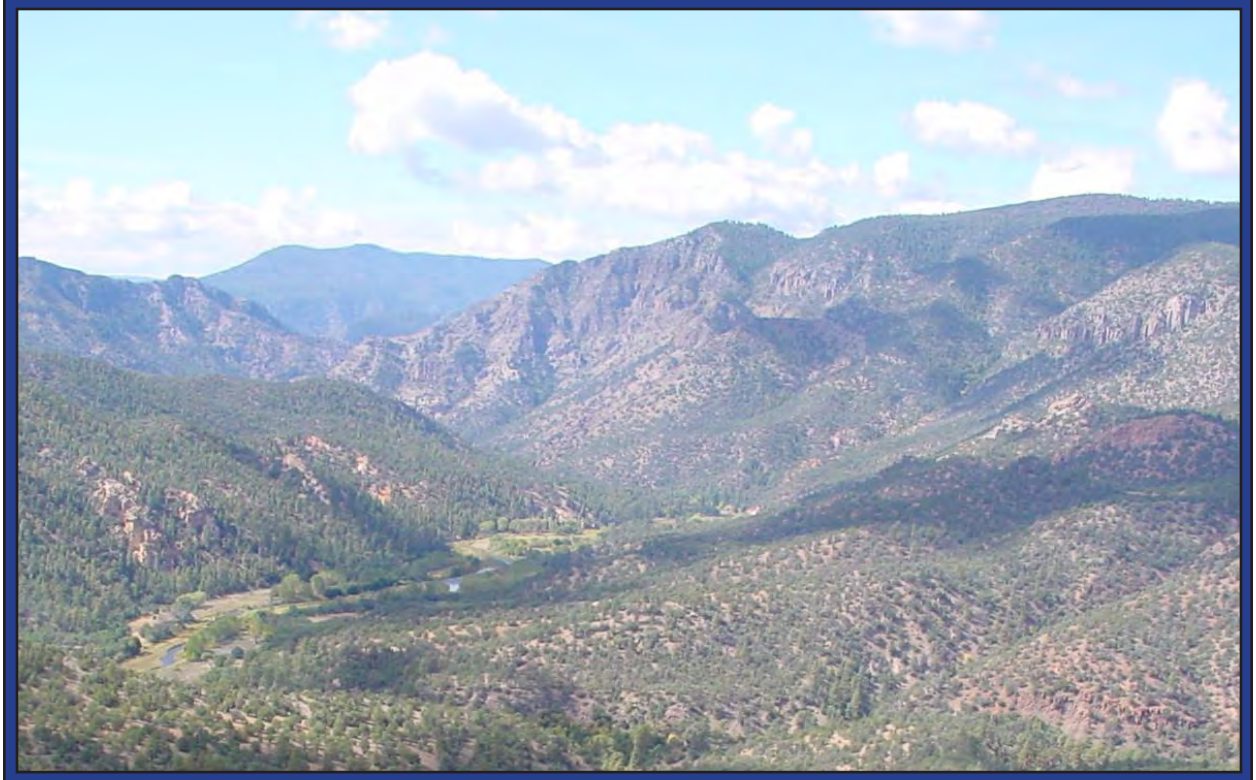
State of New Mexico Nonpoint Source Management Program



2012 Annual Report

New Mexico Environment Department
Surface Water Quality Bureau
Watershed Protection Section

State of New Mexico
Nonpoint Source Management Program

2012 Annual Report

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Executive Summary

This annual report to the United States Environmental Protection Agency (EPA) provides an overview of Clean Water Act (CWA) Section 319(h) Nonpoint Source Management Program related activities conducted in New Mexico in 2012. 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. The 2012 milestones for which a specific schedule is provided in the Nonpoint Source Management Program are reported on pages 5-6. Significant achievements include:

- Over 300 people attended the seven workshops held throughout the state that made up the 2012 New Mexico Watershed Forum. The workshops were a sharing of the latest information, lessons learned, and success stories in the field of watershed restoration and protection in New Mexico.
- Comparison of the 2010-2012 303(d)/305(b) Integrated Report with the 2012-2014 303(d)/305(b) Integrated Report indicates the stream miles designated as impaired in New Mexico decreased by 4%.
- The MOU between NMED and the Southwestern Region of the United States Forest Service was renewed in 2012.
- A request for proposals (RFP) was released to fund projects with the greatest potential of success under the National Water Program Guidance for Fiscal Year 2012.
- A second RFP was released to fund watershed-based planning; three Watershed-Based Plans covering 37 priority watersheds were completed in 2012 that EPA formally recognized as meeting the nine planning elements described in the Nonpoint Source Program and Grants Guidelines for States and Territories.
- Four on-the-ground projects funded under Section 319 were completed; and a final report was completed for the project, "Nonpoint Source Effectiveness Assessment 2008-2011," describing and applying statistical methods to confirm water quality improvements.
- The Wetland Program Plan for New Mexico was updated by the SWQB Wetlands Program for the next five years.
- Two new Wetlands Program Development projects were awarded funding by EPA Region 6 in 2012, and two projects funded under CWA Section 104(b)(3) Wetlands Program Development Grants were successfully completed this year.
- Fifteen River Ecosystem Restoration Initiative projects were successfully completed.

In addition, 4 National Forests, 4 Bureau of Land Management field offices, the Natural Resources Conservation Service state office, and 2 state agencies provided information for the report on their activities related to nonpoint source pollution control in 2012. Two large wildfires affected water quality in New Mexico in 2012. The Whitewater Baldy Complex Fire burned 297,845 acres in several headwater watersheds of the Gila and San Francisco Rivers, and the Little Bear Fire burned 44,330 acres, mostly in the Rio Bonito and Rio Ruidoso watersheds in the Sacramento Mountains. The effects of these fires on water quality are still being assessed.

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 2012 by the Watershed Protection Section (WPS) of the New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWQB). The report presents the state's progress in meeting the milestones outlined in the goals and objectives of the New Mexico Nonpoint Source Management Program, and provides information on reductions in nonpoint source (NPS) pollutant loading and improvements to water quality of New Mexico watersheds as required under Section 319(h)(11) of the Clean Water Act (CWA). The majority of funding for projects listed in this report was provided by 319(h) grants awarded to NMED by the U. S. Environmental Protection Agency (EPA), and state funds provided by the New Mexico Legislature under the River Ecosystem Restoration Initiative. 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 natural resource agencies other than NMED.

What is Nonpoint Source (NPS) Pollution?

Polluted runoff, or NPS pollution, is defined by the EPA as "caused by rainfall or snowmelt moving over and through the ground and carrying natural and human-made pollutants into lakes, rivers, streams, wetlands, estuaries, and other coastal waters and groundwater. Atmospheric deposition and hydrologic modification are also sources of nonpoint source pollution."

Sediment laden stormwater.

Sediment choking stream bottom.

A few examples of NPS pollution include: bacteria and nitrates from aging or out of compliance septic systems; sediment and ash from forest and rangeland fires; oil, grease and other hydrocarbons from parking lots and roads; sediments from poorly designed unpaved roads; fertilizers, nutrients and bacteria from agricultural practices; and bacteria from pet waste. Increased water temperature resulting from degraded streambanks, loss of streambank vegetation, and hydromodification is another example of NPS pollution. New Mexico's most common causes of NPS pollution (in order) are temperature, bacteria, and nutrients.

Clean Water Act Section 319

Cattle along a creek bank.

Overwide stream with no canopy.

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

New Mexico's Nonpoint Source Management Program

The goal of New Mexico's Nonpoint Source Management Program is:

> ***To implement watershed-based restoration and protection programs with the assistance of all stakeholders, for all watersheds within New Mexico, to meet and maintain water quality standards and beneficial uses of surface water and groundwater resources.***

As lead agency for the management of NPS pollution, NMED coordinates activities within the state through the SWQB and the Ground Water Quality Bureau (GWQB). In accordance with the CWA, the SWQB has developed a 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.

The primary focus of New Mexico's Nonpoint Source Management Program is to fund and support projects which implement Total Maximum Daily Loads (TMDLs) to reduce the pollutant load. The focus on existing impairments is directed at those impaired waters for which a TMDL has been calculated. The TMDL is the total amount of pollutant a waterbody can assimilate daily and still meet water quality standards. In New Mexico TMDLs are generally only calculated on impaired waterbodies. In calculating a TMDL for an impaired waterbody, a target value of pollutant reduction is also provided.

An important component of this process 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). The WBP expands on the information provided in the TMDL by identifying causes and sources of impairment, recommending management measures, estimating expected load reductions from management measures, providing methods to measure implementation success, estimating funding needs, and outlining potential education and outreach efforts.

Volunteers listen to stream restoration plans prior to a day working on the Santa Rosa tributary of San Antonio Creek.

NPS Management Program

NPS Management Program Milestones

At the core of the NPS Management Program are specific objectives aimed at reducing and preventing NPS pollution in New Mexico: Watershed-Based Planning, Addressing Water Quality Problems, Water Quality Protection, Education and Outreach, Protect Groundwater Resources, and Interagency Cooperation. Within each objective are specific activities and milestones to meet the objective. Milestones are an integral part of the NPS Management Program and a requirement under Section 319(b)(2)(c) of the Clean Water Act. The following table lists each milestone identified in the NPS Management Plan which has a specific numeric goal and an established time frame, and its status.

Objective number	Objective Short Name	Milestone (abbreviated)	Schedule	2012 Status
1	Watershed Based Planning	All nine planning elements are addressed in watershed plans.	2012: 3 plans, 49 watersheds. 2014: 2 additional plans, 20 additional watersheds.	This milestone was partially met. Three Watershed-Based Plans covering 37 priority watersheds were completed in 2012. One WBP covering one additional priority watershed was completed 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	NMED met this milestone for 2012 with two previous success stories in three priority watersheds.
2	Addressing Water Quality Problems	Wetlands Action Plans are implemented in at least one priority watershed per year.	1 watershed per year	This milestone was not met. One WAP is in development for several priority watersheds within the Pecos Headwaters watershed (13060001).
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.	This milestone was met. Comparison of the 2010-2012 303(d)/305(b) Integrated Report with the 2012-2014 303(d)/305(b) Integrated Report indicates the stream miles designated as impaired in New Mexico decreased by 4%.
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.	This milestone was met.

NPS Management Program Milestones (continued)

Objective number	Objective Short Name	Milestone (abbreviated)	Schedule	2012 Status
3	Water Quality Protection	NMED proposes to WQCC adoption of water quality standards for wetlands.	2014	NMED is on schedule to meet this milestone in 2014.
4	Education and Outreach	The Forest and Watershed Health Program Virtual Library experiences an annual increase in internet hits of at least 10% between 2009 and 2014.	Annually	This milestone was met. The Virtual Library (www.allaboutwatersheds.org) received 17,296 visits in 2011 and 29,674 visits in 2012.
4	Education and Outreach	NM Watershed Forum is attended by more than 300 people.	2010, 2012, 2014	This milestone was met for 2012. Over 300 people attended the seven workshops that made up the 2012 New Mexico Watershed Forum.
4	Education and Outreach	*Clearing the Waters* is published quarterly.	Quarterly	This milestone was not met. Three issues of *Clearing the Waters* were published in 2012.
4	Education and Outreach	*Clearing the Waters* circulation increases to 1000 by 2014.	2014	This milestone was met. *Clearing the Waters* currently has a circulation of 1,555.
6	Interagency Cooperation	The MOU between NMED and USFS is renewed.	2014	This milestone was met. The MOU between NMED and the Southwestern Region of the USFS was renewed in 2012.
6	Interagency Cooperation	The Agreement in Principle between NMED and USDOE will be renewed in 2010.	2010	This milestone was met. The agreement was extended in 2008 and is valid until 2013.
6	Interagency Cooperation	The MOU between NMED and NMDOT will be renewed in 2010.	2010	This milestone was not met. The JPA between NMED and NMDOT that terminated in 2010 has not been renewed, mainly due to lack of funds to support a joint NMED/NMDOT position.

NPS Management Program Milestones (continued)

The WPS continues to forge and maintain relationships to promote interagency cooperation. This is critical in New Mexico where over 30% of the land is managed by the U.S. Forest Service (USFS) and the Bureau of Land Management (BLM).

A memorandum of understanding (MOU) between the Southwestern Region of the USFS and NMED, in review since 2007, was approved in August. The MOU documents the cooperation between USFS and NMED with the common objective of improving and protecting the quality of New Mexico's waters by implementing progressive watershed-based restoration and protection programs to meet and maintain water quality standards. In addition to other topics, the MOU acknowledges the USFS role in implementing the State's Antidegradation Policy as it relates to NPS pollution on USFS system lands that could affect Outstanding National Resource Waters (ONRWs).

A coordination meeting was held with the USFS on November 7, 2012 between staff from each National Forest in New Mexico and several SWQB programs. One major subject of discussion was the process by which USFS may comply with the andtidegradation policy by notifying NMED of emergency actions, including contemplated fire suppression activities, that may impact water quality within ONRW watersheds. A related topic was the newly developed form that USFS may use to report on such actions after they have been implemented.

Coordination with the Natural Resources Conservation Service (NRCS) also increased during 2012, mostly in response to the new National Water Quality Initiative. More information on coordination with NRCS is found in the outside agency section starting on page 90.

At the Four Corners River Health Workshop, Jose Pino, Hilary Bravenec, Ana Gomes and Chambliss Lantana (all with NRCS) demonstrating how vegetation helps precious rainfall infiltrate the soil to grow more vegetation, and reduces soil, bacteria, and nutrients leaving the site.

NPS Management Program Objectives Completed in 2012

2012 was a key year for implementation of the NPS Management Program, because several milestones identified in the Nonpoint Source Management Program were to be completed. Four of six of the objectives outlined for 2012 in the 2011 NPS Annual Report were met, including:

- A Request for Proposals (RFP) was released in February 2012 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). Two selected projects (of three) are scheduled to be complete at the end of 2014, and thus may contribute to meeting the milestone related to completing watershed-based plans by 2014.
- A second RFP was released in March 2012 to select on-the-ground projects with the greatest potential of success under EPA performance activity measures (PAMs) WQ-10 and SP-12 in EPA's National Water Program Guidance for FY 2012. Three new on-the-ground projects are beginning in early 2013 as a result.
- A nomination for a 319 Success Story under PAMs WQ-10 and SP-12 was completed for Comanche Creek, based on statistically significant temperature reduction.
- A final report was completed for the project, "Nonpoint Source Effectiveness Assessment, 2008-2011". Practical methods were described and applied to confirm water quality improvements in Comanche Creek and the Rio San Antonio. A web page presenting the report is at: www.nmenv.state.nm.us/swqb/wps/Effectiveness.

Five watershed-based planning projects were scheduled to be complete in 2012 (the 2011 NPS Annual Report incorrectly identified four). Four of the five projects were completed, and the fifth was extended. A watershed-based plan is the main deliverable of each project. EPA officially recognized that three of the plans (for the Cimarron, upper Gallinas River, and Pecos Headwaters watersheds) meet the nine watershed-planning elements.

The NPS Management Program includes a significant milestone that reads, "By 2012, all nine planning elements identified in the Nonpoint Source Program and Grants Guidelines for States and Territories will be addressed in three watershed plans covering forty-nine priority watersheds". At the end of 2012, NMED and cooperators had completed a total of four watershed plans covering thirty-eight priority watersheds. NMED developed a dedicated web page for each of these plans, at www.nmenv.state.nm.us/swqb/wps.

In 2012, four on-the-ground projects funded under Section 319 were completed. Each project was implemented within one priority watershed (not considering outreach or planning elements, which often affect additional priority watersheds), resulting in pollutant load reductions reported below.

Three new on-the-ground Section 319 projects were developed in 2012. These projects will be implemented within 5 priority watersheds. One of these, On-The-Ground Improvement Projects for the Upper Gallinas River and Porvenir Creek, directly implements portions of a watershed-based plan. The other two were considered to have adequately addressed the watershed-based planning elements in their project workplans. These projects contribute to meeting an objective in the Nonpoint Source Management Program that reads, "By 2012, develop and begin implementation of watershed restoration projects described in watershed-based plans or equivalent documents to reduce nonpoint source pollutant loads within eight priority watersheds." Considering other 319 projects developed in recent years, this objective has been met.

NPS Management Program Objectives for 2013

The WPS has identified the following NPS Management Program activities to meet program objectives for 2013.

- Release a Request for Proposals (RFP) in February 2013 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 will not meet the program objective identified in the current NPS Management Program, but may support meeting a program objective to be identified in a revised NPS Management Program.
- Release a second RFP in February 2013 to select on-the-ground projects with the greatest potential of success under PAMs WQ-10 and SP-12 (also called WQ-SP12.N11 in newer guidance) in EPA's National Water Program Guidance for FY 2013.
- Complete a nomination for a 319 Success Story under PAM WQ-10 for Comanche Creek, based on its sediment delisting coupled with project information and statistical evidence of water quality improvement.
- Review changes in the 2012-2014 State of New Mexico 303(d)/305(b) Integrated List for Assessed Surface Waters relative to earlier versions of the List to identify additional potential candidates for Success Story nomination.
- In addition, four watershed-based planning projects are scheduled to be complete in 2013. A watershed-based plan is the main deliverable of each project. Each plan, if accepted by EPA, will assist the NPS Management Program in meeting a significant milestone that reads, "By 2014, all nine planning elements identified in the Nonpoint Source Program and Grants Guidelines for States and Territories will be addressed in two additional watershed plans covering twenty additional priority watersheds." Considering the interim milestone of forty-nine watersheds that was to have been met in 2012, sixty-nine priority watersheds should have watershed-based planning completed in 2014. At the close of 2012, thirty-one watersheds remain to meet this goal. The four projects which are scheduled for completion in 2013 are summarized in the following table:

Project Number	Project Title	Scheduled completion date	Streams included	Number of priority watersheds in project area
09-G	Río Pueblo de Taos Watershed Comprehensive Planning	December 31, 2012	Rio Pueblo de Taos, Rio Grande del Rancho (WBP was in review in early 2013)	10
09-B	Paso del Norte Watershed Based Plan	June 30, 2013	Rio Grande in New Mexico downstream of Elephant Butte Reservoir	37
09-H	Development of an Upper Rio Grande Basin Plan for Ecological Restoration	June 30, 2013	Rio Grande in New Mexico upstream of the Red River	10
11-F	Mogollon Creek Watershed Based Plan	December 31, 2013	Mogollon Creek	3

- Three Section 319 implementation projects scheduled to be complete in 2013 are listed in the following table. The numbers of priority watersheds below do not include watersheds affected only by outreach or planning elements.

Project Number	Project Title	Scheduled completion date	Streams included	Number of priority watersheds in project area
08-13/ULO	Ponil Creek Riparian Restoration Project	May 10, 2013	South Ponil Creek and Middle Ponil Creek	1
11-D	Redondo Creek and San Antonio Creek Riparian Restoration and Temperature Reduction Project	December 31, 2013	Redondo and San Antonio Creeks	2
11-E	Rito Peñas Negras Riparian Restoration and Temperature Reduction Project	December 31, 2013	Rito Peñas Negras	1

EPA is in the process of revising the Nonpoint Source Program and Grants Guidelines for States and Territories. This document will determine priorities and allowable costs for NMED, and will provide Region 6 EPA with guidance for reviewing NMED's applications for 319 grants and project workplans. NMED reviewed a draft of the Guidelines (available at water.epa.gov/polwaste/nps/cwact.cfm) in late 2012, and early indications are that they are only lightly revised relative to the earlier Guidelines (published in the October 23, 2003 Federal Register). The draft Guidelines indicate a stronger emphasis

on implementation projects. By requiring watershed-based planning to be funded with "program" funds, the Guidelines may reduce NMED's ability to support watershed-based planning in the future. This shift may be appropriate considering that several watershed-based plans are complete or nearing completion, and Section 319 funds are still often considered a primary source of funds for implementing these plans. The shift towards implementation may also ultimately mean that other activities outlined in the NPS Management Plan will receive fewer resources.

NMED expects to at least partly adapt to this development in 2013, during which an application will be submitted for a Section 319 grant to fund major aspects of the Nonpoint Source Management Program (and projects) in state fiscal years 2014 and 2015. NMED also plans to revise the Nonpoint Source Management Program planning document during state fiscal year 2014 (beginning July 1, 2013), and will further adapt to new policy directives through the revision process. Input on these changes will be sought from the public and other agencies that assist in implementing the Nonpoint Source Management Program.

NPS Management Program Problems and Concerns

The 2012 Legislature did not fund Healthy Rivers New Mexico in FY 2013 (July 1, 2012 – June 30, 2013). NMED further developed the initiative in 2012, emphasizing the goals of HRNM related to water quality, economics (e.g., the value of angling and rafting), and flood mitigation. The value of HRNM as match for future federal grants has also been included in brief fact sheets intended for decision makers. The initiative has full support of the NMED senior management and the Governor's office. Healthy Rivers New Mexico is included in NMED's budget request for FY 2014, but the status was unknown at the end of 2012. The earlier River Ecosystem Restoration Initiative (RERI) has remained a critical component of match for Section 319 funds for FY 2012 and 2013, but will be insufficient for FY 2014.

While a Success Story nomination for Comanche Creek was completed in 2012 as planned, EPA did not accept it. The information submitted did not qualify Comanche Creek as a Success Story for EPA Performance Activity Measures SP-12 or WQ-10, because the stream was not listed as impaired by temperature in 2002 (SP-12 uses 2002 as a baseline), and the stream was not delisted for temperature (WQ-10 requires delisting, not just improvement). In 2013, NMED plans to complete a nomination for a 319 Success Story under PAM WQ-10 for Comanche Creek, based on the 2008 sediment delisting, coupled with project information and statistical evidence of water quality improvement.

NMED also plans to develop a process for reviewing changes in the impaired waters list, to identify candidates for success stories. This activity was planned for 2011 and 2012, but not implemented because more effort was placed on measuring success using labor-intensive monitoring approaches. NMED has one full time employee (FTE) whose principal responsibilities are water quality monitoring, data management, and analysis to determine and report effectiveness of nonpoint source pollution controls. One FTE may not be sufficient for this task, but due to limited Section 319 funding NMED is not presently considering directing more resources towards this activity.

NMED did not conduct or support any workshops on watershed-based planning in 2012, as intended. The workshops conducted in 2010 and 2011 were well received and resulted in improved proposals for watershed-based planning projects, so this is still considered a worthwhile activity. A decision was made to hold the next workshop in southern New Mexico. However, 2012 saw significant activity in stream channels requiring Section 404 permitting, which required Watershed Protection Section staff in southern New Mexico to focus on reviewing proposed projects for consistency. Also, southern New Mexico WPS staff were involved in the implemetation of multiple Wetlands Program Development Grant projects.

The NMDOT/NMED liaison position remained vacant in 2012. There are no plans to fill this position, and funds are not available (and have not been requested) to fill it. The vacancy has not resulted in specific reportable problems in 2012.

If provided the opportunity, NMED will recommend targeted watersheds for the Natural Resource Conservation Service (NRCS) National Water Quality Initiative (NWQI) in 2013. Experience with NWQI in 2012 indicated that significant institutional and legal obstacles exist that may prevent NWQI from quickly having its desired effect. An example institutional obstacle is that NRCS is limited by their applicant pool, and also has limited ability to conduct targeted outreach to develop projects that address specific resource concerns. NRCS is unable to fund the specific management measures recommended in a watershed-based plan, for example, if an applicant doesn't request funds for those management measures. An example legal obstacle encountered in 2012 is that successful applicants must pay tax on income received through NWQI. Small producers often raise livestock for personal use, and while they do qualify as applicants based on the value of their product, they strive to minimize operational costs. Increased tax is perceived as an increase in operational costs. NWQI may be an insufficient incentive for these producers to reduce grazing pressure on riparian areas, for example. More details about NWQI and how it was implemented in New Mexico in 2012 are provided in the outside agency section.

Effectiveness Monitoring of NPS Pollution Controls

Effectiveness Monitoring continued, for a fourth year in 2012, to document the effects of nonpoint source pollution control projects on water quality. These projects are primarily those funded under CWA Section 319, but also include projects funded by the state River Ecosystem Restoration Initiative (RERI), and the SWQB Wetlands program. This year's highlights include the completion of the summary report for Effectiveness Monitoring for 2008-2011 which contains the results of the statistical analysis for temperature and turbidity on multiple streams and is now available online: www.nmenv.state.nm.us/swqb/wps/Effectiveness.

In 2012, stream temperature monitoring continued on multiple streams. Thermographs were deployed to record hourly temperature upstream and downstream of project reaches, and additional sites where tributary inputs could have significant effects. During the summer field season, Scott Murray, an MAS intern at the time, was recruited to assist with deployments and data retrieval. Results from the data analysis indicate that the peak summer temperatures in many streams have improved but still exceed the standard of 20°C for coldwater aquatic life in many cases. However the projects are expected to have beneficial effects which will continue to increase as vegetation grows over the years. Further data collection and analysis will be conducted in accordance with project-level Quality Assurance Project Plans. Also in 2012, baseline data collection was initiated for two new monitoring projects in the Jemez Mountains: Rio de las Vacas and Jaramillo Creek.

Another highlight for the program in 2012 was participating in the 20th annual Nonpoint Source Monitoring Workshop in Tulsa, Oklahoma, by presenting the results of Effectiveness Monitoring in New Mexico. This presentation was well received at the national workshop and it was a good opportunity for learning and networking with other states and EPA staff. Other activities for the Effectiveness Monitoring Program this year included assisting with MAS water quality surveys in the Chama basin and the Sacramento Mountains, EA reviews for the Watershed Protection Section, and participating in the NM Watershed Forum Arroyo workshop. The Effectiveness Monitoring Coordinator also participated again this year on the RFP Committee to select projects for 319 funding, including both on-the-ground projects and watershed-based planning projects. We look forward to more Effectiveness Monitoring results and success stories in 2013.

Summary of streams selected for Effectiveness Monitoring

Waterbody	Start	Comments
Comanche Creek	2009	Maximum temperature has decreased; sedimentation delisting; geomorphic analysis complete; success story pending.
Rio de los Pinos	2009	Temperature monitoring has continued through 2012.
Middle Ponil Creek	2009	Temperature monitoring has continued through 2012; analysis hampered by drought and prolonged periods without flow.
Bluewater Creek	2009	Temperature monitoring has continued through 2012.
San Antonio Creek	2009	Temperature monitoring has continued through 2012; temperature decreased but still exceeds standard; turbidity inconclusive; continue monitoring.
Lower Santa Fe River	2010	Success story accepted and published in 2011.
Redondo Creek	2010	Temperature monitoring has continued through 2012.
Rito Peñas Negras	2010	Temperature monitoring has continued through 2012.
Jaramillo Creek	2012	Baseline temperature monitoring initiated in 2012.
Rio de las Vacas	2012	Baseline temperature monitoring initiated in 2012.

Problems and Concerns 2012: The Second Consecutive Year with the Largest Wildfire in New Mexico History

Whitewater-Baldy Complex Fire burning in the Whitewater Creek watershed above the town of Glenwood. Photo courtesy of the Gila National Forest.

