Clearing The Waters

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A Quarterly Newsletter of the Watershed Protection Section

In this issue....

New Mexico Environment Department

Surface Water Quality Bureau

Valle Vidal - Outstanding National Resource Waters!

by Jane DeRose-Bamman, SWQB

In December 2005 and January 2006, the NM Water Quality Control Commission (WQCC) took action to protect the waters of the Valle Vidal from further water quality degradation. The surface waters within the U.S. Forest Service Valle Vidal Special Management Unit are now designated Outstanding National Resource Waters or "ONRWs". This designation creates the second ONRW in the State of New Mexico. The first is the Rio Santa Barbara, which the WQCC approved in early 2005.

Continued on Page 2

See CTW Fall 2005 for an in-depth description of ONRW desigantion and information on the recent Rio Santa Barbara ONRW

The Valle Vidal

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- CTW is also available on our website:

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

New Mexico Riparian Council Awards SWQB Staff Member, David Menzie

New Mexico Riparian Council presented David Menzie with the Habitat Enhancement Award at their Annual Award Ceremony on Tuesday October 18th, 2005. The ceremony was held in Albuquerque in conjunction with the Joint State/Federal Wetland and Riparian Area Legal Workshop: *Identifying "Waters of the U.S." after SWANCC* (refers to: Solid Waste Agency of Northern Cook County - US Supreme Court 2001 wetlands ruling).

The Habitat Enhancement Award is given to a person, group, or business in New Mexico who has contributed significant amounts of time to the enhancement of riparian ecosystems.

Menzie is a geological engineering specialist with the Surface Water Quality Bureau of the NM Environment Department out of Silver City. He has contributed to many watershed restoration projects throughout the state in the course of his career. His expertise in geology, augmented with Rosgen training is a powerful suite of knowledge. He has reached out to help identify and procure funding for watershed restoration projects and has helped Soil & Water Conservation Districts to establish monitoring protocols that they will be able to share with others.

One nominator stated: "Dave is a true public servant working on behalf of the people and watershed of New Mexico". Another nominator noted that "He is very dedicated to his fieldwork" and that he "has been an invaluable asset to all of us doing watershed enhancement work in southwest New Mexico for as long as I can remember".

Valle Vidal ONRW *continued from page 1...*

The Valle Vidal lies within the Carson National Forest of Taos and Colfax Counties and is one of New Mexico's most prized areas. Donated to the people of the United States by the Pennzoil Corporation in 1982, the Valle Vidal hosts activities such as trophy elk hunting, fly fishing, horseback riding, hiking, bird watching, and cross country skiing. Water is the lifeblood for all the area's terrestrial and aquatic wildlife populations. The streams of the Valle Vidal flow into two major drainages, the Rio Grande and South Canadian, and are home to New Mexico's state fish, the Rio Grande cutthroat trout.

ONRWs are waters that possess ecological or recreational significance. Designation as an ONRW helps ensure that water quality is maintained or improved from the point in time of designation to protect water quality for existing uses. ONRW designation would not limit existing uses as long as these uses do not degrade water quality from the levels at the time of designation.

Being aware of the valuable resource of the Valle Vidal and having the desire to protect the resource, in early 2005, Governor Richardson requested three NM State Agencies (the Departments of Game and Fish, Environment, and Energy, Minerals & Natural Resources) to develop the documentation for nominating the waters of the Valle Vidal as ONRWs. The parties petitioned the WQCC in October 2005 to designate the new ONRW.

The WQCC held a hearing December on the nomination petition. The Coalition for the Valle Vidal provided technical testimony in support of the designation and numerous citizens provided public comment during the hearing, mostly in support of the designation. The change to the NM Water Quality Standards rules for the Valle Vidal ONRW designation became effective on February 16, 2006. ~

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Rio Grande Cutthroat Trout

Nutrient Criteria Development in New Mexico

By Shelly Lemon, SWQB

Photo 1: Example of algae growth in a wadeable stream (Gila River, NM)

Nutrients, such as phosphorus and nitrogen, are essential for proper functioning of ecosystems. Rain, overland runoff, groundwater, drainage networks, and industrial and residential waste effluents all transport nutrients to receiving waterbodies. Once nutrients enter a waterbody they can be taken up by algae, other aquatic vegetation (macrophytes), and microorganisms either in the water column or in the stream bottom sediment (Photo 1); they can sorb to organic or inorganic particles in the water column and/or sediment; they can accumulate or be recycled in the sediment; or they can be transformed and released as a gas from the waterbody (denitrification).

