SAPELLO WATERSHED RESTORATION PROJECT

FY02-J FINAL REPORT
Submitted to Surface Water Quality Bureau, New Mexico Environment Department, and the Environmental Protection Agency, Region VI
February 2007

Cover page photo:

Canvas painting entitled “Terre Mote” by well known artist Pola Lopez. She was a participant and as part of her contribution she donated this interpretative painting of her project area to be used in future publications.

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INTRODUCTION

The Sapello Watershed is a sub-basin of the Mora River system, which forms part of the Canadian River Basin. The Manuelitas Creek is the main tributary to the Sapello River. The headwaters begin at an elevation of 10,000 feet in the Santa Fe National Forest that includes the Left-hand Sapello River and its junction with Johns Canyon Creek to form the Sapello River and then dropping 6,200 feet just above the village of Sapello at the junction of the Sapello River and the Manuelitas Creek. At the bottom of the watershed is a broad valley floor that begins to climb in elevation through more and more convergence of steeper mountainsides and a narrowing of the valley.

The forested area was affected severely by a catastrophic fire some 95 years ago and was heavily logged prior to that. From these events, most of the forest is single age stand with many areas of dog-haired conditions, (highly populated stands of trees growing close together). Twenty percent of the watershed is greater than 60% slope with approximately 30 inches of annual rainfall. This has left much of the unattended area in danger of wildfires such as occurred in 2000, "The Manuelitas Fire"

The two mainstream systems, Sapello and Manuelitas, are dotted with beaver activity today. Dams can be found throughout the lengths of them. Beavers have been present throughout the developmental process of these valleys. The dams created overflow zones for riparian sediment deposits that enhanced the valley floor, contributing to the present day topography.

From the 2000 census, we know that San Miguel County's population is increasing in the rural areas while city growth declined. More homes are being constructed and with them come new roads and driveways along with septic systems that have the potential to contribute sediment and nutrients to the stream systems.

*A new irrigation diversion dam was completed in 2002 that will affect the in-stream flow of Manuelitas Creek. The previous diversion and acequia (irrigation ditch) had been non-functional for several years causing landowners to irrigate on limited basis using a pump and sprinkler system.

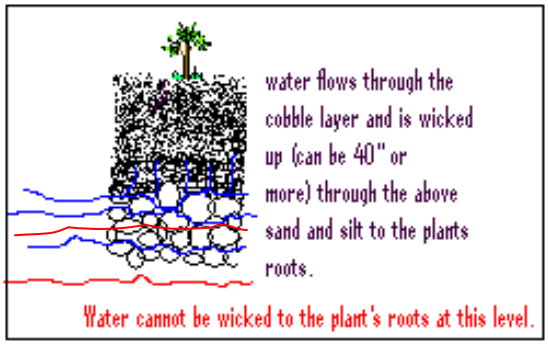
PROJECT PURPOSE AND DESCRIPTION

The recent drought has resulted in low water flow in streams within the watershed. In addition, the catastrophic fire of 2000 has severely affected the water quality in the Sapello River from Manuelitas Creek to its headwaters. As a result of vegetation loss, large amount of ash and soils highly vulnerable to erosion, severe runoff and turbidity have become major problems. This watershed condition has caused increased siltation in the river and placed fisheries in danger and increased erosion on the land. Data to support these problems include assessments on the burn area including the watershed by NM State Forestry and USDA-Natural Resources Conservation Service.

This project addressed the problems by developing and implementing Best Management Practices (BMP's) including riparian and fisheries habitat restoration through bioengineering and fencing; educational outreach on watershed management; grass seeding and seedling plantings. It was our goal that sedimentation and turbidity be reduced in local streams, fisheries and riparian areas would be improved and a healthier watershed would result with the successful implementation of this project.

PROJECT GOAL AND OBJECTIVES

The project goal with the use of BMP's was to address the problems, improve, protect and restore the watershed. Through riparian restoration and bioengineering it was expected that stream bank stabilization and restoring fisheries habitat would be achieved. When we use induced meandering and stream bank stabilization techniques there are several reasons and goals that we apply to each site. They are listed below:



Induced meandering is applied to stabilize a degraded stream reach that has incised to a point where a flood plain doesn't exist or if one does, a normal storm event that occurs once every 1.3 to 1.7 years cannot spill out onto it. It is very important for a stream to do this to sub-irrigate the valley soils from one meander turn to another and recharge the aquifer at the same time. If the water cannot reach the natural cobble layer then the over lying vegetation will starve, eventually dying off to be replaced by less desirable plants that require less water. Another necessary and important factor that flood plains do is to help dissipate the stream's energy during a storm event.

Types of structures used in our project work in streams:

Baffle to induce meander and build point bars or flood plains. Constructed of cedar pickets and filled with rock or weaved with willows.

Vane to induce meander or protect eroding stream bank. Made of cedar posts, rock, boulders or partially buried logs.

Weir to raise the stream bed and can be used to direct the stream's flow. Made of cedar pickets or large rock placed across the stream.

Root wads to provide stream bank protection at turns. Taken from fallen cotton wood or pine trees that have an intact root mass attached to 10 to 12' of trunk.

Cross Vanes are used to raise or maintain the stream's bed elevation and prevent head cutting. It creates a plunge pool, which helps oxygenate the water also. They are made of boulders or large rock.

Stream bank armor to prevent the stream from under-cutting an outside bank while providing woody vegetation time to establish behind it. Made from boulders, large rock or even buried willow fascines (bundled live willow stems laid horizontally) held in place with live willow whips or cedar stakes.

In site specific land management/treatment, the following practices were used: fencing to reduce grazing around riparian areas; diversion structures (rock structures, log structures, straw wattles, brush bundles fascines, etc.) to control runoff and filter sediment from flood waters before they reach the rivers; and various methods for erosion control and stabilization for vegetation regrowth. An educational component comprised of providing training for landowners on the methods available to them for specific problems they may have and the proper maintenance and upkeep of structures installed. Ten educational presentations were given throughout the year for the students within the area school districts. Educational booklets, pamphlets were provided for awareness of watershed health and protection issues.

Active participants in this project and their involvement were as follows:

- Tierra y Montes Soil and Water Conservation District (SWCD) served as the fiscal agent and the lead agency for this project. The district manager, Frances Martinez, and project coordinator, Steve Reichert, oversaw the progress and implementation of projects. All public and educational participation was coordinated by Tierra y Montes, as was the support activities provided by other agencies. The district provided all administrative and reporting duties.
- New Mexico Environment Department (NMED), Surface Water Quality Bureau monitored progress on the project and oversaw all other aspects of the project.
- USDA Forest Service assisted with technical and professional assistance.
- USDA Natural Resources Conservation Service assisted with technical design assistance on projects.

- Adelante RC&D assisted with the facilitation of public meetings.
- NM State Forestry assisted with technical and professional assistance, especially with the thinning projects.
- Rancho Valmora School students assisted with labor on projects and benefited from on-the-ground workshops.
- Robertson High School MESA club assisted with labor on projects, and benefited from on-the-ground workshops.
- City of Las Vegas Schools provided classroom time for SWCD to provide outdoor classrooms on water quality issues.
- Landowners provided many hours implementing projects on their personal and neighboring properties.

Development of a WRAS on the Sapello Watershed

WRAS was developed in June of 2003. WRAS will be updated as work continues in the watershed.

Selection of project participants

57 individual landowners were contacted with visual assessments being made on 46 sites. The project's parameters were explained to landowners and a request for permission to visit the property to assess its condition. In many cases individuals are unaware of persistent problems occurring on their land, for example, an incised road capturing hillside surface runoff and channeling it to another area, robbing the original valley of its water supply. Some see the land as the way it has always been, but in some cases degrading changes have been occurring for many years. See attached spreadsheet for names and projects. (Appendix A)

Project Implementation

Bioengineering on stream banks to reduce erosion and siltation.
Several major sites were completed in the project work area along with other smaller sites. Following are smaller site projects:

In the summer of 2003, 65' willow fascines were installed along an eroded stream bank of Fred Espinoza's property. Nine members of the Youth Conservation Corp (YCC) assisted in this project. 21 narrow leaf cottonwood poles were also planted along the stream frontage.

Also installed were 15’ of willow fascines along the stream of Richard Bodner’s property and 10 narrow leaf cottonwood poles were planted to help armor the bank. This was to re-introduce the taller woody vegetation to accompany the shorter willow and alder community. These plantings are to provide habitat for wildlife and shade for the stream. Combined it involved about 500’ of the Manuelitas Creek channel length. Nine members of the YCC also assisted in this work.

In June of 2003, remedial work was done on properties affected by the Manuelitas fire of ’02. On the Geney Nix property, 255’ of logs were laid on contour to slow runoff down and assist with loss of soil and erosion.

13 small rock check dams, some incorporating soil filled burlap bags along with one rock dams were installed to slow surface water flow, retain sediment and increase water infiltration. 4 log check dams and 3 larger boulder and rock check dams were constructed to reduce and heal erosion-taking place in several arroyos.

