

CLEARING THE WATERS

A quarterly newsletter by the Surface Water Quality Bureau

Volume 22, No. 4

Winter 2017

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Clearing The Waters is available on our website at:

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

319 Project Spotlight

Riparian Restoration Improves Water Quality on Bluewater Creek

By Daniel Guevara, Environmental Scientist

Waterbody Improved

restoration and best management practices have improved water quality on Bluewater Creek in Cibola County.

Prior to the improvements, Bluewater Creek was heavily impacted by off-road vehicle use and grazing. Staff from the Surface Water Quality Bureau (SWQB) at the New Mexico Environment Department (NMED) documented water quality problems such as high nutrients, turbidity, and temperature. As a result, Bluewater Creek was added to the state's list of impaired waters in 2006.

Starting in 2009, WildEarth Guardians conducted a Clean Water Act Section 319 project on the portion of the creek managed by the State Land Office. They built exclusions to restrict access to the riparian area by herbivores and off road vehicles, and replanted native cottonwoods and willows. Additionally, the

Cibola National Forest improved grazing management in the upper watershed by rounding up wild horses that were impacting the area. The results were impressive as the area was transformed from a denuded channel to a lush riparian forest in just a few years (*Figure 1 and*

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Bluewater Creek *continued from page 1*

Figure 2). Subsequent water quality surveys indicated that nutrient and turbidity levels had improved, and these impairment listings were removed from the 303(d) List of Impaired Waters. The success of this work indicates that these proven methods could be applied in other similar locations to improve stream habitat and water quality.



Figure 1. Bluewater Creek - 2009



Figure 2. Bluewater Creek - 2016

Bluewater Creek above Bluewater Reservoir before (2009) and after (2016) restoration. Note: rocks in the foreground and cliffs in the background that indicate same photo point location.

Problem

Bluewater Creek's designated use of Coldwater Aquatic Life was not supported due to nutrients, turbidity, and temperature impairments. Probable sources included off-road vehicle use, loss of riparian habitat, forest road construction and use, wild horse grazing, rangeland grazing, silviculture harvesting, and streambank modifications/destabilization.

Results

The CWA Section 319(h) projects in Bluewater Creek have resulted in removal of the turbidity and nutrient impairments from the 303(d) List of Impaired Waters as well as a significant decrease in temperature. In 2010, there were only 1 of 7 exceedances of the interim turbidity numeric translator of 25 NTU, and this assessment unit was declared as unimpaired for turbidity. The nutrient impairment was also removed in 2011 after a Level One nutrient assessment indicated that the nutrient levels had fallen below impairment levels. Effectiveness monitoring data collected by the SWQB Watershed Protection Section upstream and downstream of the restoration reach before and after the project showed a canopy cover increase from 4% in 2009 to 57% in 2016 (see Figure 3 and 4). Additionally, an Analysis of Covariance (ANCOVA) performed on temperature data showed (see Figure 5) that the project resulted in a mean temperature decrease of 1.6 °C. Although stream temperature still occasionally exceeds the standard, this trend in decreasing temperature is positive and should lead to a future delisting of the temperature impairment as well.

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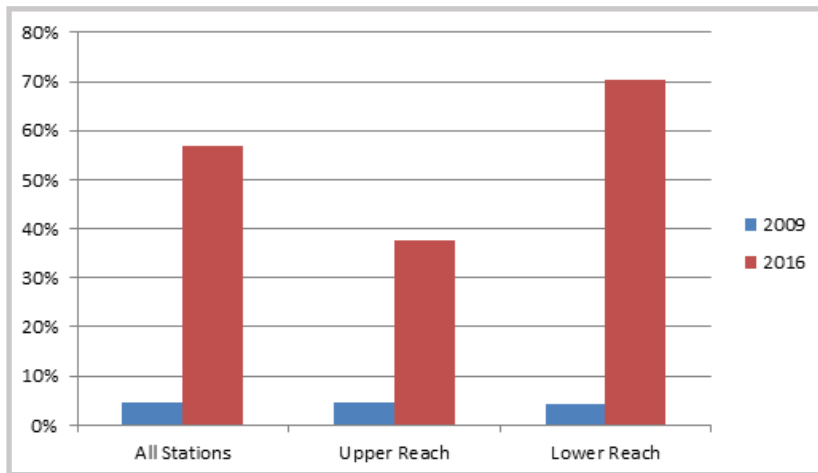


Figure 3. Measurements of canopy cover show a dramatic increase following restoration project.

