

**THE BOARD OF COUNTY COMMISSIONERS OF
THE COUNTY OF SANTA FE
RESOLUTION NO. 2016- 110**

A RESOLUTION ADOPTING MANAGEMENT PLANS FOR LOS POTREROS OPEN SPACE, LA CIENEGUILLA OPEN SPACE, AND SAN PEDRO OPEN SPACE AND DIRECTING STAFF TO IMPLEMENT THE PLANS

WHEREAS, Santa Fe County (County) owns and maintains a network of over 6,600 acres of open space and parks, and 46 miles of trails, including the Los Potreros Open Space, the La Cieneguilla Open Space, and the San Pedro Open Space; and

WHEREAS, the 2015 Sustainable Growth Management Plan and the Open Land and Trails Plan call for developing individual management plans for open space properties; and

WHEREAS, management principles were developed with community input to guide the development, management, and maintenance of Santa Fe County Open Space properties; and

WHEREAS, the management principles developed include appropriate public access, minimal maintenance needs, limited capital investments, protection of resources, diverse use opportunities, and increased youth and community participation in site stewardship; and

WHEREAS, numerous stakeholders, community members, adjacent property owners, and relevant public entities worked to develop a long range vision for each of the three properties through a vigorous community planning process; and

WHEREAS, the Santa Fe County Open Land, Trails and Parks Advisory Committee (COLTPAC), with the support of the Board, approved the development of management plans for the Los Potreros Open Space (Exhibit A), the La Cieneguilla Open Space (Exhibit B), and the San Pedro Open Space (Exhibit C) (the Management Plans); and

WHEREAS, the Management Plans which have been developed prioritize projects for implementation in the short-term, mid-term, and long-term; and

WHEREAS, the Management Plans define Best Management Practices (BMPs) in order to guide maintenance in a responsible and effective manner; and

WHEREAS, according to the Management Plans, additional staffing would enhance the County's ability to address deferred maintenance needs, and increase the likelihood of implementing the Management Plans in a timely and efficient manner; and

WHEREAS, the Management Plans contain estimates regarding implementation costs; and

WHEREAS, COLTPAC has reviewed and supports the Management Plans.

NOW, THEREFORE, BE IT RESOLVED by the Board that:

1. The Management Plans attached hereto as Exhibits A, B, and C, are hereby adopted;
2. Staff is directed to implement the Management Plans to the extent possible with available resources and to request amendment of the plans as needed;
3. Staff is directed to request necessary budget for staffing, training, planning, maintenance, and capital funding for implementation of the Management Plans;
4. Staff is directed to involve community members and the public in the outlined management projects and activities contained within the Management Plans when appropriate.

PASSED, APPROVED, AND ADOPTED this 27th day of September, 2016.

BOARD OF COUNTY COMMISSIONERS

Miguel M. Chavez

 Miguel M. Chavez, Chairman

Attest:

Approved As To Form:

Geraldine Salazar

 Geraldine Salazar, Santa Fe County Clerk

Gregory Shaffer

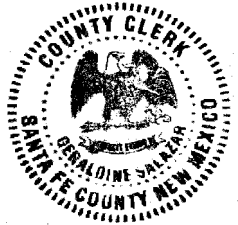
 Gregory Shaffer, County Attorney



COUNTY OF SANTA FE) BCC RESOLUTIONS
 STATE OF NEW MEXICO) ss PAGES: 332

I Hereby Certify That This Instrument Was Filed for
 Record On The 12TH Day Of October, 2016 at 09:30:30 AM
 And Was Duly Recorded as Instrument # 1806826
 Of The Records Of Santa Fe County

Witness My Hand And Seal Of Office
 Deputy *Laura Howard* County Clerk, Santa Fe, NM
 Geraldine Salazar



SFC CLERK RECORDED 10/12/2016



SANTA FE COUNTY OPEN SPACE AND TRAILS PROGRAM

SAN PEDRO OPEN SPACE MANAGEMENT PLAN

FINAL DRAFT
SEPTEMBER 13, 2016



Ecotone



ACKNOWLEDGMENTS

The planning team acknowledges the support and insights offered by the 2015-2016 Board of County Commissioners of Santa Fe County.

Henry Roybal– District 1

Miguel Chavez – District 2

Robert Anaya – District 3

Kathleen Holian – District 4

Liz Stefanics – District 5

Furthermore, the planning team wishes to acknowledge the support and insights offered by the County Open Lands, Trails, and Parks Advisory Committee (COLTPAC).

The extensive knowledge, effort and guidance from the County Open Space and Trails (OS&T) planning, project development, and maintenance staff was invaluable in developing this plan.

Maria Lohmann, OS&T Senior Planner,

Paul Olafson, Planning Project Manager

Erin Ortigoza, Senior Community Planner

Colleen Baker, OS&T Project Manager

Shane Martinez, OS&T Maintenance Technician
Lead

This plan is informed by input from the approximately thirty people who participated in the stakeholder input process for this plan. Stakeholder input was particularly important in the planning process to confirm the network of stakeholders, identify critical land and water conservation issues, understand land management issues in the area, formulate a vision for the property, identify preferred land uses and management activities, verify Management Plan priorities, and obtain feedback on draft management plan language.

The planning team obtained stakeholder input in a variety of ways:

- Meetings, telephone interviews, e-mail communications, and field walks with approximately 12 advisory people in the community
- Three community meetings at the Edgewood Fire Station in Edgewood; between 15 and 25 people participated in each of the meetings
- A public review and input process of the public review draft version of the Management Plan; comments were summarized in a table and responses were formulated behind each one of the comments; seven people submitted written comments on the Draft Management Plan.

The San Pedro Open Space Management Plan was developed by a planning team led by Ecotone. The Ecotone planning team included:

Ecotone / team lead, ecologist

Jan-Willem Jansens

The Community Store / facilitator

Carl Moore, Jessie Lawrence

River Source / ecological planner

Richard Schrader, Carlos Herrera

Surrounding Studio / land planner

Faith Okuma , Sandra Donner,

Earth Analytics, Inc./ GIS planners

Wetherbee Dorshow, Tonya Fallis.

Kim Kearns

TABLE OF CONTENTS

1.0 Introduction

- 1.1. Plan Purpose and Need 1
- 1.2. Property Description 2
- 1.3. Management Plan Development Process 4

2.0 San Pedro Open Space Management Plan

- 2.1. A Vision + Goals for San Pedro Open Space 7
- 2.3. Conceptual Master Plan 13
- 2.4. Community Relations 20
- 2.5. Terrain Management 23
- 2.6. Plan Implementation and Financing Mechanisms 26

SAN PEDRO OPEN SPACE APPENDICES

- APPENDIX A: Overview of Management Activities for San Pedro Open Space
- APPENDIX B: A Field Characterization for the San Pedro Open Space Property Santa Fe County, New Mexico - An Existing Conditions and Inventory Report
- APPENDIX C: Abstract Of An Archaeological Survey Of 160.8-Acre San Pedro Open Space Santa Fe County, New Mexico
- APPENDIX D: Maintenance Plan for San Pedro Open Space
- APPENDIX E: Maintenance, Stewardship, and Restoration Projects for Year-1





EXECUTIVE SUMMARY

San Pedro Open Space (SPOS) is a 160 acre property in San Pedro in southern Santa Fe County. This property was acquired in 2011 as a scenic gateway to the San Pedro Mountains and southern Santa Fe County. It provides recreational and educational opportunities as a connector to public lands, and potential regional trail hub.

The acquisition of this property was strongly supported by the residents of San Pedro for the preservation of its scenic beauty, connection to public lands, and its potential for linking regional recreation facilities.

The goal of this plan is to provide practical and effective management steps to maintain and enhance the natural beauty and recreational opportunities of San Pedro. This plan was developed in collaboration with community members, adjacent property owners, and Santa Fe County staff. The plan has received strong support from residents of San Pedro.

This open space property includes important wildlife habitat as well as significant, historic and cultural resources. Management site challenges include hazard mitigation, protection of cultural resources, appropriate access, and environmental restoration. The property's ecological and cultural resources are impacted by natural processes and a lack of consistent maintenance. Current threats include erosion and grassland degradation, impacts on significant cultural resources, and public safety related to historic mining activities. This management plan was developed to preserve, protect and restore the property's valued resources and outlines a vision, regular and scheduled maintenance activities, land improvement priorities, as well as stakeholder involvement in land stewardship.

The SPOS Management Plan identifies short-term, mid-term, and long-term management priorities for the property. The short-term phase focuses on ecological restoration and maintenance activities related to public safety and stabilization of cultural resources. In the mid- to long-term, Santa Fe County will work with stakeholders and neighboring BLM to develop recreation opportunities to realize the goal of a regional trail hub and an interpretive education program at SPOS to help visitors explore and understand the unique history, geology and ecology of the area.

The Management Plan for SPOS emphasizes the importance of collaboration regarding stewardship, conservation, and development of this property in the short and mid-long term phases. The plan identifies several opportunities for active public participation in stewardship activities to enhance preservation and restoration of the property to reach the vision for San Pedro Open Space.





Figure 1. View of San Pedro Open Space - from south looking to north Source: Google Earth

This Management Plan for the San Pedro Open Space was developed with community members, neighbors, property owners and other stakeholders from San Pedro and the surrounding area.

The planning team worked with participants to formulate a vision for the San Pedro Open Space and to verify the final plan components and priorities.

1.1. Plan Purpose and Need

The San Pedro Open Space (SPOS) Management Plan was developed between June 2015 and May 2016. Along with the Management Plan, a Field Characterization Report, a detailed Maintenance Plan, a cultural resources survey, and a Planners' Guide for County staff accompany this plan. The Planners' Guide includes technical planning methods, approaches to County capacity building, best management practices (BMPs), and recommendations for plan implementation.

The SPOS Management Plan outlines a planning direction and specific action priorities for short-term, mid-term, and long-term phases. The Plan was written for Santa Fe County policy makers, staff, community stakeholders, and site stewards with the purpose to:

- Describe the vision, goals, and objectives for management of the property;
- Help staff and the public understand terrain conditions and suitability of the land for different uses of the property;
- Clarify priorities for site restoration and maintenance;
- Identify projects for future investment and financing mechanisms to fund them;
- Streamline management protocols within Santa Fe County.

The Plan was developed in response to a recommendation from the County Open Lands, Trails, and Parks Advisory Committee (COLTPAC) and with clear and strong support for enhanced management of open space properties from the Board of County Commissioners (BCC). The Plan arose from a growing need for:

- A strategic management plan that includes community outreach, a conceptual master plan, funding analysis, and maintenance plan to direct County staff in managing SPOS;
- A strong vision with clear objectives and strategies for resource conservation, agricultural preservation, passive recreation, and public access;
- An overview of existing conditions and a site-specific inventory report;
- A detailed maintenance plan with recommendations for labor and equipment needed;
- A conceptual plan that identifies, prioritizes and estimates timing and costs for key projects;
- An analysis of potential funding mechanisms to implement the plan.

Management Plan Need

The SPOS Management Plan is a priority due to the completion of the first phase of a mine hazards assessment on SPOS and the neighboring Bureau of Land Management (BLM) property by the State Abandoned Mine Land Program (AML). Additionally, the management plan is needed to address ecological and functional site conditions that require systematic attention, consistent maintenance and resource management.

In recent years, community members and trail advocates have expressed an urgent need for transparency and clarity about timelines and actions toward realization of a regional trail hub and opportunities for community-stewardship of the SPOS.



Figure 2. Location Map - San Pedro Open Space

1.2. Property Description

The San Pedro Open Space (SPOS) is a 160-acre County Open Space property in the southern part of Santa Fe County in the western foothills of the San Pedro Mountains. Located east of the intersection of State Road 14 and State Road 344, SPOS has frontage and access on State Road 344. The location creates the potential for the site to be a regional trailhead center and access point to public lands, such as the adjacent BLM lands to the east of the SPOS (Figure 2).

The SPOS property includes significant cultural resources associated with the historic mining town of San Pedro and pre-historic Native American presence on the land. Pinon-juniper woodlands and grasslands weave in an interlocking landscape pattern across the site. The hills offer impressive sweeping views to the south, the west and north. The quiet, semi-pristine natural environment offers valuable wildlife habitat. The local community has discussed with Santa Fe County the desire to create a regional trail hub and other low intensity recreational facilities for local residents and visitors at SPOS.

The SPOS Management Plan is informed by a landscape assessment (“A Field Characterization for the San Pedro Open Space Property Santa Fe County, New Mexico - An Existing Conditions and Inventory Report”) completed as part of this management planning process (APPENDIX B). The plan also incorporates findings of a cultural resources survey of the entire SPOS property conducted by TAMARCH in 2016 (APPENDIX C).

Current conditions create needs for resource protection and restoration. Threats to the property’s resources and public safety include:

- Potential degradation of important cultural resources associated with pre-historic Puebloan artifacts and ongoing ancestral Puebloan connections to the land, the historic San Pedro settlement, and historic mining activities;
- Wildfire risk in grassland and woodland edges;
- Erosion risk at headcuts of gullies and along steep stream banks;
- Degradation of wildlife habitat qualities due to lack of water and inappropriate fencing;
- Safety risks associated with off-site shooting, hazardous mine sites on the SPOS property and immediately across the eastern boundary on BLM land, arroyo areas and flood-prone areas;
- Illegal uses on site, such as dumping, shooting, off-road vehicle use, night use and campfires.

Recently, BLM staff conducted a mine site reconnaissance survey at the SPOS and identified a small number of mine pits that require rehabilitation or protective measures for public safety. Several meetings with BLM and New Mexico Abandoned Mine Lands Program (AML) staff were held to clarify plans and timelines for abandoned mine rehabilitation on the County and BLM lands.

The BLM and AML discussions highlighted that completion of mine rehabilitation plans for the County and BLM properties will dictate the timing for implementation of the SPOS Management Plan. In addition, the completion of any mine hazard remediation required by the AML mine rehabilitation plan will affect the timing of any regional trail hub development on the SPOS property.

Significant cultural and historical resources on the SPOS property are related to the historic period of the San Pedro mining settlement, beginning around 1900. The 2016 comprehensive cultural resource survey for the property identified two additional historic sites and expanded the boundaries of a previously known site. These cultural sites comprise approximately 30% of the SPOS land area. All three sites are being recommended for protection under the National Register of Historic Places.

The cultural resources affect management of the SPOS. The required review process with the State Historic Preservation Office will affect detailed development plans for trails, other site development and activities. Implementation schedules must include time for safety and cultural resource clearances for any proposed activities in the identified cultural resource areas.

Any trail design will be influenced by soil conditions, stormwater runoff, views, and the existence of old trails on rocky grades. Trail development will be most suitable on the wooded, higher ridges with gravelly and rocky soils, and on the eastern, gravelly and rocky slopes, which afford spectacular views to the south, west and north. The eastern part of the property also includes several old trail alignments that could be readily used for new trails.

During the planning process, stakeholders repeatedly stated grave concerns about ongoing shooting activities on adjacent BLM property to the southeast of SPOS. Concerns about shooting focus on stray bullets and noise impacts to SPOS. Stakeholders were concerned about the lack of clarity and the slow pace of the mine assessment and reclamation process which affects developing trails and other recreational infrastructure on SPOS and adjacent BLM lands. Local residents and other stakeholders also expressed an urgent desire for transparency about timelines and steps toward a regional trail hub and community stewardship of the SPOS.

The San Pedro Mountains are part of a regional wildlife link between the Sangre de Cristo Mountains to the north and the Sandia-Manzano Mountains to the south. This linkage is important for cougar, mule deer, black bear, bobcat, foxes, and various smaller mammals. The area is also habitat to bats and raptors. Native ungulates graze on the site's grasslands and find cover in the woodlands. Various rodents live in both the grasslands and woodlands. Wild felines and canines benefit from the ecotones offered in the transitions between woodland and grassland, and the many little canyons and rocky outcrops. However, wildlife movement is hampered in this area by gradual ex-urban development, sparse water sources, and wildlife-unfriendly fencing. Community members noted that the undeveloped character of the SPOS can play a role in accommodating wildlife needs in this area.



1.3. Management Plan Development Process

The planning process was informed by the County's initial goals for acquisition of the San Pedro Open Space, and a set of planning principles. The planning principles were formulated based on goals for the County Open Space and Trails Program.

INITIAL GOALS FOR ACQUISITION

- Preserve open lands qualities.
- Develop an open space gateway to southern Santa Fe County by developing trail connections (to BLM land, and regional trail hub) and public recreation.
- Preserve the scenic, historic, and cultural landscape qualities and develop interpretive education.

PLANNING PRINCIPLES

- Adhere to goals and purpose of Open Space program.
- Ensure public access and safety.
- Keep maintenance needs to a minimum (commensurate to County capacity and community-based stewardship support).
- Minimize needed investments related to master planning.
- Minimize the disturbance of cultural and ecological resources.
- Identify and enhance opportunities for agricultural use of Open Space properties.
- Involve youth and create educational opportunities.

The planning process included three phases:

Scoping and Reconnaissance Phase

- Interviews with key stakeholders, community members, and County staff to develop an initial understanding for engaging the community in the management plan process.
- Review of relevant Santa Fe County plans and policies.
- Site visits to identify specific research needed for this management plan.
- The first public input meeting to develop an initial community vision for the site.

- Follow-up interviews with key stake-holders and community members to refine the approach for the second public input meeting.
- Research on topics identified in the Scoping and Reconnaissance phase.
- Additional site visits to confirm terrain management units and collect data for a land suitability assessment and the development of management recommendations.
- Mapping of findings of the Scoping/Reconnaissance and Research phases.

Planning Phase

- The second public input meeting to present research and land suitability findings and formulate ideas for management of the property.
- Writing the first draft of the management plan.
- Interviews and reviews with County staff to confirm plan coordination and implementation opportunities.
- The third public meeting to confirm the draft vision statement and goals and review the major components of the draft management plan.
- Writing and submittal of the final draft management plan for official approval.

Information Management

Santa Fe County will gradually streamline and enhance the procedures that help staff acquire, store, and share knowledge that is essential for effective resource management of SPOS. Recommendations about County capacity building, knowledge development, information management, plan updates and community involvement methods are described in the Planners' Guide.

Plan Updating

This plan is a living document which will be updated and amended when necessary. The scope of the plan is approximately 15-20 years. Plan information is specific for the short-term (years 1-5), descriptive for the mid-term (years 6-10), and preliminary for the long-term (year 11 and beyond).

Changing community needs, terrain conditions, and County management capacity will inevitably lead to the need for plan adjustments. Priorities and timelines may shift, and objectives for planned projects, maintenance activities, and community relations may change or expand. Following completion and assessment of actions beyond the mid-term span of this plan (10-15 years), this plan may need a thorough updating.



Photo 1. Views from San Pedro Open Space to Sandia Mountains



Photo 2. Historic pit-mining example



Photo 3. Transition between grasslands and pinon-juniper woodland



This section describes the San Pedro Open Space vision, the management goal and specific site management objectives.

Included are recommendations for monitoring and information management, a conceptual master plan with key projects, community stewardship, terrain management, and funding options.

2.1. A Vision + Goals for San Pedro Open Space

Vision Statement

The San Pedro Open Space vision statement is based on responses from community meeting participants to questions that asked “What would “good” look like?”, “What do you want for the future of this place?”, “What might other people think would be good for this site, but you don’t?”, and “What would worry you if it happened on the site?” The draft vision statement was shared and verified with community members at the third community meeting.

San Pedro Open Space Vision Statement

In 2025, the San Pedro Open Space (SPOS) is a safe and peaceful area for people and wildlife. The open space includes viewing areas, public access, some primitive trails, and public education about the scenic, historic, and cultural landscape. The open land remains wildlife habitat and a wildlife corridor. Local residents, especially younger generations, are actively involved in the maintenance and stewardship.

In the longer term, the SPOS may serve as a regional hub for hikers, mountain bikers, and horseback riders to access a system of trails through southern Santa Fe County. The area may also include additional space for children’s play or community gatherings.

The SPOS will not include loud or disruptive activities or overly-developed facilities.

San Pedro Open Space Management Goal

Based on the vision statement, the central management goal for SPOS is:

Santa Fe County and community members of the area collaboratively maintain and enhance the open land qualities of San Pedro Open Space and its wildlife habitat and corridors; its scenic, historic, and cultural resources; and its local and regional recreation opportunities.

SPOS management aims for the gradual development of a regional trail hub to public land and to trails in the wider region, including some simple trail head and interpretive education facilities, at a scale that requires little maintenance, encourages local community stewardship, and respects the area’s significant cultural resources.



Photo 4. Eroded historic wagon trails



Photo 5. Typical pinon-juniper woodland conditions



Photo 6. Example of mine hazards on BLM along SPOS boundary

Management Goals + Objectives

San Pedro Open Space Specific Management Objectives

Specific management objectives in support of the vision and the central goal are:

1. **Holistic & Neighborly.** Manage the property in a way that the different values and objectives are balanced as a whole, and that improvements and changes are introduced in a gradual way; seek and maintain optimal working relationships with neighbors and other local stakeholders, and encourage the involvement of people from younger generations.
2. **Public Safety.** Enhance public safety by prohibiting motorized vehicles, open fire pits, and the use of fire arms, and by protecting the public from any potential harm associated with old mine sites .
3. **Access.** Control access by managing easements, roads, trails, fences, gates, stiles, drainage crossings and signage.
4. **Natural appearance.** Maintain the area's natural appearance and sweeping scenic views, and keep maintenance limited; maintain a rural, natural visual quality by using natural design principles and natural materials, and by allowing natural processes to assist in management activities when possible.
5. **Education.** Provide and maintain interpretive education, and encourage educational and research opportunities.
6. **Cultural Resources.** Protect the area's cultural, historic, and pre-historic resources.
7. **Ecological Health.** Maintain the ecological health, resilience, and productivity of the SPOS, and maintain wildlife habitat qualities and connectivity across the landscape.
8. **Grazing.** Explore and use – when appropriate – managed, restorative grazing practices (and rest periods) as a way to improve grassland health and examine options to develop agricultural uses on the site.
9. **Infrastructure.** Develop basic infrastructure such as space for parking, benches at viewing areas, and community spaces that serve the vision for SPOS.

Management Objective #1 is Holistic & Neighborly management. Management of the SPOS property will need to be done in coordination with activities and conditions on the adjacent properties.

Santa Fe County, Bernalillo County, Sandoval County, and the BLM, as a possible trail head and gateway to landlocked BLM lands to the east of the SPOS. Another purpose was the preservation of cultural resources associated with the historic San Pedro mining settlement and wildlife pathways both of which extend into the larger landscape beyond the SPOS.

Santa Fe County, the BLM, and local stakeholders acknowledge the many connections that SPOS has with the surrounding properties, the San Pedro Mountains, and beyond. The long-term success of the Plan will require coordination and collaboration with adjacent property owners, community stakeholders, BLM, and open space initiatives in Bernalillo County, Sandoval County, and other agencies.

2.2. Monitoring, and Information Management

Monitoring

To ascertain that progress is made toward achieving management goals, County staff together with local community partners will periodically monitor certain indicators of progress (*Table 1*).

Monitoring activities for SPOS include a first tier of five measurements for which baseline data was established during the management planning process; and a second tier consisting of five additional monitoring activities that Santa Fe County staff may conduct as staff time and budget allow. The first tier monitoring activities are numbered and their locations indicated by number on a TMU map (*Figure 6*). Locations for the second tier of monitoring activities will need to be established later.

Based on the monitoring overview described below, and as part of plan implementation, Santa Fe County staff will develop a detailed monitoring plan. A detailed monitoring plan will enable staff and stakeholders to track progress made toward specific goals and objectives. Ideally, the monitoring plan will be updated annually with community members and stakeholders.

A detailed monitoring plan specifies how the indicators will be measured or documented, when and where this will be done, who will do, and what equipment or supplies are needed. Additionally, a detailed monitoring plan will establish or estimate numerical thresholds and conditions that serve to indicate whether corrective action will be needed.

Base-line methods and findings are described in "A Field Characterization for the San Pedro Open Space Property Santa Fe County, New Mexico - An Existing Conditions and Inventory Report" (2016). Methods for additional monitoring activities are in a list of BMPs in the Planners' Guide.



Photo 7. Grasslands, when disturbed, are susceptible to erosion.



Photo 8. An arroyo associated with water management



Photo 9. Typical grass land productivity in 2015.

Monitoring Example

To reduce fire hazard and juniper encroachment on grassland areas, a simple method is to monitor the increase of junipers, dead wood, and brush in grassland areas using GPS data-linked photos on a regular basis. If the monitoring indicates that management activities are not resulting in a reduction of junipers, dead wood and brush in the monitored area, an evaluation can be done to identify the reasons for the impairment (e.g., lack of fire, thinning, grazing, or natural die back) and adjustments made to continue toward the goal of reducing fire hazard and juniper encroachment.

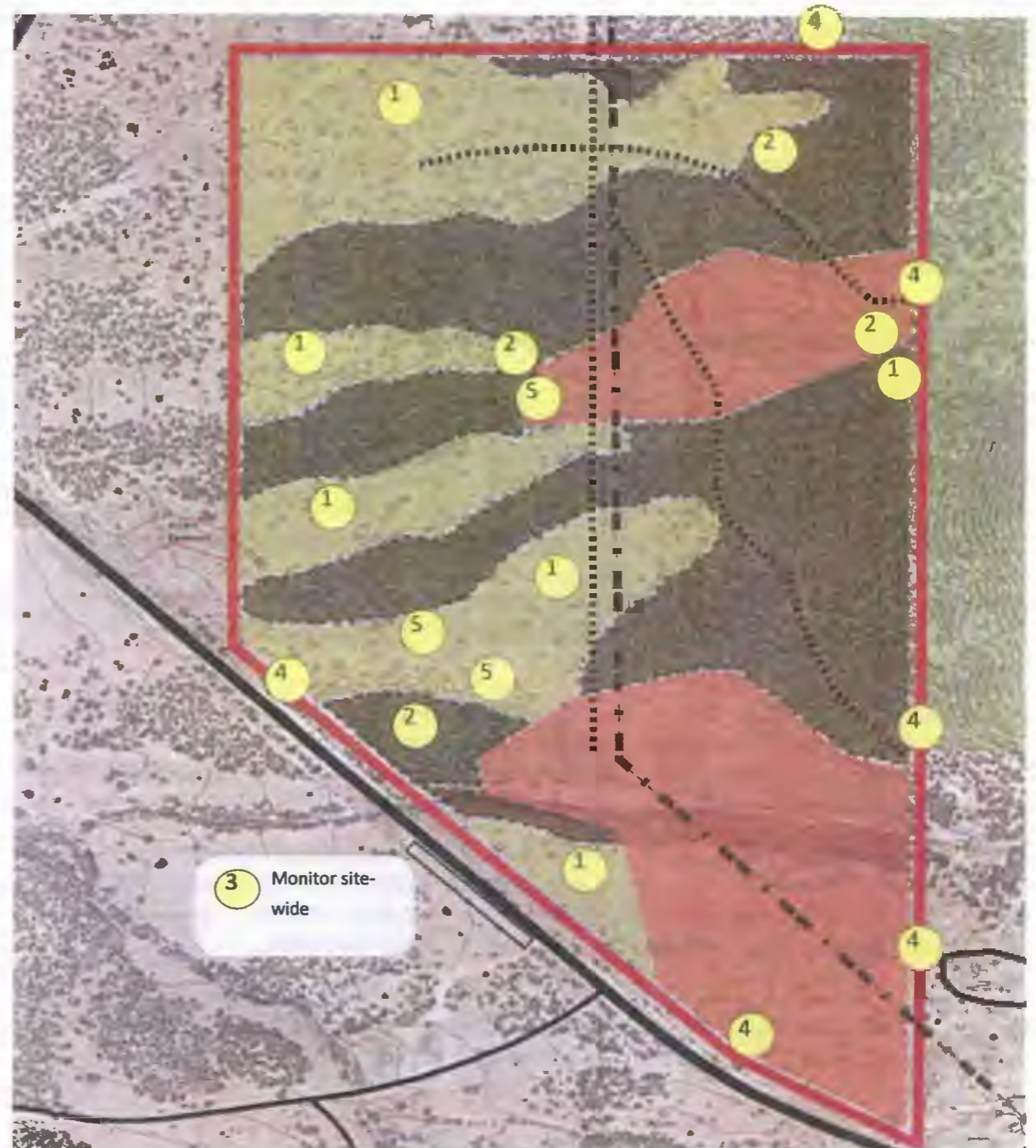


Figure 3. Monitoring Points for San Pedro Open Space

No.	Conditions Monitored	Mgmt. Objectives	Indicators and Monitoring Method	Monitoring Frequency and Season
1	Grassland vegetation cover and richness, and potential forage quality of grasslands	Ecological Health / Grazing	Species richness and plant cover assessments in 10 sample plots along a transect; literature review of forage quality and quantity of plants found in transects	Once in 2-3 years (in the fall)
2	Fuel load of grassland and woodland units	Ecological Health	"Brown's Line" transects for fuel load estimates	Every 3 years in spring or fall
3	Dead & down wood in woodland and grassland units	Ecological Health	Visual observation during walk- through and photo point documentation; tally number of stems	Every 3 years in spring or fall
4	Fence conditions	Access	Visual observation during walk- through and photo point and GPS/Avenza PDF Map of fence conditions for people and wildlife	Annually
5	Erosion and headcut features	Public Safety / Ecological Health	Visual observation during walk- through and photo point and GPS/Avenza PDF Map of erosion features	Annually or at least every 5 years
6	Neighbor and stakeholder stewardship, relations	Holistic & Inclusive	Public participation and initiative; public feedback and expressions of support	Annually
7	Scenic quality	Natural Appearance / Education	Visual observation during walk through and photo point documentation	Annually or at least every 5 years
8	Liability and public safety risks (also in connection with BLM land)	Holistic & Inclusive / Public Safety	Visual observation during walk through and photo point documentation	Quarterly or at least Annually
9	Preservation of cultural resources	Cultural Resources	Visual observation during walk- through and photo point and GPS/Avenza PDF Map any cultural resource disturbances	Annually or at least every 3 years
10	Infrastructure and signage conditions	Infrastructure	Visual observation during walk- through and photo point and GPS/Avenza PDF Map infrastructure damage	Once installed bi-annually or at least annually

Note: The table indicates the minimum suggested monitoring frequency. In some circumstances frequencies may need to be increased if/when staff time and funds allow, or if monitoring activities can be conducted by community volunteers.

