

**Final Report  
June 25, 2012**

**Restoring Wetlands and Wet Meadows on the Valles Caldera National  
Preserve Project  
Assistance Agreement #CD-966016-01-0**



**San Antonio Creek**

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## Overview and History

The Valles Caldera National Preserve (VCNP) is located in Sandoval County, in north-central New Mexico. The Valles Caldera Trust (VCT) was established to manage the Preserve and the governing body is a Board selected by the President of the United States. The VCNP was formerly a privately owned ranch initially deeded as a land grant in the late 19<sup>th</sup> century. The “Baca Ranch” was purchased by the federal government in 2000 under the Valles Caldera Preservation Act. This 89,000 acre property is unique in several ways, especially the geology that has created the stage for the stunning grasslands and the high peaks in a ring around them. This area has been geologically active for at least the past four million years and is one of the larger calderas in North America. The collapsed volcanic field forms the bottom of a circular bowl, the Valle Caldera, roughly 13 miles across and is bounded by volcanic activity forming mountains (approximately 1.2 million years before present) 1200 feet higher than the caldera floor, such as Redondo Peak. Following that, several series of mountains erupted, creating new mountains around the northern and western interior of the caldera.

The circular shape of the caldera also defines the drainage systems that have developed in this area. The presence of geothermal waters in and around the Valle Caldera is a reminder that this volcanic field is only dormant. Water as well as volcanism shaped the present landscape. During its geologic past, lakes filled parts of the caldera forming thick soil horizons attributing to the uniquely prevalent grassland vegetation. Approximately 27 miles of streams within the preserve offer habitat suitable for trout, although many of the streams and wetlands are in need of rehabilitation. The most common impairments to these streams and wetlands include excessive sedimentation and stream channels wider and shallower than would be expected resulting in temperatures higher than desirable for salmonid fisheries. The impairments are thought to have been a result of the heavy grazing that occurred in the early 20<sup>th</sup> century, it has been reported that more than 30,000 sheep along with cattle and horses were grazed annually. Heavy timber extraction also occurred mid-century and the many miles of associated roads created conduits for sediment mobilization. <sup>1</sup>

Since becoming public land, staff from the VCNP have been conducting inventory and monitoring of the natural systems. The research includes many professionals worldwide who have

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<sup>1</sup> Valle Caldera National Preserve: Framework and Strategic Guidance for Comprehensive Management, 2003

submitted requests to study in this area. The Preserve had several key design elements as part of its mission. This included “Science-based adaptive management”, interpreted as having the management practices based on successful data, and if the data did not show positive results, then management practices were reviewed and changed. Los Amigos de Valles Caldera (Los Amigos) was created in 2004 as a “friends” group, finalized its 501(c)(3) status in 2007, and supports the Valle Caldera Trust accomplish its goals <http://losamigosdevallescaldera.org/>. In this capacity, Los Amigos has garnered grants, works as a fiscal agent and supplies volunteers through its membership focusing on surface water and wetland restoration. In 2007 Los Amigos contracted with Surface Water Quality Bureau to complete the performance measures outlined in the workplan.