48 structures were built along **1200’** of an arroyo located on the Ernestine and Mary Ann Perea property in 2003 and 2004. This was another property that was affected by the Manuelitas fire. Some of the 2004 work was follow up maintenance, but the majority was adjusting or installing new structures applying different techniques learned while attending erosion control workshops taught by Bill Zeedyk. As noted below, after the good monsoon season of 2005, that the gully bottoms are healing and banks beginning to repose back.

Photos of structure installed and the after effect of the structure on the Perea property. These structures assist with erosion and runoff control.

Tino Gallegos a local landowner who was probably most affected by the Manuelitas fire had some gully erosion as a result. He constructed a large earth tank that helped deal with the problem. Below this area two log structures and 7 other various rock structures were place along **165'** of the arroyo. The log structures were used at head cuts to stop valley migration and step the water flow down to the lower elevation. One rock dams and rock over silt fabric in a bowl shape helped complete this project work.

Five small rock structures were placed on the Amanda Raffle property. This involved **85'** of disturbed area located adjacent to the Genny Nix property in the same burn area.

Seeding took place on the following project and burn areas:
Genny Nix-½ acre of upland erosion in lower burn area.
Tino Gallegos-¼ acre of upland erosion in burn area.
Amanda Raffle, Mary Ann Perea, 1 acre of area around structures.
Jeffery Mills- 2 acres of seeding in burn area.
Henry Rodgers-1 acre of upland disturbed area.
David Lucero – ½ acre of disturbed area and 3 acres of hillside disturbed area.
Pete Lucero & Elaine Spielman- 2 acres of disturbed area
William Brainard, Gene King (Bahai Center) and Johnny Martinez- 2 ½ acres of disturbed project area

Photo of area seeded, within installed structure, after 1 year of growth

In the Shirley Nelson, Joseph Montoya and Dave Follmer properties: 200 willow, 15 cotton wood poles, 15-14" rooted cotton woods, and 12 red osier dogwood trees were planted in 2004 and 05' along this project reach. Julian Marquez had 180' degraded stream channel that was planted with willows whips on 4 to 6' center sites along with 6 narrow leaf cotton wood poles. 100 willow whips were also planted between structures at Elaine Spielman's property.

Libby Smith planted and caged 8-cotton wood poles and 14-14" rooted cotton wood trees and 12 red osier dogwood trees during April of 2005. Within this same time, Jane Lumsdum and Randy Nakasone property owners along Manuelitas Creek, assisted in planting 19 cotton wood poles and 30-14" containerized cotton wood trees along the beaver created wetlands.

Spring of 2004, **2308'** of riparian fencing took place on Shirley Nelson, Dave Follmer and Joseph Montoya properties to enclose one project reach on Manuelitas Creek. **870'** of riparian fence was placed along a beaver created wetland on Manuelitas Creek. This involved moving some 350' of fence from the FLOODED area up to higher ground. The fence at right is designed to allow limited access to livestock when in this pasture.

1600' of riparian fencing was completed on Bill Zeedyk's property in February of '06. This included one access point for watering during occasional grazing periods.

The Zeedyk fence pictured on the left. The plastic tube is to prevent injury to wildlife at their common crossing areas.

Shrubs, Cottonwood trees and poles planted from March through May of 06
**14" rooted/containerized

10--Skunk Bush Sumac (Rhus-trilobata)
10--Little Leaf Sumac (Rhus-microphyllum)
10--Silverleaf Buffaloberry (Shepherdia-argentea)
27--Wax Currant (Ribes-cereum)
14—Littleleaf Mockorange (Philadelphus-microphyllus)
13—Red Osier Dogwood (Cornus-sericea)
18—Snowberry (Symphoricarpos-oreophilus)
10—Narrowleaf Cottonwood (Populus-angustifolia)
111—Total

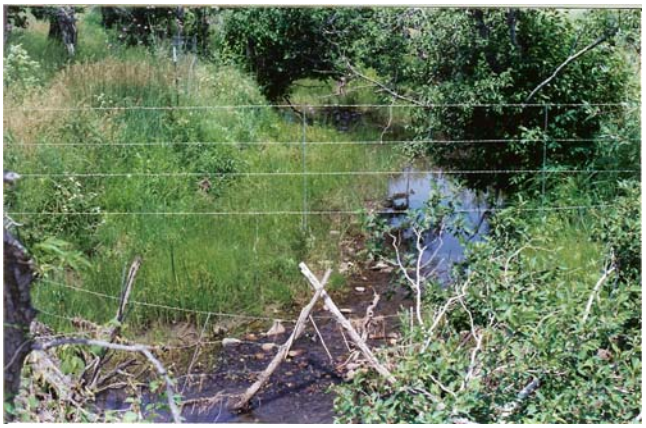
**54 Cottonwood Poles were 8 to 12 feet, harvested from the Pat Jones property
3-27-06
Jones and Lucero—22 various shrubs
4-04-06
Bill Zeedyk----10 various shrubs 10 Cottonwood poles
4-17-06
Pat Jones and Bill Brainard—14 various shrubs
4-17-06
Shirley Nelson—5 shrubs
4-17-06
Dave Follmer—3 shrubs
4-18-06
Sally Swift—17 shrubs
10 Narrowleaf Cottonwoods (14" containerized)
20 Narrowleaf Cottonwood Poles
4-24-06
David Blagg---15 Cottonwood poles
5-10-06
Johnny Martinez—9 shrubs
5-10-06
Bahai Center (Kings)—5 shrubs
5-11-06
Carol Semetana—10 shrubs 5 Narrowleaf Cottonwood poles
5-11-06
Karen & James Bender—5 shrubs
4 Narrowleaf Cottonwood poles

Stream surveys were completed along with the 404 and 401 permitting process to do 1500' of induced meandering and stream bank stabilization at the Shirley Nelson property. The work began in 2004 and involved all hand labor using cedar stakes, posts and weaving willows between them. 15 weirs, 2 baffles and three vanes were installed. Bill Zeedyk, an ecological consultant, assisted in the assessment of the project (pictured below) along with several others that were implemented during this grant period.

Before induced meandering on Nelson's

After induced meandering on Nelson's property

Below, Shirley Nelson riparian area before fencing exclusion and during second season of no grazing.



Photos above, riparian fencing on Shirley Nelson's property

PAT JONES PROJECT

Fall of 2004 walk through assessment was done on Pat Jones property along the Manuelitas Creek. A longitudinal survey was completed on 11/04.

Survey work is performed prior to project implementation to determine meander length, stream sinuosity, bankfull depth and width along with flood prone width. With these surveys, we can then determine if a stream reach is degraded or normal and if degraded, what our design plan for improvement should be. This is also needed for the permitting process.

Mechanical work entailed 118 hours and 38 various structures were installed over three property owners. These included: Pat Jones, Stanly Lucero, and Elaine Speilman. Materials were found locally—boulders from a fire line created during a fire in 02', a hillside of glacial piled rock and trees toppled by wind, erosion and beaver. 4 point bars were also shaved to allow the stream more room to spill onto the flood plain and take pressure off the eroding outside stream banks.

Further assessment was done with Bill Zeedyk on Arroyo Horno, a tributary to Manuelitas Creek on 12/1/04**,** copy of assessment enclosed. In January and February 05, survey work was performed on Arroyo Horno that flows over three properties before it enters Manuelitas Creek: The National House of Justice Tarbiyat Bahai Community, Johnny Martinez and Pat Jones.

September, 05 induced meandering and stream bank stabilization work was completed on **3800'** of Manuelitas Creek. Most was done with heavy equipment, but a part was also completed with hand labor during an educational workshop held on the property. Picture to left, a cottonwood log vane being installed at Jones' property

Boulders and large rock had to be harvested from the participants' land before the heavy equipment could then begin construction of the 38 planned structures

Root wads installed August of 2005, one year later

This project involved a classroom of different structure designs. Cedar post, log and boulder vanes along with cottonwood root wads, rock and picket weirs and baffles.

PHOTOS ON PAT JONES PROJECT SPRING 2005

Before installation of vanes

After installation of vanes for streambank stabilization

Before induced meandering

After induced meandering

Before baffle installation

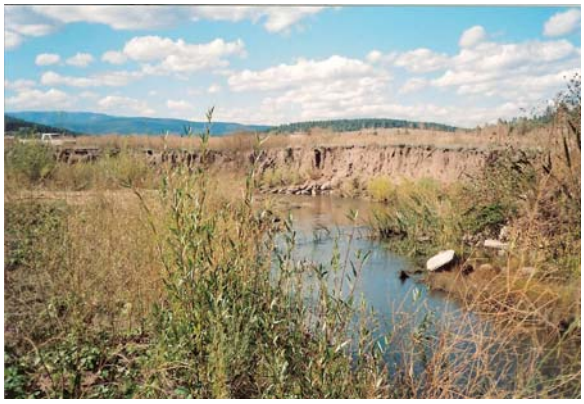
After baffle was installed

PAT JONES PROJECT…CONTINUED

Before crossvanes were installed

After installation of crossvanes

Before boulder vanes were installed



After boulder vanes were installed

Planting of willow whips and some willow fascines was done on a part of the Pat Jones project that was completed last year. This was done to assist some of the vane structures already in place to stabilize the eroding stream bank. Rock was also hand placed along the bank to help armor it.

