

# CLEARING THE WATERS

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A QUARTERLY NEWSLETTER OF THE WATERSHED PROTECTION SECTION

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## WQCC Visits Rio Santa Barbara - New Mexico's First Outstanding National Resource Water

by Jane DeRose Bamman - SWQB, Santa Fe



Rio Santa Barbara at Pecos Wilderness Area

After being stuck in hearing rooms for years, on August 9, 2005, eight members of the Water Quality Control Commission (WQCC) ventured on a field trip to visit New Mexico's first Outstanding National Resource Water (ONRW), the Rio Santa Barbara located in the Pecos Wilderness near Penasco, NM.

The outing was hosted by New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWQB) staff so that the WQCC could experience first-hand some of the activities SWQB staff address.

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New Mexico  
Environment Department



### Great News!

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See page 7 for information about the paper and where it comes from.*



Surface Water  
Quality Bureau

[www.nmenv.state.nm.us/swqb/wps](http://www.nmenv.state.nm.us/swqb/wps)

After a welcome by Marcy Leavitt, SWQB Chief, Rachel Conn, of Amigos Bravos discussed the process for petitioning the WQCC to designate the Rio Santa Barbara as an ONRW. Ms. Conn shared that the process took about four years from the data gathering stage to the final designation effective in May of 2005.

Next, SWQB staff explained the Bureau's stream monitoring responsibilities and showed field equipment used for various monitoring needs. In addition, WQCC members were treated to an instream sampling demonstration (below). The instream demonstration also highlighted some topics that may be addressed in future petitions to amend New Mexico Water Quality Standards, such as biological criteria.



NMED staff talk with WQCC Commissioner Hutchinson (rt.) at the entrance to the Pecos Wilderness Area, the edge of the ONRW.



SWQB staff, Stephanie Stringer ( 2nd from left) explains aquatic macroinvertebrates to field trip participants.

After the stream demonstration, participants learned about local efforts to protect the Rio Santa Barbara through the management of nonpoint sources (Federal Clean Water Act section 319 projects). Cecilia Seesholtz, District Ranger for the Camino Real Forest District, (below) shared details about the Forest Service forest thinning project and grazing management practices.

Lastly, many participants hiked about one-mile from the campground to the Pecos Wilderness area to see the furthest downstream point of the designated ONRW. All the activities were accomplished before the afternoon monsoon arrived. ~

Jane DeRose Bamman is the Standards, Planning and Reporting Team leader of the Surface Water Quality Bureau in Santa Fe. She can be reached at: 505-476-3671 or [jane.derosebammen@state.nm.us](mailto:jane.derosebammen@state.nm.us)

## Bacteria Source Tracking Study

### *First of it's Kind in the Desert Southwest*

The NMED Surface Water Quality Bureau, Albuquerque Metropolitan Arroyo Flood Control Authority (AMAF-CA), Bernalillo County and Parsons Consulting are inviting the public to a meeting on the Middle Rio Grande Microbial Source Tracking Final Report. This report is the result of a 3-year study conducted by Parsons to determine the sources of bacteria in the Rio Grande and its stormwater tributaries. Current and historical surface water data have revealed exceedances of fecal coliform water quality criteria. These high levels of bacteria are associated with rainfall and runoff from rural and urban areas.

### PUBLIC MEETING

November 16, 6:30 pm - 8:30 pm;

NM Museum of Natural History & Science; 1801 Mountain Rd., Albuquerque

## Just What is an ONRW?

by Jane DeRose Bamman

**O**NRW is shorthand for “Outstanding National Resource Water.” This term specifically comes from the “antidegradation” requirements of the federal Clean Water Act regulations (40 CFR 131.12(a)(3)).

The concept of antidegradation is based on the spirit, intent, and goals of the Clean Water Act (CWA) to “restore and maintain the chemical, physical and biological integrity of the Nation’s waters” (CWA Section 101(a)). Antidegradation is specifically addressed in New Mexico’s water quality management plan in order to protect and enhance the quality of waters of the state. Antidegradation is an integral part of a State’s water quality standards program.

The water quality management plan divides the State’s antidegradation provisions into three “tiers” to ensure that waters are not further degraded. “Tier 3” provides the most protection ensuring that high quality waters designated as an outstanding National resource are not degraded. ONRWs may include, but are not limited to, surface waters of the state within national and state monument, parks, wildlife refuges; waters of exceptional recreational or ecological significance; and waters identified under the Wild and Scenic Rivers Act.

