

**Final Report  
September 2010  
Planning for Wetlands in the Galisteo Watershed Project  
Assistance Agreement No. CD-976733-01-0 (FY2004) and  
Addendum (Galisteo Pilot Project) (FY2009)**



**Canoncito (Eldorado Wilderness)**

## Project Description and Location

The projects “Planning for Wetlands in the Galisteo Watershed” (2004-2009) and “Galisteo Pilot Project” (2009-2010) incorporate wetland restoration and protection into local and regional planning initiatives in the Galisteo Watershed. These initiatives include Santa Fe County’s current planning initiatives for the area, identification of areas of Significant Conservation Value as part of “Green Infrastructure” planning for the Galisteo Watershed (Galisteo Watershed Conservation Initiative), efforts related to tamarisk and other non-native invasive species management, a plan for 24 archeological areas developed by BLM based on recent Federal Legislation, the statewide network New Mexico Wildways, and inclusion in the USFWS Partners for Fish and Wildlife Upper Rio Grande priority area among others. The Wetlands Action Plan takes advantage of the opportunity to coordinate wetland restoration with these planning initiatives as steps to establish a long-term, watershed- wide wetlands restoration and protection program.



Figure 1. Residents, agency representatives, and conservation organizations have formed a collaborative team to discuss the design for the restoration of riverine wetlands in the Village of Galisteo.

The former project developed and used a prioritization process for selecting sites for assessment of their restoration potential and needs, and implements demonstration

restoration projects in the Galisteo Watershed. Both projects include innovative and affective techniques and resources for educating the public, landowners and resource managers about wetlands and their important the functions, ecosystem services and benefits locally and on a regional and national scale. The project also includes the completion of a Wetlands Action Plan. This planning process was instrumental to obtaining additional funding and resources, providing key information for the protection of wetlands from potential threats and impacts, and for the implementation of restoration measures for nearly all wetland sites that were assessed for restoration potential.

The Galisteo Watershed, located mainly in Santa Fe County, includes 467,000 acres with approximately 1,000 acres of remaining wetlands and an estimated 4,000 acres of potential wetlands. Elevation variation from 5,000 to 10,000 feet and a very diverse ecology offer a variety of wetlands and wetland opportunities with a wide range of ecological functions. The area is semi-arid, which means that wetlands are especially valuable to wildlife. 69% of the land is privately owned and large ranches are gradually being converted for residential development. This rapid rate of urbanization at four times the national average underscores the urgency of wetland planning and conservation actions in the area.