Table 1. Monitoring Matrix



2.3. Conceptual Master Plan

The Conceptual Master Plan for San Pedro Open Space (SPOS) describes proposed land improvement projects and associated investments to support the SPOS vision and management goals. The proposed projects result from stakeholder wishes and planning opportunities given the limiting conditions set by the suitability of the land and the need to protect cultural resource of the site. The Conceptual Master Plan describes alternatives for site access, improvements, specific projects, their purposes, priorities, and a suggested timeline for implementation.

Land Use and Development Plan

The SPOS Conceptual Master Plan aims to conserve the site's scenic beauty and integrity, wildlife habitat, and protect its unique historic and cultural resources. The conceptual master plan envisions recreational and interpretive education facilities for a regional trail hub and local recreational uses.

Land conservation is already the de facto land use at SPOS. This plan does not propose any immediate changes to that land use. However, within the context of land conservation, gradual improvements will be made toward planned recreational and interpretive education uses.

The scope, scale and timing of recreational uses and trail development depend on the nature and timing of mine hazards mitigation and cultural resource protection requirements on the adjacent BLM property and the SPOS property. In the short- and mid-term, Santa Fe County will work with stakeholders to plan and establish a few recreational improvements. Short-term recreational improvements may include the construction of a few entry stiles, a natural surface trail, benches, and some interpretive education signage. Santa Fe County will work to conserve cultural resources through careful trail alignment design and review with the State Historic Preservation Office. In the mid-term, steps will be taken to develop a master plan for long-term recreational development, with options varying from regional trail hub facilities to rustic park facilities. Longer-term improvements may include entry gates, parking areas, trails expansion, trail head facilities, and enhanced interpretive education facilities.

Other uses and activities in support of the vision, such as managed grazing and construction of wildlife drinkers and wildlife-friendly fencing, will take place gradually during and after the short-term maintenance and restoration phase. Improvements will in addition focus on grassland health, wildfire prevention, and soil conservation in the grassland units.

Baseline site conditions indicated a need for maintenance of fences, management of juniper encroachment and gully erosion in the grasslands, and a need for dead wood removal in woodland units. Archaeological sites and a few hazardous abandoned mine pits will require additional planning to avoid or mitigate soil disturbance caused by proposed activities in the Cultural Resources TMU (*Figure 6*). All proposed activities that have a potential to disturb soil will need approval from the State Historic Preservation Office.

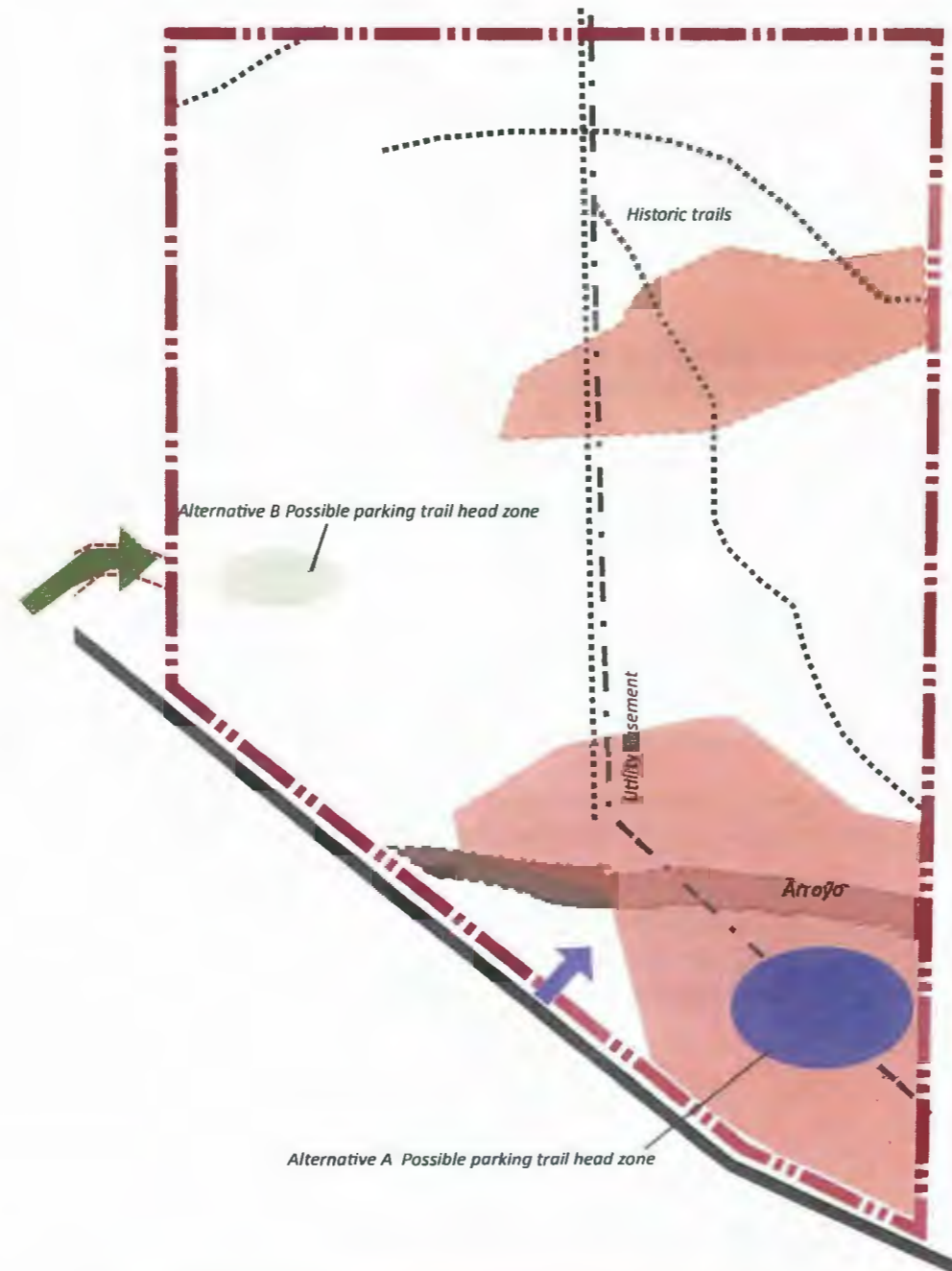


Figure 4. Alternative A - Access at southeastern area and Alternative B- Use off-site easement to the southwest

Possible long-term recreational and access development alternatives identified during this planning process with the community were 1) No Action, 2) Preferred Solution, and 3) Alternative Solution.. The two alternatives to the No Action Alternative were developed in response to cultural resource preservation concerns (Figure 4). Other alternatives may need to be developed during the future planning processes for specific improvements.

No Action Alternative

No Action Alternative has been the default situation since the time of purchase of the SPOS property. This alternative will likely end during the Short Term phase of the Management Plan. Santa Fe County and local stakeholders prefer an action alternative that begins to prepare the property for the development of access, recreational activities, and a proposed regional trailhead.

No Action helps preserve the significant cultural resources of the property and the semi-pristine natural character. However, this alternative would preclude investments in ecological terrain improvements, safety improvements, and signage.

Alternative A: Preferred Solution / Development at the Southeastern Corner

Alternative A is the preferred option and will be developed first for review and approval by the State Historic Preservation Office. If this alternative is met with serious cultural resource protection concerns that delay implementation, seriously limit development options, or significantly increase implementation costs, Alternative B will be explored.

Description. Alternative A includes an entrance point to the north into the property across from the eastern end of the pullout strip along the south side of State Road 344. The proposed access road would loop eastward up the hill out of sight from State Road 344, offering parking opportunities on higher ground, and avoiding sheet flow and viewshed impacts on the lower part of the slopes. From there, a trailhead area would be developed on solid terrain south of a large arroyo that crosses the SPOS from east to west. A trail would run at a suitable point across the arroyo to give access to connections for trails northward on the SPOS and potentially eastward onto BLM land.

Advantages of this alternative are that the improvements are all on solid, mostly gravelly and rocky, substrate with minimal needs for drainage management and erosion control features. This alternative would also offer the least total square footage of ground disturbance for the improvements, have the least impacts on the area's predominant views to the west, and connect best to existing historical trail alignments and to future trails on BLM land.

Disadvantages of this alternative are that the improvements will take place on one or more recorded cultural resource sites, and that the potential impacts of the improvements will need to be evaluated and cleared with the State Historic Preservation Office. This may constitute a costly and time-consuming, iterative planning process. Additionally, this alternative would require a well-designed trail crossing across the large arroyo that dominates the southern part of the SPOS property.

Alternative B: Alternate Solution / Development Using Southwestern Easement

Description. Alternative B includes an entrance point on the southwest side of the property via an existing access easement from State Road 344 across private property located on the west side of the SPOS. The proposed access road within the easement would curve eastward across the lower end of a grassland swale and end at the western tip of a woodland area on gravelly soils. Parking and a trailhead area would be developed in the woodland strip, and cars would be partly concealed from view by the remaining juniper and piñon trees. Trails would run eastward through the woodland strip and northeast through the grasslands to such points on the eastern part of the SPOS property that would allow trail connections to existing old trail alignments that run northward on the SPOS and trail connections onto BLM land to the east.

Advantages of this alternative are that it largely avoids the cultural resource sites and would be able to proceed with fewer regulatory oversight procedures. Much of the improvements would be on solid gravelly soil with limited needs for any drainage and erosion control features. There would also not be a need to construct an arroyo crossing for the main trail into the SPOS.

Disadvantages of this alternative include that road construction within the access easement would need to be supported with engineered drainage and erosion control features, because the access road would cross a wide, grassy drainage swale that is expected to carry considerable sheet flow after rain storms. This alternative would require a greater square footage of soil disturbance and a longer total trail length to be built to reach connection points to trails going north and east on BLM land. The alternative would also involve greater impacts of the predominant views to the west from higher vantage points on the eastern parts of the property.

Other implementation-level alternatives will occur in relation to choices regarding locations of improvements, the use of materials, and the selection of implementation techniques for specific projects. Review and selection of alternatives for individual projects will be addressed during the Detailed Master Plan phase and the design process for each project.



Key Planning and Research

Every proposed projects requires planning and research beforehand, so that projects are well conceived, funded and implemented. Because planning and research is critical to achieve this plan, the following are key planning and research activities that are recommended.

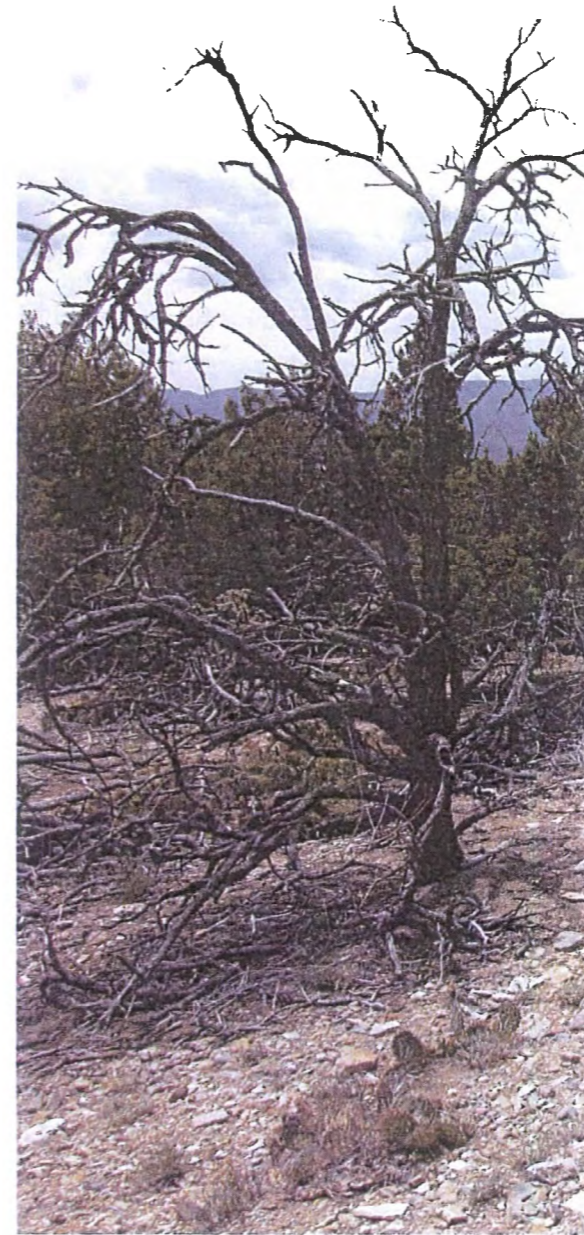
Short-Term Planning and Research

1. Develop protocols for communication and verification about maintenance and land restoration work, mapping, monitoring, and team coordination.
2. Develop and implement a monitoring plan to develop base-line data for all scheduled activities and associated terrain conditions.
3. Develop a basic signage plan with signs for boundary marking and/or acknowledgement of the SPOS and acknowledgement of any relevant access easement, along with a bulletin board that will serve to post flyers and announcements; it will be useful if signage address public safety rules, leave-no-trace principles, and Santa Fe County contact information; signage design that has a natural appearance and is simple and unobtrusive will best meet the vision for the SPOS.
4. Identify hazardous mine sites.
5. Select appropriate methods to protect the cultural resource sites.
6. Plan a community stewardship structure and specific stewardship events.
7. Research and plan a construction project for water harvesting-based wildlife drinkers.
8. Develop a grassland management plan, including removal of encroached juniper and brush, wildfire prevention, weed management, and developing, testing and evaluating a restorative grazing pilot program.

9. Develop a woodland management plan based on rotational woodland treatment over a 20-year rotation period.
10. Plan an erosion control project including arroyo bank stabilization and headcut stabilization at various locations.
11. Plan fence upgrades and property fencing projects.
12. Plan the implementation of preliminary, small-scale trail development.
13. Identify funding and financing of all identified projects.

Mid- and Long-term Planning and Research

14. Guide ongoing development of the community stewardship structure.
15. Develop educational and research opportunities.
16. Plan Recreational and Regional Trail Hub Master Plan for the future use of the SPOS.
17. Plan a comprehensive interpretive education program for the SPOS.
18. Plan the implementation of the Recreational and Regional Trail Hub Master Plan.



The Concept Master Plan proposes projects and activities as listed below and as generally shown in *Figure 5* on this page and the next.

The proposed projects are prioritized based on prioritization criteria outlined in the Planners' Guide.

Prioritization and phasing of projects and activities for SPOS are also based on the assessment of terrain conditions in early 2016, protection of archaeological resources, and mitigation of abandoned mine hazards.

Short-term

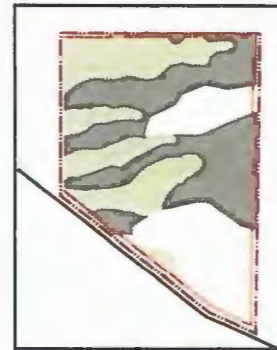
- Activities focus on land restoration, maintenance, and the improvement of wildlife habitat to address conditions caused by deferred maintenance
- Install site signs and bulletin board
- Research and planning activities for longer-term land health improvements and the implementation of projects in support of recreational development.

Mid-term

- Fence improvements.
- Grassland and woodland restoration activities, including possibly the introduction of managed, restorative grazing practices.
- Possible construction of a simple, natural surface trail loop within the SPOS property, using the historical trail alignments as much as possible.

SHORT TERM

MAINTENANCE



ANNUAL / BIENNIAL

- Initiate tree removal in grassland areas
Begin in 15 to 20 acre sections
Continue annually across site
- Initiate woodland thinning dead wood clearing
Begin in approx. 5 acre sections
Continue annually across site
Spread dead wood as bare soil cover, surface erosion control
- Maintain and repair fencing

IMPROVEMENTS



FENCING IMPROVEMENTS

- Close gaps in fencing on east side
- Upgrade overall perimeter fence



WILDLIFE IMPROVEMENTS

- Wildlife friendly fencing
- Wildlife drinkers

EROSION CONTROL

- Headcut stabilization
- Arroyo bank stabilization

PLANNING

HABITAT MANAGEMENT PLANNING

- Develop woodland management plan
Rotational plan (15 to 20 year cycle)
Treatment scale (4 to 5 acres per year)
- Study and plan restorative grazing program
Design program
Conduct test
Evaluate results

EROSION CONTROL PLANNING

- Plan and design headcut and arroyo stabilization

INTERPRETIVE PLANNING

- Research and design interpretive plan

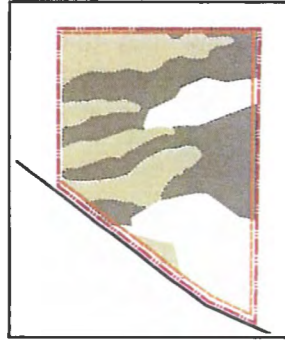
COMMUNITY STEWARDSHIP

- Organize community stewardship group
- Community maintenance events
Wildlife improvements

COUNTY-BLM-SHPO COORDINATION

- Coordination with BLM and SHPO needed
- Begin plans when appropriate for
Hazard mitigation
Cultural resource protection
Public access of site
Trails and connectivity

MID TERM - LONG TERM

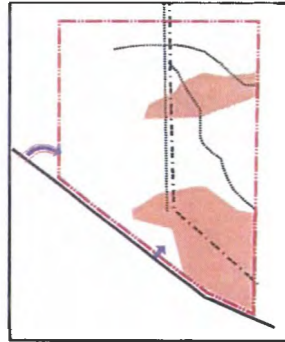


ANNUAL / BIANNUAL CONTINUED

- Continue rotational grassland tree removal program
- Continue rotational woodland thinning, dead wood management
- Continue fence maintenance and repair

RESTORATIVE GRAZING MANAGEMENT

- Implement restorative grazing program in cleared grasslands
- Manage as per restorative grazing plan



CONTINUED IMPROVEMENT OPPORTUNITIES

- Install fencing if needed for restorative grazing plan
- Interpretive and signage improvements

COORDINATED IMPROVEMENTS

- Cultural resources protection
- Hazard protection
- Trails improvements
- Access improvements

TRAIL + SITE PLANNING

- Create master trails and site plan
- Fund trails and site projects (in phases)
- Implement trails and site projects (in phases)

COMMUNITY STEWARDSHIP

- Strengthen community stewardship group
- Continue community events
- Develop educational and research opportunities

INTERPRETIVE PLANNING

- Fund interpretive projects (in phases)
- Implement interpretive projects (in phases)

Long-term

- Ongoing annual grassland and woodland restoration activities.
- Master plan components, such as the possible development of facilities for a regional trail hub, including connections to trails on BLM land.
- Installation of interpretive education signage.

Planning and preparation is required for all improvements proposed. Implementation of improvements will be based on maintenance and repair activities and schedules.

Community involvement is essential for the maintenance, improvement and planning for SPOS. Public involvement may include feedback on proposed project details during future planning and design sessions; active engagement in the planning and implementation of projects; and on-going maintenance of the site. Several maintenance activities will be suitable for community or volunteer participation, which will facilitate community stewardship for open space care and maintenance.

Figure 5. Maintenance/Improvement/Planning Diagram

Santa Fe County intends to include and involve a diverse group of community stakeholders in volunteer stewardship activities at the San Pedro Open Space.

These groups would include:

- o Immediate neighbors and members of the San Pedro Neighborhood Association
- o Local youth, Boy Scouts, area schools and their students (e.g., East Mountain High School or San Antonio Elementary School in Sandoval County)
- o Camp Oro Quay
- o The East Mountain Regional Trails Council
- o The Turquoise Trail Preservation Trust
- o The Turquoise Trail Regional Alliance
- o Equestrian groups in the area
- o Local livestock owners
- o Local mining and prospecting groups and individuals
- o Native American communities, such as Santa Ana Pueblo and San Felipe Pueblo
- o Regional conservation groups, hiking and outdoor organizations, and other similar entities that are interested in SPOS.

2.4. Community Relations

Santa Fe County intends to develop and maintain productive, neighborly and collaborative relations with the San Pedro community and other stakeholders as a critical activity in the implementation of the SPOS Management Plan.

Information Exchange

Santa Fe County plans to expand and develop several methods for information exchange with community members and stakeholders.

Signage

Santa Fe County will install simple signage to identify the San Pedro Open Space property. Signage will inform the public about safety aspects, leave-no-trace principles, suggestions for general care and stewardship behavior, and contact information for Santa Fe County. Santa Fe County will install safety signage, flagging, and/or fencing to keep people and pets away from hazardous mine sites and develop ways to protect sensitive cultural resource sites. Boundary markers will be installed for maintenance and access control. A bulletin board will be placed on the SPOS property along State Road 344 for public notices, such as specific events, meetings, and terrain management activities.

Website

Santa Fe County will maintain the website pages dedicated to the County Open Space & Trails program. The website may be expanded with a specific webpage describing the SPOS landscape and history, management plan information and activities, and planned events at the SPOS.

Community Contact

Santa Fe County will work with the community to identify a communication structure with community members who are available to field comments and questions and contact County staff for follow-up actions. Communication may address signage, cultural resource management and site protection, public safety measures, grassland management, wildfire prevention, and collaboration on fencing and wood removal projects, among other initiatives, especially in the initial phase of plan implementation.

Education, Coordination and Collaboration

Santa Fe County and community members understand that it is important to cultivate educational and research activities at SPOS to raise awareness about the area's unique mining history, cultural resources, and ecology and to mobilize support for future stewardship. Santa Fe County and community members encourage youth engagement and will include school groups in educational activities and site maintenance.

A significant portion of the community relations will revolve around maintenance of the open space property, both to announce maintenance work done by Santa Fe County and its contractors, and to plan and coordinate maintenance work done in collaboration with community members. All maintenance and restoration activities will be reviewed with affected neighbors and stakeholders prior to implementation, or discussed and coordinated in community meetings.

Maintenance activities that are suitable for groups of volunteer stewards include:

- Maintenance of stiles, fence repair and fence adjustments for wildlife,
- Removal of dead wood and woody debris in grasslands,
- Trail maintenance, drainage management, and erosion control around old and new trails (if/when established).

Maintenance activities can provide benefits for the community. Such benefits may include the distribution of dead wood as firewood to community members and sharing of information about cultural resources or wildlife in the area.





Collaboration on maintenance activities will be most effective by organizing community partners around specific, tangible projects to foster communication and trust, and generate additional objectives, priorities, and creative new ideas for problem solving. The following topics are of interest in the community and may serve as pilot projects for implementation of this plan:

- Fencing upgrades for wildlife and construction of stiles to access the property
- Wildlife habitat conservation,
- Wood harvesting,
- Trail building and stewardship,
- Interpretive education programming, including recording oral history narratives,
- Public and youth education.

A more detailed list for community involvement is included in Section 2.6 about short-term implementation activities.

2.5. Terrain Management

For purposes of maintenance and land use suitability, the SPOS Management Plan identifies several **Terrain Management Units (TMUs)** (*Figure 2*). Each TMU encompasses an area with similar landscape features, maintenance requirements, and land suitability characteristics (i.e., opportunities for land use). The dominant terrain types are grasslands and pinon-juniper woodlands. The TMUs organize the spatial management aspects of this plan.

Terrain management activities are described in detail in a separate Maintenance Plan for SPOS. The following sections summarize terrain management in the context of the SPOS Management Plan. The proposed terrain management activities also reference specific Best Management Practices (BMPs), which are described in the Planners' Guide.

Maintenance and Restoration Plan Summary

Terrain management includes land restoration, maintenance, and community stewardship. Terrain management activities are specific for each different Terrain Management Unit (TMU). Each TMU requires a discrete set of management activities to maintain their ecological functions as part of the central management goal for the SPOS.

An overview of terrain management activities is included in *Table 2*. A comprehensive Maintenance Plan for SPOS is included in *APPENDIX D*. Detailed lists of terrain management activities in Year-1 are included in *APPENDIX E*. The County will face challenges to finance all the maintenance needs that will arise in the future. Strategies that can be useful to optimize maintenance dollars and effort, include:

- Collaborate with adjacent properties, agencies and community stewards to leverage working together to address maintenance needs;
- Invest smaller consistent amounts of time and labor in well-planned maintenance activities;
- Conduct maintenance activities at the optimum time based on monitoring information or a regular schedule.



TERRAIN MANAGEMENT UNITS

LEGEND

-  SP-GRA-P GRASSLAND-PASTURE UNIT
relatively dry, high-quality pasture, valley bottomlands
-  SP-WOO WOODLAND UNIT
higher, rugged upland areas with piñon-juniper vegetation
-  SP-CUL CULTURAL LANDSCAPE UNIT
areas highly altered by historical land use (mining, habitation, grazing, etc.) requires close collaboration with BLM, AML and SHIPO to manage these units
-  SP-ARR ARROYOS UNIT
arroyo channels and arroyo banks
-  UTILITY EASEMENT
-  PATHS - EXISTING
-  PROPERTY BOUNDARY
-  OFF-SITE PARKING



Figure 6. San Pedro Open Space - Terrain Management Units Map

Where	What	Why	When
TMU	Anticipated Regular Maintenance Activities	Objective	Maintenance Frequency*
All TMUs	Communication and outreach with neighbors and stakeholders and integrate feedback in planning	Holistic & Inclusive	Annually
All TMUs	Inspect property boundary markers	Public Safety	One time (year-1) and when needed
All TMUs	Inspect and repair:	Public Safety / Access / Education / Infrastructure	a. Annually
	a. Fences, gates and stiles		b. Annually
	b. Roads and trails		c. Annually
	c. Signage		d. Annually
	d. Benches and trash cans		e. Annually
	e. Drainage crossings		
All TMUs	a. Change fencing to be wildlife friendly	Ecological Health	a. Year 1 and annual inspection
SP-CUL	a. Maintain signage	Education / Cultural Resources	a. Annually
SP-GRA-P	a. Thin juniper that encroached on grassland, spread branches to cover soil, limit erosion, protect artifacts	Ecological Health	a. Years 1+2; and then once in 10 years
SP-GRA-P	a. Thin juniper and pinon encroaching on grassland	Ecological Health	a. Annually (14 ac/yr)
	b. Spread branches to cover soil and reduce erosion		b. Annually (14 ac/yr)
	c. Check and remove any noxious weeds		c. Annually
	d. Headcut stabilization and erosion control in rills		d. When needed (after year 2)
SP-GRA-P	a. Inspect and repair fences	Ecological Health / Grazing	a. Annually
	b. Develop and manage restorative, managed grazing (limited acreage/year)		b. Annually (after year 3)
	c. Deliberately rest selected acres		c. Annually
SP-WOO	a. Remove dead and leaning trees	Cultural Resources / Ecological Health	a. Every 5 years
	b. Thin trees and spread branches (lop & scatter) to cover soil against erosion and to protect artifacts		b. Annually: 5 ac/y (esp. in first 5 y)
SP-WOO	a. Thin woodlands based on stewardship plan	Ecological Health	a. Annually (5 ac/yr) (20-yr rotations)
	b. Spread branches to cover soil and reduce erosion		b. Annually (5 ac/yr) (20-yr rotations)
SP-ARR	a. Inspect and remove brush that inhibits flow and causes bank erosion	Ecological Health	a. Annually
	b. Erosion control and bank stabilization		b. When needed (once in 5 y)

Table 2. Terrain Management Units- Maintenance Activities



2.6. Plan Implementation and Financing Mechanisms

Plan implementation will start by identifying priorities and timelines among staff for activities regarding maintenance, planning and project preparation, community outreach, and community stewardship involvement. Prioritization will be based on balancing the recommended tasks at hand, and the staff and funds available to accomplish the tasks.