To protect some of our critical plantings, 6' welded wire made into cages and T-posts to secure the cage. This is to protect against livestock and wildlife damage. Deer and elk girdle the trunks and limbs while rubbing their antlers. Beavers will clip them off if they are in the area. Finally, mice can girdle the trunks leaving them to die. To protect

against that, expandable 8" tall plastic covers were used. After a couple of years of growth they can be removed and used elsewhere.

Pat Jones: 5 cotton wood poles were used and 7 large poles were planted in the same trench made for root wads as an experiment. Willow whips were also planted around structures installed in September of 05' (400) and March of 06 (150). Each planting site (hole) has 4 to 6 stems placed in it. Each stem provides more support than a single stem and hormonal activity between stems to encourage growth. In photo to the right, approximately 200 ft² of live wildings including, a variety of wetland plants; coyote willows, cottonwood, sedges and rushes, were planted with the use of a track hoe, around installed structures.

Dozens of wildings were planted, using shovels, during a workshop held in September of 05'. Wildings, whether planted by hand or with equipment, provide the quickest and most successful establishment of plants to a desired area.

DAVE AND NANCY MAKOWSKI PROJECT

In January and February of 2005, survey work was initiated on the Dave and Nancy Makowski property to do erosion stabilization work on two arroyos that originated from an early road in the area and by cattle trailing. Some of the banks are 14 feet high and 5 head-cuts were actively moving up valley on one of them. The owners were already working on the second arroyo with brush from forest thinning and a couple of small earth tanks.

Five log head cut structures and 7 smaller rock structures were installed on this **600'** project arroyo site using local materials.

Above, (start to finish) of work involved in building one structure with approximately 40 logs.

After a 30 minute, 2½" rain event in '06. This happened to two of the 4 log head-cut structures. One was rebuilt with adjustments to hopefully prevent this and the one pictured, will be re-done using boulders and rock.

ARROYO HORNO PROJECT

Arroyo Horno Stabilization work began on 3/30/06 with the assistance of the County of San Miguel to supply the project with boulders and large rock. Some came from the old courthouse and the largest portion was harvested along the county road. This stream reach was **3300'** in length and consisted in the installation of 46 structures. All except a handful were installed with heavy equipment. The county was collaborating with us because part of our work was design to protect one of their road bridges. It was being eroded in such a manner that would eventually risk collapsing.

Before work on County Bridge

After installation of vanes to prevent further undercutting of bank

Four point bars were shaved during this project to allow for stream flow. Where induced meandering was applied, some of the stream bank was excavated out to speed up the process. This material was then placed on the baffles.

Arroyo Horno Project Continued……..

After assessment of the stream bank, along the arroyo horno, it was decided that boulder vanes would be installed to stabilize the stream bank and to establish woody vegetation which would protect and resist erosion due to a high flow event.

Below, footer boulders being placed on the Arroyo Horno streambed elevation, to avoid under-cutting of the vane structures.

Same area after above vane was installed

SALLY SWIFT PROJECT

Summer of 2006, induced meandering can be accomplished by planting point bars and removing vegetation on turns to encourage stream extension in that particular direction. Pictured at right are a couple of planted point bars on the Sally Swift property. As the plants grow and catch material, the stream is pushed in the opposite direction and eventually will increase sinuosity and length.

On the same property (at left), we took advantage of the bedrock to raise the streambed elevation some 10" by cementing two layers of rock to it. This structure, the only one of its type constructed there, was part of a series of structures installed throughout this incised channel reach.

Heavy equipment work began on October 25, 2006 and was completed after three days. Rock and boulders were harvested on site for the structures. The project area is **2800'** and consisted of 31 structures and the planting of 6-point bars as mentioned above. Two point bars were shaved back and three bends excavated next to a baffle for induced meandering.

Below are two photos of the upper reach, before and after. At right is a rock/boulder weir, boulder baffle and at left, another weir and baffle above it.

April ’06, erosion control structures were installed on the Sally Swift property using local materials. This particular property offers us (fortunately or unfortunately) an outdoor classroom with classic head-cut erosion problems along with a degraded stream channel. This being the result of over-grazing, logging roads and other agricultural practices contributing to a de-stabilized situation on the land. Educational outreach was done on this property and will be mentioned later in this report.

On one **550’**arroyo 10 active head-cuts were found. Seven have since been treated with Zuni or rock bowls sitting on silt fabric. One diversion channel was dug to take the water out of the arroyo and put it on the landscape to irrigate the pasture. The idea is to starve 4 lower head-cuts so they can eventually repose back, vegetate over and heal.

At right, the upper part of the arroyo after construction of head cut structures and a partially failed structure during a storm event. 11 more structures were built consisting of rock bowls, one rock dams, baffles, a silt dam and a “media luna” or half moon rock structure.

This last structure was built where we wanted to divert water again, from another arroyo (the logging road) on to flat land to help disperse the water more evenly. If we can break the single thread flow into numerous flows around the 40’ edge of the lower outside rim of the half moon, the possibility of erosion is reduced completely.

On the Sally Swift project a weir is being built with a track hoe from the stream terrace. Note the bank excavation on the left and then right below the track hoe arm.

Planting of willow whips and 2400 feet of riparian fencing is being planned along the finished project area on the Sally Swift property. This project tentatively is scheduled to begin spring 2007.

POLA LOPEZ PROJECT

Stream restoration of upper Arroyo Horno on the Pola Lopez property began on 10/10 and was completed on 10/25. This involved a total of 5 days of heavy equipment work. The area involved was approximately **800'** and when completed, *regained 170'* of historic stream reach. The 290'gully and head cut shown in this photo had developed in response to an old 1970's era earth tank filling with sediment. A poorly designed spillway exacerbated the problem by channeling over flow water down valley instead of back into the original channel.

A large portion of the gully was filled with material removed from the new reconnection channel. A boulder silt dam was built at the end of the old gully to hold any water during wet periods creating a seasonal wetland.

At the upper end of this work area were two more major head cuts one on each side of a earth tank berm. Several options were looked at and the one chosen was to rebuild the dam with an adequate spillway to accommodate a 25 year storm event.

The tank was cleaned leaving a finished depth of 2.5'. The tank was restored to provide water for wildlife and occasionally, domestic livestock and to protect a lush wetland area above this site.

Tank prior to work

Tank upon completion of work

Boulders and rock for this spillway, the lower reconnection channel and the 9 structures involved, were harvested on site. This spillway required over 90yds^3 to complete. The above mentioned wetland area is in the photo's background.

The upland erosion work on Pola Lopez's property consisted of building into the roadbed a set of rolling dips to get the water out of the road. This road was made on the side of a hill running **1140'** in the project reach. Over the years the roadbed incised to the point that it was capturing ALL surface flow coming down above it. With the hillside slope and the distance involved, considerable erosion was taking place along its length. This material was spilling into the valley below and contributed to filling the lower earth tank located on this property.

Cross-drains or 7-rolling dips were built along this reach. A rolling dip is taken from "***Water harvesting from low-standard rural roads***", a booklet written by Bill Zeedyk and published by the Quivira Coalition through a grant from the EPA and NMED's Surface water quality bureau. Removing material from the roadbed and placing it down road from where the water is captured and routed off the road and back into the lower valley create the dip. They are placed at close enough intervals and locations where the out flowing water will not erode the hillside. They are to be self-maintaining, meaning that the silt won't back up and cause an overflow back down the road.

This work took about 6 hours using a track hoe to complete as we moved the machine down to do our planned stream restoration work. It was the first time this contractor built a rolling dip and he caught on to the design and concept after doing the first one. Fixing the road and reducing sediment loading to Arroyo Horno's stream were two objectives, along with using it for a future demonstration site.

INFORMATIONAL AND EDUCATIONAL WORKSHOPS

Throughout the four year grant span, outdoor classroom presentations were given to students from Sapello elementary school. 11 presenters from various agencies (NMED, NM State Forestry, NM State Parks Division, US National Park Service, USDA Forest Service, US Fish and Wildlife Service, Tierra y Montes SWCD, Los Alamos Wildlife Center, and NMACD) attended and provided a variety of subject matter such as, water quality, quantity among a range of other subjects.

Tierra y Montes SWCD staff, Frances Martinez and Steve Reichert assisted Sapello students with activities which consisted of testing home water samples and a trip to Sapello River, behind the school, to sample water and talk about the stream and life in the water.