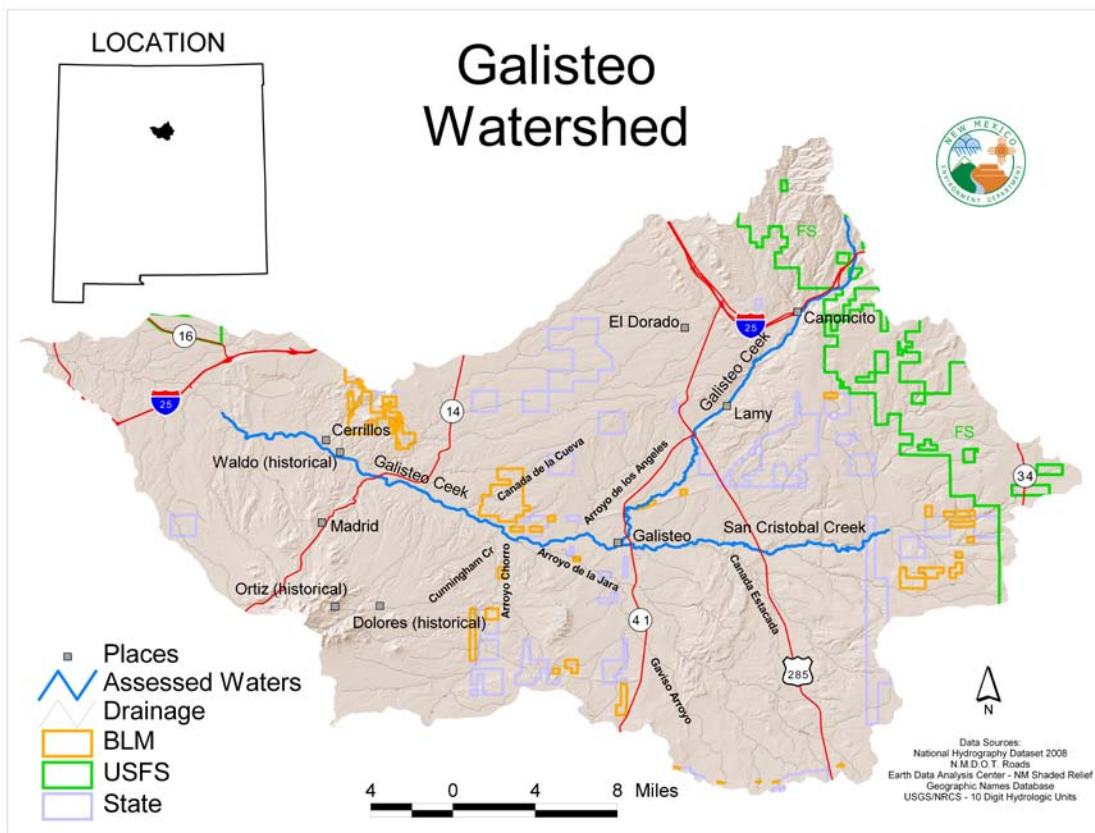


Figure 2. Galisteo Watershed with major perennial drainages, Galisteo Creek water quality assessment reaches, land ownership and geographical features shown.

## **Project Goals and Objectives**

The primary goal of this project is to develop a multi-year wetlands planning, assessment, restoration, and protection plan of action in the Galisteo watershed. This was accomplished as a central component in the establishment of a green infrastructure network in the watershed. This goal was linked to watershed restoration goals for water quality improvements through inclusion in the Galisteo Watershed Restoration Action Strategy (WRAS) update in 2005.

Project objectives have translated into action steps (tasks):

1. Incorporating wetland issues into the work of the Galisteo Watershed Partnership (GWP) and Santa Fe County's current planning initiatives for the area. Establishment of a wetlands steering committee for the watershed as part of the GWP.
2. Developing wetland restoration, and protection plans for seven identified high priority areas.
3. Identifying and assessing other potential wetlands by reviewing the history of wetlands in this area.
4. Evaluation of priority potential wetland restoration sites based on function and value and in particular to select two projects for implementation under this grant.
5. Developing monitoring plans for the selected wetland areas. Project monitoring was in accordance with the SWQB QAPP.
6. Informing the community of the project activities, educating the community about wetland protection and restoration, and building support for undertaking the efforts that were identified.
7. Restoring two wetland areas determined to be the highest priority for immediate action.
8. Creating community consensus on how existing and potential wetlands might be protected and how a protective buffer zone around these wetlands might be established through conservation easements.
9. Work with the Santa Fe Conservation Trust to produce a conservation easement plan which includes wetlands and buffers for land within the watershed

10. Exploring how local wetlands might become financially self-sufficient in the future based on economic wetland benefits, such as improving water quality, increasing aquifer recharge, benefiting wildlife, and stimulating eco-tourism.
11. (Galisteo Pilot Project) Restoration of wetlands in the Eldorado Wilderness (Canoncito)
12. (Galisteo Pilot Project): Completion of Galisteo Watershed Wetlands Actions Plan (WAP)
13. (Galisteo Pilot Project): Outreach and education in the form of informational brochures and signage.



Figure 3. Sign installed at Eldorado Wilderness Preserve as part of the Galisteo Pilot Project.

### Original Timeframe

The project's original time frame encompassed 3 years (36 months), from October 1, 2004 through September 30, 2007. However, the professional services agreement with our partners, Earth Works Institute was not approved until March 2005 and extended through February 2008.

The project was extended through March 2009 because of land title issues in areas that were selected for restoration. The original set of tasks was completed in early 2009 (4 years), then the project was on hold pending the completion of an addendum to include

Planning for Wetlands in the Galisteo Watershed Final Report  
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the Galisteo Pilot Project which was awarded by EPA in September 2009. The project continued with the additional funding through September 30, 2010.