ONRWs may be waters with exceptional ecological significance and other qualifying attributes, but may not have water quality, as measured by the traditional parameters such as dissolved oxygen or pH, that is particularly high. Waters of exceptional ecological significance also include waters whose characteristics cannot adequately be described by traditional parameters (such as wetlands and estuaries).

A discharge may be allowed if it causes only temporary and short-term changes in water quality that do not impair existing uses. Such discharges must undergo antidegradation review.

The ONRW designation provides further incentive to maintain the quality of these waters into the future for the benefit of both humans and wildlife. Designation as an ONRW helps ensure that water quality is maintained or improved from the point of designation forward. ONRW designation would not limit existing uses as long as these uses do not degrade the quality of water at the time of designation.

### ONRW NOMINATION REQUIREMENTS:

From the New Mexico Standards for Interstate and Intrastate Surface Waters (20.6.4.9 NMAC), a person preparing a petition must include:

1. A map.
2. A written statement and scientific evidence that the waterbody meets the ONRW criteria listed in Subsection B of 20.6.4.9 NMAC.
3. Baseline water quality data.
4. A discussion of activities that might contribute to reduction of water quality in the proposed ONRW.
5. Any additional evidence to substantiate designation, including an analysis of the economic impact of the designation on the local and regional economy and benefit to the state.
6. Affidavit of publication of notice.



For more information about the Santa Barbara ONRW petition visit the Amigos Bravos website at:  
<http://www.amigosbravos.org/projects/cleanwatercircuitrider>

## Watershed Protection Section Adds Staff to the Las Cruces Field Office



**Chris Canavan of the SWQB  
Las Cruces office.**

Last February the New Mexico Environment Department's Surface Water Quality Bureau (SWQB) has added staff to the field office in Las Cruces to provide better service to the public, local governments, and various agencies in southern New Mexico. Staff in this office assist with watershed protection activities and review and certify 401/404 dredge or fill permits. Previously, these activities in the southeast and southwest New Mexico were coordinated by SWQB's Silver City Office. Activities in the southeast portion of the state will now be coordinated by the new project officer of the Las Cruces office, Chris Canavan. Mr. Canavan's territory will include Doña Ana and Sierra Counties east to the Texas state line and north to De Baca and Curry counties.

Mr. Canavan has been a resident of Las Cruces for the past 23 years, and while he is new to SWQB, he has worked in the environmental field for the past 10 years. He attended New Mexico State University (NMSU) where he was a double major receiving undergraduate degrees in Biology and English in 1989. After working in the Entomology, Plant Pathology, and Weed Science Department at NMSU studying rangeland weed control, Mr. Canavan returned to school and received a Masters in Interdisciplinary Studies. His graduate research examined the biogeochemical cycle of mercury at Elephant Butte and Caballo reservoirs. Following graduation, Mr. Canavan started a small environmental consulting business that conducted water quality surveys on several New Mexico reservoirs and their tributaries.

Under the Federal Clean Water Act section 319(h) program, Mr. Canavan is working with the Sierra Soil and Water Conservation District and Taylor Creek Watershed Committee on rehabilitation activities in several drainages near the headwaters of Gila River's East Fork. These activities include identification and implementation of best management practices in the riparian corridor and adjacent areas to improve water quality in the watershed. Mr. Canavan is also assisting several groups in submitting grant proposals to conduct 319(h) restoration work in the lower Rio Grande and Tularosa Basin, as well as overseeing 401 activities in southeastern New Mexico. ~

*The Las Cruces office is located at 1170 N. Solano Dr., Suite M.*

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## Students & Teachers Spend a Week of Their Summer Vacation Studying the Rio Ruidoso

For most middle and high school kids, the last thing they want to do over summer break is study, much less spend a week doing so with their teachers; but that is exactly what 20 students and 19 teachers did this past July. New Mexico teachers each selected one or two of their students to join them at the 2005 Summer Environmental Academy in Ruidoso New Mexico. This unique annual program is run by New Mexico State University's WERC program, a consortium for environmental education and technology development. The focus this year was on water quality in the Rio Ruidoso Watershed and participants learned about everything from land use practices to water chemistry and aquatic biology. The groups also conducted 3 day, mini research project on the water quality of Rio Ruidoso with the aid of their week long "mentors" from the Surface Water Quality Bureau and Los Alamos National Lab. Guest lecturers included a local rancher, and representatives from the US Forest Service, Mescalero Apache Tribe, NM State Land Office, NM Game and Fish, the National Resource Conservation Service, NM Watershed Watch, and the Rio Ruidoso Watershed Association. Everyone had a great week - the students found that spending a week on a river with your teacher (and a bunch of other kids) can actually be fun, and teachers came away with a lot of great ideas for continuing water quality studies in their classrooms. ~