Earthday activities, similar to the Outdoor Classroom mentioned above, were held at the USFS office facilities in Las Vegas in 2005 and '06. Students spend the morning at different stations and come away filled with information and excitement. A total of 1200 students attended these two years.

An outdoor workshop was held, on site, in 2005 and two more in ’06. These sessions consisted in an informal classroom setting to present the project’s goals and purpose to begin the day and hands on work to get better acquainted with the project’s inter-workings. A term Bill Zeedyk likes to use is “Reading the landscape”, which refers to not just repairing the damage, but looking at the cause and start from there. This was our methodology for the workshop.

An article was published in the Las Vegas Optic on October 18th explaining the stream bank stabilization and induced meandering workshop. While our first session in ’05 was a group made up of local landowners among others that do this type of work, local students attended the other sessions.

The local FFA chapter is seen here working on upland erosion problems. Seeding between the rocks of a “Media Luna”.

Below, students from another learning center, Valmora Youth Center, had an opportunity to see what the FFA group had done a month before and construct several Zuni or rock bowls and initiate the excavation of a diversion channel. Both groups got to see and hear explanations of the work being done on the stream channel.

At left, landowner Sally Swift, explains the importance of land stewardship and her involvement in the restoration project.

During July of ’03 and ’04, the district worked with 9 Youth Conservation Corp participants, to plant willows, cotton wood poles, construct riparian fencing, pole planting cages, repair and build induced meandering structures and remove invasive musk thistle at 3 project sites.

3/10/06 a demonstration tour of the finished Jones/Manuelitas Creek Stabilization was given to Jemez USFS staff and NM Surface Water Quality Bureau Staff.

Highlands University Students along with their instructor also toured the site with NMSWQB staff.

Students from the Sapello Elementary 5th grade classroom are being instructed on Aquatic Micro-Organisms and the importance of healthy natural stream flow.

The district also worked on a variety of other educational outreach activities: Science Olympiad in Las Vegas, provided water quality presentations at Luna Community College for the summer youth college (60 students attended throughout the 5 day period including those from the Sapello school district area), water presentations were given to home schooled students at NMHU, and "Rolling Rivers" demo to the public attending a fire prevention and water conservation day at NMHU (200 people were in attendance).

In addition to providing workshops and training, project coordinator attended many workshops offered such as: Low maintenance roads, Erosion Control-head cut stabilization using jute fabric filled with mulch and earth provided by Earthworks Institute of Santa Fe, "Reading the Landscape" workshop held on Los Trigos Ranch in Rowe, NM and (three sessions, three days each) Riverine Wetland and Cienaga Ecosystem workshop in '06. Various conferences were also attended by the project coordinator and other staff, which provided information and insight on various methods used within the project such as Quivira Coalition's Annual Conference held in Abuquerque in –'04,'05 and '06.

PROJECT BARRIERS:

Initially, getting participants interested and aboard was a concern as past experience has told us that unless it is an emergency, landowners are reluctant to attend meetings. Going out door-to-door, although time consuming, appears to be the most effective means of getting interest or a foot in the door so to speak.

Recognizing degraded landscapes including riparian areas is not easy for many local landowners. Some of this is due to degradation being a slow process and doesn't have nearly the same impact as a 25- 50 or 100-year flood event would have. You hear at times, "it has been like this as long as I can remember and nature will take care of itself eventually." Economics also plays a part in land stewardship as livestock or pleasure animals, like horses, are left grazing too small an allotment or too long on the same piece of land without rotating them to a new pasture. Some figure they can ride out a drought by keeping the grazers in the riparian area thus continuing the downward trend of riparian health.

Labor and or equipment to do the required work

Because much of our project work is labor intensive, on occasion we run into landowners who are senior citizens among other individuals who are incapable of doing the hand labor required to make a one-rock dam or check dam. Some are on a fixed income and can't afford to hire someone to do the work. Sometimes a relative can fill in, but more often than not this doesn't happen. If material needs to be hauled from one site to where a structure is to be built a pick up or trailer is necessary and not all landowners have one available.

Materials to do work

Finding suitable materials on site can be an obstacle to some projects. To help offset the cost of a project if the landowner has the material it helps them to get it accomplished. Out of pocket expenses, especially if significant, are many times more than the landowner is willing to spend. On stream bank stabilization, large rock and boulders are the best resource to accomplish the project. If they had to be purchased elsewhere and hauled in, the cost might be insurmountable.

Critical planting—This referring to getting cotton wood trees re-established. This watershed has a large population of elk that polish their antlers on a nice 8 to 10' tall, young-supple cotton wood tree. They work perfect for the animal, as there is enough give in them to push back and forth allowing them to clean all around the antler. At the same time this rubs off all the bark from the tree girdling it or breaking it down. Alders receive the same treatment from deer and elk.

The smallest of cottonwood saplings receive the attention of browsing dear, elk,voles, mice and gophers, chewing their tops and the young bark off, leaving them girdled to die.

In some cases where we put plastic protectors around them and we happen to get a good snow, the small mammals walk right up on top of the snow to the now un-protected sapling—meal time!

Lastly, we want to live with the beaver, but if we are not careful, a whole planted area can be denuded in minutes of young cottonwoods. Since most of our project areas are just starting an upward trend of re-vegetation, protection is necessary of all those trees we desire to keep. We have come back to a work site after several weeks to find nearly the entire riparian zone next to the stream, bare, much like it would look if you ran a mower over it. Fortunately most of it, especially the willows come back, but a whole season of growth is lost.

Fall planting of cotton wood poles was done on a limited basis in late August of '05 as we were putting in root wads. This stock had calipers of 3 to 5 inches and a height to reach the water table and the outside environment some 6' above. These poles sprouted beautifully before winter sit in, but died before spring. This was an experiment to see with some luck if we could grow some trees and also add more stability to the root wad structures.

PROJECT SUCCESSES

We were able to tie together 13 landowners' properties down Cañon del Medio, Arroyo Horno and Manuelitas Creek essentially into one work area. 5 landowners not involved in any work, were passed over as the work progressed up the watersheds. This totaled 3.75 miles of watershed length.

The projects host a myriad of structure designs, techniques and materials.

Because our projects employ low tech, local on site-materials promoted by Bill Zeedyk's mythology, we created many structures to fit the situation. We now prefer a Zuni bowl to a rock and brush dam to heal a head cut because it is more effective. Media Lunas are completely new and still being improved upon, but very appropriate for harvesting water, distributing it across the terrain while catching sediment and healing an erosion problem. We are using willow whip plantings on point bars to help induce meandering. These are just a few examples that we see are very beneficial and produce rapid results.

When we did our stream restoration workshop and induced meandering some of the comments were that they could see changes almost immediately after making a weir or baffle. Point bars and flood plains are developing where our installed structures were designed to do so.

Vegetation response

We feel the response from the growth in vegetation was very positive. Grass growth around our erosion control structures was very positive, especially on the Pereas. Seeding on Ginny Nix's property in the burn area from the 2000 Manuelitas fire has taken off nearly eliminating all sheet erosion. Willow wildings along with sedges and rushes planted on the Manuelitas-Pat Jones projects respond quickly and have filled in considerably in one year. Fencing out cattle on the Shirley Nelson project showed a great response from all the vegetation. The stream bank is vegetating over protecting itself against erosion. The bank's edge is covering over with vegetation and becoming more defined instead of loose trampled and exposed soil.

We are testing "MycoApply Endo plus, a mycorrhizal granular inoculum consisting of selected species of endomycorrhizae and trichoderma fungal species. This biostimulant contains mycorrhizal fungi that colonize roots and move into the surrounding soil to help boost root growth along with enhancing the root's ability to absorb water and nutrients. We used this on grass seeding at the Pola Lopez property, sedge (Eleocharis rostellata) transplants and some willow wildings. Overall it is to improve germination and the survival rate of these plants.

Neighbors and county contributing materials

We mentioned landowners lacking sufficient materials in the barriers section. In a couple of cases where our project was covering several landowners, materials were donated to a neighbor to make the necessary structures. In another situation, the county contributed material to do part of a project since our work was going to add significant protection to a road bridge. Collaboration between neighbors and governmental entities pays off to affect a greater portion of the watershed.

Other Projects

Because of this initial project implementation, other projects were funded. New Mexico State Forestry Division has granted over $400,000 for Hazardous Mitigation and Defensible Space thinning in the Sapello area. Over 160 acres have been treated to date and more acres continue to be treated.

RECOMMENDATIONS AND CONCLUSION

Education and Outreach:

Get individuals out to see finished projects through tours or workshops. We have a variety of restoration methods on these projects all within close proximity that will lend itself as a major educational tool. Word of mouth from locals convinced of a project's

benefits is the best way to sell BMP's for conservation. With these examples of restoration practices we can provide choices to other local landowners that have problems that they would like to address.

We have to reach more landowners with a convincing message that fencing riparian areas isn't a sacrifice, but an investment in the long-term health and production capability of their land.

