New Mexico Wetlands Protection Program
FY04 EPA WETLANDS GRANT PROGRAM
CWA Section 104(b) (3)
CD# 976731-01-0 (FY2004)

FINAL REPORT

Restoring Wetlands and Training Wetlands Restoration Specialists on Cedro Creek

Executive Summary

Wetlands and wet meadow ecosystems are among the most productive ecosystems in the southwest and are a vital part of New Mexico's watersheds. They provide food, water and cover for wildlife and in some areas, forage for livestock. In addition, they sustain a great variety of hydrologic and ecologic functions vital to ecosystem integrity. These functions include flood abatement, sediment retention, groundwater recharge, nutrient capture, and plant and animal diversity. In arid and semi-arid landscapes wetland and riparian environments are estimated to comprise less that 1 percent of the total landscape; wetland acreage in New Mexico has decreased an estimated 33% since the 1780's.

The greatest impact to the Cedro Creek Watershed has been in the form of road building beginning with the early wagon roads. It was typical of the times that these roads followed the stream bottoms with numerous crossings. These crossings tended to break down the stream banks and the roads reduced riparian vegetation exposing soils to erosion and streams to subsequent downcutting. The succession of roads that followed only served to exacerbate the problem, and further isolate the floodplain from the stream channel in many areas. The wagon roads were replaced with more modern roads in the 1930's by the Civilian Conservation Corps which was then followed by the first highways that often relocated the channel to one side of the canyon.

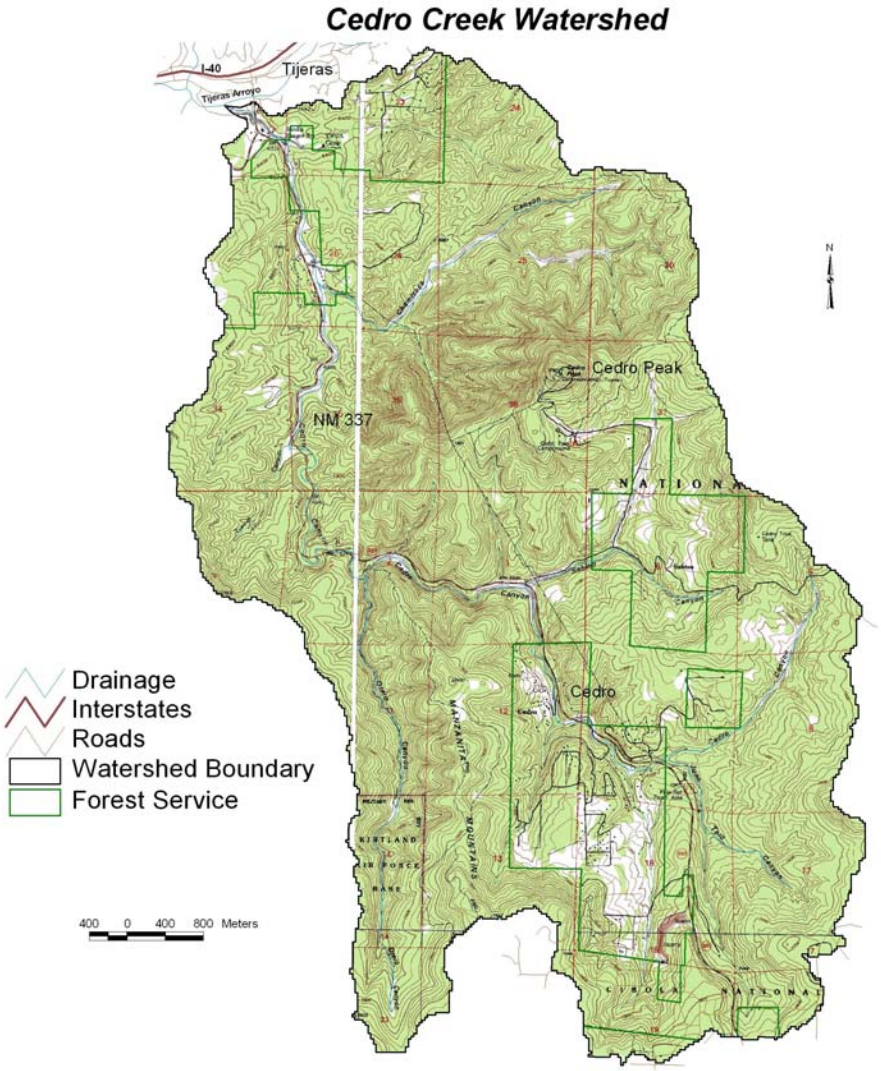
The *Restoring Wetlands and Training Wetlands Specialists on Cedro Creek* project proposed to address impacts from poorly designed road construction utilizing a combination of on-the-ground implementation practices (induced meandering), training seminars, outreach, and volunteer engagement. The techniques employed in induced meandering are based on the principles developed by Dave Rosgen and utilizing locally available materials. The techniques have been proven especially effective for improving wetland, riparian and stream habitat in ephemeral and interrupted streams in arid landscapes. This combined effort facilitated not only the improvements on 17 acres of wetland and riparian wetland habitat, but included 1,286 volunteer hours from diverse community groups, and utilized and trained "hands-on" 34 seminar participants who commonly engage in wetland restoration activities, through the completion of a nine-day training course that took place on Cedro Creek in 2006. This training was entitled "Restoration Methods for Riparian, Wetland and Ciénega Ecosystems". This project also educated another 56 participants in two targeted-audience technical seminars on wetlands and roads best management practices and procedures.

