

Restoring and Protecting Wetlands in Cebolla Canyon Closed Basin

Project Summary:

Numerous partners are undertaking a demonstration project for the restoration of historical wetlands degraded by former agricultural practices in Cebolla Canyon closed basin in Cibola County, New Mexico. The Albuquerque Wildlife Federation, Bureau of Land Management, New Mexico Environment Department, New Mexico Wilderness Alliance, Rio Puerco Alliance, Rio Puerco Management Committee, and other partners will restore historic wetlands by more than 80 acres and develop a Wetlands Action Plan that develops measures for protection and restoration of wetlands in the Cebolla Canyon watershed within the North Plains closed basin. Workshops will be conducted on the restoration field methods. Project partners will also organize a Watershed/Wetlands Academy for high school students and teachers in the Grants area with special emphasis on local and tribal schools.

Project Description:

The Cebolla Canyon is primarily within and protected by a congressionally designated Wilderness Area (Cebolla Wilderness) within the congressionally designated El Malpais National Conservation Area (EMNCA) near Grants, New Mexico. All of the project area is Bureau of Land Management (BLM) Public Lands. Within the project area, Cebolla Spring and Little Cebolla Spring emerge from the ground and provide habitat and/or critical constant water in a semi-arid landscape to a variety of wildlife species including bald eagle, mule deer, elk, mountain lion, bobcat, Abert's squirrel, two subspecies of wild turkey (*Meleagris gallopavo intermedia*, *Meleagris gallopavo Merriami*) and reptiles such as the side-blotched lizard (*Uta stansburiana*).

The valley was homesteaded in the early 1900s. Today only ruins of the stone houses and hydrological modifications established by early settlers remain. The historic wetland of Cebolla Creek has been drained and earthen dams constructed to retain water for agricultural use. These changes to the area's hydrology coupled with cattle grazing have reduced the historic wetland to a fraction of its original size and inadvertently created a massive down-cut, incising the stream banks in some areas as deep as 50 feet.

Previously, water from the springs was impounded and used for irrigation almost exclusively. Former wetlands were drained and dams, irrigation ditches, and impoundments were constructed along Cebolla Creek to support agriculture. The irrigation systems and impoundments are no longer functional, but Cebolla Creek is displaced from its natural drainage, headcutting is occurring in the valley bottom and the wetlands have been slow to recover. Plant community composition in the valley had deteriorated to a monoculture of blue grama grass (*Bouteloua gracilis*) with rabbit brush (*Chrysothamnus nauseosus*) increasing in the valley bottom. This coupled with increasing encroachment of piñon (*Pinus edulis*) and juniper (*Juniperus scopulorum*) from the uplands has converted the vegetative composition of the valley to that of a warm season upland plant community.

In 1994, a seven-acre enclosure was constructed by BLM to reduce livestock use of Cebolla Spring. In one growing season, the spring turned from a mud bog to standing water. The water

promoted vegetative growth, which increased ground cover and shade, reducing loss of water to evaporation. As a result, a permanent saturated zone developed, providing the conditions for a nascent wetland. Since the fall of 2000, the Albuquerque Wildlife Federation has been organizing volunteer groups to help with restoration efforts in Cebolla Canyon. The groups have worked to construct restoration best management practice (BMP) structures to spread water over the valley. These structures are re-wetting the meadow, widening the stream banks, and building up the channel bottom to return this portion of the wilderness area to its natural condition of a perennial stream and a properly functioning wetland. The result has been two-fold: the creek gradient is flattened and water infiltration into the banks has increased, promoting an increase in emergent wetland plant species, which add to bank stability. The saturated zone associated with the spring has expanded downstream along the first terrace adjacent to the creek. The saturated zone currently is over 40 acres. With further restoration efforts, the wetlands area associated with the spring could double in size to over 80 acres. Additional acreage of restored wetlands, riparian and buffer along the floodplain of Cebolla Creek are also goals of the restoration project. A long-term landscape-based approach to improving the ecological health of Cebolla Canyon and its associated wetlands is needed.

The proposed project protects, sustains and restores ecosystems and builds community capacity to make decisions that protect the environment. This project will demonstrate new methods for wetland and stream restoration and protection in the arid Southwest. The project creates new, multi-jurisdictional, public/private partnerships, which include local communities, local schools, local, state, and federal government agencies, non-governmental organizations and private environmental institutions. The comprehensive approach and the combination of these unique aspects of the project will lead to advances in wetland/stream restoration and protection technology in the region. The project includes a multi-year post-installment monitoring component.

