State of New Mexico Nonpoint Source Management Program

2010 Annual Report

New Mexico Environment Department
Surface Water Quality Bureau
Watershed Protection Section

State of New Mexico
Nonpoint Source Management Program

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Table of Contents

List of Acronyms..... II
Executive Summary..... 1
Introduction..... 2
What is Nonpoint Source Pollution? 2
Clean Water Act Section 319..... 2
Clean Water Act Sections 303(d) and 305(b)..... 3
New Mexico's Nonpoint Source Management Program..... 3
319(h) Project Spotlight - Santa Fe River Restoration..... 4
NPS Management Program Milestones..... 6
SWQB Program Updates..... 9
Watershed Protection Section..... 9
NPS Management Program Problems and Concerns..... 10
NPS Management Program Objectives for 2011..... 10
Effectiveness Monitoring Program to Evaluate 319 Success..... 11
Outreach Milestone Spotlight..... 12
New Mexico Watershed Restoration Priorities and Progress (map)..... 13
Project Summaries for WPS 2010 319(h) Projects..... 14
Wetlands Program..... 19
NM Water Quality Standards Program..... 22
Triennial Review..... 22
Outstanding National Resource Waters..... 22
CWA §303(d)/§305(b) Integrated Report and TMDLs..... 22
Monitoring and Assessment Program..... 23
Water Quality Surveys..... 23
Sediment Stream Assessment Protocol..... 23
Nutrient Assessment Protocols..... 24
River Ecosystem Restoration Initiative..... 25
CWA Section 401 Certification Activities..... 26
New Mexico Mining Act Activities..... 27
Groundwater Quality Bureau Update..... 28
Permitting and Compliance for Large Capacity Septic Systems..... 28
New Mexico Water Fair and Water Quality Outreach Program..... 28
Projects Completed by Non-NMED Agencies..... 29
Bureau of Land Management..... 30
New Mexico State Forestry Division..... 35
Soil and Water Conservation District (SWCD) Projects..... 36
U.S. Forest Service Projects..... 37
Natural Resources Conservation Service..... 47

List of Acronyms

AWP	Animas Watershed Partnership
BMP	Best Management Practice
CART	Categorical and Regression Tree
CR	County Road
CWA	Clean Water Act
EPA	Untied States Environmental Protection Agency
FR	Forest Road
GWQB	Ground Water Quality Bureau
HUC	Hydrologic Unit Code
NMAC	New Mexico Administrative Code
NMDOT	New Mexico Department of Transportation
NMED	New Mexico Environment Department
NMRAM	Rapid Assessment of New Mexico Wetlands
NPS	Nonpoint Source Pollution
NPDES	National Pollutant Discharge Elimination System
NWI	National Wetlands Inventory
ONRW	Outstanding National resource Waters
PAM	Performance Activity Measure
QAPP	Quality Assurance Project Plan
RERI	River Ecosystem Restoration Initiative
RFP	Request for Proposals
STEPL	Spreadsheet Tool for Estimating Pollutant Load
SWQB	Surface Water Quality Bureau
TMDL	Total Maximum Daily Load
UAR	University of Arkansas
USDA	Untied States Department of Agriculture
USGS	United States Geological Survey
WBP	Watershed Based Plan
WPS	Watershed Protection Section
WQCC	Water Quality Control Commission

Executive Summary

This annual report to the United States Environmental Protection Agency (EPA) provides an overview of Clean Water Act (CWA) Section 319(h) Nonpoint Source Management Program related activities conducted in New Mexico in 2010 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." Nonpoint source pollution is the leading cause of water quality degradation in the United States and poses a substantial problem for the health of New Mexico's rivers, wetlands, lakes and streams. When Congress amended the CWA in 1987, section 319 was added to provide federal leadership to assist states, territories and tribes in developing programs that address NPS pollution. Under section 319, states, territories and tribes receive grant funding to support activities such as: outreach and education, training, 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. The 2010 milestones are reported on pages 6-8. Significant achievements include: the release of a request for proposals (RFP) to fund projects with the greatest potential of success under the National Water Program Guidance Fiscal Year 2008 PAMs WQ-10 and SP-12, the release of a second RFP to fund watershed-based planning, the submittal to EPA of a 319 Success Story under PAMs WQ-10 and SP-12 for the Santa Fe River, the EPA acceptance of the Rio Santa Barbara Watershed-Based Plan, the completion of a Wetlands Action Plan for the Galisteo watershed, assisting the SWQB Monitoring and Assessment Section staff with revising the State of New Mexico Surface Water Quality 10-Year Monitoring and Assessment Strategy by developing a Monitoring and Assessment Strategy for Wetlands, and hosting the second biannual New Mexico Watershed Forum. In addition to the above accomplishments, 22 proposals resulting from the two RFPs were reviewed and six workplans were developed and submitted to EPA for review. These projects received final approval by year's end, and are in the final stages of contract issuance.

Load reductions were calculated for all of the 319(h) projects administered by the Watershed Protection Section that concluded in 2010 where BMPs were implemented. Load reductions were reported on three of the projects which were completed in 2010.

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 2010 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, and nonpoint source projects implemented by other natural resource agencies outside of NMED.

What is Nonpoint Source Pollution?

Polluted runoff, or nonpoint source 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 in stormwater runoff.

Clean Water Act Section 319

Nonpoint source (NPS) pollution is the leading cause of water quality degradation in the United States and poses a substantial problem for the health of New Mexico's rivers, wetlands, lakes and streams. When Congress amended the CWA in 1987, Section 319 was added to provide federal leadership to assist states, territories and tribes in developing programs that address NPS pollution. Under Section 319, states, territories and tribes receive grant funding to support the following activities: outreach and education, training, 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 *State of New Mexico CWA §303(d)/§305(b) Integrated 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 (NPS Management Plan). 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 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.
- ◊ Develop WBPs with key stakeholders for coordinating watershed restoration efforts.
- ◊ Implement BMPs to address NPS pollution based on recommendations of an accepted WBP.

Sapello Creek following stream restoration.

319(h) Project Spotlight - Santa Fe River Restoration

The Santa Fe River watershed is a sub-basin of the Rio Grande and is located in north central New Mexico. The watershed's primary watercourse, the Santa Fe River, extends from its headwaters at Santa Fe Lake in the Pecos Wilderness of the Sangre de Cristo Mountains at an elevation of 12,408 ft. to it's confluence with the Rio Grande at Cochiti Reservoir at an elevation of approximately 5,200 ft. The Santa Fe River has two major impoundments: McClure and Nichols reservoirs, which provide water to approximately 30,000 homes and businesses in the Santa Fe area. The stream is classified as intermittent, and is dry through much of the City of Santa Fe, but maintains two perennial reaches. The first is from the headwaters to the bridge at Cerro Gordo Road in Santa Fe, and the second is from the City of Santa Fe's wastewater treatment plant through the Santa Fe River Preserve to La Bajada.

Santa Fe River in 2000 prior to restoration (photopoint G).

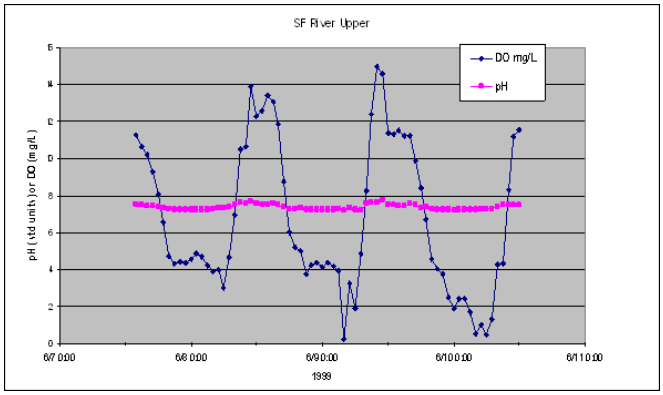
The Santa Fe City Council passed a resolution in 2002 recognizing a Rural Protection Zone on City-owned property in the vicinity of the airport to formally recognize the significance of the reach and to foster environmental protection, erosion prevention, and flood prevention. The County of Santa Fe acquired the downstream section as Open Space to be managed with a variety of environmental objectives in mind. The Wild Earth Guardians planned and implemented restoration activities in coordination with the City, County, and NMED in the area which is now known as the Santa Fe River Preserve.

In 2000, the Santa Fe River from Cochiti Reservoir upstream to the Santa Fe waste water treatment plant was impaired for stream bottom deposits, dissolved oxygen and pH. Subsequent TMDLs were written and approved by EPA for stream bottom deposits in March, 2000 and for dissolved oxygen and pH in January, 2001. Initial restoration efforts were funded through a Partners Grant from the U.S. Fish and Wildlife Service. In 2000, the Wild Earth Guardians received funding through a CWA 319(h) grant administered by NMED for the

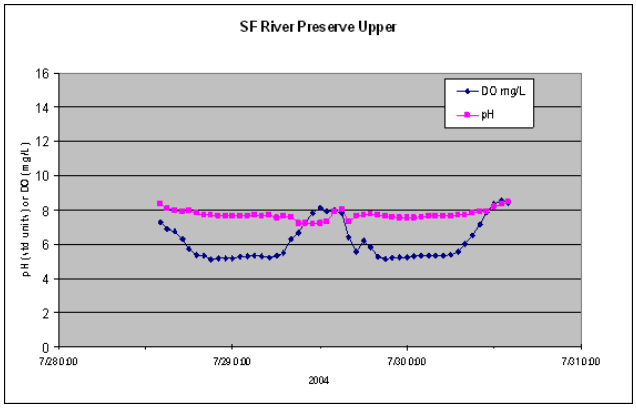
Santa Fe River in 2004 following initial restoration (photopoint G).

Santa Fe River Restoration Project and again in 2005 for the *La Cieneguilla Open Spaces / Santa Fe River Restoration Project*. The primary objectives of these projects were to improve the ecological condition of the riparian ecosystem and improve water quality in the Santa Fe River.

Restoration efforts on the Santa Fe River Preserve have improved water quality by establishing and protecting an abundant native riparian corridor. Restoration was conducted along a 1.5 mile reach of the river and included fencing to reduce the impacts from livestock grazing, inhibit unauthorized motorized vehicle use within the riparian area, and to prevent illegal dumping along the river. The floodplain was restored by removing earthen berms and non-native plants, and planting native riparian vegetation including 5,000 cottonwood poles, and 15,000 willow whips, as well as other shrubs, grasses and forbs. This created a buffer to filter stormwater, strengthened the streambank, and facilitated the formation of riparian wetlands, which reduced sediment loading and increased canopy cover. Increasing canopy cover and reducing available sunlight can have a direct impact on algal growth, and algae are known to be directly related to fluctuations in dissolved oxygen and pH in many aquatic ecosystems.



Dissolved oxygen and pH in the Santa Fe River in 1999 prior to restoration.



Dissolved oxygen and pH in the Santa Fe River in 2004 following initial restoration.

In 2002, 9 out of 11 grab samples exceeded the pH criterion (pH range from 6.6 to 9.0). In 2008, out of the 10 grab samples collected none exceeded the pH criterion. In addition, sondes deployed at both the station immediately below the Santa Fe waste water treatment plant in July 2005 and at the USGS gage above Cochiti Lake in October 2007 indicated full support for pH (minimum to maximum recorded pH values were 7.37 to 8.68 and 7.25 to 8.78, respectively). Therefore, pH was removed as a cause of impairment on the *2008-2010 State of New Mexico CWA §303(d)/§305(b) Integrated Report*. Furthermore, sedimentation/siltation was removed as a cause of impairment on the upstream reach which includes the Santa Fe River Preserve. It is also anticipated that dissolved oxygen will be removed as an impairment in the *2010-2012 State of New Mexico CWA §303(d)/§305(b) Integrated Report* based on data collected during the summer of 2010.

NPS Management Program Milestones

At the core of the NPS Management Program plan there are specific objectives aimed at reducing and preventing 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. Milestones are an integral part of the NPS Management Program and a requirement under Section 319(b)(2)(c) of the Clean Water Act. The following table lists each milestone identified in the NPS Management Plan which has a specific numeric goal and an established time frame, and its status.