Problem Statement

The Cedro Creek Watershed is located east of Albuquerque, New Mexico in the Manzanita Mountains and is a sub-watershed of the Rio Grande-Albuquerque Watershed (HUC 13020203). It is a relatively small watershed draining approximately 14 mi^2 and consisting of several primary drainages including Cedro Creek, Chamisoso Canyon, Otero Canyon, Tunnel Canyon, Juan Toro Canyon, and Sabino Canyon. All are ephemeral except Cedro Creek which is an interrupted stream with several perennial reaches containing both riparian and wetland habitats.

Cedro Creek is unique in that the watershed is primarily located in limestone terrain. Most of the soils are formed from material weathered from limestone or dolomite, both of which

tend to weather to clays. In some areas, exposed bedrock and thin soils could not support wetland and riparian vegetation. Therefore, a key component of the restoration of wetlands and riparian areas was to capture and retain sediment and organic matter to help develop soils and moisture retention by soils.



The greatest impact to the watershed has been in the form of road building beginning with the early wagon roads. It was typical of the times that these roads followed the stream bottoms with numerous crossings. These crossings tended to break down the stream banks and the roads reduced riparian vegetation exposing soils to erosion and streams to subsequent down cutting. The succession of roads that followed only served to exacerbate the problem. The wagon roads were replaced with more modern roads in the 1930's by the Civilian Conservation Corps which was then followed by the first highways that often relocated the channel to one side of the canyon. Eventually, the new highways were placed on the hillslope off the valley floor, drainage was improved, and culverts were placed at the stream crossings. While this decreased the width of the floodplain in some areas and deposited excess fill in others, the new highways

have improved drainage and result in less erosion. The erosion and subsequent loss of flood plain has lead to a decrease in both wetland and riparian habitats.

Cedro Creek and its tributaries is one of a few perennial sources of water in the area encompassing the Sandia and Monzano Mountain ranges and serves as a functional wildlife corridor. Cedro Creek is critical in establishing linkages between surrounding semi-arid regions and connects wildlife migration networks between the Southern Rocky Mountains to the north and the New Mexico Mountains[1] to the south. Additionally, the surface water drainage system of its riparian zones and wetlands serve as small stepping stones for waterfowl and neotropical migratory birds.

Project Goals

The restoration of Cedro Creek was designed to be an educational project, and included field trips, hands-on demonstrations and outdoor classroom for school children and their teachers. It also served as participant training for restoration training sessions, and on-site training and work days for other cooperators like the New Mexico Riparian Council. One of the attractions of this hands-on demonstration of innovative restoration techniques was that, over the life of the project, noticeable improvements and recovery to the creek ecosystem were evident, adding to the sense of accomplishment that comes from working with nature.

The project contained three primary goals:

I. To conduct restoration work along Cedro Creek and it's tributaries with school children and their teachers from the Albuquerque area, with other cooperators and with diverse community groups to restore approximately 5.5 miles of stream and create approximately thirty acres of wetlands and wet meadows;

II. To develop and implement a series of three training seminars in innovative self-sustaining riparian and wet meadow restoration techniques that will result in at least 35 trained "restoration specialists." These trainings will disseminate innovative methods of wetland and riparian restoration technology that will allow stakeholders to repair their watersheds without needing large amounts of money to do so.

III. To develop and implement a specialized training session for the New Mexico Department of Transportation focusing on interactions between roads and the riverine environment and wetlands; one seminar focusing on county roads and one on ranch roads.

Timeframe

The original grant was awarded by EPA Region 6 to the Wetlands Program on September 20, 2004 and to be completed on June 29, 2007. The timeframe of the contract was amended in May 2005 to be extended to June 30, 2008. The first amendment was necessary to allow for the extra time to complete the permitting process and the archaeological survey during the first year of the project. The archaeological survey was completed in January 2006. It was amended a second time on February 12, 2008 to extend the project an additional six months to December 31, 2008. The purpose of the amendment was to allow sufficient time to complete the Wetlands Action Plan, to allow for an additional volunteer work days during the field season, and allow time to complete the quarterly and final reports.