We need to do more work to improve roads that have deteriorated over the years for one reason or another. Because of rural development new roads are being built to get to these homes and some are improperly designed. This would apply to county roads also. Proper road construction and design needs to be taught through workshops and tours.

All of these issues will be addressed in the Watershed Restoration Action Plan (WRAS) mentioned earlier in this report. The WRAS is a document that we will be reviewing in 2008, getting public input and participation of actions, BMPS and problem areas, as well as documenting the successful projects listed in this project.

Monitoring:
Since most of the finished projects are in their infancy, Rosgen Level II, longitudinal, cross-section surveys and hub monitoring will be done on these stream reaches to assess the progress of the work. Photo monitoring will also be followed up at established photo points at each project reach.

One highlight of this project was when Stephen Riechert, Project Coordinator and Tierra y Montes SWCD was nominated for the 5th Annual Clarence Burch Award. Although we did not receive the award we were very proud of the efforts recognized by those who nominated us.

APPENDIX A

List of Participants

PARTICIPANT LIST

PARTICIPANT	Possible Project Implement	Implemented
Mike Mateo Sapello School	Water Quality Ed.	X
Valmora Youth Center	Erosion control & streambank stabilization	X
Robertson FFA Chapter	Erosion control & streambank stabilization	X
Ginny Nix	Upland erosion control	X
Lorenza Garcia	Initial contact	
Ernie Quintana	Erosion control & streambank stabilization, critical planting	
Pete Lucero	Streambank stabilization, critical planting	X
David Lucero	Streambank stabilization, critical planting	X
Darla Roach	Streambank stabilization	
Jane Lumsdem & Randy Nakasone	Critical planting, riparian fencing	X
Mike Baca	Streambank stabilization	
Tina Neuman	Streambank stabilization	
Fred Espinoza	Streambank stabilization, critical planting	X
Rick & Lesley Laffedo	Initial contact	
Lino Sanchez	Streambank stabilization	
Augustine & Adeline Lucero	Streambank stabilization, critical planting	
Joseph Montoya	Streambank stabilization, critical planting	X
Mary Ann Perea	Upland erosion control	X
Don St. John	Upland erosion control	

Richard & Virgina Bodner	**Streambank stabilization, critical planting**	**X**
Tino Gallegos	**Upland erosion control**	**X**
Angie Salas	**Riparian fencing**	
Alma Gregory	**Critical planting**	
Pat Jones	**Streambank stabilization, critical planting**	**X**
James Chadburn	**Initial contact**	
Hutchison Ranch	**Initial contact**	
Amanda & Cynthia Riley	**Upland erosion control**	**X**
Rueben Silva	**Initial contact**	
Jay Quintana	**Streambank stabilization, critical planting**	
Jeff Mills	**Streambank stabilization, critical planting, seeding**	**X**
Libby Smith	**Upland erosion, streambank stabilization, critical planting**	
Terry Tobin	**Initial contact**	
David Blagg	**Streambank stabilization, critical planting**	**X**
Shirley Nelson	**Streambank stabilization, critical planting, fencing**	**X**
Julian Marquez	**Streambank stabilization, critical planting**	**X**
Leroy Gutierrez	**Initial contact**	
Jim Matlock	**Streambank stabilization, critical planting**	
Dave & Nancy Makowski	**Upland erosion**	**X**
Maria Padilla	**Site Assessment**	**X**
Zenon Montoya	**Site Assessment**	**X**
Paul Doloff	**Site Assessment**	**X**
Peggy Procter	**Site Assessment**	**X**

Phil Brown Ranch	**Streambank stabilization, critical planting**	
Jerry Gomez	**Upland erosion**	**X**
Gene King	**Streambank stabilization, critical planting**	**X**
Johnny Martinez	**Streambank stabilization, critical planting**	**X**
Henry & Jack Rodgers	**Upland erosion, critical planting and seeding**	X
Sally Swift	**Streambank stabilization, upland erosion, critical planting**	**X**
Dave Follmer	**Streambank stabilization, critical planting**	**X**
Caroline Rackley	**Streambank stabilization**	
Bill Zeedyk	**Riparian fencing and critical planting**	**X**
Pete Trujillo	**Site Assessment**	**X**
Karen Bender	**Streambank stabilization, critical planting**	
Carol Semetana	**Streambank stabilization, critical planting**	
Baker Ranch (Susano Ortiz)	**Site Assessment**	**X**
Pola Lopez	**Upland erosion, streambank stabilization**	**X**
Ignacia Herrera	**Upland erosion**	

APPENDIX B

Final Costs for Project & Matching Funds

Sapello 319
Final Costs for Project and Matching Funds

Project Tasks	**Grant Request**	**District Match**
Project Employee Salary	$81,930.00	$12,894.28
Demonstration Projects	32,000.00	20,676.03
Educational	28,463.00	20,134.00
Fencing	12,221.33	12,671.52
Critical area planting	16,020.00	12,925.00
Headcut stabilization	18,097.00	13,344.00
Streambank stabilization	36,038.69	16,936.00
Seeding for disturbed areas	5,337.31	48.00
Total	**$230,107.33**	**$109,628.83**

APPENDIX C

Project Assessments, Plans & Surveys

Progress Report
Manuelitas Creek
Pat Jones Property

Bill Zeedyk
PO Box 582
Sandia Park, NM 87047

December 7, 2004

Steve Reichert
Tierra Y Montes SWCD
1926 7th Street
Las Vegas, NM 87701

Dear Steve:

This letter is to summarize observations and recommendations resulting from our reconnaissance survey of proposed riparian restoration sites along Manuelitas Creek and Cañon del Horno, December 1, 2004. Proposed project area includes lands primarily owned by Pat Jones but also includes some adjacent ownerships especially on the tributary stream which is named Cañon del Horno on the USGS map.

Although we examined the area as one potential project, I recommend that because of the comparative wide range of conditions encountered between the two streams, any further planning addresses the sites separately.

Manuelitas Creek

In the project area, Manuelitas Creek is a Rosgen C channel with short subreaches of the F Type. Upstream of the confluence with Horno the channel is more stable than below indicating adverse effects of sediment supply entering from Horno. Channel is actively eroding the concave bank at several places, exacerbating the bed load problem and accelerating formation of short radius point bars. Beaver are present throughout and have removed old age cottonwood trees from the bank although willows seem to be responding favorably to their presence. The Jones property is not grazed by livestock but heavy browsing by elk on willows and herbaceous vegetation was noted.

Recommendations

1. Protect concave banks from erosion and undercutting by installing post vanes or J-Hooks at unstable sites.
2. Consider inducing an additional meander in the F-channel subreach downstream from the confluence with Horno Creek.
3. Plant willows to either induce or retard meander formation as needed.

4. Conduct Level II survey of channel to develop Longitudinal and Cross Section profiles of representative subreaches (above and below Horno).
5. Because of the scope of this project, use of heavy equipment should be considered.

Horno Creek

Horno Creek enters Manuelitas from the north side (left bank) of the river. It is a Rosgen G channel with short F subreaches. It is actively downcutting or widening at several locations and carries a heavy sediment load which is adversely impacting the stability of Manuelitas Creek. Although the Jones Property is not grazed, upstream properties are moderately to heavily grazed by cattle, horses or both. Portions of the channel have been realigned, diked or straightened in the past, although not recently. There is evidence that the mature channel type was Rosgen E but that condition is probably no longer attainable. The critical need is to stabilize and revegetate those subreaches where unacceptable rates of erosion are presently occurring. At least four such areas were identified.

Recommendations

1. Conduct Rosgen Level II survey of the channel and develop profiles of representative reaches.
2. With concurrence of land owners, identify subreaches to be treated. Two of four subreaches lend themselves to application of induced meandering methods to increase channel length and reestablish an accessible floodplain. One could be treated using vanes to stabilize eroding banks and one needs weirs to stabilize channel bed in a reach where meander pattern is satisfactory.
3. A change in grazing regime is recommended or establish a riparian buffer zone to improve bank stability.
4. Needed instream structures could be installed by hand.
5. This area is suitable for one or more volunteer workshops.

If you have questions, please call.