First Year Implementation

Implementation of this plan will start upon approval of the plan by the County. Recommended Year-1 implementation activities include:

1. Periodic community meetings to explain and work through the planned implementation activities with an emphasis on:
 - b. Clarification regarding protection of cultural resource sites, rehabilitation and public safety around abandoned mine sites on SPOS and BLM lands and an update on timelines;
 - c. Terrain inspections, base-line data collection, priority maintenance activities, and planning activities for a few, short-term key projects for community activities, repairs and improvements;
 - d. Identifying community interest and capacity to assist with the planned activities.;
 - e. Developing as specific as possible, outlines and timelines for collaborative community activities between Santa Fe County and neighbors and other local stakeholders.;
 - f. Coordinating specific community involvement with the selected projects;
 - g. Evaluating at the end of Plan Year-1, the outcome of Year-1 activities and establishing priorities for Year-2.
2. Implementation of selected terrain inspections, base-line data collection for future monitoring, maintenance activities by County staff and with neighbors and local volunteers. Inspections, data gathering and priority maintenance will include:
 - h. Fencing of hazardous mine sites;
 - i. Inspecting conditions of cultural resource sites;
 - j. Inspecting and repairing exterior fence conditions;
 - k. Removing dead wood, dead brush, and live and dead junipers in the grasslands;
 - l. Inspecting arroyo banks to assess whether ongoing erosion and woody debris in arroyos could lead to more bank erosion

Organizing to implement priority projects and community activities (“Things people can do”), which may include:

- a. Enlarging the group of interested people and involving more youth;
 - b. Development and placement of sign, a bulletin board and marking cultural resource areas;
 - c. Counting animals to support fence repair and readjustments;
 - d. Identifying feasible entry points and future trail alignments;
 - e. Juniper cutting and removal dead wood removal in grasslands;
 - f. Installation of wildlife drinkers and their water-harvesting systems;
 - g. Collecting stories and historical information for future interpretive education programming;
 - h. Collecting botanical and ecological information for future interpretive education programming.
4. Research and planning activities for the preparation of larger initiatives that are planned to be implemented at a later date, including:
- a. Development of protocols and methods of information management, staff development, and coordination;
 - b. Development of a interpretive education signage plan, site specific signs; public outreach and communication strategies;
 - c. Grassland management planning and the development of a managed, restorative grazing program;
 - d. Development of a woodland stewardship program;
 - e. Planning for headcut stabilization;
 - f. Interpretive education planning;
 - g. Evaluation of the Short-Term phase and adaptive planning for subsequent years.





Financing Mechanisms, Funding Sources, and Partners

Santa Fe County owns and manages more than 6,600 acres of open space properties and park areas, but it has insufficient funding and staff resources to meet the acquisition and management goals for the properties. Santa Fe County will be able to implement this plan and other property, if it successfully continues to develop new funding mechanisms, identify new funding sources, and cultivate collaborative relationships with neighbors, local stakeholders, and other interest groups.

To implement this plan, Santa Fe County will include neighbors, stakeholders and other partners for monitoring, planning, and implementation of specific projects. This collaborative approach will help build neighborly relationships and increase buy-in from and stewardship by the people with the greatest interest in the property and it will reduce the need for outside funding for property management.

Santa Fe County will pursue funding sources and explore creative funding mechanisms to ensure the financial viability of managing the SPOS according to the recommendations of this management plan. Potential funding sources and funding mechanisms are outlined in *Table 3*.

POTENTIAL FUNDING SOURCES	PURPOSE	ACQUISITION TIME FRAME
General Fund (Santa Fe County)	Staff costs	Annual budgeting process
Grants	Staff and consultants for various tasks, such as:	Dependent on funding source timelines
	Fencing	
	Signs, bulletin board	
	Managed grazing	
	Monitoring program	
	Arroyo banks and headcut stabilization	
	Wildlife drinkers and water harvesting systems	
	Trail and recreational development	
	Mine rehabilitation and protection work	
	Cultural resource protection	
	Interpretive education research and implementation	
Wildfire prevention: grassland and woodland thinning		
CIP funds	For all the above	Annual budgeting process
FFS (Fee for Service)	Grazing contract	On a contract basis
Hiring a grant writer for OS funding	Pursue more grant funding	Short-term
Cultivating community stewards	Delegating word to local community stakeholders	Short-mid term
Organizing social/cultural (fund raising) events with non-profit partners	Generating discretionary income and public outreach	Mid-long term
Establishing a "Friends of SPOS" group	Generating discretionary income and public outreach	Mid-long term
Collaboration with non-profit entities for co-management activities	Sharing the burden with organized stakeholders	Mid-long term
Voter-approved Revenue Initiatives	Providing a dedicated annual revenue stream for OS, Parks and Trails	Long-term
Establishing an NGO for overarching support to OS property management	Sharing the burden with organized stakeholders	Long-term

Table 3. Potential Funding Sources and Mechanisms



SAN PEDRO OPEN SPACE APPENDICES (separate document)

APPENDIX A: Overview of Management Activities for San Pedro Open Space

APPENDIX B: A Field Characterization for the San Pedro Open Space Property Santa Fe County, New Mexico - An Existing Conditions and Inventory Report

APPENDIX C: Abstract Of An Archaeological Survey Of 160.8-Acre San Pedro Open Space Santa Fe County, New Mexico

APPENDIX D: Maintenance Plan for San Pedro Open Space

APPENDIX E: Maintenance, Stewardship, and Restoration Projects for Year-1



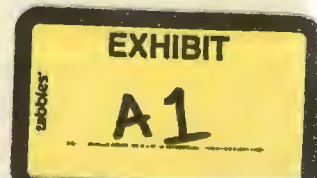


SANTA FE COUNTY OPEN SPACE AND TRAILS PROGRAM
SAN PEDRO OPEN SPACE MANAGEMENT PLAN

APPENDICIES
FINAL DRAFT
SEPTEMBER 13, 2016



Ecotone



SAN PEDRO OPEN SPACE APPENDICES (separate document)

APPENDIX A: Overview of Management Activities for San Pedro Open Space

APPENDIX B: A Field Characterization for the San Pedro Open Space Property Santa Fe County, New Mexico - An Existing Conditions and Inventory Report

APPENDIX C: Abstract Of An Archaeological Survey Of 160.8-Acre San Pedro Open Space Santa Fe County, New Mexico

APPENDIX D: Maintenance Plan for San Pedro Open Space

APPENDIX E: Maintenance, Stewardship, and Restoration Projects for Year-1



APPENDIX A: OVERVIEW OF
MANAGEMENT ACTIVITIES

SFC CLERK RECORDED 10/12/2016

	# (Term and Priority)	Project or Management Activity	Objective or Purpose	Location Code	Actor	Timeline	Recurring (R) or Not Recurring (NR)		Labor and Cost Estimates	Funding Source
MAINTENANCE	1.1	Communication & outreach with neighbors and stakeholders; integrate feedback in planning	Holistic & Inclusive Management	Entire property	SFC-M (Crew) and Planning staff	ST-MT-LT	R		Annually (or more often)	GF
	1.2	Inspection and repair of fences and boundary markers	Public Safety / Access Management / Cultural Resource Protection	N, E, and S sides only: approx. 7,500 lf (1.44 miles)	SFC-M (Crew)	ST-MT-LT	R		Annually: 3 days for 2-person crew (48 h/y)	GF
	1.3	Fence closures on East side	Public Safety / Access Management	3 or 4 openings on east boundary: 20-25 lf	SFC-M (Crew) or volunteers	ST	NR		One-time investment in posts and wire: possibly around \$500 in material and 2 days for 2-person crew (32 h)	GF
	1.4	Fence adjustments for wildlife	Ecological Health	Entire property (N, E, and S sides only): approx. 7,500 lf (1.44 miles)	Contractor or SFC-M (Crew)	ST	NR		5 days for 2-person crew (80 h); Costs TBD: Based on proposal (one-time investment); possibly around \$5,000 depending on material and labor costs and special features	GF, CIP
	1.5	Thinning out juniper and other shrubs that have encroached into grassland; and spreading branches for soil cover and erosion control	Ecological Health	SP-GRA-P	SF County Fire Crew	ST-MT-LT	R		3-5 days/year for 1 sawyer and a swamper (80 h/y)	GF, CIP, grant
	1.6	Cutting and removal of shrubs that have overgrown grassland in central-northeastern area alongside cultural site	Ecological Health	SP-CUL	SF County Fire Crew	ST	NR		3 days for 1 sawyer and a swamper (48 h)	GF, CIP, grant
	1.7	Annual woodland thinning, based on stewardship plan: cutting and removal of dead, dying, leaning, and low-vigor trees; and spreading branches for soil cover and erosion control	Ecological Health	SP-WOO	SF County Fire Crew	ST-MT-LT	R		5 days/year for one sawyer and one swamper (80 h/y)	GF, CIP, grant
	1.8	Inspection of arroyo banks for woody debris and bank erosion	Public Safety / Ecological Health	SP-ARR	SFC-M (Crew)	ST-MT-LT	R		0.5 days/year, annually (4 h/y)	GF
	1.9	Headcut stabilization and erosion control	Public Safety / Ecological Health	SP-GRA-P, SP-ARR (4 or 5 locations)	Contractor or SFC-M (Crew)	ST	NR		After year-2, based on cost proposal (probably up to \$50,000)	CIP or GF

# (Term and Priority)	Project or Management Activity	Objective or Purpose	Location Code	Actor	Timeline	Recurring (R) or Not Recurring (NR)	Labor and Cost Estimates	Funding Source	
1.10	Managed grazing (oversight)	Ecological Health / Grazing	SP-GRA-P	Contractor	ST-MT-LT	R	Annually in the first 3-5 years; after that every 5 years (approx. up to \$5,000/y)	CIP	
1.11	Inspection of roads, trails, stiles, signage, benches, trash cans, etc.	Education / Infrastructure Effectiveness	Entire property	Contractor or SFC-M (Crew)	ST-MT-LT	R	Once trails and signs are installed (approx. up to \$5,000/y)	CIP or GF	
1.12	Weed management	Ecological Health	SP-GRA-P	Contractor	ST-MT-LT	R	When necessary, based on cost proposal	CIP	
2.1	Bank erosion stabilization	Public Safety / Ecological Health	SP-ARR	SFC-M (Crew) or contractor	MT	R	When necessary, based on cost proposal	GF or CIP	
IMPROVEMENTS	1.1	Placement of boundary markers, property recognition signs, and a bulletin board	Education (identification of SPOS as open space property)	On property boundary along SR 344	SFC-M (Crew) or contractor	ST	NR	TBD, based on plan and bid	GF or CIP, grant
	1.2	Fencing of hazardous mine pits	Public Safety / Cultural Resource Protection	Selected priority mine pits	SFC-M (Crew) or contractor, AML	ST	NR	TBD, based on plan and bid	GF or CIP, grant
	1.3	Fence upgrades, incl. closure of gaps on east boundary and perimeter fence improvements	Public Safety / Access Management / Ecological Health / Grazing	Around entire property	SFC-M (Crew) or contractor	ST	NR	TBD, based on plan and bid	GF or CIP
	1.4	Water harvesting and wildlife drinkers	Ecological Health (wildlife roaming)	SP-WOO: (woodland edges)	SFC-M (Crew) or contractor	ST-MT	NR	TBD, based on plan and bid	GF or CIP, grant
	1.5	Large headcut and arroyo bank stabilization (large projects that SFC-M crew cannot do)	Public Safety / Ecological Health / Cultural Resource Preservation	Selected areas: SF- GRA-P, SP-ARR, SP-CUL	Contractor	ST-MT	NR	TBD, based on plan and bid	CIP, grant
	2.1	Fence upgrades for managed grazing	Ecological Health / Grazing (grassland improvement)	SP-GRA-P	SFC-M (Crew) or contractor	MT	NR	TBD, based on plan and bid	GF or CIP, grant
	2.2	Simple trail loop development, including stiles and benches	Access Management / Education / Infrastructure	Selected locations and mostly on established old trail alignments in SP-WOO	SFC-M (Crew) or contractor	MT	NR	TBD, based on plan and bid	GF or CIP, grant
	2.3	Mine site protection and rehabilitation	Public Safety / Cultural Resource Protection	Entire property	AML, contractor	MT	NR	TBD, based on plan and bid	CIP, grant
	2.4	Cultural resource protection measures	Cultural Resource Protection	Entire property	Contractor	MT	NR	TBD, based on plan and bid	CIP, grant

# (Term and Priority)	Project or Management Activity	Objective or Purpose	Location Code	Actor	Timeline	Recurring (R) or Not Recurring (NR)	Labor and Cost Estimates	Funding Source	
3.1	Installation of interpretive education signs	Education (public awareness, understanding, appreciation, care)	Selected locations	Contractor	LT	NR (or phased)	TBD, based on plan and bid	CIP, grant	
3.2	Development of trail hub facilities, including parking, gates, trails, signage	Access Management / Education / Infrastructure (regional trail hub and local recreational opportunities)	Selected locations	Contractor	LT	NR (or phased)	TBD, based on plan and bid	CIP, grant	
PLANNING	1.1	Develop and implement protocols for maintenance work, team coordination, on-going fund identification acquisition	All management goals (effective management)	Entire property	Planning staff	ST-MT-LT	R	TBD (25 h/y)	GF
	1.2	Develop monitoring plan and collection of base-line data	All management goals (effective management)	Entire property	Planning staff	ST	NR	TBD (80 h/y)	GF
	1.3	Develop basic signage plan	Education	Entire property	Planning & Projects staff	ST	NR	TBD (30 h/y)	GF
	1.4	Plan fencing for hazardous mine sites and protection for cultural resource sites	Public Safety / Cultural Resource Protection	SP-CUL	Planning & Projects staff	ST	NR	TBD (30 h/y)	GF
	1.5	Plan and implement community stewardship structure and events	Holistic & Inclusive Management	Entire property	Planning & Community Services staff	ST-MT-LT	R	TBD (250 h/y)	GF
	1.6	Research and plan water harvesting techniques, wildlife drinkers	Ecological Health	SP-WOO	Planning & Projects staff	ST	NR	TBD (30 h/y)	GF
	1.7	Develop grassland management plan (including fencing, weed control, juniper management, managed grazing, and revegetation)	Ecological Health / Grazing	SP-GRA-P	Planning & Projects staff	ST	NR	TBD (40 h/y)	GF
	1.8	Develop woodland stewardship plan (20-year rotation)	Ecological Health	SP-WOO	Planning & Projects staff	ST	NR	TBD (30 p/y)	GF
	1.9	Launch managed grazing pilot program	Ecological Health / Grazing	SP-GRA-P	Planning & Projects staff	ST	NR	TBD (20 h/y)	GF

# (Term and Priority)	Project or Management Activity	Objective or Purpose	Location Code	Actor	Timeline	Recurring (R) or Not Recurring (NR)	Labor and Cost Estimates	Funding Source	
	1.10	Plan and design headcut stabilization and arroyo bank erosion control	Public Safety / Ecological Health / Cultural Resource Preservation	SP-GRA-P, SP-ARR, SP-CUL	Planning & Projects staff	ST	NR	TBD (20 h/y)	GF
	1.11	Plan fence upgrades and property fencing for phase-2	Public Safety / Ecological Health / Grazing	Entire property	Planning & Projects staff	ST	NR	TBD (20 h/y)	GF
	1.12	Plan preliminary trail alignment (coordinate w/cultural resource review)	Access Management / Cultural Resource Protection	Selected areas: SP-WOO, SP-CUL, SP-GRA-P	Planning & Projects staff	ST	NR	TBD (20 h/y)	GF
	1.13	Oversee managed grazing program	Grazing	SP-GRA-P	Planning & Projects staff	ST-MT-LT	R	TBD (40 h/y)	GF
PLANNING	2.1	Develop interpretive education program with educational and research opportunities	Education	Entire property	Planning staff	MT	NR	TBD (40 h/y)	GF
	2.2	Update and manage grazing program	Grazing	SP-GRA-P	Planning staff	MT	NR	TBD (40 h/y)	GF
	2.3	Guide and coordinate headcut stabilization, erosion control work on the grasslands	Public Safety / Ecological Health	SP-GRA-P	Projects staff	MT	NR	TBD (20 h/y)	GF
	2.4	Oversee ongoing woodland thinning and removal of trees encroaching on the grasslands	Public Safety / Ecological Health	SP-GRA-P	Planning & Projects staff	MT-LT	R	TBD (40 h/y)	GF
	2.5	Coordinate (for SF County) the mine sites rehabilitation and protection program	Public Safety / Cultural Resource Protection	SP-CUL	Planning & Projects staff	MT	NR	TBD (20 h/y)	GF
	2.6	Plan and lead trail hub and Recreation Master Plan process; incl. funding for plan, design, implementation	Access Management / Education / Infrastructure	Entire property	Planning staff	MT	NR	TBD (160 h/y)	GF
	2.7	Coordinate implementation of pilot project of initial trails	Access Management / Education / Infrastructure	Entire property	Projects staff	MT	NR	TBD (80 h/y)	GF
	3.1	Guide implementation of phase-1 interpretive education program	Education	Entire property	Planning & Projects staff	LT	NR	TBD (80 h/y)	GF
	3.2	Guide the implementation of phase-1 Trail Hub and Recreation Master Plan, incl. parking, trails, signage, etc.	Education	Entire property	Planning & Projects staff	LT	NR	TBD (160 h/y)	GF

**APPENDIX B: EXISTING CONDITIONS
AND INVENTORY REPORT**

SFC CLERK RECORDED 10/12/2016

Santa Fe County Open Space Management Planning Initiative

Field Characterizations for the San Pedro Open Space Property
Santa Fe County, New Mexico

An Existing Conditions and Inventory Report

February 19, 2016



View south from northern grasslands across the full length of the San Pedro Open Space

Ecotone

Conservation Planning for Landscapes in Transition

1413 Second Street, Suite 5
Santa Fe, New Mexico 87505
505-470-2531
jwjansens@gmail.com

Table of Contents

INTRODUCTION	3
Research Topics and Methods	3
FINDINGS OF EXISTING CONDITIONS: SAN PEDRO OPEN SPACE – SAN PEDRO	4
Scope of Research	4
Summary of Findings, Conclusions and Recommendations	4
Coordination with Resource Management Agencies	4
Access and Parking Opportunities	6
Woodland, Grassland and Wildlife Conditions	8
KEY ASSESSMENT PROJECTS	21
APPENDIX A – ALL OPEN SPACE PROPERTIES: LAND SUITABILITY GOALS	22

INTRODUCTION

This report provides an overview of field characterizations, including existing conditions and a list of key assessment (research) projects to be addressed at a later date for the San Pedro Open Space property in San Pedro, in Santa Fe County, New Mexico. The report describes the findings of the second phase – Inventory and Assessment – of the 2015 Santa Fe County Open Space Management Planning Initiative for the SPOS property.

The purpose of the (Phase-2) Inventory and Assessment research is to collect more in-depth data on selected issues to have the minimally needed information to proceed with Master Planning, to develop Maintenance Plans and to complete Management Plans for the SPOS property. Findings of the Inventory and Assessment phase will also play a directing role in structuring community input for Master Planning for the community of SPOS stakeholders.

Research Topics and Methods

The Ecotone project team conducted the research for this project phase from October through December 2015. The research scope focused on selected issues identified in phase-1. A summary of the selected research issues during the Inventory and Assessment phase is listed at the top of the Findings section.

Research activities included two terrain visits at the Open Space property, supported by web- and literature research, and fact-checking and interviews with experts. The project team collected detailed terrain data along a series of grassland vegetation transects and documented specific observations through photography and GPS documentation of the locations of the issues observed. Terrain assessments included specific assessments of fuel loads on the ground to quantify fire hazard in wooded areas. Project team members also conducted formal and informal meetings and fact-checking with experts, such as staff from the EMNRD Abandoned Mine Land Program (AML) (regarding mine hazard conditions at SPOS) and County fire staff (regarding woodland thinning at SPOS).

The project team also developed a set of goals and guidelines for land suitability planning which was used in the assessment of the suitability of various forms of land use (Appendix A).

While this report focuses on findings, it also includes some conceptual conclusions and recommendations. Detailed maintenance and ecological restoration recommendations will be formulated in Phase 3 of the Open Space Management Planning initiative and included in the final Management Plan.

FINDINGS OF EXISTING CONDITIONS: SAN PEDRO OPEN SPACE – SAN PEDRO

Scope of Research

Table 1: Listing of Phase-2 Research Topics

#	Research Topics
1a	Coordination with AML regarding abandoned mine management
1b	Coordination with BLM regarding trail connections and public safety issues
2a	Id opportunities, conditions and needs regarding access easements
2b	Id geophysical suitability for access points, parking, etc.
3	Woodland inventory and fire and erosion risk assessment
4	Grassland inventory and weed, fire and erosion risk assessment
5	Id wildlife crossing and free roaming improvement needs
	TOTAL

Summary of Findings, Conclusions and Recommendations

Coordination with Resource Management Agencies

1a: Coordination with AML regarding Abandoned Mine Management

Maria Lohmann of Santa Fe County and Jan-Willem Jansens of Ecotone met with John Kretzmann and Lloyd Moiola of the EMNRD Abandoned Mine Land Program (AML) to identify possibilities for AML support with identifying hazard levels of mine areas on the San Pedro Open Space. During this meeting AML staff offered to request the BLM hazard assessment team to conduct a mine site hazard reconnaissance on the SPOS. This reconnaissance work will be coordinated with Tamara Stewart (archaeology contractor for Santa Fe County) and will be completed by the end of 2015. AML staff will also be made available if the reconnaissance outcomes require any further hazard assessments and rankings on the SPOS (Figure 1). AML staff also committed to sharing ArcGIS shape files on mine sites for the BLM area once they become available. The map information will help Santa Fe County understand where certain hazardous mine areas are on BLM land and it might help with planning of trail connections.

The mine safety process is still in the procedural planning phase. BLM is currently compiling an Environmental Assessment (EA) for the BLM parcels regarding abandoned mine reclamation and construction of protective structures. The EA is expected to be completed by the summer of 2016. Starting in November 2015, an archaeological survey will be undertaken across the BLM properties, with a final report due in the spring of 2016. AML expects that many mine features and sites will be eligible for listing on the National Register. The cultural and historical importance of the mine sites and the problem that there are hundreds of mine sites and also

hundreds of ongoing private mine claims together make this project very complicated and time consuming.

The timeline between the completion of assessments in mid-2016 and the completion of mine closures (i.e., construction of mine protection infrastructure) may take 4 to 5 years. BLM grants for construction will expire in 4 years (late 2019). AML expects that BLM will prioritize the protection of mine sites on the western side of the BLM properties because of the severity of hazards on the mine sites in that area.



Figure 1. One example of the numerous mine exploration pits that are scattered across the SPOS property. (Photo by Jan-Willem Jansens)

1b: Coordination with BLM regarding Trail Connections and Public Safety Issues

No communication with BLM staff took place during the Research Phase (phase 2) of the Open Space Management Plan project for SPOS. However, it became clear from conversations with AML staff who have been in frequent contact with BLM that it would take until late 2019 before certain parts of the BLM area would be safe for access. The planning and implementation of a

trail system on BLM land may take another four to five years, because it would require a full NEPA process. The timeline means that trailhead development and developing trail connections to access BLM lands on the SPOS would not be relevant until around 2024. Santa Fe County would also not issue any financing opportunities through a general obligation bond issue for such investments until 2020.

Access and Parking Opportunities

2a: Opportunities, Conditions and Needs regarding Access Easements

A special access easement is in place across private land on the far southwestern corner of the SPOS. However, the easement offers access to a meadow area that has limited potential for trailhead development. Concerns about this access point include drainage problems and viewshed impacts, as well as a relatively long distance to future trail connections on BLM land. Other access easements seem to exist along Hwy 344 which are more beneficial for future access needs.

2b: Geophysical Suitability for Access Points, Parking, etc.

Ecotone assessed and mapped terrain suitability for several uses of the SPOS (Figure 2). The suitability of access points, parking, trails, or a park are determined by suitability goals and criteria described in Appendix A.

Access Points

Only a few good access opportunities exist that have safe lines of sight on Hwy 344 and few engineering and earth moving requirements. The best access opportunities are located across from the east side of an existing pullout on the south side of Hwy 344 (Figure 3).

Low-Impact Park Facilities

For reasons of cost minimization, safety, terrain suitability, and user experience optimization, the development of a small recreational park is most suitable in the southern triangular area (south of the east-west running arroyo). However, the NRCS Ecological Site Description for soils on the SPOS (based on the WebSoil Survey) indicates that the suitability of the southern triangular area below the large arroyo on the open space property has suitability limitations for trail, park and playground development related to flooding (sheet flow in the grassland and the presence of arroyos), dustiness due to erosion sensitive soil conditions, steep slopes, and gravel content in the soil. All of these limitations can be mitigated or avoided for park development in this area. For example, the large arroyo on the north side of the triangular area a steep slope and an arroyo in the southeastern corner will need to be avoided (Figure 4). Additionally, with careful planning and appropriate safety precautions, a trail system could potentially run along a few old mine pits for purposes of interpretive education, while the majority of the pits can be avoided.

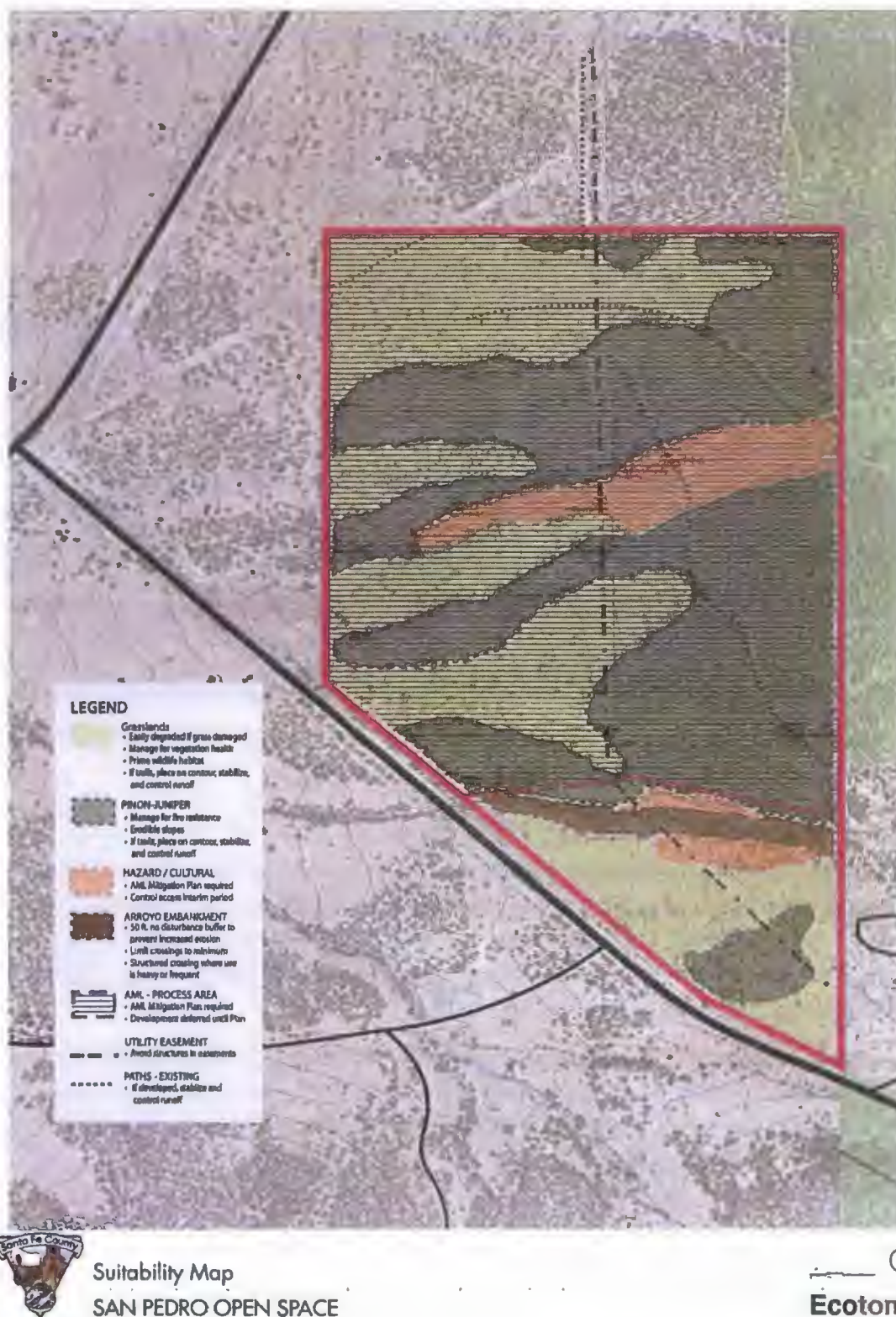


Figure 2. San Pedro Open Space – Land Suitability Map.



