

GALLINAS RIVER WATERSHED RESTORATION ACTION STRATEGY (WRAS)

INTRODUCTION

The Gallinas River is one of the most important tributaries of the Pecos River. It is the third most important cold water fishery on the east side of the Sangre de Cristo Mountains and is also the primary source of water for the City of Las Vegas, New Mexico and contributes 90% of the water to Storrie Lake State Park.

The watershed is very diverse in that it ranges in elevation from 11,600 feet to 4,900. Nearly 33,000 acres of National Forest land are found in the upper watershed. Also located in the valleys throughout the middle Gallinas River reach is over 10,500 acres of private land and 9,000 of City land. This area is a rugged, mountainous topography within the Sangre de Cristo Mountains. The watershed typically has broad ridges and deep canyons with steep side slopes, showing the different rock types within the area. The upper Gallinas River valley is sparsely populated and is impacted mainly by recreational uses and grazing of domestic animals. The middle and lower regions of the Gallinas River are more densely populated and are impacted by grazing of domestic animals and agriculture. Populations at middle and lower regions utilize treated water sources for drinking.

The Forest Service manages over 57% of the upper watershed, and along with the community, believes that the maintenance and enhancement of this watershed is imperative to the conservation of clean water. The 1994 Gallinas River Watershed Plan (GRW Plan) describes a project(s) formulated for the purpose of improving the overall health of the Gallinas Watershed, while increasing the availability of quality water to the Gallinas River. The measures for watershed improvement identified in the plan include, but are not limited to: paving of a Forest Service Road to limit sedimentation of the Gallinas River, increase/enhance riparian buffer zones between roads and stream, close and rehabilitate roads necessary, to reduce sedimentation and resultant turbidity of the Gallinas River, stabilize stream banks in areas of need, and reduce the risk of catastrophic fire from the watershed by mechanical thinning and prescribed fire.

The ultimate goals of this plan are to improve the condition of the Gallinas River watershed to meet current water quality standards and to restore normal hydrologic function. The benefits of meeting these goals are numerous and include the improving habitat for aquatic, bird and plant species. Other objectives include providing sustainable economic use and creating enhanced recreational opportunities for people in local communities as well as visitors to the area.

The New Mexico Environment Department (NMED) conducted a water quality survey on the Pecos Headwater, USGS hydrologic unit (13060001). This intensive study was done by the NMED to set Total Daily Maximum Loads (TMDLs). The data gathered from the TMDL's will be utilized in this WRAS to help plan and implement watershed restoration projects in conjunction with the 1994 GRW. The TMDL document identifies

goals against which to measure progress toward the achievement of water quality standards. The information is used to design and implement management practices for the purpose of improving water quality. Several proposals, including the numerous activities now being planned and implemented with the various partners, when implemented, will result in an improvement of the watershed. This WRAS will focus on the Gallinas River and its tributaries as a sub-watershed of the upper Pecos watershed.

This watershed is not attaining state water quality standards for these various parameters: stream bottom deposits, turbidity, temperature, aluminum, conductivity and below the City of Las Vegas an unknown toxicity and total ammonia. Most of these watersheds designated uses are for high quality cold water fishery.

Joint Powers Agreements have been formalized with the NMED (FY99-M) and with the NM State Highway Department for watershed improvement and restoration projects. Various other partners have both formal and informal agreements to assist in meeting restoration and improvement goals for the watershed.

Precipitation & Vegetation

In the Gallinas watershed annual precipitation ranges from 15 inches in Las Vegas to more than 30 inches at the higher altitudes above 9,000 feet. Summer rains fall almost entirely during brief intense thunderstorms. The average annual snowfall in the area ranges from 30 to well over 100 inches at the higher altitudes.

Vegetation in the watershed comprises several life zones. Pinon/Juniper and ponderosa pine vegetative zones grow at the lower altitudes and on drier sites. Oak brush and mountain mahogany also cover large areas on slopes. The mixed conifer zone is at intermediate and higher altitudes. Douglas fir, blue spruce, limber pine, white fir, ponderosa pine, and aspen are the principal trees found in this zone. The spruce-fir zone is found in higher altitudes generally above 9,000 feet on more moist sites. Timberline and alpine vegetation grow at an altitude of about 11,500 feet.