State, local, and/or other stakeholder participation

The project will lean on existing partnerships and collaboration networks with the Albuquerque Wildlife Federation (AWF), Rio Puerco Alliance (RPA), Rio Puerco Management Committee (RPMC), Bureau of Land Management (BLM), and the New Mexico Wilderness Alliance. These entities and networks offer direct opportunities for coordination of projects in the area and for inviting partners to assist the project. New partners could include the Lava Soil and Water Conservation District and the Pueblo of Acoma.

Previously, the AWF in partnership with the New Mexico Wilderness Alliance were the only groups involved in wetland restoration in this area. This project will increase volunteer involvement, as well as let more people in the area know about the potential for restoring agricultural land.

Baseline for Measurement. We will collect water chemistry, geomorphology, wetland delineation, and vegetation data to establish a baseline for the project area. Additionally, we will install piezometers to collect information about the hyporheic zone associated with Cebolla Creek. We will monitor throughout the life of the project and obtain three years of post-installation data.

Project Tasks:

Task 1: Project Administration. This includes developing and overseeing contracts, reimbursement requests, obtaining information for reports, writing semi-annual reports, one final report, and establishing a Steering Committee to provide technical assistance for the project design and implementation. The Steering Committee will meet quarterly over three years and will include representatives from AWF, RPA, SWQB, RPMC, New Mexico Wilderness Alliance, BLM, among others. March 2009 – June 2012.

Task 2: Restoration Reconnaissance. We will conduct a structures and materials inventory of the Cebolla Creek sub-watershed from Reach 0 to Reach 7 (see map below) in order to assess the appropriate location of restoration structure placement for this project and for the Cebolla Creek Wetlands Action Plan. Specific locations for installing BMPs will be identified and mapped. March 2009 - May 2009

Task 3: Compliance. BLM staff will perform National Environmental Policy Act (NEPA) compliance and obtain Clean Water Act (CWA) sections 404/401 permits if necessary. An authorization to use appropriate “minimal tools” within the wilderness will be included in the NEPA authorizing work in the Cebolla Wilderness.

Task 4: Developing Cebolla Creek Wetlands Action Plan (WAP). This task will include developing a WAP for Cebolla Canyon. SWQB and RPA will develop a draft plan in conjunction with the Restoration Reconnaissance (Task 3) and Wetland Restoration Design (Task 5) starting March 2009, and distribute it to stakeholders for input by October 2011. The plan will be adopted into the Rio Puerco Watershed Restoration Action Strategy (WRAS) to facilitate further restoration in the area.

Task 5: Wetland Restoration Design. Under this task, restoration work to return Reaches 1, 3, 4, 6, and 7 of Cebolla Creek to their natural condition will be designed by a surveyor and a stream restorationist who have experience in the area. March 2009 - May 2010

Task 6: Install Fencing. Approximately 15 volunteers (over six 10-hour volunteer days) will install fence around the Cebolla Spring, expanding the area protected from grazing to approximately 40 acres of wetland. It is expected that at least 40 more acres of wetland will be created this way. May 2010 - October 2010

Task 7: Reach 1 Restoration. Move existing dam material from an abandoned irrigation berm to fill the incision in Reach 1 for approximately 50 feet. This will redirect runoff to rewet the old natural channel. Rock, riprap, seed, and mulching materials will be used to stabilize the disturbed banks. May 2010 - October 2010

Task 8: Reach 3 Implementation. Coarse deposition caught by the wetland below has caused a grade change in this reach. The stream bottom is building up and holding water longer. Approximately 6-7 feet of sediment has been captured thus far. Gullies along the road need rock fords made of permeable fill to hold more water up drainage. We expect to haul rock by front-loader to create fords (permeable fill structures). We will hold six 10-hour workdays (of approx. 15 volunteers each) over two years to install the restoration structures and re-vegetate with

wetland species. Participants will learn about wetland restoration hands-on. May 2010 - September 2011

Task 9: Reach 4 Implementation. The lower end of Reach 4 was deliberately ditched and drained when it was cultivated. We need to build a grade control structure (either a cross-vane or filter dam) to raise the bed approximately two feet. We will need rock hauled by front-loader to build the grade control structure (using a backhoe or excavator). A huge slope wetland and cienega has been created from Cebolla Spring due to previous restoration work by AWF. We may need to install a low wicker structure at the existing channel by the fence line or we may need a log dam to keep water on flood plain. We will hold ten 10-hour workdays (of approx. 15 volunteers each) over two years to install 12 moist soil wicker weirs in the old channel to move flood flows to river right and to rewet wetland right and about 12 short berms to plug rills that are draining the wetland terrace. We need to block the abandoned diversion channel leading from Cebolla Spring to the storage reservoir valley right and re-connect groundwater flow from the spring to the abandoned wetland valley right. June 2010 - September 2012