## Vegetation and Hillslope Erosion Key to Mangas Creek Water Quality Study

Adapted from a draft report<sup>1</sup> by Bill Wells, Gila NF and Mike Matush, SWQB Silver City

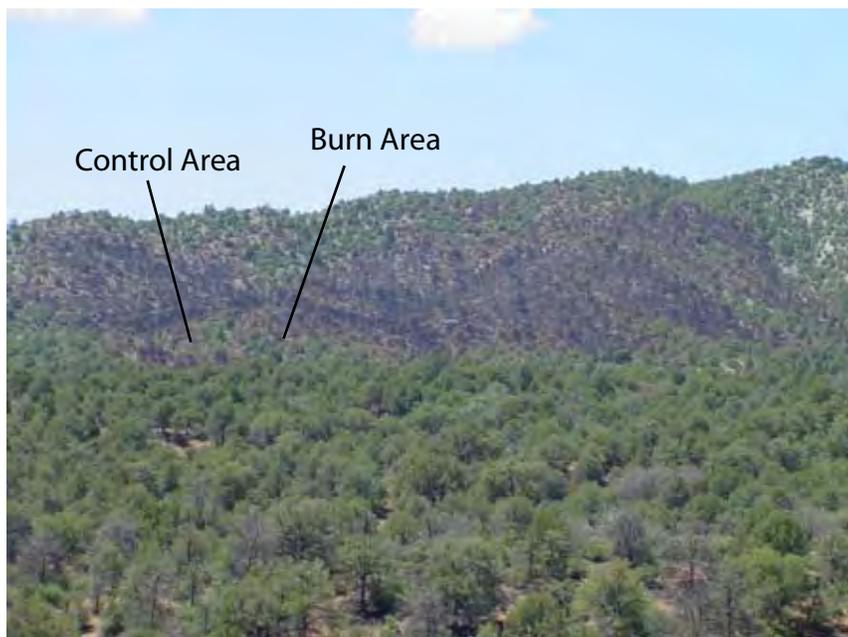
Over the last 100 years, the Big Burro Mountains located near Silver City, New Mexico have been undergoing a decrease in the herbaceous plant community and a subsequent increase in woody plant species such as Pinyon Pine, Juniper, and Gray Oak. Possible explanations for the change in vegetation may include an absence of fire (wild or prescribed), aggressive fire suppression tactics, grazing management, climate changes, and recreational use. The increase in woody species has resulted in a reduction of herbaceous ground cover and a higher percentage of bare soil.

The Big Burro Mountains area consists of numerous unnamed ephemeral streams and occupies a large percentage of the 250 square mile Mangas Valley watershed. Mangas Creek is located within the Mangas Valley watershed and is listed by the New Mexico Environment Department's Surface Water Quality Bureau (SWQB) as not meeting state water quality standards. The lack of adequate ground cover in the Big Burro Mountains may be resulting in a significant amount of sediment emptying into the numerous ephemeral tributaries of Mangas Creek and may be an indirect contributor to its listing on the 2004-2006 New Mexico 303(d) list of impaired water bodies (Gila River to Mangas Springs reach).

303(d) refers to a section of the federal Clean Water Act which requires states to publish a list of waters that do not meet state standards. This list is available on the SWQB website:

[www.nmenv.state.nm.us/swqb/mas](http://www.nmenv.state.nm.us/swqb/mas)

In collaboration with the Grant Soil and Water Conservation District (GSWCD) and SWQB, the Gila National Forest is attempting to improve watershed conditions through the introduction of prescribed fire into the ecosystem of the Big Burro Mountains under the non-point source management program known as the Mangas Water Quality Project. The Bullard Peak prescribed burn, conducted June 6-8, 2004, was meant to remove much of the existing woody vegetation and allow for the natural reestablishment of herbaceous ground cover. This would then lead to a reduction in the amount of erosion occurring on the surrounding hillslopes and ultimately decrease the amount of sediment yield reaching the ephemeral tributaries of Mangas Creek.



**Bullard Peak prescribed burn area.**

Shortly after the Bullard Peak Prescribed Burn began, a monitoring program was put in place to measure soil loss on the surrounding hillsides. The monitoring site is a North facing hillslope consisting of a 0.4 acre burned (Burn Area) hillslope and a 0.33 unburned or Control Area adjacent to the burned area (photo at left). The area burned in a mosaic pattern with varying degrees of intensity. In the high intensity burn areas, such as the one selected for this project, there was nearly complete removal of canopy and ground cover. Within this area, expected soil erosion may be very high and recovery of herbaceous ground cover may take several years to become reestablished assuming an adequate native grass seed source exists. Following the prescribed burn approximately 100 lbs. of

a native grass seed mixture was spread by hand throughout the area, included a small portion of the Burn Area. It remains to be seen whether the reseeding effort has been successful as it may take several growing seasons to notice a substantial change. However, areas that did receive seed appear to have a

*continued on page 6*

higher density of new growth and are expected to recover faster and better than those areas that did not receive any additional seed.