Soils

The upper half of the watershed consists of outcrops, or very nearly outcropping, Precambrian Age gneisses, schists, quartzites, granites, and pegmatites. All of these rocks are relatively hard, highly fractured rocks which tend to resist erosion, and to be quite permeable.

The lower half of the watershed is situated primarily in an area of outcropping, or very nearly outcropping, Pennsylvanian Age limestones, sandstones, and shales, Permian Age sandstones, or shales, and with some more Pre-Cambrian Age granites.

Land Use

Land ownership in the Gallinas watershed consists of 57% National Forest, 23% private land and 20% belonging to the City of Las Vegas. The Gallinas River Watershed serves approximately 20,000 people who currently rely on the watershed as their source supply of drinking water.

Almost all development within the watershed is limited to the valley bottom along Gallinas and lower Porvenir Creek. Private lands along the valley bottom in the lower part of the watershed, downstream from the national forest boundary contain the small communities of Gallinas and El Porvenir and numerous seasonal and year-round homes and ranches. Livestock production and outdoor recreation are major economic activities in the area. Most of the valley bottom from Gallinas to the national forest boundary is irrigated pasture for livestock grazing.

Located along the Gallinas River are two campgrounds and seven day-use picnic areas. Cattle grazing is permitted along parts of the headwaters and most of upper Porvenir Creek. The Gallinas watershed is also an important recreation area for hiking, sightseeing, fishing, hunting, and camping.

Public Outreach

A collaboration of federal, state and local agencies, along with the citizens of San Miguel County, New Mexico, developed and commenced implementation of a Natural Resource Plan for the Gallinas River Watershed (GRW Plan) in 1994. The need for the plan was a direct result of concerns about the quality and quantity of water available to the City of Las Vegas from its source supply of drinking water (municipal watershed), the Gallinas River Watershed.

The plan has had publicity that encourages others to follow its example of collaboration since its development. There have been several tours of the watershed conducted for citizens, private landowners, Federal, State, and Local governments. The plan was exhibited by former Chief of the Forest Service, Mike Dombeck, as an innovative way to create partners and collaboration of interested parties to address and solve ecosystem/watershed problems. Currently the Gallinas River Watershed Plan has had several projects implemented throughout the watershed on both public and private land. The following partners have worked together to accomplish various goals: Tierra y Montes Soil and Water Conservation District (TyM SWCD), Natural Resources Conservation Service (NRCS), City of Las Vegas, New Mexico State Forestry Division (NMSFD), New Mexico State Engineers Office, New Mexico Environment Department (NMED), US EPA, New Mexico Game and Fish Department, New Mexico Highlands University and the Santa Fe National Forest. Additional Partners in the project have emerged since 1994 including, the National Fish and Wildlife Foundation, Environmental Protection Agency, Rocky Mountain Elk Foundation, New Mexico State Highway Department, United World College, the Placita de Arriba Acequia Association and many private landowners.

Other agencies, associations, groups and organizations have been also been formed throughout the years to address the Gallinas watershed issues and have contributed to the WRAS. Some of these are:

Las Vegas Community Water Compact Committee – this committee was formed through City Mayor appointments and addressed four areas. Community, water use priorities, storage and conservation. Recommendations were to complete adjudication of the basin, increase storage, implement modernization of all water infra-structure, and promote conservation of water through: reduced evaporation and conservation practices and encourage proper forest management as a viable approach to water quality and quantity issues, including forest fire mitigation in the Gallinas Watershed.

Gallinas Technical Group – this group consisted of representatives from the USDA Forest Service, City of Las Vegas, Tierra y Montes SWCD, New Mexico Highlands University, US Fish and Wildlife, City of Las Vegas and San Miguel County. These meetings, once again, brought out the concerns of the water quality and quantity of the Gallinas Watershed.

Mora/San Miguel Regional Water Planning Steering Committee – this committee consists of representatives from the Western Mora, Mora-Wagon Mound and Tierra y Montes SWCD's, Mora County Commission, Wagon Mound City Council, City of Las Vegas, San Miguel County, New Mexico Highlands University, United World College, Luna Vocational Institute, Neighborhood Associations, Acequia Associations, and various private landowners. These meetings are public participation work sessions in which input is used to prepare a water plan including water supply, demand and what alternatives are available.