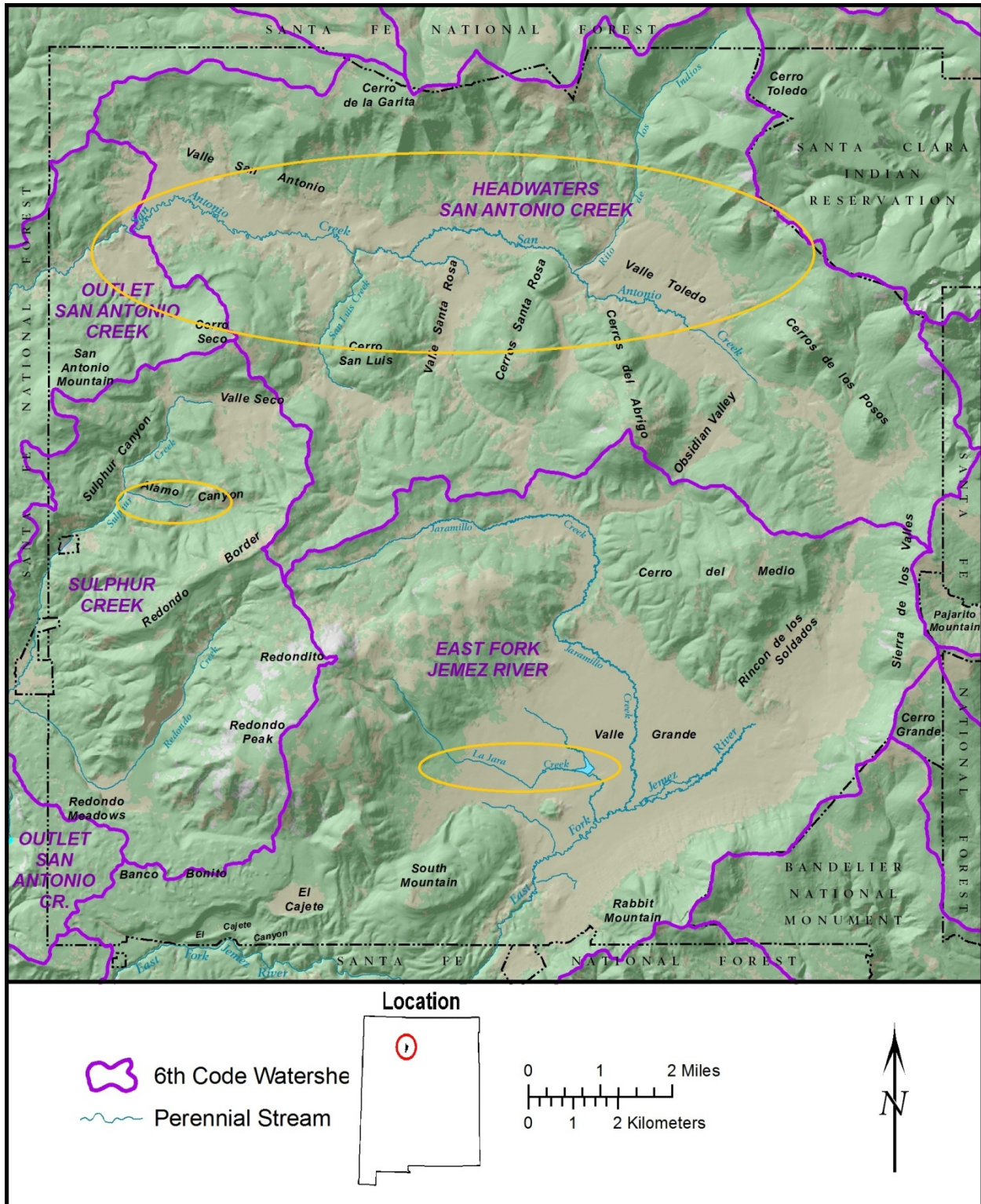


Figure 1. Map of the Valle Caldera National Preserve. Project sites outlined in yellow.

## **Project Location and Description**

The Valle Caldera Trust, Los Amigos de Valles Caldera (Los Amigos) and others partnered with the Surface Water Quality Bureau, New Mexico Environment Department (SWQB) to locate and restore fen and slope wetlands and floodplain wet meadow habitat. This project included tasks on three streams, all headwaters in the Jemez Watershed (HUC #13020202) in north–central New Mexico. The project workplan focuses on activities in three stream systems in the Valle Caldera National Preserve. The streams identified in this project are the San Antonio Creek, Sulphur Creek fen and ponds, and La Jara Creek all within the VCNP and identified in Figure 1. The project used innovative restoration techniques pioneered in New Mexico, which were observed to function well. The course of events was to study and map these areas of interest and then design and implement the restoration process. Most of the vegetation and climate is classified as upland-montane, and winters can bring fairly severe weather between the months of October to May, roads can be impassible during most of that time so work time is tightly scheduled during the summer and fall months without disturbing other recreation events that occur on the VCNP.

The SWQB, in cooperation with Los Amigos, identified existing wetland areas and degraded wetlands along the entire length of the San Antonio Creek, within the VCNP, which is about 15 miles. Habitat for the rare “bog birch” (*Betula pumila*) in the headwaters of Sulphur Creek in Alamo Canyon was identified and assessed and volunteers were engaged to protect this unique habitat. The slope wetland/wet meadow along the southeast side of Redondo Peak near La Jara Creek was inspected and problem areas were identified so that the road was not capturing ground flow.