A 3-F Erosion Bridge installed in the Burn area, Oct. 29, 2004

## METHODS

Two methods for measuring sediment yield were adopted for this project. These included the 3-F Erosion bridge for measuring observed sediment yield and the Hillslope Erosion Model (HEM)<sup>2</sup> to provide predicted values of sediment yield. The 3-F erosion bridge is an onsite method for evaluating soil loss caused by sheet, rill and gully erosion on a given area; it is inexpensive, easily transported and setup, simple to use, accurate, reliable, and effective in yielding valid data. This method can express results in tons per acre per year or in tons per project area per rainfall event. The Hillslope Erosion Model (HEM) was selected as a suitable model based upon the nature of the problem, available data, computing resources, cost, and USDA Forest Service recommendation. The HEM provides predictions of sediment

yield produced by rainfall events. It will simulate erosion processes along the hillslope and will return runoff volume, sediment yield, interrill detachment, rill detachment, rill deposition, and the mean concentration of sediment in the flow for each hillslope segment. An Onset Computer Corporation rain gauge with HOBO data logger was installed in the project area and has been providing precipitation data since July 27, 2004. Runoff, a required input of the HEM, is calculated from precipitation data using the SCS Curve Number Method.

## PRELIMINARY RESULTS

Although precipitation data has been collected since late July 2004, Profiles were not established until early February 2005. Between February 10, 2005 through May 28, 2005 there have been a total of 4 precipitation events large enough to produce runoff, according to SCS Curve Number calculations, and which also resulted in measurable soil loss or sediment yield (Fig. 1). After each of the 4 precipitation events, onsite measurements of soil loss from each erosion bridge was measured and recorded.

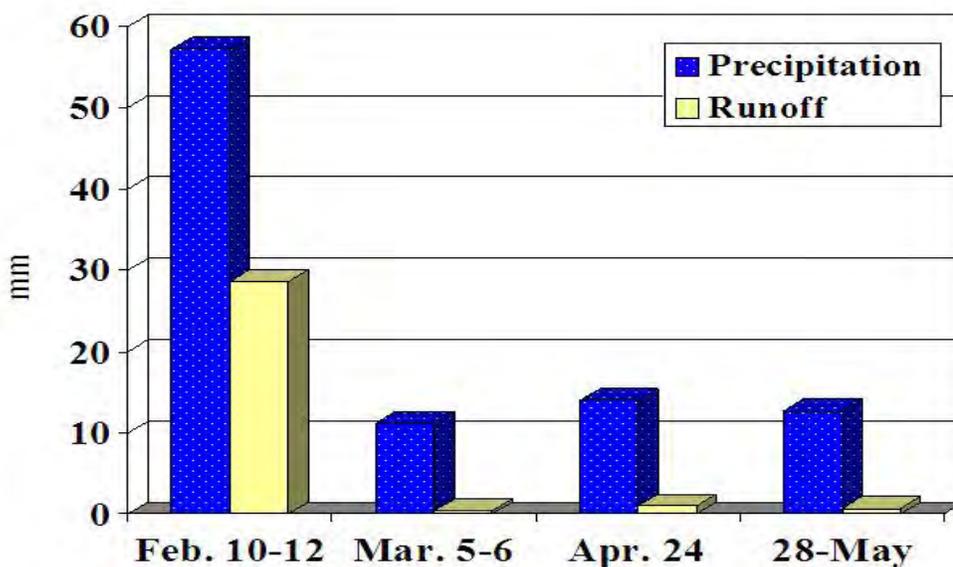


Fig. 1. Precipitation and runoff data (mm) from burn and control site.

An estimate or prediction of the sediment yield can be determined for each of the 4 precipitation events using the HEM required inputs such as percentage of ground and canopy cover, slope gradient and length, soil texture class, an optimized soil erodibility value, number of segments, and runoff. Shown in Figure 2 (above right) is a comparison of the average observed and predicted sediment yield for each of the 4 precipitation events for the Burn area the Control area.