Rio Gallinas Watershed Partnership was formed in May of 2003. This partnership consists of private landowners, representatives from Tierra y Montes SWCD, New Mexico Highlands University, USDA Forest Service, NM Environmental Department, USDA Natural Resource Conservation Service, USDA Rural Community and Development, NM State Forestry, Rio Gallinas Acequia Association and Amigos Bravos. This group has compiled by-laws and has a board of directors. The primary mission is to preserve and improve stream flow and water quality of the Rio de las Gallinas and is a mean to gather and disseminate information to improve collaborative efforts of the watershed stakeholders. The partnership is to serve as a vehicle for watershed protection and improvement activities by stakeholders.

A Coordinated Resource Management in Watershed Planning Initiatives session was held in Las Vegas with over 23 different agencies being represented. This initiative brought agencies together to voluntarily plan a process in the management of natural resources and watershed management. Stakeholders were brought together to set common goals and resolve resource issues as a team. The priority issue was water, its quality and quantity.

A forum and tour was hosted by Tierra y Montes Soil and Water Conservation District (SWCD) to educate residents and agency representatives of the watershed concepts and the initiative of individual landowners to solve site specific problems. Many area landowners, city council members, county commissioners and area agencies attended. Continued efforts were made through presentations to NRCS personnel, US Fish & Wildlife Service Eco-Team and NM Association of Conservation Districts to spread information on Gallinas watershed.

Two public meetings were held for input on the information used to complete this WRAS report. Representatives from some agencies attended; NM Environmental Department, San Miguel County, City of Las Vegas, Las Vegas Land Grant, US Forest Service, NM Highlands University, USDA-Natural Resource Conservation Service, USDA Adelante Rural Community Development and many landowners.

Many local landowners were vital and have contributed to the process: Ron Ortega, Carleton Starkey, John Meyers, Natividad Roybal, Luis Martinez, Robert Padilla, Pat Galligan, Damian Lujan Sr., Gabe Estrada, Michael Krebe, Mary Lou Shartle, and Sharon Parcel. This is only a partial list; many others have contributed and continue to contribute. This list could continue on as there were many landowners to mention. The projects implemented by these landowners varied from fencing out riparian areas, seeding of critical areas, erosion and streambank restoration, rock and grade stabilization and bio engineering on streambanks and also provide educational tours and hands-on training for students (including teenagers involved with the MESA club, Junior High Science classes, and area college students all of which are contributing).

As time goes by, there is a potential for additional meetings with all these groups mentioned. As more projects are in the planning process, input will be sought from the public. Many events and situations will arise where tours and public meetings will highlight all the watershed efforts that have been accomplished. This public outreach will be continuous and a vital part of the success of the Watershed Restoration Action Strategy plan.

Watershed/River Restoration Projects

The following is a list of projects completed with the help of those partners mentioned above:

- Forest Service paved 2.7 miles of Forest Road 263 using “cold-mix” asphalt cement where the road was closest, and sediment was most readily available, to the Gallinas River. Partners who assisted financially or with technical expertise included: NRCS, TyM SWCD, NMSFD, NMED, EPA and the City of Las Vegas.

- Forest Service accomplished approximately 500 acres of thinning with help from the National Fish and Wildlife Foundation (NFWF), the Environmental Protection Agency (EPA), NMED and TyM SWCD. The task was designed to improve watershed health by reducing tree density to encourage vegetative ground cover instead of bare soil or pine litter that results from high tree density. Furthermore, the task is designed as fuel break to reduce the risk of stand replacing (high intensity) fires and improve habitat for a variety of wildlife species (raptors in particular).



USDA Forest Service Gallinas Watershed thinning

- Approximately 10 acres of riparian habitat was improved by the relocation of campsites from the stream bank to the upper slopes to reduce the impacts from recreation on the Gallinas River and improving the buffer zone of vegetation between recreational sites and the stream. Reseeding of this area took place after the project was completed. Partners for this task are NFWF, TyM SWCD, EPA, NMED and the Forest Service.



Relocated campground site



Reseeding of area after project was completed

- Riparian work on 1 mile and 1,700 feet of the Gallinas river walk was completed. Approximately 4,196 feet of cable and 210 posts were installed to prevent ATVs from further eroding the riverbank. Ten signs were posted along the river walk informing the public of ATV prohibition. Partners for this task were Tierra y Montes SWCD and the City of Las Vegas.



