An integrated water management handbook, http://www.nm.nrcs.usda.gov/technical/handbooks/iwm/nmiwm.html, was developed and integrated cropland management training sessions were held for planners and partners across the state in 2008. As follow-up in 2009, 10 sustainable agriculture workshops were held across the state for producers, partners, and planners.

Land Treatment for Surface Water Management

Diversions (29918 ft) and Terraces (41443 ft) were installed across New Mexico, chiefly in Colfax, Curry, Guadalupe, Quay, Roosevelt, San Miguel, Sandoval, and Union counties.

Pest Management

Pest management systems (in acres) were applied on cropland, pasture and rangeland to utilize resources efficiently and reduce pesticide runoff and leaching in the following counties: Chaves (4647), Cibola (9), Curry (14793), De Baca (2495), Dona Ana (1229), Eddy (3201), Grant (40), Hidalgo (325), Lea (4715), Luna (562), Otero (104), Quay (24300), Rio Arriba (43), Roosevelt (1801), San Juan (648), San Miguel (194), Sandoval (38), Torrance (1128), and Valencia (326). Brush management practices were applied on 157705 acres. Brush management training was provided for planners and partners across the state. Windows Pesticide Screening Tool was utilized to evaluate environmental risks of adsorbed runoff, solution runoff and leaching potential of soil-pesticide interactions. Appropriate integrated pest management alternatives were selected for implementation.

Prescribed Grazing

Prescribed grazing practices (in acres) were applied on rangeland in the following counties: Catron (810), Chaves (8442), Cibola (16570), Colfax (8233), Curry (135), De Baca (66959), Dona Ana (6), Eddy (10026), Guadalupe (6395), Harding (20556), Hidalgo (23059), Lea (113334), Lincoln (78108), Otero (19604), Quay

(10772), Rio Arriba (12), Roosevelt (13717), San Miguel (3774), Santa Fe (5809), Taos (33), Torrance (22637), Union (1989), and Valencia (6). Fences were installed on 1,145,846 acres.

Residue Management

Conservation crop rotation (74811 acres), cover crop (571 acres), mulch till (363 acres), no till (2790 acres), seasonal residue management (74295 acres) were applied to cropland to reduce sediment losses and runoff and utilize resources efficiently, chiefly in Chaves, Colfax, Curry, De Baca, Dona Ana, Eddy, Grant, Hidalgo, Lea, Luna, Otero, Quay, Roosevelt, San Juan, Sandoval, Socorro, Taos, Torrance, Union, and Valencia counties.

Watershed Plans

Watershed plans were developed in Bernalillo (1), Chaves (1), Cibola (1), Guadalupe (1), Lea (2), Luna (1), Otero (1), Roosevelt (3), Santa Fe (1), and Valencia (1) counties.

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