The project QAPP was submitted to EPA April 20, 2005 and final signature was obtained January 18, 2006.

Cooperators

The New Mexico Environment Department's Wetlands Program administered the grant through the assistance of project officers Julie Walker and Chris Canavan. The project officers coordinated the partnership, provided guidance for implementation of the restoration, and worked in the field with the rest of the partners on monitoring and restoration.

Bill Zeedyk LLC designed the restoration and the training curriculum and conducted training. Currently, Bill is the only person fully "trained" in his innovative methods and therefore the only person who could oversee both the project and the training.

The Quivira Coalition organized and conducted the training seminars and coordinated the baseline monitoring for the restoration. Project officer Julie Walker helped develop the list of invitees, and coordinate and conduct the training sessions. The Quivira Coalition has organized similar "riparian restoration" and "erosion control" workshops across New Mexico. NMED and The Quivira Coalition have worked extensively with Bill Zeedyk on successful restoration projects on Largo Creek, Comanche Creek, and the Dry Cimarron. Steve Carson, Steve Vrooman, and Van Clothier, who have been trained by Bill, provided technical expertise for, and oversight of, the restoration work and helped with the training seminars and "on-the-ground" training.

Other cooperator organizations that helped with the restoration work included the Cibola National Forest, Tree New Mexico, Albuquerque Wildlife Federation, Ciudad Soil and Water Conservation District the New Mexico Riparian Council, New Mexico State Forestry, NRCS Los Lunas Plant Materials Center, New Mexico Museum of Natural History and Science, PNM, and children and teachers from various Albuquerque area schools, and Boy Scouts and Girl Scouts of America. The Ciudad Soil and Water Conservation District completed a Watershed Restoration Action Strategy for the Upper Tijeras Creek Watershed, which includes Cedro Creek. The District is a key partner in the adoption of the Cedro Creek Wetlands Action Plan as an addendum to the Watershed Restoration Action Strategy.

Volunteers help build structures on Cedro Creek.

Funding History:

Funding for SWQB staff activities, travel and supplies were provided by this grant. In addition, funding for curriculum development, restoration design and implementation, seminars, and monitoring were funded by this grant. The grant award included an additional $30,000 given by EPA Region 6 at the time of the award to conduct the NMDOT Training workshop.

Match was achieved by in-kind services by watershed stakeholders, by non-federal trainees attending training sessions, in-kind services for training manual development, in-kind services for project design and monitoring by project contractors, and donated supplies. Some

match was also contributed through SWQB general funds. Match was documented in quarterly reports to EPA.

$137,445 Federal $115,659.59 Match 46% of total cost of the project

Environmental Outputs: Tasks and Deliverables:

Task 1: *Archaeological compliance for Cedro Creek work* - **COMPLETED**

The Forest Service and Gen Head (contract archaeologist) completed a literature search through ARMS and Forest Service records, an on-the-ground survey (which encompassed ~30 meters on either side of the Creek or its tributaries) over at least 5.5 miles, a report to SHPO, the 30-day comment period which SHPO requires, and any response to comments from SHPO. The final report **"Restoring Wetlands and Training Restoration Specialists Along Cedro Creek – Phase I Cultural Resource Survey-February 2006"** prepared by Gen Head, is on file with the Forest Service, Sandia Ranger Station and at The Quivira Coalition office in Santa Fe. Before commencement of on-the-ground work, sensitive sites were flagged and verified with the implementation manager for the project.

Task 2: *Design the curricula for the three training seminars* **– COMPLETED**

Curricula were designed for 3 different seminars - One specifically for county road maintenance crews and one for NM Department of Transportation personnel. Curriculum for a three part series of training sessions for training restoration specialists was also created. Each of these training sessions is described below.

A two-day seminar especially designed for County Commissioners and Road Superintendants ***"A Good Road Lies Easy on the Land: Water Harvesting from County Maintained Roads"*** was hosted by the Cimmaron Watershed Alliance and Colfax County, was conducted by The Quivira Coalition and the training was lead by Bill Zeedyk of Zeedyk Ecological Consulting, LLC. Workshop materials included:

- Management and Techniques for Riparian Restoration: Road Field Guide volumes 1 and 2
- Managing Roads for Wet Meadow Ecosystem Recovery
- Low Maintenance Roads for Ranch, Fire and Utilities Access
- Riparian Road Guide: Managing Roads to Enhance Riparian Areas and
- Informational Materials developed by Bill Zeedyk

Instructors Bill Zeedyk, Van Clothier, Steve Vrooman and Steve Carson in conjunction with Project Coordinator, Tamara Gadzia developed curriculum materials and agendas for 3, 3-day ***"Restoration Methods for Riparian, Wetland and Ciénega Ecosystems"*** seminars