- An area below Bradner Reservoir was chosen for an erosion control project. Seed was broadcast and an erosion control blanket was installed. Tierra y Montes SWCD and the City of Las Vegas were partners on this project.



Bradner Reservoir project

- The United World College was chosen as a site for bioengineering along the stream bank. Two hundred cottonwood and willow poles were planted and various erosion control structures were installed (rock & brush dams etc.) Tierra y Montes SWCD and the College students and teachers were partners in this project.



Cottonwood & Willow pole plantings



United World College students building rock & brush dams

- Approximately 25 presentations are made to area schools, colleges and public on water quality, soil stewardship, watershed management and protection, and other pertinent watershed issues.
- Wetland creation of 2 acres was completed within the Gallinas watershed National Forest land.

- A total of 678 acres on private land have been treated. Private landowners have become active in watershed treatments to include thinning practices reducing the risk of wildland fires. These projects have been funded through partnerships between NM State Forestry and Tierra y Montes SWCD. To date, 100 acres of riparian encroachment was treated to improve the Gallinas watershed within the National Forest boundaries.



- Three springs were developed to improve livestock distribution and improve watershed conditions within the National Forest boundaries.



Prior to enhancement, livestock and wildlife were trampling springs



A collection box developed and water piped away from spring to prevent trampling

- Approximately 400 acres of prescribed burning was completed within the National Forest boundaries. Over 100 acres of prescribed burn on private land has also been completed.



Prescribed burn to reduce thinning slash



Over 20 Forest Service personnel assist with prescribed burn

- Santa Fe National Forest closed approximately two miles of forest service system roads to improve watershed conditions.
- A total of five geomorphology structures were installed along the Gallinas River to assist with streambank erosion. Two “J” hook vanes, two “V” log structures, and one “V” rock structure were installed.

- Restoration of the riparian areas at the City of Las Vegas Skating Pond was restored. Fencing and guardrails were installed to prevent vehicles from causing extensive erosion within riparian area. Thinning of invasive elm trees was completed and hand broadcast seeding of this area took place. Critical area plantings were installed within 135 foot stretch of riparian area. Willow stems and cottonwood poles were planted in 100 different sites within the area. Partners were the City of Las Vegas, New Mexico Environment Department, local volunteers, and Tierra y Montes SWCD.



City of Las Vegas Skating Pond before restoration



City of Las Vegas Skating Pond after restoration

- Some of the private landowners who have done work and continue to work on their properties are as follows:

-Ron Ortega installed approximately 1,935 feet of fence to prevent cattle from an area that had willow plantings installed to assist with streambank and headcut stabilization. 1.7 acres of reseeded area was completed to help restore vegetation in an area that had been under timber production to prevent runoff into the creek, which eventually lands up in the Gallinas River.



1.7 acres of reseeded area on Ron Ortega's property

-Pat Galligan installed a total of 1,700 feet of fence along the riparian area within his property.



-Gabe Estrada and Tierra y Montes SWCD staff installed 5 -30' willow fascines along the Gallinas river streambank. This will assist in allowing the stream to re-establish banks.



Area before fencing at Gabe Estrada's



Area after installation of fence on Estrada's place

-John Meyers installed approximately ¼ mile of fencing to prevent livestock from continuous eroding of streambank. He also reseeded 4 acres of land along the Gallinas River to prevent further erosion and runoff of sedimentation into river.



Meyer's fencing project

-**Natividad Roybal** and Tierra y Montes SWCD staff installed a total of 14 rock and brush dams to assist with erosion control. 10 to 12 cubic yards of rock along with cedar branches were used to construct these dams. They also reseeded the area to increase vegetation and slowdown runoff.



Erosion on Natividad Roybal property



Rock & Brush dams to prevent further erosion

-**Mary Lou Sharttle and Michael Krebs** also reseeded 8 acres of land to assist in further erosion of land.

-**Damian Lujan Sr.**, along with volunteers installed a 30 foot vane structure in the Gallinas River to assist with streambank erosion and provide stability for vegetation to grow. 180 coyote willow stems were planted on 30 different sites within his property. The family was instructed on proper planting of stems as they will continue to plant in areas most needed.