Two large wildfires affected water quality in New Mexico in 2012. The Whitewater Baldy Complex Fire burned 297,845 acres in several headwater watersheds of the Gila and San Francisco Rivers, and the Little Bear Fire burned 44,330 acres, mostly in the Rio Bonito and Rio Ruidoso watersheds in the Sacramento Mountains. Burned Area Emergency Response (BAER) reports are complete for both fires, which characterize the impacts to watersheds and outline actions to be taken to reduce the impacts of these fires on streams and other resources.

Only 14 percent of the Whitewater-Baldy complex fire area is rated as being in the severe category, and many of those acres are in higher elevation forest types where stand-replacing fires occur naturally, although at very infrequent intervals. The Gila National Forest estimates that sixteen Outstanding Natural Resource Water (ONRW) streams and ten ONRW wetlands are within the area burned by the Whitewater Baldy Complex Fire.

A higher proportion of the area burned by the Little Bear Fire was in middle elevation forest, so the estimate that 34 percent of the burn area in the severe category may indicate a relatively greater deviation from the natural range of variability for the fire-adapted ponderosa pine forest in that area. The headwater reaches of several streams in both burn areas are greatly impacted, regardless of whether the impact is natural. The Little Bear Fire BAER report provides estimates of increased discharge at different frequencies, for several streams and canyons in that area. For example, the 25 year pre-burn event for the South Fork Rio Bonito (an ONRW in its upper reaches) is estimated to have been 3,590 cubic feet per second (cfs) before the fire, and to be 13,254 cfs after the fire. Many of the projected increases are in the range of 1.5 to 3 times of the pre-burn flows, which is less, relatively, than increases in flooding observed or expected downstream of other burn areas in the southwest.

Several actions outlined in the BAER reports have been carried out. These typically include aerial seeding and mulching, removal of infrastructure that may impede flood flow, and pumping of campground vault toilets near streams. 26,200 acres in the Whitewater Baldy Complex Fire area were aerially seeded, at a cost of $1.7 million. 14,204 acres of the Whitewater Baldy Complex Fire burned area were mulched, at a cost of $11.4 million. NRCS funded 1,500 acres of aerial seeding on private lands in the Little Bear Fire area, through the Emergency Watershed Protection Program. The Gila National Forest evacuated isolated populations of Gila Trout, and relocated them to the Mora Fish Hatchery and fishless streams elsewhere in the region.

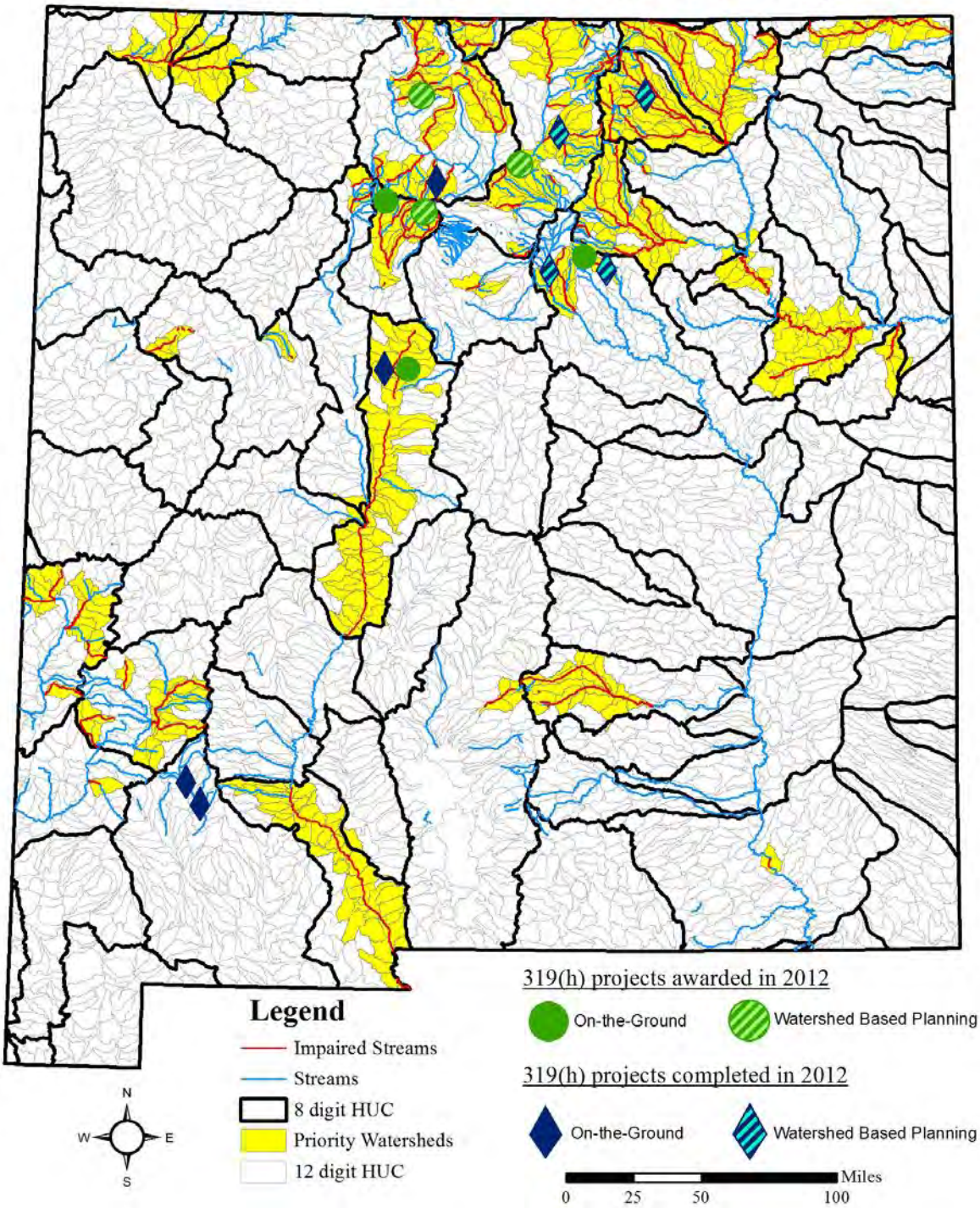
The burned areas are both largely within designated wilderness and other National Forest system lands, but relatively costly impacts occurred on private lands in the Ruidoso area, where 242 residences were destroyed. Staff from several programs within NMED participated in a response team focused on public health and safety in the Ruidoso area. Additional impacts downstream of both burned areas result from post-fire flooding and to a degree from efforts by communities to mitigate flood risk. In some cases, such efforts have included excavation of channels, bridge and culvert replacement or temporary removal, and removal of riparian and floodplain vegetation perceived as an impediment to the movement of water and a hazard to downstream bridges and culverts.

Helicopter with a load of straw mulch for the aerial mulching operation. (USFS photo)

The effects of these fires (and of the response to the fires) relative to water quality standards are difficult to assess. The Surface Water Quality Bureau conducted a water quality survey in the Sacramento Mountains in 2012, and the resulting data may be used to assess impacts of the fires on water quality. Some data that were scheduled to be collected through long term deployment of sondes or thermographs weren't collected because of the risk to the equipment posed by flooding. Biological data weren't collected from the Rio Bonito because the conditions of 2012 were not considered to be representative. Tentative plans have been made to collect sufficient data to assess the Rio Bonito against the narrative water quality standard for sediment in 2013. The Gila and San Francisco watersheds were surveyed in 2011, and will be surveyed again in approximately 2019.

High severity burn area in the Mineral Creek Watershed that was aerial seeded with certified noxious weed-free seed mixture of native perennial grasses and annual barley, which is a quick growing non-persistent annual that provides protective ground cover in a short period of time.

New Mexico
Watershed Restoration Priorities and Progress



Summaries for 319(h) Projects Completed in 2012

Mimbres River Streambank Stabilization, Sediment Abatement and Revegetation Project (FY07-E)

Project Budget: Federal 319(h): $58,239 Match: $28,791 Project Total: $87,030
Watershed: Mimbres (HUC 13030202)
Subwatershed(s): Noonday Canyon-Mimbres River (130302020105).
Impairments: The Mimbres River (Perennial reaches downstream of Willow Springs) is listed as impaired for exceedances in *E.coli* and temperature water quality standards. No TMDLs have been developed for the Mimbres watershed.

Project Summary:
Severe lateral erosion of streambanks and the resulting channel widening are concerns for many Mimbres Valley landowners. This project assisted landowners through the Mimbres River valley near the town of Mimbres to protect streambanks and fields with streambank stabilization techniques such as revetment fencing, toe wood, bankfull benches, and plantings of native riparian, xeric shrub, and grass species. This will enable agricultural producers on the Mimbres River to protect streambanks to prevent increased channel widening, braiding, and water temperatures. The beneficial environmental effects of the project include: enhanced aquatic habitat, improved bank stability, reduced erosion, restored channel dimensions, restored connection to the floodplain, promotion of natural long-term stability, increased shade, and improved water quality. The Grant Soil and Water Conservation District acted as fiscal agent and was the primary cooperator. Additional cooperators included the Natural Resources Conservation Service, Black Range RC & D, and private landowners as well as subcontractors Ellen Soles and Dryland Solutions.

A streambank stabilization workshop was held in Silver City, and featured many national Natural Resources Conservation Service presenters from the West National Technology Support Center. The goals of workshop were to review geomorphological concepts, present a diverse array of streambank stabilization techniques, and increase success rate of streambank stabilization projects. The workshop agenda consisted of both classroom and field components including fluvial geomorphology, hydraulics, geology, soil mechanics, geotechnical bank stability, sediment transport and scour, vegetative treatment techniques, and structural stabilization techniques.

Project Outcome:
The specific goal was to stabilize streambanks along over 0.5 miles of the Mimbres River using multiple techniques to create a depositional environment thus rebuilding lost bank material and encourage the development of a riparian corridor to decrease water temperature, erosion, and nonpoint source nutrient and sediment pollutants from reaching the river. Implemented BMPs include: installation of approximately 2,781 linear feet of 9-gauge galvanized streamside revetment fencing and construction of bankfull benches along 600 linear feet of actively eroding banks. Over a thousand cuttings of Fremont cottonwood (*Populus deltoides*) and willow species (*Salix* sp.) collected from the Mimbres watershed were transplanted to the benches, banks, and terraces. A native upland seed mix was utilized

for drier disturbed surfaces at higher elevations from the river. The streambank stabilization workshop was attended by over 30 participants from federal, state, and private entities. In addition, this project leveraged $43,383.60 in federal match from the NRCS EQIP program.

Bank Erosion Hazard Index field exercise during Streambank Stabilization Workshop with Dr. Barry Southerland (NRCS).

Load Reduction:
To estimate nonpoint source load reductions, the geomorphology data combined with projections of canopy cover improvements due to revegetation were entered into the Stream Segment Temperature Model (USGS) for temperature and STEPL for nutrients and sediment. Over the course of the project, the reductions of the following nonpoint source pollutants were calculated: 495.2 lbs/year nitrogen, 127.5 lbs/year phosphorous, 161.1 tons/year sediment, and 5 joules/m^2/sec (temperature).

Cold Springs Rehabilitation (FY08-2 ULO)

Project Budget: Federal 319(h): $5,000 Match: $3,333 Project Total: $8,333
Watershed: Mimbres (HUC 13030202)
Subwatershed(s): Gavilan Arroyo-Mimbres River (HUC 130302020502)
Impairments: Cold Springs Canyon is a major tributary to the Mimbres River (Perennial reaches downstream of Willow Springs) that is listed as impaired for exceedances in *E.coli* and temperature water quality standards. No TMDLs have been developed for the Mimbres watershed.

Project Summary:
The Mimbres Watershed Restoration Action Strategy (WRAS) (2006) notes that encroachment by woody upland vegetation, historic grazing practices, fire suppression, and periodic drought have created conditions over much of the Mimbres watershed in which former herbaceous and shrub cover has been lost, leaving bare ground. Higher runoff rates over exposed soils contribute to the intensity of flood events in the Mimbres River and its tributaries. Incision within these tributaries often triggers gullying of the surrounding landscape, particularly where historic cattle trailing or unimproved roads are present to capture and concentrate surface runoff. Loss of herbaceous cover accelerates this process, and as incision occurs, hydrologic connectivity across the landscape is also lost. Runoff that enters gullies is transported rapidly downstream and typically carries large volumes of sediment and other nonpoint source pollutants to main stem rivers.

This project was developed to demonstrate the efficacy of well-designed, low cost methods, using local materials, for repairing badly gullied landscapes. The approach undertaken for this project was to stabilize the active headcut, capture sediment on which native vegetation can establish, while slowing the runoff of water and sediment that eventually reaches the Mimbres and causes deteriorated water quality. Most importantly, the project provided an opportunity to demonstrate to other landowners on the Mimbres watershed the effectiveness of these relatively simple techniques in repairing damage to the watershed. The long-term goal of these projects is to inspire other landowners to adopt such practices techniques throughout the Mimbres River watershed.

Cold Springs Gully Rehab Workshop May 2009

The Mimbres community has shown an interest in watershed improvement. The Grant Soil and Water Conservation District sent over 900 letters to Mimbres residents prior to the completion of the Mimbres WRAS requesting feedback on resource concerns. Gullies, watershed restoration, and streambank stabilization were the three highest concerns. The private property owners served as project managers. The Grant Soil and Water Conservation District acted as fiscal agent and outreach coordinator. Additional cooperators included the Natural Resources Conservation Service and Black Range RC&D, as well as subcontractors Ellen Soles and Dryland Solutions.

Project Outcome:

Implemented BMPs include:

- Construction of a large drop structure to arrest the advancement of the primary headcut. Two rock rundowns were constructed to prevent future headcut formation by armoring potential knick points where water is entering the gully.
- Installation of 43 grade control structures using rock materials to slow runoff and capture sediments to encourage vegetation establishment.
- Installation of 5 water spreader structures to spread concentrated flows in critical areas.
- Use of juniper thinned from the landowner's property to slow sheet flow and dissipate concentrated flows into the gully.
- All gully rehabilitation structures were seeded with native grasses to slow surface runoff, improve soil infiltration capacity, anchor sediments, and improve hydrologic function.
- Two education and outreach workshops were organized by the Grant SWCD for Mimbres community at the Cold Springs project site. The workshops were widely advertised and offered at no-cost. These workshops were instructed by Craig Sponholtz of Dryland Solutions, and attended by over 30 participants. The workshop agenda consisted of both classroom

GOT GULLIES?

Want to know how to fix them?

(before) (after)

FREE GULLY REHABILITATION WORKSHOP

Instructor: Craig Sponholtz, Dryland Solutions, Inc.

Presentation:
Thursday, May 21st 7:00-8:30PM Roundup Lodge, Aeklin Hill Road, just west of the San Lorenzo Elementary School in the Mimbres Valley, New Mexico. Slide show presentation on the nature of erosion and mitigation strategies. No registration necessary and there's plenty of space.

On-the-ground Workshop:
Saturday, May 23rd 9AM-4PM. For a hands-on learning experience, we will construct a full suite of different erosion control structures using low-cost techniques and local materials. Register early since space is limited to 20 people. Directions to the project area in the Mimbres Valley and other workshop details will be given after registration.

Come to one or both! For more information, or to register for the on-the-ground workshop, please contact Rebecca Benavidez at (575)-388-1416.

Sponsored by: Grant Soil and Water Conservation District and the New Mexico Environment Department

Workshop flyer distributed around the region. Workshop announcements also appeared in local newspaper and radio spots.

and field components. The goals of workshop were to review the nature of erosion and mitigation strategies. For a hands-on learning experience, a variety of different erosion control structures were constructed using low-cost techniques and local materials. The monitoring and maintenance of previously built structures was also demonstrated. Positive feedback was received from the volunteers, and many indicated that they intended to build similar gully control structures on their property. The project successfully demonstrates that a lot of education and outreach can be accomplished with even small outlays of grant funding. By structuring the project as a volunteer built process, community members not only learned the erosion control theory, but also the physical process of construction. This learning process greatly increases the likelihood of workshop attendees constructing similar structures on their own private property. Then there is also a strong sense of ownership and commitment to any future maintenance.

Load Reduction:

To estimate nonpoint source load reductions, the geomorphology data combined with projections of revegetation were entered into the STEPL model for nutrients and sediment. Over the course of the project, the reductions of the following nonpoint source pollutants were calculated: 64.9 lbs/year nitrogen, 25.1 lbs/year phosphorous, and 51.1 tons/year sediment.

Cold Springs Gully Rehab Workshop May 2009

Polvadera Creek Riparian Project (FY08-7 ULO)

Project Budget: Federal 319(h): $49,560 Match: $33,150 Project Total: $82,710
Watershed: Rio Chama (HUC 13020102)
Subwatershed(s): Polvadera Ceek (HUC 130201021004)
Impairments: TMDL for temperature. Also impaired for sedimentation/siltation.

Project Summary:
Polvadera Creek is designated a high quality coldwater fishery, but is not meeting this designated use due to elevated stream temperature. Polvadera Creek is known to be occupied by pure strain Rio Grande cutthroat trout, and is designated a core population for the species by the US Fish and Wildlife Service. Sediment/siltation was added as an additional cause of impairment in the 2012-2014 303d/305b Integrated Report. This recent impairment was likely due to the effects of the South Fork Fire in 2010. This project accelerated post fire watershed recovery, and lessened the effects of off-road vehicles and rangeland grazing on the recovering watershed.

Project Outcome:
The following activities were implemented and completed on this project:

- *Non-Riparian woody encroachment riparian thinning and riparian vegetation planting*. Rocky Mountain Juniper was manually removed/cut and dropped back into stream for shade and habitat cover of Rio Grande Cutthroat trout along 2.5 miles of stream. Material was manually placed in strategic areas in and along Polvadera Creek to slow erosion and protect willow saplings.
- *Off road vehicle closure adjacent to stream corridor.* Physical barriers were constructed in two areas to implement 4 miles of motorized trail closures. This process was coordinated with Forest Service law enforcement to ensure effective enforcement of the Closure Order. The area has since been identified as a non-motorized corridor in the Santa Fe National Forest Travel Management Plan.
- *Riparian Fencing.* Approximately 100 acres of riparian fencing was constructed on Polvadera Creek. Certain segments were constructed out of pipe in areas of high recreational use.
- *Allotment Management.* Two trick tanks were constructed as alternative water sources on the uplands of the14,500 acre Polvadera Creek allotment in an effort to relocate livestock use away from the sensitive riparian areas.
- *Environmental Education.* The Forest Service conducted outreach to the allotment permittees in the form of the Allotment Management Plan. During the biannual meetings the Forest Service conducted educational sessions on rangeland management measures according to the NEPA process.

Completed trick tank

Load Reduction:
From the Stream Segment Temperature Model (USGS), the load reduction estimate for the project was 28.35 joules/m^2/sec (temperature).

Storm Water Quality Best Management Practices and Monitoring in Bernalillo County, NM (FY09-C)

Project Budget: Federal 319(h): $165,075 Match: $94,982 Project Total: $260,057
Watershed: Rio Grande-Albuquerque (HUC 13020203).
Subwatershed(s): City of Albuquerque (HUC 130202030304)
Impairments: Impaired for *E. coli*, dissolved oxygen, and water temperature.

Project Summary:
This Project represents a cooperative effort between the Ciudad Soil and Water Conservation District (SWCD) and the Bernalillo County Public Works Division (BCPWD) to implement strategies and practices from the 2008 Rio Grande-Albuquerque Watershed Restoration Action Strategy to reduce the discharge of storm water-borne fecal coliform and *E. coli* bacteria into the Rio Grande, in accordance with the objectives of the 2002 Middle Rio Grande Total Maximum Daily Load for Fecal Coliform and the 2010 Total Maximum Daily Load (TMDL) for the Middle Rio Grande Watershed.

The Bernalillo County Public Works Division, in cooperation with the United States Geological Survey, has since 2004 monitored storm water from each of its four storm water pump stations for several contaminants, including fecal coliform and *E. coli* bacteria. During storm events, *E. coli* concentrations in storm water discharged from each of the four County pump stations have commonly exceeded the applicable criterion of 410 CFU/100mL set for segments 20.6.4.105 and 20.6.4.106 in the NM Water Quality Control Commission 2007 "Standards for Interstate and Intrastate Surface Waters." However, as shown in the table below, two county pump stations (at Adobe Acres and at Sanchez Farm) have shown levels of *E. coli* in storm water that are 60% to 80% lower than levels observed in storm water from the other two pump stations (at Alameda and at Paseo del Norte). Unfortunately, *E. coli* loading rates to the Rio Grande cannot be computed for comparison with TMDL targets, because reliable records of storm flow volumes do not exist.

Notably, the Adobe Acres and Sanchez Farm drainages include some storm water management structural best management practices (e.g. vegetated swale, engineered clarifier, wet meadow/wetland) that appear to have contributed to reduced discharges of *E. coli*. The Bernalillo County Public Works Division is interested in partnering with the Ciudad SWCD to seek and define opportunities to implement one or more strategies identified in the WRAS, and will continue its storm water quality monitoring program to evaluate the successes of best management practices.

Pump Station	Average *E.coli* (MPN/100ml)	Maximum *E.coli* (MPN/100ml)
Adobe Acres	5,557	51,720
Alameda	37,981	241,960
Paseo del Norte	14,782	241,960
Sanchez Farms	5,897	77,010

E. coli (MPN/100mL) in stormwater at Bernalillo County Pump Stations (2004-2009)

Project Outcome:

- *Engineering Evaluation*

Radian Engineering was selected by Bernalillo County to prepare an engineering study of four Bernalillo County pump stations that outfall directly into the Rio Grande with the emphasis being on improving water quality; and also to design one specific water quality improvement project. The study, completed in August 2011, evaluated existing conditions at the Alameda Boulevard storm water pump station, the Paseo del Norte storm water pump station, the Adobe Acres storm water detention pond and pump station, and the Sanchez Farms storm water detention pond and pump station. For each of the four locations, Radian, along with CH2M-HILL who served as a sub-consultant, studied existing known levels of pollutants, proposed and prioritized several possible structural best management practice (BMP) approaches, estimated the effectiveness of each possible improvements (including estimated reductions in pollutant loading), and estimated the construction and operational costs for each of these BMPs. Possible water quality improvement methods evaluated included: dry extended detention basins, retention (wet) ponds, existing retrofit sediment traps, low flow wetland features, constructed wetland ponds, outlet structure modifications, forebay construction, low-flow channel construction, and widened low flow channels. In addition, some off-site improvements such as increased street sweeping, good housekeeping, improved landscape maintenance, construction SWPPP measures, "scoop the poop", increased storm sewer cleaning, grass buffers, grass swales, gravel lined swales, bio-retention, sand filter, constructed wetlands, permeable pavements, and catch basin inserts were also recommended. The project selected for construction is a modified pump station inlet structure at the Adobe Acres detention pond that detains storm water for a much longer period, thereby allowing harmful contaminants to settle out. The project construction was completed in April 2012.

- *Outreach*

Ciudad SWCD issued a Request for Proposals in early 2011 for a public outreach consultant, and received two responses. After review of the proposals, Cooney-Watson & Associates (CWA) was selected. CWA developed a public information campaign targeted at three separate groups: Septic system owners, septic waste haulers and realtors who are required to arrange septic system inspections before property sales. The campaign involved the following elements: A "brand" for the campaign; research among the targeted groups; development of educational materials to reach the targeted groups; an educational workshop for the public; and a direct mail campaign to East Mountain residents whose properties have septic systems. The campaign was conducted from the summer of 2011 through the summer of 2012.

Based on the results of the survey and a search for appropriate literature, CWA developed three specific brochures:

1) "Understand and Take Care of Your Septic System" – Designed for homeowners
2) "Septic System Inspections in New Mexico" – Designed for real estate and title company professionals
3) "Septic Waste Hauling and Disposal in Central New Mexico" – Designed for septic system maintenance and hauling companies.

Each brochure was developed in cooperation with a number of campaign partners, listing information and contact telephone numbers and websites for them, including: Albuquerque Bernalillo County Water Utility Authority, Bernalillo County Office of Environmental Health, New Mexico Environment Department Liquid Waste Program. Where appropriate, the brochures also listed other resources, including telephone numbers and website information or the National Association of Waste Transporters and the U.S. Environment Protection Agency.

- *Installation of Equipment*

Accurate and reliable information about precipitation rates and storm water flows is necessary to understand the relationship between precipitation rate and storm water flow rate, and to determine the contamination impact of storm water discharged from County pump stations. Preliminary data suggest a correlation between storm water temperature and fecal coliform/*E. coli* concentrations, and reliable temperature monitoring is required to explore this relationship. Component 3 of this Project involves the installation of state-of-the-art sensors and data loggers at each pump station, via a contract with the USGS, and the acquisition of a field-grade laptop computer to allow County personnel to collect the data. Meaningful storm water data is expected to be available starting with the 2010 monsoon season, however: storm water data has been somewhat lacking due to drought conditions since the installation of new equipment.

Load Reduction:

Project construction was completed in April of 2012. The resulting load reduction is approximately 1.0×10^{14} colony forming units per year of *E. coli*.

Upper Pecos WRAS Improvement (FY09-E)

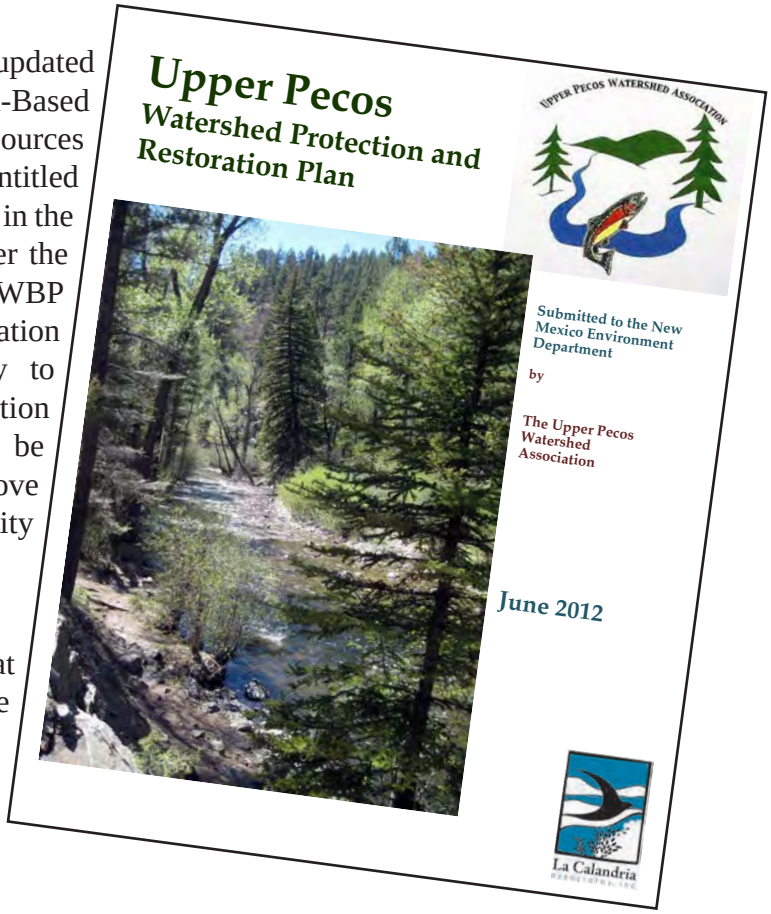
Project Budget: Federal 319(h): $52,030 Match: $35,810 Project Total: $87,840

Watershed: Pecos Headwaters (HUC 13060001).

