CLEARING THE WATERS

A quarterly newsletter by the Surface Water Quality Bureau

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Editor:
Susan j. Styer
susan.styer@state.nm.us

If you would like to receive this newsletter by email or be removed from the mailing list, please contact Cassie J. Salazar at Cassie.Salazar@state.nm.us.

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319 Project Spotlight
Nonpoint Source Success Story

Management Efforts on Public Land Restored Riparian Zone and Reduced Water Temperature in Jaramillo Creek

By Daniel Guevara, Environmental Scientist

Jaramillo Creek was once a productive trout fishery on the Valles Caldera National Preserve in northern New Mexico. Fish surveys conducted in 2003 showed a dramatic decline in water quality, and the stream was listed as impaired for temperature, turbidity, and aluminum. Beginning in 2011, the New Mexico Environment Department funded multiple stream restoration projects. The watershed group Los Amigos de Valles Caldera used plug-and-pond methods to raise the water table and restore wetlands. They also installed in-channel structures to prevent erosion and sedimentation. Another project implemented by WildEarth Guardians protected riparian areas by planting native vegetation and constructing cattle and elk exclosures. As a result, Jaramillo Creek was delisted for temperature in 2016. The creek remains listed for turbidity, aluminum, and nutrients. NMED expects the creek to continue improving as the vegetation matures and riparian conditions improve.

Problem

The NMED conducted a special water quality survey in 2001–2002 when the Valles Caldera National Preserve was transferred from private to public land ownership. This survey indicated water quality problems; as a result, NMED listed Jaramillo Creek as impaired for temperature, turbidity, and aluminum. The creek was failing to meet its designated use for High-Quality Cold Water Aquatic Life. Historically, Jaramillo Creek had been a productive trout

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Jaramillo Creek *continued from page 1*

fishery, but a 2003 fish survey captured only two fish in the project reach, compared with a similar reach on the nearby East Fork Jemez River where 279 fish were found. The probable sources of impairment on Jaramillo Creek included road runoff, rangeland grazing and wildlife use.

Story Highlights

The successful restoration of Jaramillo Creek results from several projects, including meadow wetland restoration, fencing and planting (*Figure 1*). First, Los Amigos de Valles Caldera completed a project to preserve and restore high elevation slope wetlands using the plug-and-pond method, which involves plugging an incised channel with excavated soil from meadow sediments and creating small ponds as a by-product (*Figure 2)*. This method restores sheet flow to meadow surfaces during spring runoff and other high-flow events. Los Amigos de Valles Caldera successfully restored wetlands and retained sediment by installing plug and pond structures at 25 sites, with 10 built by hand and 15 with heavy machinery. Additional post-fire sediment and turbidity pollution prevention was achieved by installing one-rock dams at 25 sites, sod clump bank protection at 10 sites, Zuni Bowls at two headcuts, and rolling dips and trial drains at seven sites.

Figure 1. Volunteers plant native species along Jaramillo Creek in the Valles Caldera National Preserve.

Subsequently, the WildEarth Guardians, with help from the New Mexico Youth Conservation Corps, planted native riparian vegetation on a 2.3 mile reach of Jaramillo Creek with over 60,000 willow stems, which exceeded the workplan objective. Additionally, they mixed in 400 cottonwood, 400 thinleaf alder, 400 aspen, and additional forage species. They constructed nine exclosure fences that protected a total of 43 acres of newly restored riparian habitat. Crews also built small exclosures to protect individual cottonwood and aspen from rodent depredation.

Results

The many projects that have been implemented in Jamarillo Creek have helped improve the water quality. The Surface Water Quality Bureau at NMED has measured stream temperature on Jaramillo Creek to monitor the effects of these projects since 2012. The surveys showed decreases in temperature; the creek met all criteria for High-Quality Cold Water Life Use, including maintaining a maximum temperature below 23°C. As a result, Jaramillo Creek was delisted for temperature impairment in 2016. The creek met temperature criteria during 2017 as well (*Figure 3*).

Keystone Restoration Ecology monitored additional effects of the Los Amigos de Valles Caldera project. Before and after project photo point monitoring shows that the plug-and-pond treatments successfully spread water and restored wetlands (*Figure 2*). The Bank Erosion Hazard Index, which evaluates the susceptibility of stream banks to erosion, showed that the average score for treated banks dropped from 31 (high) to 8 (very low).