Figure 4. Restoration structures and Canoncito

**WHAT CAN YOU DO?**

*We can all contribute to the protection, restoration and preservation of wetlands.*

1. **Learn about wetlands.** Learn about their ecology and ecological functions and the environmental services wetlands offer us. Learn and identify what values wetlands offer our community and society and how we can protect wetlands, legally and physically.
2. **Monitor and reduce your water consumption** and collaborate with organizations that protect nearby wetlands from drying up.
3. **Join a community association or stewardship team** to collaborate with government agencies, experts, and conservation groups on local and regional wetland protection and restoration projects. Such work will also benefit the preservation of wildlife and water resources.
4. **Join the local and state political process** for public education about wetlands, for greater protection of wetlands, for the creation of incentives in the land use planning processes of the county and local developers, and for legislation that reduces the pollution of surface water and wetlands.
5. **Be a conscientious wetlands steward** by keeping your land adjacent to a wetland covered under native vegetation and mulch, preventing erosion, and allowing as much precipitation to infiltrate the soil as possible, and by preserving a buffer zone of undeveloped and undisturbed land for at least 200 feet around a wetland or along a stream corridor.
6. **Eliminate future development in and around wetlands** on your property by entering into a voluntary land protection agreement (e.g., a conservation easement), while reaping possible tax benefits from such an agreement and potentially increasing your property value.




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Surface Water Quality Bureau

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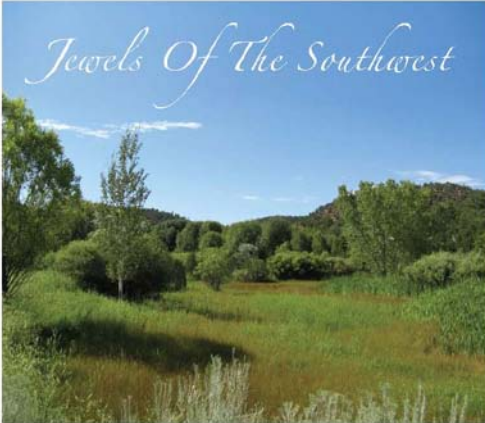
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*Jewels of the Southwest*

**WETLANDS OF THE GALISTEO WATERSHED**




Figure 5. Galisteo wetlands brochure.

## Cooperators involved

NAME	ROLE IN PROJECT
Earth Works Institute	Project coordinator, project subcontractor for SWQB Wetlands Program and involved in every aspect of the project
Santa Fe County - Planning Division	Steering Committee partner; local government partner seeking integration of wetland issues in local regulations and land use code
Santa Fe Conservation Trust	Steering Committee partner; local land trust organization, brokering conservation easements in wetland buffer areas
Eldorado Community Improvement Association	Local partner/landowner interested in restoration of wetlands in the Eldorado Community Preserve (Canoncito)
Galisteo Community Association	Local partner/landowner interested in restoration of wetlands in the bosque (river wetland area - community commons) in the Village of Galisteo
San Marcos Association	Local neighborhood association interested in wetland restoration and protection in the San Marcos District
Galisteo Watershed Partnership (GWP/GWA)	Local watershed association and coalition of local partners
Commonweal Conservancy	Local partner/landowner interested in wetland restoration on the Galisteo Basin Preserve
Archaeological Conservancy	Landowner and archaeological easement holder of the San Marcos Pueblo wetlands area
US Army Corps of Engineers	Steering Committee partner, partner in restoring Galisteo Reservoir wetlands, and regulatory agency for CWA 404 permits
New Mexico Historic Preservation Division	Regulatory agency for historic preservation certification on project areas
Santo Domingo Tribe - Tribal Utilities Department, Ecology Division	Steering Committee partner, interested in watershed and wetland restoration in the Galisteo watershed
University of New Mexico - Community & Regional Planning Program	College program interested in offering field study programs for students on data gathering and field monitoring
Eldorado Community School	Elementary school interested in offering outdoor education opportunities for students in wetland ecology
Tierra Encantada (Charter School 37)	High school interested in outdoor education and expeditionary learning, involved in some wetland ecology field studies in 2006-2008
Turquoise Trail Charter School	Elementary school interested in offering outdoor education opportunities for students in wetland ecology

Other subcontractors, organizations and citizens involved with the project include WildEarth Guardians, Steve Vrooman (Cuchilla Blanca Ecology), Jonathan Coop (plant taxonomist), Mark Kaltenbach (botanist), University of New Mexico Natural Heritage Program and local residents.