Task 10: Reach 6 Implementation. AWF installed a small “worm ditch” here to starve the headcut. A new ditch of greater capacity, or directly treating eroding headcuts is needed. Excess soil from this process will be used to form a berm on river left (downstream side). Grade control structures will need to be installed. Weirs will be needed in the lower gully and more meandering should be created. Starting at the top, about 1,000 feet of berm should be created to divert flows around the headcut at the main channel gully. At the upper channel we will need to add numerous one-rock dams to raise the grade and establish floodplain access in the riparian pasture. We will pick up rocks from the road with a front-loader to build the dams and stockpile them in. We will hold four 10-hour workdays (of approx. 15 volunteers each) over two years to do the work. May 2010 - June 2012

Task 11: Reach 7 Implementation. We need to raise the road crossing to form grade control. Approximately ½ mile of induced meanders will be installed by volunteers (two 10-hour workdays of approx. 15 volunteers each). The road will also need to be drained and reshaped to reduce sediment yield to the wetland. Rock will need to be hauled to raise the bed of the low water crossing and provide materials for volunteer workdays. May 2010 - June 2012

Task 12: Outreach and Education. The Steering Committee will develop a timeline for workshops and other outreach events when the project commences in early 2009. Included in the planned educational events is a workshop on the methods being used to restore Cebolla Creek which will be conducted during one of the volunteer workdays. In addition, field trips for interested state and federal personnel (members of the Rio Puerco Management Committee and others), non-profit organizations and the public to the project area will be conducted during the summer months annually during the life of the project (2009, 2010, 2011, 2012). We will also draft articles for the RPA (published quarterly), SWQB Clearing the Waters (published semiannually) and AWF (published monthly) newsletters to disseminate information about this project and its effects. We will also develop and participate in a Watershed/Wetlands Academy with wetlands as the theme to be held in the fall of 2011. The San Jose Watershed/Wetlands Academy will target high school students and science teachers from the Grants area/Rio Puerco Watershed and will focus on local and tribal school participation. Information on the project will also be made available at the BLM visitor’s center nearby.

Each of these events will be advertised through Rio Puerco Alliance, Albuquerque Wildlife Federation, and NMED Surface Water Quality Bureau newsletters, flyers at schools and possibly the local newspapers and letters to teachers and other participants. We may also send e-mails and make phone calls to targeted participants. The events will be announced at RPMC, AWF meetings and other appropriate meetings. March 2009 - October 2012