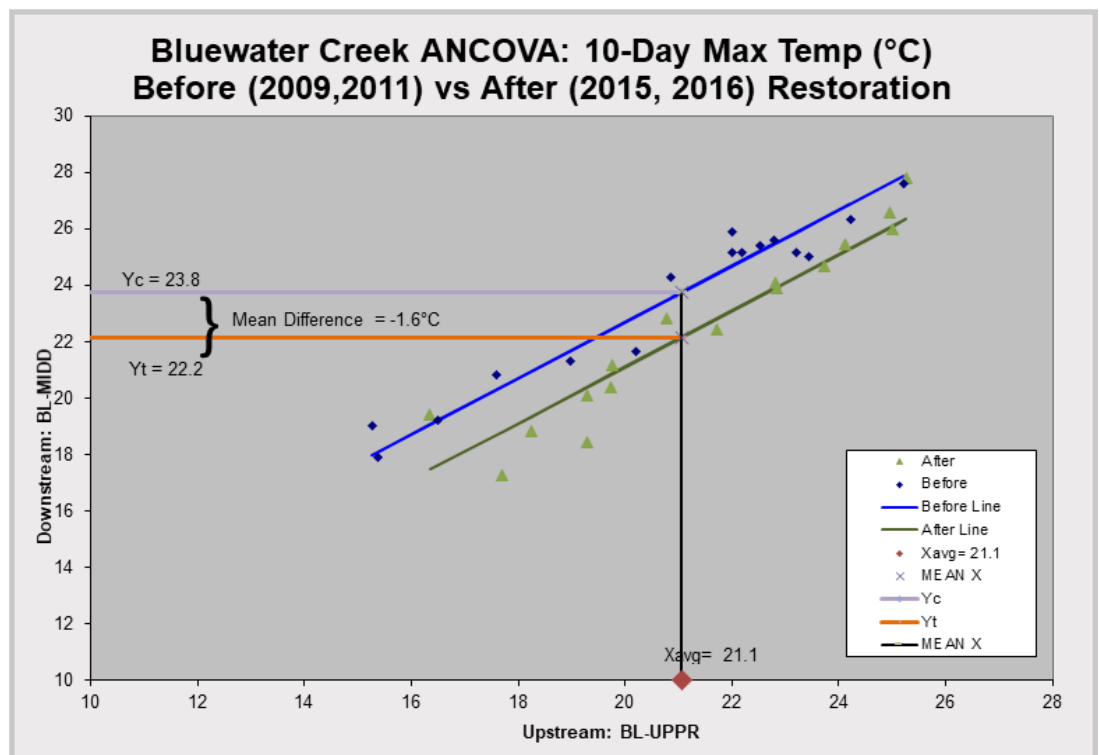
	All Stations	Upper Reach	Lower Reach
2009	4%	5%	4%
2016	57%	38%	70%
p-value*	0.000	0.011	0.000
n	12	4	7
% increase	1162%	700%	1519%

* one-tailed t-Test: Paired Two Sample for Means

Figure 4.

Bluewater Creek Canopy Cover Results

Figure 5. Results of the Analysis of Covariance showing that the restoration project caused a decrease in temperature of 1.6°C.