The project began in May 2007. The tasks will be specifically reviewed further in this document. However, they are briefly described as:

- looking at the San Antonio Creek to determine priority actions to take;
- write and submit the state and federal clearances for project implementation; write and submit to EPA the San Antonio Creek Subwatershed Wetlands Action Plan;
- create a wetlands restoration design for Alamo Canyon and slope wetlands;
- and finally with tasks 5 and 6 – implement the San Antonio Creek, Alamo Canyon, and slope wetlands restoration. Monitoring, including the development of a Quality Assurance Project Plan and the project administration occurred during the during the project life.

## Highlights of Restoring Wetlands and Wet Meadows Project

- In the spring of 2007 SWQB contracted with Los Amigos de Valles Caldera to implement tasks one and three through eight of the workplan. On July 12, 2007, the Valles Caldera was mapped aurally using a digital camera and a sub-meter Trimble GPS unit. Sterling Grogan, the pilot, volunteered his airplane and his time for this endeavor. Photographs were taken by Van Clothier, Streambank Dynamics, a sub-contractor who used this method to survey the San Antonio watershed. The first tier of problems was identified. The data, including the 260 photographs and the flight track of the airplane were loaded into a GIS map document by Wetherbee Dorshow of Earth Analytic, Inc..
- Ground truthing activities and reconnaissance followed the flight survey in the latter part of July 2007 with SWQB, VCT and Streambank Dynamics staff walking the almost 15 miles of the San Antonio Creek within the VCNP, collecting data. An additional 155 photos were collected, and were used to identify and rank the ecological problems on the creek. VCT staff created an updated interactive map that has been used for many presentations and funding opportunities since then. Appendix A.
- VCT staff completed the draft Environmental Assessment in 2008, and a decision was made in April 2009 in support of this project. These documents are included as Appendix C. Section 1.3 of the Environmental Assessment lists 12 activities in the proposed actions that supports the values of the Preserve as identified in the Act (U.S.C. 2000). This document also referenced the project work in the tributary, Alamo Canyon, of Sulfur Creek. Alamo Canyon has unique hydrologic and biologic issues.
- Design work commenced in the Alamo Bog and a volunteer work weekend was held in August 2008 to create exclosures for the unique botanical species, *Betula glandulosa*, bog birch. Approximately 35 people participated in this endeavor.
- The design work was completed and accepted by the work group in 2009 for Alamo Canyon. Another volunteer work weekend was held in August 2009 with approximately 40 people participating. The bog birch looked to be more vigorous with more sprouts observed. Rockwork on the headcuts was also begun in 2009 by hand and machine constructed structures were implemented by July 2010. The volunteers again met in August 2010 focusing most of their efforts on erosion structures. Appendix E.
- A 'no cost' amendment with EPA and SWQB on the workplan for this project was completed in 2009, extending the project period and clarifying tasks.
- The La Jara Creek task design work was completed and implemented by October 2010.
- The Clean Water Act §404 permit for work on the San Antonio was submitted in December 2010. A field review was conducted with Van Clothier, Craig Sponholtz

(contractors), Corps of Engineer (COE) and SWQB staff. This is included with an appended version and with the verification letter from COE included in Appendix D.

- The San Antonio Wetlands Action Plan was completed and accepted by EPA in 2011 and is included in Appendix J.