Seminar #1 was conducted May 3-5, 2006 at the Sandia Ranger Station, Tijeras, NM. Topics included:

- Wetland Types and Hydrology,
- Restoration Methods and Practices: Project Highlights for perennial, ephemeral intermittent, low elevation and Ciénegas and Riverine wetland types
- Wetland Delineation and Field Examples
- Channel Type, Morphology and Terminology
- Valley Types and Stream Types
- Channel Types and their relationship to proper functioning condition
- Stream Channel Survey Methods
- Channel Survey Field Demonstration

Seminar # 2 was held August 2-4th at the Sandia Ranger Station, Tijeras, NM with topics included:

- "Reading the Landscape" and Creating a Vision for the Restored Site
- Induced Meandering: When to use, where to use, and what it accomplishes
- Formulas and Measurements for Inducing Meandering
- Structures of Induce Meandering: What they do, When and Where to use
- Design & Implementation
- Assessment and Design to Induce Meandering – Field Day
- Demonstration of Structure Installation on Sandia Prep Reach based on plan
- Team presentations of induced meandering designs

Seminar # 3 was held October 4-6th at the Sandia Ranger Station, Tijeras, NM with topics included:

- "Reading the Landscape" & Identifying Impacts on Wetland & Riparian Areas
- Monitoring Practices and Treatments
- Threatened & Endangered Species Issues
- Roads, Wetlands & Riparian Areas: Problems and Solutions
- Project Plan, Design, Implementation, Demobilization
- Student Practicum Reviews
- Project Field Trip

Bill Zeedyk of Zeedyk Ecological Consulting and Tom Moody of Natural Channel Design, created a curriculum and Power Point presentation for the NM Department of Transportation 3-day seminar, ***"Incorporating Natural Channel Design into Transportation Engineering"*** held May 16-18, 2006. This workshop was especially designed for DOT Road Technicians and Design Engineers and included field reviews. Topics included new concepts for controlling maintenance costs, reducing soil erosion and conserving water, protecting water quality and wetland /riparian habitats. Specific topics included:

- Geomorphology and Road Design:
- Interactions between Roads and the Watershed
- Fundamentals of stream geomorphology, channel maintenance flows, hydraulic and sediment transport processes, and regional geomorphic relationships.
- Road/Site Conditions & Design Considerations: Hydrology, Hydraulics, Regional Curves, Road Template including tools to use in design.
- Tools for Managing Roads while Maintaining Natural Hydrology
- Roadside Drainage and Vegetation: The design of roadside ditches, effective road drainage, use of buffer strips, seeding, & soil bioengineering.
- Stream and Meadow Crossings: Use of permeable structures; tools for sighting and designing bridges, culverts and low-water crossings to effectively carry water and sediment.
- Stabilization Measures: "Thinking outside the Right of Way"

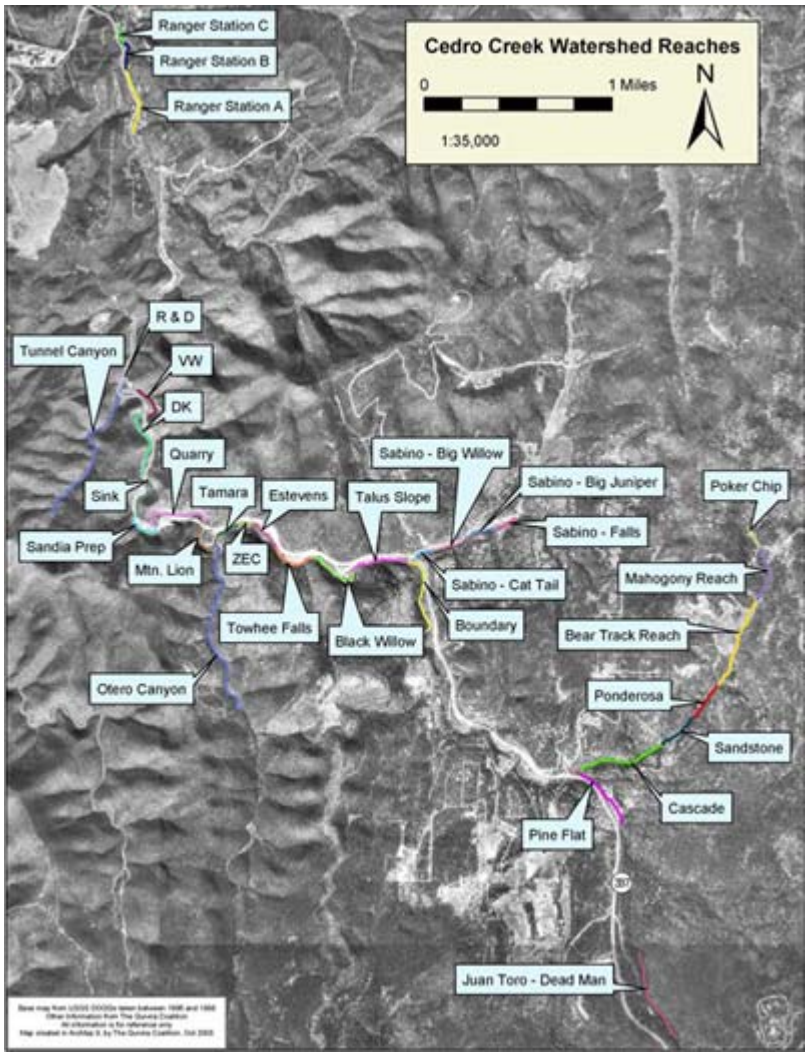
Copies of all training seminar materials are located at NMED-SWQB and The Quivira Coalition Office.