## Funding

The original Federal amount was \$140,230 and \$68,725 match. The **final match amount** was **\$320,779 (\$252,054 overmatched)**.

Donation of Goods	1198.13
Santa Fe FConservation Trust for the Galisteo Watershed Conservation Initiative (Green Infrastructure)	49,987.16
Monitoring UNM	28,081.25
Donation of Time (Steering Committee other meetings and committees)	20,136.26
NMED	826.35
Commonweal Conservancy for the completion of the Southwest Arroyo wetlands at the Galisteo Basin Preserve (GBP)	2,000
Eldorado Community Improvement Association: for completion of an archaeological survey, trail workshops, trail improvements, and community outreach activities in the Eldorado Community Preserve	\$6,491.84
Santa Fe County: restoration of the Miners' Spring at Cerrillos Hills	\$17,500
State of New Mexico-RERI (Increasing Riparian and Wetland Health in the Galisteo Creek Watershed, 2007-2010): for restoration of the Galisteo Spring and Arroyo de los Angeles (Galisteo Basin Preserve) and the Finger Lakes on 3-Horse Ranch, as identified by the Planning for Wetlands (etc.) grant	\$167,094
State of New Mexico-RERI (restoring Riparian Health of Critical Ecological Areas in the Galisteo Creek Watershed, 2009-2012): for restoration of the Canoncito Arroyo in the Eldorado Community Preserve (Wilderness) in 2009.	\$27,464
<b>Match Total</b>	<b>\$320,778.99</b>

### Major Project Highlights

Between 2005 and the present, the projects "Planning for Wetlands in the Galisteo Watershed" and "Galisteo Pilot Project" facilitated an expanded effort to create, restore, and protect wetlands in the Galisteo Watershed. Already during its lifetime, the project succeeded in bringing wetland protection under the attention of the public, incorporating wetland planning and protection in local (County) planning initiatives, and in generating a broad variety of spin-off initiatives. These projects helped accomplish the restoration and protection of a large number of wetlands, riparian areas, and buffer zones in the Galisteo Watershed and in other locations throughout Santa Fe County (more than 100 acres in total).

Several protection measures were identified and put into place as a result of the process of this project. These measures include:

- Inclusion of wetland planning in the Santa Fe County 2010 Sustainable Land Development Plan and Code and the 2008 "Oil and Gas Element" to the Land Use Planning for Wetlands in the Galisteo Watershed Final Report

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#### Code.

- Completion of report Wetland Assessment and Plan in 2006
- Completion of a watershed-wide Green Infrastructure plan and prioritization plan for open space and wetland restoration and protection in 2007
- Completion of an analysis of wetland functions and wetland values in 2006
- Completion of the development of wetland outreach and education programs and materials 2009
- Completion of detailed assessments and designs for three pilot restoration sites through 2008
- Completion of two restoration projects on one pilot site through 2009
- Organization of Community Stewardship Teams for restoration site monitoring and maintenance through 2009
- Completion of many spin-off sites identified in the assessment and plan through other funding mechanisms and included as match through 2009
- Postponement or possible abandonment of oil and gas drilling in and around wetlands in the Galisteo Watershed through 2007
- Leverage of nearly \$650,000 for wetland restoration in the Galisteo Watershed and more than \$500,000 in other parts of Santa Fe County between 2007 and 2012.
- Completion of Wetlands Action Plan for the Galisteo Watershed in 2010

#### **Explanation of any Delays or Milestones not met**

- Although established immediately upon execution of the project agreement in December 2004, the Wetlands Project Steering Committee was not formalized through the development of written agreements and responsibilities between member parties until May 2005 and the first project meeting took place in July 2005
- Originally, NMED Financial Section would only allow contracts to end at the end of the State fiscal year, so as soon as the EWI contract was in place we had to start amendment procedures which took administration time and delayed project implementation. Working with the financial Section of SWQB, we were allowed to extend the contract time until February of 2008. We also applied and received an extension from EPA through June of 2008.
- The completion of the wetland assessment report and plan for wetland restoration was completed by July 2006, after a delay of 5 months, due to greater upfront time requirements for administrative and partnership start up activities