Subwatershed(s): Headwaters Cow Creek (HUC 130600010101), Bull Creek (HUC 130600010102), Apache Creek (HUC 130600010103), Outlet Cow Creek (HUC 130600010104), Panchuela Creek (HUC 130600010201), Rio Mora (HUC 130600010202), Rio Mora-Pecos River (HUC 130600010203), Indian Creek-Pecos River (HUC 130600010204), Dry Gulch-Pecos River (HUC 130600010205), Glorieta Creek (HUC 130600010206), Glorieta Creek-Pecos River (HUC 130600010207), Tortolita Canyon-Pecos River (HUC 130600010208)

Impairments: The Upper Pecos river and its tributaries are listed as non-supporting for high-quality coldwater aquatic life due to exceedences of turbidity and temperature water quality standards.

Project Summary:
Upper Pecos Watershed Association (UPWA) updated and expanded the Upper Pecos Watershed-Based Plan with important new information about sources of contamination (such as the 2008 report entitled Impact of Recreational Use on Water Quality in the Pecos, which was prepared for UPWA under the 2007 CWA 319(h) grant agreement). This WBP builds on the substantial volume of information and public participation gathered already to develop a prioritized list of specific restoration projects within the watershed that could be implemented immediately to begin to improve these situations that contribute to water quality degradation in the Upper Pecos watershed.



Project Outcome:
EPA has formally accepted the WBP; and that acceptance letter and the WBP are available at:
www.nmenv.state.nm.us/swqb/Pecos/Upper/WBP/index.html.

Load Reduction:
This was a planning project, with no direct pollutant load reduction.

Rio Pueblo de Taos Watershed Comprehensive Planning Project (FY09-G)

Project Budget: Federal 319(h): $55,095 Match: $49,327 Project Total: $104,422

Watershed: Rio Pueblo de Taos (HUC 13020101).

Subwatershed(s): Rito del Gato (HUC 130201010603), Outlet Rio Fernando de Taos (HUC 130201010604), Rio Fernando de Taos-Rio Pueblo de Taos (HUC 130201010605), Arroyo Seco-Rio Pueblo de Taos (HUC 130201010606), Arroyo del Alameda-Rio Pueblo de Taos (HUC 130201010607), Outlet Rio Grande del Rancho (HUC 130201010504)

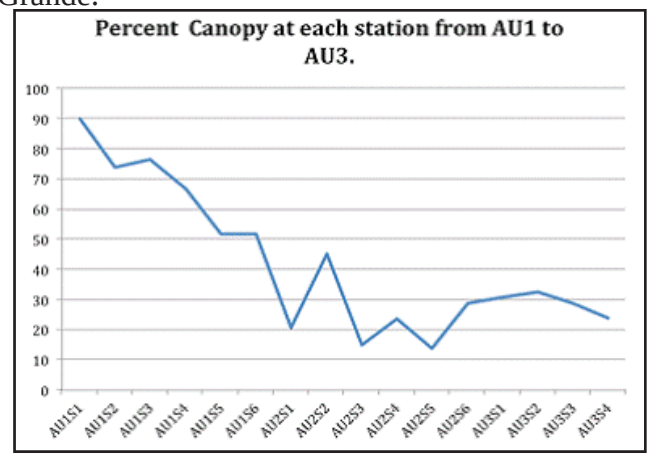
Impairments: Three sections of the Rio Pueblo de Taos (Rio Grande to the Arroyo del Alamo, Arroyo del Alamo to Rio Grande del Rancho, and Rio Grande del Rancho to Taos Pueblo Boundary) are listed for temperature and have TMDLs. The Rio Pueblo de Taos (Arroyo del Alamo to Rio Grande del Rancho) also has a TMDL for sediment, but was delisted during the project term based on data collected by NMED.

Project Summary:

The objective of this project was to develop a watershed-based plan (WBP) for water quality standards attainment in the Rio Pueblo de Taos Watershed. The resulting plan identifies causes and the sources of impairment and describes management measures that can address these concerns. The WBP outlines plans for outreach, funding, monitoring, and tracking of proposed measures.

The Rio Pueblo de Taos watershed is approximately 400 square miles in area, and reaches from Old Mike Peak at 13,113 feet to its confluence with the Rio Grande at 6,100 feet, in the Rio Grande gorge. The mountainous portion of the stream and its watershed is on Taos Pueblo, and was beyond the scope of this plan. The middle portion of the watershed is a gently rolling volcanic plateau that contains the agricultural valleys and urban portions of the watershed, along with rangeland mostly dominated by sagebrush and low density residential development. As the Rio Pueblo de Taos drops off towards the Rio Grande, Taos Pueblo and the state share jurisdiction of water quality programs (with Taos Pueblo land on the right bank, and private and BLM land on the left), and the river flows beneath basalt cliffs, within a gorge of its own, prior to reaching the Rio Grande.

This project was implemented by Amigos Bravos, with intensive outreach to private landowners and technical assistance from the Taos Soil and Water Conservation District, Water Sentinels of Taos, Taos Valley Acequia Association, Carson National Forest, US Bureau of Land Management, the Town of Taos, Taos County, Taos Pueblo, the Natural Resources Conservation Service (NRCS), Keystone Restoration Ecology, and RiverSource. Several key volunteers contributed significant effort towards the project, mainly in the areas of outreach and monitoring.



Percent shade measured on the Rio Pueblo de Taos, from upstream to downstream.

Examples from sites along Rio Pueblo de Taos exhibiting low (top), moderate (middle), and extensive canopy cover (bottom photo).

The non-point source impairments within the Rio Pueblo de Taos are Temperature and Stream Bottom Deposits. The project identified sediment sources and management measures to address sediment in the Rio Pueblo. These management measures focus on BMPs related to road building and maintenance, as roads were the primary source of sediment identified. Sediment loading from smaller subwatersheds, and load reductions expected from management measures, were estimated using a low-tech model developed by the Pacific Southwest Interagency Committee (PSIAC). NRCS staff provided instruction in the PSIAC model.

To better understand temperature impairments, canopy measurements were taken at sixteen locations along the river, which enabled prioritization of stream reaches that, due to poor cover by vegetation, are prone to warming. The Stream Segment Temperature Model (SSTEMP) was used to model temperatures that would result under different scenarios of shading and flow. GIS mapping was used to highlight specific project target areas that will provide the maximum amount of load reduction.

Project Outcome:

The watershed-based plan has been favorably reviewed by the Environmental Protection Agency, with recommendations for revisions. Amigos Bravos has committed to completing a revision to address some of EPA's comments in 2013. The current draft of the WBP is available at:
www.amigosbravos.org/cleanwater-3.php.

The project had a large stakeholder involvement component with many outreach activities such as watershed tours and cleanups, door to door canvassing, radio interviews, watershed meetings, and regular stakeholder meetings and updates. This project also partially supported completion of the river guidebook, *The Rio Grande: A River Guide to the Geology and Landscapes of Northern New Mexico*, by Paul Bauer, in 2011.

Load Reduction:

This was a planning project, with no direct pollutant load reduction.

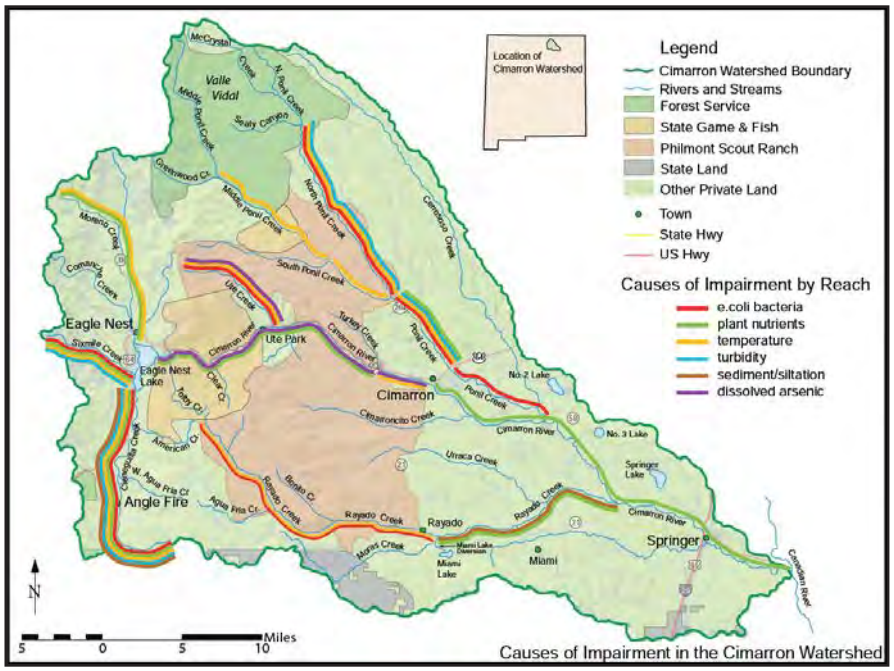
Updated Watershed-Based Plan for the Cimarron Watershed (FY10-B)

Project Budget: Federal 319(h): $67,484 Match: $57,014 Project Total: $124,498

Watershed: Cimarron (HUC 11080002).

Subwatershed(s): Headwaters Cieneguilla Creek (HUC 110800020103), Outlet Cieneguilla Creek (HUC 110800020104), Cimarroncito Creek-Cimarron River (HUC 110800020109), Cimarroncito Creek (HUC 110800020108), Rayado Creek-Cimarron River (HUC 110800020403), Springer Lake (HUC 110800020401), Salado Creek (HUC 110800020402), Cimarron River (HUC 110800020404), Ute Creek-Cimarron River (HUC 110800020107), Middle Ponil Creek (HUC 110800020202), Greenwood Canyon (HUC 110800020201), Headwaters Moreno Creek (HUC 110800020101), Outlet Moreno Creek (HUC 110800020102), Outlet North Ponil Creek (HUC 110800020205), Ponil Creek (HUC 110800020209), Outlet Cerrososo Creek (HUC 110800020208), South Ponil Creek (HUC 110800020204), Chase Canyon (HUC 110800020206), Outlet Rayado Creek (HUC 110800020306), Urraca Creek (HUC 110800020305), Chicoso Creek (HUC 110800020304), Moras Creek (HUC 110800020303), Headwaters Rayado Creek (HUC 110800020302), Agua Fria Creek (HUC 110800020301), Eagle Nest Lake (HUC 110800020105), South Ponil Creek (HUC 110800020204), Ute Creek (HUC 110800020106).

Impairments: Each of the fifteen stream sections has one or more parameters that exceed water quality standards, and for which TMDLs have been developed (see figure below).

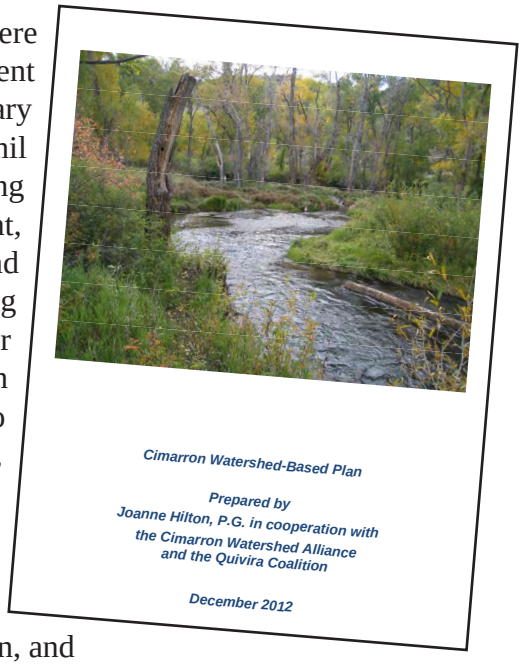


Project Summary:
The main objective of this project was to develop a watershed-based plan for water quality standards attainment for the Cimarron watershed. Nine planning elements outlined in EPA's Nonpoint Source Program and Grants Guidelines for States and Territories (Federal Register, October 23, 2003) were followed to produce a plan that identifies causes and sources of impairment, describes management measures to address those pollutants, estimates pollutant load reductions for management measures, and outlines plans for education, monitoring, funding, and tracking the progress of implementation.

West Agua Fria Creek Road

The Cimarron Watershed Alliance led this project, with technical assistance provided by Joanne Hilton (a Hydrology and Water Resources Planning consultant), and administrative assistance and facilitation provided by the Quivira Coalition. The main steps towards project completion were stakeholder engagement (achieved through monthly Cimarron Watershed Alliance meetings, field workshops, and direct contact with landowners), historical data compilation and review, field reconnaissance, and compilation of the watershed-based plan. The resulting plan relies on the total maximum daily load documents for setting overall load reduction goals. Stakeholders familiar with each stream section estimated the percentage of the preventable pollutant load originating from each identified pollutant source. When estimates from different stakeholders varied, they were averaged. Management measures appropriate for the pollutant sources were identified.

Four "Tier 1" projects or groups of management measures were analyzed in relative detail, for potential water quality improvement projects on Cieneguilla Creek, West Agua Fria Creek (a tributary to Cieneguilla Creek), Middle Ponil Creek, and North Ponil Creek. The projects primarily include combinations of grazing management, road drainage improvement or realignment, riparian planting, and bank stabilization. The pollutant load reduction expected for these projects was estimated using three different models. These were the Spreadsheet Tool for Estimating Pollutant Loads (used for modeling hillslope erosion processes), the Stream Segment Temperature Model (used to evaluate temperature reduction expected with increased shade), and the Bank Assessment for Non-Point Source Consequences of Sediment model (BANCS, used to evaluate sediment loading from eroding streambanks). The BANCS model was useful for determining that over three quarters of the sediment loading in North and Middle Ponil Creeks is from bank erosion, and that focusing on the banks and the riparian area makes sense on those streams.



Project Outcome:
The final Cimarron Watershed-Based Plan was completed in December 2012, and EPA formally recognized that the plan meets their national program guidance. The acceptance letter and the WBP are available at: www.nmenv.state.nm.us/swqb/Cimarron/WBP

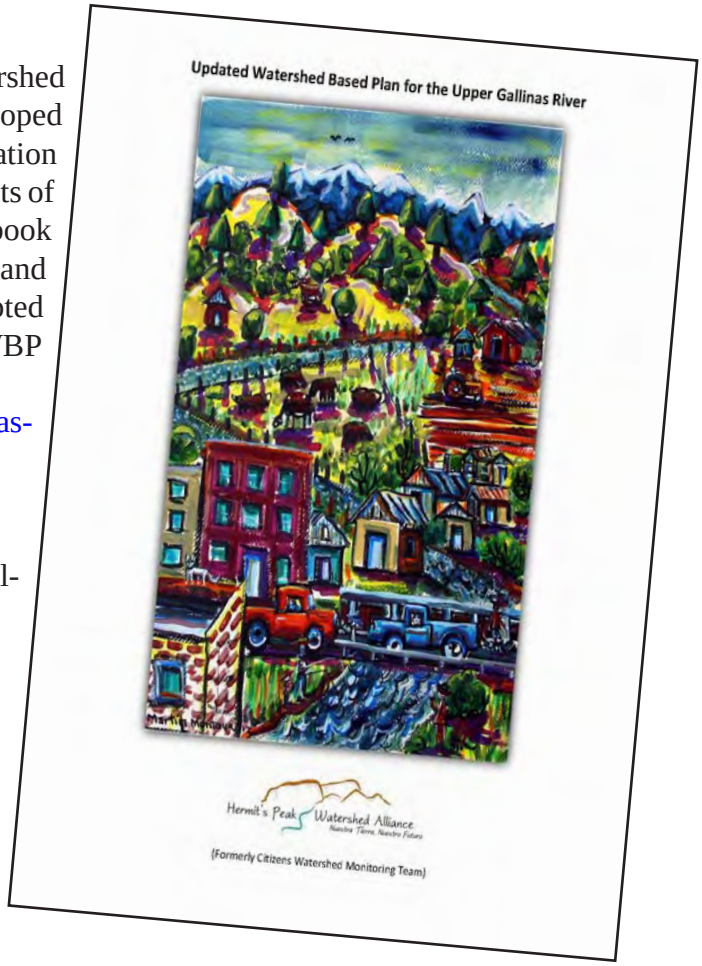
Load Reduction:
This was a planning project, with no direct pollutant load reduction.

Updated Watershed Based Plan for the Upper Gallinas River (FY10-H)

Project Budget: **Federal 319(h): $106,790 Match: $74,420 Project Total: $181,210**
Watershed: Pecos Headwaters (HUC 13060001).
Subwatershed(s): **Porvenir Canyon (HUC 130600010801), Porvenir Canyon-Gallinas Creek (130600010802), Arroyo Pecos-Gallinas River (130600010805).**
Impairments: TMDL for temperature.

Project Summary:
The objective of this project was to prepare an Updated Watershed Based Plan for the Upper Gallinas Watershed (WBPGW) that clearly identifies actions to restore the temperature-impaired reaches of the Gallinas River, resulting in improved overall watershed health.

Project Outcome:
This project updated the Gallinas River Watershed Restoration Action Strategy (WRAS) developed by Tierra y Montes Soil and Water Conservation District in 2005 to comply with the nine elements of watershed based plans and with the EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters, 2005. EPA formally accepted the WBP, and that acceptance letter and the WBP are available at:
www.nmenv.state.nm.us/swqb/UpperGallinas-River/WBP/index.html.



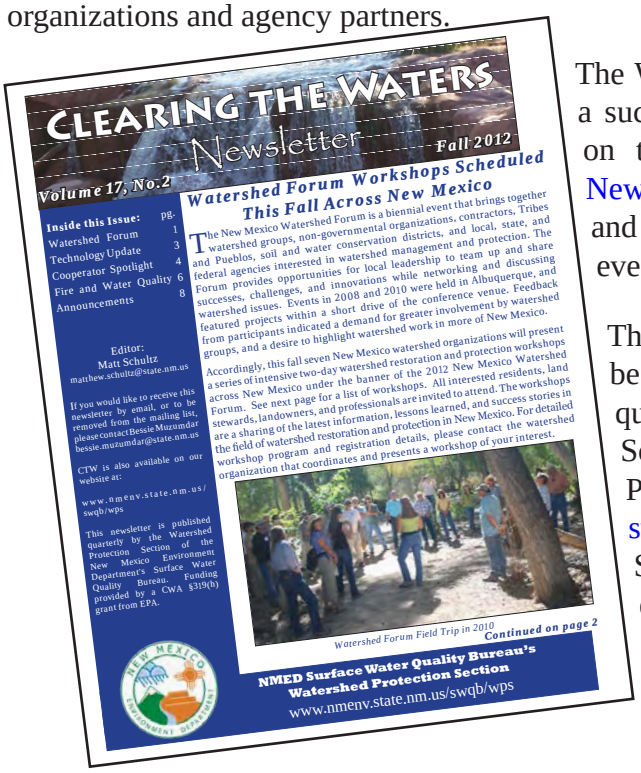
Load Reduction:
This was a planning project, with no direct pollutant load reduction.

For More Information
More complete descriptions of completed and in-progress Section 319 projects are available on the Grants Reporting and Tracking System (GRTS), at www.nmenv.state.nm.us/swqb/wps/GRTS. All of New Mexico's current 319 projects appear under grants awarded in 2008, 2010, and 2011.

Outreach

Numerous outreach activities are conducted by WPS staff each year. These activities take many forms and include: participating in children's water festivals; giving presentations to stakeholder groups, community organizations, and agency partners; conducting site tours; publishing a quarterly newsletter; and conducting training workshops. In 2012, staff participated in over five Children's Water Festivals, logged over 50 hours of classroom time including the Science Olympiad at Western New Mexico University and Pecos Summer School, and two days on the Gila River with La Plata Middle School students, and gave dozens of presentations to stakeholders, community organizations and agency partners.

4th grade students listen to a presentation at a Children's Water Festival on the WNMU campus.



CLEARING THE WATERS
Newsletter
Fall 2012
Volume 17, No.2

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Cooperator Spotlight 4
Fire and Water Quality 6
Announcements 8

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If you would like to receive this newsletter by email, or to be removed from the mailing list, please contact Bessie Muzumdar bessie.muzumdar@state.nm.us

CTW is also available on our website at:

www.nmenv.state.nm-us/swqb/wps

This newsletter is published quarterly by the Watershed Protection Section of the New Mexico Environment Department's Surface Water Quality Bureau. Funding provided by a CWA §319(h) grant from EPA.

Watershed Forum Workshops Scheduled This Fall Across New Mexico

The New Mexico Watershed Forum is a biennial event that brings together watershed groups, non-governmental organizations, contractors, Tribes and Pueblos, soil and water conservation districts, and local, state, and federal agencies interested in watershed management and protection. The Forum provides opportunities for local leadership to team up and share successes, challenges, and innovations while networking and discussing watershed issues. Events in 2008 and 2010 were held in Albuquerque, and featured projects within a short drive of the conference venue. Feedback from participants indicated a demand for greater involvement by watershed groups, and a desire to highlight watershed work in more of New Mexico.

Accordingly, this fall seven New Mexico watershed organizations will present a series of intensive two-day watershed restoration and protection workshops across New Mexico under the banner of the 2012 New Mexico Watershed Forum. See next page for a list of workshops. All interested residents, land stewards, landowners, and professionals are invited to attend. The workshops are a sharing of the latest information, lessons learned, and success stories in the field of watershed restoration and protection in New Mexico. For detailed workshop program and registration details, please contact the watershed organization that coordinates and presents a workshop of your interest.

Watershed Forum Field Trip in 2010

Continued on page 2

NMED Surface Water Quality Bureau's Watershed Protection Section
www.nmenv.state.nm.us/swqb/wps

The WPS newsletter, *Clearing the Waters*, continues to be a success. Reaching over 1,500 stakeholders and posted on the SWQB website (www.nmenv.state.nm.us/swqb/Newsletters/index.html), it contains articles on monitoring and restoration techniques, project updates, a calendar of events and cooperator spotlights.

The Surface Water Quality Bureau web site continues to be a useful source of information on New Mexico's water quality programs. Most material related to the Nonpoint Source Management Program is available on a Watershed Protection Section page (www.nmenv.state.nm.us/swqb/wps). Special pages were created in 2012 on Section 401 certification public comment opportunities, effectiveness monitoring, three completed watershed-based plans, and instructions for public access to the Grant Reporting and Tracking System used by NMED and EPA to track and report Section 319 grants.

The web-based GIS tool at gis.nmenv.state.nm.us/SWQB was updated and refined in 2012 to permit easier review of Nonpoint Source Management Program priorities. The layer called "Stream Impairments" highlights the main priority streams for water quality improvement. These are the streams with impairments described by TMDLs, plus the limited category of streams considered to be impaired by reduced flow rather than by excessive pollutant loading (i.e., Category 4C streams). The layer called "Priority Watersheds" indicates the 12-digit watersheds which drain directly to those streams.

Workshops

Brian Drypolcher, River Coordinator for the City of Santa Fe, describes a River Ecosystem Restoration Initiative project on the Santa Fe River during the 2012 Watershed Forum.

The New Mexico Watershed Forum is a biennial event that brings together watershed groups, non-governmental organizations, contractors, Tribes and Pueblos, soil and water conservation districts, and local, state, and federal agencies interested in watershed management and protection. The Forum provides opportunities for local leadership to team up and share successes, challenges, and innovations while networking and discussing watershed issues. Events in 2008 and 2010 were held in Albuquerque, and featured projects within a short drive of the conference venue. Feedback from participants indicated a demand for greater involvement by watershed groups, and a desire to highlight watershed work in more of New Mexico. Participation from more parts of New Mexico would be increased and a greater variety of projects could be highlighted if the Forum were held in other communities. Accordingly, this past fall seven New Mexico watershed organizations presented a series of intensive two-day watershed restoration and protection workshops across New Mexico under the banner of the 2012 New Mexico Watershed Forum. See next page for a publicity flyer listing the workshops. All interested residents, land stewards, landowners, and professionals were invited to attend. Over 300 people attended the seven workshops (with a range of about 30 to 175). The workshops were a sharing of the latest information, lessons learned, and success stories in the field of watershed restoration and protection in New Mexico.

Forum participants from the Cerrillos and Madrid area become acquainted with principles of water harvesting at the Ampersand Sustainable Learning Center.

Kent Reid, of the New Mexico Forest and Watershed Restoration Institute, guides forum participants through ponderosa stands thinned under three different prescriptions at the Las Vegas workshop.

2012 New Mexico Watershed Forum

The New Mexico Watershed Forum is going on the road in 2012! Please consider attending one or more of these workshops on watershed management and restoration topics:

Workshops – Dates & Places

Santa Fe - Sept. 21st & 22nd: Caring for Arroyos in your Neighborhood
Register with Felicity Broennan at (505) 820-1696 or e-mail her at: felicity@santafewatershed.org or go online: www.santafewatershed.org

Pecos - Sept. 26th & 27th: A Changing Landscape: The Pecos Watershed and its Future
Register with Lexy St. James at (505) 757-3600 or e-mail her at: upwa@pecoswatershed.org

Las Vegas - Sept. 28th & 29th: Preparing for and Adapting to Drought in Northern New Mexico
Register with Molly Walton at (505) 820-2544, ext. 6# or e-mail her at: mwalton@quivira coalition.org

Silver City - Oct. 4th & 5th: Rainwater Harvesting: A Graceful Resolution for an Urban River
Register with Van Clothier at (575) 388-5296 (office), (575) 590-0549 (cell), or e-mail him at: streamdynamics@aznex.net

Cerrillos - Oct. 6th & 7th: Watershed Restoration ~ The Cutting Edge: Catching , Sinking, Storing, and Using Water Where it Falls
Register with Amanda Bramble at (505) 780-0535, ampersandproject@yahoo.com, or go online: www.ampersandproject.org

Mosquero - Oct. 11th & 12th: Canadian River Riparian Restoration Project ~ Treatment Results and Discussion
Register with Summer Eaton at (575) 646-2362, seaton@nmsu.edu

Farmington - Oct. 16th & 17th: Collaborating for Water Quality in the San Juan Basin
Register online: https://sites.google.com/site/sanjuanwatershedgroup/riverhealthworkshop

For more information, including updates, please visit www.nmenv.state.nm.us/swqb/wps/2012WatershedForum

Wetlands Program Trainings and Workshops

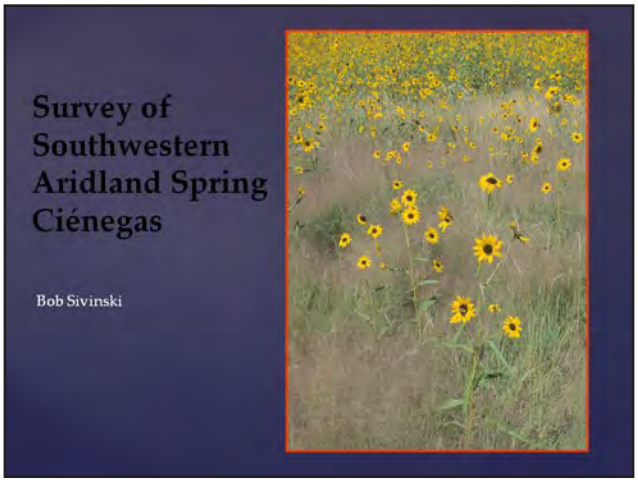
The Wetlands Program and UNM Natural Heritage presented a one-day Botany Booster Training on October 10, 2012. This training was a botany refresher and designed to help participants become familiar with plants that they would encounter when conducting the New Mexico Rapid Assessment Method (NMRAM) for assessing the condition of wetland resources. Over thirty participants attended.