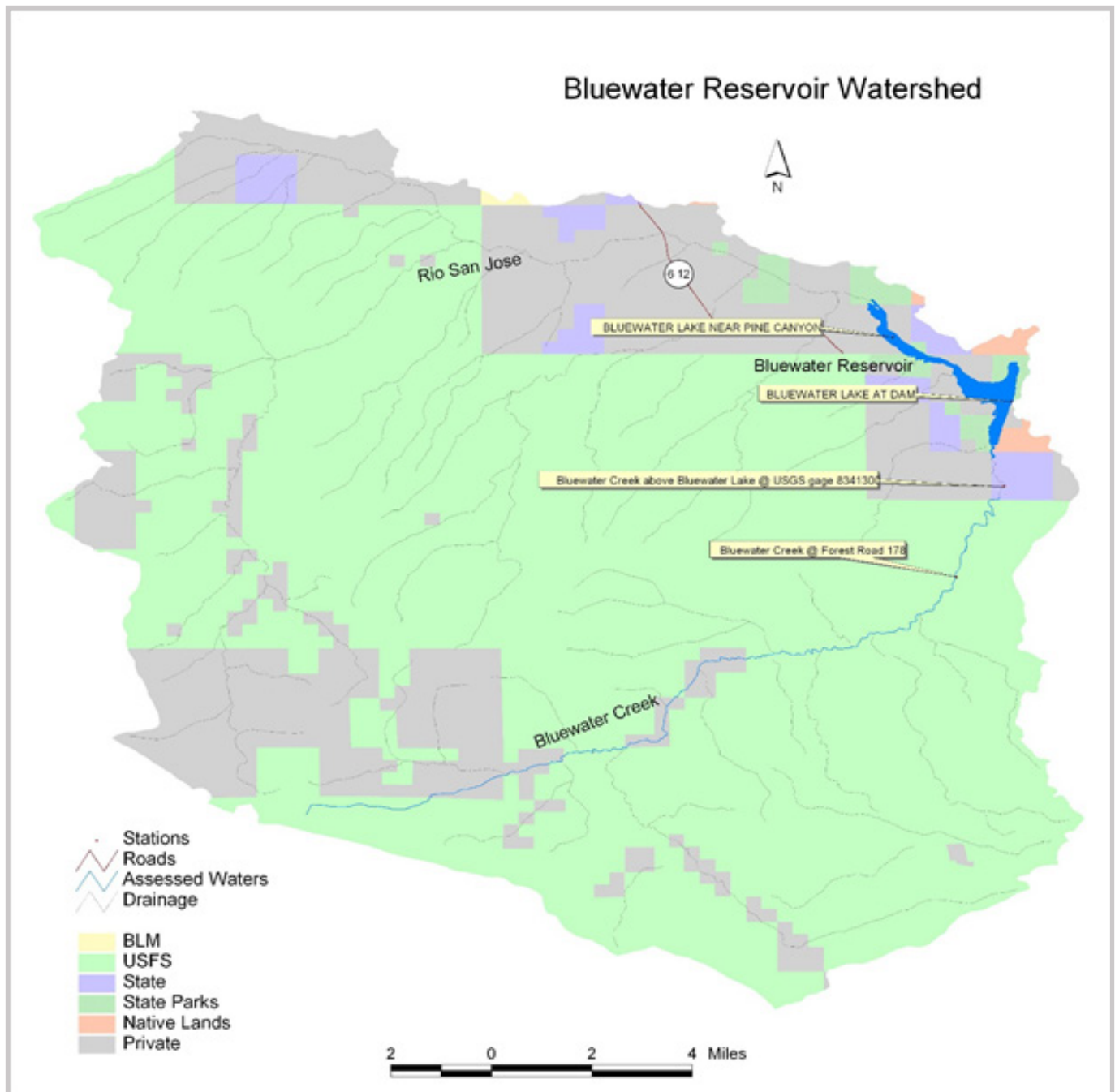
Project Highlights

A primary factor in improving water quality was the CWA Section 319(h) Project entitled “*Bluewater Creek Temperature Reduction and Riparian Restoration Project*,” which was conducted by the WildEarth Guardians from January 2009 to December 2010. This project dramatically increased the riparian canopy cover and reduced temperature loading by planting 2,500 cottonwood trees, 35,000 willow trees, and 500 native riparian shrubs. To protect these plantings from domestic livestock grazing, elk-browsing, and off-road vehicles, the Guardians also constructed elk-proof fenced exclosures along 1.3 miles of the creek. Additionally, the Cibola National Forest rounded up feral horses on their portion of the watershed, which has also improved the condition of the riparian areas.