- The identification of potential, historical wetlands in the area has only been addressed partially and would require more in-depth research and commensurate additional resources; preliminary findings were included in the wetland assessment and plan document of July 2006
- The restoration of a second wetland site had to be canceled due to land dispute issues. At the recommendation of NMED legal counsel, in 2007, the project team stopped pursuing this site due a lingering land dispute over a strip of undeeded land within the project area (Galisteo Creek in the Village of Galisteo).
- We turned to a third priority site. However, in the spring of 2008, we concluded that we also could not implement restoration plans for this site after negotiations with the landowner (Archaeological Conservancy) failed to generate an ecologically viable anticipated outcome of restoration for the site and still protect the important archaeological resources of the site.
  - The landowner could not support the project team's proposition to perform annual removal of saltcedar and Russian olive resprouts and could not sponsor such efforts within the archaeological site.
  - Downstream landowners were strongly opposed to the use of herbicide because of feared contamination of their drinking water supply.
  - Tribal consultation included concerns by Santa Clara Pueblo that the removal of Russian olive could conceivably impair the archaeological resources and leave them exposed to vandalism without additional protection measures included in the site design.
  - More funding was needed than available in order to complete a more inclusive site design including protection measures for archaeological resources.
- The project team decided to return to the first restoration site (Canoncito Arroyo) and conduct additional removal of non-native phreatophytes in anticipation of the implementation of a new, State-funded (RERI) project at the site in 2009. In the mean time, the project had leveraged many matching, spin-off restoration initiatives in the watershed that satisfied (and exceeded) the project's restoration goals.
- It has been a tall order to determine how the wetlands might become financially self-sufficient in the future based on beneficial wetland functions, such as improving water quality, increasing aquifer recharge, benefiting wildlife, and stimulating eco-tourism. Due to a general lack of information, the project team

found it unwise and subjective to develop economic assessments and valuation reports of each wetland area, indicating its economic functions and values that might make wetland maintenance more self-sufficient. However, a preliminary overview of economic potential (“ecosystem services”) of wetlands is included as a deliverable for this project and is included in the Wetlands Action Plan. The wetlands brochure also includes some reference to the economic value of wetlands.

## **Project Chronology**

- A Professional Services Agreement between NMED and Earth Works Institute was completed on March, 2005.
- First meeting of Wetland Project Steering Committee (March 24, 2005)
- A Data Dictionary Committee was organized to coordinate GIS mapping of wetlands resources, data set development, data management and storage that serves this wetlands project and provides a link to the Green Infrastructure project, the Galisteo Watershed Partnership, the County, and other agencies involved in mapping in this area.
- David Petrie, Wetlands Intern, hired to help work on project including historical background search, field technician and GIS mapping (May 2005).
- Creation of draft runoff/infiltration map by Santa Fe Conservation Trust and Earth Works Institute to help delineate surface water, wetland and buffer areas as conservation easement targets, June 2005.
- QAPP completed and approved by EPA, August 25, 2005
- Hosting of a Regional Wetland Delineation Workshop by Earth works Institute in collaboration with the US Army Corps of Engineers, US EPA and SWQB Wetlands Program (August 29 – September 2, 2005)



Figures 6 and 7. Wetlands Delineation Training Workshop on Galisteo Creek and at Leonora Curtin Wetland Preserve.

- Earth Works Institute and Santa Fe Conservation Trust awarded \$50,000 for mapping for Green Infrastructure Plan and workplan amended to count as match for this project, December 2005.
- Preliminary budget analysis for restoration of each site has also been developed and a ranking process begun. Plans for spin-off projects to be funded with other resources begins.
- Completion of the report “Assessment and Plan for the Creation, Restoration and Protection of Wetlands in the Galisteo Watershed” by Steven S. Vrooman for Earth Works Institute (July 2006)
- Completion of a Prioritization Scheme for wetland restoration, protection, and creation (decision tree January 18, 2006, draft schedule March 15, 2006, final March 21, 2007)
- Completion of a Summary of Wetlands Functions and Wetlands Values (December 4, 2006 and April 19, 2007)
- Completion of Final Designs for Canoncito Phase 1 and Galisteo Creek at the Village of Galisteo (Pilot Projects) March 2007
- Completion of the Implementation of the First Phase of the Canoncito Wetlands Pilot Project (June 2007)
- Beginning of seasonal goat grazing at the Galisteo Dam Reservoir and wetlands by SunStar Herbs’ goat program under contract with the US Army Corps of Engineers (ongoing between summer 2007 and June 2010) (non-qualifying Federal match)



Figure 8. Goat grazing at Gaslisteo Dam to control weeds and invasive species.

