

CLEARING THE WATERS

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These grass plants were the original elevation of the seedbed, newly deposited sand from the flood in the background

Flood Restoration on the Gila

by Mike Matush, SWQB - Silver City

On the evening of February 12th a warm front entered the Gila River watershed releasing a warm rainfall, melting a large snow pack in the upper elevations, creating a flood event that damaged the river channel and associated bottomlands to the Arizona border. The peak recorded flow at the Gila River gage station on the boundary of national forest near Gila, New Mexico was 17,000 cubic feet per second during the rain event. The average median daily flow based on the last 75 years on this date is approximately 75 cubic feet per second.

This particular rainfall event was one that produced catastrophic changes to the channel. The Nature Conservancy (TNC) owns and manages property about 2.5 miles below the Gila Gage Station and has been a beneficiary of the Clean Water Act's section 319(h) grant program on this property since 2000. In 2002 approximately 17 acres were planted on the TNC bottomlands to add cover and wildlife habitat. The planting had the aid of surface irrigation and was beginning to fill in nicely, producing approximately 1,600 pounds/dry weight of a mixture of cool and warm season forbs and grasses. Prior to the flood event *continued on page 2*

New Mexico
Environment Department



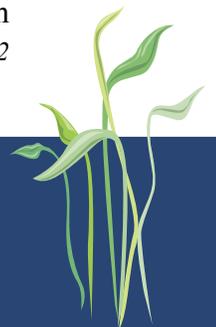
Surface Water
Quality Bureau

319 Grant Funding for 2006

RFP Opens August 1

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the Gila River channel was about 200 yards from the newly planted site, but the river has since removed 7 acres of bottomland and now maintains flow against the field. During the course of the flood, standing vegetation caught 1 inch of organically rich silt, but on top of that was deposited about 8 inches of course sand. The material was extremely loose and had the characteristics of dune sand moving constantly over the last few months.

A soil test was done to ascertain any unknowns that might interfere with successful replanting of the site. The pH was 7.2, organic matter 1.4 percent and, as usual, low in all macro and micro nutrients except for iron, copper, and manganese.

Replanting course sands in New Mexico has always presented problems in reclamation attempts. Most of these problems stem from poor seed placement in a sandy seedbed that offers no cohesion or firmness during the seedbed preparation. The original seedbed was planted with a Brillion drill, noted for its ability to plant in existing vegetation in loamy to clay loam soils. The previous seedbed was the accumulation of thousands of years of flooding in the Gila valley producing varying pockets of loamy sands and sandy loams.

Due to the new seedbed material it was decided to re-plant using a drill that had double disc openers, to help insure seed placement at the required depths. The suggested plan at this time is to reirrigate prior to drilling to help settle the sand. We will then drag the Brillion drill over the wet seedbed to cultipack the material and add firmness, allowing the older style drill with disc openers to plant seed into a firm wet bed. The Brillion will be dragged over again to cultipack and firm the seed into the course sand. Dry fertilizer will be added before the last dragging of the Brillion to push the granuals into the seedbed.

We will be applying approximately 20 pounds of nitrogen, phosphorus and potassium per acre, since the seedbed is nutrient poor. Subsequent watering will be managed to make good use of the fertilizer first, since we expect poor distribution of those nutrients in course sands compared to soils with finer textures. The cost per acre for the seed is \$124. We will be drilling a combination of native warm season grasses that are still found occupying the Gila River bottom in protected areas. Approximately 23 seeds per square foot will be drilled in late June, and will be irrigated twice prior to monsoon season. Availability of the seed limited our planting to a mix consisting of 50% alkali sacaton, 10% sand dropseed, 10% western wheatgrass, 10% cane bluestem, 5% blue grama, 5% sideoats grama, 5% inland saltgrass and less than 5% apache plume, rabbit bush and 4-wing saltbush. We are concentrating getting our turf established first since adding a brush component to disturbed conditions is relatively easy. ~



Old style drill with double disc openers insures of proper seed placement in loose sands



Cultipacker wheels used in preparing the seed bed.