Figure 3. View (left of highway) of one of the better access points to the property from Hwy 344, across from an existing pullout. (Photo by Jan-Willem Jansens)

Spatial development of the park may be most suitable in the far eastern part and on the edges of the space, leaving the central and western grassland space of the area undeveloped to maintain the scenic and ecological quality of the grasslands, optimize drainage of the terrain, optimize views from the eastern higher areas to the west and south, and minimize the visual impact of the park on the surrounding rural scenery.

Various parking options exist. Parking could be initially concentrated in the pullout along SR344. Additionally, parking could be developed in one or more small parking areas on site or on pullouts along a loop road on the southern triangular area on the property that could lead to day-camping sites and other facilities.

Woodland, Grassland and Wildlife Conditions

3: Woodland Inventory and Fire and Erosion Risk Assessment

Approximately 56% (89 acres) of the San Pedro Open Space (SPOS) consists of woodland, dominated by one-seed juniper and piñon. Woodland soils consist largely of the Pedegral – very

cobbly loam (#513 of NRCS Santa Fe County Soil Survey). A small section of steeper woodlands on the far eastern boundary with the BLM lands consists of Cochiti – extremely cobbly loam (#512 of NRCS Santa Fe County Soil Survey).



Figure 4. View across large arroyo delineating a southern triangular area from the larger northern part of the SPOS. Note the mine waste pile, remnants of an old bridge and ruins from structures from around 1900 along the arroyo banks. (Photo by Jan-Willem Jansens)

Wildfire Risk

The woodlands carry about 12.4 tons/acre of woody biomass fuel, which is a moderately high fuel load (Figure 5). However, most of the woodland area is safe regarding wildfire hazard because of a general absence of fine surface fuels (mostly grasses), despite the high levels per acre of woody biomass on the ground. The patchy nature of undergrowth and small litter and the rather discontinuous woody biomass fuel are factors that reduce the likelihood of catastrophic fire igniting in the woodland.



Figure 5. The woodland area includes juniper and pinon trees and large amounts of dead woody material. (Photo by Richard Schrader)

Yet, while the vegetative undergrowth in the woodlands is very sparse, locally, the duff and small plant litter component on the ground is sufficiently large to carry a fire, if such a wildfire were ignited outside the woodland area. Woody fuels on the grasslands are sparse (0.15 tons/acre), but the dense decadent grass vegetation could readily ignite. A fire originating in the grasslands or in the more grassy woodland strips between the grasslands in the central and western part of SPOS, could possibly cause a grassland and brush fire. Western winds could fan such a fire toward the woodlands up the hill and cause a wildfire in the woodlands as well.

Erosion

The Pedegral soils consist of slightly decomposed plant material and very cobbly loam in the topsoil, on top of very cobbly clay loam with deeper layers of coarse sand. Slopes range between 8% and 15%. The cobble content offers great protection of these soils against erosion. Yet, the loam and organic components of the soil are highly erodible when the soil structure is disturbed. The erosion tolerance (i.e., the soil's natural regeneration capacity) is rated at 2

tons/acre/year (t/a/y), which means that the soil is rather fragile and its regeneration capacity is low when disturbed.

The Cochiti soils consist of extremely cobbly loam on very to extremely cobbly clay loam with deeper layers of extremely cobbly sandy loam. Slopes range between 15% and 35%. The high cobble content offers excellent protection against erosion. However, the loam and clay-loam components are readily erodible when exposed. The erosion tolerance is rated at 5 t/a/y, which means that the soil's regeneration capacity is relatively high.

Soil loss in the woodland area is limited to arroyos, steep slopes, and areas with exposed loamy soils. Understory plant cover in the woodland area is sparse. However, the stone and gravel component, combined with patches of deep litter and duff layers along with scattered piles of dead wood provide a high amount of ground cover. At present, the overall soil loss is very low, except in isolated spots and in arroyos (Figure 6). In most of the woodland area, soil loss remains at levels far below the "tolerance" level.



Figure 6. Rill and early gully erosion in a meadow with brush encroachment, looking downhill to the southwest. (Photo by Jan-Willem Jansens)

During a field assessment in November 2015, 49 measurements along 5 transects revealed that the estimated average soil loss per transect site varies between 0.04 tons/acre/year (t/a/y) and 1.28 t/a/y, with a total area average of 0.33 t/a/y. The erosion tolerance for the dominant soil type of the woodland area is 2 t/a/y. So, the erosion is occurring at sustainable / tolerable rates. However, caution is needed for development and land use in certain areas. Disturbance, such as woodland thinning or trail development, by which slash is removed and soil crust and rock layers are removed or damaged, may cause excessive soil loss and gully erosion on slopes over 10% of the loamy soil components. As a rule of thumb for this area, removal of approximately 50% of the vegetation biomass and/or soil cover would lead to soil erosion over the tolerance level. The risk is greatest on the steeper slopes at the eastern boundary of the open space property.

Woodland Management

In the past years of County ownership, the woodland area has not been actively managed. There are also few signs of active management or use of the woodlands from before County ownership. There are occasional signs of historical wood harvesting, some trail corridors, and many signs of soil disturbance related to mining activities that date back at least 100 years.

Under the current conditions, the need for woodland management is low. In the next 3-5 years, removing some dead wood would benefit the lower woodlands and in preparation for the use of the area for trail development. Dead wood is best spread out on bare ground or placed on contour lines to protect exposed soil against erosion. While no woodland thinning is recommended at this time, removal of junipers that have encroached on the grassland would help improve the grasslands by reducing competition for water (Figure 7). Additionally, it would be useful from a wildfire management perspective to remove dead or dying woody plants in the woodland strips between the grasslands.

Woodland Suitability for various Uses

The woodland area is generally suitable for trail development, except in specific places, such as the eastern boundary area, where the terrain is too steep, and in very stony/rocky, or in loamy areas where disturbance of dry soil can lead to dusty conditions and wind and water erosion. In most places, the existing old trail alignments are adequate or even very suitable for new trails. Little to no engineering or slope modifications (cut and fill) would be required for effective trail development in the woodland area. However, until the mine hazards are safeguarded, the woodland area cannot be considered suitable for any recreational (trail development) uses.

The woodland area is poorly suitable for the development of more intensive recreational uses, such as a park or playground facilities, because of slope steepness, stoniness, shallow depth to a cemented hardpan, and anticipated stormwater runoff. Dustiness can also become a problem with higher intensity uses and development of recreational features and facilities. Mitigation costs of these impediments will likely be high in either the design phase and/or for annual maintenance and periodic repairs.

4: Grassland Inventory and Weed, Fire and Erosion Risk Assessment

Erosion

The grasslands of San Pedro Open Space consist of two types. The most northern grassland area consists of the Cerrillos-Sedillo complex. These soils are characterized by a soil type that consists of an eolian (wind-originated) top layer of clay-loam on top of alluvial (river-originated) gravelly sandy loams, and another soil type of eolian, very fine sandy loam and loam on alluvial, cobbly and gravelly sandy loam or loam. Slopes range between 1% and 3%. The slowest permeability is moderately slow; generally, these soils are well drained. This soil type is moderately erodible and has a soil tolerance factor of 5 t/a/y (NRCS Santa Fe County Soil Survey).



Figure 7. Woodland vegetation has encroached in many locations onto the grassland area. (Photo by Jan-Willem Jansens)

The more central and southern grasslands of the open space area consist of the Lazarus-Manzano complex. These soils are all alluvial in nature and consist of silt loam on silty clay loam

or gravelly loam. Slopes range between 0% and 3% for the lower Lazarus soil type and 4%-8% for the Manzano soils higher up. For these soils, the slowest permeability is also moderately slow, which means that the soils are generally well drained. Yet, this soil type is highly erodible due to the silty and clayey particle content. The soil tolerance factor is 5 t/a/y (NRCS Santa Fe County Soil Survey).

The grasslands are in many places located in natural drainage swales in the landscape that are slightly lower than the surrounding strips of woodland. The NRCS WebSoil Survey indicates that the grassland ecosystems may experience occasional flooding resulting from storm events. Especially the Manzano soils are reportedly flood prone, which means that significant sheet flow events can occur.

Presently, active soil loss on the grasslands is low and mostly concentrated around several deep, but localized headcuts and arroyos (Figure 8). The cause of these forms of erosion are probably related to the sheet flow occurrences on the Manzano soil type in combination with the historical roads and trails and past mining activities that have disturbed the soil, and the construction of a power line and clearing for a maintenance track. Most arroyos end in sediment plumes which they have deposited on the flatter, downhill terrain of the Lazarus soil type.



Figure 8. A headcut advances into a healthy grassland by eroding soil and removing soil moisture on the advancing edge. (Photo by Richard Schrader)

Grassland Vegetation Cover and Forage Production

A grassland survey, using sample transects, conducted by the project team in October 2015 revealed that the grasslands are in a varying but relatively healthy condition (Figure 9). The exceptional rainfall of late 2014 and all year 2015 probably influenced these findings. Soil cover and land health findings are displayed in Table 2.

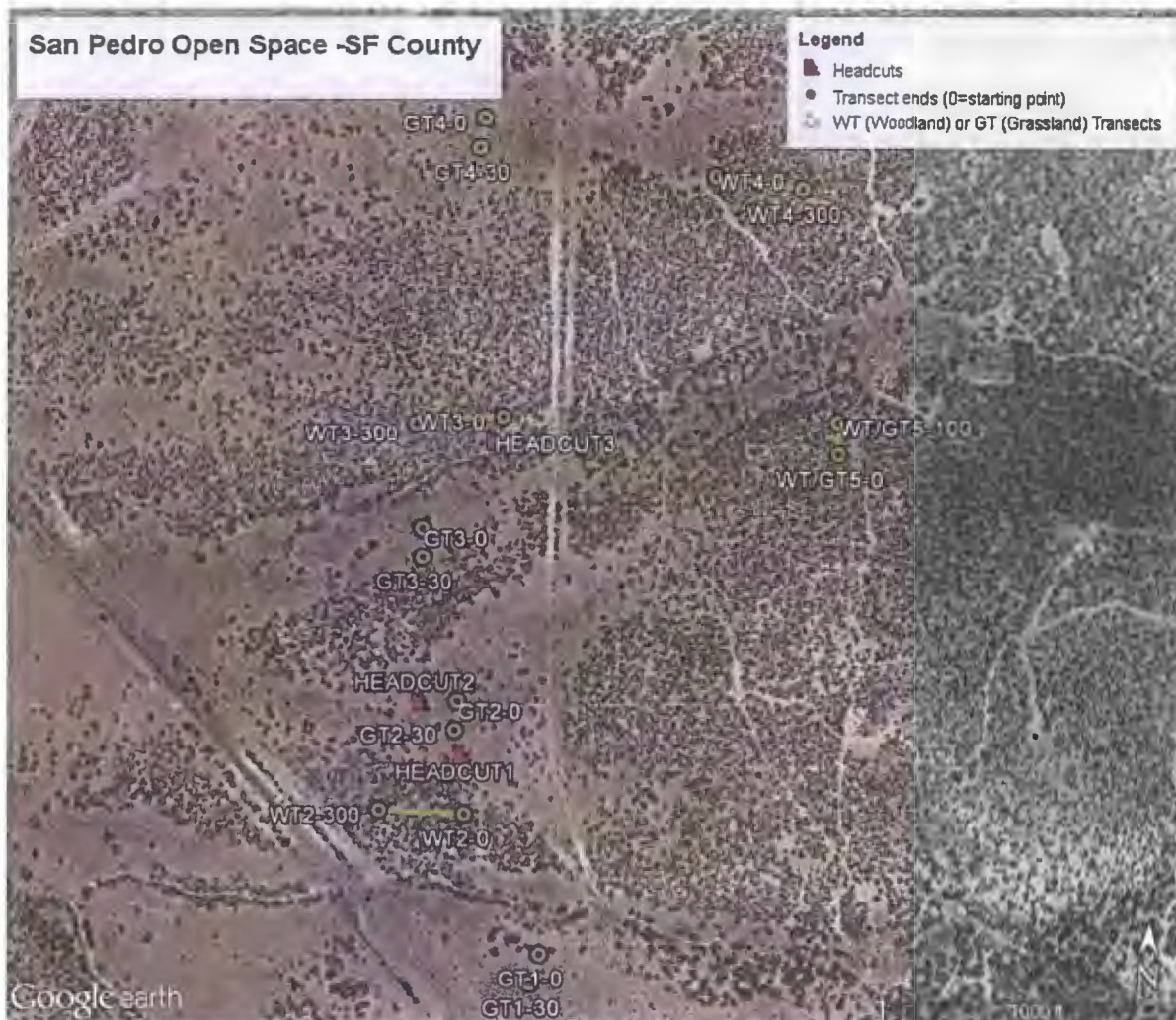


Figure 9. Map of SPOS with indication of vegetation sampling transects.

Field findings show that the northern grasslands (transect #4) are generally in the healthiest condition with more than 90% vegetative ground cover, the lowest percentage of bare ground, high levels of plant litter, and very low levels of soil erosion. However, this plant community also includes high amounts of dead plant material and a relatively wide variety of plant species, many of which are annual or perennial pioneer species of a weedy or unpalatable type. The

plant composition seems to point at some form of past disturbance of the area. The amount of forage plants for grazing in this area is rather low with only 46% of forage species.

The southwestern (transect #2) and central western (transect #3) grassland areas are of moderate (#2) and moderately high (#3) quality (Figure 10). These grassland show 18.4% and 14.4% bare ground, respectively, moderate levels of leaf litter, and low levels of observed soil loss. The plant community includes high levels of blue grama (67% and 73%, respectively), which is very productive for this kind of grassland.

Table 2. Grassland soil cover and vegetation in 5 transects in October 2015

Transect/Site	Plant Cover (%)	Dominant / Subdominant plant species	Bare Grd Total (%)	Leaf litter Total (%)	Water Total (%)	Rock Total (%)	Land Health
LP Transect 1 / southern triangle area	71	blue grama (61%) / broom snakeweed (7%)	28.7	6.5	0	4.1	mod. low
LP Transect 2 / southwestern grassland	78.5	blue grama (67%) / broom snakeweed (5%)	18.4	6	0	0	moderate
LP transect 3 / central western grassland	83.5	blue grama (73%) / one-seed juniper (6%)	14.4	7.2	0	0.3	mod. high
LP transect 4 / northern grassland	92.8	blue grama (26%) sanddrop seed (20%) / broom snakeweed (20%) tree cholla (13%)	11.8	15.6	0	0	high
LP transect 5 / sparse woodland on central eastern boundary (woodland area)	16.3	one-seed juniper (5.5%) pinon pine (3%) / annual forbs (5.5%) perennial grass (1%)	16.8	44.5	0	29.6	low

Please note: plant cover can exceed 100% as plant species can overlap each other.

The grassland in the southern triangular area, south of the large arroyo across the property (transect #1), has a moderately low grassland health, characterized by 25%-30% bare ground, some stoniness, and low levels of soil loss (rills and small gullies). This grassland is well covered with blue grama, some galleta grass, and several brush species.

A transect in the woodland area (transect #5) shows that the woodlands have much less vegetation covering the ground, with much higher levels of stoniness and litter cover, but not necessarily a high level of bare ground. Forage production in the woodland area is very low.

The NRCS WebSoil Survey offers estimations of forage productivity during favorable, normal, and less favorable conditions for the grassland types on the SPOS. Forage productivity estimates for the grassland areas are listed in Table 3.

The forage production estimates confirm that the southern and central western grasslands are the most productive ones with more than 2,600 lbs/a/y during good years, such as 2015. These findings coincide with the signs of natural irrigation by surface flows and the more loamy soil conditions and high cover percentage of high-quality forage plants. The northern grasslands, however, are far less productive, possibly due to a higher percentage of non-palatable species and the somewhat poorer, fine sandy and gravelly soil conditions. Overall, the woodlands are moderately productive, according to the WebSoil Survey, possibly due to grassy patches within the woodlands combined with a relatively high level of organic matter in the top soil and a high water holding capacity in the loamy components in between the cobble matrix of the soil.



Figure 10. View of the central grassland area toward the south (east of transect 3, along the powerline easement). Grasslands are of moderately high forage quality and are dominated by blue grama grass, interspersed with cholla cacti and a variety of shrubs. (Photo by Jan-Willem Jansens)

Table 3. Forage Productivity of Grasslands and Woodlands based on the NRCS WebSoil Survey for the LPOS area.

Transect/Site	Forage in Unfavorable Year (in lbs/acre/year)	Forage in Normal Year (in lbs/acre/year)	Forage in Favorable Year (in lbs/acre/year)
LP Transect 1, 2 and 3: Lazarus-Manzano complex	1022	1817	2611
LP transect 4 / northern grassland: Cerrillos-Sedillo complex	367	700	933
LP transect 5 / woodland: Pedegral very cobbly loam	600	700	1100
Woodland: Cochiti extremely cobbly loam	500	700	900

Grassland Suitability for Trails and Other Recreational Uses

According to the NRCS WebSoil Survey for this area, the northern grassland area is generally suitable for trails and other recreational uses. Some potential dustiness is the most important suitability limitation. However, this could be mitigated by siting trails so that they are self-draining and keeping trails narrow (12-18 inches) and keeping the surrounding landscape well covered with vegetation.

The central and southern grassland areas are generally suitable for trails or day-camping facilities. However, these grasslands have poor suitability for more intensive recreational uses. Besides some potential dustiness, the greatest concern for active recreational use on the grasslands is the chance of sheet-flow erosion and flooding events. Furthermore, a relatively high gravel content and slope steepness in some places render the grasslands less conducive to the use of the area as a park, playground or sports field. Proper trail siting, so that they are self-draining, keeping trails narrow (12-18 inches), and keeping the surrounding landscape well covered with vegetation will largely help mitigate the cited suitability concerns.

Trail development in the grassland area needs to be planned in ways that avoid trail proximity to sites with severe headcut and gully erosion. In some places, old trail alignments could be upgraded to be incorporated in new trails. However, the development of trails and other recreational features in the grassland areas will have to wait until the open space area has been cleared to avoid cultural resources and hazards related to historical mining features.

Grassland Management

In the years of County ownership, the grassland area has not been actively managed. There are some signs of grazing of the grassland prior to County ownership, expressed by the profusion of invasive plant species such as cholla cactus, broom snakeweed, and occasionally mullein. Also

wolfberry, a few large barberry shrubs, and chamisa indicate some form of past human occupation and soil disturbance. Additionally, there are some signs of historical wood harvesting, some historical trail and road corridors, and the remains of water and erosion management structures. A large arroyo in the southern part of the property and a gully originating from a mining location to the northeast on BLM land toward the southwest of the Open Space property provide signs of soil disturbance related to past mining activities.

The November 2015 field survey found a high content of standing dry and dead plant biomass, along with a local profusion of cacti, shrubs, and juniper which are indicative of a grassland that has not been grazed for several years. Grazing is possible and advisable, if managed well, to reduce wildfire in the grasslands, avoid degradation of plant diversity and cover, avoid encroachment of less palatable and weedy plant species, and prevent soil loss.

A vegetation management regime could help reduce the amount of dead biomass (which could be more than 2600 lbs/a/y in productive years, as indicated above, based on the NRCS WebSoil Survey), which constitutes a large amount of fine fuels that can carry fire and suppresses natural plant regeneration. The goal of active vegetation management would be to optimize the presence, cover percentage, and diversity of native, perennial grassland vegetation.

Perhaps the most desirable form of vegetation management for this land would be a combination of managed, restorative grazing and the removal of woody plants that have encroached into the grassland. Managed grazing would help remove and recycle standing plant material and plant litter and increase opportunities for the regeneration of native, perennial vegetation. The thinning (by hand – i.e., with a chainsaw) of junipers and other shrubs in the grasslands would reduce competition for water and space and enhance the regeneration of native grasses.

5: Wildlife Crossing and Free Roaming Improvement Needs

The SPOS is part of a regional wildlife corridor between the Sangre de Cristo Mountains and the Sandia and Manzano Mountains, across the Galisteo Basin and San Pedro valley. The SPOS is habitat to mountain lion, bobcat, black bear, mule deer, and other large wildlife species, as well as to smaller mammals, such as rodents, and to associated predators, such as raptors and snakes.

Wildlife habitat and corridor qualities on the SPOS are limited due to the absence of sources of open water. This reduces the area to the functions of winter and night shelter, foraging, and roaming grounds. Healthy grass cover for ungulates such as deer and antelope is beneficial. The variation between open land and denser vegetation offers opportunities for shelter, nesting, and bedding for various animals.

Ambient conditions are generally favorable for the presence of wildlife. The area is generally calm and remote; there is little vehicular traffic and no off-road vehicle use; night lighting is

very limited. Disturbances include some distant shooting noise and potentially occasional hunting. Fencing along SR344 limits road crossing opportunities for some animals (Figure 11). Simple fence modifications, such as removing the fourth strand (increasing the distance between the ground and bottom strand to 16-18 inches) and putting smooth wire on the bottom and top strands of fences would make the fences more wildlife-friendly.



Figure 11. The 5-strand barbed-wire fence with smaller opening between the lower strands prevents most wildlife from freely roaming into and from the SPOS property. (Photo by Jan-Willem Jansens)

KEY ASSESSMENT PROJECTS

1. Research and develop guidelines for establishment of a local stewardship team.
2. Study and improve the safety aspects of the shooting area on BLM for uses on SPOS.
3. Conduct a characterization assessment of the hazard levels of the various mine pit areas on the SPOS (whether the mine sites are considered not hazardous and could be incorporated in the master planning process or whether some or all need further examination and potential reclamation and protective measures before the area can be included in master planning for public use); research what protection is needed before trails can be built.
4. Develop a detailed woodland and grassland stewardship plan with 20-year rotation for maintenance work (treating 8 ac/yr: 4-5 acres of woodland and 3-4 acres of grassland): thinning, spreading dead wood and branches in order to improve soil cover and reduce wildfire risk.
5. Research restorative grazing possibilities, needs for fencing improvements, an entrance area and gate, and water facilities, as well as appropriate contracting mechanisms and potential contractors to work with. Development of a restoration grazing plan and RFP.
6. Research, planning and design for appropriate headcut stabilization and erosion control.
7. Research and planning for preliminary trail system development, including parking (possibly on the existing highway pullout), a gate (entrance location), benches, and (interpretive) signage.
8. Identify the interpretive value of the archaeological sites identified in the recent cultural resources survey. Develop an interpretive education program / plan.
9. Research and master planning for a park and expanded trail system.
10. Research and panning for water harvesting features and wildlife and horse drinkers.
11. Study and plan the most suitable and desirable trail connections to BLM land from SPOS property.

Primary Goals for Land Suitability Assessment and Master Planning include:

- a. Minimization of Upfront Development Costs and Complexities
 - Length and area of disturbance: costs of road development, paving, fencing
 - Engineering and earth moving requirements: topography, cut&fill, bridges
 - Soil suitability, drainage, vegetation disturbance/removal
- b. Minimization of Mitigation and Restoration Costs due to Resource Disturbance
 - Disturbance of cultural and historical sites
 - In appropriate use (waste) of, disturbance of or cumulative negative effects on natural resources
 - Susceptibility to erosion after disturbance
 - Scenic quality impacts (viewshed disturbance; e.g., views on/over parked cars)
- c. Public Safety Optimization
 - Safe line of sight at road intersections
 - Public visibility of public areas (avoidance of illicit activities; social surveillance and control of nuisance behavior: dumping, shooting, theft, harassment, etc.)
 - Safety regarding terrain features (flood hazard, wildfire hazard, steep or unstable slopes, gullies, dump sites, hazardous mine pits, proximity to shooting areas, etc.)
- d. Experiential Quality Optimization
 - Richness of experiences (e.g., diversity of view shed, and micro-texture of the land, such as vegetation types and specific things to see/experience)
 - Options for different (trail) users (e.g., trail extensions; distance variations, destinations, trail connectivity)
 - Diversity of user groups for which the land use scenario is appealing

APPENDIX C: ABSTRACT OF
ARCHAEOLOGY SURVEY

SFC CLERK RECORDED 10/12/2016

The following abstract is from an archaeological survey prepared by Tamara J. Stewart (TAMARCH Cultural Resource Management Services). The document is filed under New Mexico State Survey Permit Number NM-15-082, TAMARCH Report No. 15-02, NMCRIS Activity No. 134629, December 2015.

In October 2015, TAMARCH CRM Services conducted a cultural resource survey of the 64.8-hectare (ha) [160.-acre (ac)] San Pedro Open Space property and 0.83-ac (0.34-ha) public access easement through private land east of the open space, located south of the Town of Golden, Santa Fe County New Mexico (refer to Figures 1-2). The parcel is north of and adjacent to NM 344, 1.4 km (.87 mi) southeast of the intersection with NM 14. Santa Fe County acquired the undeveloped property in 2011 (Tract 1 of Campbell Corp's South Mountain Ranch) and requested the survey. The access easement is on private land adjacent to Tract 1. The parcel is located on unplatted land in the eastern San Pedro Grant in projected Sections 20 and 29, Township 12 North, Range 7 East, N.M.P.M. on the San Pedro and Golden, NM Quadrangles (Figures 3-5).

A check of the New Mexico Cultural Resource Information System (NMCRIS) revealed two previously recorded archaeological sites LA 16305 and 139793 that extend within the property boundaries from adjacent BLM land and represent loci of the historic townsite of San Pedro and associated copper and gold mining features (Figure 6). LA 16305/San Pedro Townsite extends into the southeastern portion of the property and includes residential remains of the townsite (Figure 15) (Oakes and Zamora 2013). LA 139793/San Pedro Townsite Placer Field South extends within the southeastern portion of the parcel north of and adjacent to LA 16305 and includes mining features associated with the historic townsite and thousands of historic artifacts (Travis and Bogess 2003). The site boundary for previously recorded LA 139793 was adjusted to include the southern placer mining field and to group the townsite structural foundations and associated features with LA 16305/Western San Pedro Townsite (Figures 5-6). The San Pedro Townsite, more densely concentrated to the east on Bureau of Land Management (BLM) property, was previously determined eligible for inclusion on the NRHP under Criterion D and is the subject of current studies sponsored by the Abandoned Mine Land (AML) Program.

LA 183746/Placer Field North is a newly recorded site in the northeastern, upland portion of the parcel, consisting of a placer mining operation and associated historic artifact scatter that extend southwest from adjacent BLM land (Figures 6-7). The site consists of hundreds of shallow placer pits and historic artifacts associated with 1880s-1930s copper and gold mining in the San Pedro Mountains of the New Placer District, and is recommended as eligible for listing on the National Register of Historic Places (NRHP) (Figure 19).

The San Pedro Townsite is not listed on the New Mexico State Register of Cultural Properties (SRCP) or the NRHP, and no other properties listed on the registers are located within the property boundaries or vicinity, defined as a 1.6-kilometer (km) [1.0-mile (mi)] radius around the parcel.

Seven previously recorded archaeological sites are located in the vicinity of the parcel, all but one relating to the historic period San Pedro mining townsite. Several prehistoric lithic tools, utilized flakes, and lithic debris were identified in wooded areas of the parcel (refer to Table 1). Eighty-one isolated occurrences (IOs) were identified within the property, summarized in Table 3 and shown on Figures 10-13. The information potential of the IOs is considered to have been exhausted through in-field recordation. Proposed Santa Fe County trail and interpretive development of the property will avoid identified sites within the property boundaries. No further cultural resource investigation of the property is recommended.