In contrast, *excess* nutrients cause conditions unfavorable for the proper functioning of aquatic ecosystems. Nuisance levels of algae and macrophytes can develop rapidly in response to nutrient enrichment when other factors (e.g., light, temperature, substrate, etc.) are not limiting. The relationship between nuisance algal growth and nutrient enrichment in stream systems has been well documented in the literature. Unfortunately, the magnitude of nutrient concentration that constitutes an "excess" is difficult to determine and varies by ecoregion.

In a national report to congress, the U.S. Environmental Protection Agency (EPA) reported that nitrogen (N) and phosphorus (P) concentrations are among the leading causes of water quality impairment in the U.S. Nutrient impairment occurs when algal and macrophyte growths interfere with designated uses such as contact recreation, domestic water supply, or high quality coldwater aquatic life. According to the report, 40% of rivers/streams and 51% of lakes/reservoirs in the U.S. have designated use impairments from excess nutrients, resulting in excessive algal growth.

Nutrient impaired waters can cause problems that range from annoyances to serious health concerns. Documented impacts that can be attributed to nutrient impairment include:

- Taste and odor problems in drinking water supplies
- Increased treatment required for drinking water
- Human health problems, such as blue baby syndrome and non-Hodgkin lymphoma
- Adverse ecological effects, such as large diurnal swings in dissolved oxygen (DO) and pH and reduction of habitat utilized by aquatic organisms by smothering or clogging
- Harmful algal blooms (e.g., brown tides, toxic *Pfiesteria piscicida* outbreaks, and some types of red tides)

Currently, the State of New Mexico's Water Quality Standards has narrative criterion to determine nutrient impairment, which states:

> *"Plant nutrients from other than natural causes shall not be present in concentrations which will produce undesirable aquatic life or result in a dominance of nuisance species in surface waters of the state" (NMAC 2005).*

This narrative criterion can be challenging to assess because the relationships between nutrient levels and impairment of designated uses are not defined, and distinguishing nutrients from "other than natural causes" is difficult. Therefore, in 2002 the NM Environment Department's Surface Water Quality Bureau (SWQB) developed a Nutrient Assessment Protocol to assist in meeting these challenges. ***Continued on Page 4***

Nutirents *continued from page 3...*

The protocol was developed for wadeable streams because they represent the majority of assessed surface waters in the state. While this protocol was successfully applied and used to develop 100% non-point source Total Maximum Daily Loads (TMDLs), it lacked impairment thresholds and quantitative endpoints necessary to develop TMDLs with both point and non-point sources. It addressed both cause (total nitrogen and total phosphorus) and response variables (dissolved oxygen, pH, periphyton, chlorophyll a, and benthic macroinvertebrate metrics) but did not result in quantifiable values that could be used as targets for TMDLs and associated waste load allocations for point source dischargers.

To address these deficiencies, the SWQB with assistance from the EPA and the U.S. Geological Survey (USGS) refined the Nutrient Assessment Protocol in 2004 using a weight-of-evidence approach (i.e. using both cause and response variables). The weight-of-evidence approach was adopted to conduct a more robust assessment and to account for diverse stream habitats as well as dynamic nutrient cycling. Analysis of existing data and literature reviews were utilized to develop impairment threshold values for each of the cause and response variables used in the assessment protocol. The threshold values are used to translate the current narrative nutrient criterion into quantifiable endpoints, which can be used in the development of TMDLs.

The SWQB has compiled a wadeable streams dataset for New Mexico using data from the National Nutrient Database. Data from other sources such as current and historical water quality monitoring data from Federal, State, Tribal, and local water quality agencies and university studies will also be incorporated into the dataset. Furthermore, the survey of fifty reference sites in 2004 and forty-seven reference and test sites in 2005 will contribute significantly to the dataset. Data will continue to be collected by the SWQB as part of the nutrient criteria development project and intensive water quality surveys. Sampling will focus on reference and test sites in the various stream classes and waterbody types. A subset of sites will be monitored seasonally and over multiple years to examine inter- and intra-year variability.