Botany Booster attendees at Santa Fe River to map plant communities and identify winter dominants.

New Mexico Wetlands Roundtable meetings are supported by Wetlands Program Development Grants from EPA Region 6 to foster partnerships and collaboration for the restoration and protection of wetlands and riparian areas in New Mexico.

A Wetlands Agency Roundtable was conducted on February 23, 2012 at the New Mexico State Library in Santa Fe. This Roundtable focused on monitoring and assessment topics and water quality standards development for wetlands. Other topics such as the Mesilla Valley State Parks Restoration project and an update on USACE Nationwide Permits were presented as well. Jeanne Christi, Director of the Association of State Wetland Managers, and Richard Prather, Technical Advisor from EPA Region 6 Wetlands Program, attended and presented as special invitees at this meeting.

A Nongovernmental Organization (NGO) Wetlands Roundtable was conducted in partnership with the New Mexico Riparian Council on March 1, 2012 at the New Mexico State Library. The agenda of the NGO Roundtable was based on feedback from questions asked of key NGOs that work with the Wetlands Program. The agenda consisted of science speakers, an NGO spotlight presentation, an update from the USACE, and a training session on photo monitoring.



One presentation topic at the Wetlands Agency Roundtable this year.

A combined Wetlands Agency Roundtable and NGO Wetlands Roundtable meeting was conducted on October 31, 2012 at the New Mexico State Library. The groups were combined because the topics and presentations of interest to both groups, and the meeting was co-sponsored by New Mexico Wildlife Federation (NMWF). NMWF presented their efforts for riparian and wetlands restoration in the Middle Rio Grande through large North American Wetlands Conservation Act grants. Other topics included a geohydrology study of La Cienega springs, mitigating climate change, and a presentation by Santa Fe Girls School about their wetland preserve on the Santa Fe River. Dan Taylor of Bat Conservation International and Sharon Daugherty of EPA Region 6 attended and presented as special invitees.

Wetlands Program

New Mexico Wetland Program Plan

In 2012, the Wetland Program Plan for New Mexico (WPP) was updated by the SWQB Wetlands Program for the next five years. The 2012 WPP has been accepted by EPA as meeting the four elements for such plans (monitoring and assessment, regulation, voluntary restoration and protection, and water quality standards for wetlands). New Mexico's is the only accepted WPP in EPA Region 6. More information (including New Mexico's updated WPP) is available at:
http://water.epa.gov/type/wetlands/wpp.cfm.

Funding Awarded to the Wetlands Program

Two new Wetlands Program Development projects have been awarded funding by EPA Region 6 in 2012. The federal grants for these projects total $755,785 in federal assistance awarded through the FY12 EPA Wetlands Program Development Grant Program authorized by CWA Section 104(b)(3).

The "*Rapid Assessment for New Mexico's Playa Region, Southern High Plains*" project will target playa wetlands in the Southern High Plains (SHP) of Eastern New Mexico. This project will advance the development of the Wetlands Program and is consistent with New Mexico's draft Assessment and Monitoring Strategy for Wetlands and Wetlands Program Plan. Through this grant four major objectives will be accomplished. 1) A rapid assessment method that is geared to playas depressional wetlands will be developed. Using this method, playa data will be collected, analyzed and final metrics will be selected to complete the NMRAM Playa Depressional Wetlands Manual and Field Guide that describes a reference set of conditions and stressors, and provides rapid assessment method details, underlying rationale, and worksheets for future data collection and reporting. 2) A "Texas/New Mexico Wetlands Across Borders" workshop will be conducted that brings together information and diverse groups. 3) The NM Wetlands Roundtable will be maintained by convening meetings focused on the established objectives of the group. 4) Phased development of our web-based database that includes GIS mapping capabilities, will be continued and include depressional wetlands NMRAM data.

The "*Innovative Restoration of Historic Wetlands along Sulphur Creek, Valles Caldera National Preserve*" project will demonstrate innovative restoration techniques being evaluated in New Mexico to restore wetlands and floodplain wet meadow habitat in the Sulphur Creek Sub-Watershed within and adjacent to the Valles Caldera National Preserve. This project will build the capacity of the Wetlands Program by improving our understanding of effective new methods, building our restoration technique "tool box", contributing to and improving our Wetlands Action Plan Program, and building capacity at the local level. This project will 1) restore at least 30 acres of wetlands damaged by geothermal exploration activities and other impacts within the Sulphur Creek watershed using the innovative "plug and pond," porous road fill, and other restoration methods; 2) collect baseline and post-implementation data from Sulphur Creek wetlands, and compare these data to other areas on the Preserve where "plug and pond" restoration has recently been implemented to determine the effectiveness of these methods for high mountain meadow streams; 3) prepare a scientific report and technical guide about the use and effectiveness of the "plug and pond" innovative technique that restores ecologically significant hydrological processes to degraded riverine systems; 4) disseminate information about the restoration

methods through volunteer field work days, roundtables, newsletters, websites, and conferences; 5) develop a Wetlands Action Plan that will coordinate wetlands restoration, activities and funding for the Sulphur Creek Sub-Watershed. The Sulphur Creek WAP will be integrated into the Draft Valles Caldera National Preserve WAP and the Jemez Watershed Restoration Action Strategy.

Projects Completed in 2012.

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

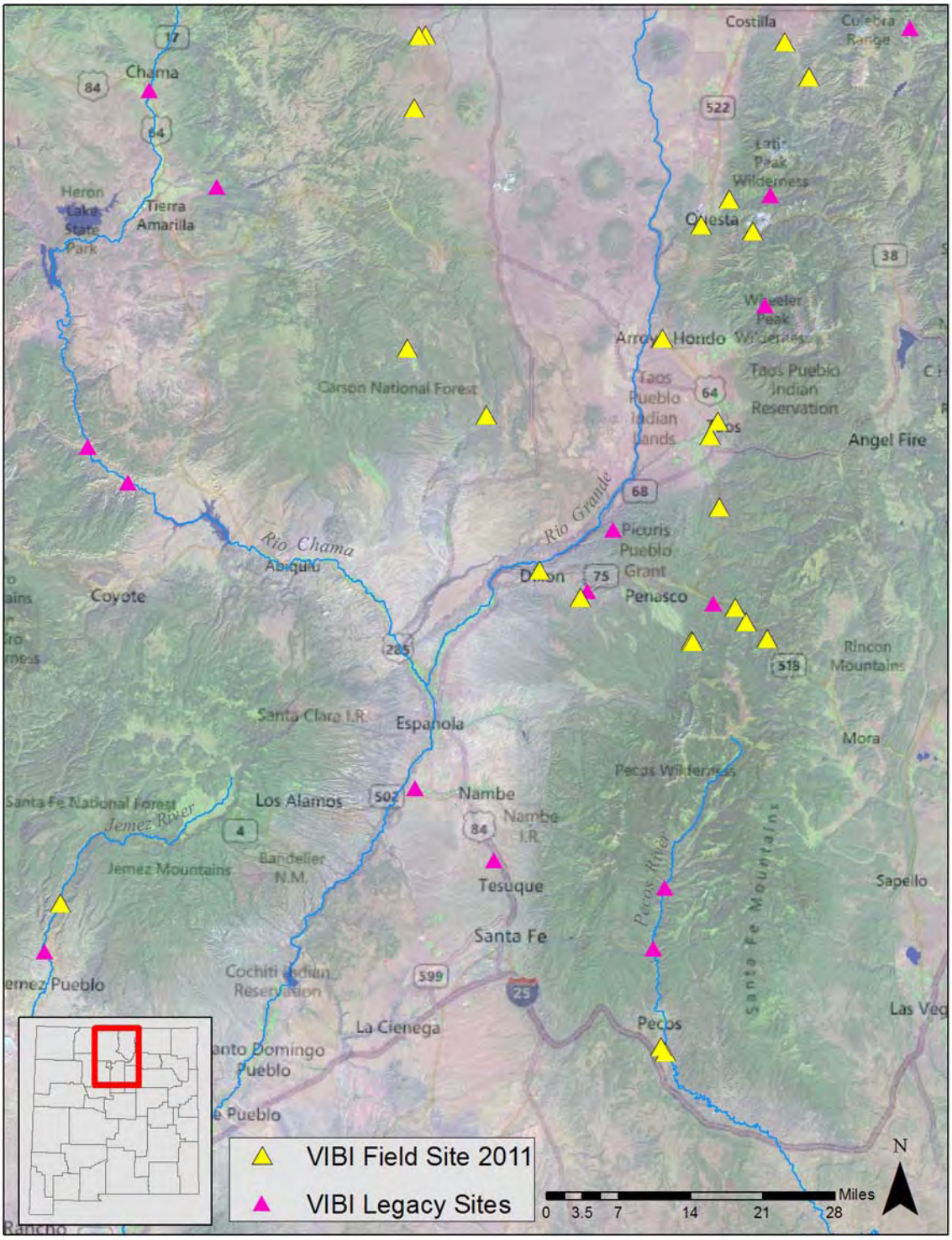
The "*New Mexico Wetlands Monitoring and Assessment Strategy – Development of Elements 1 and 2*" project focused on the development of a comprehensive wetlands assessment and monitoring program strategy that is integrated into the broader state water quality monitoring strategy. Integrating wetlands assessment and monitoring components into the Surface Water Quality Bureau's planning and programmatic guiding documents was another primary achievement. The elements in the "State of New Mexico Assessment and Monitoring Program Strategy For Wetlands" (Strategy) document provide guidance for completing a comprehensive assessment within the next ten-years, to be followed with a long-term iterative wetland monitoring program. The Strategy includes all levels of data collection including remote sensing for mapping and classification, rapid assessment methods for determining condition and functionality of wetlands and identification of stressors, and more intensive surveys and methods to measure wetlands restoration and management success and to validate our other data collection methods and metrics. The Strategy emphasizes the identification of impairments to wetland resources and measurement of change over time, and the identification of stressors acting upon wetland ecosystems that are causing change or threaten to degrade these systems. Preliminary assessment and follow-up monitoring will be utilized to determine our future wetlands management activities. The Strategy also emphasizes the need to integrate wetland assessment findings into data sets from other water bodies in the state and provide insight to their interdependency and resulting consequences. The strategy provides guidance to help NMED and agency partners further incorporate wetlands protection into other water quality efforts in the state. The final project product, available at ftp.nmenv.state.nm.us/www/swqb/MAS/Monitoring/10-YearStrategy.pdf, includes the development of all 10 Elements of the Strategy.

The "*New Mexico Wetlands Ecological Indicators Project*" (formerly called "*Integrating the Use of Biological Indicators and Assessment with Hydrogeomorphic (HGM) Assessment*") completed an interim report for the development of a Vegetation Index of Biological Integrity (VIBI) following the methodology developed in Colorado by Rocchio (2007) and others but adapted for the riverine wetlands of the Upper Rio Grande watershed. The Interim report includes a literature review, provisional VIBI model, and a floristic quality assessment index review. The VIBI is being developed to validate the New Mexico Rapid Assessment Method (NMRAM) for assessing the condition of mid-montane riverine wetlands in the Upper Rio Grande watershed as well as select reaches in the Chama, Pecos and Jemez watersheds. Beyond this high-resolution validation (Level 3), the VIBI is being examined as a separate tool for evaluating wetland ecological integrity. The project builds on data sets collected using the NMRAM method, the collection of new data, the review of legacy data from sites that meet the mid-montane riverine subclass description, and the Coefficients of Conservatism

species lists developed for adjacent landscapes in southern Colorado (modified based on a NM panel of botanical experts). A multi-variate statistical analyses was applied to a combination of biological and environmental data (including NMRAM scores and subscores) to produce a fully realized VIBI model based on New Mexico wetlands species. The final product will be completed under another grant in 2013 with a final report detailing the methods, analysis, and the VIBI models along with associated database and GIS materials.

The vegetation of Montane Riverine Wetlands subclass can be broadly characterized as a complex of montane riparian forests, shrublands, and emergent herbaceous wetlands following the National Vegetation Classification System (Federal Geographic Data Committee, 2008). This photo is an example of Rocky Mountain and Great Basin Montane Riparian Forest, dominated by cottonwood located near Embudo, New Mexico.

Photo Credit: Yvonne Chauvin


Costilla
Culebra Range
Chama
Heron Lake State Park
Tierra Amarilla
Latir Peak Wilderness
Questa
Wheeler Peak Wilderness
Arroyo Hondo
Taos Pueblo Indian Lands
Taos Pueblo Indian Reservation
Taos
Angel Fire
Carson National Forest
Rio Chama
Abiquiu
Rio Grande
Picuris Pueblo Grant
Dixon
Penasco
Coyote
Rincon Mountains
Santa Clara I.R.
Espanola
Mora
Pecos Wilderness
Santa Fe National Forest
Jemez River
Los Alamos
Nambe
Nambe I.R.
Jemez Mountains
Bandelier N.M.
Tesuque
Pecos River
Sapello
Santa Fe
Santa Fe Mountains
Jemez Pueblo
Cochiti Indian Reservation
La Cienega
Pecos
Las Vegas
Santo Domingo Pueblo
VIBI Field Site 2011
VIBI Legacy Sites
0 3.5 7 14 21 28 Miles
N

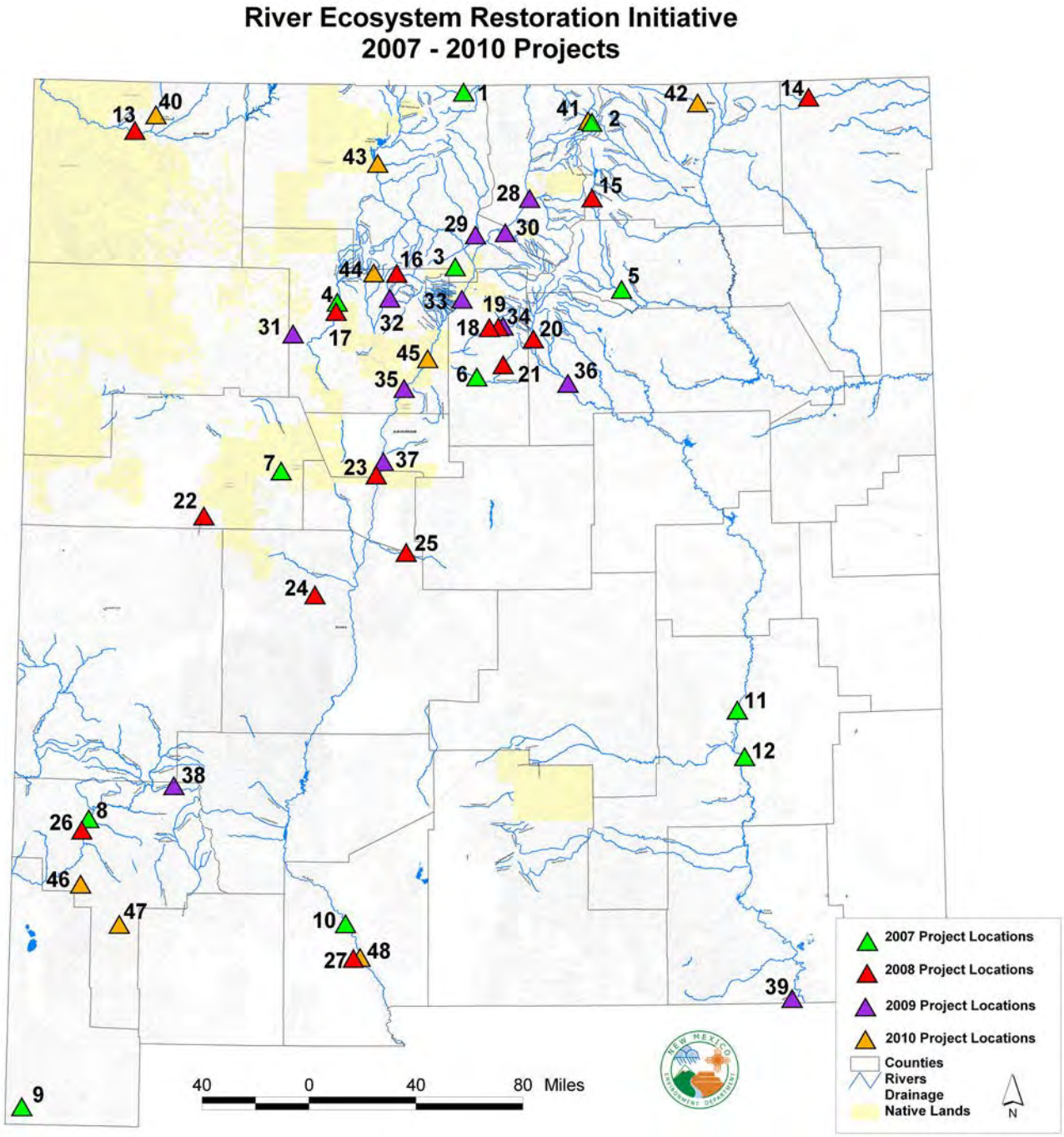
State Funded Projects

Cross vane on the Pecos River reduces erosion and creates fish habitat.

The River Ecosystem Restoration Initiative (RERI) is a multi-agency state effort to restore in-stream ecosystem and watershed health to major New Mexico river basins. RERI is restoring approximately 95 river miles and 3,345 acres of riparian area in 48 projects throughout the state (see map next page). Projects have been implemented along the Rio Puerco, Rio Chama, the upper, middle and lower Rio Grande, and the San Juan, Gila, Canadian, Pecos, and Santa Fe rivers, as well as numerous tributaries. A total of $8.2 million in capital outlay funding was appropriated for RERI by the state legislature over a four year period from 2007-2010. RERI complements both NMED's Clean Water Act 319(h) Program and the Wetlands Program that have the goals of improving surface water quality and restoring wetlands respectively. Many of these projects address primary causes of NPS pollution in New Mexico: sediment and temperature. Several RERI projects are co-located in the vicinity of a 319(h) or a 104(b)(3) restoration project serving to leverage funds and increase project success. RERI has engaged a diverse group of stakeholders, 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. These stakeholders bring to these projects not only a diverse set of skills, but diverse sources of private and public funding as well. The following summaries provide specific information on the RERI projects that were funded beginning in FY2008 and completed in FY2012.

Volunteer crew constructs post vane in Comanche Creek to mitigate stream bank erosion.

Emerging wetland along San Antonio Creek (channel in foreground) only two weeks after construction.


River Ecosystem Restoration Initiative
2007 - 2010 Projects
2007 Project Locations
2008 Project Locations
2009 Project Locations
2010 Project Locations
Counties
Rivers
Drainage
Native Lands
N
40 0 40 80 Miles

Cieneguilla Creek Riparian Ecosystem Restoration

Project Budget: $29,000 in RERI funds.
Watershed: Cimarron (HUC 11080002)
Subwatershed(s): Headwaters Cieneguilla Creek (HUC 110800020103)

Project Summary:
Cieneguilla Creek is a perennial creek in the Canadian River watershed. Historic land use, roads and grazing pressure from elk have contributed to channel incision, lowering of the water table, widening of the stream, bank erosion, and lack of woody vegetation. The project area is located adjacent to the Angel Fire County Airport. This project builds upon a Federal Aviation Administration Grant awarded to Colfax County whereby the county designed and constructed a safety fence around the airport runway. Cieneguilla Creek flows parallel to the runway. A riparian elk exclosure could therefore be built for approximately half the normal cost by tying in to the runway fence. The exclosure fence provides the riparian area with protection and time needed for recovery from elk grazing.

Cieneguilla Creek showing airport runway in background (2008). Photo by Cimarron Watershed Alliance.

A post vane constructed on Cieneguilla Creek to divert high velocity flow away from a cutbank. Photo courtesy Cimarron Watershed Alliance.

Project Outcome:
The Cimarron Watershed Alliance constructed an 8-foot high riparian exclosure fence along approximately 2,200 linear feet of Cieneguilla Creek to provide rest from elk grazing. 1,500 willow poles were planted to revegetate the stream banks, and eight instream structures were constructed (structural pole vanes and rock baffles) to improve stream morphology. Results include a reversal of the current floodplain abandonment trend, lowering the channel's width-to-depth ratio, and water temperature reduction due to woody vegetation that provides shade.

Habitat Restoration Along the Upper Santa Fe River

Project Budget: $123,000 in RERI funds.
Watershed: Rio Grande-Santa Fe (HUC 13020201)
Subwatershed(s): Headwaters Santa Fe River (HUC 130202010102)

The new Santa Fe River channel, immediately following construction and planting. Photo by Santa Fe Watershed Association.

Project Summary:
The Santa Fe Watershed Association restored the Santa Fe River to its historic flowpath in the upper watershed on the Nature Conservancy's 525 acre Santa Fe Canyon Preserve. The majority of the water that flows into the Santa Fe River in the upper watershed is impounded in two reservoirs for municipal supply. Periodic releases from the reservoirs were conveyed in a pipe to a diversion channel. The primary purpose of this project was to restore a ½ mile reach of the natural river course to allow surface water connection to a shallow pond downstream that provides habitat for a variety of wildlife, including deer, bear, beaver, mountain lion, and 140 species of birds that have been sighted on the property. One of the few open water ponds in Santa Fe County, this is a valuable area of biodiversity for flora and fauna, and an important recreation area for the residents and visitors.

Project Outcome:
A 1,200 foot river channel featuring riffles and pools was constructed with heavy machinery. A new irrigation diversion structure was built, 300 native shrubs and trees were planted by volunteers, and the disturbed area was hydro-seeded with grass and mulched. In addition, the underground pipes were cut to re-route the water into the channel, and a flow meter was installed to measure discharge along the stream. The success of the project is supported by the City of Santa Fe's 2012 Living River Ordinance which commits to a release of 1,000 acre-feet from the reservoir to the river bed (pro-rated in drought years).

Contractor Steve Carson, Rangeland Hands, during construction of Santa Fe River Channel. Photo by Santa Fe Watershed Association.

La Jencia Creek Cienega and Riparian Restoration

Project Budget: $135,700 in RERI funds.
Watershed: Rio Salado (HUC 13020209)
Subwatershed(s): Outlet La Jencia Creek (HUC 130202090608)

Project Summary:
La Jencia Creek is an intermittent stream that flows to the Rio Salado and thence to the Rio Grande in Socorro County. The project location comprises three miles of La Jencia Creek and 60 acres of riparian/wetland ecosystem. Springs within the project area and upstream provide for perennial water on reaches of the creek. Livestock grazing, water diversions, episodic flood events and exotic plant invasions drastically altered the health of this once-rich ecosystem. The creek had become incised up to 45 feet, base flows had been diminished, native riparian vegetation was reduced in diversity and density, the previously meandering channel had become straightened, and the existing cienega had been mostly filled in with sand and silt. Non-native vegetation had invaded the floodplain where native cottonwood, willow and other native shrubs and grasses once flourished. Cattle previously had year-round access to the riparian area. With the removal of all cattle from the project area in 2007, there was the opportunity to realize the potential of this desert stream ecosystem.

La Jencia Creek before restoration (2006-top) and after restoration (2012-bottom).
Photos by Jim Matison, WildEarth Guardians.

Project Outcome:
WildEarth Guardians removed non-native vegetation (salt cedar and Russian olive) from the riparian area, and planted 10,000 willows, 1,500 cottonwoods, and 200 native forage species. Densely planted willow thickets proved effective in holding stream meanders in place while withstanding a subsequent flash flood. Students from Colorado College assisted annually with the riparian plantings, providing volunteer labor and the opportunity for service learning about riparian desert ecosystems. Two additional grants from the US Fish & Wildlife Service (US FWS) focused on creating two wetland ponds and planting native riparian vegetation in the main cienega. These areas provide habitat for a wide range of aquatic, terrestrial and avian species. In 2010, 38 northern leopard frogs were introduced to the area by the USFWS as part of plans to establish a frog refugium.

Increasing Stream Ecosystem Health in the Upper Pecos Watershed

Project Budget: $300,000 RERI funds, $60,000 private funds, and $10,000 state funds from the NMDGF.
Watershed: Pecos Headwaters (HUC 13060001)
Subwatershed(s): Monastery Lake (HUC 130600010207)

Project area before restoration, looking downstream at the old gabion dam in the west channel. Photo courtesy of Upper Pecos Watershed Association.

Project Summary:
The project area is located below the Lisboa Springs Fish Hatchery on the Pecos River upstream of the Village of Pecos. The objectives of the project were to address water quality impairments (temperature and turbidity) for a 1,400 foot reach of the river through channel and bank restoration, and the creation of a new wetland area, thus improving general river ecosystem health. The project area river includes a west channel which receives the majority of the river flow, and an historic east channel. The west channel contained an old gabion dam that diverted water from the river for irrigation at the downstream Pecos Benedictine Monastery and Monastery Lake, a popular public fishing site. The river was wide and shallow in the west channel due to the negative effects of the gabion dam, whereas water in the east channel was deeper and stagnant. The project design included removal of the old gabion, construction of a new headgate and rock diversion structure, construction of several boulder cross vanes to step down the grade in the west channel, installation of boulders for trout habitat, mechanical re-shaping of the banks in the west channel, re-shaping of the east channel into a wetland area with a narrow stream, and vegetation of both areas with a diverse population of woody vegetation, shrubs, grasses, sedges and rushes.

Project Outcome:
The Upper Pecos Watershed Association managed the project that included permitting, monitoring, construction, and planting work in both river channels. All of the construction objectives were met, resulting in a narrower, deeper river in the west channel and a new wetlands area with a small stream channel in the east channel. The boulder cross vanes are oxygenating the water and reducing water temperature, and the vegetation in both areas is providing increased canopy cover to reduce water temperature. In addition, the wildlife habitat benefits of the project have been significant.

Project area looking upstream in west channel. Photo courtesy of Upper Pecos Watershed Association.

Restoring Cebolla Canyon

Project Budget: $159,111 in RERI funds provided matching funds to leverage $265,239 in federal CWA Wetlands Program Development Grant funds. Other funding used for additional restoration in the project area includes $300,000 in federal American Recovery and Reinvestment Act funds, and a $25,000 grant from the New Mexico Community Foundation.

Watershed: North Plains Closed Basin (HUC 13020206)

Subwatershed(s): Cebolla Creek (HUC 130202060601)

Project Summary:

Springs within Cebolla Canyon south of Grants, New Mexico are the only constant water source within several miles. As a result, these springs provide habitat and water to a variety of wildlife species including bald eagle, elk, mountain lion, bobcat, Abert's squirrel, wild turkey, and reptiles such as the side-blotched lizard. The canyon is within a congressionally-designated wilderness area in the El Malpais National Conservation Area under the jurisdiction of the U.S. Bureau of Land Management. The canyon was homesteaded in the early 1900s. Former wetlands were drained, and dams, irrigation ditches and impoundments were constructed to support agriculture along Cebolla Creek. These changes reduced the historic wetland to a fraction of its original size and created massive stream erosion, incising the stream banks in some areas as deep as 50 feet.