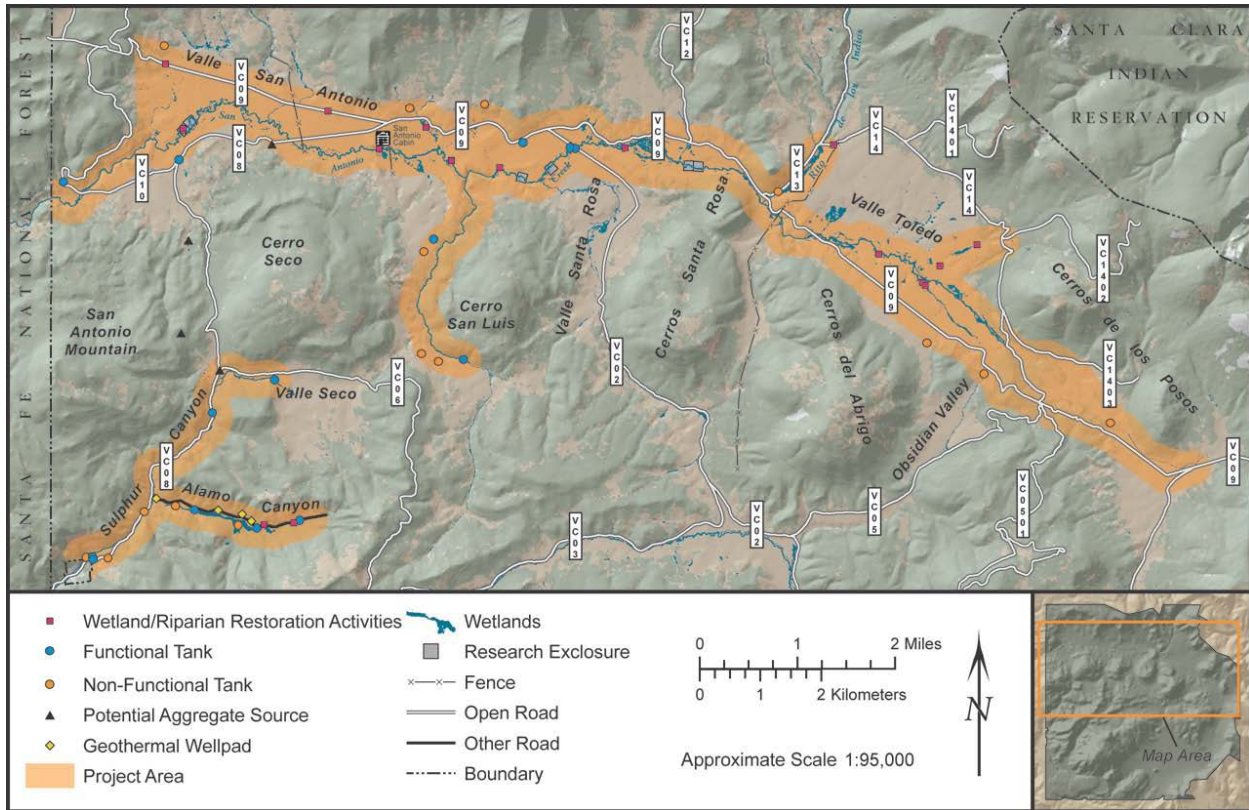


Figure 2. Map from NEPA document



## Project Tasks, Objectives and Accomplishments

Tasks 1 and 4 describe the restoration reconnaissance and design aspect for the San Antonio watershed and the Alamo Canyon and La Jara slope wetlands. Tasks 5 and 6 provided the direction for the implementation aspects of the project. Task 2 addresses the permits and clearances needed to initiate the project. This was delayed by activities within the Valle Caldera Trust, and the National Environmental Policy Act (NEPA) did not get completed on the timeline shown in the workplan. The project also went through staff changes in the Surface Water Quality Bureau, slowing down some of the processes. None-the-less, the work done through contractors and volunteers has provided the foundation and is meeting the goals of improving wetland habitat and identifying problem areas. Several new projects were garnered out of the information gathered through this project. They include two distinct projects funded under Section 319 of the Clean Water Act and one project funded under a state program “River Ecosystem Restoration Initiative. A proposal to further the work started on the Alamo Canyon has been submitted.

The Alamo Canyon implementation included work done on the uppermost pond that was eroding, creating rundown high level areas that would turn into wetland buffers. Rock rundown and erosion prevention structures were also constructed at the abandoned geothermal exploratory pad. Restoration of the deteriorating logging road included improved drainage design on 1.5 miles of road. Although not documented as part of the match, the VCT contributed several culverts in the first section of road, thereafter, rolling dips were installed to prevent sediment coming off the road into the wetland. Through these efforts we hope to see approximately 20 acres of renewed wetland community. Through the efforts of volunteers for the life of this project, we have safeguarded and increased the area of the bog birch species – unique because it usually doesn’t occur this far south and is only in documented fens. The following is an excerpt of a report by Bill Zeedyk, project designer.