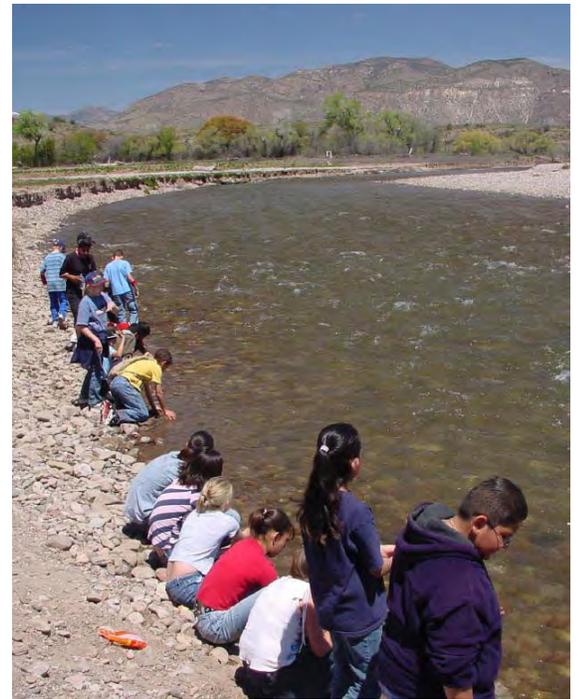
Clearing The Waters is a publication of the NMED Surface Water Quality Bureau's Watershed Protection Section
For comments, article submissions, and mailing list changes contact the CTW editor:

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Getting to Know the Gila

“Eww... bugs are gross, I’m not touching those!” was the exclamation of one 5th grade girl at the 2nd annual Gila Water Festival. By the end of the 20-minute lesson on aquatic macroinvertebrates, however, she was not only picking them up but identifying them too. “This was sooo much fun!” was her parting comment as she left with her classmates to check out another activity station.

Part one of the Gila Water Festival was held on April 12th at The Nature Conservancy’s Lichty Center on the banks of the Gila River. Over 300 fifth graders from schools in Silver City, and surrounding areas spent the day traveling from station to station with their classes learning about a variety of river related topics ranging from water chemistry to casting animal tracks. Volunteers from state agencies, non-profit groups, and river associations presented 20 different activities and topics that introduced the diversity and complexity of the Gila River System while addressing several components of the state science education standards. Students, teachers, and parents all had a great time and celebrated the end of the day by cooling off in the river itself.



Fifth Graders Study the Gila River near Silver City at the Gila Water Festival

Part two of the festival was held on April 28th at Western New Mexico University. This session was designed to give area 4th graders an introduction to river ecology, water conservation, and New Mexico water issues through a series of activities. In total over 575 were involved in this year’s festival and even more are hoped for next year by involving additional schools in surrounding towns.

Organizers designed the two part event to give 5th graders an opportunity to build on concepts learned at last year’s festival and give 4th graders a foundation to build on next year when they get to visit the river. Prior to this festival, more than half the area fourth and fifth graders said they had never been to the Gila River, according to Blake. “At this age students learn best by doing, by being actively engaged in the learning process...,” says Steve Blake, director of the Gila Conservation Education Center, a co-sponsor of the festival. “The most important issue facing our children’s generation may be water. We must educate our kids with factual and science-based information about our local water resources.” The theme of this year’s festival was “Water: Lifeblood of the Gila Ecosystem and its People.” Other sponsors included NM Environment Department Surface Water Quality Bureau, Silver Consolidated Schools, and The Nature Conservancy. In addition to the two festival days, organizers also visited several classrooms before and after the event.

~ For more information about the Gila Water Festival contact: Mike Matush with the Silver City Surface Water Quality Bureau (505) 388-0599 or [Mike.Matush@state.nm.us]

The River on Wheels

By Dana Vackar Strang and Nina Wells

The New Mexico State Land Office (SLO) has purchased a watershed teaching model called the “Rolling River” as part of a § 319(h) Clean Water Act grant, administered through the New Mexico Environment Department’s Surface Water Quality Bureau (SWQB) and the US Environmental Protection Agency. The purpose of the 319 project, named the “Rio Nuevo Restoration Project”, is to establish a local community based partnership and instill awareness of the watershed through educational workdays and re-establishment of a viable riparian habitat. Under The Rolling River model provides visual information on erosion, riparian habitat, and sinuosity of rivers. SLO plans to use the model as part of its activities focusing on the one mile segment of Santa Fe River owned by the State Land Office near Airport Road and Highway 599.

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Breathing Life Back Into The Santa Fe River

By Jim Matison

Like many river systems in the southwestern United States, the Santa Fe River has been modified by numerous activities, which have each individually and synergistically changed the river's functioning capacity. Stepping into the Santa Fe River Preserve, it is hard to imagine that less than 9 years ago, this 2 mile stretch of the Santa Fe River was just another barren southwestern river. It is a powerful reminder of a long history of overgrazing, floodplain confinement, and wetland loss, resulting in the degradation of water quality, water quantity, and loss of wildlife habitat within this essential riparian system.