Project Outcome:

Rio Puerco Alliance and its partners used a variety of best management practices (BMPs) in Cebolla Canyon to return the springs, creek and wetlands to their natural function. Roads were rerouted outside of the stream area. Old berms and dams were physically removed. Fences were constructed to control grazing, and native vegetation was planted. Numerous rock structures were built to stabilize banks and stream beds, arrest erosion, protect and restore moisture storing areas of the landscape, and cultivate plant communities to build soil. These structures used techniques that have been developed and pioneered by New Mexico contractors and were constructed using heavy equipment and volunteer hand labor. The project engaged volunteers from the Albuquerque Wildlife Federation, Wild Turkey Federation, New Mexico Wilderness Alliance, and Fuhrman University, as well as paid youth from the Acoma Southwest Conservation Corps.

Before (top), during (middle), and after (bottom) construction of a Zuni Bowl to arrest headcut migration that was draining valley wetlands.

The Santa Fe River Watershed: Restoring Riparian Vegetative Cover, Improving Infiltration and Sinuosity, and Stabilizing the Channel and Banks

Project Budget: $235,000 in state RERI funds augmented $4.1 million in municipal capital outlay bonds and legislative appropriations.
Watershed: Rio Grande-Santa Fe (HUC 13020201)
Subwatershed(s): Headwaters Santa Fe River (HUC 130202010102)

Project Summary:
In 2007 the Santa Fe River was a dry arroyo bisecting the city, identified by the conservation group American Rivers as one of America's most endangered rivers. Historically the Santa Fe River had perennial or intermittent flows. In the 1.3 mile urban reach between Camino Alire and Frenchy's field, the river was an entrenched straight channel with steep banks. As this channel lacked vegetation or physical structures to slow the water, the power of storm flows threatened to erode adjoining properties. Previous failed attempts to control downcutting had littered the riverbed with wire and concrete debris.

In 2008, as part of the larger Santa Fe River Trail capital improvement project, the City of Santa Fe received River Ecosystem Restoration Initiative (RERI) funding for the planting of natural vegetation and storm drain construction that help ensure project success. Native vegetation was planted in the river bed along the one mile river reach between Camino Alire to Frenchy's Field: 100,000 willows, 1,000 cottonwood trees and various other native shrubs and trees. Native grasses and wildflowers were seeded and mulched to help stabilize the river banks. Two urban storm drains were reworked in a manner that slows water down, allowing for infiltration and providing water to native plants along the river channel and recharge to the aquifer that supplies drinking water to Santa Fe residents.

Project Outcome:
The City of Santa Fe restored the 1.3-mile urban reach of the Santa Fe River to control erosion, support native vegetation, and provide a valuable recreational resource for city residents. The overall project stabilized the Santa Fe river bed, banks and arroyos. Although RERI funding provided a small percentage of the overall project funding, the vegetation is critical to holding the river bed together. The project engaged local schools and residents to assist with planting. The diverse vegetation now provides shade and habitat for aquatic and riparian species. The rock structures hold the river grade and protect the banks from erosion, and the vegetation slows storm water and allows it to infiltrate.

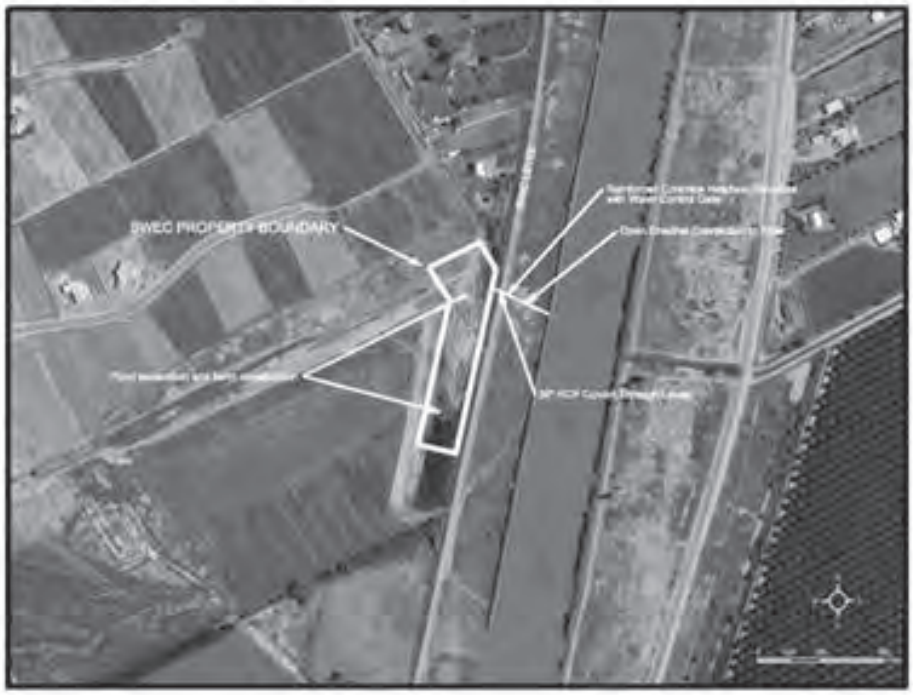
The success of this project was enhanced by a significant water policy change by the City of Santa Fe. In 2012 the City adopted a city ordinance which allows for 1,000 acre-feet of water to be released annually from upstream reservoirs. The ordinance provides a flow prescription that is pro-rated during times of drought. This flow will help support the project and future projects. As a result, a typical afternoon in the Santa Fe River bed includes children laughing and splashing through the water, abundant avian wildlife, neighbors walking pets and visiting with each other, and cyclists and runners on a new paved trail.

La Mancha Wetland

Project Budget: $99,920 in RERI funds.
Watershed: El Paso- Las Cruces (HUC 13030102)
Subwatershed(s): Alameda Arroyo- Rio Grande (HUC 130301020608)

Project Summary:
The La Mancha Wetland project is located on three acres of land owned by the Southwest Environmental Center and adjacent federal land along the Rio Grande near Mesilla, NM. When completed, it will consist of ponds that are connected to the river, simulating a side channel of the river, and creating year-round backwater habitat that is extremely important as fish spawning, nursery and feeding grounds for native fish. This type of slow-water habitat has largely been eliminated from the Rio Grande in southern New Mexico and west Texas. Southwest Environmental Center oversaw the excavation of the La Mancha Wetland with 2008 RERI funds. A second allocation of (2010) RERI funding will complete the project in 2014. The project was delayed by administrative processes in acquiring water rights. When completed, the project will provide wildlife habitat and environmental education and public recreation opportunities.

Heavy equipment excavating and shaping the future La Mancha Wetland.
Photo courtesy of Southwest Environmental Center.



Aerial photo of the La Mancha Wetland site adjacent to the Rio Grande River south of Las Cruces, New Mexico. Labeled photo courtesy of Southwest Environmental Center.

Gila River Floodplain Restoration

Project Budget: $116,000 in RERI funds.
Watershed: Upper Gila- Mangas (HUC 15040002)
Subwatershed(s): Bear Creek-Upper Gila River (HUC 150400020401), Sycamore Creek-Gila River (HUC 150400020404)

Project Summary:
The Gila River is the only major river in New Mexico that is free of permanent dams. It also has extraordinary biodiversity of plants and animals. However, the river in the Cliff-Gila Valley has been altered by a variety of detrimental practices, including: reduction of beaver populations, localized year-round livestock grazing in riparian areas, and construction of levees and berms. These alterations denuded the stream banks and channelized and incised the river, making it difficult for the river to access its floodplain. However, because the flow regime of the river is intact, there is tremendous opportunity for recovery of a healthy floodplain and riparian ecosystem. This project utilized passive and active BMPs to yield dramatic improvement in the riverine ecosystem in a short period of time.

Project Outcome:
The Nature Conservancy restored 1.5 miles of river bank and 238 acres of floodplain habitat on three riverfront properties (Gila Farm, Agnew Tract, and Iron Bridge Tract). Trespass livestock were fenced out of the riparian area, allowing riparian vegetation to re-generate naturally. Exotic trees (salt cedar, Siberian elm, and tree of heaven) were removed using cutting and herbicide treatments. Native trees, shrubs and grasses were planted. The work was performed by numerous local subcontractors and by volunteers from the Upper Gila Watershed Alliance. The outcomes of the project are improved plant, animal and hydrologic diversity along the Gila River. As the trees and willow thickets mature, the river channel will narrow and deepen, and water temperature will be reduced by shaded river banks.

Summer 2007 (top photo) and Summer 2012 (bottom photo) at the Iron Bridge Tract, Gila River. Photos courtesy of The Nature Conservancy.

Riverine- Floodplain Restoration on the Pueblo of Isleta

Project Budget: $156,465 in RERI funds.
Watershed: Rio Grande-Albuquerque (HUC 13020203)
Subwatershed(s): Town of Chavez- Rio Grande (HUC 130202030604)

Project Summary:
The Pueblo of Isleta restored riparian habitat along 15 acres of pueblo land along the Rio Grande south of Albuquerque. The restoration area is part of a larger 180 acre area that was choked with non-native Russian olive, salt cedar, kochia and tumbleweed. The area burned in 2000 and 2004 followed by re-colonization of the same nonnative fire-tolerant assemblage of species. Along the bankline were historic jetty jacks, linear metal structures installed in the 1940s to help channelize the Rio Grande and control flooding.

Project Outcome:
The Pueblo of Isleta Department of Water Resources removed non-native vegetation, removed jetty jacks along most of the bankline in the project area, lowered the river bank 12 to 18 inches, and planted coyote willows, Goodings willows, and cottonwoods in trenches dug by heavy machinery to the depth of the water table. The result of the project is re-introduction of native bosque species and opportunity for the river to connect with its floodplain in a localized area. During times of higher flow in the river, the water will inundate part of the project area and provide for natural regeneration of willows and cottonwoods.

Abo Arroyo Watershed Restoration Project

Project Budget: $116,000 in RERI funds.
Watershed: Rio Grande-Albuquerque (HUC 13020203)
Sub-watershed(s): Deer Canyon-Abo Arroyo (HUC 130202030502)

Project Summary:
The project is located in Abo Arroyo west of Mountainair, NM. Abo Arroyo drains west from the foothills of the Manzano Mountains to the Rio Grande. Flow in the arroyo is primarily ephemeral in response to storms, but locally there is perennial spring flow. Abo Arroyo is deeply incised and suffers from episodic erosion events that contribute to increased channelization, loss of native vegetation, increases in invasive vegetation species, and decreased water quality due to turbidity. The watershed is in need of restoration projects that slow the flow and increase native vegetation. This project addressed: 1) erosion control along roads in Deer Canyon Subdivision within the upper watershed, and 2) re-establishment of native riparian vegetation at a spring below Scholle Bridge. The spring area had previously been treated to remove non-native phreatophytes (salt cedar).

Project Outcome:
Claunch-Pinto Soil and Water Conservation District oversaw the construction of several rock structures in Deer Canyon that are designed to stabilize headcuts, slow and infiltrate water, and promote vegetation growth. The structures utilized local rock materials donated and included rock rundowns, Zuni bowls, and one rock dams. These structures were underlain by erosion control mat and seeded with native grass species. Members of the Deer Canyon community and students from Mountainair High School aided in the construction and gained knowledge about the techniques for future small scale projects on their lands. At Scholle Bridge, contractors and high school students planted approximately 650 willows and 20 cottonwood trees to promote wildlife habitat and help stabilize the arroyo banks.

Restoration of Channel Complexity and Improving Habitat Conditions for Native Fish in the San Juan River

Project Budget: $398,070 in RERI funds.
Watershed: Middle San Juan 14080105
Subwatershed(s): Malpais Arroyo-San Juan River (HUC 140801051001), Beclabito Wash-San Juan River (HUC 140801051003)

Project Summary:
This project is located along the San Juan River on the Navajo Nation downstream (west) of Shiprock. The project focuses on reducing turbidity, increasing floodplain connection, and improving nursery and spawning habitat for native fish. Specifically, the project addresses recovery of two endangered species: Colorado pikeminnow and razorback sucker. Low-velocity habitats, backwaters, and secondary channels have been shown to be critical to the survival of the young fish. However, since the 1930s the San Juan River has generally been narrowing and converting to a more stable and less complex channel, and many open bar areas have become vegetated islands or floodplain areas, resulting in a loss of critical habitat. Under the technical direction of the San Juan Recovery Implementation Program (SJRIP), a multi-agency program, the project improved backwater native fish habitat at six secondary channels with a combined total length of three miles.

San Juan River Inlet (#127.2N) before (top photo) and after (bottom photo) channel reconnection. Photo courtesy Keller-Bliesner Engineering.

Project Outcome:
The Nature Conservancy oversaw construction work in coordination with the SJRIP. Six sites with a combined length of three miles were selected where removal of non-native vegetation (salt cedar and Russian olive) and manipulation of the channel could reconnect secondary channels and improve the size and quality of backwaters. A combination of four methods was used at the sites: 1) secondary channel flushing (channel sluicing); 2) secondary channel inlet re-establishment and cleaning; 3) excavation of a new secondary channel; and 4) mechanical clearing/chemical treatment of invasive species and re-planting native species. The channel inlets were designed to re-establish a continuous flow of 5-10 cubic feet per second (cfs) at a San Juan River base flow of 500-700 cfs. Ground and aerial photos show that the project successfully established baseflow in five of the six channels, and the fifth will receive water during higher flow events. Monitoring of this project for native fish recovery is scheduled as part of the SJRIP until 2023.

Rio Puerco Riparian Restoration Project

Project Budget: $157,750 in RERI funds.
Watershed: Rio Puerco (HUC 13020204)
Subwatershed(s): Arroyo San Jose-Rio Puerco (HUC 130202040106); Arroyo de Los Pinos-Rio Puerco (HUC 130202040202)

Project Summary:
The project is located along the Rio Puerco south (downstream) of Cuba, New Mexico. The primary goal of the Rio Puerco Riparian Restoration Project is the re-establishment of a viable and self-sustaining native riparian/wetland community on a highly visible ten mile portion of public land along the Rio Puerco. The project addresses 65 acres of floodplain along a 3.5 mile river reach and complements similar work in adjacent areas that was performed with 2007 RERI funding. Activities implemented in the project include removal of non-native vegetation (salt cedar and Russian olive), planting of native riparian vegetation, and fencing to exclude elk and trespass livestock. The long term objectives for the river are the reconnection and expansion of floodplain, increase in channel sinuosity, and suitable conditions to allow beaver re-establishment in order to aid the natural river processes.

WildEarth Guardians staff and volunteers planting cottonwood poles on the Rio Puerco in May 2004. Photo courtesy WildEarth Guardians.

Project Outcome:
WildEarth Guardians and volunteer crews removed non-native vegetation and planted 2,500 cottonwoods, 22,000 willows, and 300 native riparian shrubs along the 3.5 mile reach. Native grasses and sedges were seeded in areas where ground disturbance occurred. Twenty elk exclosures were constructed to protect the plants. The exclosures are seven feet tall and made of woven field fencing and barbless wire. Maintenance of the fences and treatment of non-native re-sprouts will continue for ten years, until the vegetation is well-established. Monitoring will continue through photo monitoring that already shows a dramatic improvement in riparian vegetation. Natural plant regeneration is evident and the river channel is narrower and deeper. The RERI funds leveraged $105,000 in National Fish and Wildlife Foundation grant funding, which allowed WildEarth Guardians to expand the project area.

The same location as the above photo in 2012. Riparian vegetation is flourishing. Photo courtesy WildEarth Guardians.

Restoring Riparian Health of Critical Ecological Areas in the Galisteo Creek Watershed

Project Budget: $169,859 in RERI funds.
Watershed: Galisteo Creek (HUC 13020201)
Subwatershed(s): San Cristobal Arroyo-Galisteo Creek (HUC 130202010306)

Community work event at Galisteo Creek in October 2010. Volunteers are building rock structures for erosion control. Photo courtesy of EarthWorks Institute.

Project Summary:
This project is located along Galisteo Creek upstream of the community of Eldorado at Santa Fe, on recreation land owned by the Eldorado Community Improvement Association. This area consists of 65 acres and includes 3,500 feet along the creek and several hiking trails. The Galisteo Creek watershed has been recognized as an important wildlife corridor and waterfowl flyway. However, the watershed has been negatively affected by land use such as housing development and the construction of roads and the railroad. The creek is incised, excessive sediment has accumulated in the stream, native cottonwood and willow groves have dwindled, while aggressive nonnative vegetation has invaded the riparian habitat. This project focused on improving watershed health by stabilizing the creek banks and beds using bioengineered erosion control structures.

Project Outcome:
EarthWorks Institute, its contractors, and volunteer crews constructed twenty eight erosion control structures along the creek bed, banks, and in side arroyos using hand labor and machinery. The structures types included rock baffles, rock cross vanes, one rock dams, baffles, and media lunas, as well as some experimental brush structures. The structures in the arroyos stabilize headcuts, while the one rock dams slow the flow of water, recruits vegetation and captures sediment which gradually raises the creek bed level. The single layer of rock in a one rock dam is also effective mulch that increase soil moisture, infiltration and plant growth. In addition to the rock structures, non-native vegetation (Russian olive) was removed and native riparian and wetland species were planted.

A media luna rock structure constructed at Galisteo Creek to disperse flow. Photo courtesy of EarthWorks Institute.

Restoring San Antonio Creek

Project Budget: $116,000 in RERI funds
Watershed: Jemez (HUC 13020202)
Subwatershed(s): Headwaters San Antonio Creek (HUC 130202020201)

Project Summary:

Project volunteers from Los Amigos de Valles Caldera dig and haul sod to form a channel plug. Photo by Karen Menetrey, NMED.

The project is located on San Antonio Creek in the Valles Caldera National Preserve (VCNP) in the Jemez Mountains. This 89,000 acre property is known for its high mountain meadows, abundant wildlife, meandering streams, and remarkable scenery. The property was privately owned until 2000, and was used for sheep and cattle grazing, logging, well development for geothermal resources, gravel mining, and unmanaged elk foraging. These activities took a toll on the riparian ecosystems and water quality in the streams. Los Amigos de Valles Caldera (Los Amigos), a non-profit organization, was established to assist VCNP with outreach, education, restoration, and collaboration. Los Amigos and its contractors have performed extensive assessment work to establish restoration priorities, and identified several sites along San Antonio Creek where streambank erosion and headcuts had reduced wetlands acreage and floodplain connection, or was threatening to do so. The project used innovative, low cost methods to treat several sites along the miles of creek in a manner that slows water, increases infiltration, and expands wetland acreage.

The plug re-routes water to the new channel, raises the water table and expands wetlands. Photo by Van Clothier, Stream Dynamics.

Project Outcome:

Through this project, Los Amigos restored 30 acres of wetlands and improved water quality along 10 miles of creek. The project utilized heavy machinery and volunteer hand labor to construct numerous rock and sod structures that arrest bank and headcut erosion at 36 locations within the project area. At one site, volunteers installed 15 one-rock dams, six Zuni bowls, and 10 small plug and pond structures. The plug and pond is an innovative technique used to raise the water table, retain water in the shallow subsurface, and promote wetlands, and to help modulate peak flows downstream. Heavy machinery was used at three locations to prevent meanders from breaking through and to create plug and pond structures; and at approximately 30 locations to fortify the creek banks with transplanted sod. This project provides matching funds for a $165,400 CWA 319(h) grant and the projects were coordinated for efficiency and cost-savings. This project and others in the area resulted in statistically significant temperature reductions in San Antonio Creek, documented at www.nmenv.state.nm.us/swqb/wps/Effectiveness.

Dry Cimarron Riverine Restoration Project

Project Budget: $131,636 in RERI funds.
Watershed: Cimarron Headwaters (HUC 11040001)
Subwatershed(s): Fishing Creek-Dry Cimarron River (HUC 110400010202)

Project Summary:
The project area is located on the Dry Cimarron River in northeastern New Mexico, approximately four miles west of the town of Folsom. The river channel on Rainbow Ranch was previously straightened for agricultural irrigation management purposes. The result of the hydrologic modifications to the channel was a river that incised and lost substantial connection with its floodplain. The goal of this project was to restore riparian ecosystem function and associated ecosystem services by using heavy earthmoving machinery to reinstate the natural meander system along 6,300 feet of the Dry Cimarron. By successfully reinstating meanders in a downstream section during a previous 319(h) project, The Quivira Coalition had shown that this approach could increase channel length, raise the level of the river bed,, stabilize eroding banks with native vegetation, and promote wetlands development.

Meander reinstatement #1 on the Dry Cimarron before construction, May 2010 (top photo) and after construction showing dramatic recovery, May 2012 (bottom photo). Photos by the Quivira Coalition.

Project Outcome:
The Quivira Coalition was the project manager for the construction of three meander reinstatements in which earth and rocks were placed mechanically to re-route the river from the straightened channel back into its original meander. The project increased the channel length by 522 feet, increased sinuosity to slow the river, restored floodplain access, increased wetland acreage, improved riparian and wetland vegetation, and reduced stream bank erosion and channel down-cutting. Enhanced ecosystem services include water filtration, in-bank storage, native fishery habitat, riparian flora and fauna habitat, and increased forage range for upland species such as mule deer and elk. Extensive monitoring was performed for the project, including fish and avian, vegetation and geomorphologic surveys, as well as water temperature measurements. The monitoring results attest to a diverse and thriving riparian ecosystem with abundant native plant and animal species.

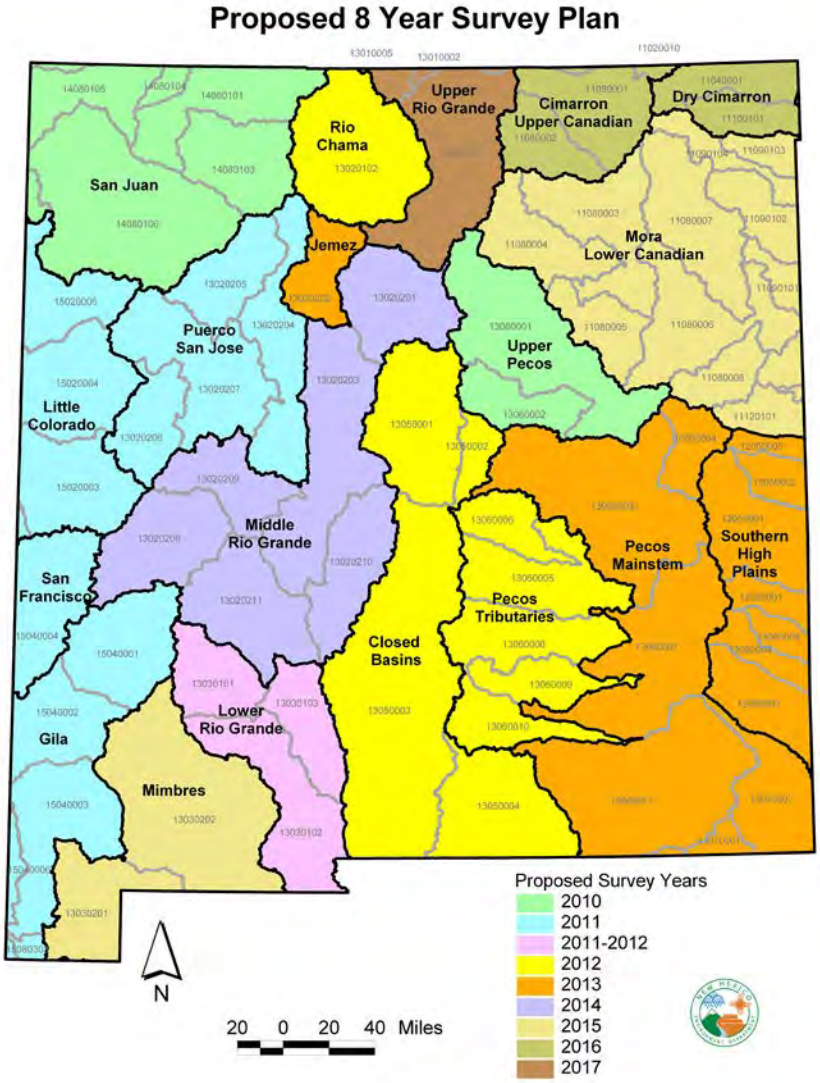
As an added benefit of the project, RERI funds leveraged a $10,000 National Audubon Society TogetherGreen grant that paid for an education workshop attended by 21 local community members, and paid for the printing a of a handy set of flipcards showing principles of watershed restoration and instructions for the construction of erosion control structures.

Other Water Quality Protection Programs

Monitoring, Assessment and Standards Program

Water Quality Surveys

The Monitoring, Assessment, and Standards Section conducted two primary water quality surveys in 2012, collecting water quality data from 112 monitoring locations within 63 stream assessment units and 8 lake assessment units covering 888 stream miles and 14,848 lake acres. The watersheds surveyed included the Rio Chama (598 miles, 14,798 acres) and the Sacramento Mountains (290 miles, 50 acres). These surveys are part of an eight year rotation throughout the state (see Figure). In 2013, the SWQB will focus on the Jemez and Lower Pecos river basins.

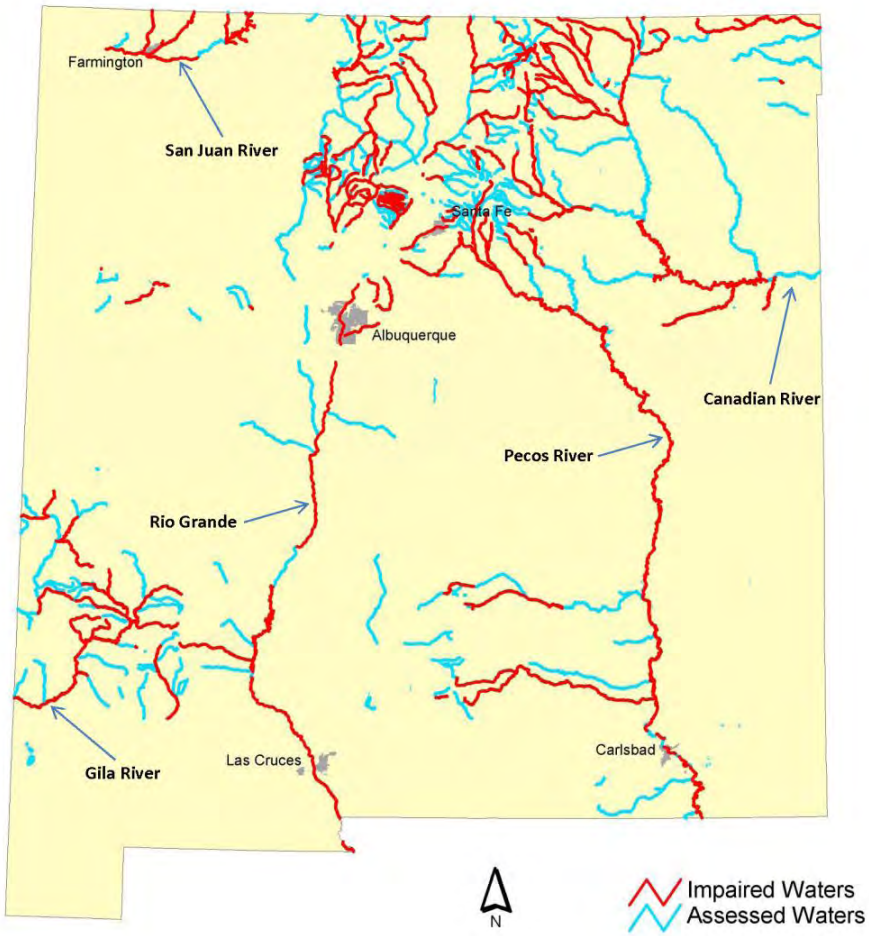


Clean Water Act §303(d)/§305(b) Integrated Report Update

As required by the Clean Water Act (CWA), every two years the State evaluates, through application of the State's Assessment Protocols, the data it has collected as well as all readily available water quality data to determine if the water quality standards are met and the uses achieved. Similar to most states, New Mexico has utilized a targeted, rotational watershed approach to ambient water quality monitoring since 1998 to achieve comprehensive coverage of the state. Those waters which exceed water quality standards are "impaired" for the associated use and are identified in the Section §303(d) List of Impaired Waters (see map).