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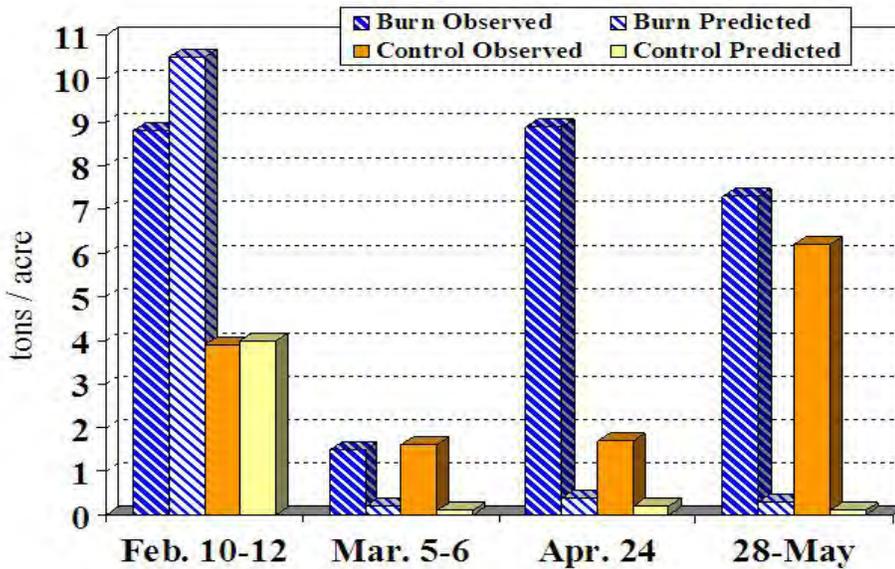


Fig. 2. Observed and predicted sediment yields from burn and control site.

The precipitation event that occurred in February totaled 2.25 inches and lasted for 48 hours. The following storms all measured between 0.44 and 0.55 inches. In addition, they also lasted for a much shorter time period. From these 4 precipitation events, several observations can be made: a) the HEM can accurately predict sediment yield on large precipitation events and is unreliable for use on small precipitation events within this project area, b) the Burn area, as expected, has greater soil loss, and c) sediment yield with smaller precipitation events varies widely in both project areas and may be more a function of precipitation intensity rather than precipitation amount.

### CONCLUSION AND RECOMMENDATIONS

Early indications are that the Hillslope Erosion Model can be an accurate and reliable tool for sediment yield predictions on large precipitation events, but not necessarily for smaller precipitation events. This conclusion is based upon only 4 precipitation events and additional precipitation events, especially between 0.5 to 2.25 inches are needed to determine the required minimum precipitation amount needed to allow for accurate and statistically valid predictions of sediment yield.

Ground cover has the most significant impact upon sediment yield predictions and the expectation is that the Burn area will revegetate with herbaceous vegetation from existing seed with soil loss eventually decreasing below that of the Control area. Those areas that received the native grass seed mixture are expected to recover the quickest with herbaceous vegetation and may develop into a third monitoring area should a significant difference develop in the percentage of ground cover between it and the unseeded Burn area. ~

1. A complete model and final report for this project will be completed by the end of this year. Please contact either Bill or Mike if you are interested in obtaining a copy.
2. Additional information about the HEM, including a link to running the model and selected reference documents, can be found at: <http://eisnr.tucson.ars.ag.gov/hillslopeerosionmodel>

Bill Wells is a hydrologist with the Gila National Forest. He can be reached at [bewells@fs.fed.us](mailto:bewells@fs.fed.us).

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**When it comes to protecting our environment and natural resources, the Surface Water Quality Bureau wants to do our part!**



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## UPCOMING EVENTS

### Nov. 16

Bacteria Source Tracking Study - public meeting to discuss results of the project. 6:30-8:30 pm; NM Museum of Natural History & Science, 1801 Mountain Rd. SW, Albuquerque. (contact: the SWQB at 505-476-1866)

### Dec. 13

Water Quality Control Commission to hold public hearing regarding the Outstanding National Resource Water (ONRW) nomination of Valle Vidal's waters. (Time and location to be determined; check with Amigos Bravos or the WQCC for more info)

### Jan. 12-14, 2006

Quivira Coalition's 5th Annual Conference - Bridging the Urban-Rural Divide: Re-connecting People to Land and Each other; Albuquerque Hilton (Check Quivira's website soon for more info)

### *Contacts for more information on upcoming events:*

**Amigos Bravos: 505-758-3874; [www.amigosbravos.org](http://www.amigosbravos.org)**

**Quivira Coalition: 505-820-2544; [www.quiviracoalition.org](http://www.quiviracoalition.org)**

**Water Quality Control Commission: 505-827-2425; [www.nmenv.state.nm.us/wqcc](http://www.nmenv.state.nm.us/wqcc)**



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