Today this section of the Santa Fe River is brimming with life, with immense stands of cottonwoods, willows, and other native wetland plants, all of which have improved water quality and provided excellent wildlife habitat. As a result of this restoration work this waterway is on its way to becoming a properly functioning and self-sustaining river system.



1996



2004

This portion of the Santa Fe River is unique in that the riparian system is sustained by a perennial water source via the effluent released from the Santa Fe Wastewater Treatment Plant. The Santa Fe River above Santa Fe is captured for municipal use and although it flows through the City in wet years, such is not always the case.

Forest Guardians, a regional non-profit environmental advocacy organization based in Santa Fe, began restoration work along this portion of the Santa Fe River in 1996, with approval of the City of Santa Fe Airport (where the property is located). This restoration work included the exclusion of livestock via fencing and planting cottonwoods and willows along the riverbank.

New Mexico Environment Department and 319 funding

In 2000, the New Mexico Environment Department became a vital partner in this restoration project by funding restoration work through its 319 program. This funding was provided to remedy the Santa Fe River's perennial status on New Mexico's 303d list of polluted waters. Temperature levels, dissolved oxygen levels, and turbidity all contributed to the pollution in the river.

This funding allowed Forest Guardians to: remove earthen berms located within the Preserve floodplain; plant additional native riparian vegetation; and remove nearly 4,000 non-native, invasive riparian trees which had flourished and out-competed the native species within the Preserve. All non-native species were removed through various mechanical processes utilizing no chemical treatments. After one-year, these mechanical methods are having a greater than 95% success rate in preventing re-sprouting of non-native species.

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Rolling River continued from page 3...

The Rolling River is a trailer modified to show concepts of a watershed. It is the size of a regular truck bed approximately 8 feet long by 4 feet wide, and sits on a frame with regular size tires. The axle allows the slope of the trailer to change, either increasing steepness or flattening the slope. The pump and pipes access a 30-gallon tank and water is pumped up to the head of the trailer and comes out through two faucets, one at each corner. The velocity of the water coming through the faucets can be managed to simulate flood or drought events. The sand used in the model is synthetic, and simulates natural sediment, such as lighter silica and the heavier metallic particles.

Landscape model tools such as miniature cars, bridges, trees and farms are used to show changes in a watershed in response to severe water flow events. For example, observing the changes when a parking lot is created adjacent to a stream is a powerful teaching tool. The slope, velocity of water and vegetation are all variables that can be manipulated and the results of the changes can be both predictable and surprising. Other Rolling River models are available throughout New Mexico by contacting Soil and Water Conservation District offices (<http://www.nm.nacdnet.org/page5.html>).



Children's Water Festival, February 2005

The model has been used at Community Day and Earth Day events, in classroom activity lessons and at several River Angel presentations. The River Angel Program, part of the Rio Nuevo Project, provides environmental and conservation concepts to multi-age students. The Rolling River model will be offered for use to other partnering state, county, and city agencies performing watershed education in the Santa Fe area. Orientation on the proper use of the trailer will be announced and offered by the SLO and SWQB in the near future. ~

Dana Vackar Strang is an Environmental Specialist with the Field Operations Division of the New Mexico State Land Office. Nina Wells is with the Surface Water Quality Bureau. For further information contact:

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The Rio Hondo Watershed Group Formation

By Delbert Trujillo

Delbert Trujillo with the New Mexico Environment Department's Watershed Protection Section (WPS) and Rosemary Romero, facilitator and Project Officer with the Meridian Institute were part of a historic watershed meeting on April 21, 2005. Rosemary and Delbert are the project officers responsible for formation of watershed groups along the Rio Grande from Pilar New Mexico north to the Colorado border. The purpose for forming these groups is to give communities an opportunity to improve water quality in the areas they live and work.

One of the watersheds along the Rio Grande Corridor is the Rio Hondo watershed located 10 miles north of Taos. The communities along this river valley include Arroyo Hondo at the confluence of the Rio Grande (lower elevation area) and the Village of Taos Ski Valley (VTSV) located at the headwaters of the Rio Hondo (higher elevation area). However, for many years the two communities have been at odds with each other regarding water quality in the Rio Hondo. The community of Arroyo Hondo has long been skeptical of the impacts on the river from VTSV activities, especially housing growth and the VTSV sewage treatment plant.

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Santa Fe River continued from page 4...