Objective number	Objective Short Name	Milestone (abbreviated)	Schedule	2010 Status
1	Watershed Based Planning	All nine planning elements are addressed in watershed-based plans (WBPs).	2012: 3 plans, 49 watersheds. 2014: 2 additional plans, 20 additional watersheds.	In progress. One plan covering one priority watershed was accepted by EPA in 2010.
2	Addressing Water Quality Problems	Improve water quality in priority watersheds, meeting EPA performance measures SP-12 or WQ-10.	Three watersheds by 2012 and three more by 2014	In progress. One nomination was submitted in 2010, for one stream segment and two sixth-level (12-digit) watersheds.
2	Addressing Water Quality Problems	Wetlands Action Plans are implemented in at least one priority watershed per year.	1 watershed per year	Achieved for 2010. One Wetlands Action Plan was implemented in one priority watershed.
3	Water Quality Protection	The CWA §303(d)/§305(b) Integrated Report does not indicate an increase in the percentage of assessed stream miles designated as impaired.	The Integrated Report is scheduled for completion in 2010, 2012, and 2014.	Milestone not achieved. Impaired streams increased by 177 miles (1%).

NPS Management Program Milestones (continued)

Objective number	Objective Short Name	Milestone (abbreviated)	Schedule	2010 Status
3	Water Quality Protection	The CWA §303(d)/§305(b) Integrated Report provides summaries of water quality survey activity, analysis, and conclusions.	The Integrated Report is scheduled for completion in 2010, 2012, and 2014.	Achieved for 2010. The 2010-2012 §303(d)/§305(b) Integrated Report was released in 2010.
3	Water Quality Protection	NMED proposes to WQCC adoption of water quality standards for wetlands.	2014	In progress. WQCC included specific wetlands within ONRWs in 2010.
4	Education and Outreach	The Forest and Watershed Health Program Virtual Library experiences an annual increase in internet hits of at least 10% between 2009 and 2014.	Annually	Behind schedule. Capability to track hits was added in 2010.
4	Education and Outreach	NM Watershed Forum is attended by more than 300 people.	2010, 2012, 2014	Milestone not achieved. The 2010 NM Forum had 230 registered attendees.
4	Education and Outreach	Clearing the Waters is published quarterly.	Quarterly	Milestone achieved. Four issues of Clearing the Waters published in 2010.
4	Education and Outreach	Clearing the Waters circulation increases to 1000 by 2014.	2014	Milestone achieved. Circulation is estimated at 1,004.
6	Interagency Cooperation	The MOU between NMED and USFS is renewed.	2014	In progress.

NPS Management Program Milestones (continued)

Objective number	Objective Short Name	Milestone (abbreviated)	Schedule	2010 Status
6	Interagency Cooperation	The Agreement in Principle between NMED and USDOE will be renewed.	2010	Milestone achieved. The agreement was actually extended in 2008 and is valid until 2013.
6	Interagency Cooperation	The MOU between NMED and NMDOT will be renewed.	2010	Milestone achieved. A new agreement is in place.

The WPS also continues to forge relationships to promote interagency cooperation. To this end, a planning meeting was held with the U.S. Forest Service on November 16, during which USFS staff from each National Forest in New Mexico and staff from several programs within SWQB provided information on their respective programs. The main focus was watershed-based planning initiatives.

Another component of the NPS Management Program includes reporting other NPS pollution reduction related activities within the SWQB and those conducted by outside agencies. They are reported in other sections.

SWQB Program Updates

Watershed Protection Section

2010 was a year of relative stability during which activities described in the NPS Management Plan were implemented. Most of the objectives outlined for 2010 in the 2009 NPS Annual Report were met, including:

- ◊ A Request For Proposals (RFP) was released in February 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). This activity is directed at completing three watershed plans containing all nine planning elements covering 49 priority watersheds by 2012.

- ◊ A second RFP was released in February to select on-the-ground projects with the greatest potential of success under the National Water Program Guidance Fiscal Year 2008 Performance Activity Measures (PAMs) WQ-10 and SP-12.

- ◊ A nomination for a 319 Success Story under PAMs WQ-10 and SP-12 was submitted for the Santa Fe River. A nomination was not submitted for the Gallinas River as planned in early 2010 because staff working on the nomination decided that more compelling information may be provided through a new planning project being developed there.

- ◊ Monitoring and Assessment Section staff, with assistance from WPS staff, revised the State of New Mexico Surface Water Quality 10-Year Monitoring and Assessment Strategy, specifically in the area of developing a Monitoring and Assessment Strategy for Wetlands.

- ◊ A second New Mexico Watershed Forum was conducted, in September. This event brought 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.

- ◊ The Wetlands Program and the River Ecosystem Restoration Initiative were developed and supported in 2010.

In addition to the above accomplishments, 22 proposals resulting from the two RFPs were reviewed and six workplans were developed and submitted to EPA for review. These projects received final approval by year's end, and are in the final stages of contract issuance. More detail is provided on several activities implemented as part of the NPS Management Program in other sections.

NPS Management Program Problems and Concerns

One staff member departed for personal reasons in 2010, and her position has not been filled due to a shortfall of state funds and concomitant hiring freeze. This was the position for a NMDOT/NMED liaison, and the work that would be conducted by the position is central to the Memorandum of Understanding between the two agencies. The position was already vacant when a tanker truck operated by a NMDOT contractor carrying a load of hot asphalt emulsion tipped over on a remote road near the Rio de las Vacas. An NMDOT crew was nearby, with heavy equipment, and could have reduced the amount of asphalt reaching the stream, but did not respond. It is likely that the liaison would have facilitated a different response, reducing the seriousness of the spill.

There were no other major problems or concerns implementing New Mexico's NPS Management Program in 2010.

NPS Management Program Objectives for 2011

The WPS has identified the following specific NPS Management Program activities to meet program objectives for 2011.

- ◊ Release a Request For Proposals (RFP) in February 2011 to select projects that will develop or update 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 may contribute to meeting the milestone related to completing watershed-based plans by 2014.

- ◊ 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 for Fiscal Year 2011 PAMs WQ-10 and SP-12.

- ◊ Complete a nomination for a 319 Success Story under PAMs WQ-10 and SP-12 for Comanche Creek.

- ◊ Review changes in the 2010-2012 *State of New Mexico 303(d)/305(b) Integrated List for Assessed Surface Waters* relative to the 2008-2010 *Integrated List,* to identify additional potential candidates for Success Story nomination.

- ◊ Continue to develop and conduct watershed-planning workshops in different communities.

- ◊ Complete the Nonpoint Source Program Effectiveness Assessment project for 2008-2011, and determine whether and how to incorporate effectiveness monitoring into regular activities funded under Section 319.

- ◊ Assist Monitoring and Assessment staff with conducting water quality surveys in the lower Rio Grande, Gila, and San Francisco watersheds.

◊ 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 Section 319 funded projects (319 projects). 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. To accomplish this goal, the effectiveness monitoring coordinator is involved in many aspects of 319 project development, and includes: participating in the annual 319 project grant evaluation process, assisting in the development of individual 319 project Quality Assurance Project Plans (QAPP), providing support for 319 project monitoring, and analyzing the monitoring data to determine project success.

319 project effectiveness data were collected on the following waterbodies in 2010.

Waterbody	Data Collection 2010	Comment
Rio de los Pinos	Thermographs	Second year of data collection
Bluewater Creek	Thermographs	319 Project completed this year
San Antonio Creek	Thermographs, Sonde Deployment	Second year of data collection
Middle Ponil Creek	Thermographs, Canopy Density	Second year of data collection
Dalton Creek	Thermographs	First year of baseline data
Comanche Creek	Thermographs	Post-Implementation monitoring
Santa Fe River	Thermographs, Sonde Deployment	Post-Implementation monitoring

In addition to conducting monitoring for 319 projects, the effectiveness monitoring coordinator assisted the SWQB Monitoring and Assessment Section with habitat surveys and electrofishing on the Pecos River. Other activities included: completing a QAPP for Effectiveness Monitoring for the *Pecos River Respect the Rio Managing Recreation Project*, assisting in incorporating monitoring tasks into the workplans of all on-the-ground projects funded in 2010, and submitting a nomination to the EPA for the Santa Fe River for recognition under the EPA's 319 Success Story Program.

Outreach Milestone Spotlight

The 2010 New Mexico Watershed Forum- From Mountaintop to River Bottom: Teaming up for Healthy Watersheds

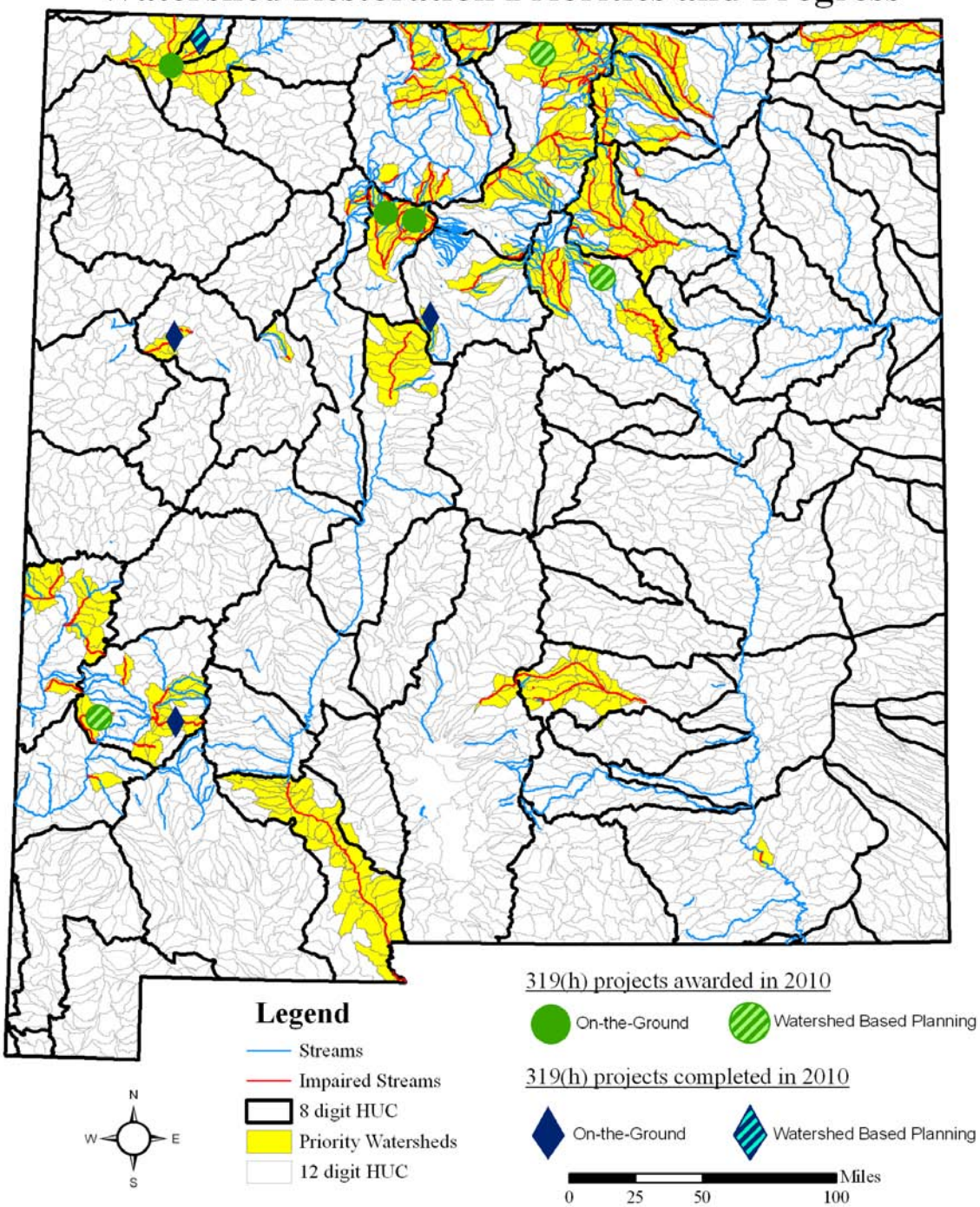
The 2010 NM Watershed Forum – "From Mountaintop to River Bottom: Teaming Up for Healthy Watersheds" brought together 247 people from throughout and beyond New Mexico over three days to attend presentations, workshops and a field trip of multiple on-the-ground watershed restoration projects. Participants included representatives of federal, tribal, state and local natural resource agencies; non-profit conservation and watershed groups; and consultants, engineers and restoration practitioners. There were 48 speaker presentations, approximately 20 poster sessions and 15 exhibitor tables. The overall focus of the presentations was on how to use collaboration to make improvements to a watershed's forests, rivers, and wildlife habitats. Workshops ranged from policy, planning, monitoring, implementation practices, organizational development and educational outreach. Participants learned practical tips for implementing restoration projects, determining project effectiveness, characterizing the watershed and identifying water quality problems, creating effective watershed based restoration plans, building organizational capacity, and approaches for developing plans for environmental flow protection in New Mexico.