KEYSTONE RESTORATION ECOLOGY

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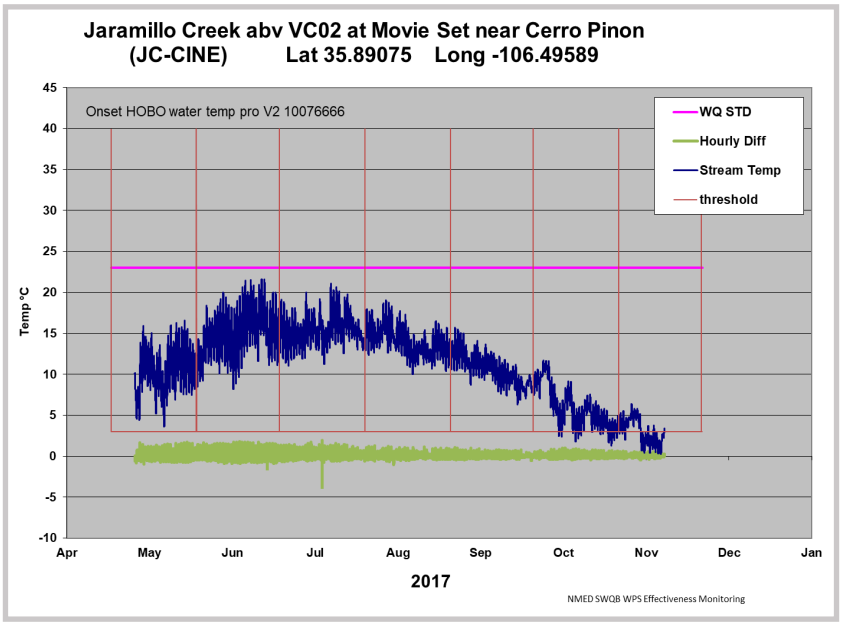
Jaramillo Creek *continued from page 2*

Figure 2. Jaramillo Creek before (top) the plug-and-pond treatment and after (bottom) .



Monitoring by Timberline Environmental for WildEarth Guardians indicates that over 75 percent of the riparian species planted have survived, and they are expected to further enhance shading as they mature. Shade has significantly increased within the project area, with densiometer monitoring indicating that shade has increased to 49.5 percent, which is greater than the 30 percent objective. Enhanced shading due to the high survival rate of riparian plantings have contributed to lower water temperatures in Jaramillo Creek. The exclosures that were constructed to protect plantings and alter resource use by livestock and wildlife have been successful. The exclosures are protecting the native riparian woody plantings as well as the existing herbaceous vegetation from the impacts of grazing, which has allowed the opportunity for the vegetation to grow and shade the creek.

Partners and Funding

The primary partners on the restoration projects were Los Amigos de Valles Caldera, Keystone Restoration Ecology, WildEarth Guardians, Timberline Environmental, New Mexico Youth Conservation Corps and the Valles Caldera National Preserve. The total Clean Water Act Section 319(h) funding for these projects was $596,746, and the projects were managed by the Watershed Protection Section of NMED SWQB.

Figure 3. The 2017 thermograph for Jaramillo Creek downstream of the restoration reach shows that temperatures have remained below the standard.

USDI Bureau of Land Management
Taos Field Office 2018 NPS Activities

Prepared by Ryan Besser: Fisheries, Riparian, and Water Resources

The Bureau of Land Management (BLM) Taos Field Office conducted multiple activities that reduce nonpoint source pollution in fiscal year 2018. These activities included; water resources, fisheries and wildlife, range, fire, and forestry.

Fisheries, Riparian, and Water Resources

Water Quality:

The Fisheries, Riparian and Water Resources Program monitors water quality including pH, turbidity, water temperature, conductivity, total dissolved solids, dissolved oxygen, phosphorus, and salinity. Water quality is tested at eleven sites starting at the Colorado State line to Velarde, NM including six sites along the Rio Grande, two sites on the Rio Embudo, one site on each of the Rio Pueblo de Taos, Rio Hondo, and Red River. The parameters are important to determine if there are increases in non-point source pollution as well as aquatic ecological health.

Thermographs:

Thermographs are deployed at 15 sites that include; Agua Caliente Creek, Rio San Antonio, Rio de las Trampas, Mora River, Santa Fe River, Santa Cruz River, five sites on the Rio Grande, two sites on the Chama, and two sites on the Rio Embudo. Thermographs are important to monitor for potential nonpoint source pollution that can contribute to higher temperatures such as erosion, runoff, deforestation and other man-made influences. These thermographs record water temperature every hour throughout the year to monitor temperature changes in our waterways.

Staff collecting water quality data.