The SWQB is currently fine-tuning the threshold values for wadeable streams with regional data and exploring improved stream classification systems. Once the threshold values have been thoroughly tested, the refined values for wadeable streams will be proposed for adoption into the New Mexico Water Quality Standards in accordance with the New Mexico Water Quality Control Commission (WQCC) and the procedures set forth in the New Mexico Water Quality Act and Water Quality Management Plan (NMWQCC 2002). The SWQB has started development of weight-of-evidence approaches for lakes/reservoirs and non-wadeable rivers in order to eventually propose nutrient criteria for these unique waterbody types as well.

With recognition of the pervasiveness and severity of nutrient-related problems, the need to accurately monitor and assess nutrient impairment and develop effective TMDLs for impaired waters is clear. Numeric translators, or threshold values, are necessary to accurately assess waters of the state. ~

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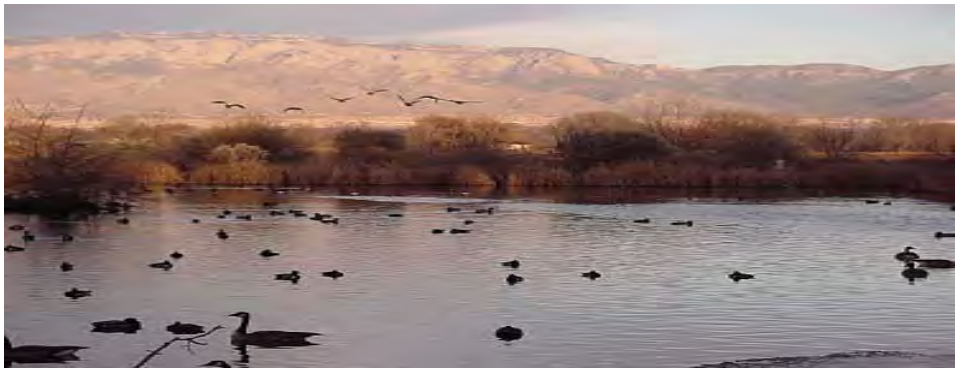


The Nutrient Assessment Protocol can be found on our website at: www.nmenv.state.nm.us/swqb/protocols/e.pdf

New Mexico's Nonpoint Source Management Program - 2005 Annual Report Highlights

The recently completed Nonpoint Source (NPS) annual report provides an overview of NPS management related activities conducted around New Mexico between January and December, 2005. The report identifies programs and actions which address specific nonpoint source pollution problems and help address the goals and objectives outlined in the NMED Surface Water Quality Bureau's (SWQB) NPS Management Program Plan.

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

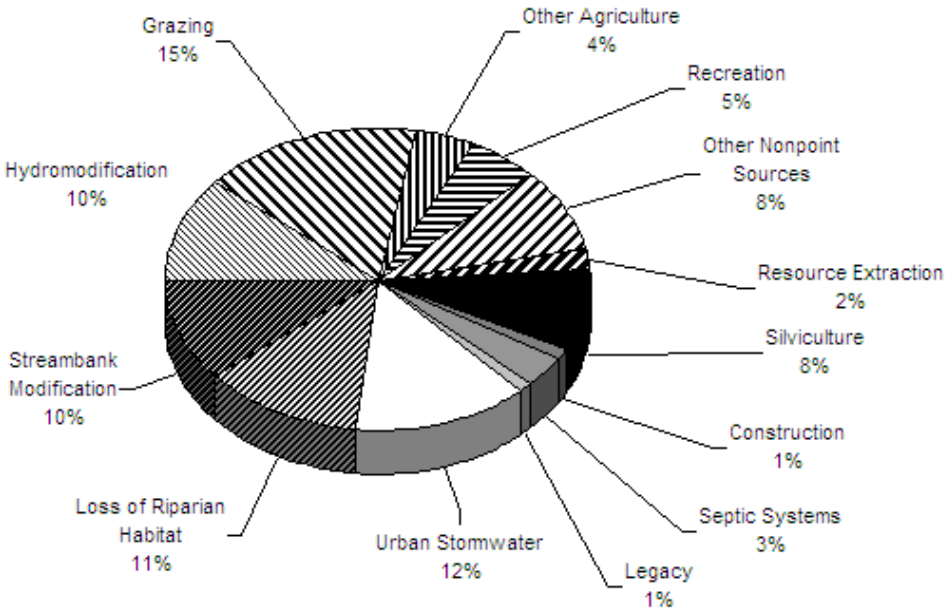
Nonpoint source pollution is the leading cause of water quality degradation in the United States and poses a substantial problem for the health of New Mexico's streams and rivers. When congress amended the Clean Water Act (CWA) in 1987, section 319 was added to establish a national program to control nonpoint sources of pollution. Under §319 (h) funds are made available to state and local agencies, non-profit organizations, and citizen watershed groups to address nonpoint source water pollution.