Of the approximately 7,000 assessed perennial stream miles in New Mexico, nearly 2,500 miles, or 35%, have identified impaired designated uses while approximately 60,833 out of 94,310, or 65%, categorized publically-owned lake, reservoir, or playa acres do not fully support designated uses. Temperature, nutrient/eutrophication, and *E. coli* are the top three causes of river and stream water quality impairments in New Mexico. Mercury in fish tissue, PCBs in fish tissue, and temperature are the top three causes of water quality impairments in lakes and reservoirs.

The State is beginning the development of the 2014-2016 §303(d) List of Impaired Waters, starting with the revision of SWQB's assessment protocols, as needed, to enhance designated use impairment determinations. Updates for this list will focus on data collected during the 2011 Gila, San Francisco, Rio Puerco, Little Colorado, and Lower Rio Grande Water Quality Surveys and during the 2012 Rio Chama and Sacramento Mountain Water Quality Surveys.



Water Quality Standards Update

The SWQB petitioned the Water Quality Control Commission (WQCC) to amend the water quality standards for the Santa Fe and Galisteo rivers. The petition included proposed amendments for a separate classified segment with appropriate standards (uses and criteria) for McClure and Nichols Reservoirs, two new classified segments with appropriate standards for the Santa Fe River from Nichols Reservoir to the City of Santa Fe Wastewater Treatment Facility, and modifications to the classified segment from the wastewater treatment facility to Cochiti Pueblo. Public input and data gathered through the Use Attainability Analysis or "UAA" process for the Galisteo River supported a change from the high quality coldwater aquatic life use to the coolwater aquatic life use in perennial reaches of the watershed from Kewa Pueblo upstream to just upstream of Lamy. On December 11, 2012 the WQCC voted to approve and adopt the proposed amendments. The adoption will be codified and all documentation will be forwarded to the EPA for final approval in accordance with 40 CFR 131.21. Hearing proceedings are available at:
www.nmenv.state.nm.us/OOTS/HearingOfficer/WQCC12-07_R

Final EPA Decisions

The EPA recently approved changes to aquatic life uses on the lower Dry Cimarron River and the addition of 19 new classified segments for 62 lakes that were either previously unclassified or classified within existing stream segments in the Rio Grande, Pecos, Canadian, Gila, San Juan and Little Colorado basins. The WQCC adopted the revisions on July 10, 2012 and the EPA approved the revisions on November 20, 2012. In a separate action dated June 18, 2012, the EPA approved revised narrative criteria for turbidity and new or revised hardness-based criteria for aluminum, cadmium and zinc. These were the final items from the 2009 Triennial Review which EPA had yet to take final action. The revision documents and approval letters, along with EPA's rationale and technical support documents can be viewed at:
www.nmenv.state.nm.us/swqb/Standards/#EPAdecision

Pending EPA Decisions

Amendments to the water quality standards during the 2009 Triennial Review and subsequent approvals of the amendments by the WQCC (October 14, 2010) and EPA (April 18, 2011), allow the use of the SWQB's Hydrology Protocol (HP) to support the revisions of standards for ephemeral waters. The HP was approved as an appendix to the SWQB's Water Quality Management Plan/Continuing Planning Process (WQMP/CPP) document by the WQCC on May 10, 2011, and approved by EPA on December 23, 2011. Application of the HP was used to document the hydrologic condition of 18 unclassified, non-perennial stream segments associated with 13 NPDES permitted facilities located throughout New Mexico; this documentation provides technical support for UAAs as a basis for reclassifying the streams as ephemeral. In accordance with the regulations and the WQMP/CPP procedures for the HP process, the UAAs were posted on the SWQB's water quality standards website for a 30-day public comment period (July 27, 2012 to August 27, 2012). The UAAs and responses to comments were submitted to EPA on October 11, 2012 for technical approval. If EPA grants technical approval, the waters will be subject to ephemeral waters standards (20.6.4.97 NMAC). The SWQB will periodically petition the WQCC to list ephemeral waters under Subsection C of 20.6.4.97 NMAC, either during Triennial Revisions, or as appropriate. See www.nmenv.state.nm.us/swqb/Hydrology for more about the Hydrology Protocol regulations and procedures.

The EPA has not taken action on a petition designating perennial streams and lakes as well as identified wetlands in U.S. Forest Service wilderness areas as Outstanding Natural Resource Waters (ONRWs). These regulations and associated changes to the state's Antidegradation Policy were adopted by the WQCC on November 30, 2010, and are effective for state purposes as of January 14, 2011. This action also amended the Antidegradation Policy Implementation Procedure applicable to point source discharges, and approved a new implementation document, Guidance for Nonpoint Source Discharges in ONRWs. See www.nmenv.state.nm.us/swqb/Standards/#ONRW for more information.

Visit the NMED Surface Water Quality Bureau Water Quality Standards website for future updates at: www.nmenv.state.nm.us/swqb/Standards

Water Quality and Assessment Database Merger

SWQB maintains an in-house water quality database to store all field measurements, laboratory analytical results and biological monitoring data. This database system is designed to work with EPA's WQX (Water Quality eXchange) / STORET (STOrage and RETrieval) through a "node" which streamlines uploading of SWQB ambient water quality and effluent monitoring data into WQX/ STORET. With the recent development of the ability to store long-term deployment datasets (sondes and thermographs) all physical, chemical and biological data from SWQB's water quality surveys are now stored in the Bureau's in-house database. The SWQB is currently working with the NMED's Office of Information Technology to merge the in-house database with the Assessment Database (ADB) to further streamline data management and reporting.

The ADB is a relational database application for tracking water quality assessment data, including use attainment, and causes and sources of impairment. New Mexico needs to track this information and many other types of assessment data for hundreds of waterbodies, and integrate it into meaningful reports under Sections 305(b), 303(d), 314, and 319 of the Clean Water Act. The ADB is designed to make this process accurate, straightforward and user-friendly. In addition, the ADB stores assessment information over multiple reporting cycles. This supports tracking water quality improvements through time and allows the ADB to document both the listing of new TMDL problems and the de-listing of waters where management actions have led to water quality improvements and use attainment. By merging SWQB's water quality database with the ADB, the process of analyzing and tracking data and information that are used to provide content for designated use attainment conclusions is made much easier and consistent. The database merge should be complete in the summer of 2013.

TMDL Update

In 2012, the SWQB developed nine *E. coli* TMDLs for the Upper Rio Grande watershed. The SWQB received approval for the TMDLs from the WQCC on August 14, 2012 and by the EPA Region 6 on September 13, 2012. The SWQB is planning TMDL development for the San Juan and Animas River watersheds as well as the Upper Pecos watershed for 2013.

Ground Water Quality Bureau

Permitting and Compliance Assistance for Large Capacity Septic Tank/Leachfields

Facilities throughout New Mexico that discharge greater than 2,000 gallons per day of domestic wastewater to septic tank/leachfield systems are required to obtain a Ground Water Discharge Permit from the Ground Water Quality Bureau (GWQB). The GWQB's initiative is to protect ground water quality from non-point source 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 assistance activities, GWQB staff provides outreach material, assistance forms and spreadsheets along with the Discharge Permits that are helpful to permitees who are required to complete and submit monitoring reports. In addition GWQB staff performs routine site inspections to inspect the septic tank/leachfield system(s) and offer face-to-face communication with the permittee. It is critical to make sure that the sites are discharging potential pollutants, such as nitrogen compounds, pursuant to their Discharge Permits. In some incidences, ground water quality is monitored and, if contamination is detected, corrective action will be required.

New Mexico Water Fair and Water-Quality Outreach Program

Residents of New Mexico primarily rely on ground water for drinking water, and in some locations ground water is the only available source of drinking water. Since many communities are concentrated in river valleys where ground water is shallow, their drinking water supplies are susceptible to contamination from non-point source pollution, predominantly household septic tank/leachfield systems, cesspools and inappropriate agricultural practices. However, the extent and severity of potential contamination of drinking water supplies in rural communities of New Mexico is largely unknown. Most homeowners do not test their domestic well water for contaminants, because they are unaware of potential contamination or find the cost associated with water testing unmanageable.

Zuni Water Fair, October 10, 2012.

To identify possible non-point source water quality problems in rural New Mexico communities, the GWQB conducts free testing of domestic wells ("water fairs") throughout the state. 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 with valuable information on ground water quality in rural communities. NMED continues to receive

numerous requests for water fairs from community organizations, NMED Field Offices, other State, County and City agencies, and private citizens. The Water Fair Program continues to be an important tool for identifying possible non-point source water quality problems.

Water samples collected during the Hobbs Water Fair, September 12, 2012.

Water quality outreach events include the demonstration of a ground water model/simulator (ant farm). The model is a hands-on visual aid that makes difficult ground water concepts understandable for all ages. Ground water model/stimulator demonstrations are often conducted in schools, community centers or state fair exhibits.

Many families in rural New Mexico have become more knowledgeable about water quality, potential for contamination, and pollution prevention. In 2012 the GWQB conducted 11 water fairs and one water quality outreach event. The GWQB is proud to announce the highest attendance to date—we received and analyzed 135 water samples at the Hobbs Junior College. Overall, the level of public participation during 2012 proved to be a success.

CWA Section 401 Certification Activities

Staff continue to process water quality certifications under Section 401 of the federal Clean Water Act. 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 (the Corps) comply with state water quality standards.

In February 2012, the Corps released for public notice new Section 404 Nationwide Permits (NWPs) with accompanying regional conditions. At the same time, NMED released for public notice the state's intention to consider certifying the NWPs. The Corps issued final NWPs on March 16, and NMED certified them on April 13. These activities involved several protocol changes to streamline Section 404 permitting and to comply with other law, especially recent changes to state regulations about Section 401 certification. This effort required coordination between NMED and the Corps, especially to establish a new Corps regional condition (Regional Condition a.) that requires NMED to be notified of activities which the Corps may authorize under a NWP, and giving NMED the opportunity to confirm that a proposed activity would comply with the Section 401 certification. The regional conditions, including Regional Condition a., can be viewed at:

www.spa.usace.army.mil/Portals/16/docs/civilworks/regulatory/Regional%20Conditions/NM%20regional%20conditions%20FINAL.pdf

Since April, NMED's Surface Water Quality Bureau (SWQB) has issued informal confirmation of NWP activities, and formal 401 certification is generally required only for 404 individual permits. SWQB issued five certifications of individual permits, after requesting and considering public comments.

CWA Section 401 Water Quality Certification Activities	
Confirmations	
NWP Certifications Confirmed	62
NWP Expedited (emergency) Confirmations	14
Actions in Progress	25
Total	**87**
Other Actions	
No Permit Necessary	15
Individual Permits Certified	5
Enforcement Actions	6
Regional General Permit Certified	1
Total	**27**

New Mexico had a record-breaking fire season, which led to many emergency actions downstream of burned areas. Most of these were simply expedited processing of authorizations under NWPs, with SWQB confirmation. To clarify the process and information required of applicants, the Corps (with SWQB encouragement) initiated a new regional general permit (RGP) to approach these kinds of emergency actions. At the end of 2012, SWQB had drafted a Section 401 certification of this RGP, after providing an opportunity for public comment.

These Section 401 activities involved at least 30 SWQB contacts with the regulated community (with no further SWQB involvement), and a similar number of document reviews (usually including additional SWQB contacts with the regulated community). SWQB participated in at least 34 site visits and meetings, usually with Corps staff. SWQB staff assisted the Corps in at least 6 enforcement actions.

More information on Section 404 and 401 in New Mexico is available at:
www.nmenv.state.nm.us/swqb/404.

New Mexico Mining Act Activities

The New Mexico Mining Act (19 NMAC 10) obligates NMED to review and comment on various applications associated with non-coal mining in New Mexico. Proposed actions range from recreational mining (such as panning for gold) to large mine and mill operations. For exploration applications or modification of existing exploration permits, NMED is provided an opportunity for formal comment. For new mining operations, NMED is responsible to "certify that water quality standards are expected to be met" and to determine that the proposed closeout plan will "achieve compliance with all applicable air, water quality and other environmental standards if carried out as described". For modification of existing operations, NMED has an opportunity to concur with proposed permit changes. In general, NMED has 20 days from receipt of an application to respond.

NMED has an informal team that includes representatives from 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 (often 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 EMNRD, the USACE, the Nuclear Regulatory Commission, and others.

In 2012, SWQB reviewed numerous mining notices, applications, restoration plans, hydrologic reports, monitoring plans, and activity reports. SWQB reviewed permit applications and associated documents for exploratory drilling programs, proposed new mining activities, and modification of existing mining activities. Most of these permitting actions required site visits, consultations with the applicants, coordination with land-management and regulatory agencies (federal and state), and written comment. The following is a summary of the most significant recent mine-permitting actions:

- The proposed reopening of the mine at Copper Flat near Hillsboro generated several reports and site visits this year. The Copper Flat Mine is a relatively small to moderate-sized copper porphyry which was most recently mined in the late 1970's. New Mexico Copper Corporation submitted a permit application package including a report on the characterization of the baseline environmental data at the site and a Mine Operation and Reclamation Plan.
- The proposed uranium mine near Ambrosia Lake, to be operated by Roca Honda Resources, likewise generated several hydrologic, biologic, and similar reports, including a large Baseline Monitoring Report and a detailed report of previous mining history. The draft Operations Plan and Reclamation Plan have undergone numerous revisions, including modification of the proposed water treatment system. SWQB participated in several site visits and otherwise coordinated with the state departments of Game and Fish and State Engineer, as well as the USFS and USACE.
- The Cebolleta Mine (Neutron Energy, Inc .) and the La Jara Mesa Mine (Laramide Resources (USA) Inc.) are two other proposed uranium mines, located near Laguna and Ambrosia Lake, respectively. So far each of these have generated only permit applications and Sampling and Analysis Plans, but the projects have required several site visits and similar coordination with other agencies.

Projects Completed by Non-NMED Agencies

Each field office of the Bureau of Land Management (BLM), each National Forest in New Mexico, the state office of the Natural Resources Conservation Service (NRCS), the New Mexico Department of Game and Fish, New Mexico State Forestry Division (NMSF), and all of New Mexico's Soil and Water Conservation Districts (SWCDs) were asked for information for this report. Each was provided information on the Nonpoint Source Management Program Plan, and was asked to report on any of the six program objectives identified in the plan. They were asked to emphasize their reporting on activities intended to address water quality problems. The Carson National Forest, BLM Roswell Field Office, and NRCS provided project spotlights and more detailed information which is provided in this report. Additionally, several SWCDs provided support for projects, as reported in other sections of this report.

The other information reported by agencies other than NMED is summarized in the tables below. These land management agencies completed various projects around New Mexico that ultimately contribute to the reduction of nonpoint source pollutants in surface waters. The most common NPS issues addressed in 2012 are excessive erosion, sedimentation, encroachment of exotic vegetation, streambank instability, excessive nutrients, and excessive water temperature.

Watersheds containing non-NMED project work affecting water quality

Watershed Name	8-digit HUC
Animas Valley	15040003
Animas Valley	15040003
Blanco Canyon	14080103
Caballo	13030101
Canadian Headwaters	11080001
Carrizo Wash	15020003
Cimarron	11080002
Conejos	13010005
El Paso-Las Cruces	13030102
Elephant Butte Reservoir	13020211
Jemez	13020202
Jornada Draw	13030103
Mora	11080004
Mimbres	13030202
Middle San Juan	14080105
Pecos Headwaters	13060001
Plains of San Agustin	13020208
Playas Lake	13030201

Watershed Name	8-digit HUC
Rio Chama	13020102
Rio Grande-Albuquerque	13020203
Rio Grande-Santa Fe	13020201
Rio Hondo	13060008
Rio Peñasco	13060010
Rio Puerco	13020204
Rio San Jose	13020207
Salt Basin	13050004
San Francisco	15040004
San Simon	15040006
Tularosa Valley	13050003
Upper Gila	15040001
Upper Gila-Mangas	15040002
Upper Pecos	13060003
Upper Rio Grande	13020101
Upper San Juan	14080101
Western Estancia	13050001

Bureau of Land Management Projects

Carlsbad Field Office (Not reporting)

Farmington Field Office

Watersheds	Project Description	Watershed Benefits
Upper San Juan	Remove nonnative Russian olive trees from 430 acres of Pump Canyon riparian area.	• Remove nonnative vegetation to promote the regrowth of native riparian vegetation to reduce erosion.

Las Cruces Field Office

Watersheds	Project Description	Watershed Benefits
Animas Valley	Brush control treatment for 5,054 acres Riparian condition assessments Abandoned mine: 141 inventoried; 25 remediated.	• Reduce invasive brush species, increase herbaceous ground cover, reduce surface runoff, erosion and sedimentation, and improve infiltration • Protection and restoration of riparian vegetation • Reduce flooding • Decrease erosion and sedimentation
Caballo	Riparian condition assessments (several areas)	• Reduce invasive brush species, increase herbaceous ground cover, reduce surface runoff, erosion and sedimentation, and improve infiltration • Protection and restoration of riparian vegetation • Decrease erosion and sedimentation • Improve water quality
El Paso-Las Cruces	Salt cedar treatment on Rio Grande (8 acres) Riparian condition assessments (several areas) Gary spring and Dripping Spring water quality sampling and reporting Abandoned mine: 437 inventoried; 266 remediated. Illegal dumpsite cleanup efforts on approximately 30 acres located outside of the communities of Hatch and Salem. Removing approximately 85 tons of trash.	• Reduce invasive brush species, increase herbaceous ground cover, reduce surface runoff, erosion and sedimentation, and improve infiltration • Protection and restoration of riparian vegetation • Reduce flooding • Decrease erosion and sedimentation • Improve water quality • Removing trash within or along waterways to prevent potential ground and surface water contamination • Improve wildlife and aquatic habitats • Removal of indirect exposure to chemicals/hazardous wastes • Improvement of waterway aesthetics on public lands
Jornada Draw	Brush control treatment for 21,510 acres Riparian condition assessments (several areas)	• Reduce invasive brush species, increase herbaceous ground cover, reduce surface runoff, erosion and sedimentation, and improve infiltration • Protection and restoration of riparian vegetation
Mimbres	Brush control treatments for 10,287 acres Pitchfork Ranch erosion control structures Riparian condition assessments (several	• Reduce invasive brush species, increase herbaceous ground cover, reduce surface runoff, erosion and sedimentation, and improve infiltration

Las Cruces Field Office (continued)

Watersheds	Project Description	Watershed Benefits
	areas) Abandoned mine: 1476 inventoried; 17 remediated.	• Protection and restoration of riparian vegetation • Reduce flooding • Decrease erosion and sedimentation
Playas Lake	Brush control treatment for 15,517 acres Riparian condition assessments (several areas) Abandoned mine: 636 inventoried; 0 remediated.	• Reduce invasive brush species, increase herbaceous ground cover, reduce surface runoff, erosion and sedimentation, and improve infiltration • Protection and restoration of riparian vegetation • Improve road access across drainage without use of culverts to maintain overland flow • Reduce erosion due to vehicular use during wet conditions
Salt Basin	Mechanical treatment of piñon/juniper 740 acres Brush control treatments for 5,953 acres Riparian condition assessments (several areas)	• Decrease risk of extreme wildfire and associated erosion • Decrease runoff and erosion • Reduce over story • Increase herbaceous ground cover • Increase infiltration, water holding capacity • Reduce invasive brush species, increase herbaceous ground cover, reduce surface runoff, erosion and sedimentation, and improve infiltration • Protection and restoration of riparian vegetation
San Simon (eastern portion)	Abandoned mine: 325 inventoried; 0 remediated. Riparian condition assessments (several areas)	• Reduce invasive brush species, increase herbaceous ground cover, reduce surface runoff, erosion and sedimentation, and improve infiltration • Protection and restoration of riparian vegetation • Reduce flooding • Decrease erosion and sedimentation • Improve water quality
Tularosa Valley	Brush control treatments, and Salt Cedar Control for 2,152 acres Riparian condition assessments (several areas) Illegal dumpsite cleanup efforts on approximately 10 acres south of Alamogordo, NM. Removed approximately 15 tons of trash. Abandoned mines: 719 inventoried; 153 remediated.	• Increase water yield • Increase desirable herbaceous cover in riparian zones and ephemeral drainages • Decrease salinity • Improve PFC • Reduce invasive brush species, increase herbaceous ground cover, reduce surface runoff, erosion and sedimentation, and improve infiltration • Protection and restoration of riparian vegetation • Improve water quality • Removing trash within or along waterways to prevent potential ground and surface water contamination • Improve wildlife and aquatic habitats • Removal of indirect exposure to chemicals/hazardous wastes • Improvement of waterway aesthetics

Las Cruces Field Office (continued)

Watersheds	Project Description	Watershed Benefits
Upper Gila	Exclusion fence structure project for livestock exclusion Riparian condition assessments (several areas)	• Reduce invasive brush species, increase herbaceous ground cover, reduce surface runoff, erosion and sedimentation, and improve infiltration • Protection and restoration of riparian vegetation • Reduce flooding • Decrease erosion and sedimentation • Improve water quality
Upper Gila-Mangas	Exclusion fence structure project (maintained) to exclude livestock (Gila Lower Box) Riparian condition assessments (several areas) Collected Fremont cottonwood seed, forwarded to NRCS Los Lunas Plant Materials Center to establish a cottonwood pole production field – locally adapted plant material (cottonwood poles) for riparian restoration to be available soon.	• Decrease risk of extreme wildfire and associated erosion • Protection and restoration of riparian vegetation • Decrease runoff and erosion • Reduce over story • Increase herbaceous ground cover • Increase infiltration, water holding capacity • Improve water quality

Rio Puerco Field Office (Not reporting)

Roswell Field Office

Watersheds	Project Description	Watershed Benefits
Rio Hondo (Rio Bonito River)	Treatment of salt cedar, Russian Olive, and Siberian Elm trees on 20 acres of wetland and 2 linear miles of stream along the Rio Bonito River. Planted 4 Rio Grande Cottonwood trees, 15 long stem wolfberry shrubs, and 15 apache plume shrubs along the Rio Bonito River post treatment. Mechanically thinned 20 acres of piñon/juniper. Prescribed broadcast burn of 200 acres of piñon-juniper, mixed desert shrub plant community. Constructed 40 erosion control structures on headcuts and trail closures to reduce accelerated erosion and non-point source pollution on the Fort Stanton-Snowy River NCA public land	• Protection and restoration of riparian vegetation. • Reduction in sediment transport • Improvement of water quality

Socorro Field Office (Not reporting)

Taos Field Office

Watersheds	Project Description	Watershed Benefits
Rio Chama	Closed roads	• Reduce sedimentation and turbidity caused by runoff from road.

Taos Field Office (continued)

Watersheds	Project Description	Watershed Benefits
Rio Grande – Santa Fe	Watershed Planning with Lower Santa Fe River group	• Nonpoint source pollution issues identified
Upper Rio Grande (Rio Embudo)	Installed 7 channel control structures	• Control channel erosion and hold sediment
Upper Rio Grande	Closed roads and riding trails with high erosion	• Reduce sedimentation and turbidity caused by runoff from roads and trails.
Upper Rio Grande	3675 acres vegetation treated and 28 acres of roads maintained	• Reduce sediment delivered to river that can indirectly lead to increased temperatures

Bureau of Land Management, Roswell Field Office, Project Spotlight

The Rio Bonito flows from its headwaters above 9,000 feet in the White Mountain Wilderness to its confluence with the Rio Ruidoso at an elevation of 5,200 feet. Bonito Lake is a major impoundment on the Rio Bonito which provides water to the City of Alamogordo. Below Bonito Lake, the river passes historic Fort Stanton, the historic town of Lincoln, the Bureau of Land Management (BLM) Fort Stanton Snowy River Cave National Conservation Area (FSSRCNCA), and the BLM Rio Bonito Acquired Lands (RBAL). The Rio Bonito has perennial flow from the headwaters down to Bonito Lake, but reservoir operations have resulted in intermittent flow from Bonito Lake to Government Spring. BelowGovernment Spring, the river has perennial flow to its confluence with the Rio Ruidoso, but flow is reduced by reservoir operations and irrigation diversions.

NMED recognized in the 2012-2014 303(d)/305(b) Integrated Report and earlier versions of the report that the lower Rio Bonito (from the Rio Ruidoso to NM 48 near Angus) doesn't meet water quality standards because of low flow alterations. The Roswell Field Office (RFO) BLM has been involved with several interagency projects which reduced the amount of low flow alterations diversions from the Rio Bonito and improved the water quality of the Rio Bonito.

The BLM Fort Stanton Snowy River Cave National Conservation Area (FSSRC NCA) and the Rio Bonito Acquired Lands (RBAL) have surface water rights administered by the State of New Mexico. The BLM has entered into an agreement with the New Mexico Interstate Stream Commission (ISC) where the BLM has assigned a portion of the BLM Rio Bonito surface water rights to ISC, which prevents the assigned water right from being diverted from the Rio Bonito. This agreement keeps water in the Rio Bonito that may have otherwise been diverted from the river to irrigate BLM public land. This project helps lessen the low flow alterations and impairment caused to the Rio Bonito from water being diverted from the Rio Bonito with BLM water rights.

The BLM Roswell Field Office also has entered into a cooperative agreement with the Upper Hondo Soil and Water Conservation District (UHSWCD) to perform watershed restoration on portions of the FSSR NCA and the RBAL public land. This is a watershed restoration project funded by the New Mexico Water Trust Board and offered to the local community through the Upper Hondo Soil and Water Conservation District. The project consists of the removal of non-native phreatophyte, noxious/invasive species in Lincoln County, primarily on the Rio Bonito and its tributaries.