Task 3: *Design restoration for Cedro Creek and associated tributaries* **- COMPLETED**

Parts of the Cedro Creek watershed are on Forest Service lands, in private hands and partly under County control. This project was conducted on lands under Forest Service jurisdiction under this grant. County and private lands will be targeted as future projects in the Cedro Creek Wetlands Action Plan as a priority for a next phase of this project, as some of those areas show great potential for restoration and wetland creation.

The project area was mapped and reaches were selected in the watershed that were amenable to the techniques utilized to induce meandering. Cedro Creek is an interrupted stream with a total of three miles of perennial waters interspersed with wetlands. The rest is ephemeral. Some of the tributaries have the potential for becoming perennial, but restoration is limited in other areas due to a geologic fault where surface flows go underground and do not resurface. That area has no real potential for wetlands, although some riparian areas can be enhanced. The work being done on the 5.5 miles of Cedro Creek and its tributaries was not on contiguous sections. For each section, we have listed the types of treatments that could be used and the goals of the treatment. Specific design of some of the treatments was done by the trainees in the training seminars.

The assessment of the Cedro Creek Watershed took place in April and May of 2005 by Bill Zeedyk, Steve Carson, Steve Vrooman and Tamara Gadzia. For ease of discussion and mapping, twenty-eight reaches were identified and named encompassing 43,890 feet (8.31 miles) of riparian and wetland areas throughout the watershed. The named reaches include: Sink, Otero, Juan Tomas, Poker Chip, Sabino-Cattail, Sabino-Big Willow, Sabino-Big Juniper, VW, DK, Cascade, Sandstone, Ponderosa, Ranger Station (A, B, & C), Sandia Prep, Quarry, Mt. Lion, Tamara, ZEC, Estevens, Black Willow, Talus Slope, Boundary, Bear Track and Mahogany.



During the assessment, approximately 230 treatments were identified for implementation. An assessment report was compiled and is on file at the NMED-SWQB and The Quivira Coalition Office.

Task 4: *404 and 401 permitting for the restoration work on Cedro Creek by the Forest Service* **- COMPLETED**

Section 404 of the Clean Water Act (33 U.S.C. 1344) - Section 404 of the Clean Water Act prohibits the discharge of dredged or fill material into waters of the United States without a permit from the U.S. Army Corps of Engineers (USACE). Therefore, using data from the assessment report developed in Task 3, the Forest Service applied for and received a 404 permit from the USACE and a section 401 water quality certification from the New Mexico Environment Department to restore selected reaches of Cedro Creek. A copy of this report can be found at The Quivira Coalition Office in Santa Fe and with the USDA Forest Service office in Albuquerque, NM. Eighteen reaches were selected for treatment and include: Mahogany, Bear Track, Boundary, Talus Slope, Black Willow, Estevens, ZEC, Tamara, Mt. Lion, Quarry, Sandia Prep, Ranger Stations A, B, & C, DK, VW, Sabino-Big Juniper and Sabino-Big Willow encompassing 24,726 feet of creek (~4.68 miles & 28.38 acres of wetland) and ~175 treatments. Total discharge for the permit was 21,988 square feet**.** The 404/401 permit is on file with the Forest Service, under Nationwide permit No. 27, Action # 2005 00051 (October 12, 2005). This Nationwide permit ended March 31, 2007. Implementation of treatments must be completed by March 31, 2008. Maintenance of treatments may occur indefinitely.

Task 5: *Continued meetings of partnership to oversee restoration and training.***- COMPLETED**

The Cibola National Forest, the Museum of Natural History, the Environment Department Wetlands Program, The Quivira Coalition, the Albuquerque Wildlife Federation, the New Mexico Riparian Council, Bill Zeedyk, subcontractors, PNM and the Ciudad Soil and Water Conservation District planned to conduct 2 meetings a year to oversee this project, to assure that it was meeting its goals and to produce a Wetlands Action Plan. These meetings were coordinated and led by Julie Walker (Wetlands Program project officer) and included field trips to the restoration site when applicable.