APPENDIX D: MAINTENANCE PLAN

SFC CLERK RECORDED 10/12/2016

Santa Fe County Open Space Management Planning Initiative

A Maintenance Plan for the San Pedro Open Space Property Santa Fe County, New Mexico

FINAL DRAFT
June 30, 2016



San Pedro Open Space grassland maintenance is a short-term to mid-long term need and includes removal of encroached juniper and weedy and unpalatable species and erosion control

Ecotone

Conservation Planning for Landscapes in Transition

1413 Second Street, Suite 5
Santa Fe, New Mexico 87505
505-470-2531
jwjansens@gmail.com

Table of Contents

INTRODUCTION	3
VISION STATEMENT, GOALS AND OBJECTIVES	3
WOODLANDS	7
GRASSLANDS	8
FENCING AND OTHER MAINTENANCE	9
INSPECTIONS, MONITORING, AND ADAPTIVE MANAGEMENT	13
Inspection Protocols	13
Monitoring	13
Adaptive Management: Identifying Choices and Making Decisions	13
LABOR REQUIRMENTS AND CAPACITY BUILDING	14
FTEs	14
Santa Fe County Capacity	14
Community Outreach and Engaging Volunteers	15
Potential Volunteers	15
Volunteer Maintenance Activities	16
Community Liaisons	16
County Point Person	16
APPENDIX A: Santa Fe County Open Space Inspection Checklist – San Pedro OS	18

INTRODUCTION

This Maintenance Plan documents recommended maintenance activities for the San Pedro Open Space (SPOS) property in San Pedro, in Santa Fe County, NM, based on the analysis of findings and community feedback during a general inventory phase and a more detailed field characterization phase. The purpose of this document is to provide a detailed maintenance plan, which includes projected needs for labor and equipment, as part of the SPOS Management Plan. This Maintenance Plan also makes strategic recommendations for the frequency, timing, and human capacity options Santa Fe County may want to consider to implement the maintenance activities.

VISION STATEMENT, GOALS AND OBJECTIVES

The following vision statement for the SPOS Management Plan is based on feedback from community meetings and other input from stakeholders.

In 2025, the San Pedro Open Space is a safe and peaceful area for people and wildlife. The open space includes viewing areas, public access, some primitive trails, and public education about the scenic, historic, and cultural landscape. The open land remains wildlife habitat and a wildlife corridor. Local residents, especially younger generations, are actively involved in the maintenance and stewardship.

In the longer term, the SPOS may serve as a regional hub for hikers, mountain bikers, and horseback riders to access a system of trails through southern Santa Fe County. The area may also include additional space for children's play or community gatherings.

The SPOS will not include loud or disruptive activities or overly-developed facilities.

Based on this vision description, the central management goal for SPOS is:

Santa Fe County and the community of the area around San Pedro Open Space collaboratively maintain and enhance the open land qualities of SPOS and its wildlife habitat and corridors; its scenic, historic, and cultural resources; and its local and regional recreation opportunities. SPOS management includes the gradual development of a regional trail hub to BLM land and to trails in the wider region, including some simple trailhead and interpretive education facilities, at a scale that requires little maintenance, encourages local community stewardship, and respects the area's significant cultural resources.

Specific management objectives in support of this vision and the central goal are:

1. Manage the property in a way that the different values and objectives are balanced as a whole (and not one despite another), and that improvements and changes are introduced in a gradual way; seek and maintain optimal working relationships with neighbors and other local stakeholders, and encourage the involvement of people from younger generations
2. Enhance public safety, for example by negotiating the closing of the shooting area on adjacent BLM land, prohibiting motorized vehicles, open fire pits, and the use of fire arms, and by protecting the public from any potential harm associated with old mine sites
3. Control access by maintaining easements, roads, trails, fences, gates, stiles, drainage crossings, and signage
4. Maintain the area's natural appearance and sweeping scenic views, and keep maintenance limited; maintain a rural, natural visual quality by using natural design principles and natural materials, and by choosing deliberately when to let nature run its course
5. Provide and maintain interpretive education, and explore and use educational and research opportunities
6. Protect the area's cultural and historic resources
7. Maintain the ecological health, resilience, and productivity of the SPOS, and maintain wildlife habitat qualities and connectivity across the landscape
8. Explore and use – when appropriate – managed, restorative grazing practices (and rest periods) as a way to improve grassland health and in response to the need to develop an agricultural use for County Open Space properties
9. Develop basic infrastructure such as space for parking, benches at viewing areas, and community spaces that serve the vision for SPOS.

Management decisions, including maintenance activities, should be made in the spirit of the vision, aimed at meeting the central management goal, and in adherence to the specific objectives for the SPOS.

TERRAIN MANAGEMENT UNITS

Maintenance activities are often strongly related to specific terrain characteristics. The Land Suitability Map developed in Phase-2 for identifying appropriate uses for the different types of terrain was based on the identification of Terrain Management Units, and the Suitability Map describes the Terrain Management Units. The same map will be used in this plan to identify the Terrain Management Units as a basis for identifying maintenance activities (Figure 1). Table 1 lists the Terrain Management Units and their regular maintenance activities in relation to management goals.

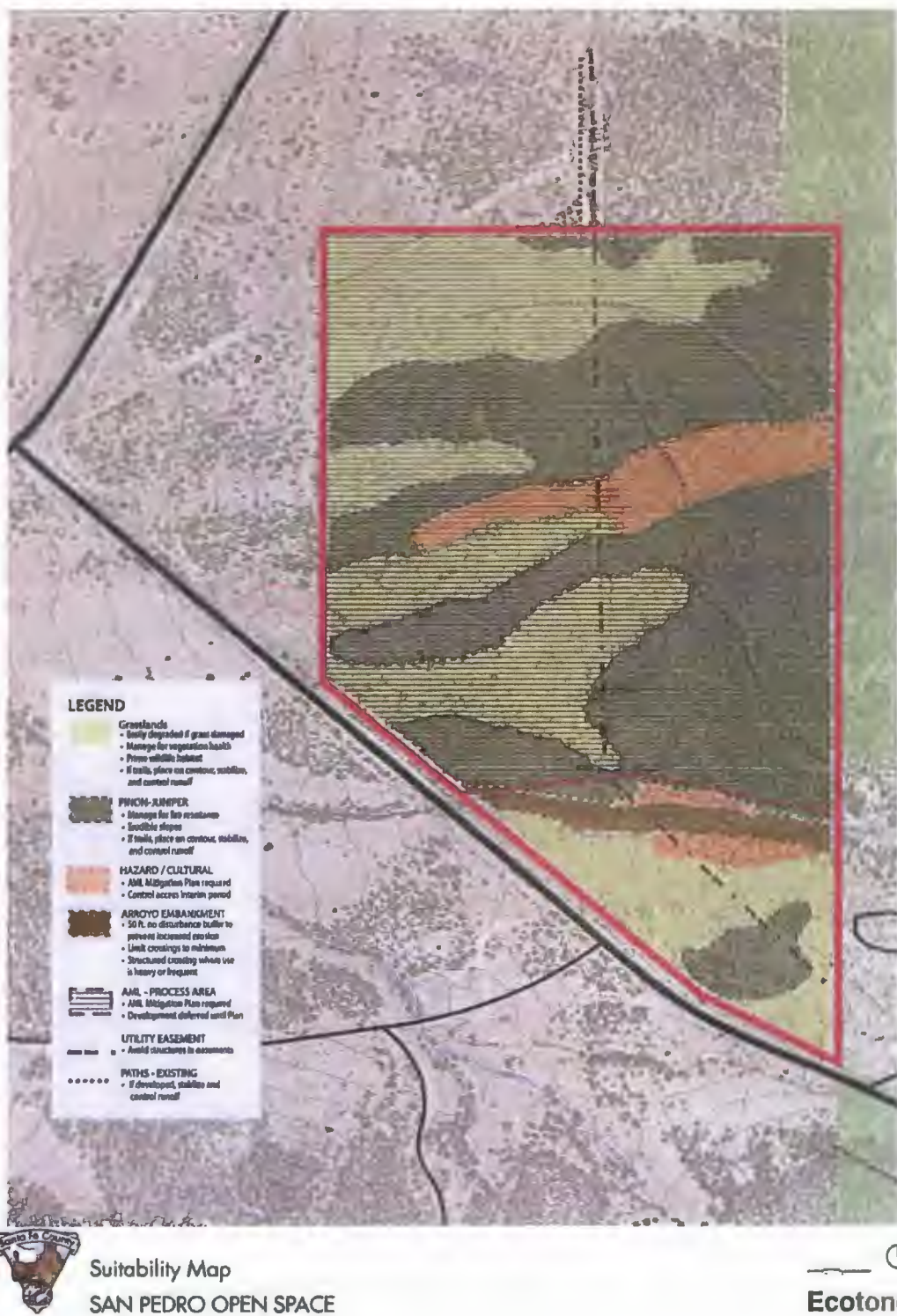


Figure 1. San Pedro Open Space – Terrain Management Units Map

Table 1. Overview of Terrain Management Units and anticipated regular maintenance activities related to subordinate management goals for the property.

Mgmt Goals	Terrain Management Unit	Anticipated Regular Maintenance Activities	Maintenance Frequency
1	All Terrain Management Units	Communication and outreach with neighbors and stakeholders and integrate feedback in planning	Quarterly
2	All Terrain Management Units	Delineation and inspection of property boundary markers	One time (year-1) and when need arises
2, 3, 5	All Terrain Management Units	Inspection and repairs of: a. Fences, gates and stiles b. Roads and trails c. Signage	a. Annually b. Annually c. Annually
7	All Terrain Management Units	a. Change fencing to be wildlife friendly	a. Year 1 and annual inspection
9	All Terrain Management Units	a. Maintain trails, stiles, signs, benches, drainage crossings, and trash cans	a. Annually (after completion of improvements)
5, 6	Cultural resource areas (SP-CUL)	a. Install and maintain signage	a. Annually
6	Grasslands – esp. in the most southern triangular area (SP-GRA)	a. Thin juniper that encroached on grassland, and spread branches to cover soil, limit erosion, and protect artifacts	a. Years 1+2; and then once in 10 years
7	Grasslands (SP-GRA)	a. Thin juniper and pinon encroaching on grassland b. Spread branches to cover soil and reduce erosion c. Check and remove any noxious weeds d. Headcut stabilization and erosion control in rills	a. Annually (14 ac/yr) b. Annually (14 ac/yr) c. Annually d. Periodically (after year 2)
8	Grasslands (SP-GRA)	a. Inspect and repair fences b. Develop and manage restorative, managed grazing (limited acreage/yr) c. Deliberately rest selected acres	a. Annually b. Annually (after year 3) c. Annually
6	Woodlands – esp. in area of cultural resources (SP-WOO)	a. Removal of dead and leaning trees b. Thin trees and spread branches (lop & scatter) to cover soil against erosion and to protect artifacts	a. Every 5 years b. Years 1-5 (20-yr rotations)

Mgmt Goals	Terrain Management Unit	Anticipated Regular Maintenance Activities	Maintenance Frequency
7	Woodlands (SP-WOO)	a. Thin woodlands based on stewardship plan b. Spread branches to cover soil and reduce erosion	a. Annually (5 ac/yr) b. Annually (5 ac/yr)
7	Arroyo & Embankments (SP-ARR)	a. Inspection and brush removal that inhibits flow and causes bank erosion b. Erosion control and bank stabilization	a. Annually b. When needed (once in 5 y)

WOODLANDS

Woodland maintenance is a long-term need. Despite the presence of a considerable fuel load constituted by dead tree carcasses, there is no need for immediate maintenance. Erosion rates are low, except in a few locations where rills and gullies exist. The management planning team recommends that prior to beginning any woodland maintenance work, Santa Fe County develop a woodland stewardship plan aimed at grass cover improvement (as undergrowth beneath the woodland tree cover) and woodland stand management. A rotational thinning and soil conservation program with annual or biennial entries (of 4.5 acres or 9 acres respectively) in a 20-year rotation period would suffice to cover the entire 89-acre woodland area. Table 2 lists several recommended maintenance activities.

Table 2. Woodland Management and Restoration Needs, with Labor Estimates and Implementation Timelines and Prioritization.

LOCATION	MANAGEMENT ACTIVITY	AREA	FREQUENCY	LABOR
All woodlands	Development of a detailed woodland stewardship plan	90 acres	Once in 20 y	TBD, based on proposal
All woodlands	Cutting dead, dying, and low-vigor woodland trees (and maintaining a groupy/clumpy woodland structure)	90 acres	5 acres yearly, and returning every 18-20 y	5 days for one sawyer and one swamper
All woodlands	Spreading of dead & down and leaning woody debris (approx. 12.4 tons/acre)	90 acres	5 acres yearly, and returning every 18-20 y	5 days for two workers
Woodland-grassland edges	Thinning of juniper encroachment on the grasslands; thinning of juniper in the northern and southern edges of the woodland strips between the grasslands	10-15 acres	Once every 5 y	5 days for one sawyer and one swamper (incl. spreading)

GRASSLANDS

Grassland maintenance is a short-term to mid-long term need. This terrain management unit is prone to sheet flows, flooding, soil erosion, wildfire, and the proliferation of invasive plant species and noxious weeds. Burnable biomass fuel consists of dense patches of dead grasses, brush, and some isolated piles of dead wood. Additionally, there is considerable encroachment of woody plants (shrubs and juniper trees) onto the grassland. Together these conditions could bring a grass fire up into the woodlands. There are also several deep gullies and large headcut areas that will need to be stabilized in the next 5-10 years to prevent damage to artifacts and to any historical or new trails.

The planning team recommends that over time Santa Fe County considers the use of managed grazing as a grassland management tool to remove decadent, old grass clumps, prevent shrub regeneration, and improve native grass density. Additionally, a rotational plan for the removal of woody plants that encroach into the grasslands would help maintain the grassland ecosystem. Table 3 lists several recommended maintenance activities.

Table 3. Grassland Management and Restoration Needs, with Labor Estimates and Implementation Timelines and Prioritization.

LOCATION	MANAGEMENT ACTIVITY	AREA	FREQUENCY	LABOR
Valley in the northeastern sector of the SPOS	Thinning of brush and juniper encroachment in overgrown grassland	10-15 acres	Once, followed by regular upkeep every 5 years	One time 3 days for one sawyer and one swamper (incl. spreading)
All over the grasslands	Removal of dead shrubs and cacti & down and leaning woody debris (spreading to cover exposed soil)	70 acres	Once every 5 y	Initially about 5 days; then 1-3 days/yr for one sawyer and one swamper (incl. spreading)
All over the grasslands	Managed grazing for 4-5 years to remove dead grass and weedy plants (including long rest periods between grazing)	70 acres	Every year for 4-5 years and after that based on a grazing plan	2-3 months
Select locations	Headcut stabilization	5 sites; approx. 1 acre	One time and when needed	Based on design proposal

FENCING AND OTHER MAINTENANCE

Additional maintenance at SPOS includes periodic (mostly annual) inspections of fences, gates and stiles, and any infrastructure once it has been built. In the short term, some adjustments and repairs would be necessary on fences and on locations with serious soil erosion. Fence work includes regular repairs, adjustments for wildlife passage, and closures of fence openings and informal gates to the BLM property on the eastern boundary of the Open Space property.

A detailed overview of maintenance and repair activities is included in Tables 4 and 5. These tables will be available in spreadsheet format for convenient adjustments and tracking of maintenance and repair activities.

Table 4. Summary of Recommended Maintenance Activities for Year-1 for suggested Human Capacity Entities for Implementation.

Location Code	Management Activity	Location	Staff Prep	Volunteer Activity	SF County-M (Crew)	Contractor	Labor & Cost Items
Entire property	Fence inspection and repair	Entire property (N, E, and S sides only): approx. 7,500 lf (1.44 miles)	One time to establish standards and prescription				Annually: 3 days for 2-person crew
SP-WOO	Fence closures on East side	3 or 4 openings on east boundary: 20-25 lf	One time to establish standards and prescription and to choose form of labor source				One-time investment in posts and wire: possibly around \$500 in material and 2 days for 2-person crew
Entire property	Fence adjustments for wildlife	Entire property (N, E, and S sides only): approx. 7,500 lf (1.44 miles)	One time to formulate standards				5 days for 2-person crew; Costs TBD: Based on proposal (one-time investment); possibly around \$5,000
SP-GRA	Thinning out juniper and other shrubs that have encroached into grassland; and spreading branches for soil cover and erosion control	Grasslands	One time to establish protocols and methods				3-5 days/year for 1 sawyer and a swamper
SP-GRA, SP-WOO, SP-CUL	Cutting and removal of shrubs that have overgrown grassland in central-northeastern area alongside cultural site	Woodland/grassland	One time to establish protocols and methods				3 days/year for 1 sawyer and a swamper
SP-WOO	Cutting and removal of dead, dying, leaning, and low-vigor trees; and spreading branches for soil cover and erosion control	Woodlands	One time to establish standards and prescription				5 days/year for one sawyer and one swamper
SP-ARR	Inspection of arroyo banks for woody debris and bank erosion	Arroyo and embankments	One time to establish standards and prescription				1/2 day for one person
SP-ARR	Bank erosion stabilization	Arroyo and embankments	One time to establish standards and prescription				TBD: dependent on proposal

Table 5. Summary of Recommended Maintenance Activities for Different Time Periods.

Location Code	Management Activity	Location & Area Size	YR1	YR2	YR3	YR4	YR5	YR6-10	YR11-20	>YR20	Team	Logistical Needs	Labor & Cost Estimate
Entire property	Fence inspection and repair	Entire property (N, E, and S sides only): approx. 7,500 lf (1.44 miles)									SFC-M (Crew)	Notepad/GPS (Avenza), camera	Annually: 3 days for 2-person crew
SP-WOO	Fence closures on East side	3 or 4 openings on east boundary: 20-25 lf									SFC-M (Crew) or volunteers	Fencing supplies	One-time investment in posts and wire: possibly around \$500 in material and 2 days for 2-person crew
Entire property	Fence adjustments for wildlife	Entire property (N, E, and S sides only): approx. 7,500 lf (1.44 miles)									Contractor or SFC-M (Crew)	Fencing supplies	5 days for 2-person crew; Costs TBD: Based on proposal (one-time investment); possibly around \$5,000 depending on material and labor costs and special features
Entire property	Inspection of roads, trails, stiles, signage, benches, etc.	Entire property									Contractor or SFC-M (Crew)	Notepad/GPS (Avenza), camera	TBD; once trails and signs are installed; no short-term need
SP-GR	Thinning out juniper and other shrubs that have encroached into grassland; and spreading branches for soil cover and erosion control	Grasslands									SF County Fire Crew	Woodland management tools	3-5 days/year for 1 sawyer and a swamper
SP-GRA, SP-WOO, SP-CUL	Cutting and removal of shrubs that have overgrown grassland in central-northeastern area alongside cultural site	Woodland/grassland									SF County Fire Crew	Woodland management tools	3 days/year for 1 sawyer and a swamper
SP-WOO	Cutting and removal of dead, dying, leaning, and low-vigor trees; and spreading branches for soil cover and erosion control	Woodlands									SF County Fire Crew	Woodland management tools	5 days/year for one sawyer and one swamper
SP-GRA	Managed grazing (oversight)	Grasslands									Contractor	Community notification	Annually in the first 3-5 years; after that every 5 years
SP-GRA	Headcut stabilization and erosion control	Grasslands									Contractor		After year-2, based on cost proposal
SP-GRA	Weed management	Grasslands									Contractor		When necessary, based on cost proposal
SP-ARR	Inspection of arroyo banks for woody debris and bank erosion	Arroyo and embankments									SFC-M (Crew)	Notepad/GPS (Avenza), camera	0.5 days/year, annually
SP-ARR	Bank erosion stabilization	Arroyo and embankments									SFC-M (Crew) or contractor	TBD	When necessary, based on cost proposal

SP-GRA = Grassland, Pasture Unit

SP-WOO = Woodland Unit

SP-CUL = Cultural Resource Unit

LP-ARR = Arroyos Unit

INSPECTIONS, MONITORING, AND ADAPTIVE MANAGEMENT

Effective maintenance must be grounded in scheduled, periodic field inspections and a rigorous monitoring schedule. Findings from inspections and monitoring must lead to a confirmation of scheduled maintenance, and to specifications and adaptations in the scope and scale and timing of maintenance work. It may also lead to changes in the identification of who should do the maintenance work. Eventually, inspections and monitoring lead to adaptive management of the Open Space property and to lessons learned for all involved. This collaborative learning process will likely have both a practical aspect and an aspect of community building as the interaction of learning together may contribute to people's appreciation for the area and for the different people involved. The latter is important to grow people's interest, care, and respect for the place, and their support for recurring maintenance work.

Inspection Protocols

County staff must establish a regular inspection schedule based on the recommended maintenance tasks and their recommended inspection frequency as described above. Inspections follow a protocol by filling out an inspection form. Information is gathered by using all the senses and if possible by speaking with neighbors, users, or passersby. Santa Fe County already has an adequate inspection form. A template inspection protocol that outlines the communication and verification process and adaptive management for inspections is included in Appendix A.

Monitoring

Monitoring is the rigorous practice of documenting or measuring specific landscape features to verify whether a change of certain indicator factors is achieved or whether threshold levels of indicators are exceeded. Analysis of monitoring data will help ascertain whether the measured or observed changes are meeting management goals or not.

Monitoring can be done by taking photographs at very specific locations and comparing a time series of photographs at each photo point to detect change. Monitoring can also be done by taking specific measurements or documenting qualitative field observations on data logs.

Monitoring work must be based on a study design of the monitoring process, based on selected indicators which, in turn, reflect progress toward a stated goal. Therefore, monitoring protocols are goal and site specific, and it is not useful to present templates of monitoring protocols. However, there are monitoring Best Management Practices, such as those developed for the US Forest Service Collaborative Forest Restoration Program (CFRP), or for EPA and NRCS funded stream measurements. A selection of monitoring BMP references is included in the Santa Fe County Open Space Management Planning Guide.

Adaptive Management: Identifying Choices and Making Decision:

Feedback from inspections and monitoring will offer information that needs to be compared with goals and objectives for the property in order to decide whether the information points

toward progress in meeting goals and objectives or not. No action is needed in most cases if the information supports management goals. However, if the information indicates that the situation in the field is deviating from management goals, choices will have to be made about appropriate action.

Depending on the seriousness of the deviation of terrain conditions from management goals, a choice can be made to deliberately defer maintenance activities and letting nature take its course. This choice may be relevant if a triage or allocation of County resources is necessary to determine where maintenance efforts should be focused, or if County staff would like to experience what the consequences are of deferring maintenance.

Alternatively, County staff will want to make adjustments to either the management goals or to the terrain conditions by organizing maintenance or repair activities. It is useful to evaluate findings in a group of stakeholders and experts in order to learn from each other's viewpoints and arrive at a well-thought-out and broadly supported solution for corrective action. Such an approach also offers optimal collaborative learning opportunities and ensures strong, broadly carried stewardship over time.

LABOR REQUIRMENTS AND CAPACITY BUILDING

FTEs

The recommended maintenance and repair work for SPOS would require 0.09-0.15 FTE each year for regular maintenance, and up to 0.39 FTE annually of planning staff time for planning, coordination, and community outreach. Additionally, it would require 0.18 FTE each year of the County Fire Crew time.

Santa Fe County Capacity

The maintenance work identified in this Maintenance Plan for SPOS will require capacity building among Santa Fe County staff and among volunteers who assist staff with plan implementation. The planning team recommends that capacity building includes:

1. Expansion of County maintenance staff to meet the required FTEs for SPOS maintenance.
2. Workshops and training for higher management on (a) strategies and methods of capacity building, continued education, and leadership development (for planning and oversight staff, supervisors, and crew); (b) content matter aspects of Open Space management, such as agricultural program development, interpretive planning, cultural resource preservation, trail and road management, vegetation management, soil & water conservation, etc.; and (3) the use of electronic (IT) tools, including GIS, for terrain management, labor allocation, budget control, and public outreach services.
3. Staff and crew training workshops, seminars, conferences, and literature on Best Management Practices (BMPs). Essential BMPs for maintenance of SPOS would include:

- a. Vegetation management, including botany and native plants, thinning, pruning, planting, mowing, etc.
 - b. Grazing management and grassland restoration
 - c. Integrated Pest Management, including approaches to weed control, invasive animal management, pathogen/vector management (e.g., mosquitoes)
 - d. Wildlife management
 - e. Soil and water conservation (erosion control, water quality improvement)
 - f. Trail and road management and drainage
 - g. Access management: Fencing, gates, stiles, and signage
 - h. Cultural resource conservation protocols
 - i. Inspections and monitoring
4. Collaborative collection and review of periodic inspection reports and monitoring reports, and joint analysis and discussion of corrective action needed or changes in management.
 5. Staff training and guidance for managing community volunteers and site stewards, contractors, contracts and leases aimed at supporting field assessments, maintenance and repair at the Open Space properties.

Community Outreach and Engaging Volunteers

Santa Fe County has more Open Space, Parks and Trails assets and associated maintenance needs than it will likely have staff capacity and funds to address them. Therefore, and also in order to grow community buy-in and stewardship of the Open Space properties, Santa Fe County needs to strengthen its community outreach and volunteer engagement services.

Potential Volunteers

SPOS has a diverse spectrum of community stakeholders that are interested in the property and that Santa County can mobilize for volunteer stewardship work. These stakeholder groups include:

- a. Immediate neighbors and members of the San Pedro Neighborhood Association
- b. Local youth (e.g., East Mountain High School or San Antonio Elementary School in Sandoval County)
- c. The East Mountain Regional Trails Council
- d. The Turquoise Trail Preservation Trust
- e. The Turquoise Trail Regional Alliance
- f. Equestrian groups in the area
- g. Local livestock owners
- h. Local mining and prospecting groups and individuals
- i. Pueblos, such as Santa Ana Pueblo and San Felipe Pueblo
- j. Area schools and their students
- k. Any regional conservation groups, hiking and outdoor organizations, and other entities that could become interested in the SPOS – however, the involvement of such outside

groups must be discussed first with local stakeholders in order to ensure good working relationships

Volunteer Maintenance Activities

Maintenance activities that are particularly suitable to be conducted with support from (small) groups of volunteer stewards include:

- Maintenance of stiles, fence repair and fence adjustments for wildlife
- Removal of dead wood and woody debris in grasslands
- Trail maintenance, drainage management, and erosion control around old and new trails (if/when established)

The planning team recommends that volunteer activities are conducted according to a regular schedule to establish precedent, leading to an accountable system that after several years may even become a “tradition”. In this way, people will look forward to the maintenance events, and the events become part of the community calendar or the annual schedule of the volunteer groups. These activities also ensure periodic face to face contact between County staff and volunteer stewards. The more the activities include a sense of celebration, fun, sharing, and play, besides getting good work done that builds pride, the more participants will enjoy the events and return any next time.

Community Liaisons

Besides developing volunteer stewardship engagement, it may prove essential to cultivate a couple of community liaisons that can serve on a rotational basis to communicate with Santa Fe County staff and help mobilize and direct volunteer stewards. Santa Fe County already recognized the EMRTA and the San Pedro Neighborhood Association as informal liaisons. However, it would be important to clarify and formalize these relationships and perhaps identify any alternates that could support these groups.

County Point Person

Volunteer activities need to be diligently prepared and coordinated to ensure participant safety, work effectiveness, and general enjoyment by all. It will be essential that Santa Fe County identify a staff member for SPOS who serves as the designated point person in the communication with the community liaisons and stewardship volunteers. This staff person would be in charge of fielding questions and alerts from the community, communicating messages from Santa Fe County, and organizing any volunteer stewardship events. This staff person also would need to identify and mobilize, when necessary, any technical experts, either in the community, within Santa Fe County staff, or among contractors, to assist with technical guidance and quality control before, during and after the volunteer stewardship events. Additionally, this person would be in charge of planning and coordination between staff and maintenance crew to assist and to provide equipment and supplies, such as fencing materials and baling wire or twine, or plant stock, soil amendments, mulch, and stone material. This staff

person would also be responsible for any safety instructions and for ensuring that people work in a safe manner and have adequate protective gear.

Finally, Santa Fe County will need to develop a repository of tools, protective gear and supplies to provide during work days. Systems would need to be developed to account for tools and gear that is handed out, and a crew member or the County point person for the community would need to be in charge to account for the supplies and tools at the end of the work day.