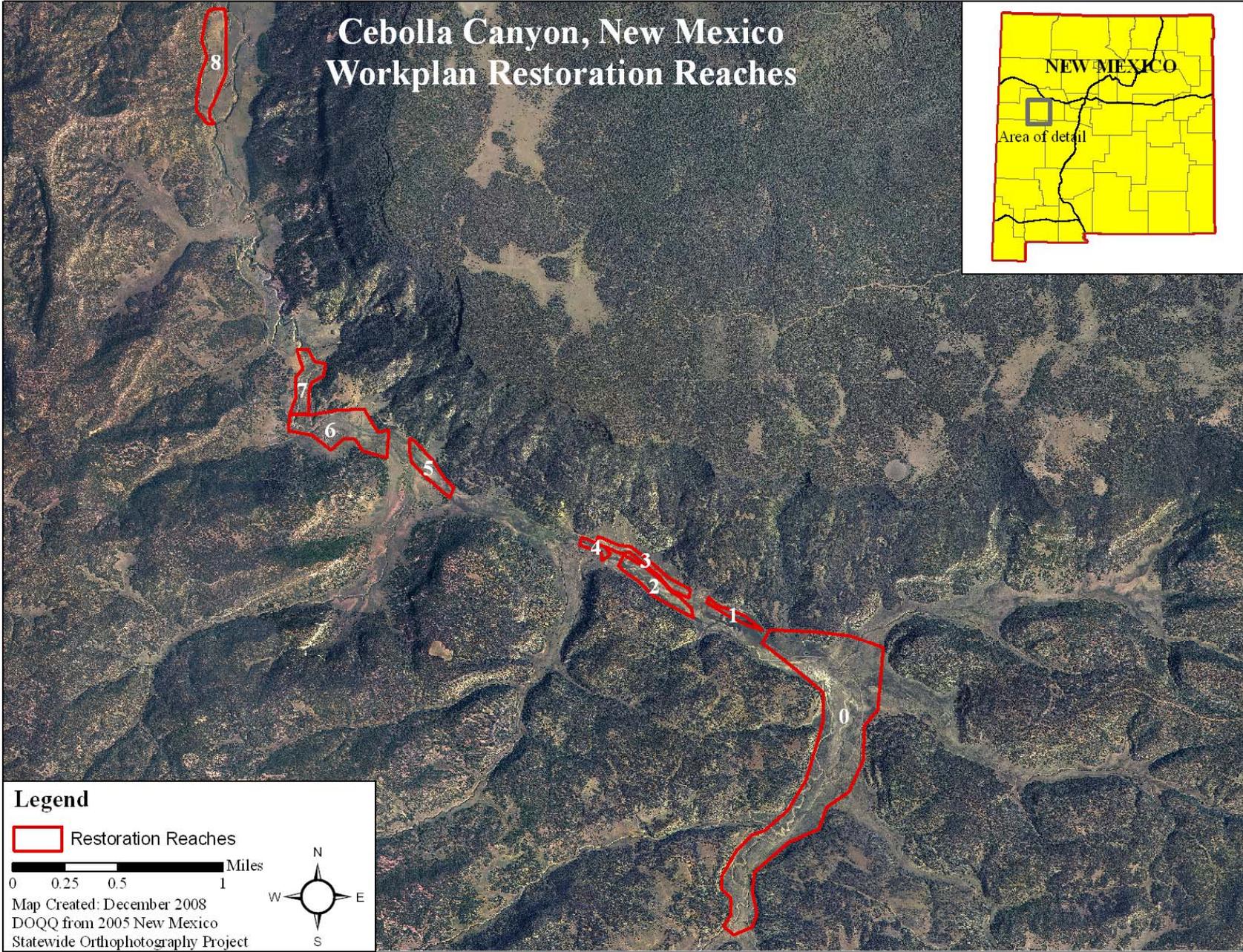
Task 13: Monitoring. Monitoring will continue throughout this project for three years. Baseline data collection in the first year of the project will begin with wetlands delineation and photo points by a contractor. A contractor will install transects for vegetation monitoring and collect baseline data during the first year. Installation of piezometers in the first year by a contractor and with the help of volunteers, will help determine whether the hyporheic zone and wetland areas are expanding with the restoration work. Other measurements will include temperature, turbidity, Rosgen Geomorphologic Assessment Methodology (Level 2) annually by a contractor during the life of the project. SWQB and RPA will develop a Quality Assurance Project Plan (QAPP) by April 2009, and will supervise data collection according to the procedures outlined in the QAPP. Volunteers will be trained, and under the supervision of RPA, the monitoring contractor, and SWQB will collect some data including photo-point and vegetation transect data (six 10-hour workdays of approx. 10 volunteers each over 3 years). Any Monitoring that occurs after the project is completed will be conducted by the Bureau of Land Management and/or by trained volunteers. March 2009 - October 2012

We will transfer project results and methods to other government entities and the public through community meetings in the area and field trips to project sites, presentations at meetings of the Rio Puerco Management Committee, meetings with elected officials, government agency staff, and other professional and decision makers in the area, statewide presentations for other watershed organizations, Soil & Water Conservation Districts, etc., and through displays at the El Malpais Visitors Center. In addition, publication of project accomplishments and lessons learned in regional media, on SWQB Wetlands Program website, in conference proceedings, in newsletters of the Rio Puerco Alliance and Albuquerque Wildlife Federation, etc. will inform the public. The Watershed/Wetlands Academy and other workshops to train volunteers will also directly transfer information to those involved.



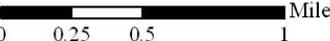
Cebolla Spring

Cebolla Canyon, New Mexico Workplan Restoration Reaches

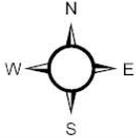


Legend

 Restoration Reaches

 Miles
0 0.25 0.5 1

Map Created: December 2008
DOQQ from 2005 New Mexico
Statewide Orthophotography Project



A compass rose showing cardinal directions: N (North), S (South), E (East), and W (West).