Opening morning at the Albuqurque Hilton.

Field trip to Cedro Creek.

What is the value of such a gathering? We celebrated and learned from our successes and failures, as well as gained a broader understanding of the challenges and advantages of working together. We strengthened professional relationships, met new people and planted the seeds for future collaborations that will preserve and restore New Mexico's environment. The forum was a collaborative effort in itself, with representatives from five agencies, three non-profits and a contractor (River Source) sharing responsibilities over a six month planning period that resulted in a successful event.

New Mexico
Watershed Restoration Priorities and Progress



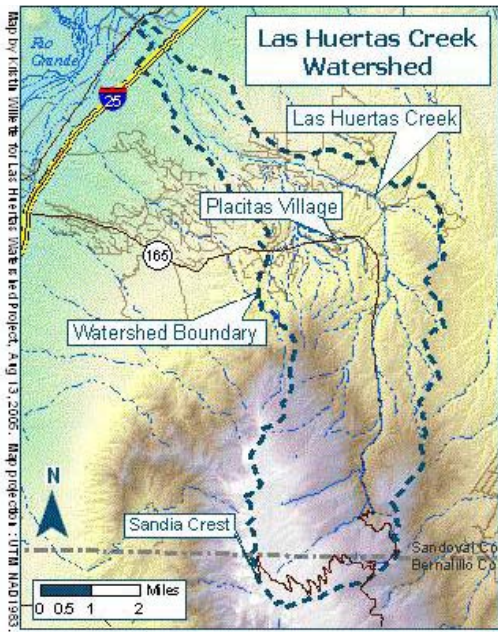
Project Summaries for WPS 2010 319(h) Projects

Las Huertas Watershed Project (FY06-L)

Project Budget: Federal 319(h): $214,684 Match: $213,392 Project Total: $428,076
Watershed: Rio Grande - Santa Fe (HUC 13020201)
Sub-Watershed: Las Huertas Creek (HUC 130202010610)
Impairments: Sedimentaion/Siltation

Project Summary:

The Las Huertas watershed is located in central New Mexico east and northeast of the city of Albuquerque. The headwaters of the watershed are located along the eastern slope of the northern Sandia Mountains eventually forming Las Huertas Creek and flowing north through the village of Placitas and then northwest to the Rio Grande near the town of Bernalillo. The watershed is approximately 19,659 acres in area, and the Creek is approximately 16 miles in length.



Las Huertas Watershed.

The goal of this project was to address the sedimentation/siltation impairment by stabilizing a section of the riparian corridor, and reducing upland erosion. The Placitas Watershed Group and other volunteers conducted restoration by implementing induced meandering techniques, removing non-native and non-riparian trees, and planting trees, shrubs, native grasses and forbs. Upland terraces along the project reach were stabilized with juniper slash cuttings and reseeded with a southwestern wildland grass seed mix to reduce sediment transport from overland flow.

Project partners included the US Fish and Wildlife Service, US Forest Service, Bureau of Land Management, NMED, NMDOT, City of Albuquerque Open Space Division, Sandoval County, Eastern Sandoval County Arroyo and Flood Control Authority, Coronado Soil and Water Conservation District, New Mexico Watershed Watch, Quivira Coalition, Earthworks Institute, New Mexico Land Conservancy, Wild Horse Observers Association, Pathways – Wildlife Corridors of New Mexico, Las Placitas Presbyterian Church, WildEarth Guardians, Anasazi Fields Winery, and private citizens and landowners.

Project Outcome:

A total of 27 machine-built and 8 hand-built in stream structures were completed over 11,000 feet of river during the course of this project. These included, boulder vanes, post vanes, cross vanes, one rock dams, rock baffles, Zuni bowls, picket baffles, and cobble rundowns. An additional 3,000 feet of improved road drainage wetland rehabilitation were also completed. Approximately 2 miles were treated to improve riparian vegetation. This involved the removal of tamarisk, Siberian elm, Russian olive, and one seed juni-

Rock baffle on Las Huertas Creek.

per from the riparian corridor and planting 180 cottonwood poles, 1500 willow whips, 48 New Mexico olives, and 38 chokecherries and currants. There were also 7 instructional workshops held on stream restoration and implementation of best management practices with a total of 265 participants. These resulted in some level of voluntary landowner implementation on private property.

Load Reductions

The STEPL model was used to estimate a sediment loading reduction of 128.4 lb/day or 0.5% of the total load resulting from implementing this project. Other load reduction estimates include:

Nitrogen	0.19 lb/day	0.3% of the total load.
Phosphorus	0.05 lb/day	0.3% of the total load.
BOD	0.25 lb/day	0.1% of the total load.

Black canyon Creek: Temperature Impairment Remediation (FY07-B)

Project Budget: Federal 319(h): $19,191 Match: $18,892 Project Total: $38,083
Watershed: Upper Gila (HUC 15040001)
Sub-Watershed: Outlet Black Canyon (HUC 150400010704)
Impairments: TMDL for temperature

Project Summary:

This project was implemented to address temperature exceedances in Black Canyon Creek, a major tributary of the Gila River and a reintroduction site for native Gila trout. The creek drains a total watershed area of 113 square miles, nearly all (102 square miles) within either the Aldo Leopold Wilderness or Gila Wilderness Areas. The watershed is mostly steep and forested at elevations ranging from about 5,700 to 9,000 feet. In 2002, the *State of New Mexico CWA §303(d)/§305(b) Integrated Report* listed Black Canyon Creek as nonsupporting for its designated use for high-quality coldwater aquatic life. At the SWQB sampling station, 37% of temperature readings exceeded the 20° standard for high-quality coldwater aquatic life. The most likely cause of temperature exceedances was high-intensity wildland fire and subsequent flooding in 1995–1996. This resulted in a loss of riparian shade cover and inhibited vegetation regeneration, increased sediment runoff and delivery to the channel, and increased width/depth stream morphology. The project goal

Mesilla Valley Flyfishers harvesting willows.

was to reduce temperature exceedances on Black Canyon Creek due to stream over-widening, high sediment loads, and a lack of riparian bank cover and shading.

Project cooperators included the: Grant Soil & Water Conservation District (fiscal agent), Jornada Resource, Conservation and Development Council, Mesilla Valley Flyfishers Association, New Mexico Department of Game & Fish, NMED, Sierra Soil and Water Conservation District, Trout Unlimited, Wilderness and Silver City Ranger Districts of the Gila National Forest, and USDA Natural Resources Conservation Service.

Project Outcome:

To decrease the width/depth ratios, 15 rock stream barbs and 16 rock weirs were installed. To increase riparian canopy and shading, approximately 1500 cottonwood and willow poles/whips were harvested locally and planted. This increased the measured canopy in the project area from 57% to 74%. Locally obtained obligate wetland species (rushes and sedges) were planted on low floodplain, bar surfaces, and backwater areas to capture sediment that may otherwise have been deposited in pool features.

Volunteers from the Mesilla Valley Flyfishers Association and Trout Unlimited made two trips to the site to assist in monitoring and re-vegetation efforts. These efforts were highlighted in a New Mexico Game and Fish video production called "Gila Trout Cover" and broadcast on the New Mexico Wild TV show (the video clip can be viewed online at:

http://www.youtube.com/user/NMGameandFish#p/c/0391D5CAF9A971D4/11/z1HqqLrNQ9k.

Load Reductions

Direct measurements of water temperature showed a decrease in exceedances of the water temperature standard from 37% to 14% exceedance during the project period using thermographs recording on an hourly basis. Load reductions were estimated with the SSTEMP model by using TMDL parameters and project specific results including an increase in vegetation canopy cover from 57 to 74% based on field measurements. Loading was reduced by approximately 60.45 joules/meter^2/second within a 2.5 mile reach (14% of the TMDL segment length), equivalent to an average load reduction of 8.5 joules/meter^2/second for the TMDL segment.

A Watershed Planning Approach to Overcome Political Barriers on the Animas river (FY06-M)

Project Budget: Federal 319(h): $90,912 Match: $60,620 Project Total: $151,532
Watershed: Animas (HUC 14080104)
Sub-Watershed:
Impairments: TMDL for nutrients.

Project Summary:

The Animas River headwaters in the San Juan Mountains of southeast Colorado and flows south through the towns of Silverton and Durango before crossing the border into New Mexico. A tributary of the San Juan River, the Animas River has been successfully remediated from heavy metal loading left from a history of mining in the upper watershed. Today, due to explosive growth and development, a new legacy of issues has been created in the lower watershed. The Animas River from its confluence with the San Juan River upstream to Estes Arroyo in Aztec has been on the *State of New Mexico 303(d)/305(b) Integrated List for Assessed Surface Waters* for nutrient enrichment since 2004, and TMDLs were approved in 2006 that set overall goals for nutrient load reduction. The Southern Ute Indian Tribe and the State of Colorado have not adopted nutrient criteria for streams. However, the Animas River Nutrient Workgroup has come to a consensus that nutrient enrichment and impairment to designated uses already exist.

The goals of this project were to expand the Animas River Nutrient Workgroup into a watershed-wide planning group, identify and prioritize water quality issues, create a watershed-based plan addressing nine planning elements in EPA's *Nonpoint Source Program and Grants Guidelines for States and Territories* (Fed Reg Vol 68, No 205, October 23, 2003), develop a common sampling and analysis plan to gather consistent and comparable data across the political boundaries in the Animas River Watershed, complete a basin-wide GIS database and repository, and implement a demonstration project to reduce nutrient loading in New Mexico. The project was jointly funded by NPS programs in New Mexico and Colorado, along with funding from several non-federal partners.

Project Outcome:

The Animas River Nutrient Workgroup expanded into a watershed-wide planning group called the Animas Watershed Partnership (AWP). AWP identified and prioritized water quality issues and created a watershed-based plan that spans all the political entities on the Animas River and partially meets the planning guidelines established by EPA. The watershed-based plan is available from NMED on request. The AWP developed a sampling and analysis plan to gather consistent and comparable data across political boundaries, and they completed a basin-wide GIS database and repository for data collected in the Animas River Watershed. This new watershed group achieved measurable success on the ground and financial independence, through implementation of a demonstration project to improve water quality. The demonstration project was located in Kiffen Canyon, an arroyo tributary to the Animas River, where a geomorphic approach was taken to stabilize a reach of the arroyo and detain a volume of sediment in a new depositional feature.

Load Reductions

The Kiffen Canyon demonstration project prevented approximately 5460 tons of sediment, 5.5 to 43.7 pounds of Nitrate-N and 36.0 to 81.9 pounds of phosphorous from entering the Animas River. The volume of sediment was estimated from physical surveys, and corresponding nutrient estimates were provided by an NRCS soil scientist.

Bluewater Creek Temperature Reduction and riparian restoration Project (FY08-12/ULO)

Project Budget: Federal 319(h): $186,520 Match: $141,628 Project Total: $328,148
Watershed: Bluewater (HUC 13020207)
Sub-Watershed: Bluewater Lake-Bluewater Creek (130202070206)
Impairments: TMDL for nutrients and temperature.