APPENDIX A: Santa Fe County Open Space Inspection Checklist - San Pedro OS

Inspected by: _____

Date: _____ Time: _____

Item to be Checked Use a separate page to describe the necessary repairs	OK or FIX = needs work	Comments (corrective action or work needed, who needs to be contacted)
Monthly		
Exterior Fence condition		
Santa Fe County Open Space Signage		
Signs of garbage or illegal dumping		
Signs of illegal off-road vehicle use		
Gates or open stile entrances		
Annually		
Headcuts in arroyos are not advancing		
Woody invasive plants are not increasing		
Banks in main arroyo are stable		

APPENDIX E: YEAR 1 PROJECTS

APPENDIX E: Maintenance, Stewardship, and Restoration Projects for Year-1

List of Terrain Management project activities for year-1 aimed at land health restoration.

Location Code	Management Activity	Location	Staff Prep	Volunteer Activity	SF County-M (Crew)	Contractor	Labor & Cost Items
SP-GRA	Thinning out juniper and other shrubs that have encroached into grassland; and spreading branches for soil cover and erosion control	Grasslands	One time to establish protocols and methods				3-5 days/year for 1 sawyer and a swamper
SP-GRA + SP-WOO	Cutting and removal of shrubs that have overgrown grassland in central-northeastern area alongside cultural site	Woodland/grassland	One time to establish protocols and methods				3 days/year for 1 sawyer and a swamper
SP-WOO	Cutting and removal of dead, dying, leaning, and low-vigor trees; and spreading branches for soil cover and erosion control	Woodlands	One time to establish standards and prescription				5 days/year for one sawyer and one swamper
SP-ARR	Bank erosion stabilization	Arroyo and embankments	One time to establish standards and prescription				TBD: dependent on proposal

List of Terrain Management maintenance and stewardship activities for year-1 aimed at land health maintenance

Location Code	Management Activity	Location	Staff Prep	Volunteer Activity	SF County-M (Crew)	Contractor	Labor & Cost Items
SP-all TMUs	Fence inspection and repair	Entire property (N, E, and S sides only): approx. 7,500 lf (1.44 miles)	One time to establish standards and prescription				Annually: 3 days for 2-person crew
SP-all TMUs	Fence closures on East side	3 or 4 openings on east boundary: 20-25 lf	One time to establish standards and prescription and to choose form of labor source				One-time investment in posts and wire: possibly around \$500 in material and 2 days for 2-person crew
SP-all TMUs	Fence adjustments for wildlife	Entire property (N, E, and S sides only): approx. 7,500 lf (1.44 miles)	One time to formulate standards				5 days for 2-person crew; Costs TBD: Based on proposal (one-time investment); possibly around \$5,000
SP-ARR	Inspection of arroyo banks for woody debris and bank erosion	Arroyo and embankments	One time to establish standards and prescription				1/2 day for one person

SFC CLERK RECORDED 10/12/2016



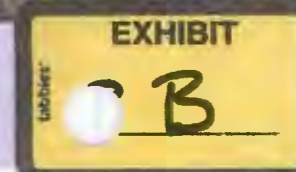
SANTA FE COUNTY OPEN SPACE AND TRAILS PROGRAM

LA CIENEGUILLA OPEN SPACE MANAGEMENT PLAN

FINAL DRAFT
SEPTEMBER 13, 2016



Ecotone



ACKNOWLEDGMENTS

The planning team acknowledges the support and insights offered by the 2015-2016 Santa Fe County Board of Commissioners.

Henry Roybal– District 1

Miguel Chavez – District 2

Robert Anaya – District 3

Kathleen Holian – District 4

Liz Stefanics – District 5

Furthermore, the planning team wishes to acknowledge the support and insights offered by the County Open Lands, Trails, and Parks Advisory Committee (COLTPAC).

The extensive knowledge, effort and guidance from the County Open Space and Trails (OS&T) planning, project development, and maintenance staff was invaluable in developing this plan.

Maria Lohmann, OS&T Senior Planner,

Paul Olafson, Planning Projects Manager

Erin Ortigoza, Senior Community Planner

Colleen Baker, OS&T Project Manager

Shane Martinez, OS&T Lead Maintenance Technician

More than forty people participated in the stakeholder input process for the Plan. Stakeholder input was particularly important in the planning process to confirm the network of stakeholders, identify critical land conservation issues, understand complicated land and water management practices in the area, formulate a vision for the property, identify preferred land uses and management activities, verify Management Plan priorities, and obtain feedback on draft management plan language.

The planning team obtained stakeholder input in a variety of ways:

- Meetings, telephone interviews, e-mail communications, and field walks with approximately six key-informants in the community
- Three community meetings, two of which at the La Cienega Community Center and one at El Rancho de las Golondrinas Meeting Room; between 12 and 30 people participated in each of the meetings
- A public review and input process of the public review draft version of the Management Plan; comments were summarized in a table and responses were formulated behind each one of the comments; eight people submitted written comments on the Draft Management Plan.

The La Cieneguilla Open Space Management Plan was developed by a planning team led by Ecotone. The Ecotone planning team included:

Ecotone / team lead, ecologist

Jan-Willem Jansens

The Community Store / facilitator

Carl Moore, Jessie Lawrence

River Source / ecological planner

Richard Schrader, Carlos Herrera

Surrounding Studio / land planner

Faith Okuma , Sandra Donner,

Earth Analytics, Inc./ GIS planners

Wetherbee Dorshow, Tonya Fallis,

Kim Kearns

TABLE OF CONTENTS

1.0 Introduction	
1.1. Plan Purpose and Need	1
1.2. Property Description	2
1.3. Management Plan Development Process	4
2.0 La Cieneguilla Open Space Management Plan	
2.1. A Vision + Goals for La Cieneguilla Open Space	7
2.2. Monitoring, and Information Management	9
2.3. Conceptual Master Plan	13
2.4. Community Relations	20
2.5. Terrain Management	23
2.6. Plan Implementation and Financing Mechanisms	26
LA CIENEGUILLA OPEN SPACE APPENDICES	
APPENDIX A: Overview of Management Activities	
APPENDIX B: A Field Characterization for the La Cieneguilla Open Space Property Santa Fe County, New Mexico - An Existing Conditions and Inventory Report	
APPENDIX C: Maintenance Plan for La Cieneguilla Open Space	
APPENDIX D: Maintenance, Stewardship, and Restoration Projects for Year-1	





EXECUTIVE SUMMARY

La Cieneguilla Open Space (LCOS) is a 150 acre County Open Space property in the traditional community of La Cieneguilla. This property was the first Open Space purchased by the Open Space Program in 2000 as an undeveloped gateway buffer to La Cieneguilla. It provides conservation of wildlife habitat, recreational and educational opportunities, as well as a connection to cultural resources on public lands.

The acquisition of this property was strongly supported by the residents of La Cieneguilla and La Cienega for the preservation of its scenic beauty, rural landscape attributes, diverse natural resources, connection to public lands, and its potential for education and outdoor recreation.

The goal of the La Cieneguilla Open Space Management Plan is to provide practical and effective management steps to maintain and enhance the natural beauty and ecosystem function of La Cieneguilla. This plan was developed in collaboration with community members, adjacent property owners, and Santa Fe County staff. The plan has received strong support from residents of La Cieneguilla and La Cienega.

La Cieneguilla Open Space includes important wildlife habitat as well as a rich variety of flora and fauna. Challenges for managing this site include: holistic riparian system maintenance, environmental restoration, protection of dryland soils, wildlife habitat, appropriate access, and hazard mitigation. The property's ecological and cultural resources are impacted by natural processes and inconsistent maintenance. Current threats include flooding and erosion, potential for wildfire, proliferation of invasive plant species, and degradation of grassland. This management plan was developed to preserve, protect and restore the property's valued resources. The plan outlines the vision, regular and scheduled maintenance activities, land improvement priorities, and stakeholder involvement in land stewardship.

The LCOS Management Plan identifies short-term, mid-term, and long-term management priorities for the property. The short term phase focuses on ecological restoration and maintenance activities related to flood and erosion control, public safety, and site cleanup. In the mid- to long- term, Santa Fe County will work with community stakeholders to develop educational and recreation opportunities at LCOS in order to utilize the open space in a way that benefits the community while preserving and protecting the land.

The Management Plan for LCOS emphasizes the importance of collaboration regarding stewardship, conservation, and development of this property in the short- and mid- to long- term phases. The plan identifies several opportunities for active public participation in stewardship activities to enhance preservation and restoration of the property to reach the vision for La Cieneguilla Open Space.





Figure 1. View of La Cieneguilla Open Space - from south looking to north Source: Google Earth

This Management Plan for the La Cieneguilla Open Space was developed with community members, neighbors, property owners and other stakeholders from La Cieneguilla and La Cienega valley area.

The planning team worked with participants to formulate a vision for the La Cieneguilla Open Space and to verify the final plan components and priorities.

1.1. Plan Purpose and Need

The La Cieneguilla Open Space (LCOS) Management Plan was developed between June 2015 and May 2016. Along with the Management Plan, a Field Characterization Report, a detailed Maintenance Plan, and a Planners' Guide for County staff accompany this plan. The Planners' Guide includes technical planning methods, approaches to County capacity building, best management practices (BMPs), and recommendations for plan implementation.

The LCOS Management Plan outlines a planning direction and specific action priorities for short-term, mid-term, and long-term phases. The Plan was written for Santa Fe County policy makers, staff, community stakeholders, and site stewards with the purpose to:

- Describe the vision, goals, and objectives for management of the property;
- Help staff and the public understand terrain conditions and suitability of the land for different uses of the property;
- Clarify priorities for site restoration and maintenance;
- Identify projects for future investment and financing mechanisms to fund them;
- Streamline management protocols within Santa Fe County.

The Plan was developed in response to a recommendation from the County Open Lands, Trails, and Parks Advisory Committee (COLTPAC) and with clear and strong support for enhanced management of open space properties from the Board of County Commissioners (BCC). The Plan arose from a growing need for:

- A strategic management plan that includes community outreach, a conceptual master plan, funding analysis, and maintenance plan to direct County staff in managing LCOS;
- A strong vision with clear objectives and strategies for resource conservation, agricultural preservation, passive recreation, and public access;
- An overview of existing conditions and a site-specific inventory report;
- A detailed maintenance plan with recommendations for labor and equipment needed;
- A concept plan that identifies, prioritizes and estimates timing and costs for key projects;
- An analysis of potential funding mechanisms to implement the plan.

LCOS Management Plan Need

The need to develop a Management Plan for LCOS has been a high priority because of a variety of ecological and functional site conditions that require systematic attention and consistent maintenance and resource management. Notably, local community members have raised management concerns about the Santa Fe River portion of the LCOS as well as about access limitations and the use of the grassland portion of the property. Maintenance needs have been accumulating and have led to the need for several ecological and infrastructure restoration projects.

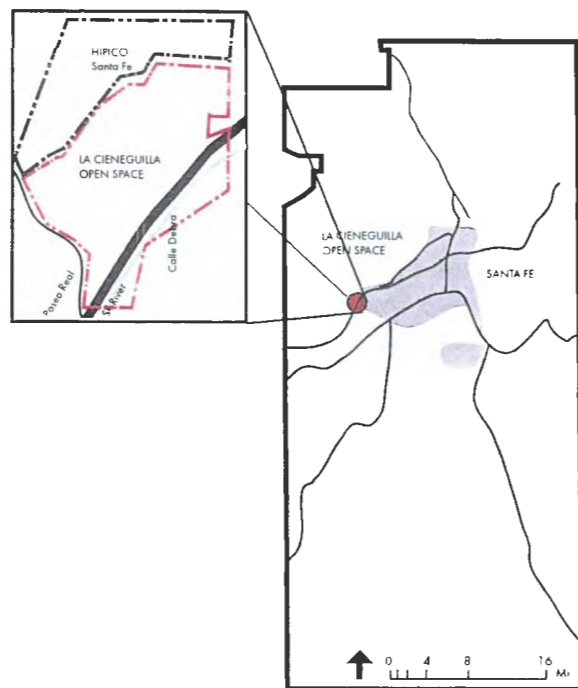


Figure 2. Location Map - La Cieneguilla Open Space

1.2. Property Description

La Cieneguilla Open Space (LCOS) is a 150-acre County Open Space property along the Santa Fe River in La Cieneguilla, just west of the City of Santa Fe (Figure 2). Paseo Real (County Road 56) runs through LCOS from the north to the south following the banks of the Santa Fe River. The LCOS is bordered on the east side by the Santa Fe Airport and the Calle Debra subdivision. On the north and northwest side is HIPICO Santa Fe (previously the Santa Fe Horse Park). On the west and south sides is land managed by the Bureau of Land Management (BLM). Separating the site from the BLM property is County Road 56C.

Santa Fe County purchased the LCOS as one of its first Open Space properties from a corporate land development partnership of private landowners in 1999. The purchase did not include any water rights. Another portion of the land owned by the land development partnership located to the west of the LCOS was purchased by the BLM.

LCOS property includes natural resources associated with the Santa Fe River and with grasslands and former fields on old river terraces. The area includes a well-developed riparian ecosystem and valuable wildlife habitat and corridors. After the completion of a riparian restoration project in 2006, the riparian area has gained importance as a wildlife migration corridor and habitat for beaver. Anecdotal wildlife observations point at the presence of rodents, raptors, coyotes, and mule deer in the grassland and riparian area of the LCOS. It is likely that the area is also a pathway for bobcat, mountain lion, foxes, and bear, and that it is important habitat for bats, insects, and a variety of reptiles and amphibians. The riparian area is potential habitat of the Southwest willow flycatcher, a federally listed species, although no surveys have been conducted to confirm this. Ecologically the LCOS is an extension of the BLM's Area of Critical Ecological Concern (ACEC). Santa Fe County has developed ongoing communication with BLM regarding ecological management coordination. Additionally, Santa Fe County participates in the Santa Fe River Traditional Communities Collaborative regarding management of the Santa Fe River Corridor.

LCOS is near the center of what used to be the La Cieneguilla Land Grant. It is located north of the historic settlement of La Cieneguilla and close to many prehistoric cultural sites. However, no cultural resources are known to exist on the property. LCOS shares cultural resource management concerns with the BLM lands to the west. Those lands are managed under the BLM's West Santa Fe – Cieneguilla Special Recreation Management Area and include sites also under the Galisteo Basin Archaeological Sites Protection Act of 2004. The LCOS includes an alignment of the El Camino Real de Tierra Adentro National Historic Trail which has shared management responsibilities through the National Park Service and BLM.

LCOS is also a desired location for potential future recreational facilities for local residents as well as for ongoing education and research programs about the area's unique ecological and historical characteristics. The property's recreational potential is supported by its location in proximity to neighborhoods that are not served with any recreational facilities and by its ecological, historical and scenic qualities. The upland area offers 360-degree views of the Santa Fe County landscape and the rural setting of the former La Cieneguilla Land Grant. The LCOS includes only one publicly accessible trail that runs along the left bank of the Santa Fe River on the east side of the property. However, this trail dead ends on the southern end of the property. The larger western part of the property dominated by grasslands is not open to the public. The property is fenced with 4- and 5-strand barb-wire fencing, and includes some interior fencing as well. Except in a few locations where the fence is broken, fences are in moderate to good condition.

This Plan is informed by a landscape assessment which was completed in early 2016. The report documents the riparian and wetland conditions along the Santa Fe River at LCOS and conditions on the grasslands and the Arroyo de las Calabasas (*APPENDIX B*).

Current conditions constitute several needs for resource protection and restoration. Threats to the property's resources include:

- Flood risks in the Santa Fe River area of the property, including damage to infrastructure;
- Ongoing public safety hazards related to old construction debris and mixed waste dumps along the Arroyo de las Calabasas;
- Soil loss risks from water and wind erosion on grasslands and on river banks; the area colonized with juniper trees shows signs of soil erosion and poor plant diversity and cover;
- Slow proliferation of invasive exotic plants, such as Russian olive and Siberian elm, in the riparian area and widespread infestation of *Kochia* spp. on degraded grassland areas;
- Wildfire risk in the dense and dried out areas of the Santa Fe River area as well as on the grasslands.

Several of these management concerns were expressed by diverging stakeholder viewpoints about the desired future condition and associated management of the riparian area. While certain groups favor the conditions that have evolved after riparian restoration around 2006 and the subsequent beaver activity in the riparian area, other stakeholders are concerned that the current ecological conditions in the riparian area reduce the volume of water available for irrigation downstream. Additionally, current ecological conditions require maintenance and restoration to prevent damage from flooding, bank erosion and wildfire.

A management concern for the future development of the upland area of the LCOS is the potential public safety hazard and ecological degradation associated with the dump sites of construction debris and mixed waste along the Arroyo de los Calabasas. These management concerns are exacerbated by the rare chance of serious flooding in the arroyo along with pollution from horse bedding, manure, and solid waste dispersing from HIPICO Santa Fe into the arroyo and onto the already contaminated and degraded grasslands downstream.

While no dumping has been occurring the arroyo in recent years, the current waste piles include objects, holes and sharp protruding material that could injure open space users. It is unknown whether the waste includes any hazardous materials. The waste piles also cause gully and bank erosion along the arroyo. The piles are also likely habitat for rodents and snakes.



Photo 1. Views looking south from La Cieneguilla Open Space



Photo 2. Debris piles in large arroyo



Photo 3. Existing unpaved trail on east side of Santa Fe River

1.3. Management Plan Development Process

The planning process was informed by the initial goals for the acquisition of the property and a set of planning principles. The planning principles were formulated based on public input and management conditions within Santa Fe County.

INITIAL GOALS FOR ACQUISITION

- Buffer suburban expansion from the City of Santa Fe
- Offer access to BLM sites for interpretive education
- Conservation of water for acequias (downstream)
- Conservation of wildlife habitat
- Conservation of cultural resources
- Create recreational open space for adjacent subdivisions and regional residents coming from urban and rural areas

PLANNING PRINCIPLES

- Adhere to goals and purpose of Open Space program.
- Ensure public access and safety.
- Keep maintenance needs to a minimum (commensurate to County capacity and community-based stewardship support).
- Minimize needed investments related to master planning.
- Minimize the disturbance of cultural and ecological resources.
- Identify and enhance opportunities for agricultural use of Open Space properties.
- Involve youth and create educational opportunities.

The planning process included three phases:

Scoping and Reconnaissance Phase

- Interviews with key stakeholders, community members, and County staff to develop an initial understanding for engaging the community in the management plan process.
- Review of relevant Santa Fe County plans and policies.
- Site visits to identify specific research needed for this management plan.
- The first public input meeting to develop an initial community vision for the site.

- Follow-up interviews with key stakeholders and community members to refine the approach for the second public input meeting.
- Research on topics identified in the Scoping and Reconnaissance phase.
- Additional site visits to confirm terrain management units and collect data for a land suitability assessment and the development of management recommendations.
- Mapping of findings of the Scoping/Reconnaissance and Research phases.

Planning Phase

- The second public input meeting to present research and land suitability findings and formulate ideas for management of the property.
- Writing the first draft of the management plan.
- Interviews and reviews with County staff to confirm plan coordination and implementation opportunities.
- The third public meeting to confirm the draft vision statement and goals and review the major components of the draft management plan.
- Final draft management plan for review and the approval process.

Information Management

Santa Fe County will gradually streamline and enhance the procedures that help staff acquire, store, and share knowledge that is essential for effective resource management of LCOS. Recommendations about County capacity building, knowledge development, information management, plan updates and community involvement methods are described in the Planners' Guide.

Plan Updating

This plan is a living document which will be updated and amended when necessary. The scope of the plan is approximately 15-20 years. Plan information is specific for the short-term (years 1-5), descriptive for the mid-term (years 6-10), and preliminary for the long-term (year 11 and beyond).

Changing community needs, terrain conditions, and County management capacity will inevitably lead to the need for plan adjustments. Priorities and timelines may shift, and objectives for planned projects, maintenance activities, and community relations may change or expand. Following completion and assessment of actions beyond the mid-term span of this plan (10-15 years), this plan may need a thorough updating.





*This section describes the La Cieneguilla Open Space vision, the **management** goal and specific site **management** objectives.*

Included are recommendations for monitoring and information management, a conceptual master plan with key projects, community stewardship, terrain management, and funding options.

2.1. A Vision + Goals for La Cieneguilla Open Space

Vision Statement

The La Cieneguilla Open Space vision statement is based on responses from community meeting participants to questions that asked “What would “good” look like?”, “What do you want for the future of this place?”, “What might other people think would be good for this site, but you don’t?”, and “What would worry you if it happened on the site?” The draft vision statement was shared and verified with community members at the third community meeting.

La Cieneguilla Open Space Vision Statement

In 2025, the La Cieneguilla Open Space (LCOS) is a healthy ecosystem with native grasslands, a flowing river, clean water, irrigation water, and high-quality native wildlife habitats. Wildlife pathways connect to the larger landscape. The open space is managed holistically so that the land and water resources are protected, monitored, and maintained; the cultural resources are protected; and there are educational opportunities for the public to learn about the land, water, ecology, human history, and past and current uses of the place.

The LCOS may include one or more trails, including a trail to improve the safety of walkers and bikers. The area may include family-friendly, safe outdoor recreation opportunities for neighborhood residents and their children. It may also include agricultural activities that protect and regenerate the grasslands.

Local residents, especially youth, are actively involved in the maintenance and stewardship of LCOS.

La Cieneguilla Open Space Management Goal

Based on the vision statement, the central management goal for LCOS is:

Santa Fe County and the community of the Santa Fe River valley around La Cieneguilla collaboratively maintain and enhance the land and water resources of LCOS for wildlife, recreation, education, and other low-impact uses. LCOS is managed in such a way that opportunities are developed gradually for interpretive education, research and public education, and low-impact recreational uses by neighborhood families and the public, at a scale that requires little maintenance, encourages local community stewardship, and protects the land and water.



Photo 4. Pond leveler on section of Santa Fe River



Photo 5. Northern boundary with HIPICO Santa Fe



Photo 6. Waste accumulation from HIPICO Santa Fe on LCOS grassland

Management Goals + Objectives

La Cieneguilla Open Space Specific Management Objectives

Specific management objectives in support of the vision and the central goal are:

1. **Holistic & Neighborly.** Manage the property in a way that the different values and objectives are balanced holistically (and not one despite another), and that improvements and changes are introduced in a gradual way, and seek and maintain working relationships with neighbors and other local stakeholders
2. **Public Safety.** Enhance public safety for example, by cleaning up old waste dumps, maintaining appropriate fencing of flood zones and steep slopes, and developing a trail along Paseo Real.
3. **Access.** Control access by managing roads, trails, fences, gates, stiles, river crossings, and signage
4. **Natural Appearance.** Maintain the area's natural appearance, sweeping scenic views, and cultural-historical qualities, keep maintenance limited, and maintain a rural, natural visual quality by using natural design principles and natural materials, and by choosing deliberately when to let nature run its course
5. **Education.** Provide and maintain interpretive education, and explore and use educational and research opportunities
6. **Infrastructure.** Develop basic infrastructure such as community gathering areas and play areas that are as natural and low-maintenance as possible
7. **Ecological Health.** Maintain the ecological health, resilience, and productivity of the LCOS uplands and riparian area, and maintain wildlife habitat qualities and connectivity across the landscape
8. **Grazing.** Explore and use – when appropriate – managed, restorative grazing practices (and rest periods) as a way to improve grassland health and respond to the need to develop an agricultural use for County Open Space properties
9. **Grasslands.** Evaluate the removal of some junipers to improve the regeneration of the grasslands while maintaining visual benefits

Management Objective #1 is Holistic & Neighborly management. Management of the LCOS property will need to be done in coordination with activities and conditions on the adjacent properties.

Santa Fe County acquired the LCOS to preserve the character of this part of the Santa Fe River valley as well as to conserve wildlife habitat, water resources, and the cultural resource heritage of nearby prehistoric settlements and the historic La Cieneguilla Land Grant. Another original goal was to offer access to adjacent BLM lands to enhance interpretive education options about the area's cultural heritage. Santa Fe County, the BLM, and local stakeholders acknowledge that the LCOS is connected to the surrounding landscape.

Santa Fe County acknowledges the many connections that LCOS has with the surrounding properties, the Santa Fe River, and beyond. The long-term success of the Plan will require coordination and collaboration with adjacent property owners, community stakeholders, wildlife-river advocates and the BLM.

2.2. Monitoring, and Information Management

Monitoring

To ascertain that progress is made toward achieving management goals, County staff together with local community partners will periodically monitor certain indicators of progress (Table 1).

A basic set of monitoring activities for LCOS includes first tier of three measurements for which a base-line of data was established during the management planning process. These proposed first tier monitoring activities are numbered and their locations are indicated by number on a TMU map (Figure 3). A second tier consists of 7 additional monitoring activities that Santa Fe County staff may conduct in the future if staff time and budget allow. Locations for these second tier activities will need to be established later.

Based on the monitoring overview described below, and as part of plan implementation, Santa Fe County staff will develop a detailed monitoring plan. A detailed monitoring plan enables staff and stakeholders to track progress made toward specific goals and objectives. Ideally, the monitoring plan will be updated annually with community members and stakeholders.

A detailed monitoring plan specifies how the indicators will be measured or documented, when and where this will be done, who will do, and what equipment or supplies are needed. Additionally, a detailed monitoring plan will establish or estimate numerical thresholds and conditions that serve to indicate whether corrective action will be needed.

Base-line methods and findings are described in "A Field Characterization for the La Cieneguilla Open Space Property Santa Fe County, New Mexico - An Existing Conditions and Inventory Report" (2016). Methods for additional monitoring activities are in a list of BMPs in the Planners' Guide.



Photo 7. Woody debris in Santa Fe River



Photo 8. Interior view of juniper rows north of Poseo Real



Photo 9. Embankment and concrete piles in Arroyo de las Calabasas

MONITORING LOCATIONS MAP

Monitoring Example

To maintain or improve the ecological health, resilience, and productivity, and wildlife habitat and connectivity along the Santa Fe River, a simple monitoring could be done by setting baseline levels of (a) native vegetation cover, (b) presence of non-native plant species, (c) the amount of dead wood material, or (d) the diversity of animal species in the riparian unit, using data from a selected monitoring year. Corrective action would be taken if monitoring shows that conditions have declined in relation to the baseline conditions. Causes for the impairment would be researched and addressed. This might mean that non-native plant species or dead woody material need to be removed, or that access, forage, shelter, water, or predation conditions for wildlife need improvement.