Six partnership meetings were conducted during the project period: April 15, 2004, November 18, 2004, March 22, 2005, November 21, 2005, November 8, 2006, and June 29, 2007. In late 2007, the first draft of the Cedro Creek Wetlands Action Plan was distributed to the partnership for comments and additional information. A second draft was created incorporating comments from the partnership in early 2008. In July, 2008, the Wetlands Program Coordinator determined that more work was needed to complete the Cedro Wetlands Action Plan to SWQB Wetlands Program specifications. Partnership member interviews and an additional field review were conducted by the project's new project officer, Chris Canavan who subsequently revised the Final Draft of the Wetlands Action Plan for Cedro Creek.

Task 6: *Baseline monitoring of area to be restored.* **– COMPLETED**

A QAPP was developed for this project and was forwarded to EPA for comment in April 2005. The final approval by EPA was completed January 2006.

The areas being restored during the project period were monitored by The Quivira Coalition staff and NMED project officer, with oversight by Bill Zeedyk, using Rosgen Level 1 and 2 protocols and Alma Windward's Green Line protocol. Maps of the proposed work were made and photo points were established to be used in follow-up monitoring. Once assessment of the watershed and mapping was complete, proposed treatments, geomorphology and vegetation surveys were implemented. A geomorphology survey was conducted in six reaches: DK, Sandia Prep, Quarry, Mt. Lion, ZEC, and Estevan. A vegetation survey was conducted in five reaches: Quarry, Mt. Lion, Sandia Prep, ZEC and Estevans and twenty-four permanent photo monitoring

points were established in Mt. Lion (7), Quarry (1), Sandia Prep (3), DK (6), ZEC (1), Estevans (3) and Boundary (3)

All baseline data collected from these surveys can be found in the ***Cedro Creek Monitoring Report, December 2005*** prepared by Steve Vrooman, Steve Vrooman Restoration Ecology. This report is on file at NMED-SWQB and at The Quivira Coalition office.

Task 7: *Organize and conduct at least 6 training seminars with one specifically for the New Mexico Department of Transportation.* **- COMPLETED**

These training seminars were designed to disseminate innovative methods of wetland and riparian restoration technology that will allow stakeholders to work to repair their watersheds without needing large amounts of money to do so. Two seminars specifically address road related impairment of stream systems, riparian areas and wetlands.

Five trainings have been completed:

1. The Quivira Coalition, the Cimarron Watershed Alliance, and Colfax County hosted a two day seminar entitled***: "A Good Road Lies Easy on the Land: Water Harvesting from County Maintained Roads"*** with instructor Bill Zeedyk, October 20-21, 2005 at the Buster Brown Building, Philmont Boy Scout Ranch, Cimarron, NM with 31 participants.

2. Bill Zeedyk of Zeedyk Ecological Consulting and Tom Moody of Natural Channel Design presented to the NM Department of Transportation a 3-day seminar which included a day of field visits to sites where road construction interacts with streams. The training was ***entitled "Incorporating Natural Channel Design into Transportation Engineering"*** held May 16-18, 2006 with 25 participants.

3. All three training sessions to train restoration specialists have been completed with 34 out of 40 participants completing all three trainings. Certificates of Completion were given to all that completed the course.

   a. Seminar #1 was conducted May 3-5, 2006
   b. Seminar # 2 was conducted August 2-4, 2006

c. Seminar # 3 was conducted October 4-6, 2006

Restoration methods for Riverine, Wetland and Cienega Ecosystems Training
Seminar #2

- **Reading the landscape**
- **Induced meandering**
- **Formulas and Measurements**
- **Structures to Induce Meandering**
- **Design and Implementation**
- **Field day**

Task 8: *Restoration of Cedro Creek to increase the area of wetlands, wet meadow and riparian areas.* **– COMPLETED**

The work plan called for at least 9 workdays, 3 a year, to do the restoration work on 5.5 miles of the Creek and its tributaries. A total of **13 volunteer workdays** took place between April 1, 2006 and March 15, 2008. These workdays were attended by seminar trainees, other cooperators, and school children and their teachers from various Albuquerque schools. Each workday had at least one foreman to oversee the work and assure the safety of participants. The foremen and Bill Zeedyk arranged for the supplies needed and set up the area for the restoration work. These workdays were organized by The Quivira Coalition, the Albuquerque Wildlife Federation with help from NMED Project officer and the New Mexico Museum of Natural History & Science.