- Moratorium on oil and gas drilling in the Galisteo Basin which was supported by Wetlands Action Plan development in the watershed.
- Award of the first New Mexico River Ecosystem Restoration Initiative grant to Earth Works Institute for additional wetlands restoration (provided by this project's Wetlands Assessment) in the Galisteo Watershed (October 15, 2007) (match)
- Completion of the Southwest Arroyo restoration project at Galisteo Basin Preserve as part of the Galisteo Watershed Conservation Initiative (March 2008) (match)
- Organization of the first Community Stewardship Team at the Village of Galisteo, Monthly meetings



Figure 9 Wetlands near Village of Galisteo described in Wetlands Assessment.

- EWI introduction of wildlife corridor planning and their association with wetlands and water resources of the Galisteo Watershed at a meeting at Santa Fe Community College, May 2008. Formation of Wildlife Working Group.
- Completion of the Arroyo de los Angeles restoration project at Galisteo Basin Preserve as part of the RERI project (July 2008) (match)
- Completion of the Galisteo Spring restoration project at Galisteo Basin Preserve as part of the RERI project (August 2008) (match)
- Completion of Draft Galisteo Watershed Conservation Initiative report and presentation to Santa Fe County (August 2008) (match)
- Proposal for Galisteo Pilot Project submitted to EPA, October 2008.
- Completion of the Wetland Brochure Jewels of the Southwest (November 2008)
- Completion of the Miners' Spring Arroyo restoration project in the Cerrillos Hills Historic Park (winter 2008-2009) (match)
- Completion of the Finger Lakes restoration project at Galisteo Basin Preserve as part of the second RERI project (October 2009) (match)
- Galisteo Pilot Project Award Funding, September 2009

- Presentation of an Interpretive Sign and Kiosk at the Eldorado Community Preserve (October 2009)
- Completion of brochure printing under Galisteo Pilot, December 2009
- Completion of the Implementation of the Second Phase of the Canoncito Wetlands Pilot Project (winter 2009-2010)
- Draft Wetlands Action Plan for the Galisteo Watershed (June 30, 2010)
- Final Wetlands Action Plan (September 30, 2010)
- Completion of a Final Project Report (January 6, 2011)

### **List of Major Deliverables:**

Meeting Minutes (Delivered with Quarterly and Semi-Annual Reports)

QAPP (Attached)

Assessment Plan for nine wetland areas (Galisteo WAP Appendix B)

Decision Tree for Prioritization Process (Galisteo WAP Appendix E)

Function and Value Study (Galisteo WAP Appendix D)

Runoff/Infiltration Model (Attached)

Natural Heritage New Mexico Wetlands Vegetation Study (Galisteo WAP Appendix A)

Jewels of the Southwest Brochure (Galisteo WAP Appendix F)

Power point presentations (Attached)

Semi-Annual and Final Reports, Match reporting

Permits and Clearances (Attached)

Restoration Photos (Attached)

Monitoring Report (Attached)

### **Lessons Learned**

In New Mexico, many streamside areas have small tracts of unclaimed land because of changes in stream bed location (meandering) and other reasons. NMED legal requires that all privately owned sites where restoration will take place, requires a landowner agreement signed by the landowner. If a landowner cannot be found or the land is in dispute, then this could delay project implementation.

The process of creating the Wetlands Action Plan created the momentum for action, including stakeholder (citizen and local agency) involvement in wetlands protection, private landowners involved in restoration, NGOs involved in volunteer services and incentives and information needed to leverage funding and resources.