Section 319 contains three main strategies for addressing polluted runoff:

- Require states to prepare assessments of NPS pollution problems
- Require states to develop management programs to address NPS issues
- Create a grant program allowing EPA to fund state programs for nonpoint source assessment and control.

Continued on Page 6...

Principal Sources of Surface Water NPS Pollution in New Mexico:



Nearly 95% of water quality impairment identified in New Mexico's streams & rivers is due to nonpoint sources (NPS) of water pollution. Nonpoint sources also account for widespread ground water contamination in New Mexico. Hydromodification may affect attainment of state water quality standards by diverting water out of stream channels, by impounding waters, and through channelizing and dredge-and-fill activities.

The 2005 New Mexico Nonpoint Source Annual Report is available on our website at: www.nmenv.state.nm.us/swqb/wps or by calling 505-476-1866

NPS Annual Report continued from page 5...

The SWQB NPS Management Program goal is to implement progressive watershed-based restoration and protection programs with the active assistance of all stakeholders, for all watersheds within New Mexico in order to meet water quality criteria that will fully protect designated uses as described in the NM Water Quality Standards.

The NPS Management Program focuses on:

- The Watershed Restoration Action Strategy (WRAS) (also known as a watershed implementation / management plan) for coordinating watershed restoration efforts
- Fostering watershed associations
- Partnerships with agencies, entities, & the public
- Implementing total maximum daily loads (TMDLs)

The program also relies on established resource protection, nonpoint source pollution prevention programs, and activities of other land management / resource protection agencies. The SWQB identifies programs and activities that will facilitate the achievement of surface water quality criteria and uses a voluntary approach to achieve water quality improvements. Incentives to voluntarily implement projects and restoration efforts include competitive grant funding through section 319 (h) of the federal Clean Water Act and technical support and guidance through the SWQB. ~

The 2005 NPS Annual Report summarizes projects completed in 2005 by SWQB program cooperators and by other agencies (Bureau of Land Management, Natural Resource Conservation Service, NM Dept. of Transportation, NM State Land Office, and US Forest Service).

Examples of 319 (h) grant program projects completed in 2005 include:

Valle Grande Grass Bank Water Quality Improvement Project

Pecos Headwaters Watershed

NPS issues: overgrazing
303(d) listed impairments: Conductivity (Willow Cr.), Sedimentation (Cow Cr., Willow Cr., & Rio Tusas), Temperature (Cow Cr.), Turbidity (Cow Cr.)
Project Type: Rangeland management, rest from grazing

Project Description:
This project provided the Best Management Practice (BMP) of rest from grazing for four grazing allotments on the Santa Fe and Carson National Forests. From 2001 to 2005, the Valle Grande Grassbank (located on the east side of Rowe Mesa, Santa Fe National Forest) hosted a total of 1,133 head of cattle from four allotments utilizing approximately 5,665 animal unit months of forage. Selected participating allotments were those with need for restoration and with merit for a combination of successful treatments on National Forest lands. The project also helped the Valle Grande Grassbank grow into a stable institution, with more diverse funding base and a promising future for supporting sustainable ranching in northern New Mexico.

East fork of Rio Santa Barbara - By fostering careful management of the grazing resource within its watershed, the project helped preserve the qualities of this special river.