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Partners and Funding

The restoration project on Bluewater Creek was funded by a CWA Section 319(h) grant for \$186,516. The funds were awarded through a competitive Request for Proposals from the NMED SWQB, who also provided project oversight, development, and effectiveness monitoring. The environmental non-profit group WildEarth Guardians submitted the successful proposal and carried out the on-the-ground work. The New Mexico State Land Office is the managing agency for the project area. These cooperators provided \$223,481 in non-federal matching funds. Additionally, the Cibola National Forest manages the land up-stream which encompasses the majority of the watershed.



REQUESTS FOR GRANT APPLICATIONS FOR SURFACE WATER QUALITY IMPROVEMENT PROJECTS

to be released

By Abe Franklin, WPS Program Manager

The Watershed Protection Section (WPS) plans to release a Request for Grant Applications (RFGA) in February for on-the-ground surface water quality improvement projects. Streams with completed watershed-based plans (WBPs), and a limited category of waters with similar planning complete (Category 4B waters), will be eligible. The RFGA will focus on meeting the goals developed in total maximum daily load (TMDL) documents, or (in the case of Sandia Canyon) on meeting water quality goals in a Category 4B Demonstration. The RFGA will be used to select projects that improve water quality sufficient for them to meet water quality standards, or make measurable progress toward that goal.

ELIGIBILITY

As noted above, projects that implement WBPs or New Mexico's only Category 4B Demonstration will be eligible. WBPs are a specific type of planning document, described further at www.env.nm.gov/surface-water-quality/wbp. Currently, the following watersheds have WBPs:

- Black Canyon Creek watershed (in Grant County)
- Animas River watershed (in San Juan County)
- Cimarron River watershed (including all tributaries)
- El Paso – Las Cruces watershed (downstream of Caballo Reservoir, also known as Paso del Norte watershed)
- Gallinas River watershed (upstream of the City of Las Vegas diversion)
- Mora River watershed (a middle section in the Upper Canadian Plateau ecoregion)
- Pecos Headwaters watershed (portions upstream of where I-25 crosses the Pecos River)
- Rio Nutrias watershed (this Rio Nutrias is a tributary of the Rio Chama)
- Rio San Antonio watershed (this Rio San Antonio is in the larger Conejos watershed)
- Rio Santa Barbara
- Rio Puerco watershed (pending, for several assessment units with TMDLs)

The WBPs are available at www.env.nm.gov/surface-water-quality/accepted-wbp. Sandia Canyon's Category 4B Demonstration is available at www.env.nm.gov/swqb/303d-305b/2014-2016/LANL.

All types of organizations will be eligible to implement these projects, regardless of which organization developed the WBP or Category 4B demonstration. We might receive eligible applications from federal agencies, state agencies, soil and water conservation districts, Indian Nations, Pueblos, Tribes, nonprofits, or for-profit firms.

PROJECT TERMS

The schedule in the RFGA will indicate a target date for subgrant agreement approval (i.e., when the projects can start) in July, 2018. The RFGA will request that project terms not exceed 3.5 years.

EVALUATION CRITERIA

The RFGA will contain evaluation criteria used to select the most effective (and cost-effective) projects. Interested people should read that section of the RFGA carefully, and ensure that each evaluation criteria can be scored based on information provided in the application.