*On June 30, 2010, I inspected the earthwork and erosion control treatments installed by Craig Sponholtz, of Dryland Solutions, at Alamo Bog. All scheduled work was completed as planned. The work is described from East to West, as follows:*

1. *Upper Pond. Two spillways were armored with rock rundowns and reshaped to be of identical elevation in order to maintain stream flow to downstream wetlands while preserving the pond as key wildlife habitat.*



*Spillways had eroded and threatened to breach. Additional rock was stockpiled at site for placement by volunteers.*

2. *Grade control structures. Rock was delivered and stockpiled at all staked sites for the subsequent installation of Zuni Bowls and rock weirs by volunteers. This work is scheduled for mid-August by Albuquerque Wildlife Federation.*

3. *Road drainage structures. Nine rolling dips were installed between the upper pond and Well Pad #1. These treatments will minimize mobilization and delivery to the wetlands*

*while harvesting road runoff at the most advantageous locations for wetland stabilization and expansion. Drainage outfalls were stabilized with rock mulch where the potential for erosion was present, especially where runoff spills onto non vegetated soils at sulfur vent sites.*



4. *The site known as Well Pad 1, was stabilized for erosion control and sediment abatement. Treatment consisted of*



*constructing an earthen berm 360 feet in length, installing 2 cobble rundowns (60 feet by 10 feet each), 2 media luna rock structures (45 feet by 6 feet) and (30 feet by 6 feet), 1 Zuni Bowl headcut control structure, 5 one rock dams and 2 rolling dips to divert road and hill slope runoff across the well pad. The area treated is approximately 1.5 acres. As the result of treatment, portions of the site should evolve to ephemeral wetland. Moist*

*soil species such as Baltic rush, white Dutch clover, Kentucky bluegrass and common dandelion are already present.*

5. *Twelve rolling dips were installed to drain the road between the Well Pad and junction with VC08 at Sulfur Creek.*

In October 2010, Craig Sponholtz of Dryland Solutions, Inc. completed the slope wetlands project at the La Jara Creek. There were seven potential work sites along the VC02 road west of the cabins, but our designer, Bill Zeedyk, felt that we would get the most wetland potential from three of them, so those were the ones that were worked on. VCT again supplied culverts, and additional material was brought in. The VCT also had fill dirt, but we had to have it hauled in from some distance. This provided some scheduling conflicts because the VCNP conducts hunts during this time, and for safety reasons work was postponed so this delayed the process somewhat and increased the cost.



- At the most westerly site, there was a low-water crossing with wetlands below. A porous fill to spread water from La Jara Creek across the meadow was installed and would potentially create 1½ acres of wetlands.

- At the site just west of the Bunkhouse, a porous fill to spread water was installed, and would potentially create an acre of wetland.



- At the Bunkhouse site, we improved the road crossing which will improve water quality as well increase wetlands.

One of the first implementation practices in the San Antonio watershed was to increase wetland habitat area south of the warm springs Cabin, using volunteers to repair a headcut that was draining the wetland, and use sedge wads to spread out the slope wetlands flow from springs in the terraces. Here is a photo of the project work. We expect to see an increase of at least 15 acres of wetland habitat in this section.



Task 3, San Antonio Creek Subwatershed Wetlands Action Plan, was submitted and accepted by EPA and will be an addendum to the current Jemez Watershed Restoration Action Strategy. It is included in this report as Appendix J.

Task 9. Attend a Wetlands Training. Staff attended the Association of State Wetland Managers Coordination Meeting on March 13-15, 2012. The purpose of this annual workshop is to provide state and tribal wetland program staff respond effectively to the challenges in the coming year. Topics included wetlands, rivers and streams that have received increased attention due to physical alteration, stream delineation, mitigation, flooding and climate change. Waters subject to dredge and fill activity are very dependent on these programs to include strategies that will protect water quality and wetlands habitat. The agenda with presentations is included in Appendix K.

## **Measures of Success/Innovative Aspects**

Task 7 covered the monitoring and the Quality Assurance Project Plan (QAPP) development and implementation. The reports, developed by Steve Vrooman (Keystone Restoration Ecology), for the three specific sites, Alamo Canyon, San Antonio Creek, and La Jara Creek are included in their entirety in Appendix F. The QAPP and associated approval letter are also included in Appendix F.