Taylor Creek, Upper Gila Watershed Restoration Project

NPS issues: over grazing, fire suppression, watershed geology, and loss of riparian vegetation
303(d) listed impairments: Aluminum, temperature, turbidity (Taylor Creek)
Project Type: Watershed Group Formation & WRAS development

Project Description:
The objective of this project was to form a watershed group of local stakeholders, and develop a holistic watershed management plan to improve watershed health and water quality based upon best management practices, by identifying objectives and goals that are feasible, attainable, and beneficial to the stakeholders. Sierra Soil & Water Conservation District took the lead role in developing a workgroup to address nonpoint source issues within the Upper Gila watershed. Project outcomes included: formation of Taylor Creek Watershed Committee; initial watershed assessment (sediment yield survey, sedimentation survey on Wall Lake); initial restoration work (stream barbs installed on Taylor Creek for bank stabilization and redirect flow away from an existing cut bank); and development of a WRAS (available at: www.nmenv.state.nm.us/swqb/wps under dropdown menu for "Watershed Planning").

Galisteo Watershed Restoration Project, Phase 2

Rio Gande-Santa Fe Watershed

NPS issues: Stream channel modifications (that have led to bank collapse), poorly managed grazing on rangelands, woodlands, and riparian areas, and urban development impacts that lead to accelerated runoff and soil erosion.
303(d) listed impairments: Conductivity, temperature (Galisteo Creek)
Project Type: Riparian restoration, shading, streambank stabilization

Project Description:
This project with Earth Works Institute (EWI) of Santa Fe, is a continuation of the group's successful 2000 NPS project. The goal of these projects have been to develop a working landscape in the watershed that reflects people's sense of stewardship and caring for the land. The watershed's size, impacts of rapid urban development, and relative unfamiliarity of many landowners with local climate and landscape conditions underscore this need. Deterioration of the watershed has been overlooked for a long time, and this is the only program of its kind in the entire watershed. The project resulted in several outcomes which included:

- Development & distribution of technical field guides, outreach and education materials (Induced Meandering Field Guide and the Rangeland Health Field Guide)
- Development of a managed grazing plan for various pastures in the watershed
- Proved effectiveness of stream restoration techniques (induced meandering) for most moderately impacted stream reaches in watershed (may not work for severely impacted reaches with steep cut banks, unnaturally long river bends, and/or excessively high peak flows)
- Development Landscape Management Assistance Services Program to provide future follow-up services to existing restoration areas, private landowners, communities, and public land management agencies.

A sand bag erosion control technique: Large jute bags, filled with partly decomposed wood chips, on-site dirt, & native seed mixes applied at 2 demonstration sites. The technique (developed & tested at EWI ranch in 2004 & 2005) promises to be effective, but needs to be tested and monitored for several years to prove long-term viability.

2006 Events calendar

March

- **Stream Team, 2006 Kick-off-Party**: (March 2, Santa Fe; March 9, Albuquerque). More info: Forest Guardians 988-9126 or www.forestguardians.com
- **Xeriscape Conference:** (March 9-11, Albuquerque) www.xeriscapenm.com
- **Riparian Restoration & Erosion Control Along the Dry Cimarron:** (March 24 & 25, Folsom) with Bill Zeedyk & Steve Carson. More info: Quivira Coalition, 820-2544 or www.quiviracoalition.org

April

- **Riparian Restoration & Erosion Control Along Cedro Creek:** (April 1, 2, & 22, Tijeras Canyon - E. of Abq.) with Bill Zeedyk & Craig Sponholtz. More info: Quivira Coalition, 820-2544 or www.quiviracoalition.org
- **Stream Team - Rio Puerco Planting (Earth Day!):** (April 22). More info: Forest Guardians, 988-9126 or www.forestguardians.com
- **Gila River Water Festival:** (April 5 & 6, Silver City. More info: SWQB field office, Mike Matush 388-0599

June

- **Workshop series: Exploring the Spirit of our Dry Landscape:** (June 18, Cerrillos) Site Assessment & Planning with Jan-Willem Jansens; (June 25, Cerrillos) The Art of Dryland Planting with Craig Sponholtz. More info: Earth Works Institute, 982-9806 or www.earthworksinstitute.org

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