Four student one-day workshops were held

- April 29, 2005 – Monitoring on Tamara reach.
- July 8, 2005 – Quarry reach with Bill Zeedyk…shore up and build ORDs.
- March 16, 2006 = Mt. Lion and Quarry Reach
- April 6, 2006 – Mt. Lion and Ranger Station
- **72 students and 12 teachers** from the various programs and schools (including Van Buren Middle School MESA program, New Mexico Museum of Natural History and Science, East Mountain High School and local home school children), participated in these four workshops. The students helped monitor the project, remove noxious weeds, dispersed seeds for re-growth of native vegetation, close eroding side trails, mulch disturbed areas, and build rock water harvesting structures while learning about Cedro Creek's riparian & wetland habitats.

Students collect gravel to help construct one of the restoration structures.

Students examine what kind of life is in the water on Cedro Creek, with Julie Walker and Dave Petrie of NMED-SWQB.

Seven adult 1 or 2-day workshops were held

- April 1-2, 2006 - Volunteers from various organizations, local residents and the general public worked Mt. Lion, Tamara, Zec, Estevens and Boundary reaches shoring up filter dams and building rock weirs.
- April 22, 2006 – PNM and local residents worked on Ranger Station Reach.
- September 16, 2006 - ABQ Wildlife Federation (part of Zuni bowl constructed along with 6 rock structures on the lower section of Sandia Prep
- March 17 & 18, 2007 (2 teachers and 6 students from Van Buren Middle School also attended – vegetation planting along Estevens, ZEC, Tamara, Mt. Lion, and Quarry

Reaches – cottonwoods, NM olives, coyote willows, black willows, Wood's roses, bulrush, box elders etc.),

- June 23rd, 2007 volunteer workday was attended by 20 volunteers from the Albuquerque Wildlife Federation, local residents, state and federal employees. They helped build larger rock structures along the Sandia Prep Reach.
- August 4th, 2007 volunteer workday was attended by 40 volunteers from PNM, local residents and the general public. Structures were installed along Sabino and Sandia Prep Reaches.
- March 15, 2008 – 20 Albuquerque Wildlife Federation volunteers built 9 rock structures between the confluence of Sabino Creek and the first machine built filter dam on Boundary Reach. Willows, boxelders, NM olives, roses, and cottonwoods were also planted along Boundary Reach (120 volunteer hours).

The Ciudad Water and Soil Conservation District provided funding for the implementation of treatments using large equipment. This part of the restoration was implemented by Steve Carson of Rangeland Hands and Craig Sponholtz of Dryland Solutions. Work commenced on March 6, 2006 and was completed on March 30, 2006. A total of 15 machine built structures were installed.

The structures included 11 Filter Dams, one Zuni Bowl (Filter Dam/Drop Structure/Head Cut Control Structure), and 3 Baffle/Point Bar/Channel Re-route Structures. Numerous Siberian elm trees were mechanically removed or girdled with a chainsaw. The girdling is an experiment to see if in a drought year it will actually cause the die back of the elms. The results will be evident in 18 months.

With the help of 199 volunteers (1286 volunteer hours) and contractual labor, 163 treatments (practices or structures) have been installed along 11,315 ft. and 11 reaches of Cedro Creek with ~17 acres of wetland affected by treatments.

Structures Completed as of March 15th, 2008:

Estevens Reach:	24
ZEC Reach:	5
Tamara Reach:	18
Mt. Lion Reach:	18
Quarry Reach:	19
Sandia Prep:	11
Ranger Station:	
A Reach	6
B Reach	16
C Reach	18

Boundary:	14
Sabino Creek	14
Total	163

Estevan's Reach: As constructed in 2006 and later in the growing season

Task 9: *Continued monitoring of restoration.*

Quivira and NMED Wetlands Program conducted follow-up monitoring of restoration reaches using Green Line and Rosgen protocols and continued mapping the restoration area. Albuquerque school children, coordinated by the Museum, took photos at the photo points and help with monitoring. **– COMPLETED**

Follow-up monitoring was completed October 16, 17, 25, 26, and November 6th & 7th, 2007. The baseline and follow up data is presented in **"Cedro Creek Monitoring Report ~ Final Report, 2005-2007, March 2008"** prepared by Steve Vrooman, Steve Vrooman Restoration Ecology. The report is posted on The Quivira Coalition's website under Land and Water Program/Restoration Projects. This report is also on file at NMED-SWQB and at The Quivira Coalition office.

Task 10: Grant administration and reporting.

Grant oversight and production of quarterly and final reports to be conducted by NMED project officer. **– COMPLETED**

A total of 21 reimbursement requests to contractors, 1 contract, 4 contract amendments and 3 EPA amendments were completed during the project period.

This is the Final Report for ***Restoring Wetlands and Training Restoration Specialists on Cedro Creek*** submitted, March 2009.

Task 11: *Attend wetlands training.* - **COMPLETED.**

Two separate trainings were attended by SWQB personnel.