Project Summary:

The project was designed to address the temperature impairment. This was accomplished by planting native trees and shrubs, and constructing riparian exclosures to reduce the impacts from domestic livestock grazing, elk-browsing, and off-highway vehicles. Partners for this project included the: WildEarth Guardians, New Mexico State Land Office, Navajo Nation, NMED, and volunteers from the public.

Project Outcome:

In 2009, 1,400 cottonwoods, 20,000 coyote willows, and 200 riparian shrubs were planted over approximately 0.7 miles at the upstream end of the project area. Exclosures were then constructed to protect these plantings. In 2010, 1,100 cottonwoods, 18,000 coyote willow, 300 Gooding willow, and 200 riparian shrubs were planted in the remaining 0.6 miles of the project area immediately downstream of where work had been completed the prior year. Exclosures were again constructed to protect these most recent plantings.

Load Reductions:

No load reductions can be estimated until canopy of new plantings can be evaluated. Expect shading affect on Bluewater Creek channel and inflow temperature reductions to Bluewater Lake in approximately 3 years.

Wetlands Program

Funding Awarded

The project entitled *Rapid Assessment of Riverine Wetlands in the Gila Watershed, SW New Mexico* was selected for funding by EPA Region 6 in 2010**.** The grant totaling $456,831 in federal assistance will be awarded through the FY10 EPA Wetlands Protection Development Grant Program authorized by CWA Section 104(b)(3). This project will target riverine wetlands in the Gila Watershed in SW New Mexico and further develop and validate the Rapid Assessment of New Mexico Wetlands (NMRAM) monitoring protocol by increasing the applicability to the types of wetlands covered and regions where the NMRAM process can be used.

Projects Completed in 2010.

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

◊ *Planning for Wetlands in the Galisteo Watershed* project and the addendum *Galisteo Pilot Project*.

◊ *Rio de Las Vacas Wetlands Restoration* project.

◊ *Hyperspectral and Multispectral Imagery of 30 HGM Reference Wetland Sites in the Upper Rio Grande Watershed*.

◊ *Rapid Assessment for New Mexico Wetlands*.

The *Planning for Wetlands in the Galisteo Watershed* project was aimed at incorporating wetland protection and restoration in local and regional planning initiatives in the Galisteo Watershed. The project included the development of plans for wetland restoration and protection for seven high priority wetland areas. The seven high-priority wetland areas included:

1. Rowe Mesa Wetlands and Springs
2. Eldorado Wilderness (private open space with public access) along CR 51
3. Arroyo de Los Angeles at the Galisteo Basin Preserve
4. Village of Galisteo down to the Junction with San Cristobal Arroyo
5. Finger Lakes and Galisteo Creek at Tingle and Barclay Ranches
6. San Marcos Arroyo and the Cerrillos Hills Historic Park
7. Galisteo Reservoir downstream to the Rio Grande

Restoration of all seven priority wetland areas was implemented. Additionally, several smaller wetlands and springs were identified and assessed in the headwaters of the watershed. The original Federal award was $144, 230 and the project leveraged $270,550 in state and private funds to help complete work identified in the original high priority wetland plans**.** In 2009, an additional $10,000 was added to this award to complete a pilot

project for EPA Region 6. Completed activities of the *Galisteo Pilot Project* included completing a stakeholder driven Wetlands Action Plan for the Galisteo Watershed, creating a brochure about wetlands in the watershed entitled *Jewels of the Southwest*, and installing interpretive signs for the El Dorado Community Preserve. The Galisteo Watershed is a 730 square mile watershed to the east and south of Santa Fe, NM.

Interpretive sign at Eldorado Community Preserve.

Collection of hyperspectral and high resolution multispectral imagery from air born platform was the objective of the *Hyperspectral and Multispectral Imagery of 30 HGM Reference Wetland Sites in the Upper Rio Grande Watershed* project. Imagery for 44 reference wetland sites were collected to help understand macro-topographic features and aerial extent of mid-montane unconfined riverine wetlands, and to map wetland vegetation type and cover classes for our NMRAM reference wetland sites in the Upper Rio Grande Watershed north of Velarde. The imagery was used for on-the-ground wetland condition assessment data collection where no previous National Wetlands Inventory (NWI) maps existed, and for enhancing existing reference wetland data. The project provided the demonstration of a significant tool for understanding hydrodynamics, variability, and connectivity within the floodplain environment. Federal funding for the project amounted to $122,175 while the match exceeded $50,000.

Flow-splitter to protect the wetlands from erosion.

The *Rio de Las Vacas Wetlands Restoration* project was developed to restore wetlands and riparian areas to attract beaver back to stretches of the river that were degraded and lacked suitable habitat. The Rio de Las Vacas is a high-elevation sub-watershed of the Jemez Watershed in the Santa Fe National Forest of northern New Mexico. It has recognized impairments (Rio Cebolla to Clear Creek) and TMDLs for nutrients and temperature. Wetland restoration techniques included installation of in-stream structures to improve stream dynamics and function, planting native wetland vegetation, repairing fencing, and installing demonstration "hemi-exclosures" to protect streambank vegetation. A Wetlands Action Plan was developed with the Jemez Watershed Group. A series of workshops were

conducted about beaver and their habitat, installing beaver deceivers, the benefits of beaver on a river, and the project. Federal funds awarded were $152,380 and final project match amounts were over $51,000.

Beginning in 2008, the SWQB Wetlands Program initiated the development of rapid assessment methods to evaluate the ecological condition of wetlands and their associated riparian areas throughout New Mexico. *Rapid Assessment for New Mexico Wetlands* (Phase 1) completes the selection and evaluation of indicators and metrics, and the collection of data, from 31 sites within the Upper Rio Grande reference domain for unconfined riverine wetlands on tributaries to the Rio Grande. A wetlands database, draft User's Manual and field guide for continued data collection by our partners were developed through this project. Total federal funding was $428,036 and match amounted to more than $200,000.

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

NM Water Quality Standards Program

Triennial Review

The WQCC concluded its Triennial Review of the state's surface water quality standards in October 2010, adopting numerous amendments including: 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; refinements to the aquatic life temperature criteria, 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 amendments have been submitted to EPA for review and approval.

Outstanding National Resource Waters

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

- The Rio Santa Barbara (west, middle and east forks) within the Pecos Wilderness (2005)
- The surface waters within the U.S. Forest Service Valle Vidal Special Management Unit (2006)
- Perennial waters within US Forest Service Wilderness areas as listed in 20.6.4.8.9 NMAC (2010)

The Wilderness area designation was approved by the WQCC in December 2010 and will protect approximately 700 miles of 195 perennial rivers and streams, 29 lakes and approximately 4,930 acres of 1,405 wetlands in 12 Wilderness areas.

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

In 2010, the SWQB developed and received approval from both the WQCC and the EPA for 5 TMDLs in the Middle Rio Grande watershed and 31 in the Cimarron River watershed. The SWQB also developed TMDLs for the Rio Chama watershed and Middle Rio Grande tributaries and plans to present these TMDLs to the WQCC in April and May 2011.

The SWQB released the draft integrated list portion of the *2010-2012 State of New Mexico CWA §303(d)/§305(b) Integrated Report* for a 60-day public comment period on December 17, 2009, and the final draft was presented to the WQCC, on April 13, 2010. The WQCC approved the Report at the April 13th meeting and it was subsequently approved by the EPA on July 29, 2010.

The 2010 Triennial Review process can be viewed at www.nmenv.state.nm.us/oots/HearingOfficer/TR2009

The ONRW initiative can be viewed at www.nmenv.state.nm.us/swqb/ONRW/

The Integrated Report and TMDL developments can be viewed at www.nmenv.state.nm/swqb/TMDL

Monitoring and Assessment Program

Water Quality Surveys

The Monitoring and Assessment Section conducted two primary water quality surveys in 2010, collecting water quality data from 103 monitoring locations within 48 stream assessment units and 4 lake assessment units covering 658.5 stream miles and 19,128 lake acres. The watersheds surveyed included the Pecos River Headwaters (516.3 miles, 5,778 acres) and the San Juan River (142.2 miles, 13,350 acres).

Stream Sediment Assessment Protocol

Through funding provided by EPA Region 6, NMED worked with Tetra Tech, Inc. to develop improved assessment approaches to identify sediment impairment. This analysis looked at both excessive fines on the stream bottom (bedded sediments) as well as elevated stream turbidity (suspended sediment). SWQB plans to incorporate the findings of this study into revised assessment protocols for use developing the *2012-2014 State of New Mexico CWA §303(d)/§305(b) Integrated Report*.

Analysis of multiple sediment indicators, their responsiveness to site disturbance, and their effects on benthic macroinvertebrates resulted in identification of potential benchmarks for the bedded sediment indicators percent sand and fines and Relative Bed Stability (LRBS_NOR) in three site classes, Mountains, Foothills, and Xeric areas. The site classes distinguish sediment expectations across the State and were identified through a principal components analysis (PCA) of environmental conditions and the sediment indicators.

Percent sand and fines, described as sediment particles whose width is less than 2 millimeters, is easily measured and related strongly with biological metrics. LRBS_NOR is a formulation that considers site-specific hydraulic potential for moving stream bed sediments, so that the observed fine sediments are only considered imbalanced when the stream bed is more easily mobilized and transported than expected due to unstable conditions. Percent sand and fines and LRBS_NOR can be applied in a two-tiered assessment that first considers the simpler indicator of biological impairment, and then refines the assessment with the second indicator of geomorphic impairment, as needed. Recommended benchmark values are as follows:

Site Class	% sand & fines	LRBS_NOR units
Mountains	< 20	> -1.1
Foothills	< 37	> -1.3
Xeric	< 74	> -2.5

In the Xeric sites, given the high percent sand and fines benchmark, an alternative benchmark can be considered for percent fines, described as silt and clay particles, where > 29% fines would indicate stress. This benchmark is also based on biological responses.

Suspended sediment benchmarks were derived from the distribution of values in sites that were fully supporting their aquatic life uses. The low-flow measures were not strongly related to benthic macroinvertebrate metrics data and were not sufficient for identifying a biologically-based low-flow or high-flow benchmark.

Additional data and analyses are needed to be able to recommend specific benchmarks for suspended sediment.

Nutrient Assessment Protocols

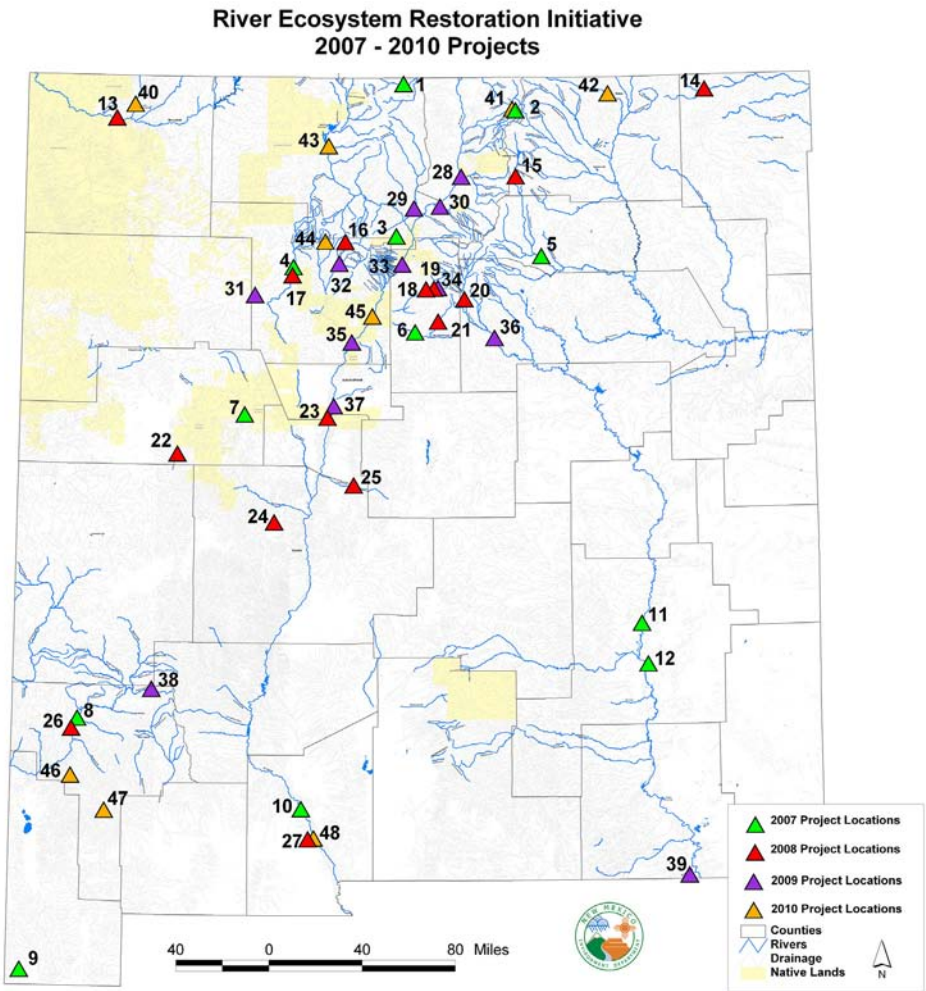
Given the pervasiveness and severity of nutrient-related problems, the SWQB recognized the need to accurately monitor and assess nutrient impairment within the states surface waters. In 2004, the SWQB, with assistance from the EPA and the US Geological Survey, developed a Nutrient Assessment Protocol for Wadeable Streams. The protocol has been employed state-wide through SWQB's rotational watershed surveys, water quality assessments for the *State of New Mexico CWA §303(d)/§305(b) Integrated Report*, TMDL documents, and newly revised NPDES permits.