Sincerely yours,

Bill Zeedyk

Bill Zeedyk

Structures on Manuelitas Creek/Jones Project

LW-live wildings consisting of sedges, rushes, willows and small Cottonwood trees
Boulders range in various sizes from 2'X3' to 9'X4'
Rock ranged in various sizes 3" to 24"

Structure

Jones's property

1. 18'- boulder/Post vane combo 10 yds³ boulders and 55ft² of LW.
2. 20'- boulder vane, 12 yds³ of boulders and 50ft² of LW.
3. 20'- boulder vane, 14 yds³ of boulders and 55ft² of LW
4. 17'- Cedar post vane and 12ft² of LW.
5. 16'- Cedar post vane and 12ft² of LW.
6. 21'- Cedar Stake weir .5 yds³ of rock. Weirs consist of 3 rows w/willows woven between the stakes.
7. 14'- Cedar post vane and 12ft² of LW.
8. Rock/Picket Baffle, 42'X8' 6 yds³ of rock and 15 ft² of LW.
9. 40' boulder Wall, 22 yds³ of boulders
10. 25'- Cedar stake weir, 1 yd³ of rock.
11. 2 Cottonwood trees removed.
12. 10' Cedar Stake weir, 1 yd³ of rock.
13. 3- Cottonwood root wads offering 35' stream bank protection. 5 yds³ of boulders 25 ft² LW and 3CW poles ranging from 8' to 12' length with 3" to 6" stems
14. 26' Cedar Post vane, 1 yd³ of rock and 10ft² LW
15. 17' Boulder vane, 7 yds³ of boulders and 80ft² of LW
16. 20' Cedar post vane, 1 yd³ of rock 40ft² LW
17. 10' Cottonwood log vane (log used is 30') 1½ yds³ of rock 30ft² LW
18. 10' Cottonwood log vane (log used is 30') 1½ yds³ of rock 80ft² of LW.
19. 2- Cottonwood root wads offering 20' of stream bank protection 3 yds³ of boulders and 50ft² of LW and 5 CW poles 6' to 14'
20. Removal of large woody debris.
21. 10' Cottonwood log vane (log used is 30'), 3 yds³ of rock.
22. 21' cedar stake weir, skewed rt. 1 yd³ of rock
23. 20' boulder vane, 12 yds³ of boulders and 20ft² LW
24. Rock/Picket baffle 21'X7', 2 yds³ of rock.
25. 21' weir skew rt. 1 yd³ of rock
26. Rock/boulder baffle 38'X12' 8 yds³ of rock/boulders
27. 10' Cottonwood log vane (log used is 30'), 1½ yds³ of rock, 20ft² LW
28. 10' Cottonwood log vane (log used is 30') 1½ yds³ of rock, 20ft² LW
29. 12' Cottonwood log vane (log used is 36') 1½ yds³ of rock, 20ft² LW
30. ***Beginning Stanley Lucero's***--Cross vane 24'X12'X24'X10', 30 yds³ of boulders and 55ft² of LW
31. 22' boulder vane, 18 yds³ of boulders, 12ft² of LW.
32. 16' boulder wall, 4 yds³ of boulders, 20ft² of LW
33. Rock Baffle and braided channel fill, 42'X24', 5 yds³ of rock and 200ft² of LW.
34. 16' Boulder vane, 8 yds³ of boulders and 60ft² of LW.
35. ***Beginning Elaine Speilman's***--Boulder wall, 3 yds³ of boulders
36. 24' boulder vane, 13 yds³ of boulders, 80ft² of LW.
37. 25' boulder vane 18 yds³ of boulders, 90ft² of LW
38. 23' boulder vane 18 yds³ of boulders, 200ft² of LW

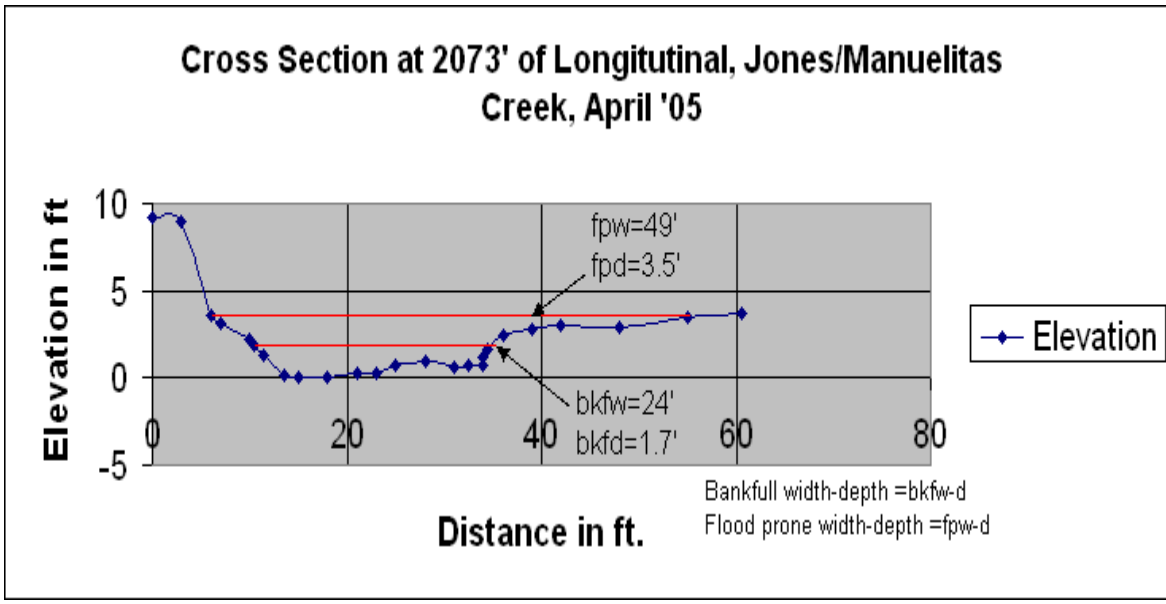
Pat Jones Project Survey….con't.

Excavation of point bars(square footage x .75)

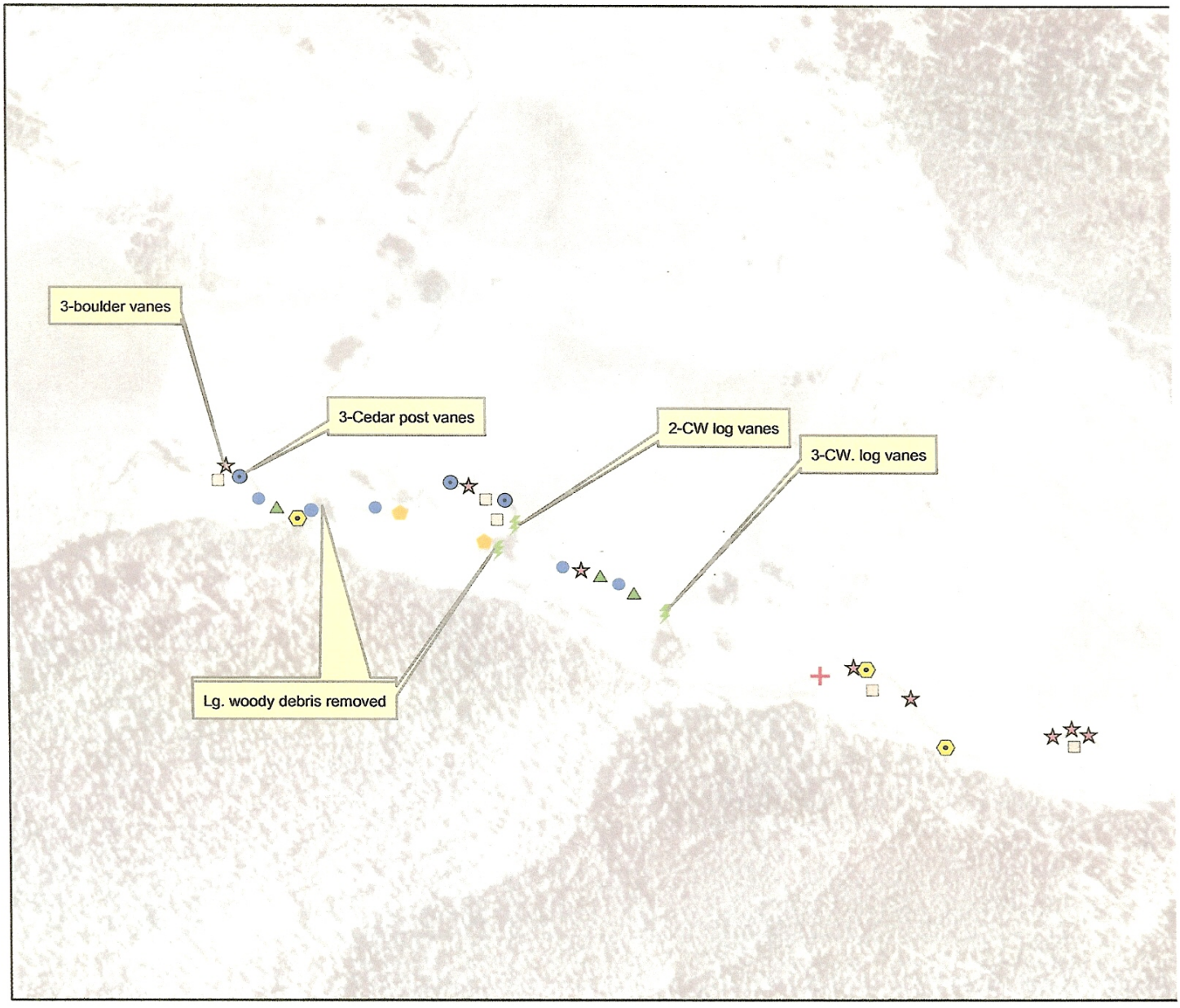
A. 55'X6' = 250 yds³
B. 30'X5' = 112 yds³
C. 50'X6' = 225 yds³
D. 120'X6' and 30'X3' = 608 yds³
E. 90'X6' = 405 yds³