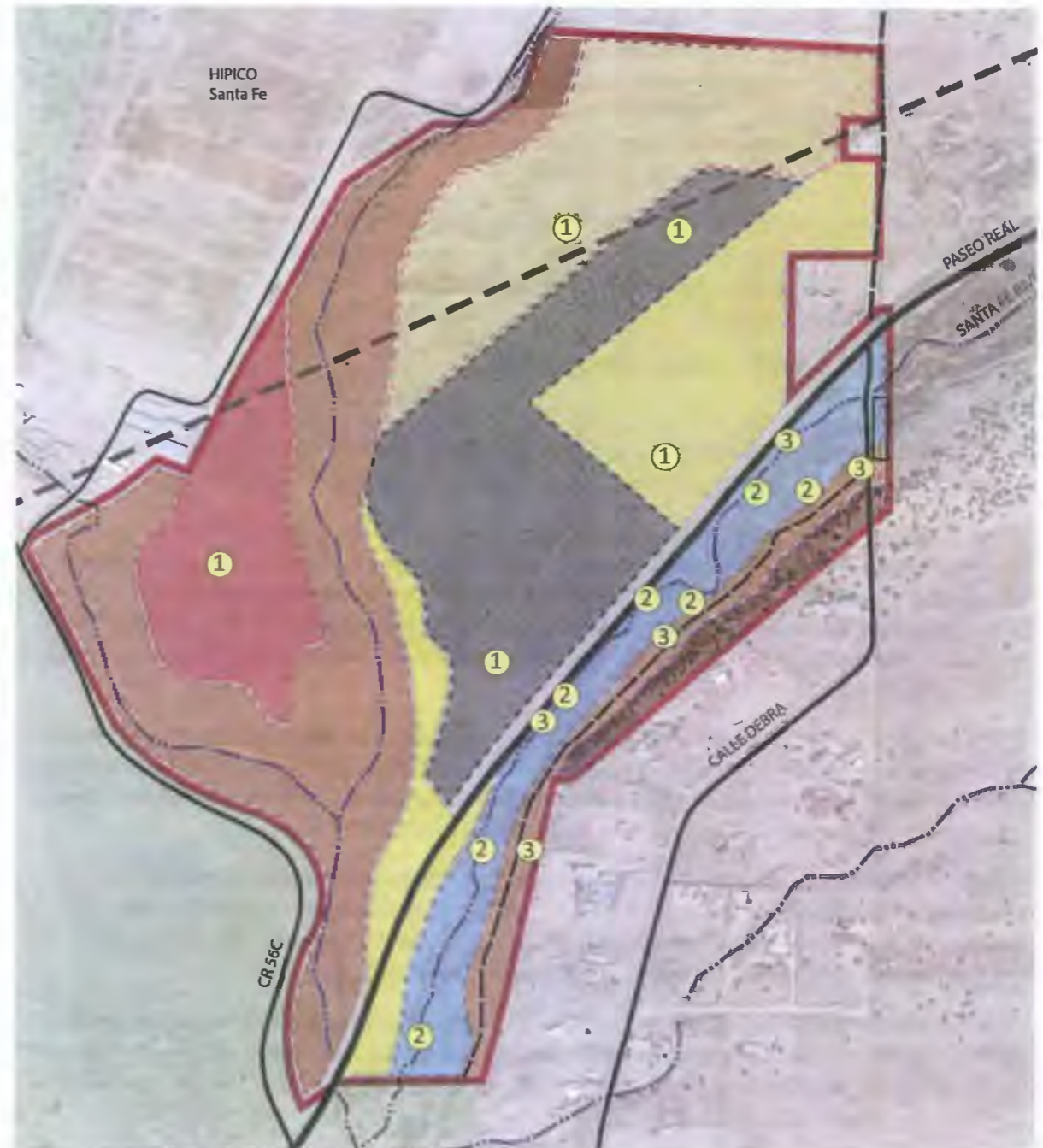


Figure 3. Monitoring Points for La Cieneguilla Open Space

No.	Conditions Monitored	Mgmt. Objectives	Indicators and Monitoring Method	Monitoring Frequency and Season
1	Grassland vegetation cover and richness, and potential forage quality of grasslands	Ecological Health / Grazing / Grasslands	Species richness and plant cover assessments in 10 sample plots along a transect; literature review of forage quality quantity of plants found in transects	Once in 2-3 years (in the fall)
2	Fuel load of riparian zone	Ecological Health	"Brown's Line" transects for fuel load estimates	Every 3 years in spring or fall
3	Erosion and drainage along trail on terrace on river left and along Paseo Real	Ecological Health	Visual observation during walk- through and photo point and GPS/Avenza PDF Map documentation of erosion and drainage problems	Bi-annually in spring and fall
4	Neighbor and stakeholder stewardship and relations	Holistic & Inclusive	Public participation and initiative; public feedback and expressions of support	Annually
5	Scenic quality	Holistic & Inclusive / Natural Appearance	Visual observation during walk- through and photo point and GPS/Avenza PDF Map documentation of scenic quality problems	Annually (spring or fall)
6	Public safety risks related to solid waste, water quality, erosion, and flooding	Holistic and Neighborly / Public Safety	Visual observation during walk- through and photo point and GPS/Avenza PDF Map documentation of public safety hazards	Quarterly (inspection of culverts, road sides, waste dumps, river)
7	Infrastructure conditions; fence effectiveness	Public Safety/ Access	Visual observation during walk- through and photo point and GPS/Avenza PDF Map documentation of fencing or infrastructure problems	(Bi-)Annually (spring and/or fall)
8	Stream channel morphology, efficiency and stability	Ecological Health	Visual observation during walk- through and photo point and GPS/Avenza PDF Map documentation of stream channel problems	(Bi-)Annually (spring and/or fall)
9	Vegetation health and botanical conditions	Ecological Health	Plant list comparison with knowledge of native plants; visual observation during walk-through and photo point documentation (identify noxious weeds)	Annually (spring or fall)
10	Pollution originating from HIPICO Santa Fe	Public Safety/ Ecological Health	Visual observation during walk- through and photo point and GPS/Avenza PDF Map documentation of any form of pollution on LCOS originating from HIPICO Santa Fe	Annually (spring or fall)

Note:

The table indicates the minimum suggested monitoring frequency. In some circumstances frequencies may need to be increased if/when staff time and funds allow, or if, monitoring activities can be conducted by community volunteers.

Table 1. Monitoring Matrix



The Conceptual Master Plan for La Cieneguilla Open Space (LCOS) describes proposed land improvement projects and associated investments to support the LCOS vision and management goals. The proposed projects result from stakeholder wishes and planning opportunities as limited by the suitability of the land. The Conceptual Master Plan describes alternative options for projects, the specific locations of projects, their purpose, priority, as well as a suggested timeline for implementation.

Land Use and Development Plan

The LCOS Conceptual Master Plan includes projects to preserve open land and natural resources, and in particular the property's scenic beauty and integrity and wildlife habitat. Furthermore, the Plan outlines ways to conserve water resources, maintain riparian habitat, and preserve the rural integrity of the traditional communities of La Cieneguilla and La Cienega. Future uses may include small-scale recreational uses, including natural surface trails and interpretive education signage, and certain agricultural uses that protect and regenerate the grasslands. Such uses are subordinate to the predominant conservation designation and will be in service to achieving the vision for the LCOS.

Natural resource conservation is already the de facto land use. This plan does not propose any changes to the current land use in the short term. Agricultural uses, such as managed grazing are possible in the context of grassland restoration. In the mid- to long-term, it is possible that agricultural uses are expanded toward dryland agriculture, and that local recreational uses are developed, such as trails, interpretive education signage, and other small-scale recreational facilities. The development of other uses in support of the vision will take place gradually after an initial maintenance and restoration phase.

Proposed projects are designed to improve ecological health of the different terrain types and vegetation across the property, improve the effectiveness of infrastructure, improve public safety on the property, and develop a local trail system and an interpretive education and research program. Projects will focus on:

- Placement of simple site signs and an information bulletin board
- Fence upgrades
- Drainage management along the trail on the terrace on river left and along Paseo Rael
- Erosion control and bank stabilization along the Santa Fe River
- Dumpsite cleanup and bank stabilization along the Arroyo de las Calabasas
- Grassland improvement and wind erosion control – possibly using managed, restorative grazing techniques.





Longer-term improvements will focus on reengineering of the Calle Debra crossing, trail development, and interpretive education signage (*APPENDIX A*).

Alternatives for proposed Conceptual Master Plan projects will be developed during the planning process of each individual projects. Alternatives vary between (1) No Action, (2) Preferred Solution, and (3) Alternative Solution(s).

Alternative O: No Action

Alternative O has been the default alternative from the time of purchase of the LCOS property. This alternative will likely be ended during the short-term phase of the Management Plan.

No Action will likely lead to increased threats of resource degradation and needs for more costly maintenance and restoration work. This alternative would preclude investments in desired ecological terrain improvements, safety measures, and signage.

Preferred and Alternative Solutions

During the Conceptual Master Plan process for LCOS no need arose to consider fundamentally different alternative solutions for the protection and improvement of conditions of LCOS. Instead, the proposed activities constitute a gradual organic development of activities spread over time.

However, at the level of specific projects (improvement), detailed technical alternatives may apply. These alternatives should be considered when these projects are being planned and designed. The advantages and disadvantages of each alternative and the determination of a preferred alternative is not timely in this Management Plan and is deferred to the full Master Plans for LCOS.

Planning and preparation is required for all Conceptual Master Plan improvements listed above. More work is needed to reach stakeholder consensus on the scope and scale of recreational facilities at the LCOS. In the mid-term, this may lead to a Detailed Master Plan for long-term recreational development, with options varying from expanded recreational trail facilities to a community park. During this community-based planning process, some low-impact recreational facilities, such as a natural surface trail loop and a few benches may be realized in the short- and mid-term. Implementation of improvements will need to follow basic short-term maintenance and repair activities needed to improve public safety and access, and prevent accelerating site degradation.

Exploring Alternatives

Alternatives for proposed LCOS projects will be developed during the plan process for individual projects.

An example of the range of alternatives that could be examined for grassland improvement are cursorily explored below.

Grassland Improvement

A No Action alternative is a “do nothing” strategy. A likely result is that in dry years, vegetative cover and plant species diversity will dwindle. There will most likely be an increase of non-palatable forbs, weedy plant species and an increase of bare soil. Wind erosion will likely increase, and associated dust storms and air pollution from the dust. The risk of wildfire will increase.

One alternative solution may be to do managed, restorative grazing with goats and/or cattle for a short duration --several weeks to a few months. Cattle grazing may be most effective on the better grassland parcels. Goat grazing may be more effective to remove forbs, weedy plants, and plant species that are generally unpalatable for cattle. Fencing and water will need to be brought in. Rest periods and monitoring would be part of the managed grazing regime.

A second alternative may include the removal of selected juniper trees that have caused the surrounding grassland to die off and become bare and be infested with invasive plants. Cut juniper material can be spread as mulch and juniper slash can be spread to stimulate grass regeneration, and supported by reseeding of native grass if necessary.

A third alternative may consist of the cultivation of a cover crop, in collaboration with eco-agricultural partner organizations and HIPICO Santa Fe. This alternative may be effective for the fine-sandy and loamy degraded grasslands between the two forks of Arroyo de las Calabasas. This alternative would require soil amendments such as compost or mulch and some form of irrigation.

The range and diversity of alternatives will take time to arrive at solutions for LCOS.





Every proposed project requires planning, research and design development beforehand so that projects are well conceived, funded and implemented. Recommended planning, research and development work to achieve this plan are:

Short Term

1. Develop protocols for communication and verification about maintenance and land restoration work, mapping, monitoring, and team coordination
2. Develop a monitoring plan to identify base-line data for all scheduled activities and associated terrain conditions
3. Develop a basic signage plan with signs for boundary marking and/or acknowledgment of the LCOS, along with a bulletin board that will serve to post flyers and announcements;
4. Plan community stewardship activities for the Santa Fe River area
5. Plan drainage improvements and erosion control work along the trail on the terrace on river left and along Paseo Real
6. Research short-term fencing and priority cleanup and rehabilitation of the Arroyo de las Calabasas TMU
7. Develop a simple grassland and grazing management plan, including juniper management, revegetation strategies, weed management, and soil improvement
8. Develop a grazing lease program and a plan for managed, restorative grazing for years 4-5
9. Research mid-term and long-term trail and recreational development
10. Plan and coordinate the Calle Debra bridge reengineering project

Mid-Term and Long-Term

11. Develop a Recreation Master Plan for the LCOS
12. Coordinate Arroyo de las Calabasas cleanup and rehabilitation projects
13. Plan grassland improvement, managed grazing and juniper removal projects
14. Develop an interpretive education program
15. Research a possibly eco-agricultural program based on dryland (low external input) agriculture activities



Prioritization and phasing for the LCOS management plan is based on the terrain conditions of early 2016. The baseline site conditions include needed maintenance on the riparian area, the grasslands, fencing, and the Arroyo de las Calabasas. The proposed Conceptual Master Plan activities follow the prioritization criteria outlined in the Planners' Guide. General phasing is shown in *Figure 4*.

- **Short-Term**
 - All activities focus on land restoration and maintenance, with an emphasis on fencing, drainage, erosion control, and riparian area management, to address the conditions caused by deferred maintenance
- **Mid-Term**
 - Implementation of several larger restoration projects, such as cleanup of Arroyo de las Calabasas, the Calle Debra crossing, and grassland improvements
 - Development of a simple trail loop
- **Long-Term:**
 - Master Plan components, such as further development and implementation of a recreational master plan and interpretive education program
 - Expanded trail and small-scale recreational facilities
 - Expansion of eco-agricultural projects.

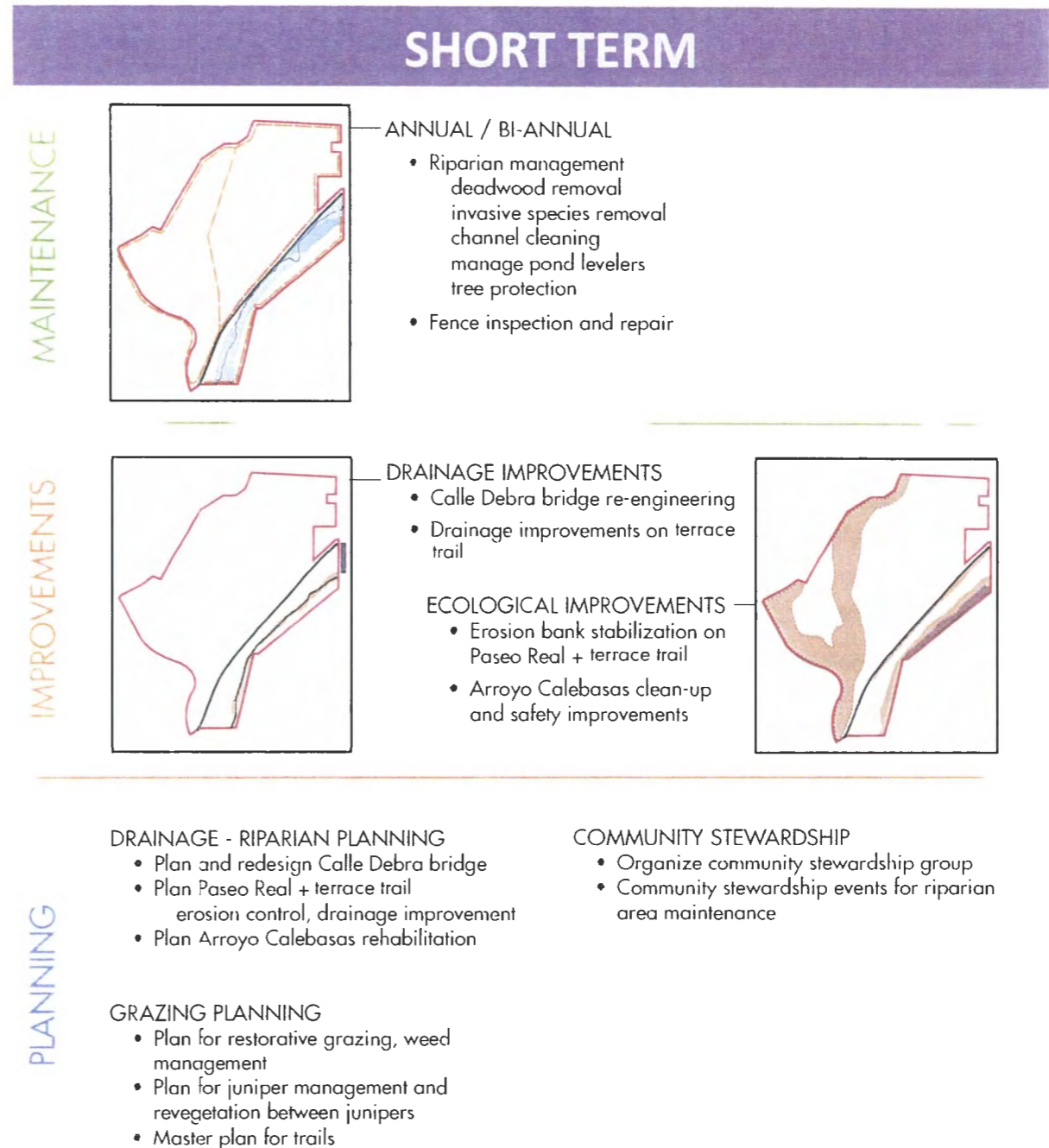


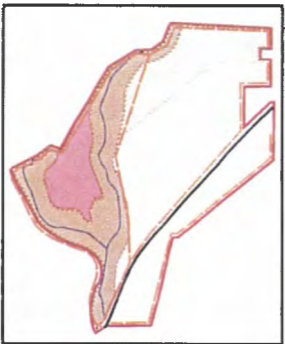
Figure 4. Maintenance/Improvement/Planning Diagram

MID TERM - LONG TERM



ANNUAL / BI-ANNUAL - CONTINUED

- Riparian management
deadwood removal
invasive species removal
channel cleaning
manage pond levels
tree protection
- Fence inspection and repair
- Managed grazing for weed control
grasslands (pasture unit, juniper unit, old field unit)



CONTINUED IMPROVEMENT OPPORTUNITIES

- Boundary fence upgrade and gates
- Restorative grazing for weed management
grassland gravel unit
grassland dry unit
- Arroyo Calebasas continued clean-up, hazard removal, vegetation management
- Trail improvements
- Signage and interpretive education program

GRAZING PLANNING

- Grazing management plan
- Grazing lease or contract

AGRICULTURAL PLANNING

- Feasibility study on gardens and agricultural opportunities

TRAIL + RECREATIONAL PLANNING

- Fund and implement initial trails for site
- Study expanded trails improvements and other possible recreational opportunities

COMMUNITY STEWARDSHIP

- Strengthen community stewardship group
- Continue community events
- Develop educational opportunities

Community involvement is essential for many of the proposed Detailed Master Plan projects. Public involvement may include feedback on proposed project details during future planning and design sessions, and active engagement during implementation of projects. Several maintenance activities will be suitable for community or volunteer participation, which will facilitate community stewardship for open space care and maintenance.

Significant stakeholder involvement will be necessary for the development of dryland agricultural uses. Dryland farming, managed grazing, public education regarding the local community's agricultural heritage, and the need for water will be addressed in a mid-term Detail Master Plan for the agricultural use of the property.

A comprehensive overview of planning activities along with maintenance activities, Conceptual Master Plan projects, and community stewardship activities is included in *APPENDIX A*. The activities are listed by functional group (planning, maintenance, community services, and projects/improvements) relative to Santa Fe County's organization of departments.

Santa Fe County intends to include and involve a diverse group of community stakeholders in volunteer stewardship activities at the La Cieneguilla Open Space.

- Immediate neighbors in La Cieneguilla
- La Cienega Valley Association (LCVA)
- HIPICO Santa Fe
- Downstream residents, farmers, and ranchers
- The Santa Fe River Traditional Communities Collaborative
- Area schools and their students, such as the MASTERS Program (high school, Santa Fe Community College), Santa Fe Indian School, the Santa Fe Girls' School, Desert Academy, and nearby elementary schools
- Several regional conservation groups (such as Santa Fe Watershed Association), hiking and outdoor organizations, and other entities that could become interested in LCOS

2.4. Community Relations

Santa Fe County intends to develop and maintain productive, neighborly and collaborative relations with the communities of La Cieneguilla and La Cienega regarding the implementation of the LCOS Management Plan.

Information Exchange

Santa Fe County plans to expand and develop several methods for information exchange with community members and stakeholders.

Signage

Santa Fe County will install simple site signage to identify the Open Space property. Signage will also inform the public about safety, leave-no-trace principles, general care and stewardship behavior, and contact information for Santa Fe County. Boundary markers will be installed for maintenance and access control. Bulletin boards will be placed at the gate on Calle Debra, at the southern end of the property along Paseo Real and at the gate to the grassland area on the eastern end of the property to provide public information, such as specific events, meetings, and terrain management activities.

Website

Santa Fe County will maintain website pages dedicated to the County Open Space program. The website may be expanded with a specific webpage describing the LCOS landscape and history, management plan information and activities, and planned events at the LCOS.

Community Contact

Santa Fe County will work with the community to identify a communication structure with community members who are available to field comments and questions and contact County staff for follow-up actions. Communication may address signage, riparian area management (e.g., removal of wood and invasive plants and tree protection), work on gates and fences, and work along the trail on the terrace on river left, among other initiatives, especially in the initial phase of plan implementation.

Education, Coordination and Collaboration

Santa Fe County and community members understand that it is important to cultivate educational activities at LCOS to raise awareness about the area's unique history and ecology and to mobilize support for future stewardship. Santa Fe County and community members encourage more youth engagement, such as school groups, in educational activities and site maintenance.

A significant portion of community communication will revolve around maintenance of the open space property, both to announce maintenance work done by Santa Fe County and its contractors and to plan and coordinate maintenance work done in collaboration with community members. All maintenance and restoration activities will be discussed with affected neighbors and stakeholders prior to implementation, or presented and coordinated in community meetings. Maintenance activities suitable for volunteer steward groups include:

- Removal of dead wood and woody debris in the river channel (during low flows) and on the floodplain of the bosque (in the late winter and early spring) ,
- Removal of invasive plants (especially elm, Russian olive, and tamarisk in late fall and early spring)
- Protecting cottonwood trees with chicken-wire type baskets or fence material to prevent beaver damage to the trees.

Maintenance activities can provide benefits for the community. Such benefits may include the distribution of dead wood as firewood for community members, and sharing of information about natural resources or wildlife in the area.





Collaboration on maintenance activities will be effective if it starts with organizing community partners around specific, tangible projects to foster communication and trust, and generate additional objectives, priorities, and creative new ideas for problem solving. The following topics are of interest in the community and may serve as pilot projects.

- Management of the bosque, including wood removal, caging of trees, removal of invasive tree species, and tracking beaver activity and their impacts on trees and streambanks, and monitoring of the effectiveness of pond levelers
- Identification of the trail on the terrace along the river and additional trail building and stewardship in subsequent years
- Interpretive education programming
- Public and youth education

2.5. Terrain Management

For purposes of maintenance and land use suitability, the LCOS Management Plan identifies several Terrain Management Units (TMUs) (*Figure 5*). Each TMU encompasses an area with similar landscape features and maintenance requirements, and similar land suitability characteristics (i.e., a unique set of options for land use). The identification of TMUs organizes the spatial management aspects of this plan.

Terrain management activities are described in detail in a separate Maintenance Plan for LCOS. The following sections summarize terrain management in the context of the LCOS Management Plan. The proposed terrain management activities also reference specific Best Management Practices (BMPs), which are described in the Planners' Guide.

Maintenance and Restoration Plan Summary

Terrain management includes land restoration, maintenance, and community stewardship. Terrain management activities are specific for each Terrain Management Unit (TMU).

Each TMU requires a discrete set of management activities to maintain their ecological functions in support of the central management goal for the LCOS. An overview of terrain management activities is included in *Table 2*. A comprehensive Maintenance Plan for LCOS is included in *APPENDIX C*. Detailed lists of terrain management activities in Year-1 are included in *APPENDIX D*.

The County will face challenges to achieve all the maintenance needs at LCOS that will arise in the future. Strategies that can be useful to optimize maintenance efforts, include:

- Collaboration with adjacent properties, agencies and community stewards to leverage working together to address maintenance needs;
- Invest smaller and consistent amounts of time and labor on well-planned maintenance activities;
- Conduct maintenance activities at the optimum time based on monitoring information or a regular schedule.



TERRAIN MANAGEMENT UNITS

LEGEND

	LC-GRA-P GRASSLAND-PASTURE UNIT • relatively dry, high-quality pasture / valley bottomlands
	LC-GRA-F GRASSLAND-OLD FIELDS UNIT • low, seasonally wet grassland on former fields or pasture
	LC-GRA-G GRASSLAND-GRAVEL UNIT • higher, gravelly grassland with variegated topography
	LC-GRA-D GRASSLAND-DRY UNIT • dry grass, forb, and shrub valley bottomlands
	LC-GRA-J GRASSLAND-JUNIPER UNIT • grasslands with juniper vegetation
	LC-ARR ARROYOS UNIT • arroyo channels and arroyo banks
	LC-RIP RIPARIAN UNIT • Stream channels, banks, riparian vegetation strips
	LC-WOO WOODLAND UNIT • higher, rugged upland areas with piñon-juniper vegetation
	UTILITY EASEMENT
	FIRE ACCESS TRAIL
	PUBLIC PARKING
	GATE + STILE
	PROPERTY BOUNDARY
	FLOWLINES

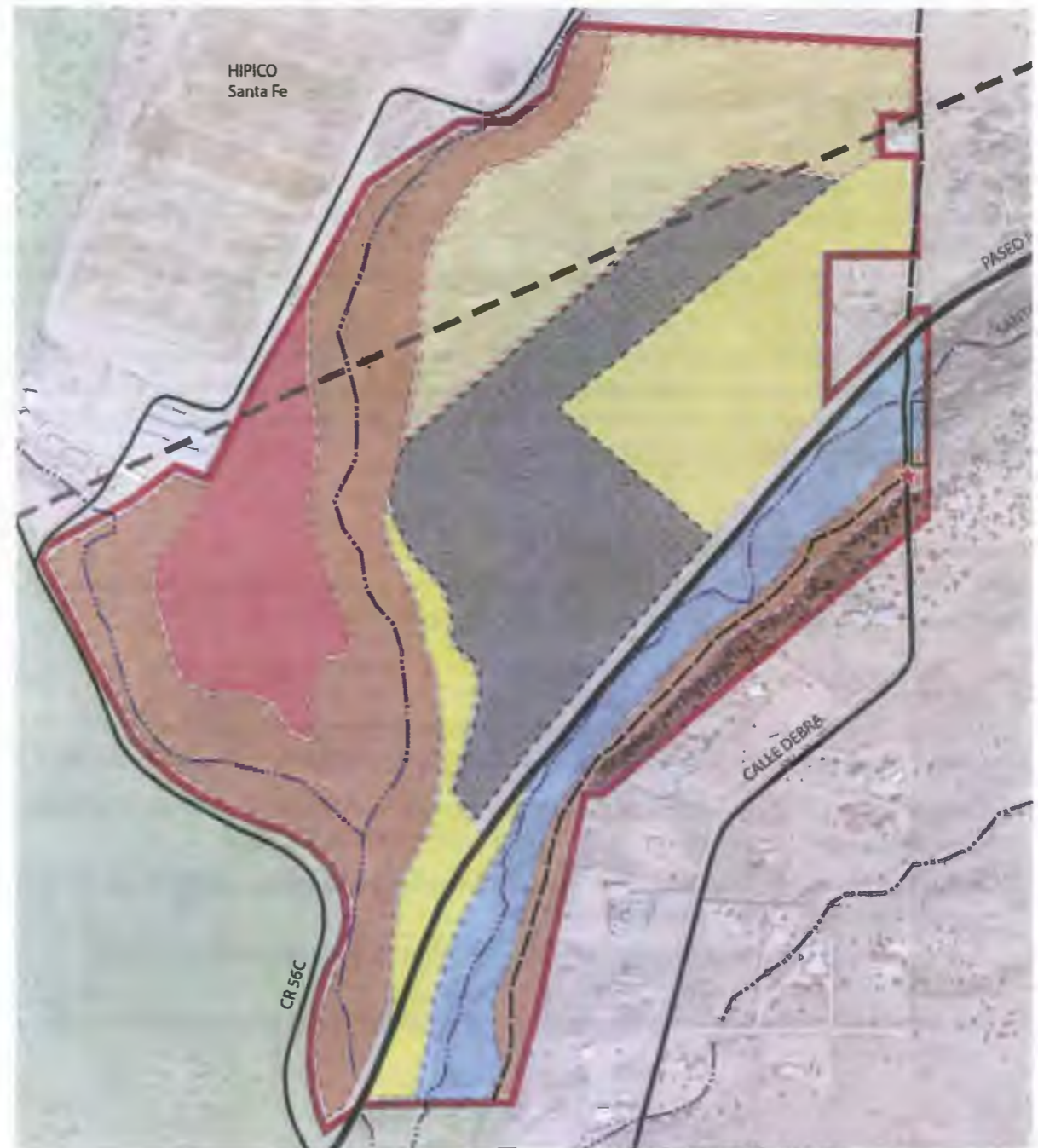


Figure 5. La Cieneguilla Open Space—Terrain Management Units Map

Where	What	Why	When
TMU	Anticipated Regular Maintenance Activities	Objective	Maintenance Frequency*
All TMUs	Communication and outreach with neighbors and stakeholders and integrate feedback in planning	Holistic & Inclusive	Annually
All TMUs	Inspect and repair of:	Public Safety / Access / Education / Infrastructure	a. Annually
	a. Fences, gates, and stiles		b. Monthly
	b. Culverts, stream crossing		c. Quarterly
	c. Roads, trails		d. Annually
	d. Signage		
LC-GRA-G	a. Invasive species inspection	Eco Health / Grazing	a. Annually
	b. Managed grazing		b. Annually after yr 3
LC-GRA-J	a. Invasive species inspection	Ecol Health / Grazing / Grasslands	a. Annually
	b. Managed grazing		b. Annually after yr 3
	c. Gradual reduction of junipers and reseeded with grasses		c. Periodically, after careful planning
LC-GRA-F	a. Invasive species inspection	Eco Health / Grazing	a. Annually
	b. Managed grazing		b. Annually after yr 3
LC-GRA-P	a. Invasive species inspection	Eco Health / Grazing	a. Annually
	b. Managed grazing		b. Annually after yr 3
LC-GRA-D	a. Invasive species inspection	Eco Health / Grazing	a. Annually
	b. Restorative and after that managed grazing and reseeded where necessary		b. Annually after yr 3
LC-ARR	a. Invasive species inspection	Public Safety	a. Annually
	b. Cleanup and grading		b. 1x / inspect annually
	c. Restorative and after that managed grazing and reseeded where necessary		c. Annually after yr 3
LC-RIP	a. Removal of dead wood	Eco Health	a. Annually for 2-3 years/as needed
	b. Removal of invasive plant species		b. Annually
	c. Channel cleaning; removal of debris		c. Twice annually
	d. Culvert cleaning		d. Twice annually
	e. Moving / maintenance of pond levelers		e. When needed
	f. Tree protection		f. Annually
	g. Fence repair and inspection		g. Annually
LC-WOO	a. Trail inspection and drainage maintenance	Ecological Health	a. Annually
	b. Thinning/pruning of junipers to reduce cover but maintain visual and wildlife habitat qualities		b. Once in 3-5 years
	c. Erosion control (e.g., using slash from thinned and pruned trees)		c. Once in 3-5 years



2.6. Plan Implementation and Financing Mechanisms

Plan implementation will start by identifying priorities and timelines among staff for activities regarding maintenance, planning and project preparation, community outreach, and community stewardship involvement. Prioritization will be based on balancing the tasks at hand, and the staff and funds available to accomplish the tasks.