In recent years, the SWQB has focused its efforts on lakes and rivers; however data for some variables were limited and evaluating environmental data can be challenging because physical, chemical, and biological data are often related in non-linear patterns, and meaningful patterns are sometimes obscured by hierarchy among predictors. 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 rivers including nutrient concentrations, dissolved oxygen levels, transparency, and algal productivity and community composition. The preliminary analysis of available data resulted in Draft Nutrient Assessment Protocols for each waterbody type: Lakes and Rivers. Preliminary threshold values that are indicative of nutrient enrichment were derived based on percentiles of the entire dataset, literature based values, or existing numeric criteria.

Prior to finalizing assessment thresholds, the SWQB is conducting additional analyses to refine the preliminary threshold values based on demonstrated stressor-response relationships instead of percentile-based thresholds. The SWQB wants to explore the use of changepoint analysis and other analytical approaches for evaluating stressor-response relationships using periphyton, phytoplankton, and/or macroinvertebrate community composition as the response variable. The SWQB recently contracted with the University of Arkansas (UAR) to analyze water quality data in order to identify water quality thresholds at which biological or chemical data exhibit a clear change in either magnitude or variability with respect to nutrient enrichment. In addition, water quality and response variables will be evaluated to determine if correlations are embedded within a hierarchical structure using Categorical and Regression Tree (CART). CART is a useful tool for exploring multi-parameter, non-linear, and hierarchical relationships in environmental data. A final report of the CART analyses and results including enhanced classification systems for lakes and rivers, as well as recommended water quality thresholds is expected to be completed by June 2011. These classes and thresholds will be evaluated and those found to be applicable will be incorporated into the Draft Assessment Protocols as a weight of evidence approach to evaluating nutrient impairment in the various classes of lakes and rivers.

River Ecosystem Restoration Initiative

The River Ecosystem Restoration Initiative (RERI) is a multi-agency effort to restore instream ecosystem function and watershed health to major New Mexico river basins. Implemented in 2007, RERI is restoring approximately 95 river-miles and 3,345 acres of riparian area in 48 projects throughout the state, including all the major river basins: the Rio Grande, San Juan River, Pecos River, Gila River, Canadian River, and Dry Cimarron basins. A total of $8.2 million in capital outlay funding has been appropriated for RERI over a four year period. RERI complements 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. Over 100 diverse partners are involved in implementing the projects, including Tribes and Pueblos, federal and state agencies, local government, soil and water conservation districts, elementary and secondary schools, universities, community groups and organizations, private entities, and citizen volunteers. The projects have created hundreds of full-time, part-time or temporary restoration-related jobs in the private sector, and have leveraged more than a 1:1 match in in-kind contributions and other funding. In 2010, $1.4 million was allocated for river restoration in 8 watersheds.



CWA Section 401 Certification Activities

Staff continue to process water quality certifications under Section 401 of the federal CWA. The purpose of the Section 401 Water Quality Certification is to ensure that Section 404 Discharge of Dredge or Fill permits issued or authorized by the U.S. Army Corps of Engineers (Corps) comply with state water quality standards.

In response to the Corps Section 404 reissue of nationwide permits on March 19, 2007, a Conditional section 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 Section 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 Section 404 permits also require a project-specific Section 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 Antidegradation Policy Implementation Plan).

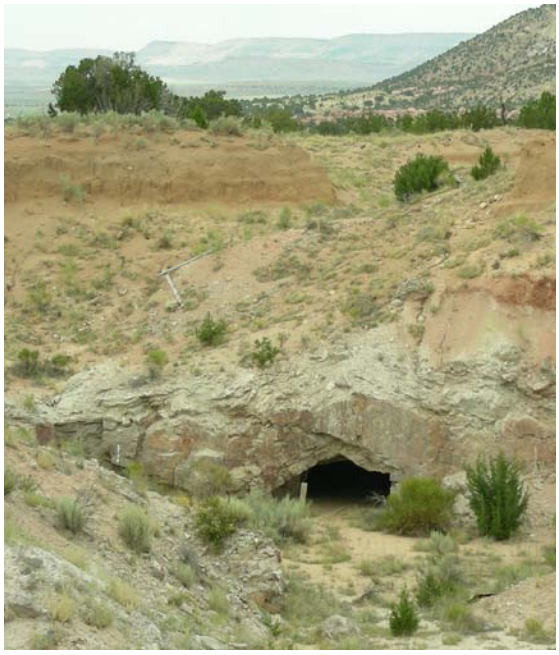
The state has been divided into five geographic areas (Northwest, Northeast, Albuquerque, Southwest and Southeast). Certification duties are presently assigned to five staff located across the state in the Santa Fe, Silver City, Las Cruces, and Las Vegas Offices. Staff duties related to the Section 401 Water Quality Certifications include, but are not limited to, coordination, consultation, inspection, and outreach.

Silt fence to minimize sediment input to the river.

CWA Section 404/401 Water Quality Certifications and Actions:	
Certifications	
Nationwide Permits Certified	86
(those in ephemerals)	18
Individual Permits Certified	4
Certifications in Progress	0
Total	108
Other Actions	
No Permit Necessary	20
Wthdrawn	3
Enforcement Action	5
Consultation	6
Total	34

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.



Abandonded uranium adit.

NMED has an informal team that includes representatives from 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 water quality standards. 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.

Beyond permitting actions, this NMED team also participates in meetings 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 2010, SWQB reviewed numerous mining notices, applications, restoration plans, hydrologic reports, monitoring plans, and activity reports providing 11 written comments and over 100 verbal comments to GWQB.

Copper Flat Mine Pit Lake.

Ground Water Quality Bureau Update

Permitting and Compliance for Large Capacity Septic Systems

The purpose of this program is to protect ground water quality from NPS pollution attributed to large capacity septic tank/leachfield systems. Technical personnel of the 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. Throughout the permitting and compliance process, GWQB staff provides outreach materials to dischargers who are required to complete and submit discharge monitoring reports. A review of ground water quality data collected from sites having septic systems shows that they contaminate ground water approximately 30% of the time. It is 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 taken.

The GWQB Permitting and Compliance activities for large capacity septic systems have improved the protectiveness of Ground Water Discharge Permits for these non-point sources that discharge nitrogen compounds. Overall, the number of facilities brought into compliance with their Discharge Permits during the 2010 year proved to be a success.

New Mexico Water Fair and Water Quality Outreach Program

Approximately 75% of the population of New Mexico relies on ground water as its drinking water supply. Many smaller rural communities are concentrated in river valleys where ground water is shallow, and lack community water and wastewater infrastructure. 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.

To identify possible NPS water quality problems in New Mexico's rural 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, providing a visible and highly appreciated service to communities. The Water Fair Program continues to be an important tool for identifying possible NPS water quality problems in rural communities. As a result of these efforts, many families in rural New Mexico have become more knowledgeable about water quality, potential for contamination, and pollution prevention.

GWQB well testing water fair.

Projects Completed by Non-NMED Agencies

The following land management agencies completed various projects in New Mexico (see tables on pages 29-41) 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
Delaware	13070002
El Paso-Las Cruces	13030102
Elephant Butte Reservoir	13020211
Jemez	13020202
Jornada Draw	13030103
Landreth/Monument Draw	13070007
Lost Draw	12080001
Mora	11080004
Mimbres	13030202
North Plains	13020206
Pecos Headwaters	13060001
Plains of San Agustin	13020208

Watershed Name	8-digit HUC
Playas Lake	13030201
Rio Chama	13020102
Rio Grande-Albuquerque	13020203
Rio Grande-Santa Fe	13020201
Rio Hondo	13060008
Rio Penasco	13060010
Rio Puerco	13020204
Rio San Jose	13020207
Salt Basin	13050004
San Francisco	15040004
Upper Gila	15040001
Tularosa Valley	13050003
Upper Canadian	11080003
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
Yellow House Draw	12050001
Zuni	15020004

Bureau of Land Management Projects:

Carlsbad Field Office

Watersheds	Project Description	Watershed Benefits
Delaware	Vehicle access control– installed two parking area barriers to keep vehicular traffic out of riparian zone.	• Increase herbaceous ground cover. • Decrease erosion. • Allow bank recovery and stabilization.
Landreth-Monument Draws Lost Draw Upper Pecos-Black	Chemical Brush Control – 125,769 acres of mesquite; 11,061 acres of creosote/tarbush/catclaw	• Decrease sheet flow and erosion. • Increase water yield. • Increase herbaceous ground cover.
Rio Peñasco	Wildfire Stabilization – repaired 14.5 miles pasture fence to exclude cattle and provide growing season rest from burned area of Four Mile Fire.	• Increase herbaceous ground cover. • Decrease sheet flow and erosion.
Rio Peñasco Upper Pecos-Black	Juniper control – Thinned 855 acres using chain saws. 530 acres in 13060011, 325 acres in 13060010.	• Reduce brush overstory. • Decrease erosion. • Increase herbaceous ground cover.
Upper Pecos-Black	Salt cedar control – removed salt cedar from 180 acres along Pecos River and 95 acres in Clayton Basin area. Treated 200 acres along Pecos River to control salt cedar re-sprouts.	• Increase herbaceous ground cover. • Increase water yield. • Decrease sheet flow and erosion.
Upper Pecos-Black	Oil Field reclamation – reclamation and reseeding on 513.5 acres of drill pad/pit, borrow pit, and lease roads.	• Decrease erosion from road prism. • Increase herbaceous ground cover.
Upper Pecos-Black	Prescribed Fire – treated 12,655 acres to remove brush and desert succulents.	• Reduce brush overstory. • Decrease erosion. • Increase herbaceous ground cover.

Farmington Field Office

Watersheds	Project Description	Watershed Benefits
Animas Blanco Canyon	Closed and reseeded 6 miles of road. Maintain approximately 800 miles of road.	• Reduce erosion and sedimentation to waters in the San Juan Basin.
Animas Blanco Canyon Upper San Juan	Approved approximately 200 Applications of Permit to Drill (APD) with Best Management Practices resulting in about 100 new silt traps constructed.	• Reduced runoff, soil erosion, sedimentation, and increased water infiltration.

Farmington Field Office (continued)

Watersheds	Project Description	Watershed Benefits
Blanco Canyon Chaco	Thin sagebrush and young piñon/juniper trees with Dixie Harrow and seed 1250 acres	• Reduced runoff, soil erosion, and sedimentation. Increase in herbaceous vegetation growth and water infiltration.
Blanco Canyon	Construct silt fences in Carrizo Wash	• Protection and restoration of riparian vegetation, and reduction in sediment transport.
Blanco Canyon Chaco Upper San Juan	Thin sagebrush chemically on approximately 15,484 acres of sagebrush/grassland	• Reduce runoff, soil erosion, and sedimentation. Increase water infiltration and herbaceous plant growth.
Upper San Juan	Conducted inventory of grassland resources, and drilled grass seed on 400 acres within the La Manga Watershed	• Reduced runoff, soil erosion, and sedimentation. Increase in herbaceous vegetation growth and water infiltration.