Springs and Seeps Inventory and Surveys:

The Fisheries, Riparian and Water Resources Program surveyed 46 springs and seeps in 2018 including mapping locations, computing area, flow rate, microhabitat characteristics, geomorphology, water quality, riparian flora and cover, invertebrates, and vertebrates. Proper functioning condition of springs and seeps are important to control erosion and filter pollutants, improving water quality; filter sediment and aid floodplain development; and improve floodwater retention and ground water recharge. Information on springs and seeps can be found at https://springsdata.org/.

Surveying a spring ecosystem.

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***BLM** continued from page 4*

Environmental Education:

The BLM Taos Field Office Fisheries, Riparian and Water Resources Program participates in multiple environmental education outreach programs discussing aquatic and riparian habitats and the relationships with mitigating nonpoint source pollution.

Envirothon

The Envirothon is a competition for high school aged students that covers five topic areas: aquatic ecology, soils and land use, forestry, wildlife, and a current environmental issue. The Taos Field Office Fisheries, Riparian, and Water Resources Program participates yearly as mentors to the students in preparation for the State and National competitions. The Envirothon is a vital program to guide the next generation of aquatic biologists and natural resource managers. www.envirothon.org.

Teaching students about the importance of riparian zones.

Hands on the Land

Hands on the Land is a national network of field classrooms that connects students, teachers, and families with multiple federal agencies to foster connections to nature with conservation, environmental literacy and stewardship programs that are hands-on and place-based. www.handsontheland.org.

Taos Soil Water Conservation District Science Conservation Youth Camp

The conservation youth camp is an interactive program for junior high students. Over the course of two days the students participate in science lessons at eight stations that include: aquatic ecology, wildlife, forestry, soils, avian biology, rangeland management, weather, and botany. The Fisheries, Riparian, and Water Resources Program contributes the aquatic ecologist and wildlife biologist instructors.

Taos Charter School Science Program

The Fisheries, Riparian, and Water Resources Program works with the Taos Charter School Science Department to teach 7th and 8th graders aquatic field biology methods. The areas discussed in detail are water chemistry, aquatic invertebrate monitoring, fish habitat measurements, fish population inventory and monitoring, riparian zone biology, watershed analysis, and climate change.

Rangeland Management

Rangeland Management conducted four rangeland improvement projects on La Seguita Northeast Allotment 00578. The first of the projects is a cross fence used to split one pasture into two pastures within the allotment for better grazing distribution. The allotment is currently a three-pasture allotment but would become a four-pasture allotment to improve the distribution of livestock and allow for a more effective rest-rotation system on the allotment. From an existing well that is already on the allotment a 17,370 feet pipeline would distribute water across the pasture to tire trough number one and then onto tire trough number two. The pipeline would be trenched, buried, and seeded with native seed mix. At the location of tire trough number two would also be a 12,000 gallon storage tank.

The project is being funded by the Natural Resource Conservation Services (NRCS) scheduled to be completed by May of 2019.

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***BLM** continued from page 5*

Terrestrial AIM

The Terrestrial Assessment, Inventory, and Monitoring (AIM) program at the BLM Taos Field Office began in 2014. The AIM program uses standardized protocols and a statistically-valid sample design to collect quantitative data on land health and natural resources on public lands across the nation. Data are analyzed and used to inform land management decisions on the local, regional, and national levels. During the 2018 field season, 72 AIM plots were sampled on BLM lands in the Taos Field Office area. Since the program's implementation, a total of 338 AIM plots have been completed. The majority of these plots are in the Rio Grande del Norte National Monument. Over 100 AIM plots have been established in vegetation treatment areas to monitor land health in response to different treatment techniques. More information about the AIM program including both terrestrial and aquatic can be found at: https://aim.landscapetoolbox.org/.

Terrestrial AIM Crew testing soil stability.

Forestry and Fire Program

Thinning projects totaling 507 acres were planned with forest health, wildland urban interface (WUI) protection and fuels reduction as primary objectives and have long term benefits reducing erosion and nonpoint source pollution.

- Woodsharks CFRP on Cerro de la Olla: 62 acres
- Forest Fitness CFRP on Cerro de la Olla: 65 acres
- NM State Forestry Contractors in Cerro WUI: 193 acres
- Picuris Pueblo thinning crew in Copper Hill area: 60 acres
- Taos BLM Fire crew at Cerro WUI: 27 acres
- Taos BLM Fire at Gorham Scout Camp: 100 acres

Prescribed fire totaled 200 acres on Cerro Montoso with the primary objectives to reduce hazardous fuels and improve forest health.