Pat Jones Project

2073' Distance	Elevation
0	9.15
3	8.98
6	3.64
7	3.15
10	2.23
10.5	1.82
11.5	1.31
13.5	0.15
15	0.08
18	0
21	0.23
23	0.31
25	0.73
28	0.98
31	0.62
32.5	0.68
34	0.73
34	1.2
34.5	1.65
36	2.4
39	2.82
42	2.98
48	2.88
55	3.48
60.5	3.73



Stream Bank Stabilzation Project
Jones / Manuelitas Creek
Tierra y Montes, SWCD



Excavation of Point Bar

Boulder Vane

Cedar Post Vane

Rock Baffle

Cedar Stake Weir

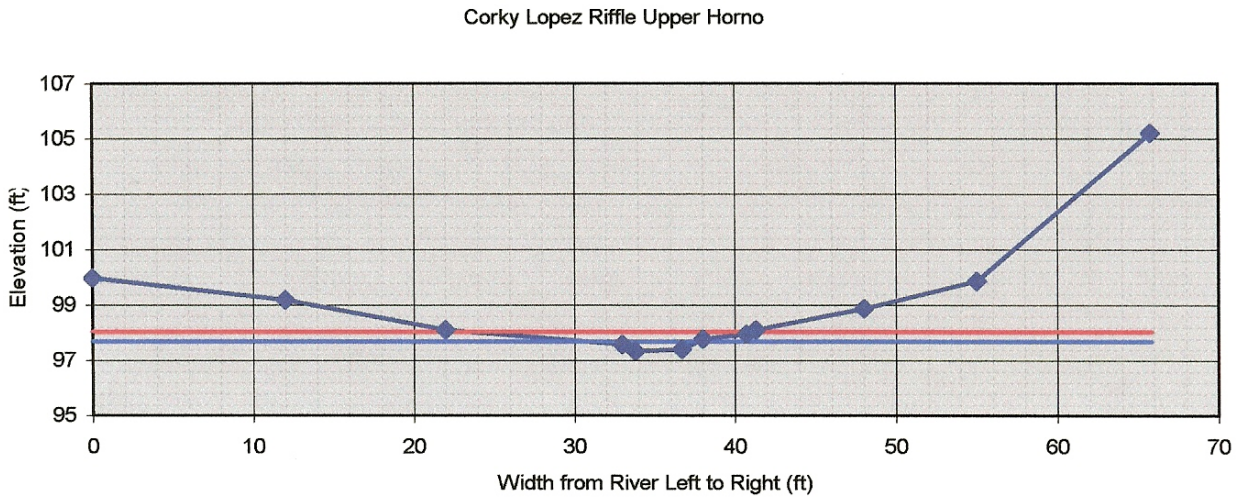
Cotton Wood Root Wad

Boulder Cross Vane

Boulder Wall

Cotton Wood Log Vane

Pola Lopez Project



section:	Corky Lopez
	Riffle
stream:	Upper Horno
location:	Sapello Watershed 02J, BM4.26 @ 325'long 40' stream right on rock
description:	5/31/2006
height of instrument (ft):	109.51

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	9.51	100
	☐	12	10.32	99.19
outside edg	☐	22	11.4	98.11
edge L ban	☐	33	11.92	97.59
TW	☐	33.8	12.15	97.36
edge R cha	☐	36.7	12.1	97.41
top R bank	☐	38	11.72	97.79
	☐	40.7	11.55	97.96
floodplain F	☐	41.3	11.39	98.12
	☐	48	10.62	98.89
btm of terra	☐	55	9.63	99.88
top of terra	☐	65.8	4.3	105.21
	☐			
	☐			

FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
11.8				
97.71	---			

dimensions			
1.4	x-section area	0.2	d mean
7.3	width	7.3	wet P
0.4	d max	0.2	hyd radi
0.0	bank ht	36.7	w/d ratio
0.0	W flood prone area	0.0	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)

Lopez-Stream Stabilization on Arryoy Horno
List of Structures

Tierra y Montes SWCD

Station	Structure description	Size	Area ft.²	Cubic ft.	
	Site-2-upper berm				
125'	Boulder Weir/edge of spillway	20'X35'X1'	700	26	
160'	Boulder Cross Vane	20'X10'X1.5'	200	11	
170'	Boulder-rock spillway	20'X30'X1'	600	22.2	
200'	Boulder Cross Vane	20'X10'X1.5'	200	11	
252'	Boulder Cross Vane	15'X10'X1.5'	150	8.3	
270'	Boulder/rock weir	8'X10'X1'	80	3	
	Site-1-lower berm				
20'(670')Long.	Boulder/rock weir	10'X10'X1'	100	3.7	
28'(714')	Boulder Cross Vane	16'X10'X1.5'	160	8.9	
	Boulder/rock outside bk armour	90'X2'X1'	180	6.7	
111'	Boulder Cross Vane	16'X10'X1.5'	160	8.9	
157'	Rock weir	18'X10'X1'	180	6.7	
	Total area ft² and Cubic yards.		**2710**	**116.4**	
	Excavation				Material to be used
31'-92'	excavate cattails/tank bed	40'X60'X1.5	2400	133 cu/yds	in the upper berm
720' of Long.	Excavate at head cut to new channel	55'X20'X1.6'	1100	67 cu/yds	
tank berm	excavate 1/3rd of lower berm	130'X16'X3'	2080	231cu/yds	
	Totals		**5580**	**431 cu/yds**	

APPENDIX D

Newspaper & Newsletter Articles

Tuesday, October 18, 2005

LAS VEGAS OPTIC

Stream restoration seminar held

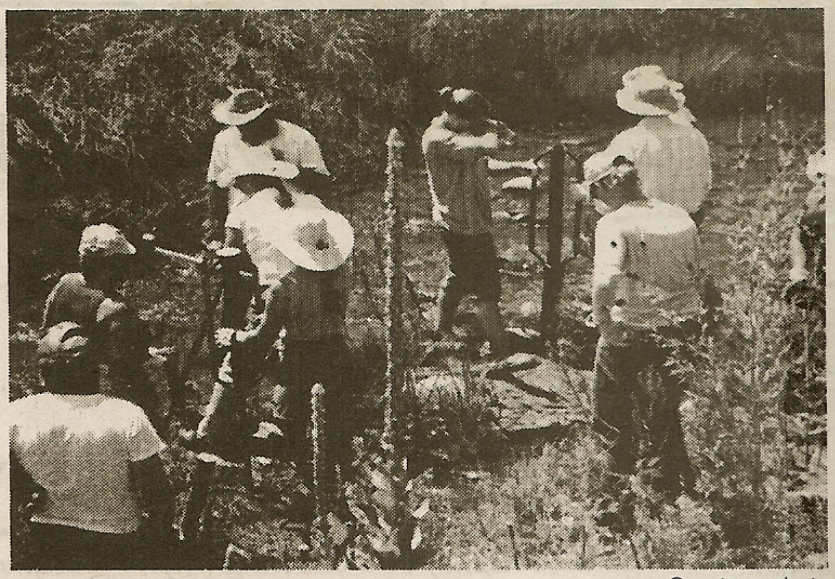
From the Optic

Local landowners and interested individuals participated in a two-day workshop held recently on Manuelitas Creek.

The workshop involved the stabilization and restoration of a 3/4-mile reach of Manuelitas Creek south of state Highway 94, about 3 1/2 miles west of Sapello.

Participants learned about the health and condition of the stream. The group examined various techniques and structures that utilize local materials to stabilize eroding streambanks. These included cottownwood root wads, logs, boulders, rock and live vegetation.

Bill Zeedyk, stream restoration specialist and instructor for the workshop, has worked on a wide variety of streams in the New Mexico and the Southwest.



Courtesy photo

Stream restoration specialists involve local citizens in work on Manuelitas Creek.

Sherri Tippie of Wildlife 2000, a Denver-based organization, gave a presentation on the benefits of beavers and the relocation techniques developed over the past 20 years.

The day was organized by Tierra y Montes Soil and Water Conservation District with collaboration from the state Environmental Department's Surface Water Quality Bureau and the Environmental Protection Agency.