Las Cruces Field Office

Watersheds	Project Description	Watershed Benefits
Animas Valley	Creosote bush control 1,220 acres	• Increase herbaceous ground cover, reduce erosion and improve infiltration.
Caballo Elephant Butte Reservoir	Creosote bush control 3,002 acres Mechanical control of piñon/juniper (Iron Mtn.) 50 ac.	• Increase herbaceous ground cover, reduce erosion and improve infiltration. • Decrease risk of extreme wildfire and associated erosion. • Increase herbaceous ground cover and improve infiltration.
El Paso-Las Cruces	Creosote bush control 29,969 acres Alameda Dam reclamation Uvas #4 Dam reclamation	• Increase herbaceous ground cover, reduce erosion and improve infiltration. • Reduce flooding. • Decrease erosion and sedimentation.
Jornada Draw	Creosote bush control 27,247 acres Mesquite control 14,158 acres	• Increase herbaceous ground cover, reduce erosion and improve infiltration.
Mimbres	Creosote bush control 11,273 acres Lordsburg Draw erosion control structures (3) Smyers erosion control structures (4) Palomas Dam reconstruction/redesign to drop structure (work began in 2010)	• Increase herbaceous ground cover, reduce erosion and improve infiltration. • Reduce flooding. • Decrease erosion and sedimentation.

Las Cruces Field Office (continued)

Watersheds	Project Description	Watershed Benefits
Playas Lake	Commodore Road all weather upgrade across tabosa draw (work began in 2010)	• Reduce erosion due to vehicular use during wet conditions.
Salt Basin	Prescribed burn on 60 acres of piñon/juniper (Timberon) and 150 acres of grassland (McGregor Range/Otero Mesa) Mechanical treatment of pinyon/juniper (Timberon) 200 acres Creosote bush control 11,504 acres Tasajillo control 2,200 acres	• Decrease risk of extreme wildfire and associated erosion. • Increase herbaceous ground cover and improve infiltration. • Increase herbaceous ground cover, reduce erosion and improve infiltration.
Tularosa Valley	Salt Cedar Control 750 acres Creosote bush control 75 acres	• Increase desirable herbaceous cover in riparian zones and ephemeral drainages. • Decrease salinity. • Improve PFC. • Increase herbaceous ground cover, reduce and improve infiltration
Upper Gila-Mangas	Mechanical control of piñon-juniper (Pinos Altos) 300 acres	• Decrease risk of extreme wildfire and associated erosion. • Increase herbaceous ground cover. • Increase infiltration, water holding capacity.

Rio Puerco Field Office

Watersheds	Project Description	Watershed Benefits
Arroyo Chico (Outlet Arroyo Chico) (San Ysidro Wash)	Treat 578 acres of saltcedar in riparian stream corridors. Thin sagebrush with herbicide application on 1,255 acres.	• Increase desirable herbaceous cover in riparian and upland zones.
Arroyo Chico (Headwaters Torreon Wash)	Dam Maintenance-rehabilitation: Stabilize spillways and berms for three (3) sediment/erosion control dams. Stabilize headcuts and gullies with approximately 200 rock instream structures.	• Reduce flooding and peak flows. • Decrease erosion and sedimentation. • Decrease channel erosion. • Increase herbaceous ground cover in channels.

Rio Puerco Field Office (continued)

Watersheds	Project Description	Watershed Benefits
Arroyo Chico North Plains Rio Puerco Rio San Jose	Prescribed fire on 5,790 acres of range and forest land. Thin 2,200 acres of pinyon-juniper forest.	• Increase herbaceous ground cover. • Decrease risk of extreme wildfire and associated erosion risk.
Rio Puerco (San Isidro Wash) (La Canada de la Lena)	Implement 'Gold Book' BMP's for four (4) Oil & Gas wells and access roads. Implement five (5) gully control projects on gas pipeline transmission corridors.	• Decrease erosion and sedimentation. • Improve road drainage.

Roswell Field Office

Watersheds	Project Description	Watershed Benefits
Lost Draw	Oil Field reclamation and reseeding of 10 acres of well pad and access lease roads.	• Increase herbaceous ground cover. • Decrease sheet flow and erosion. • Decrease erosion from road prism.
Rio Hondo (Rio Bonito River)	Mechanical treatment of 90 acres of salt cedar, Russian Olive, and Elm trees. Planted 50 plains cottonwood trees post treatment. Mechanically thinned 530 acres of Juniper. Prescribed broadcast burn on 750 acres of pinyon-juniper plant community. Pile burn of 386 acres of juniper. Chemical treatment of 2,249 acres of mesquite.	• Increase herbaceous ground cover. • Increase water yield. • Decrease sheet flow and erosion. • Reduce brush overstory. • Improve riparian veg. to reduce erosion.
Upper Pecos (Pecos River)	Chemical treatment of 1,195 acres salt cedar re-sprouts along Pecos River. Mechanically removed 20 acres salt cedar. Chemical treatment of 24,224 acres of mesquite.	• Increase herbaceous ground cover. • Increase water yield. • Decrease sheet flow and erosion.
Upper Pecos-Long Arroyo (Pecos River)	Chemical treatment of 200 acres salt cedar re-sprouts along Pecos River. Mechanically removed 10 acres salt cedar. Chemical treatment 34,719 acres of mesquite.	• Increase herbaceous ground cover. • Increase water yield. • Decrease sheet flow and erosion. • Improve riparian veg. to reduce erosion.
Yellow House Draw	Oil Field reclamation and reseeding of 62 acres well pad, pit, borrow pit, and access lease roads.	• Increase herbaceous ground cover. • Decrease sheet flow and erosion. • Decrease erosion from road prism.

Socorro Field Office

Watersheds	Project Description	Watershed Benefits
Rio Puerco	Ojo Saladito Watershed improvement Project. Construction of 30 earthen structures.	• Reduce downstream sediment loads and reduce erosion. • Stabilize head cuts and channel down cutting. • Trap sediments and decrease water velocities.
Rio Puerco	Ojo Saladito Watershed improvement Project. Closure of 1 mile of two track road	• Reduce downstream sediment loads and reduce erosion.
Rio Puerco	Ojo Saladito Watershed improvement Project. Thinning of 600 acres of Juniper	• Reduce runoff, soil erosion, & sedimentation. • Increase water infiltration. • Increase herbaceous plant growth and biodiversity.
Tularosa Valley	Thinning of 430 acres of Juniper	• Reduce runoff, soil erosion, & sedimentation. • Increase water infiltration. • Increase herbaceous plant growth and biodiversity.
Tularosa Valley	Upper Taylor Watershed improvement Project. Construction of 20 earthen structures.	• Reduce downstream sediment loads and reduce erosion. • Stabilize head cuts and channel down cutting. • Trap sediments and decrease water velocities.

Taos Field Office

Watersheds	Project Description	Watershed Benefits
Pecos Headwaters	130 acres prescribed burn on sagebrush, piñon-juniper plant community	• Increase herbaceous ground cover to reduce soil exposed to water erosion.
Rio Chama	200 acres thinned in piñon-juniper woodland	• Increase herbaceous ground cover to reduce soil exposed to water erosion.
Rio Grande – Santa Fe	45 acres removal of non-native vegetation on Santa Fe River	• Reduce sedimentation and turbidity from bank erosion.
Upper Rio Grande (Rio Embudo)	400 acres prescribed burn in piñon-juniper woodland	• Increase herbaceous ground cover to reduce soil exposed to water erosion.
Upper Rio Grande (Rio Frijoles)	237 acres thinned in piñon-juniper woodland	• Increase herbaceous ground cover to reduce soil exposed to water erosion.
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	450 acres prescribed burn on sagebrush, piñon-juniper plant community	• Increase herbaceous ground cover to reduce soil exposed to water erosion.

Taos Field Office (continued)

Watersheds	Project Description	Watershed Benefits
Upper Rio Grande	1250 acres reseeded with native grasses and forbs.	• Increase herbaceous ground cover to reduce soil exposed to water erosion.
Upper Rio Grande	6 troughs installed for cattle distribution.	• Reduce vegetation loss and soil damage from poor cattle distribution.
Upper Rio Grande	0.5 mile fence installed.	• Reduce vegetation loss and soil damage from poor cattle distribution.

New Mexico State Forestry Division

Watersheds	Project Description	Watershed Benefits
Canadian Headwaters (Dillon Canyon-Canadian River) (Rock Creek-Vermejo River)	Timber harvests in mixed conifer and ponderosa forests. (1012 acres) Waterbarring and seeding of critical areas.	• Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover. • Increase water infiltration.
Canadian Headwaters (Headwaters Caliente Canyon) (Potato Canyon-Canadian River) (Spring Arroyo)	Timber harvest (2011 ac) in ponderosa forests. Waterbarring and seeding of critical areas.	• Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. • Increase water infiltration.
Cimarron (Ute Creek) (Rayado Creek)	Timber harvest (348 ac) in mixed conifer forests. Waterbarring and seeding of critical areas.	• Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. • Increase water infiltration.
Mora (Manuelitas Creek-Sapello River)	Timber harvest (252 ac) in ponderosa pine and mixed conifer forests. Waterbarring and seeding of critical areas.	• Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. • Increase water infiltration.
Pecos Headwaters (Arroyo Pecos-Gallinas River)	Timber harvest (25 ac) in 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 (Sugar Loaf Canyon) (Alamocito Creek)	Timber harvest (812 ac) in piñon-juniper forests. Waterbarring and seeding of critical areas.	• Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. • Increase water infiltration.

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New Mexico State Forestry Division (continued)

Watersheds	Project Description	Watershed Benefits
Rio Chama (Cañada del Aqua-Rio Tusas) (Wolf Creek)	Timber harvests in mixed conifer and aspen forest. (187 acres) Waterbarring and seeding of critical areas.	• Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover. • Increase water infiltration.
Western Estancia (Torreon Draw)	Timber Harvests (80 ac) in ponderosa pine forests.	• Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover. • Increase water infiltration.

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. 122 acres thinned in 2010.	• 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 197 acres in 2010.	• Decrease risk of catastrophic wildfire • Decrease erosion

Sierra SWCD

Watersheds	Project Description	Watershed Benefits
Caballo	Ponderosa/Piñon/juniper thinning(352 acres).	• Increase herbaceous ground cover. • Decrease erosion.
Caballo	Brush management (creosote treatment 1,200 acres).	• Increase herbaceous ground cover. • Decrease erosion.
El Paso-Las Cruces	Brush management (creosote treatment approx. 14,000 acres & 14,400 acres mesquite).	• Increase herbaceous ground cover. • Decrease erosion.
Elephant Butte Reservoir	Brush management (creosote treatment 5,345 acres).	• Increase herbaceous ground cover. • Decrease erosion.
Rio Grande - Albuquerque	Salt cedar removal (325 acres) and reveg. with Gooding's willow, Rio Grande cottonwood, Four wing saltbush, wolfberry, and Giant sacaton.	• Increase herbaceous ground cover. • Decrease erosion.