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A Few Words about Flow Impairment

Some readers might read the RFGA and see reference to “Category 4C streams,” and wonder what that means. Each edition of the State of New Mexico Clean Water Act §303(d)/§305(b) Integrated List places all of the assessed streams and lakes (“assessment units”) into assessment categories. A Category 4C stream is “impaired for one or more designated uses, but does not require development of a TMDL because impairment is not caused by a pollutant.” These streams are identified in the State of New Mexico Clean Water Act §303(d)/§305(b) Integrated List as being impaired by “low flow alterations.” In the 2016-2018 edition of the List, only 13 out of 820 assessment units are in Category 4C. Two of these (Wolf Creek in the Mora watershed, and Glorieta Creek in the Pecos watershed) are within the areas covered by WBPs and will be eligible for projects under the RFGA. As with any stream or project, projects that are prioritized in a WBP are likely to receive higher scores than projects that aren’t.



STREAM OF THE QUARTER

Stream of the Quarter spotlights a New Mexico surface water and highlights various aspects including aquatic life, recreation, history, cultural significance, and water quality. As an arid state, each of our waters has a story to tell.

Restoration along the Rio de las Vacas: a History

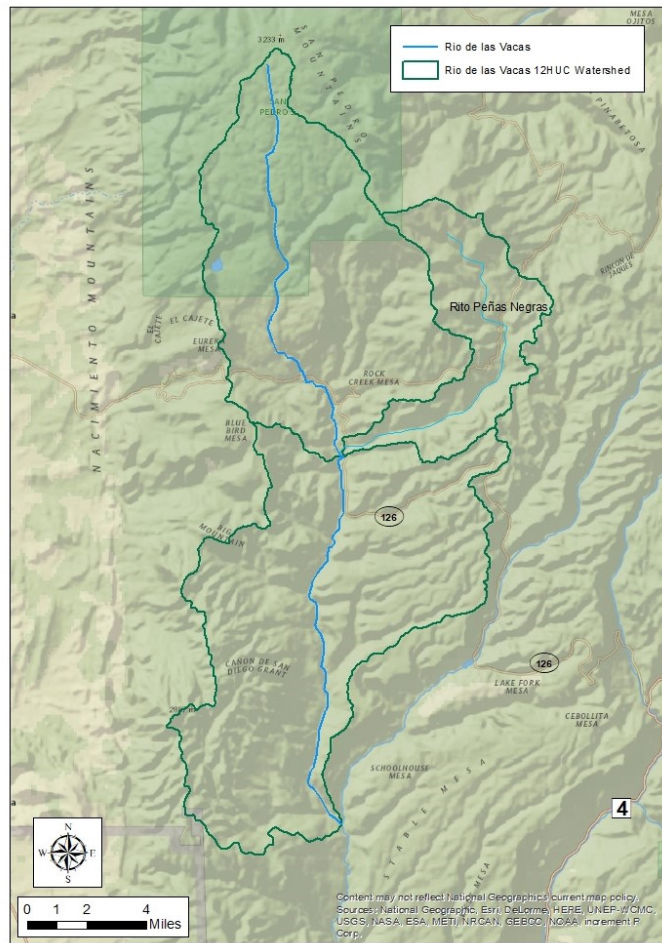
By Meg Hennessey, SWQB Environmental Scientist, Implementation and Restoration Team - Santa Fe

RIO DE LAS VACAS

is located on the Santa Fe National Forest in the Jemez Mountains. Historically used for logging, cattle grazing, and recreation, the Rio de las Vacas has become degraded over time, and its water quality is impaired. In the last twenty years there have been several NMED-funded projects attempting to address these impairments, but it was not until the last few years that these projects have been conducted on a large enough scale to make a significant impact. Currently, a project is in progress to create a Watershed-Based Plan for the Rio de las Vacas and its tributaries (see map on page 7). This plan will identify work that requires completion, any major obstacles to meeting water quality standards, stakeholders, and potential sites for implementing best management practices. The goal of the plan is to create a road-map that future interested parties can follow to collectively work towards improving and maintaining water quality throughout the entire watershed.