So far, the UHSWCD project has treated salt cedar, Russian olive, and Siberian elm on 120 acres of BLM public land. The UHSWCD and the BLM have planted native grasses, shrubs, and Plains Cottonwood trees in the project area. The removal of the non-native phreatophytes is by extraction and sawing with a follow up treatment with herbicide. The removed plant biomass has been processed through a chipper and then the wood chips are spread on the uplands at a depth of less than 3 inches which will not inhibit new plant growth. The benefits expected from the treatment are reduction of runoff, erosion, and sedimentation, improvement of water infiltration and retention in soils, increase in herbaceous plant growth and understory vegetation, protection and restoration of riparian vegetation, reduction in sediment transport, and improvement of water quality. Additional improvements should be found in the reduction of infestation and invasion by salt cedar, Russian olive, and Siberian elm downstream, improved stream bank morphology, and significant enhancement of the riparian area in general. The BLM contributed federal funds to the UHSWCD to continue to treat non-native phreatophytes on an additional 20 acres and 2 linear stream miles of the Rio Bonito.

Before (top) and after (bottom) photos of the extraction of salt cedar on Rio Bonito.

New Mexico State Forestry Division

Watersheds	Project Description	Watershed Benefits
Canadian Headwaters (Chicorica Creek-Canadian River)	Timber harvests (595 ac) mixed conifer forests. Waterbarring of access roads and skid trails, lop & scattering of slash and seeding of critical areas.	• Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. • Increase water infiltration.
Rio Chama (Chavez Creek)	Timber Harvests (270 ac) in ponderosa pine and mixed conifer forests Graded dips, waterbarring of access roads and skid trails, lop & scattering of slash and seeding of critical areas.	• Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. • Increase water infiltration.
Rio Chama (Chavez Creek – Rio Chama)	Timber harvests (200 ac) in ponderosa pine and mixed conifer forests Waterbarring of access roads and skid trails, lop & scattering of slash and seeding of critical areas.	• Reduce runoff, erosion, sedimentation due to increased herbaceous ground cover and waterbars. • Increase water infiltration.

Lop & Scattering of Slash

Skid Trail Rehabilitation and Closure

New Mexico Department of Game and Fish

Watersheds	Project Description	Watershed Benefits
Elephant Butte Reservoir (Red Canyon)	Mechanically treat 270 of 900 acres utilizing hand crews with chainsaws within unit 3 of 13. Project would also serve as a pre-treatment for a planned prescribed burn. Project would be thinned in mosaic patterns to increase edge effect habitat.	• Thinning reduced invasive PJ and provides fine fuels for future prescribed burn.
Jemez (La Jara Wash)	Removal of salt cedar and increase size on 3 existing enclosure for NWF-2003-42. Constructed three separate high fenced enclosures using pipe and field fence in order to protect planted riparian species from cows, elk and deer.	• Removal of non-native salt cedar and planting of native riparian plants helps the wet area to retain soil and remove e-coli.
Middle San Juan (Trail Canyon)	Selectively thin piñon/juniper trees, burn the slash and seed into the ash with cool season grasses and forbs. Project will provide herbaceous forage for deer, elk, bears and turkeys.	• Thinning reduced invasive PJ and provides fine fuels for future prescribed burn.
Pecos Headwaters (Pecos River)	Improve fishing access and enhance recreational experience in Cowles area. Large pond was dredged. Working on contract for ADA accessible trails.	• Removing sediment from ponds serves as a sediment retention structure.
Plains of San Agustin (Mangua and Largo Creeks)	This unit on the landscape project is the central portion that was designed to provide a migration corridor for pronghorn to allow a potentially landlocked population to migrate and exchange genetics with other herds.	• Burning reduces woody encroachment and favors herbaceous species that minimizes soil erosion.
Plains of San Agustin (Point of Rocks Canyon)	$7000 for burning portions of Sargent Ph. 3 in April 2012.	• Burning reduces woody encroachment and favors herbaceous species that minimizes soil erosion.
Rio Hondo (Rio Ruidoso)	PJ thinning of 949 acres interspersed with uncut areas every 200-300 acres in a mosaic pattern. Objective will be to reach a desired condition of 60% forage and 40% cover.	• Thinning reduced invasive PJ/PP and provides fine fuels for future prescribed burn.
Rio Penasco (Rio Penasco)	Unit 34 Vegetation/Herbicide Maintenance -Herbicide treatment for PJ re-sprouts from SEF-01-28 McGee Wildlife Openings. 30k of BGE funds and lower project costs allowed us to do both phases at once.	• Herbicide treatment reduces woody encroachment of alligator junipers and favors herbaceous species that minimizes soil erosion.
Rio Puerco (Rio Puerco)	Restore meadow by thinning 220 acres for winter elk range.	• Thinning reduced invasive PJ and provides fine fuels for future prescribed burn.
Upper Gila-Mangas (Willow Creek, Burro Mountains)	Burn 700 acres.	• Burning reduces woody encroachment and favors herbaceous species that minimizes soil erosion.

NMDGF (continued)

Watersheds	Project Description	Watershed Benefits
Upper Pecos (Dark Canyon)	265 acre deer browse and PIPO habitat improvement by thinning PJ proliferation to allow the use of RX fire for such management.	• Thinning reduced invasive PJ/PP and provides fine fuels for future prescribed burn.
Upper Rio Grade (Rio Grande)	Disk and native seed approximately 200 acres of sagebrush. Native seed mixture of grasses and forbs.	• Reducing encroaching woody species and planting herbaceous plants acts to reduce erosion.
Upper Rio Grande (Arroyo de la Petaca)	Prescribe burning fall 2011 on 475 acres within the Red Mesa Vegetation Management Project area to improve forage.	• Burning reduces woody encroachment and favors herbaceous species that minimizes soil erosion.
Upper San Juan (Largo Canyon)	Conduct Rx burn in sage/grass habitat to increase forb/grass production while maintaining a mosaic that includes significant amounts of sage.	• Burning reduces woody encroachment and favors herbaceous species that minimizes soil erosion.
Western Estancia (Arroyo de Tajique)	Improved habitat diversity and forage for mule deer by thinning woody vegetation from a historic chained area. In the future, this opening will be burned of slash to stimulate browse and herbaceous plants.	• Thinning reduced invasive PJ and provides fine fuels for future prescribed burn.

Soil and Water Conservation District (SWCD) Projects

Grant SWCD

Watersheds	Project Description	Watershed Benefits
Upper Gila Upper Gila-Mangas	NMISC Paired Watershed Study: Two watersheds continue to be studied for soil moisture and alluvial groundwater response to tree and brush thinning treatments.	• Decrease risk of catastrophic wildfire • Prevent erosion
Upper Gila Mimbres	EMNRD Wildland Urban Interface and Hazardous Fuels Reduction: Private landowners in Grant County thinned approximately 136 acres in 2012.	• Decrease risk of catastrophic wildfire • Decrease erosion

US Forest Service Projects

Carson National Forest

Watersheds	Project Description	Watershed Benefits
Blanco Canyon (Carrizo Creek)	<u>Grazing Permittee & NRCS/EQUIP Partnership</u> Improve livestock distribution on 640 acres for watershed improvement : • Installed Ciruelas pipeline; 2.5 miles and 3 troughs • Installed Ahogadero pipeline; 1.3 miles, 1 permanent storage tank, & 1 trough <u>Oil & Gas Partnerships</u> • Reclaimed 5 well pads – 10.09 acres and closed & reclaimed 10,595 feet of road • Reclaim 6,858 feet ft. of existing pipeline ROW • Up graded, surfaced and cross drained 0.85 mile of existing road • Up graded 1.3 miles of existing road • Construct 16 new silt traps • Install 11 new culverts, relocate 1 culvert • Re-slope and reclaim 0.23 acre <u>NM HSP, Sportsmen for Fish and Wildlife, and Grazing Permittee</u> • 200 acres of sagebrush restoration: mowing and seeding	• Improve vegetation cover, reduce sediment
Cimarron (Cimarron River) Mora (Coyote Ck/Mora)	<u>Angel Fire WUI Piling</u>: • 30 acres of hand piling to reduce fuel load from thinning projects and improve forest health.	• Increase in understory forage diversity and improves watershed condition.
Cimarron Eagle Nest/Cimarron River	<u>East Fuelbreak Pile</u>: • 35 acres of hand piling to reduce fuel load from thinning projects and improve forest health. Project promotes increase in understory forage diversity and improves watershed condition.	• Heavy fuel loading and lack of forage diversity.
Cimarron (N. Ponil Ck)	<u>Valle Vidal Allotment – Whitman Vega Pasture</u>: • Install one large capacity water tanks (10,000 gal) to improve livestock distribution. Improved 100 acres of watershed with improved livestock distribution and improved forage vigor for watershed protection. Work includes Partnership NRCS EQIP grant valued at $3,930.	• Poor distribution and overuse of forage in livestock pasture resulting in increased soil erosion.

Carson National Forest (continued)

Watersheds	Project Description	Watershed Benefits
Cimarron (N. Ponil Ck)	Prescribed burn 1,000 ac: • Spring burn on the east side of the Valle Vidal to improve forage vigor and watershed condition. Rx burn located in headwaters of Ring drainage.	• Rejuvenate and recycle nutrients for forage uptake and to improve forage condition.
Cimarron (Seally Cy)	Seally Canyon drainage erosion control: • Install 27 rock dams in the bottom of Seally Cy to induce meander and to arrest headcuts. Improved 27 acres of watershed. Work included install of 3 drift fences to interrupt livestock trailing in drainage channel. Work performed by Partnership with Philmont Boy Scout Ranch (see Figures 3 and 4).	• Headcut and channel erosion in drainage channel.
Conejos (Rio de Los Pinos)	Laguna Larga exclosure maintenance (3 Acres)	• Stabilize lakeside banks • Improve bank and vegetative cover/density
Conejos (Rio San Antonio)	Placitas Spring maintenance	• Decrease sedimentation/erosion surrounding spring seep
Jicarilla RD District wide	Grazing Permittees • Reduced livestock grazing number by 57% of permitted livestock Road Committee Partnership • Maintained 110 miles of Forest Roads (roads were bladed twice this year)	• Improve vegetation cover, reduce sediment • Reduce sediment
Mora (Luna Creek/Mora drainage)	Luna Chacon Range Betterment Fencing: Construct .5 mi of new fence to provide pasture boundary fencing to improve livestock distribution and forage use. Maintains forage in good condition and protects watershed condition.	• Livestock forage utilization is within the existing pasture is uneven resulting overuse of portions of the pasture.
Rio Chama (Canada Alamosa-Rio Vallecitos)	25 acres noxious weed removal Escondido Allotment	• Protect resource conditions
Rio Chama (Canada Alamosa-Rio Vallecitos)	Andy Chacon CFRP FY 12 – Pre-commercial Thinning (87 acres)	• Thinning to improve forest health and to mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Thinning also improves woody debris ground cover, vegetative ground cover and water holding capacity.
Rio Chama (Rio Tusas)	Biscara spring maintenance (0.1 mile))	• Decrease sedimentation/erosion surrounding spring seep
Rio Chama	Brushhog 200 acres in the El Rito Lobato Allotment Seed 150 acres in the El Rito Lobato Allotment	• Reduce soil erosion and sedimentation • Increase forage capacity • Increase wildlife habitat

Carson National Forest (continued)

Watersheds	Project Description	Watershed Benefits
Rio Chama (Martinez Canyon-Canjilon Creek)	Canjilon WUI Green Fuelwood Commercial Blocks FY 12 – Commercial Thinning and Piling of Activity Created Fuels (14 acres)	• Hazardous fuels reduction thinning to mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Piling also improves vegetative ground cover and water holding capacity.
Rio Chama (Lopez Canyon-Canjilon Creek)	Canjilon WUI Green Fuelwood FY 11 – Commercial Thinning and Lopping and Scattering of Activity Created Fuels (98 acres)	• Hazardous fuels reduction thinning to mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Lopping and scattering also improves woody debris ground cover, vegetative ground cover and water holding capacity.
Rio Chama (Lopez Canyon-Canjilon Creek)	Canjilon WUI Green fuelwood FY12-Commercial thinning and lopping and scattering of activity created fuels (60 acres)	• Hazardous fuels reduction thinning to mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Lopping and scattering also improves woody debris ground cover, vegetative ground cover and water holding capacity.
Rio Chama (Martinez Canyon-Canjilon Creek)	Canjilon WUI Stewardship Blocks FY 12 – Pre-commercial Thinning and Piling of Activity Created Fuels (9 acres)	• Hazardous fuels reduction thinning to mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Piling also improves vegetative ground cover and water holding capacity.
Rio Chama	Cleaned 2 cattleguards	• To minimize channelization of water and sediment transport.
Rio Chama (Canada del Agua-Rio Tusas) (Canada Alamosa-Rio Vallecitos)	Ensenada Piles FY 12 – Piling of Activity Created Fuels (264 acres)	• Piling of activity created hazardous fuels to disrupt fuel continuity and mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Piling also improves vegetative ground cover and water holding capacity.
Rio Chama (Canada del Agua-Rio Tusas) (Canada Alamosa-Rio Vallecitos)	Ensenada Piles Prescribed Burn FY 12 – Prescribed Burning of Piled Material (50 acres)	• Prescribed burning of activity created hazardous fuels to disrupt fuel continuity, decrease fuel load and decrease fire behavior which will mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Burning also improves vegetative ground cover and water holding capacity.
Rio Chama (Cedar Grove Cemetery-Arroyo Blanco) (Montoya Canyon-Canjilon Creek)	Highway 115 Corridor Personal Use Blocks FY 12 – Pre-commercial Thinning and Piling of Activity Created Fuels (5 acres)	• Hazardous fuels reduction thinning to mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Piling also improves vegetative ground cover and water holding capacity.

Carson National Forest (continued)

Watersheds	Project Description	Watershed Benefits
Rio Chama Canada del Agua-Rio Tusas	Jaramillo and Sons CFRP FY 12 – Pre-commercial Thinning and Lopping and Scattering of Activity Created Fuels (37 acres)	• Thinning to improve forest health and to mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Lopping and scattering also improves woody debris ground cover, vegetative ground cover and water holding capacity.
Rio Chama	Lined 2 stock tanks. Cleaned out 2 stock tanks	• Improve vegetation ground cover and water holding capacity
Rio Chama (Canada del Agua-Rio Tusas) (Canada de Agua-Rio Vallecitos) (Canada de los Comanches-Rio Tusas)	Petaca/Las Tablas Prescribed Burn FY 12 – Broadcast Prescribed Burning (700 acres)	• Prescribed burning of natural and activity created fuels to disrupt fuel continuity, decrease fuel load and decrease fire behavior which will mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Burning also improves vegetative ground cover and water holding capacity.
Rio Chama (Rio Tusas)	Positos Spring maintenance	• Decrease sedimentation/erosion surrounding spring seep
Rio Chama (Cedar Grove Cemetery-Arroyo Blanco) (Montoya Canyon-Canjilon Creek)	SR 115 SRS CCC Phase II – Pre-commercial Thinning and Piling of Activity Created Fuels (25 acres)	• Hazardous fuels reduction thinning to mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Piling also improves vegetative ground cover and water holding capacity.
Rio Chama (Rio Tusas-Rio Vallecitos)	Valle Grande Fuelwood – Commercial Thinning and Lopping and Scattering of Activity Created Fuels (107 acres)	• Thinning to improve forest health and to mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Lopping and scattering also improves woody debris ground cover, vegetative ground cover and water holding capacity.
Rio Chama (Rio Tusas-Rio Vallecitos)	Valle Grande Fuelwood FY 12 – Commercial Thinning and Lopping and Scattering of Activity Created Fuels (53 acres)	• Thinning to improve forest health and to mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Lopping and scattering also improves woody debris ground cover, vegetative ground cover and water holding capacity.
Rio Chama Rio Grande	Forest Thinning: 130acres of piñon/juniper and Ponderosa Pine vegetation thinned. Work accomplished by public "Stewardship Blocks'	• Increased forest understory and ground cover to improve watershed condition.
Upper Rio Grande (Comanche Ck)	Comanche Creek Trout & Riparian Habitat Impv. • Maint. on 6 vanes –replace large rock rip-rap stabilizing stream banks to	• Stabilize stream banks &floodplain condition to reduce sediment impact on WQ.

Carson National Forest (continued)

Watersheds	Project Description	Watershed Benefits
	improve 6 acres of watershed riparian vegetation improved and associated improved floodplain condition. Work includes Partnership in-kind labor valued at $9,555.	
Upper Rio Grande (Carson Reservoir-Arroyo Aguaje de la Petaca)	Red Mesa Piles Prescribed Burn FY 12 – Prescribed Burning of Piled Material (60 acres)	• Prescribed burning of activity created hazardous fuels to disrupt fuel continuity, decrease fuel load and decrease fire behavior which will mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Burning also improves vegetative ground cover and water holding capacity.
Upper Rio Grande (Carson Reservoir-Arroyo Aguaje de la Petaca)	Red Mesa Prescribed Burn FY 12 – Broadcast Prescribed Burning (475 acres)	• Prescribed burning of natural and activity created fuels to disrupt fuel continuity, decrease fuel load and decrease fire behavior which will mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Burning also improves vegetative ground cover, wildlife habitat water holding capacity.
Upper Rio Grande (Carson Reservoir-Arroyo Aguaje de la Petaca)	Red Mesa Unit 24 Thinning – Pre-commercial Thinning and Lopping and Scattering of Activity Created Fuels (124 acres)	• Thinning to improve forest health and to mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Lopping and scattering also improves woody debris ground cover, vegetative ground cover and water holding capacity.
Upper Rio Grande (Rio Chiquito/ Rio Grande del Rancho)	<u>FR437 road re-route</u>: • Obliterate, rip and seed 1470 ft of existing road out of riparian zone and influence of beaver activity adjacent road. Construct new road route of approx. 1,500 ft out of floodplain to avoid encroachment on riparian /flood plain corridor. • Work included 2 acres of riparian stream improvement by removing the influence of the road outside the floodplain	• Road encroaches upon stream corridor and drains road borne sediment into stream corridor w/out vegetative buffer.
Upper Rio Grande (Rio Pueblo)	<u>Osha Pass Wetland Protection & Habitat Improvement</u>: • Obliterate/rip 3 miles of unauthorized user created motorized OHV trails in and adjacent to/through the wetlands. Stabilize 0.3 miles of authorized OHV trails with road maintenance structures (grade dips). Create seven earthen berm/rock barriers to block motorized access pts into wetland area where use is not authorized	• Unauthorized user created trails interrupt and divert overland flow to wetlands causing drying of wetland areas. Unauthorized OHV use destroying wetland integrity directly.

Carson National Forest (continued)

Watersheds	Project Description	Watershed Benefits
Upper Rio Grande (Santa Barbara/Rio Pueblo) (Rio Grande Del Rancho) (Rio Pueblo)	Fuels Implementation Rx Burning: • Santa Barbara (Bear Mtn.) Rx burn 286 ac fall burn to reduce heavy fuel loading. Improve understory ground vegetation diversity.	• Improve nutrient cycling, promotes increase in understory forage diversity and improves watershed condition.
Upper Rio Grande (La Jara Cy/ Rio Fernando de Taos)	La Jara Fuels (SRS) • 70 acre fuel break along private lands (Taos Pines subdivision). Project promotes increase in understory forage diversity and improves watershed condition.	• Heavy fuel loading and lack of forage diversity.
Upper Rio Grande (La Jara Cy/ Rio Fernando de Taos)	Taos Cy Fuels (SRS) • 117 acres thinning to improve Forest health and reduce fuel loading. Project used strategy of lop and scatter of thinning slash. Scattering slash improves organic matter soil content and improves ground cover to improve watershed condition.	• Heavy fuel loading and lack of forage diversity.
Upper Rio Grande (Rio Grande del Rancho)	Pot Creek Noxious Weeds Control: • Hand grub and remove musk thistle over 100 acres to improve restoration of native vegetation and improve watershed condition.	• Noxious weeds impacting watershed health.
Upper Rio Grande (Gavilan Creek/Rio Hondo Ck)	Gavilan Trail re-route (.4 mi. trail re-route and .4 mile trail obliteration): • 0.4 mile of trail re-routed to lessen grade. Work includes obliteration and stabilization old trail. Est. 1 ac of watershed improved.	• Stabilize and lessen grade of trail to lessen trailsurface erosion and sedimentation of Gavilan Creek.
Upper Rio Grande (Lobo Ck/Arroyo Hondo)	San Cristobal Allotment – South Lobo pasture reseeding. • Reseed crested wheatgrass pasture to improve forage availability and ground cover. Seeding improved condition on 267 acres of watershed.	• Poor ground cover in old PJ chaining area.
Upper Rio Grande (San Cristobal Ck/ Rio Grande)	San Cristobal Allotment – North Lobo Pasture: • Construct water development to improve livestock distribution on 50 acres. Improve 50 acres of watershed with improved livestock distribution and improved forage vigor for watershed protection.	• Poor distribution and overuse of forage in livestock pasture resulting in increased soil erosion.
Upper Rio Grande (San Cristobal Ck/ Rio Grande)	Reforestation for 1996 Hondo Wildfire: • Planted 285 acres with Ponderosa Pine tree seedlings as part of ongoing effort to restore the watershed impacted by the 1996 wildfire.	• Lack of Forested canopy to help stabilize watershed area.

Carson National Forest (continued)

Watersheds	Project Description	Watershed Benefits
Upper Rio Grande (Beatty Lakes /Bonito Cy)	Valle Vidal Allotment – Beatty Lakes Pasture: • Install two large capacity water tanks (10,000 gal ea.) to improve livestock distribution. Improved 200 acres of watershed with improved livestock distribution and improved forage vigor for watershed protection. Work includes Partnership NRCS EQIP grant valued at $7,861. Noxious weed treatment: • Hand grub 125 acres of Musk Thistle near Dan Beard camp. Work done in partnership with Philmont Boy Scout Ranch.	• Poor distribution and overuse of forage in livestock pasture resulting in increased soil erosion. • Noxious weeds impacting watershed health.
Upper Rio Grande (Lookout Cy / Cerrososo Cy)	Valle Vidal Allotment – Lookout Cy Pasture: • Install three large capacity water tanks (10,000 gal ea.) to improve livestock distribution. Improved 300 acres of watershed with improved livestock distribution and improved forage vigor for watershed protection. Work includes Partnership NRCS EQIP grant valued at $11,791.	• Poor distribution and overuse of forage in livestock pasture resulting in increased soil erosion.
Upper Rio Grande (Lama Creek/Rio Grande)	Quest/lama WUI: • Lama pile burns on 142 acres to reduce fuel loading associated with prior thinning performed in partnership with Rocky Mtn Youth Corps. • Lama thinning on 54 acres to create fuel break, improve forest health, and improve forest understory forage diversity.	• Thinning and associated piling to reduce fuel loading for fuel breaks on WUI
Upper San Juan (Canon Bancos-Navajo Reservoir) (Outlet Canon Bancos)	Carracas HSP Thinning Piles Prescribed Burn FY 12 – Prescribed Burning of Piled Material (22 acres)	• Prescribed burning of activity created hazardous fuels to disrupt fuel continuity, decrease fuel load and decrease fire behavior which will mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Burning also improves vegetative ground cover, wildlife habitat and water holding capacity.
Upper San Juan (Canon Bancos-Navajo Reservoir) (San Juan River-Navajo Reservoir)	Eul/Carracas Rim Prescribed Burn FY 12 – Broadcast Prescribed Burning (84 Acres)	• Prescribed burning of natural and activity created fuels to disrupt fuel continuity, decrease fuel load and decrease fire behavior which will mitigate the threat of high intensity and high severity wildfires and the associated negative impacts on watershed health and function. Burning also improves vegetative ground cover, wildlife habitat water holding capacity.

Carson National Forest (continued)

Watersheds	Project Description	Watershed Benefits
Upper San Juan (San Juan River-Navajo Reservoir)	Oil & Gas Partnerships • Install 1 new culvert and maintain 2 silt traps • Re-slope and reclaim 0.12 acre, , and upgrade 1,760 ft. of existing road	• Improve vegetation cover, reduce sediment
Upper San Juan (Canon Bancos)	USFS & BLM • Gathered 45 wild horses Oil & Gas Partnerships • Reclaim 14,995 feet ft. of pipeline ROW Road Committee Partnership • Spot surfaced 0.5 mile of FSR 310 (improve drainage) • Installed 3 culverts on FSR 311 (improve drainage) • Spot surfaced 0.7 mile of FSR 310Q (improve drainage)	• Improve vegetation cover, reduce sediment
Upper San Juan (La Jara Creek)	Grazing Permittee & NRCS/EQUIP Partnership • Improve livestock distribution on 640 acres for watershed improvement. • Valdez pipeline 3.6 miles, 1 permanent storage tank, 4 troughs Devils Mesa Restoration Oil & Gas Partnerships • Reclaimed 1 well pad – 1.32 acres and closed & reclaimed 2,402 feet of road. • Constructed 3 silt traps and reclaimed 250 ft. of old 2-track road • Installed 2 culverts	• Improve vegetation cover, reduce sediment

Cibola National Forest

Watersheds	Project Description	Watershed Benefits
Elephant Butte Reservoir (Limestone Canyon)	Restore meadow Stream stabilization	• Close and obliterate road • Stream stabilization • Placement of in-stream structures
Rio Grande-Albuquerque (Cedro Creek)	Obliterate unauthorized motorized trail Stream stabilization	• Obliterate unauthorized motorcycle trail • Improve road drainage • Placement of in-stream structures
Rio Grande-Albuquerque (Tijeras Arroyo)	Ponderosa and piñon/juniper Treatments East slope of Sandia Mtns	• Increase herbaceous ground cover. • Restore downed woody material to sustainable levels • Decrease erosion • Spring protection
Rio Grande-Albuquerque	Ponderosa and piñon/juniper Treatments	• Increase herbaceous ground cover. • Restore downed woody material to sustainable

Cibola National Forest (continued)

Watersheds	Project Description	Watershed Benefits
(Deer Canyon–Abo Arroyo) (Canon Barranco-Abo Arroyo)		levels • Decrease erosion
Rio San Jose (Agua Medio-Bluewater Creek)	Ponderosa and piñon/juniper Treatment Bluewater Creek	• Increase herbaceous ground cover. • Restore downed woody material to sustainable levels • Decrease erosion
Forestwide	Travel Management Plan Motorized cross country use was restricted and a road system was designated through travel management decisions.	• Improve soil stability, reduce erosion, and reduce sediment movement into stream channels on over 400,000 acres.