US Forest Service Projects

Carson National Forest

Watersheds	Project Description	Watershed Benefits
Cimarron (Ponil Creek)	Ponderosa thinning (180 acres) and 2000 acre prescribed burn.	• Increase herbaceous ground cover. • Decrease erosion. • Increased water yield. • Maintain ONRW water quality.
Cimarron (Ponil Creek) Upper Rio Grande (Costilla Creek)	Resurfacing of Forest Road 1950 (7 miles).	• Improve road drainage. • Decrease erosion and sediment load. contribution to adjacent streams. • Maintain ONRW water quality.
Cimarron (Ring Drainage)	Under partnership with Albuquerque Wildlife Federation and Philmont Scout Ranch: expanded 1 exclosure, built one new exclosure, and maintained stream meander "one-rock" dams on Ring Drainage.	• Increase herbaceous ground cover. • Decrease erosion. • Increased water yield. • Stabilize stream banks to reduce erosion. • Increase bank storage. • Improve ONRW water quality by decreasing sediment load from debris fan.
Cimarron (Ponil Creek) Upper Rio Grande (Costilla Creek) (Rio Pueblo de Taos) (Red River)	Forest Road Maintenance (84.7 Miles).	• Decrease sheet flow and erosion. • Decrease sediment load from road prism.
Upper Rio Grande (Mallette Creek)	7 miles or road drainage improvement through replacement of culvert and maintenance of water bars.	• Decrease sheet flow and erosion. • Decrease erosion from road prism.
Upper Rio Grande	Replanted 300 acres of a previous wildfire burn with ponderosa pine seedlings.	• Increase herbaceous ground cover. • Increased water yield. • Decreased erosion.
Upper Rio Grande (Bitter Creek)	CERCLA hazardous mine waste removal and internment at a waste repository containment site.	• Improved water quality and removal of sources of lead and arsenic. • Stabilization of stream bank. • Re-establishment of floodplains. • Reduction of sediment load in stream.
Upper Rio Grande (Eagle Rock Lake)	Re-established railroad tie reinforcements adjacent parking area above lake bank.	• Decrease sediment load to Lake.
Upper Rio Grande (Fawn Lake)	Maintained function of headgate.	• Stabilize lake banks to reduce erosion. • Increase bank storage.

US Forest Service Projects

Carson National Forest (continued)

Watersheds	Project Description	Watershed Benefits
Upper Rio Grande (Rio Pueblo de Taos)	Ponderosa, and piñon-juniper thinning (200 acres).	• Increase herbaceous ground cover. • Decrease erosion.
Upper Rio Grande (Comanche Creek) (Gold Creek)	Maintained stream vanes, repaired 15 exclosures. Partnership with Quivira Coalition and NMED RERI Grant; constructed 1 stream re-route on Comanche Ck, and removed road fill on Gold Creek road crossing.	• Increase herbaceous ground cover. • Decrease erosion. • Stabilize stream banks to reduce erosion. • Increase bank storage. • Improve ONRW water quality by decreasing sediment load.
Upper Rio Grande (Rio Pueblo de Taos)	Storm Water Pollution Prevention Plan monitoring at Taos Ski Valley and Red River Ski Area – implementation of Summer Operation projects (50 acres).	• Increase herbaceous ground cover. • Decrease erosion.
Upper Rio Grande (Rio Pueblo de Taos)	Forest Trail Maintenance (56 Miles)	• Increase herbaceous ground cover. • Decrease erosion. • Decrease flooding.
Upper Rio Grande (Red River)	Replaced OHV bridge that crosses the Red River for the Goose Lake Road.	• Decrease sediment loading to Red River.
Upper Rio Grande (Rio Fernando)	Monitoring and Maintenance of Taos Canyon Wildlife Exclosure.	• Increase herbaceous ground cover. • Decrease erosion. • Stabilize stream banks to reduce erosion. • Increase bank storage.
Upper Rio Grande (Rio Grande del Rancho)	Resurfaced ½ mile, standard road maintenance, and installation of ½ mile guard rail along Forest Road 439 to restrict OHV damage and reduce sediment flows adjacent stream. Protect and improve wetland function adjacent important recreation area used by the public.	• Increase herbaceous ground cover. • Improve road drainage. • Decrease erosion and sediment load to adjacent stream. • Decrease flooding. • Stabilize stream banks to reduce erosion. • Increase bank storage. • Protect wetland. • Improve water quality.
Upper Rio Grande (Arroyo Aguaje de la Petaca)	Red Mesa road (FR 578G) water bar and ditch out construction (4 miles).	• Improve roadway drainage; decrease surface erosion.
Upper Rio Grande (Arroyo Aguaje de la Petaca)	FR 576 water bar and ditch out construction (1 mile).	• Improve roadway drainage; decrease surface erosion.

US Forest Service Projects

Carson National Forest (continued)

Watersheds	Project Description	Watershed Benefits
Upper Rio Grande (Rio Chama-Rio Grande)	FR 557 water bar and ditch out construction (4 miles).	• Improve roadway drainage; decrease surface erosion.
Upper Rio Grande (Embudo Creek)	Rio Santa Barbara - Acequia de Llano de San Juan Nepomuceno o Diversion and headgate replacement o Acequia Association, Interstate Stream Commission	• Reduce long-term maintenance needs, thereby reducing amount of sediment generated during maintenance.
Upper Rio Grande (Embudo Creek)	Rio de Las Trampas – Acequia de Las Trampas Sur o Replace rock and log diversion with steel plate structure and headgate o Acequia Association, Interstate Stream Commission	• Reduce long-term maintenance needs, thereby reducing amount of sediment generated during maintenance.
Upper Rio Grande (Embudo Creek)	Rito Angostura Repair flood damage to FR89 0.5 miles.	• Restore proper drainage to FR89. • Reduce roadbed surface erosion.
Upper Rio Grande (Embudo Creek)	Santa Barbara Bridge Replacement: Removed deteriorating 60 year-old bridge and replaced with new 30' bridge.	• Conveys all trail users (hikers, cows, horses) across Rio Santa Barbara without compromising stream bank stability and water quality with numerous stream crossings.
Upper Rio Grande (Embudo Creek)	FS Road 116 - resurfaced 2.9 miles. FS Road 89 – resurfaced ½ mile.	• Improve road drainage. • Decrease erosion and sediment load.
Upper Rio Grande (Embudo Creek)	East Fork Rio Santa Barbara USFS Trail #26: Completed 4.5 miles of trail maintenance. Restored tread (outslope or drainage structures) in numerous boggy segments. Logged/brushed out to keep all travel on existing trail.	• Stabilized springs to reduce erosion. • Decreased sheet flow and erosion. • Improved trail drainage.
Upper Rio Grande (Embudo Creek)	District-wide trail maintenance projects. Logged, brushed out and tread restoration on 84.4 miles of trails.	• Stabilized springs to reduce erosion. • Decreased sheet flow and erosion. • Improved trail drainage.
Upper Rio Grande (Rio Grande del Rancho)	District-wide trail maintenance projects. Logged, brushed out and tread restoration on 22 miles of trail.	• Stabilized springs to reduce erosion. • Decreased sheet flow and erosion. • Improved trail drainage.

Before

After

The Carson National Forest replaced the deteriorated bridge across the Rio Santa Barbara, an ONRW, to reduce impacts to water quality from the numerous stream crossings in the area.

Cibola National Forest

Watersheds	Project Description	Watershed Benefits
Rio Grande-Albuquerque (Cañon Barranco)	Improved soil condition on 147 acres of impaired soils by adding woody material and reducing erosion through best management practices.	• Decrease erosion. • Improve soil condition and productivity.
Rio Grande-Albuquerque (Cedro Creek)	Install stream and bank stabilization on 2 miles of Cedro Creek in upper Tijeras Creek watershed.	• Improve stream morphology. • Reduce sedimentation.
Rio San Jose (Bluewater Creek)	Improved soil condition on 637 acres of impaired soils by adding woody material and reducing erosion through best management practices.	• Decrease erosion. • Improve soil condition and productivity.
Upper Canadian (Mills Canyon)	Salt cedar removal along 25 miles of Canadian River.	• Removal of nonnative vegetation. • Habitat improvement.
Zuni (Agua Remora)	Zuni bluehead sucker habitat improvement (1 acre) in upper Rio Nutria.	• Improve stream habitat.
Forest wide	Spring inventory.	• Identify, map, characterize, and prioritize springs and needed improvements.

Gila National Forest

Watersheds	Project Description	Watershed Benefits
Caballo (Cuchillo Negro)	10 miles of new pasture fence. 3 miles of pipeline and 4 water troughs to increase cattle distribution away from riparian areas. 3 Miles of trail maintenance Prescribed bum on approx. 6,038 acres of ponderosa pine and piñon-juniper.	• Improve riparian vegetation and ground cover to reduce erosion. • Decrease erosion from trail prism. • Decrease risk of extreme wildfire and associated erosion.
Caballo (Percha Creek)	1 mile of enclosure fence to protect riparian and spring.	• Improve riparian vegetation to reduce erosion. • Increase herbaceous ground cover. • Increase water yield.
Carrizo Wash (Mangas Creek)	Slaughter Mesa Restoration (Deadhorse Piñon/Juniper Thinning 100 acres)	• Increase available water and increase herbaceous ground cover.
Carrizo Wash (Largo Creek) (Salvador Springs)	Slaughter Mesa Restoration (Chimenea Grassland Restoration 356 acres)	• Increase available water and increase herbaceous ground cover.
Mimbres (McKnight Canyon)	1. Repaired Elk Pasture Trick Tank.	• Improve vegetation by allowing cattle to use more of the pasture due to water availability.

Gila National Forest (continued)

Watersheds	Project Description	Watershed Benefits
Plains of San Agustin (Alamocito Canyon)	Fence replacement/repair: 3 miles.	• Improve livestock distribution to stabilize soils, and reduce erosion from runoff.
Plains of San Agustin	Fence replacement/repair: 2 miles	• Improve livestock distribution to stabilize soils, and reduce erosion from runoff.
San Francisco (Centerfire Creek) (San Francisco River)	Tank Maintenance and Cleaning: Two earthen stock tanks seeded following 2009 cleaning. Fence replacement/repair: *3/4* mile 34 miles of trail maintenance and reconstruction.	• Decrease erosion and sediment into Centerfire Creek. • Improve watershed condition and herbaceous ground cover. • Improve livestock distribution to stabilize soils, and reduce erosion from runoff. • Decrease erosion from trail prism.
San Francisco (Negrito Creek)	Piñon-juniper removal/watershed treatment: 83 acres. Fence replacement and repair: 4.5 miles.	• Improve livestock and wildlife distribution to stabilize soils, and reduce erosion from runoff.
San Francisco (Devils Creek & others)	Piñon-juniper removal/watershed treatment: 128 acres. Fence replacement/repair: 7.5 mile. Four dirt stock tanks cleaned. Five earthen stock tanks seeded. following 2009/2010 cleaning.	• Improve herbaceous ground cover to reduce erosion.
San Francisco (Vigil Canyon) (Pueblo Creek) (Shelton Canyon)	Snare Mesa fuelwood area and thinning: 200 acres. Hinkle Park wildland fire use: 105 acres. Trail maintenance on 8.5 miles. Water distribution improvements: Holloman Well (with 1 mile pipeline extension) & Shelton Windmill.	• Increase herbaceous ground cover to reduce erosion. • Decrease erosion and sedimentation off of trail treads by reestablishing waterbars and improved drainage features.
Upper Gila (Middle Fork of Gila River)	Noxious weed treatment: 17 acres. Fence replacement/repair: 1 mile. One earthen stock tank seeded following 2009 cleaning.	• Improve livestock distribution to stabilize soils, and reduce erosion from runoff. • Increase herbaceous ground cover to reduce erosion.
Upper Gila (O Bar O Canyon)	Two dirt stock tanks constructed.	• Improve livestock distribution to stabilize soils, increase herbaceous ground cover and reduce erosion from runoff.
Upper Gila-(Wall Lake-Black Canyon Creek)	Removed 1.2 miles of fence.	• Improve livestock distribution to stabilize soils, increase herbaceous ground cover and reduce erosion.