The Rio de las Vacas watershed is 122 square miles in area, ranging from over 10,000 feet above sea level at its headwaters in the San Pedro Parks Wilderness, to 7,200 feet near its confluence with the Rio Cebolla, where the two rivers join to form the Rio Guadalupe. Ninety-five percent of the land in the watershed is owned and managed by the Forest Service, but there are numerous small, privately owned inholdings throughout the area. Protected or notable species in the area include the New Mexico Meadow Jumping Mouse, peregrine falcon,

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spotted owl, Jemez Mountains salamander, and the Rio Grande cutthroat trout. The major land uses throughout this watershed are cattle grazing and recreation, with fishing common along the Rio de las Vacas.

For almost twenty years the Surface Water Quality Bureau has identified the Rio de las Vacas and several tributaries to be impaired, or not meeting their designated uses. On the 2016 impaired waters list, the Rito Peñas Negras is listed as impaired for eutrophication, sediment, and turbidity along its eleven miles; the Rito de las Palomas is impaired for sediment and turbidity along its six mile reach, and the main stem Rio de las Vacas is impaired for aluminum, eutrophication and temperature along its twenty-five mile reach. In 2008 a well-known restoration hydrologist, Bill Zeedyk, organized an NMED-funded project to install small innovative riparian hemi-exclosures, add native planting, and create stream structures, to address issues of erosion and sediment loading. Many of the hemi-exclosures designed to keep cattle from accessing meander cutbanks can still be seen today but are in poor condition from years of exposure.

Chapparral Girl Scout camp, to address sedimentation in that reach. The project, executed by Rocky Mountain Ecology- a private restoration firm operating in Colorado and New Mexico-included decommissioning two miles of dirt roads that had been contributing sediment into the stream, planting native vegetation, constructing stream structures, building cattle closures along the riparian area, and improving fencing near campsites to discourage RV parking in riparian areas. The results of this project, completed in July 2014, have mostly been effective in preventing camping impacts along the river and establishing large communities of native riparian vegetation.

Subsequent projects with WildEarth Guardians' Restoration Team focused on addressing impairments on the reach north of the Girl Scout Camp and on the Rito Peñas Negras, a principle tributary of the Rio de las Vacas. These projects included creating large riparian exclosures using

In 2011 a SWQB contract implemented work along the lower Rio de las Vacas, south of the Rancho de



Riparian plantings and natural succession along a formerly incised and eroded stretch of the Rio de las Vacas.

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elk-proof fencing, planting thousands of native riparian seedlings within the exclosures, and stabilizing the streambank in highly degraded areas to reduce erosion. One such area was a small swimming hole on the Rio de las Vacas where public use and vehicle impacts had created a growing headcut. That area received an exclosure, which prevents vehicles from driving in the riparian area. Restoration consultants Van Clothier and Steve Carson decommissioned the informal dirt access road with boulder placements, and armored the streambank in the headcut area. This section of the stream can still be used for fishing and other recreation activities, but the impact of these uses has been largely reduced.



Willow and other riparian seedlings planted on a formerly bare-sand beach, Rio de las Vacas.



Elk-proof riparian exclosures and plantings along a heavily incised streambank, Rito Peñas Negras.

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Another area addressed was a public fishing spot which had been degraded by RV camping and ATV use in the active stream channel. The area has responded well, and is flourishing with willows, cottonwoods, and other native riparian plants, and has been fenced so that RVs may no longer access the floodplain. The public is still welcome to fish and tent-camp in the vicinity.



A newly constructed beaver dam within a WildEarth Guardian's enclosure, Rio de las Vacas.



An established and enlarged beaver pond located within a WildEarth Guardians' enclosure, Rio de las Vacas.

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Since the completion of this WildEarth Guardians' project in 2015, beaver dams have multiplied and moved from downstream (outside the exclosures) to upstream (inside the exclosures) where there is more food, due to planting efforts, and protection from human impacts like ATVs.