Mike "Mateo" Sena Elementary School

October 1, 2004 Sapello, New Mexico

October Birthdays

Sonya Lane 10/06

Ian Parks 10/06

Ty Archuleta 10/13

Marina Paiz 10/13

David Encinias 10/14

Benny Lucero 10/16

Dr. Campos, LeeEtte Quintana & our Sapello Students at the Parade

Exciting Opportunities for Our Students

We have had a very busy month at Mike "Mateo" Sena Elementary with several exciting presentations and events. There were 32 students from our school who participated in the Robertson High School Homecoming Parade. We would like to thank Denise Barela and Dorothy Gonzales for organizing this special event. A special thanks also to Dolores Rudolph and The First National Bank for the use of the fire truck. The children really enjoyed the ride

On September 22nd the Albuquerque Zoological Park "Zoo to You" program visited our school. This program is sponsored by the Phelps Dodge Mining Company. Zoo to You instructors, Dr. Mary Williams and Dick Harris provided an educational program featuring animal classification, secrets of survival and information on endangered species. The children enjoyed the exhibits which featured live animals and various animal pelts (zebra, polar bear, and giraffe) which were provided from animals who had passed away at the Albuquerque Zoo.

We really enjoyed our delicious field trip on September 24th to the Salmon Ranch Raspberry Farm. The students enjoyed picking raspberries and eating savory raspberry sundaes.

Tierra y Montes Soil Conservation visited the 4th and 5th grade classroom on September 29th. The students learned about water quality and analyzed various water samples from our community. We learned that our water is good, but hard due to the many mineral deposits found in the water samples.

We also submitted 13 entries to the "Chillin With My Dad " essay contest sponsored by the New Mexico PTA Winners will be announced next month.

This is an exciting time for all of us and we thank the many volunteers, parents, and supporters who have visited our school and helped in making the educational process for our children fun and exciting. Señora Quintana

Free Workshop!

New date for an Introduction to induced meandering and stream bank stabilization workshop on Manuelitas Creek.

Bill Zeedyk, stream restoration specialist will head up the workshop. Bill retired from the US Forest Service as a Wild life Biologist, has been working around the Southwest and Mexico on Stream restoration for more than 10 years. Much of his work consists of low-tech, low-cost techniques utilizing local materials to remedy problems found on many of our streams and uplands.

Sherri Tippie of Wildlife 2000 located in Denver CO, will have a presentation Saturday morning from 10-12 on the characteristics and many benefits of our natural engineers, the **beaver.** Sherri has many years of experience; live catching, relocating, working with and studying the habits and personalities of beavers.

Sponsored by Tierra y Montes Soil and Water Conservation District in partnership with the New Mexico Environmental Department and the EPA.

****

Due to high stream flows in early June our workshop had to be re-scheduled to Friday and Saturday, August 26th and 27th , 2005
Registration begins at 8AM and the workshop runs from 9AM to 4PM

Attendance is limited so please register early.
For more information please call Tierra y Montes at 505-425-9088 and...

Come prepared to have a wonderful hands on learning experience.

Beautiful rustic camping is available on site!

The work shop is taking place approximately 15 miles NW of Las Vegas NM. (see map on reverse). Activities will consist of :

- Tour of the project site, discussion and evaluation of the problem areas along with the solutions chosen to remedy the situation.
- Introduction to Induced Meandering, including the structures and techniques involved.
- See completed structures made of root wads, boulder and log vanes and rock baffles
- A short tour of a previous induced meandering project, completed 2 years ago.
- Understanding and living with beavers presentation by Sherri Tippie.
- Come prepared for any type of weather; rubber boots, gloves, old clothes, sun tan lotion, repellant, water and any other special needs items.
- If possible, bring a digging bar, sledge hammer and spade or shovel if you have them.

A sack lunch will be provided both Friday and Saturday.
~~~A detailed letter will be mailed to those registered~~

Making Beaver Friends In New Mexico

You can't talk about stabilizing stream banks, or healthy riparian habitat, and not include beaver! I take that back, there *are* people who do that, but they charge *millions* of dollars to do what the beaver do for free! And, they are not as cute.

So, when Tierra Y Montes Soil and Water Conservation District, in Las Vegas, New Mexico, organized the "Induced Meandering and Streambank Stabilazation Workshop." in August. They invited **Wildlife 2000** to cover "beaver."

All the folks who attended the Workshop.

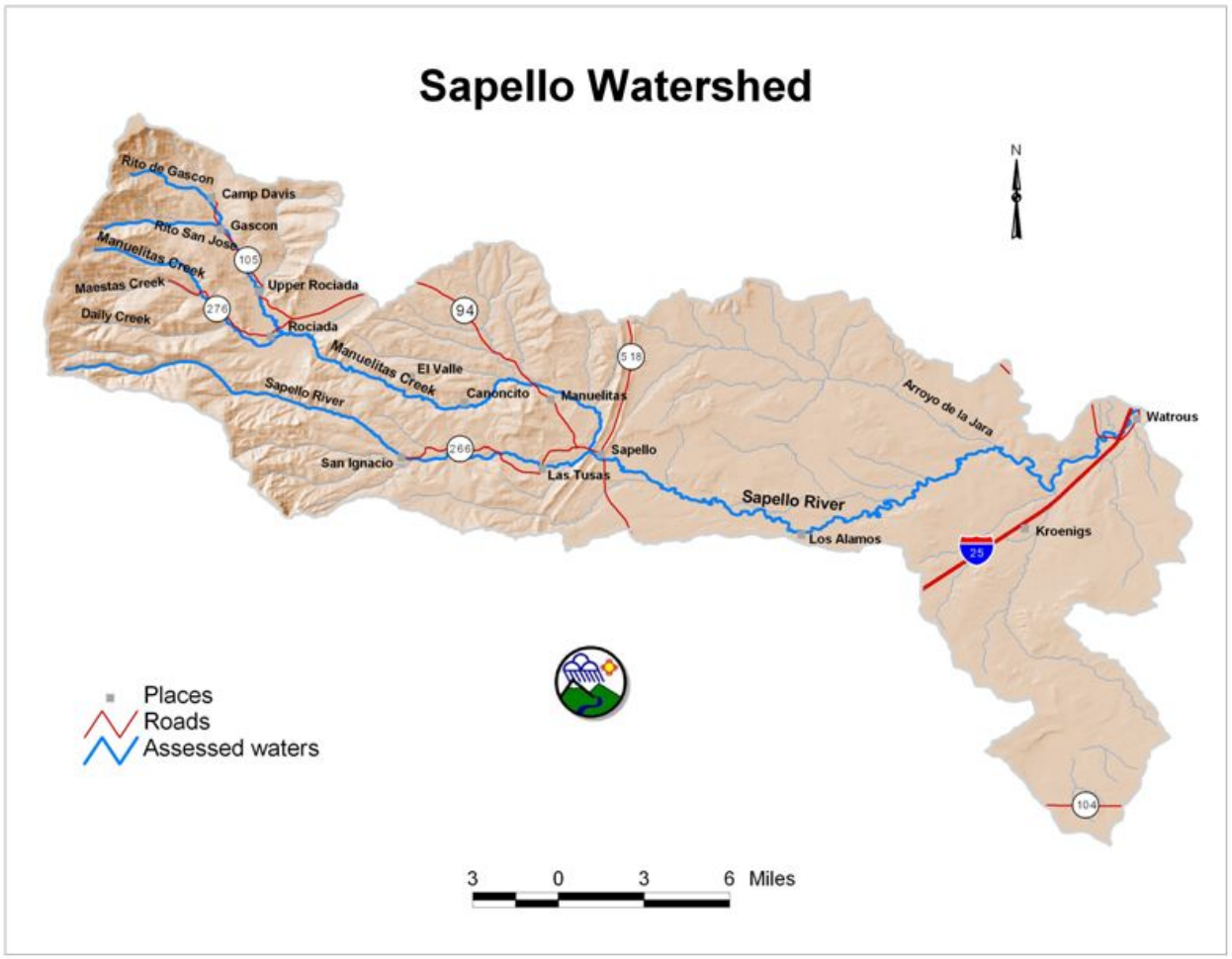
The workshop was held in Sapello, NM, where there are many small ranches, some of which have grazed their land to the nubbins, and whose streambanks are cut down so far, they continue to slough off and erode. TMSWCD has been showing people what a healthy meandering stream should look like. And, now they're getting some help; beaver have started moving back in and helping to reclaim the creeks.

A recently built beaver dam.

Willow grow back faster, stronger, and healthier, after the *pruning* effect of the beavers teeth. Cows and elk, because their teeth grind and crush the willow, have the opposite effect.

Note: The workshop was such a success, another one is being planned for next year. This time however, both Skip Lisle and I will be there! If you live in NM and want to attend, call Tippie, @ (303) 935-4995 for details!

MAP OF THE SAPELLO HEADWATERS


Sapello Watershed
N
Rito de Gascon
Camp Davis
Gascon
Rito San Jose
Manuelitas Creek
Maestas Creek
Daily Creek
105
276
Upper Rociada
Rociada
94
518
Manuelitas Creek
El Valle
Canoncito
Manuelitas
Sapello River
San Ignacio
266
Sapello
Las Tusas
Arroyo de la Jara
Watrous
Sapello River
Los Alamos
Kroenigs
25
104
Places
Roads
Assessed waters
3 0 3 6 Miles