We are confident that the innovative practices that were developed during the course of this project will provide long lasting benefits on the ground. The VCNP, as was stated earlier, became public property in 2000, after several hundred years of heavy grazing, road building, timber extraction and geothermal exploration. The staff at VCT have been very interested and involved in the discussion and application of the innovative practices, as discussed in the NEPA documents. These include structures that minimize erosion, especially head cuts such as rock drop downs, and/or Zuni bowls. Our designer, Bill Zeedyk, has given much thought to sediment erosion coming off of badly located roads and has developed techniques to ameliorate those conditions. Plug and pond practices that have recently been written about in California may be useful in slope wetlands applications and were implemented on the San Antonio Creek. We hope to see through this project and the projects that resulted from this project not only diverse and healthier wetland ecosystems, but restoration of former wetland habitat.

## **Lessons Learned**

We learned several lessons in this project.

1. Given rest and opportunity, the ecosystem – although fragile, can make a comeback. We were so grateful for the hard work and interest in learning new techniques from our volunteers, Los Amigos de Valles Caldera, Albuquerque Wildlife Federation and others. Our consultants and contractors are continually observing the natural system and are able to improve the functionality of the wetlands, and in so doing may ultimately provide increased buffer for improved water quality.
2. Working with agency land managers sometimes can deviate from schedule. Issues such as weather or fire danger can minimize opportunities for working on site, however, with open communication and a common goal we accomplished more than what we expected initially, and although the project was extended, we achieved our objectives on the ground and in policy work.

3. Change of staff was difficult, especially because the SWQB was not able to replace staff at that time. Although the new Project Officer was enthusiastic about the project, all SWQB staff carried an increase to their existing workload which sometimes slowed down progress. Having Wetlands Program Project Officers to help with these activities has helped this situation.

## **Future Activity Recommendations and On-going Projects**

As mentioned previously, this project was the groundwork for 3 current projects. A CWA § 319 project, FY 10-C Continuing Restoration Work on San Antonio Creek and a state funded project under RERI Restoration Work on San Antonio Creek are providing treatments to the San Antonio Creek based on impairments that were documented and ranked through this project. A devastating wildfire occurred last summer, the Las Conchas Fire, which burned through several thousand acres within the preserve. Parts of the watershed to the headwaters of the San Antonio were heavily burned, especially the Valle Santa Rosa and the watershed for the Los Indios tributary. These two tributaries have provided much sediment in the past and partnerships for restoration have arisen. Included in these partners is the neighbor to the northeast, Santa Clara Pueblo and the WildEarth Guardians. Both had projects before the fire, and hope to continue work post-fire. We have noticed that only by increasing the functionality and resilience of the watershed, will it be able to withstand changes in climate and especially wildfire occurrence.



*Restoring Wetlands and Wet Meadows on the Valles Caldera National Preserve*

FY07 EPA WETLANDS PROGRAM DEVELOPMENT GRANT, Region 6

CD 966449-01-0 (FY2007) CWA Section 104(b)(3)

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## Budget

Account	FY07	FY08	FY09	FY10	FY11	FY12	Total
PS & B*	\$ -	\$ 4,299.86	\$1,913.98	\$ 1,734.03	\$ 3,560.69	\$ 5,770.81	\$ 17,279.37
Contractual	\$ -	\$19,755.75	\$5,350.01	\$30,750.00	\$63,836.33	\$ -	\$119,692.09
TS & E**	\$ -	\$ 275.00	\$ -	\$ -	\$ 1,016.33	\$ 794.60	\$ 2,085.93
Indirect	\$ -	\$ 879.32	\$ 360.79	\$ 342.30	\$ 650.18	\$ 1,180.71	\$ 3,413.29
Totals	\$ -	\$25,209.93	\$7,624.78	\$32,826.33	\$69,063.53	\$ 7,746.12	\$142,470.68

Total Award \$ 190,840.00

Federal Portion \$ 143,130.00

State and local Match \$ 47,750.00

## **Attachments**

- Appendix A: Interactive Maps
- Appendix B: Match documents
- Appendix C: NEPA
- Appendix D: Compliance permits
- Appendix E: Design reports
- Appendix F: Monitoring Reports
- Appendix G: QAPP
- Appendix H: Photos
- Appendix I: Vegetation report
- Appendix J: Wetlands Action Plan
- Appendix K: Wetlands training