Looking forward, future work could include more riparian planting efforts, working with landowners to give cows alternatives to drinking from the river, and increasing public awareness on how to protect water quality. The watershed-based planning project is establishing a network of stakeholders who will work together to develop solutions to managing water quality problems throughout this beautiful and valuable watershed ecosystem.

Riparian tree and herbaceous plantings, Rio de las Vacas.



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New Mexico Environment Department
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P.O. Box 5469
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EVENTS & ANNOUNCEMENTS

January

Now - January 5th - Various locations statewide. Join Audubon for the NM Christmas Bird Count. Groups of bird-watchers will be counting every bird they see or hear! As participants in the Audubon Christmas Bird Count, they will be a part of the more than 70,000 counters at more than 2,300 locations stretching from the Arctic Circle to the tip of South America. Since 1900, the Christmas Bird Count (CBC) has provided scientists with critical data about bird populations in the Americas. Visit the Audubon website for more information and to view the schedule: <http://nm.audubon.org/nm-christmas-bird-count>.

January 11th - Albuquerque. New Mexico Water Dialogue invites you to The Dialogue's 24th Annual Statewide Meeting - *Balancing Our Water Needs: Adjudication and Alternatives*. 8:00 AM - 4:30 PM (Mountain Time). Indian Pueblo Cultural Center, 2401 12th St NW, Albuquerque, New Mexico. To register and more details please visit: <https://www.regonline.com/builder/site/Default.aspx?EventID=2052657>

January 18th - 5:00 PM MST. Application deadline - NMED SWQB Request for Grant Applications for watershed-based planning projects. Applications will be submitted via email. More information including an application form and instructions is posted at www.env.nm.gov/surface-water-quality/wbp.

January 18th - Santa Fe. NMED/SWQB Wetlands Program's northern New Mexico Wetlands Roundtable. The New Mexico Wetlands Roundtable events are combined government agency/non-governmental organizations roundtables. 9:00 a.m. to 4:00 p.m. at the Toney Anaya Building, 2550 Cerrillos Road, Rio Grande Room (2nd Floor) Santa Fe, NM.

For more information: contact Karen Menetrey (Karen.Menetrey@state.nm.us; 505-827-0194).

January 23rd - Las Cruces. NMED/SWQB Wetlands Program's southern New Mexico Wetlands Roundtable. The New Mexico Wetlands Roundtable events are combined government agency/non-governmental organizations roundtables. 9:00 a.m. to 4:00 p.m. at the Las Cruces City Hall, 700 North Main Street, Room 2007-B&C (2nd floor), Las Cruces, NM.

For more information: contact Emile Sawyer (Emile.Sawyer@state.nm.us; 505-827-2827).

January 31st - Proposal Deadline. The National Fish and Wildlife Foundation and the Wildlife Habitat Council are soliciting applications for the 2018 Five Star and Urban Waters Restoration program. The Five Star and Urban Waters Restoration grant program seeks to develop community capacity to sustain local natural resources for future generations by providing modest financial assistance to diverse local partnerships focused on improving water quality, watersheds and the species and habitats they support. Projects include a variety of ecological improvements along with targeted community outreach, education and stewardship. For more information please visit: <http://www.nfwf.org/fivestar/Pages/2018rfp.aspx>.

February

February 22nd – 23rd - Silver City. 7th Natural History of the Gila Symposium. Western New Mexico University. Field Trips Saturday February 24. Additional information, schedule and field trip information can be found by visiting, <http://gilasyposium.org/>.

February 22nd - 23rd - Albuquerque. The 2018 Land & Water Summit. This year's theme is: The Ripple Effect: Stormwater & Tree Canopy. Join Xeriscape Council of New Mexico and the Arid Low Impact Development. Early Bird Registration Open until 12/31/17. For more information and to register <http://landandwatersummit.org/>.