As a result of this restoration project, the native cottonwoods and willows are providing thermal cover for the river and stabilizing water temperatures, thereby reducing algal growth within the river. Dissolved oxygen levels have also stabilized. In addition, the removal of levees has allowed the river to access its entire floodplain, thereby allowing the river to naturally spread large volume flows and high sediment loads that have occurred with this year's immense run-off. The channel now meanders and the floodplain has aggraded more than a foot in many areas, slowing down the velocity and depositing rich soils. It is quite clear that this restoration project has directly improved water quality and the riparian system is now providing essential wildlife habitat for literally dozens of terrestrial and aquatic species.

Community Involvement

The local community has played an important role in the restoration of this river system with hundreds of citizens participating in community planting days and over a dozen local schools participating in educational workshops and riparian restoration projects. This level of community participation has reconnected many Santa Fe residents to its namesake river.



Lessons Learned

Two significant lessons were learned during this restoration work, both of which involve the mechanical removal of non-native invasive species. First, it is important that removal take place during the dormant season, especially if the invasive species is Siberian elm, thereby preventing the seed source from germinating in soils that had been disturbed as a result of the mechanical removal process.

In addition, the use of mechanical tools to remove non-native invasive species is effective, and does not require annual follow-up treatments, as long as the taproot is removed sufficiently and that any secondary roots are removed at least a foot below the soil surface and the soils are compacted to discourage re-sprouting.

Conclusion

The simple act of planting riparian trees in their natural habitat can have a profound effect on restoring balance in areas of ecological deficiencies. Rivers and streams are the life-blood in the arid southwest. Providing rivers and streams with the necessary tools to purify waters, stabilize streambanks, provide habitat, shade waters, and the ability for native species to regenerate, these arteries can provide life to many, and may also provide a healing to our soul. ~

Jim Matison is the Restoration Coordinator for Forest Guardians in Santa Fe.

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Rio Hondo Watershed continued from page 5...

On April 21, 2005, Rosemary and Delbert convened a meeting at the Arroyo Hondo Community Center to begin the process of forming a watershed group for the Rio Hondo. The meeting was attended by a host of individuals who live and work within the Rio Hondo watershed, both in Arroyo Hondo and near VTSV. There were many questions regarding the process of watershed group formation and concerns individuals had about water quality of the Rio Hondo.

Initially there was speculation from the project officers that two groups might be formed for the Rio Hondo watershed, one at Arroyo Hondo and the other at VTSV, due to the long term mistrust that persisted between the two communities. However, during the meeting VTSV officials reached out to the Arroyo Hondo community, offering to work with their downstream neighbors to establish a single watershed group and to keep them informed of activities at the ski valley. As one VTSV representative stated, "It is one watershed and we both live in it, why would we want to form two groups? We all have a vested interest in this watershed and the ski valley doesn't want to keep any secrets from our lower reach neighbors". This statement was echoed by all throughout the remaining minutes of the meeting. The two groups are now beginning to address the current and future challenges that face this watershed, which bodes well for water quality in the Rio Hondo. ~



Rio Hondo near Taos Ski Valley

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→ → → **319(h) Grant Funding Available** ← ← ←

The Watershed Protection Section of the NMED Surface Water Quality Bureau will be releasing its annual Request For Proposals for the Clean Water Act section 319 granting process. These grants are designed to help with the formation of community watershed groups or to fund on the ground watershed restoration projects, encouraging local involvement with the restoration and protection of New Mexico's surface waters.

Release Date For RFP: August 1, 2005

- grant type 1) Watershed Group Formation
- grant type 2) On the Ground Surface Water Quality Improvement Projects

Due Date For Proposals: 3:00 pm MDT, September 16, 2005

Please call the SWQB or check our website for RFP Documents on or after August 1, 2005
The RFP documents contain information regarding who is eligible to apply for grants and which watersheds are our focus for this year's program.

505-827-2981

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

UPCOMING EVENTS

- July 22-25: *Ponil & McCrystal Creek Riparian Restoration*, Amigos Bravos
- August 5: *Reading the Landscape: How Water Flows Across Landforms*, Los Trigos Ranch, Rowe, NM, Quivera Coalition
- Sept.30 - Oct.1: *Erosion Control & Riparian Restoration on the Dry Cimarron*, Rainbow Ranch, Folsom, NM, Quivera Coalition
- Sept. 12-13: *American Rivers 2nd Annual River Lobby Day in 2005*, Washington DC, Amigos Bravos
- August 1: *Surface Water Quality Bureau's 319(h) Funding RFP Available*, see page 7 of this issue for more information

contacts for more information on upcoming events:

Amigos Bravos: 505-758-3874; www.amigosbravos.org

Quivera Coalition: 505-820-2544; www.quiveracoalition.org



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