- One SWQB personnel attended the Regional Wetlands Technical Conference: Wetland Science and Conservation – Tools for Future Challenges and Success from May 17-19, 2005 in Corpus Christi, Texas.
- Two SWQB personnel and New Mexico D.O.T. members attended sessions on such diverse topics as wetlands, riparian restoration, surface water and groundwater interactions, and fluvial geomorphology, at the American Water Resources Association Annual Conference held in Albuquerque, New Mexico in November, 2007.
- Julie Walker presented the results of the Cedro Creek project at the 2007 USFS/NMED annual meeting.

Environmental Outcomes: Project Successes

This project, one of the first completed on-the-ground by the Wetlands Program has been an enormous success with a number of positive outcomes.

1. Increased participation in wetland restoration and participation by diverse sectors of the community. The project's largest success is the enormous amount of community buy-in and volunteer hours donated **(1286 hours, 199 volunteers)** to complete the project. Even the last project volunteer restoration day in March 2008 had over 30 participants, adults and children. The diversity of organizations that took part over the course of the restoration portion of this project include businesses such as PNM, NGOs such as Albuquerque Wildlife Federation, The Quivira Coalition, New Mexico Riparian Council, and Tree New Mexico, and Boy and Girl Scouts of America, federal agencies such as the US Forest Service, State and local agencies such as NMED and Ciudad Soil and Water Conservation District, and local schools (middle schools, high schools, special school programs and home schools). A variety of community population groups were included in the volunteer restoration days and each of the participants took away with them more knowledge about wetlands, stream ecology and geomorphology, wildlife habitat and restoration techniques.

2. On-going momentum to continue restoration effort. The restoration volunteer days are continuing even after this funded project has ended and the next restoration day will be in April 2009. Monitoring will continue by The Quivira Coalition after this project has ended. The Wetlands Action Plan will provide guidance to move the restoration of Cedro Creek and improvements for wetland health forward.

3. Increased stakeholder knowledge about wetlands science and importance of wetlands in an arid environment. The trainings and workdays engaged a diversity of groups that learned about wetlands in the arid Southwest. In the field, local community members experienced the aquatic environment that is the lifeblood of a wetland and also important habitat during the life cycle of many arid climate species.

4. Application of informed, scientifically valid approaches. Over 90 participants attended the different seminars conducted as outputs of this project. Task 2 lists the different technical topics that were presented. Bill Zeedyk was the lead trainer for each of the seminars and additional trainers were well qualified in the field. All of the approaches were based on sound scientific principals and included collection of scientific data as a basis for restoration design and implementation. The road seminar targeted audiences that either worked in road construction, design, maintenance and/or decision making. The restoration seminars targeted an invited audience of practicing watershed restoration specialists all presently active in the field and with plans to use the information in other parts of New Mexico.

5. Increased quality and quantity of wetlands. The project included the restoration design of five miles of Cedro Creek and its tributaries, and structure placement to improve wetland condition along 2.14 miles.

6. Applicability to other parts of the state. Each of the participants in the 9-day training course had to have another location within the state to "practice and implement" the techniques learned in the training. During each training session, several participants presented their restoration project progress reports to the rest of the class. Not only were they able to use the restoration techniques in other areas, they were given advice by the trainers and suggestions to complete and improve their restoration outcomes.

7. Improved knowledge and decision-making ability of local officials who are in the position of creating laws, ordinances, permits, etc. Two Colfax County Commissioners, Colfax County Manager, Colfax County Road Superintendant, Colfax County Maintenance Operator, Colfax County Assistant Foreman, Mora County Road Foreman, one Mora County Commissioner, two City of Cimmaron representatives and 6 NMDOT District 4 representatives in various positions attended the County Roads 2-day seminar and training held in the northeastern portion of New Mexico. They were invited in order to improve their knowledge about how county roads affect wetlands, and thus change and improve managing roads to protect wetlands and water quality.

Obstacles:

- The contract with our principal contractor, Quivira Coalition was completed March 15, 2005 delaying the initiation of key components of this project. The signing of the contract was delayed to accommodate legal review of the sole source agreement. A sole source agreement was the mechanism to obtain this contract since the Quivira Coalition was the only contractor known to provide the restoration methods expertise, the workshop development staff, and the oversight for design and implementation of specially designed low-cost innovative methods for restoration.
- The culmination of this project was delayed because the principal project officer, Julie Walker took maternity leave just as the project was winding up. Reorganization of the Wetlands Program staff caused further unforeseen delays in the completion of the final reports for this project.
- Both these delays are not uncommon in the normal course of NMED business and did not affect the actual success of the project.

EPA Feedback Loop: Reports for this project were submitted quarterly to indicate progress, outputs and the achievement of milestones. EPA was encouraged to report any comments regarding the outputs and outcomes of this project.