Gila National Forest

Watersheds	Project Description	Watershed Benefits
Caballo	Maintained 5 miles of the East Water Canyon trail	• Decrease erosion from trail prism
Carrizo Wash (Largo Creek) (Upper Largo Creek, Rito Creek)	1. Slaughter Unit 4 thinning of 1580 acres 2. Slaughter Unit 10 thinning of 789 acres 3. 205 acres Slaughter Mesa Unit 8 4. Baca Pit Community pile burn 5. Installed self-closing gates, built information Kiosk, and signed about 35 miles of CDT 6. Rebuilt short portion of CDT trail with steep grade 7. Trail maintenance on Sawmill Trail # 13 (4.38 Miles) 8. Trail maintenance on Largo Trail # 14 (4.56 miles)	• Increase herbaceous ground cover • Decrease erosion from trail prism through maintenance and providing information and signage of trail routes to prevent unauthorized side trails • Improve watershed condition and herbaceous ground cover due to improved livestock and wildlife distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation.
Carrizo Wash (Mangas Creek)	1. Slaughter Unit 11 thinning of 727 acres	• Improve watershed condition and herbaceous ground cover due to improved livestock and wildlife distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation.
El Paso-Las Cruces (Cuervo Arroyo Rio Grande)	1. Thinning of approx. 220 acres of piñon-juniper. (Tierra Blanca thin) 2. Dirt stock tank constructed: 1 (Mackey Allot.) 3. Spring improvement: 1 (Kingston Allot.)	• Improve watershed condition and herbaceous ground cover. • Improve the management of the cattle distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation.
Elephant Butte Reservoir (Headwaters Alamosa Creek)	1. Prescribed burn on approx. 2 acres of ponderosa pine and piñon-juniper. (Poverty Creek Rx)	• Reduce fuels adjacent to Poverty Creek subdivision. • Improve watershed condition and herbaceous ground cover.

Gila National Forest (continued)

Watersheds	Project Description	Watershed Benefits
Mimbres (Gallinas Canyon-Mimbres River)	1. 3 miles of maintenance of the Railroad Canyon trail #128 2. 3 miles of maintenance/ improvement of the East Railroad Canyon trail #130 3. 5 miles of maintenance/ improvement of the Gallinas Canyon trail #129 4. Gallinas tank cleaning/maintenance 5. 5 miles of maintenance/ improvement of the Crest Trail #79, south of Emory Pass 6. 7 miles of maintenance/ improvement of the Allie Canyon trail # 100 7. 3 miles of maintenance/ improvement of the Spring Canyon trail # 721 8. Horse tank cleaning/maintenance	• Decrease erosion from trail prism • Improve the management of the cattle distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation.
Mimbres (Headwaters of San Vicente Draw)	1. 2.5 miles maintenance/ improvement of the Cornell Ranch Trail#758 2. 2 miles maintenance/ improvement of the Picnic Loop trail # 714 3. 2 miles maintenance/ improvement of the Wagon Wheel Loop trail # 701 4. 1.75 miles maintenance/ improvement of the Angel Loop trail # 717 5. 1.75 miles maintenance/ improvement of the Piñon Loop trail # 711	• Decrease erosion from trail prism, enhance drainage features
Plains of San Agustin (Y Canyon)	1. Earthen stock tanks cleaned/repaired: 5	• Improve watershed condition and herbaceous ground cover due to improved livestock and wildlife distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation.
Plains of San Agustin (Patterson Lake)	1. 290 acres of PJ Thinning for the Upper Moraga Canyon Pronghorn Movement Corridor.	• Increase herbaceous ground cover. Improve watershed condition and herbaceous ground cover due to thinning in clumps resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation
San Francisco (Pueblo Creek–San Francisco River)	1. Reconstructed riparian exclosure fence around Vigil spring 2. Replaced bridge on Forest Road 232 on Pueblo Creek 3. Tank maintenance and cleaning on 4 tanks Pot, Pan, Deep and Joe 4. Aerial seeded and straw mulched 11,864 acres of high severity burn of the Whitewater Baldy Fire 5. Reconstruction of .5 miles of fence 6. Replaced 1 mile of pipeline	• Improve riparian condition at spring • Improve riparian condition and reduce sediment into Creek • Improve watershed condition and herbaceous ground cover due to improved livestock and wild life distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation • Assist in stabilizing soils and reducing erosion and subsequent sedimentation into stream courses
San Francisco (Outlet Tularosa River)	1. Aerial seeded 988 acres of high severity burn of the Whitewater Baldy Fire	• Assist in stabilizing soils and reducing erosion and subsequent sedimentation into stream courses

Gila National Forest (continued)

Watersheds	Project Description	Watershed Benefits
San Francisco (Centerfire Creek-San Francisco River)	1. Wallow Hazard Tree Removal/Salvage (143 acres) 2. Roughly 10.5 miles of fence reconstruction/major repair as result of Wallow Fire(roughly 7 miles contracted out and roughly 3.5 by permittees) 3. Burned Luna Admin Pile 4. East Centerfire RX (Broadcast Burn (300 acres) 5. East Centerfire-Freeman Unit RX (3020 acres) 6. Replacement of approximately 5.6 miles of the Karuth Pipeline and associated drinkers(Phase II) 7. Replacement of the Sand Canyon portion of the Karuth Pipeline (approximately 1.7 miles) 8. Trail Maintenance on Warm Springs Trail #124(3.1 Miles) 9. Wallow Salvage and Reforestation(180 Acres Timber Contract Sold) 10. Maintenance on Mangas Work Center Exclosure 11. Maintenance on the Following Trick Tanks/Guzzlers: Strawberry Guzzler #1, Bishop Peak TT, and Dry Top TT 12. Maintenance on Potato Patch Water Lot 13. Arch Site stabilization on 6 sites after Wallow Fire 14. Maintenance/cleaning of Swapp Tank 15. Reconstruction of approximately 1 mile of fence #005048 E of road CAT-B007(just outside Wallow burn area) 16. Pasture division fence 17. replacement/repair: 1 mile 18. Reserve WUI maintenance 19. (thinning and piling of resprouts) totaling 240 acres. 20. 209 acres of timber stand improvement completed in the Reserve WUI area. 21. Cleaned (burned) SU Pit. 22. 20. Pine Lawn Tree Salvage: 135 acres	

Gila National Forest (continued)

Watersheds	Project Description	Watershed Benefits
San Francisco (Headwaters Tularosa River)	1. Jewett Gap Pipeline Extension 2. Uno Pino Pipeline Extension 3. Construction of livestock holding facility for recreational users 4. Installed self-closing gates, built information Kiosk, and signed about 35 miles of CDT 5. Maintenance on Willow Trick Tank 6. Maintenance on Aragon Well	• Decrease erosion from trail prism • Improve the management of the cattle/wildlife distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation • Decrease erosion from trail prism through maintenance and providing information and signage of trail routes to prevent unauthorized side trails • Concentrate livestock into holding facility instead of horses being tied across a large area causing site specific erosion around individual tie trees
San Francisco (Upper Blue River)	1. Trail Maintenance on Frieborn Canyon Trail #126 (2.33 Miles) 2. Rebuild water gap on Dry Blue Exclosure 3. Maintenance/cleaning of Dave Lee Lake Tank, Frieborn Tank, and Upper Tank	• Decrease erosion from trail prism • Exclude cattle from the Dry Blue Riparian area reducing erosion and sedimentation in Spikedace/Loach Minnow critical habitat • Improve the management of the cattle/wildlife distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation
San Francisco (Outlet of Tularosa River)	1. Sheep Basin CFRP Grant project: 2. 468 acres of ponderosa pine stand 3. thinning 4. Deer timber sale: 71acres of ponderosa pine stand thinning. 5. Earthen stock tanks cleaned/repaired: 2 6. Springs cleaned/repaired: 5	• Increase water table level & flow and improve watershed condition and herbaceous ground cover due to improved livestock and wildlife distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation. • Improve watershed condition as well as thinning of overstory and herbaceous ground cover resulting in an increase of stabilized soils, reduction of reduction in runoff, erosion and sedimentation. • Reduce hazardous fuels • Thin current pinion/juniper stand • Grassland restoration • Improve the management of the cattle distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation. • Improve watershed condition and herbaceous ground cover due to improved livestock and wildlife distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation.
San Francisco (Deep Creek-San Francisco Rive)r	1. Noxious weed (Tamarisk) survey along the San Francisco River: 35 acres 2. Fence replacement/repair: Approximately 6 miles of San Francisco River Riparian Exclosure replaced.	• Reduce the spread of noxious weeds and improve watershed condition • Improve the management of the cattle distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation. • Improve watershed condition and herbaceous ground cover due to improved livestock and wildlife distribution resulting in an increase of

Gila National Forest (continued)

Watersheds	Project Description	Watershed Benefits
		stabilized soils, reduction in runoff, erosion and sedimentation.
Upper Gila Watershed (Middle Fork Gila River)	1. Aerial seeded and straw mulched 4,172 acres of high severity burn of the Whitewater Baldy Fire 2. Aerial seeded 4,208 acres of high severity burn of the Whitewater Baldy Fire 3. Pipeline install replacement: 2 miles 4. Earthen stock tanks cleaned/repaired: 4 5. Livestock removal, road and culvert maintenance after Whitewater Baldy Fire. 6. Extensive channel/soil stabilization of high intensity areas within the 2012 Whitewater Baldy Complex on private lands (inholdings) adjacent to Willow Creek.	• Assist in stabilizing soils and reducing erosion and subsequent sedimentation into stream courses • Improve the management of the cattle distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation. • Improve watershed and water quality on Willow Creek and Gilita Creek.
Upper Gila Watershed (Sapillo Creek – Gila River)	1. Aerial seeded 2,725 acres of high severity burn of the Whitewater Baldy Fire 2. Maintained 6 miles of the Miller Spring trail	• Assist in stabilizing soils and reducing erosion and subsequent sedimentation into stream courses • Decrease erosion from trail prism
Upper Gila Watershed (East Fork Gila River)	1. Salt Cedar removal: 350 acres	• Reduce the spread of noxious weeds and improve riparian/watershed condition
Upper Gila Watershed (Sapillo Creek)	1. Farm Flat Prescribed Burn on 2036 acres of Ponderosa Pine	• Decrease the risk of extreme wildfire and associated erosion
Upper Gila Watershed (Headwaters East Fork Gila River)	1. Prescribed burn on approx. 535 acres of ponderosa pine and piñon-juniper. (Indian Peaks Rx) 2. ¾ mile of re-constructed allotment boundary fence. (Corduroy/Turkey Run Allots.) 3. Maintained 5 mile of trail on South Diamond trail, 8 miles on Main Diamond trail and 7 miles on CCC trail 4. Willow Planting below Fish Barrier	• Decrease risk of extreme wildfire and associated erosion. • Improve watershed condition and herbaceous ground cover. • Improve the management of the cattle distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation. • Decrease erosion from trail prism • Improve riparian condition
Upper Gila Watershed (Corduroy Draw)	1. Prescribed burn on approx. 2,785 acres of ponderosa pine and piñon-juniper. (Indian Peaks Rx)	• Improve watershed condition and herbaceous ground cover. • Decrease risk of extreme wildfire and associated erosion.
Upper Gila-Mangas (Duck Creek)	1. Reconstructed 1 mile of Allotment Boundary fence	• Improve the management of the cattle distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation.

Gila National Forest (continued)

Watersheds	Project Description	Watershed Benefits
Upper Gila-Mangas (Bear Creek)	1. 4 miles of maintenance/ improvement of the Little Cherry Creek trail # 241 2. 5 miles of maintenance/ improvement of the CDT 3. 5 miles of maintenance/ improvement of the Tadpole Ridge trail # 232 4. 2 miles of new fence construction by Felie Subdivision up Little Walnut	• Decrease erosion from trail prism • Improve the management of the cattle distribution, protection of approximately .5 miles of riparian located on private lands within the Felie Subdivision
Upper Gila-Mangas (Blue Creek – Upper Gila River)	1. 80 acre thinning project 2. Installation of 5,000 gallon water storage tank at Astrologer Mine	• Improve watershed condition by increasing herbaceous ground cover • Improve the management of the cattle distribution resulting in an increase of stabilized soils, reduction in runoff, erosion and sedimentation

Lincoln National Forest (not reporting)

Santa Fe National Forest

Watersheds	Project Description	Watershed Benefits
Jemez (multiple)	2407 public contacts at dispersed recreation sites through the Respect the Rio program.Funded by §319 grant	• Increased knowledge of "river-friendly" camping techniques, Leave No Trace • Improved water quality as a result of increased knowledge & public stewardship
Jemez (multiple)	individual contacts at public events through the Respect the Rio program (NM Outdoor Expo, Santa Ana Environmental Fair, Jemez 4th of July; ABQ & Rio Rancho Water Festivals). Funded by §319 grant	• Increased knowledge of "river-friendly" camping techniques, Leave No Trace • Improved water quality as a result of increased knowledge & public stewardship
Jemez (multiple)	343 individual contacts at interpretive programs in developed campgrounds through the Respect the Rio program. Funded by §319 grant	• Increased knowledge of water quality issues and "river-friendly" camping techniques, Leave No Trace • Improved water quality as a result of increased knowledge & public stewardship
Jemez (Rio Cebolla)	27 volunteers from New Mexico Trout installed bollards and repaired buck & pole fencing along FR376 to prevent vehicles from driving across the stream and along the stream bank. 3 miles of stream were protected or improved through implementation of the project	• Increase herbaceous ground cover & infiltration by eliminating vehicular access • Decrease erosion • Decrease sedimentation into river • Increase public awareness of "river-friendly" camping techniques
Jemez (Rio Cebolla)	3 new interpretive panels for Respect the Rio were installed on FR376, along the Rio Cebolla (near Lake Fork Canyon)	• Improve the public's knowledge of watersheds and water quality issues • Inform public on how to be "river-friendly" campers and how to protect watersheds and water quality by being good stewards of the land and water
Jemez (Redondo Creek)	xxx exclosures along Redondo Creek built by Wild Earth Guardians; funded by §319 grant	• Improve species diversity and vigor of riparian vegetation by keeping ungulates out • Decreased erosion & sedimentation by reduced

Santa Fe National Forest (continued)

Watersheds	Project Description	Watershed Benefits
		ungulates in riparian areas
Jemez (San Antonio Creek)	Well repair for San Antonio allotments (funding from Secure Rural Schools and Respect the Rio §319 grant funds)	• Re-drill well to re-establish water in the upland allotments in the San Antonio watershed • Improved availability of water in the uplands will help keep cattle out of riparian pastures (Rio Cebolla and San Antonio Creek) and improve species diversity and vigor of riparian vegetation • Decreased erosion & sedimentation by reduced cattle in riparian pastures
Jemez (San Antonio Creek)	7 ac exclosure fence along San Antonio Creek built by Wild Earth Guardians; funded by §319 grant	• Improve species diversity and vigor of riparian vegetation by keeping ungulates out • Decreased erosion & sedimentation by reduced ungulates in riparian areas
Jemez (Rio de las Vacas)	2 mi stream improvement from new range fencing on FR20 along the Rio de las Vacas, streambank stabilization, and road drainage improvements. Funded by a grant from The Nature Conservancy	• Increase herbaceous ground cover & water infiltration by eliminating vehicular access • Decrease erosion • Decrease sedimentation into river
Jemez (multiple) Pecos (multiple)	1608 individual contacts at public events made by the Respect the Rio Education Coordinator Funded by §319 grant	• Increased knowledge of "river-friendly" camping techniques, Leave No Trace • Improved water quality as a result of increased knowledge & public stewardship
Jemez (multiple) Pecos (multiple)	3094 individual contacts at public schools and water festivals made by the Respect the Rio Education Coordinator Funded by §319 grant	• Increased knowledge of "river-friendly" camping techniques, Leave No Trace • Improved water quality as a result of increased knowledge & public stewardship
Pecos (multiple)	613 individual contacts at public events through the Respect the Rio program (NM Outdoor Expo, Pecos Middle School, Las Vegas Kiwanis Outdoor Rec Show, REI). Funded by §319 grant	• Increased knowledge of "river-friendly" camping techniques, Leave No Trace • Improved water quality as a result of increased knowledge & public stewardship
Pecos (multiple)	653 individual contacts at interpretive programs in developed campgrounds through the Respect the Rio program. Funded by §319 grant	• Increased knowledge of water quality issues, "river-friendly" camping techniques, Leave No Trace • Improved water quality as a result of increased knowledge & public stewardship
Pecos Headwaters (multiple)	3016 public contacts at USFS dispersed recreation sites and State Game Commission properties (Terrero, Bert Clancy, Mora, Jamie Koch, Willow-Davis). Funded by §319 grant through the Respect the Rio program	• Increased knowledge of "river-friendly" camping techniques, Leave No Trace • Improved water quality as a result of increased knowledge & public stewardship
Pecos Headwaters	Active participant in Upper Pecos Watershed Group. Active participant in Pecos Collaboration Group (community partnership)	• Contributed to development of collaboration amongst State, Federal, local units of Government, NGOs, and local businesses. • Public outreach and involvement

US Forest Service, Carson National Forest Project Spotlight
Ciruelas Canyon – Arroyo Compañero project

The Ciruelas Canyon – Arroyo Compañero project area is within the Jicarilla Ranger District of the Carson National Forest, approximately 40 miles east of Bloomfield, New Mexico. Four 12-digit watersheds within the Blanco Canyon watershed (14080103) make up the project area. The area was selected as one of the Carson National Forest's high priority watersheds for treatment due to ongoing partnerships and collaboration opportunities, current large scale watershed improvement and restoration planning and implementation on adjacent BLM, State of New Mexico, and private lands, as well as the potential to leverage funding from numerous sources (NRCS, BLM, San Juan Soil and Water Conservation District, oil and gas lessees, and grazing permittee). The watershed is also a pilot selected for restoration under the Watershed Condition Framework. Forest Service staff prepared a Watershed Restoration Action Plan (WRAP) for the watershed, available at apps.fs.usda.gov/WCFmapviewer. One of the four 12-digit watersheds was rated as Functioning at Risk due to poor ratings for water quality, roads and trails, soils, and terrestrial invasive species criteria. Ongoing oil and gas development activities have contributed to the watershed rating. The WRAP estimates that the Ciruelas Canyon-Arroyo Compañero watershed contains 96 road-drainage crossings, 20 miles of roads contributing sediment to drainages, and annually loses over 1,000 tons per acre of sediment from roads. The project area drains to a reach of the San Juan River listed as impaired by sediment, about 25 miles away.

Circules Canyon before (top photo) and after (bottom photo) treatment.

Accomplishments: Projects implemented in the watershed in FY2012;

- NEPA - The Jicarilla Ranger District issued a Decision Memo for the implementation of mechanical sagebrush treatment, supplemental seeding and installation of erosion control structures. Follow-up mechanical treatments and broadcast burning was also approved. Vegetation monitoring transects were established prior to implementation.

- Cultural Inventory and Clearance – Cultural clearance was completed on 200 acres of sagebrush. Cultural inventory has been completed on additional 252 acres.

Seeding Operations in Cottonwood Canyon

- Vegetation treatment - Mowed and seeded 200 acres of big and hoary sagebrush. The areas were seeded with two different seed mixes and hand seeded with winterfat.
- Livestock Distribution - Installed 3.6 miles of water line in Circules and Ahogadero canyons. Installed 4 drinking troughs and 1 storage tank in Circules and Ahogadero canyons
- Wildlife Waters – Repaired the Valencia and Ciruelas solar water wells to an operative condition; and fenced both with pipe and cable. Maintained 3 springs and 4 guzzlers for wildlife.
- Energy Development - Plugged and abandoned 4 gas wells. Reclaimed 16.4 acres of well pads and roads. Closed and reclaimed 1.44 miles of road with installation of silt traps.

Partnerships: Watershed FY 2012 accomplishments were partnered with:

- New Mexico Department of Game and Fish – Habitat Stamp Program - $20,000.00 to sagebrush restoration,
- New Mexico Department of Game and Fish – use of no-till drill,
- Sportsmen for Fish and Wildlife - $1,200.00 to tractor rental,
- Grazing permittee - $3,000.00 (in-kind) for tractor use and operator, and
- Oil and Gas Lessees – reclamation of well pads and roads, road closures and construction of erosion control silt traps.

Valencia Solar Water Well Fenced for Wildlife

US Forest Service, Carson National Forest Project Spotlight
Red River Mining District Clean-Up

Environmental Cleanup Actions

In summer 2012, the United States Department of Agriculture Forest Service resumed final environmental cleanup of 17 abandoned mines located within the Bitter Creek watershed. These mines are located within the Questa Ranger District in the mountains surrounding Red River, New Mexico. The objective of this cleanup was to reduce or eliminate the migration of waste rock containing elevated levels of arsenic and lead to Bitter Creek. NMED recognized in the 2012-2014 303(d)/305(b) Integrated Report that Bitter Creek doesn't meet water quality standards for high quality coldwater aquatic life due to exceedences of aluminum and turbidity. A construction contract was awarded in 2007 to begin the cleanup. It involved construction activities using heavy equipment, consolidating waste rock in a consolidation cell and capping the waste rock with native material.

Cleanup Work Status

Since 2007, 16 of the 17 mines sites have been remediated. In 2010, the 9,000 cubic yards of waste rock at the Memphis Mine was removed and consolidated at the Headwaters Consolidation Cell. In 2011, approximately 1,550 cubic yards of waste rock from Independence Mine was removed and consolidated in the Headwaters Consolidation Cell. Most of the disturbed areas were backfilled with clean soil. All areas were re-vegetated. Approximately 700 cubic yards of mine waste from Denmark Mine was hauled to the Headwaters Consolidation Cell. The Neptune Mine's 2,200 cubic yards of waste rock was also removed and hauled to the Headwaters Consolidation Cell.

Some of the mine sites contained remnants of old mining features. Archaeologists monitor the cleanup to ensure historic features are protected. The archaeological and historic information obtained from the data recovery is being preserved in reports donated to the Red River and Taos libraries, and other public institutions.

Cleanup Schedule

The waste removal at Big Five Mine was completed in 2012 and revegetation activities will occur in 2013, which will complete all remediation work within the Bitter Creek watershed.

Memphis Mine before (top), during (middle), and after (bottom) remediation

Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) delivers technical assistance and voluntary programs that help local people protect and improve natural resources on primarily non-federal lands. This includes addressing the resource concern of water quality. For more information visit: www.nm.nrcs.usda.gov.

The National Water Quality Initiative (NWQI) is being implemented in New Mexico through the Environmental Quality Incentives Program, EQIP. Under NWQI, each state NRCS office was directed to target five percent of EQIP funds to address water quality problems caused by agricultural nonpoint source pollution, in no more than three small watersheds (i.e., watersheds delineated by USGS with 12-digit hydrologic unit codes). NRCS in each state was directed to make this selection with input from the state water quality agency (NMED in New Mexico). In April 2012, NMED recommended that NRCS choose from among Cow Creek (in a watershed referred by USGS as Headwaters Cow Creek, HUC 130600010101), and the upper Gallinas River (in three delineated watersheds upstream of Las Vegas, New Mexico), to target NWQI. These recommendations were based on that these streams have well defined water quality impairments (excessive temperature, in both cases), their watersheds are thus identified as priority watersheds in the Nonpoint Source Management Program, and their watersheds had watershed-based plans geared towards solving those water quality problems, which were complete or nearly complete. Agricultural sources of pollution are present in each of the recommended watersheds, and are significant in three of them.

NRCS selected one of the Gallinas River watersheds (Arroyo Pecos-Gallinas River, HUC 130600010805), and a watershed near Roswell (Town of Midway-Pecos, HUC 130600070504). The Arroyo Pecos-Gallinas River watershed was selected because private agricultural land is prevalent there, and the District Conservationist was aware of potential EQIP applicants there. The Town of Midway-Pecos watershed was selected because of potential applicants there, and because the watershed drains to a section of the Pecos River that does not meet water quality standards. The Pecos River (Rio Felix to Salt Creek) is listed as impaired because of polychlorobiphenyls (PCBs) and DDT found in fish tissue in the area. In 2012, two contracts using NWQI funds were written by the Las Vegas Field Office, and none were written for the Roswell area. The two contracts include planning and implementation of conservation practices for 277 acres within the Gallinas watershed. Planned conservation practices that will improve or protect water quality include Forest Harvest Management, Water Storage Facilities, Heavy Use Protection, and Structures for Water Control. These practices will be implemented to improve watershed conditions within the uplands. The water storage facilities are a supporting practice for Prescribed Grazing and will reduce grazing pressure on riparian areas. A new Section 319 project in the Gallinas watershed will support coordination, outreach to potential NWQI or other EQIP applicants, and monitoring in 2013 through 2015.

Staff from NMED and the state NRCS office met in November 2012 to discuss potential NWQI watersheds and priorities for federal fiscal year 2013. NMED made preliminary recommendations to NRCS that twelve-digit watersheds in the Cimarron, upper Gallinas, and Cow Creek watersheds be considered for NWQI in 2013. As with the 2012 recommendations, these recommendations are based on presence of agricultural nonpoint source pollution, and recent completion of watershed-based plans that identify management measures to address those sources.

Beyond NWQI, NRCS Field Offices across New Mexico assisted individuals and groups of landusers to address water quality resource concerns in a number of ways that supported the goals of New Mexico's Nonpoint Source Management Program. EQIP and other assistance programs funded a very large number of agricultural practices in 2012 (as in most years), nearly all of which have the potential to protect or improve water quality. NRCS is able to report practices implemented by type (e.g., prescribed grazing was implemented on 3,177,210 acres), by county (e.g., irrigation water management was implemented on 491 acres in Doña Ana county), and by 12-digit watershed (e.g., irrigation water management was implemented on 20.4 crop acres in the Achenback Canyon watershed, a Nonpoint Source Management Program priority watershed in Doña Ana County). The degree to which irrigation water management in the Achenback Canyon watershed reduced *E. coli* loading to the Rio Grande (the water quality problem of concern in that area) depends on whether the involved acres are used as pasture for part of the year, among other factors not analyzed or not available for this report.

A query of practices implemented by 12-digit watershed produced 4,904 results in 948 watersheds in New Mexico. 645 results (13%) were in priority watersheds for the NPS Management Program. These 645 results were distributed in 132 priority watersheds. That 13% of the results were distributed in priority watersheds may indicate some preference towards NRCS implementing agricultural best management practices in priority watersheds. 429 (13%) of New Mexico's 3,234 12-digit watersheds are currently designated as priority watersheds, but the scarcity of private agricultural land mountainous areas (where there is a concentration of priority watersheds), and that a large percentage of New Mexico's agricultural land lies in eastern New Mexico (where there are very few priority watersheds), would likely result in fewer than 13% of practices being implemented in priority watersheds were it not for such a preference.

NRCS continues to support partnerships between private landowners, state and local governments, American Indian nations, agricultural groups, non-profits and others to focus conservation assistance on local projects. Groups that address natural resource issues in New Mexico may be able to partner with NRCS to leverage dollars and expertise through the following programs:

- Agricultural Water Enhancement Program (AWEP)
- Cooperative Conservation Partnership Initiative (CCPI)
- Conservation Innovation Grants (CIG)
- Small Watershed Program
- NRCS Assistance for Acequia Associations

These programs allow NRCS to work with partners to address water quality concerns, improve conditions on a landscape scale, and/or develop innovative approaches. For example, the Arizona – New Mexico Borderlands CCPI continues to address rangeland resource concerns in southeastern Arizona and southwestern New Mexico. Cooperating entities include NRCS, BLM, State Conservation District Associations, Black Range RC&D, various state land agencies and others. Their efforts through CCPI protect and enhance aquatic resources in their area.

Another highlight in 2012 is that 1,500 acres of forest burned by the Little Bear Fire was aerially seeded near Ruidoso, through the Emergency Watershed Protection Program. NRCS also supports watershed planning. In 2012, two watershed plans were developed in Lea County focusing on soil resources in an area with little surface water.

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