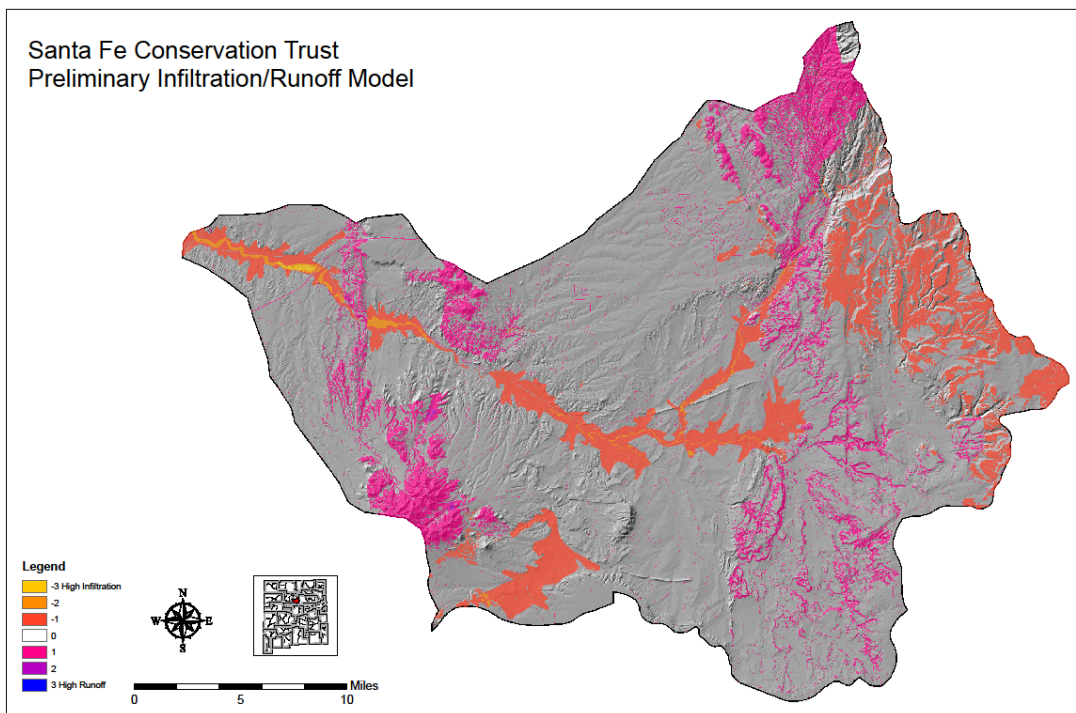
## EPA Feedback Loop

Especially when working on private lands, issues may come up that delays project completion. However the project is still worthy of support because of all the benefits and successes that are finally achieved.

This project could have benefitted if more federal partners were more directly involved including the FS and BLM. USACE was involved and contributed to watershed restoration efforts.

## Project Photo Library

**Galisteo Runoff/Infiltration model used to select corridors to protect water resources including wetlands and buffer.**



## Canoncito Arroyo Wetland Restoration





**Headcut moving upstream through coyote willow towards Canoncito Arroyo Wetland (2005).**



**Threatened Canoncito Wetlands. The headcut moved through these wetlands in a later storm event and much of it was scoured and lost.**



**Tamarisk Removal at Canoncito. Tamarisk were pulled from the floodplain floor.**



**Wild Earth Guardian crews remove tamarisk debris from Eldorado Wilderness Preserve (Canoncito)**



**Volunteers replanting in Canoncito.**



**Volunteers planting cottonwoods at Canoncito (2009).**



**(Above) Rock structures (Zuni Bowl) installed at Canoncito to prevent further headcut. (Below) One rock dam to restore riffle in entrenched reach.**





**(Above) Signage about wetlands installed at the Eldorado Wilderness Preserve (Canoncito). (Below) Attendees at the dedication.**





**Arroyo de Los Angeles at the Galisteo Basin Preserve. Wetland is more prominent at the top of the arroyo and enhanced by windmill flow (shown below).**





**Structures placed to improve meandering, prevent further down-cutting and to retain moisture. In addition the structures have been designed to work with erosion control and drainage measures for nearby development so that increased runoff will be captured and retained by structures.**



**Plantings and fencing to restore bank stability at Arroyo de Los Angeles**

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**Cerrillos Hills Wetlands invaded by Russian olive (above) that have been removed (below).**







**Conservation Corps crews chipping Russian olive at Cerrillos Hills site.**

**Apache Canyon wetland map developed by David Petrie (SWQB Wetlands Intern)**