Gila National Forest (continued)

Watersheds	Project Description	Watershed Benefits
Upper Gila (Rocky Canyon) (Sapillo Creek) (Meadow Creek)	Repaired -3/4 mile pasture fence. Purple Loosestrife removal (1 acre). Signal Peak North prescribed burn (1000 Ac).	• Improve livestock distribution to stabilize soils, and reduce erosion from runoff. • Improve native wetland plant species. • Reduce risk of catastrophic wildfire to reduce the risk of increased erosion.
Upper Gila (Corduroy)	Installed 5 miles of pasture fence. Installed 5 miles of pipeline and 6 water troughs. 4.5 miles of trail maintenance. Earthen Dam rehabilitation. Prescribed burn on approx. 3,040 acres of ponderosa pine and piññon-juniper.	• Improve riparian vegetation and ground cover to reduce erosion. • Decrease erosion from trail prism. • Decrease sheet flow and erosion. • Reduce risk of catastrophic wildfire to reduce the risk of increased erosion.
Upper Gila-Mangas (Sacaton Canyon) (Sacaton Creek)	Sacaton Fuelwood Area thinning: 25 acres.	• Increase available water and increase herbaceous ground cover.
Upper Gila-Mangas (Swan Canyon) (Willow Creek)	Completion of Kelly Well (solar). Willow prescribed burn (3,275Ac). Sawmill WUI thinning (700 Ac).	• Improve watershed condition due to improved livestock and wildlife distribution. • Reduction of sediment delivery and promote revegetation on eroded soils. • Reduce risk of catastrophic wildfire to reduce the risk of increased erosion.
Upper Gila-Mangas (Upper Bear Creek) (Little Walnut Creek)	Pinos Altos WUI thinning and fuel break maintenance (110 Ac). Little Walnut WUI thinning and fuel break maintenance (166 Ac).	• Maintenance thinning which aids in fuel reduction to help eliminate the threat of a catastrophic wildfire and an increase in ground cover/erosion control.

Lincoln National Forest

Watersheds	Project Description	Watershed Benefits
Arroyo Del Macho (Upper Hasparos Canyon) (Revention Draw)	Fuels Reduction Project: Thinning, mastication, timber sale, and broadcast burning of 3,566 acres.	• Increase herbaceous ground cover. • Decrease erosion.
Rio Hondo (Argentina Springs Trails)	Drainage improvements on 1 mile of trail by creating or repairing water bars, earthen dips and french drains.	• Improve drainage. • Decrease erosion.

Lincoln National Forest (continued)

Watersheds	Project Description	Watershed Benefits
Rio Peñasco	6313 acres invasive weed treatment.	• Improve herbaceous groundcover and riparian vegetation to reduce erosion.
Rio Peñasco	Fuels Reduction Project: Thinning, mastication, timber sale, and broadcast burning of 11,548 acres.	• Increase herbaceous ground cover to reduce erosion and improve water retention.
Salt Basin (Sacramento River)	670 acres invasive weed treatment.	• Improve herbaceous groundcover and riparian vegetation to reduce erosion.
Tularosa Valley (Rim Trail) (Dog Canyon Trail) (Osha Trail)	Drainage improvements on 19.5 miles of trail by creating or repairing water bars, check dams and earthen dips. Re-benched 1 mile of trail.	• Improve drainage. • Decrease erosion.
Tularosa Valley (Barber Ridge) (Goat Canyon) (Three Rivers) (Dry Canyon)	Drainage improvements on 8 miles of trail by creating or repairing water bars, earthen dips and French drains. One retaining wall installed.	• Improve drainage. • Decrease erosion.
Tularosa Valley (Calico Peak)	74 acres invasive weed treatment.	• Improve herbaceous groundcover and riparian vegetation.
Tularosa Valley (Headwater Ancho Gulch) (Fresnal Canyon)	Fuels Reduction Project: Thinning, mastication, timber sale, and broadcast burning of 1,741 acres.	• Increase herbaceous ground cover. • Decrease erosion.
Upper Pecos (Turkey Canyon) (Maverick Canyon)	Fuels Reduction Project: Broadcast burning and pile and slash burning of 1,500 acres.	• Increase herbaceous ground cover. • Decrease erosion.
Upper Pecos-Black (Sitting Bull Falls Trail) (Middle Last Chance Canyon) (Turkey Canyon) (Dark-Canyon)	Drainage improvements on 10 miles of trail by creating or repairing water bars, grade dips, check dams and earthen dips. One climbing turn reinforced. Installed rock step and completed 3 wash crossings.	• Improve trail drainage. • Decrease erosion.

Santa Fe National Forest

Watersheds	Project Description	Watershed Benefits
Jemez (Rio de las Vacas)	Repaired 6 miles of riparian fence. Built 2 miles of new pasture fence to aid a riparian area.	• Improve riparian veg. to reduce erosion. • Increase shade to reduce stream temperature. • Stabilize stream banks to reduce erosion. • Increase bank storage.
Jemez (Rio Cebolla)	Seventeen members of the New Mexico Peace Corps Association built check dams, planted willow stems, created willow wattles, and spread grass seed.	• Improve riparian vegetation to reduce erosion. • Stabilize stream banks to reduce erosion.
Jemez (East Fork Jemez R.)	Fifteen boy scouts spent a full work day cleaning up trash and removing all the fire rings along 2 miles of river.	• Reduce contaminated material entering the river.
Mora (Pecos Headwaters)	Active participant in Upper Pecos Watershed Group Active participant in Sapello Watershed Group.	• Contributed to development of WRAS. • Public outreach and involvement.
Mora Pecos Headwaters	Road maintenance using Best Management Practices (30 miles).	• Decrease erosion. • Improve road drainage.
Pecos Headwaters (Gallinas Creek)	Gallinas WUI thinning for fuel reduction (500 acres).	• Increase of herbaceous ground cover & infiltration to reduce runoff, erosion, sedimentation. • Watershed improvement & forest health.
Pecos Headwaters (Multiple Streams)	Invasive weed management on 125 acres.	• Provide additional groundcover to reduce runoff, erosion, & sedimentation. • Increase herbaceous groundcover.
Pecos Headwaters Rio Grande- Santa Fe	Barbero Allotment EQIP grassland maintenance (550 acres).	• Increase of herbaceous ground cover & infiltration. • Reduce erosion, runoff & sedimentation. • Watershed improvement & forest health.
Rio Chama (Cañoncito de las Lleguas)	Juniper thinning (88 acres).	• Increase herbaceous ground cover. • Decrease erosion.
Rio Chama (Gallina River)	Bear Paw fire rehabilitation on 1,037 acres. Felled snags in a severely eroding drainage to help reduce head cutting and stabilize channel. Also, cleaned out 2 non-functioning silt traps, replaced failing culvert on FR76.	• Decrease erosion. • Increase herbaceous ground cover. • Stabilize drainage. • Improve road drainage.

Santa Fe National Forest (continued)

Watersheds	Project Description	Watershed Benefits
Rio Chama (Rio Gallina)	Camino Corral Phase II Habitat Stamp Improvement Thinning Project (60 acres).	• Increase herbaceous ground cover. • Decrease erosion.
Rio Chama (Rio Cecelia)	Repaired 0.5 miles of riparian exclosure fence.	• Decreased livestock access to riparian which will help improve shade to reduce stream temperature over time.
Rio Chama (Salitral Creek)	Road maintenance FR 148.	• Improve road drainage. • Decrease sedimentation.
Rio Chama (Cañones Creek)	Trail maintenance (4.5 miles) increase cattle distribution away from riparian area. Forest Trails 97 & 82.	• Improve riparian veg. to reduce erosion. • Increase shade to reduce stream temperature. • Stabilize stream banks to reduce erosion.
Rio Chama (Polvadera Creek)	Initiated a motor-vehicle closure in Polvadera Canyon. Expanded riparian exclosure by 20 acres – total exclosure is now approximately 45 acres. Installed a new trick tank on Road Mesa – will provide approximately 300 acres of watershed benefit.	• Improve riparian vegetation to reduce stream temperature. • Provide upland water to reduce livestock and wildlife impact to streams. • Remove vehicle use within Polvadera Creek.

Before treatment (looking uphill)

Members of the New Mexico Peace Corps in cooperation with the Santa Fe National Forest constructed rock water bars, buck and pole fence, planted willows, and spread grass seed to reduce erosion. This portion of the project stabilized a hillside to reduce erosion to the Rio Cebolla.

After treatment (looking downhill)

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). No AWEP projects were selected for funding in NM in FY 2010.

Cooperative Conservation Partnership Initiative
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 2010 in New Mexico included:

• AZ-NM Borderlands CCPI
This is a cooperative effort to address rangeland resource concerns in southeast Arizona and southwest New Mexico. Cooperating entities include NRCS, BLM, State Conservation District Associations, Black Range RC&D, various state land agencies and others.

Comprehensive Nutrient Management Plans
Comprehensive Nutrient Management Plans were developed by the NRCS field offices in Chaves (2), Socorro (2) and Roosevelt (2) counties. Funding is continuing to be available for manure management through the Farm Bill Environmental Quality Incentives Program for animal feeding operations. Dairy waste storage facilities were installed in Chaves (8), Doña Ana (2), Eddy (6), Lea (4), Roosevelt (5) and Torrance (2) 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 Bernalillo (102), Catron (11), Chaves (4,005), Colfax (52), Curry (19,032), De Baca (179), Doña Ana (1,661), Eddy (1,200), Grant (125), Hidalgo (359), Lea (7,012), Lincoln (12), Luna (1,506), Otero (2), Quay (2,081), Rio Arriba (35), Roosevelt (3,941), San Juan (3), Sandoval (117), Socorro (329), Taos (298), Torrance (153), Union (2,302) and Valencia (151) 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 (8,710 ft), and windbreaks/shelterbelts (67,319 ft) were applied in New Mexico, chiefly in Chaves, Curry, DeBaca, Doña Ana, Mora, Otero, Rio Arriba, Roosevelt, Taos and Union counties. Herbaceous wind barriers planned in New Mexico totaled 11,464 ft. Conservation cover (in acres) was applied in Curry (46,678), De Baca (527), Eddy (65), Guadalupe (859), Harding (160), Lea (2,504), Lincoln (49), Quay (48,154), and Roosevelt (6,006) counties. Conservation crop rotation was applied across the state on 89,884 acres.

Irrigation Water Management

Irrigation water management practices applied, which reduce runoff and leaching, included acres applied in the following counties: Bernalillo (174), Catron (11), Chaves (4,756), Curry (15,621), De Baca (179), Doña Ana (1,398), Eddy (1,814), Grant (60), Hidalgo (498), Lea (7,199), Luna (1,516), Mora (10), Otero (2), Quay (884), Rio Arriba (2,006), Roosevelt (5,732), San Juan (1,620), Sandoval (361), Santa Fe (53), Sierra (88), Socorro (1,323), Taos (750), Torrance (405), Union (1,891) and Valencia (1,580) counties. Irrigation land leveling was applied on 1,768 acres.

Land Treatment for Surface Water Management

Diversions (17,327 ft) and Terraces (43,147 ft) were installed across New Mexico, chiefly in Chaves, Curry, DeBaca, Guadalupe, Lea, Lincoln, Luna, Mora, Roosevelt, San Miguel, Taos, 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: Bernalillo (102),Chaves (4,755), Curry (24,093), Colfax (147), De Baca (706), Doña Ana (1,535), Eddy (1,613), Grant (43), Hidalgo (266), Lea (7,520), Luna (1,522), Otero (11,308), Quay (17,423), Rio Arriba (60), Roosevelt (5,856), San Juan (23), Sandoval (101), Socorro (125), Union (2,217), and Valencia (222) counties. Brush management practices were applied on 15,7705 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: Bernalillo (14),Catron (52,750), Chaves (126,002), Cibola (35,510), Colfax (32,307), Curry (31,232), De Baca (156,297), Doña Ana (4587), Eddy (423,306), Guadalupe (9,295), Harding (14362), Hidalgo (62,013), Lea (167,242), Lincoln (333,070), Otero (302,295), Quay (163,722), Rio Arriba (865), Roosevelt (23,072), San Miguel (24,313), Santa Fe (64), Socorro (149,137), Taos (7,387), Torrance (42,832), Union (43,993), and Valencia

(23) counties. 1,294,019 feet of Fence were installed.

Residue Management

Conservation crop rotation (88,883 acres), cover crop (1,450 acres), mulch till (773 acres), no till (8,399 acres), seasonal residue management (86,924 acres) were applied to cropland to reduce sediment losses and runoff and utilize resources efficiently, chiefly in Chaves, Colfax, Curry, De Baca, Doña 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 Cibola (1), Guadalupe (1), Lea (2), Otero (1), Taos (1), and Valencia (2) counties.

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