Eroding streambank at Damian Lujan Sr.'s



Installed 30' vane structure for erosion control

- In partnership with local landowner Patrick Swayze, a project to relocate a portion of the Gallinas River to its original location on the valley floor was implemented. Benefits would be to add about 20% to channel length, flatten the grade, reconnect the channel with its historic flood plain, raise the alluvial (shallow) water table, detain and retain sediments and toxicants in wet meadow soils, restore wetland habitat, improve habitat for fish and wildlife, and enhance recreation and aesthetic values. Partners in this project include landowner, NMED, US Army Corp of Engineers, and Tierra y Montes SWCD.



River, before re-alignment, runs straight along the fence line.



Work begins on project



Re-aligned River

Tasks to be Accomplished Over the Next Year or Two

- 2,000 acres of thinning will be completed by the USDA Forest Service between 2004-2006.
- Between 2004-2006, the City of Las Vegas will thin approximately 800 acres around the municipal reservoirs and 1,000 upland acres to improve watershed health and reduce the risk of catastrophic fire.
- New Mexico State Forestry and Tierra y Montes continue to partner in the Wildland Urban Interface project (defensible space). Funding is through the NM Department of Energy and Minerals. These monies will fund projects through the end of 2005.
- Tierra y Montes SWCD received Hazardous Mitigation funding through NM State Forestry, for landowner on the ground fuel reduction. A total of approximately 300 acres will be treated within 2005-2006.

Planned and Recommended Tasks for the next 10 years

- San Miguel County has completed Community Fire Protection Plan, which identifies 11 communities within watershed that are at high risk for catastrophic fire. Within the plan they have identified protocols for defensible space and fuels treatment, thinning is the proposed best management practice (BMP).
- USDA Forest Service, USDA Natural Resource Conservation Service, Adelante Resource Conservation and Development, City of Las Vegas, New Mexico Highlands University, New Mexico State Forestry, and Tierra y Montes Soil and Water Conservation District have partnered and received funding from the Collaborative Restoration Proposal for thinning within the Gallinas watershed.
- New Mexico Highlands University and Tierra y Montes Soil & Water Conservation District have partnered to submit a proposal to USDA Cooperative State Research, Education and Extension Service to develop a Geographic Information System model of the Gallinas Watershed.
- After thinning, the USDA Forest Service plans to prescribe burn 6,000 acres to improve watershed health and reduce the risk of catastrophic fire.
- Stabilize and improve 15 acres of riparian area using native plants along the Gallinas River and its tributaries.
- Tierra y Montes SWCD will continue to provide technical support in critical area plantings to reduce erosion and siltation and fencing to reduce grazing of critical areas.
- Educational outreach will continue to be a priority in this sub watershed.
- Completed demonstration projects will be toured by agencies, legislators, local government and citizens.
- Use the Gallinas Watershed as a tool to showcase watershed management utilizing partnerships.

Potential funding

USDA Forest Service Collaborative Restoration Program
New Mexico Energy and Minerals Department
New Mexico Environment Department
Environmental Protection Agency
New Mexico Water Trust
USDA Cooperative State Research, Education and Extension Service
Federal Emergency Management Act
National Fish and Wildlife Foundation
Rocky Mountain Elk Foundation
Private Landowners

Monitoring and Evaluation

Project monitoring includes before and after photo documentation of each project completed. Other monitoring methods include, PFC (proper functioning condition assessments) assessments conducted within the riparian areas of the watershed, TWALK (thalweg watershed area link) assessments are done to attain stream health ratings, Greenline riparian community assessments for vegetation population management and water quality sampling sites are set up within the watershed to monitor total suspended solids and turbidity. It is just as important to monitor and evaluate the process of communication, collaborative planning, and project implementation on an ongoing basis. During and after every project, continuous soliciting and incorporating follow-up recommendations and input as a part of an interactive management process will take place. This is important for better project implementation, but also for improving communications, strengthening partnerships and working toward building a broad and strong watershed.

Bibliography

Gallinas River Watershed Natural Resource Plan, September 1994 by City of Las Vegas, Tierra y Montes SWCD, New Mexico Environment Department (Surface Water Quality Bureau), New Mexico State Engineer Office, USDA-Natural Resource Conservation Service, USDA-Santa Fe National Forest

Community Fire Protection Plan, 2002 , by Southwestern Environmental Consultants, Inc., City of Las Vegas

Gallinas Watershed Stewardship Enhancement Project FY-99-D Final Report, August 2004, by Tierra y Montes SWCD

Gallinas Watershed Project FY-95-E Final Report, September 1999, by Tierra y Montes SWCD