Cerro de la Olla thinning project.

Cerro Wildland Urban Interface project area.

Updates from The SWQB Monitoring, Assessment and Standards Section (MASS)

Monitoring Team News:

The monitoring team has started fieldwork on a new two-year survey of the following watersheds: Upper Pecos, Lower Rio Grande, Mimbres, Gila, and San Francisco. For details, the survey Field Sampling Plan is available at https://www.env.nm.gov/surface-water-quality/water-quality-monitoring/.

TMDL/Assessment Team News:

The Comprehensive Assessment and Listing Methodology (CALM) explains how the SWQB evaluates data to determine whether or not surface water quality standards are being attained. An update of the CALM is in process; public comment and a call for data are projected for **April 2019**.

A Total Maximum Daily Load (TMDL) is the maximum amount of a pollutant that can enter a waterbody so that it will meet water quality standards for that particular pollutant. A TMDL report for impaired waters following the 2015-2016 Canadian/ Dry Cimarron survey will be available for public comment in **spring or early summer of 2019**.

Standards Team News:

Our latest Quality Management Plan was approved by the US Environmental Protection Agency in February. The QMP is a management tool for planning, implementing, documenting, and assessing the effectiveness of environmental data operations and other environmental programs.

A revision of the SWQB Water Quality Management Plan/Continuing Planning Process is in the works. Public comment will be scheduled during **spring or summer of 2019**.

EVENTS & ANNOUNCEMENTS

April

April 19th - 21st - near Fort Union. Join Albuquerque Wildlife Federation volunteer restoration service project at Wolf Creek, near Ft. Union, NM. For additional details or to sign up: call 505-480-2906 or abq.nmwildlife.org/projects.html.

April 23rd - 25th - Las Cruces. Two Nations One Water | US-Mexico Border Water Summit 2019. Adaptive water strategies for managing drought at the triple point of New Mexico, Texas, and Chihuahua. New Mexico Farm & Ranch Heritage Museum, 4100 Dripping Springs Rd, Las Cruces, NM 88011.
To register please visit; https://www.twonationsonewater.org/.

May

May 1st - 3rd - Albuquerque. The New Mexico Watershed and Dam Owners Coalition (NMWDOC) Annual Spring Conference and Workshop will be held at the Hilton Garden Inn Uptown Albuquerque, NM. The theme for the conference is *New Mexico Dams and Watershed Health: A Need For A New Approach*. Early registration ends on **April 10th**. For more information please contact Merry Jo Fahl, NMWDOC Administrator at jornadaresourceconservationdev@gmail.com.

May 16th - 18th - Rio Mora National Wildlife Refuge.
WETLANDS RESTORATION CREW LEADER TRAINING. Colorado-based non-profit Wildlands Restoration Volunteers (WRV) has partnered with the New Mexico Environment Department (NMED), Albuquerque Wildlife Federation (AWF) and wetland restoration expert Bill Zeedyk to offer a 3 day workshop at the Rio Mora National Wildlife Refuge. The workshop will take place from Thursday, May 16th through Saturday, May 18th with camping accommodations, food, tools and training materials provided. There is no fee for the training but trainees must demonstrate prior experience with wetlands restoration and commit to leading a crew at a minimum of 2 planned volunteer work weekends (a complete list of scheduled events will be provided). Those with no prior restoration experience are invited to register with Albuquerque Wildlife Federation for the concurrent volunteer work weekend at the Rio Mora National Wildlife Refuge.
The workshop will cover the following topics:

- Organization and management of volunteers
- Building wetland restoration structures
- Wetland restoration planting techniques
- Safety protocol

With questions, or to apply please contact Morgan Crowley (WRV), morgan@wlrv.org, or (303) 543-1411 ext. 102.

May 17th - 19th - near Las Vegas. Join Albuquerque Wildlife Federation volunteer restoration service project at Rio Mora National Wildlife Refuge, near Las Vegas, NM. For additional details or to sign up: call 505-480-2906 or abq.nmwildlife.org/projects.html.

June

June 7th - 9th - Valles Caldera. Join Albuquerque Wildlife Federation volunteer restoration service project at the Valles Caldera. For additional details or to sign up: call 505-480-2906 or abq.nmwildlife.org/projects.html.

June 19th - 20th - Farmington. The New Mexico Water Resources Research Institute is hosting the 4th annual conference on the Animas and San Juan Watersheds. San Juan College, Henderson Fine Arts Center, Farmington, NM. For more information and to register; https://animas.nmwrri.nmsu.edu/2019/.