First Year Implementation

Implementation of this plan will start upon approval of the plan by the County.

Recommended Year-1 implementation activities include:

1. Periodic community meetings to explain the planned implementation activities with an emphasis on:
 - a. Terrain inspections, baseline data collection, priority maintenance activities, and planning activities for key projects for repairs and improvements,
 - b. Identifying community interest and capacity to assist with the planned activities,
 - c. Developing outlines for collaborative projects between Santa Fe County and neighbors and other local stakeholders,
 - d. Coordinating specific community involvement for the selected projects,
 - e. Annual review of prior year activities and next year implementation planning.
2. Implementation of selected terrain inspection, base-line data collection (for future monitoring), and maintenance activities by County maintenance staff, assisted by neighbors and local volunteers; inspections, data gathering and priority maintenance will include:
 - a. Interior and exterior fence conditions and repairs,
 - b. Weed removal, especially invasive tree species in the bosque area,
 - c. Removal of dead wood, fallen trees, and debris in the stream and floodplain,
 - d. Protection of cottonwood trees with wire mesh caging.

3. **Planning, collaboration, and community organizing to implement priority projects; possible projects may include:**
 - a. **Development and placement of signs and a bulletin board,**
 - b. **Drainage improvements and erosion control along the trail on the terrace on river left and along Paseo Real and identification the public access status of the trail,**
 - c. **Fencing of the entire Arroyo de las Calabasas area,**
 - d. **Identification, cleanup, or removal of the highest priority waste dumps,**
 - e. **Removal of invasive tree species.**
4. **Research and planning for the preparation of larger initiatives to be implemented at a later date, including:**
 - a. **Development of protocols for communication, staff development, and coordination,**
 - b. **Development of a signage plan that includes site specific signs, public outreach and communication strategies,**
 - c. **Grassland management planning and the development of a managed, restorative grazing program,**
 - d. **Juniper removal plan,**
 - e. **Plan for the improvement of the LC-GRA-D TMU,**
 - f. **Trail planning,**
 - g. **Evaluation of the Year-1 phase and adapt planning for subsequent years.**





Financing Mechanisms, Funding Sources, and Partners

Santa Fe County owns and manages more than 6,600 acres of open space properties and parks, but it has insufficient funding and staff resources to meet the acquisition and management goals for the properties. Santa Fe County will be able to implement this plan if it successfully continues to develop new funding mechanisms, identify new funding sources, and cultivate collaborative relationships with neighbors, local stakeholders, and other interest groups.

To implement this plan, Santa Fe County will include neighbors, stakeholders and other partners to help with planning, maintaining, and data collecting for the purposes of monitoring, planning, and developing projects. This collaborative approach will help build neighborly relationships and increase buy-in from and stewardship by the people with the greatest interest in the property and it will reduce the need for outside funding for property management.

Santa Fe County will pursue funding sources and explore creative funding mechanisms to ensure the financial viability of managing the LCOS according to the recommendations of this management plan (*Table 3*).

POTENTIAL FUNDING SOURCES	PURPOSE	ACQUISITION TIME FRAME
General Fund (Santa Fe County)	Staff costs	Annual budgeting process
Grants	Staff and consultants for various tasks, such as:	Dependent on funding source timelines
	Fencing	
	Signs, bulletin board	
	Monitoring program	
	Santa Fe River riparian area management, incl. wildfire prevention and riparian area thinning	
	River bank stabilization and drainage of the terrace on river left	
	Arroyo de las Calabasas dump site cleanup	
	Grassland and juniper management	
	Managed grazing plan	
	Dryland agricultural program development	
	Interpretive education research and implementation	
Trail and recreation master planning		
CIP funds	For the same as above	Annual budgeting process
FFS (Fee for Service)	Grazing contract	On a contract basis
POTENTIAL FUNDING MECHANISMS & COLLABORATIONS	PURPOSE	DEVELOPMENT TIME FRAME
Hiring a grant writer for OS funding	Pursue more grant funding	Short-term
Cultivating community stewards	Delegating word to local community stakeholders	Short-mid term
Organizing social/cultural (fund raising) events with non-profit partners	Generating discretionary income and public outreach	Mid-long term
Establishing a "Friends of LCOS" group	Generating discretionary income and public outreach	Mid-long term
Collaboration with non-profit entities for co-management activities	Sharing the burden with organized stakeholders	Mid-long term
Voter-approved Revenue Initiatives	Providing a dedicated annual revenue stream for OS, Parks and Trails	Long-term
Establishing an NGO for overarching support to OS property management	Sharing the burden with organized stakeholders	Long-term

Table 3. Potential Funding Sources and Mechanisms



LA CIENEGUILLA OPEN SPACE APPENDICES (separate document)

APPENDIX A: Overview of Management Activities

APPENDIX B: A Field Characterization for the La Cieneguilla Open Space Property Santa Fe County, New Mexico - An Existing Conditions and Inventory Report

APPENDIX C: Maintenance Plan for La Cieneguilla Open Space

APPENDIX D: Maintenance, Stewardship, and Restoration Projects for Year-1



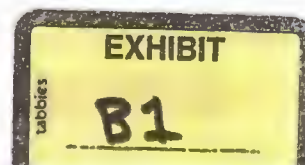


SANTA FE COUNTY OPEN SPACE AND TRAILS PROGRAM
LA CIENEGUILLA OPEN SPACE MANAGEMENT PLAN

APPENDICIES
FINAL DRAFT
SEPTEMBER 13, 2016



Ecotone



LA CIENEGUILLA OPEN SPACE APPENDICES

APPENDIX A: Overview of Management Activities Table for La Cieneguilla Open Space

APPENDIX B: A Field Characterization for the La Cieneguilla Open Space Property Santa Fe County, New Mexico - An Existing Conditions and Inventory Report

APPENDIX C: Maintenance Plan for La Cieneguilla Open Space

APPENDIX D: Maintenance, Stewardship, and Restoration Projects for Year-1



APPENDIX A: OVERVIEW OF
MANAGEMENT ACTIVITIES

SFC CLERK RECORDED 10/12/2016

LCOS	# (Term and Priority)	Project or Management Activity	Objective or Purpose	Location Code	Actor	Timeline	Recurring (R) or Not Recurring (NR)	Labor and Cost Estimates	Funding Source
Maintenance	1.1	Communication & outreach with neighbors and stakeholders; integrate feedback in planning	Holistic & Inclusive Management	Entire property	SFC-M (Crew) and Planning staff	ST-MT-LT	R	Annually (or more often)	GF
	1.2	Inspection and repair of fences, gates, stiles, and signs	Public Safety / Access Management	Entire property: approx. 20,900 lf	SFC-M (Crew)	ST-MT-LT	R	Annually, up to 4 days for 2 people (32 h/y) + supplies TBD	GF
	1.3	Inspection and cleanout of culverts, stream crossings	Public Safety / Ecological Health	LC-RIP: culvert, bridge, crossing locations	SFC-M (Crew)	ST-MT-LT	R	Monthly: (approx. 64 h/y)	GF
	1.4	Inspection and repair of drainage and erosion on road sides, bridges, and trail on terrace on river left	Public Safety / Access Management	LC-RIP, LC-WOO: Select areas	SFC-M (Crew) or contractor	ST-MT-LT	R	Annually: 1 day for 2 people (16 h/y)	GF
	1.5	Field inspection of riparian conditions	Public Safety / Ecological Health	LC-RIP: Entire riparian area; approx. 19 acres	SFC-M (Crew)	ST-MT-LT	R	35 times/y: 4 h for one person (140 h/y)	GF
	1.6	Dead willow and woody debris removal	Public Safety / Ecological Health	LC-RIP: Select areas; 4 ac/y	Contractor or volunteers	ST-MT-LT	R	Annually or every 3 yr; based on bid (rough estimate: \$14,175-\$22,680/y)	GF, CIP, VOL
	1.7	Channel cleaning, removal of woody debris	Ecological Health	LC-RIP	SFC-M (Crew) or volunteers	ST-MT-LT	R	Twice annually: 2 days for 2 people	GF, VOL
	1.8	Invasive tree species removal	Ecological Health	LC-RIP: Select areas	Contractor or volunteers	ST-MT-LT	R	Annually: based on bid	CIP, VOL
	1.9	Pond leveler maintenance or relocation; removal of unwanted beaver dams	Ecological Health	LC-RIP: Select locations	SFC-M (Crew)	ST-MT-LT	R	Several times annually; perhaps 4-6 crew member days/y (48 h/y)	GF
	1.10	Tree protection (caging with wire mesh)	Ecological Health	LC-RIP: Select trees	SFC-M (Crew), Volunteers	ST-MT-LT	R	Annually: approx. 1 day/y for 2 people (16 h/y)	GF, VOL
	1.11	Piling and burning	Public Safety / Ecological Health	LC-RIP (probably best in southern area near BLM land)	Contractor; with SFC Fire Dep and BLM	ST-MT-LT	R	Occasionally (once in 4 or 5 yr, when needed); based on bid	CIP, grant
	1.12	Grassland inspection and removal of invasive plant species	Ecological Health / Grazing / Grassland Management	LC-GRA-P, LC-GRA-F, LC-GRA-G, LC-GRA-J, LC-GRA-D, LC-ARR, LC-WOO	SFC-M (Crew), Volunteers or Contractor	ST-MT-LT	R	Annually: 1 day for 2 people	GF, VOL
	1.13	Managed grazing (select acreage yearly; a few wks/yr)	Ecological Health / Grazing / Grassland Management	LC-GRA-P, LC-GRA-F, LC-GRA-G, LC-GRA-J: Rotations in pastures	Contractor	ST (yr 4) MT-LT	R	based on bid	CIP, FFS
	2.1	Juniper removal and reseeding of grass	Grassland Management	LC-GRA-J: (1-2 acres/yr out of approx. 25 acres)	Contractor or SFC Fire Dep	MT-LT	R	2 full days for two people (16 h/); based on bid	CIP, grant
2.2	Prescribed burn	Public Safety / Ecological Health	LC-RIP (probably best in southern area near BLM land)	Contractor; with SFC Fire Dep and BLM	MT-LT	R	When need arises; TBD, based on plan and bid	CIP, Grant	

LCOS	# (Term and Priority)	Project or Management Activity	Objective or Purpose	Location Code	Actor	Timeline	Recurring (R) or Not Recurring (NR)	Labor and Cost Estimates	Funding Source
Improvements	1.1	Improve drainage from trail on terrace	Public Safety / Access Management / Ecological Health	LC-WOO: along trail on terrace on river left	SFC-M (Crew) or contractor	ST	R	Every 3-5 years: Based on assessment and bid	CIP
	1.2	Stabilize eroding stream banks	Public Safety / Access Management / Ecological Health	LC-RIP, LC-WOO: along trail on terrace ; LC-RIP: along CR56 and Calle Debra	Contractor	ST	R	Every 3-5 years: Based on assessment and bid	CIP
	1.3	Install signs and bulletin boards	Natural Appearance / Education	LC-GRA-F, LC-GRA-P, LC-RIP: Selected locations on property	SFC-M (Crew) or contractor	ST	NR	TBD, based on plan and bid	CIP, grant
	1.4	Fence off Arroyo de las Calabasas	Public Safety	LC-ARR	SFC-M (Crew) or contractor	ST	NR	TBD, based on plan and bid	CIP
	1.5	Emergency cleanup of Arroyo Calabasas; prepare long-term cleanup	Public Safety / Ecological Health	LC-ARR	Contractor	ST	NR	TBD, based on plan and bid	CIP, grant
	1.6	Repair priority fence problems	Public Safety / Access Management / Ecological Health / Grazing	Entire property: select locations	SFC-M (Crew) or contractor	ST	NR	TBD, based on plan and bid	CIP
Improvements	2.1	Boundary fence upgrades and gates (and wildlife-friendly fencing)	Public Safety / Access Management / Ecological Health / Grazing	Entire property: along roads and around perimeter	SFC-M (Crew) or contractor	MT	NR	TBD, based on plan and bid	CIP
	2.2	Grassland improvement: soil improvement, weed removal, managed grazing, partial juniper removal	Ecological Health / Grazing / Grassland Management	LC-GRA-P, LC-GRA-F, LC-GRA-G, LC-GRA-J, LC-GRA-D	Contractor + community group	MT	R (phased over several years)	TBD, based on plan and bid	CIP
	2.3	Arroyo de las Calabasas cleanup and rehabilitation	Public Safety / Natural Appearance / Ecological Health	LC-ARR	Contractor	MT	NR	TBD, based on plan and bid	CIP, State grant
	2.4	Calle Debra bridge reconstruction	Public Safety / Access Management	LC-RIP	Contractor	MT-LT	NR	TBD, based on plan and bid	CIP
	2.5	Trail development (phase-1)	Access Management / Infrastructure / Natural Appearance	LC-RIP, LC-GRA-P, LC-GRA-F, LC-GRA-G, LC-GRA-J	Contractor (+ community group?)	MT	NR	TBD, based on plan and bid	CIP, grant
	3.1	Trail development and implementation of other recreational facilities	Access Management / Infrastructure / Natural Appearance	LC-RIP, LC-GRA-P, LC-GRA-F, LC-GRA-G, LC-GRA-J	Contractor	LT	NR	TBD, based on plan and bid	CIP, grant
	3.2	Installation of interpretive education signs	Natural Appearance / Education / Infrastructure	Selected locations on property	SFC-M (Crew) or Contractor	LT	NR	TBD, based on plan and bid	CIP, grant
	3.3	Dryland agricultural development and facilities	Education / Ecological Health	Selected locations on property	Contractor and community group	LT	R (phased over several years)	TBD, based on plan and bid	CIP, grant

LCOS	# (Term and Priority)	Project or Management Activity	Objective or Purpose	Location Code	Actor	Timeline	Recurring (R) or Not Recurring (NR)	Labor and Cost Estimates	Funding Source
Planning	1.1	Develop and implement protocols for maintenance work, team coordination, and ongoing fund identification and acquisition	All management goals (effective management)	Entire property	Planning staff	ST-MT	R	TBD (20 h/y)	GF
	1.2	Develop a monitoring plan and gathering base-line data	All management goals (effective management)	Entire property	Planning staff	ST	NR	TBD (60 h/y)	GF
	1.3	Develop a basic signage plan; Develop signs and bulletin board for selected locations and establish a fund for signs and bulletin board maintenance and replacements	Holistic & Inclusive / Public Safety / Education	Entire property	Planning & Projects staff	ST	NR	TBD (25 h/y)	GF
	1.4	Ongoing community outreach and coordination of riparian area management	Holistic & Inclusive / Public Safety / Education / Ecological Health	LC-RIP	Planning & Community Services staff	ST-MT-LT	R	TBD (30 h/y)	GF
	1.5	Plan erosion and drainage improvement along the trail on the terrace on river left and along Paseo Real	Public Safety / Ecological Health	LC-WOO, LC-RIP	Planning & Projects staff	ST	NR	TBD (30 h/y)	GF
	1.6	Plan and implement community stewardship structure and events	Holistic & Inclusive / Education / Ecological Health	Entire property	Planning & Community Services staff	ST-MT-LT	R	TBD (100 h/y)	GF
	1.7	Plan and design coordination for the Calle Debra bridge/crossing re-engineering project	Public Safety / Access Management / Ecological Health	LC-RIP	Planning & Projects staff	ST	NR	TBD (20 h/y)	GF
	1.8	Plan coordination for the Arroyo Calabasas cleanup and rehab work	Public Safety / Ecological Health	LC-ARR	Planning & Projects staff	ST	NR	TBD (60 h/y)	GF
	1.9	Develop a grazing and grassland management plan (including fencing, revegetation, and juniper management)	Ecological Health / Grazing / Grassland Management	LC-GRA-P, LC-GRA-J, LC-GRA-F, LC-GRA-G, LC-GRA-D	Planning & Projects staff	ST	NR	TBD (60 h/y)	GF
	1.10	Prepare a managed grazing pilot program (and contract)	Ecological Health / Grazing / Grassland Management	LC-GRA-P, LC-GRA-J, LC-GRA-F, LC-GRA-G, LC-GRA-D	Planning & Projects staff	ST	NR	TBD (40 h/ year-1 or -2)	GF
	1.11	Launch, oversee, and evaluate the managed grazing program	Ecological Health / Grazing / Grassland Management	LC-GRA-P, LC-GRA-J, LC-GRA-F, LC-GRA-G, LC-GRA-D	Planning & Projects staff	ST	NR	TBD (40 h/ year-1 or -2)	GF
	1.12	Develop Recreation Master Plan	Natural Appearance / Infrastructure	Entire property	Planning & Projects staff	ST-MT	NR	TBD (80 h/y)	GF

LCOS	# (Term and Priority)	Project or Management Activity	Objective or Purpose	Location Code	Actor	Timeline	Recurring (R) or Not Recurring (NR)	Labor and Cost Estimates	Funding Source
Planning	2.1	Update and manage the grazing program	Ecological Health / Grazing / Grassland Management	LC-GRA-P, LC-GRA-J, LC-GRA-F, LC-GRA-G, LC-GRA-D	Planning & Projects staff	MT-LT	R (phased implementation)	TBD (20 h/y)	GF
	2.2	Update and manage the riparian area program	Holistic & Inclusive / Public Safety / Education / Ecological Health	LC-RIP	Planning & Projects staff + Community	MT-LT	R (phased implementation)	TBD (20 h/y)	GF
	2.3	Guide the Arroyo Calabasas cleanup process	Public Safety / Ecological Health	LC-ARR	Planning & Projects staff	MT	R (phased implementation)	TBD (20 h/y)	GF
	2.4	Plan and coordinate implementation of gradual juniper removal and revegetation work	Ecological Health / Grazing / Grassland Management	LC-GRA-J	Planning & Projects staff	MT-LT	R (phased implementation)	TBD (20 h/y)	GF
	2.5	Plan and coordinate detailed plans and designs for trails and other recreational uses	Natural Appearance / Infrastructure	Entire property	Planning & Projects staff	MT	NR	TBD (40 h/y)	GF
	2.6	Plan development of an interpretive education program	Natural Appearance / Education / Infrastructure	Entire property	Planning staff	MT	NR	TBD (40 h/y)	GF
	2.7	Secure funding for recreation plan implementation	Natural Appearance / Infrastructure	Entire property	Planning staff	MT	NR	TBD (20 h/y)	GF
	2.8	Plan a feasibility study for dryland agriculture development	Ecological Health / Education	LC-GRA-P, LC-GRA-J, LC-GRA-F, LC-GRA-G, LC-GRA-D	Planning & Projects staff	MT	R (phased implementation)	TBD (40 h/y)	GF
	3.1	Update and manage the upland vegetation management program	Natural Appearance / Education / Ecological Health / Grazing / Grassland Management	LC-GRA-P, LC-GRA-J, LC-GRA-F, LC-GRA-G, LC-GRA-D	Planning staff	LT	R (phased implementation)	TBD (20 h/y)	GF
	3.2	Implement the recreation plan	Natural Appearance / Infrastructure	Entire property	Planning & Projects staff	LT	R (phased implementation)	TBD (40 h/y)	GF
	3.3	Implement an interpretive education program	Natural Appearance / Education / Infrastructure	Entire property	Planning staff	LT	R (phased implementation)	TBD (40 h/y)	GF
	3.4	Plan and design a dryland agriculture program	Ecological Health / Education	LC-GRA-P, LC-GRA-J, LC-GRA-F, LC-GRA-G, LC-GRA-D, LC-ARR	Planning & Projects staff	LT	R (phased implementation)	TBD (40 h/y)	GF
	3.5	Identify and prepare funding for dryland agriculture plan implementation and guide implementation	Ecological Health / Education	LC-GRA-P, LC-GRA-J, LC-GRA-F, LC-GRA-G, LC-GRA-D, LC-ARR	Planning staff	LT	R (phased implementation)	TBD (40 h/y)	GF

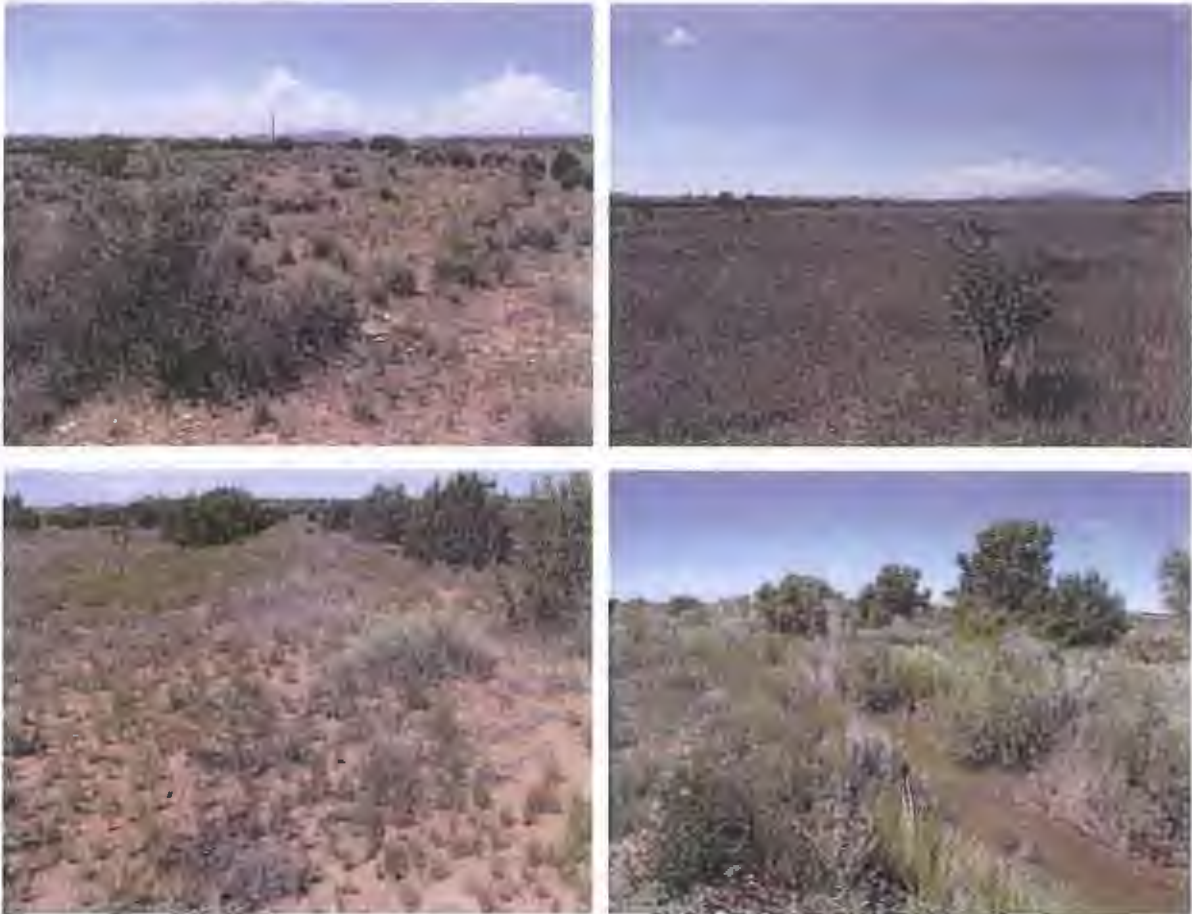
APPENDIX B: EXISTING CONDITIONS
AND INVENTORY REPORT

SFC CLERK RECORDED 10/12/2016

Santa Fe County Open Space Management Planning Initiative

A Field Characterization for the La Cieneguilla Open Space Property Santa Fe County, New Mexico An Existing Conditions and Inventory Report

February 19, 2016



Ecotone

Conservation Planning for Landscapes in Transition

1413 Second Street, Suite 5
Santa Fe, New Mexico 87505
505-470-2531
jwjansens@gmail.com

Table of Contents

INTRODUCTION	3
Research Topics and Methods	3
FINDINGS OF EXISTING CONDITIONS: LA CIENEGUILLA OPEN SPACE – LA CIENEGUILLA	4
Scope of Research	4
Summary of Findings, Conclusions and Recommendations	4
Land Health and Suitability of the Grasslands	4
Land Health of Riparian Area	14
KEY ASSESSMENT PROJECTS	23
APPENDIX A – LAND SUITABILITY AND LAND HEALTH OF GRASSLANDS	24
APPENDIX B – GEO-HYDROLOGY CONDITIONS IN LA CIENEGUILLA	29
APPENDIX C – ALL OPEN SPACE PROPERTIES: LAND SUITABILITY GOALS	34

Photographs Page 1. Top left: view across grasslands from northern gravelly grasslands to the southwest; top right: view across grasslands from southern loamy grasslands to the southwest; bottom left: view across grassland with junipers to the northwest; bottom right: view along Santa Fe River riparian zone to the west-southwest. (Photographs by Jan-Willem Jansens)

INTRODUCTION

This report provides an overview of field characterizations, including existing conditions, and a list of key assessment (research) projects to be addressed at a later date for the La Cieneguilla Open Space (LCOS) property in La Cieneguilla, in Santa Fe County, NM. The report describes the findings of the second phase – Inventory and Assessment – of the 2015 Santa Fe County Open Space Management Planning Initiative.

The purpose of the (Phase-2) Inventory and Assessment research is to collect more in-depth data on selected issues to have the minimally needed information to proceed with Master Planning, to develop Maintenance Plans and to complete Management Plans for the LCOS property. Findings of the Inventory and Assessment phase will also play a directing role in structuring community input for Master Planning for the community of LCOS stakeholders.

Research Topics and Methods

The Ecotone project team conducted the research for this project phase from October through December 2015. The research scope focused on selected issues identified in phase-1. A summary of the selected research issues during the Inventory and Assessment phase is listed at the top of the Findings section.

Research activities included two terrain visits, supported by web- and literature research, and fact-checking and interviews with experts. The project team collected detailed terrain data along a series of grassland and wetland vegetation transects and documented specific observations through photography and GPS documentation of the locations of the issues observed. Terrain assessments included specific assessments of fuel loads on the ground to quantify fire hazard in wooded areas. Project team members also conducted formal and informal meetings and fact-checking using e-mail communication with a State hydro-geologist regarding stream and groundwater flows

While this report focuses on findings, it also includes a few conceptual conclusions and recommendations. Detailed maintenance and ecological restoration recommendations will be formulated in Phase 3 of the Open Space Management Planning initiative and included in the final Management Plan.

FINDINGS OF EXISTING CONDITIONS: LA CIENEGUILLA OPEN SPACE – LA CIENEGUILLA

Scope of Research

Table 1: Listing of Phase-2 Research Topics

#	Research Topics
1a	Land health assessment of grasslands
1b	Water rights information
1c	Land suitability study of grassland for various uses/mixed use
1d	Id needs and opportunities for improvements
2a	Id flood risks, log jams, and bosque wildfire hazards
2b	Id stream flow and evapotranspiration processes regarding irrigation needs downstream and in La Cieneguilla
2c	Id stream and floodplain restoration needs
3	Id needs and costs for stormwater management and erosion control on the trail on the terrace on river left

Summary of Findings, Conclusions and Recommendations

Land Health and Suitability of the Grasslands

1a: Land Health Assessments of Grasslands

The grasslands at LCOS include six different terrain management units based on topography, soils, and vegetation, across four ecological sites (Figure 1 and Table 2). In summary, the grassland conditions range from very poor to somewhat good. Most grassland sites appear to be recovering from past impacts of drought and terrain disturbances. The grassland data, the terrain management units and ecological sites and their conditions are summarized in Table LCOS-2, and illustrated on a map in Figure LCOS-A-1, in Appendix A.

The grasslands appear not to have been grazed for many years. However, managed grazing practices aimed at grassland restoration (i.e., restorative grazing) have the potential to increase grassland health by removing undesirable weeds and increase nutrient cycling.

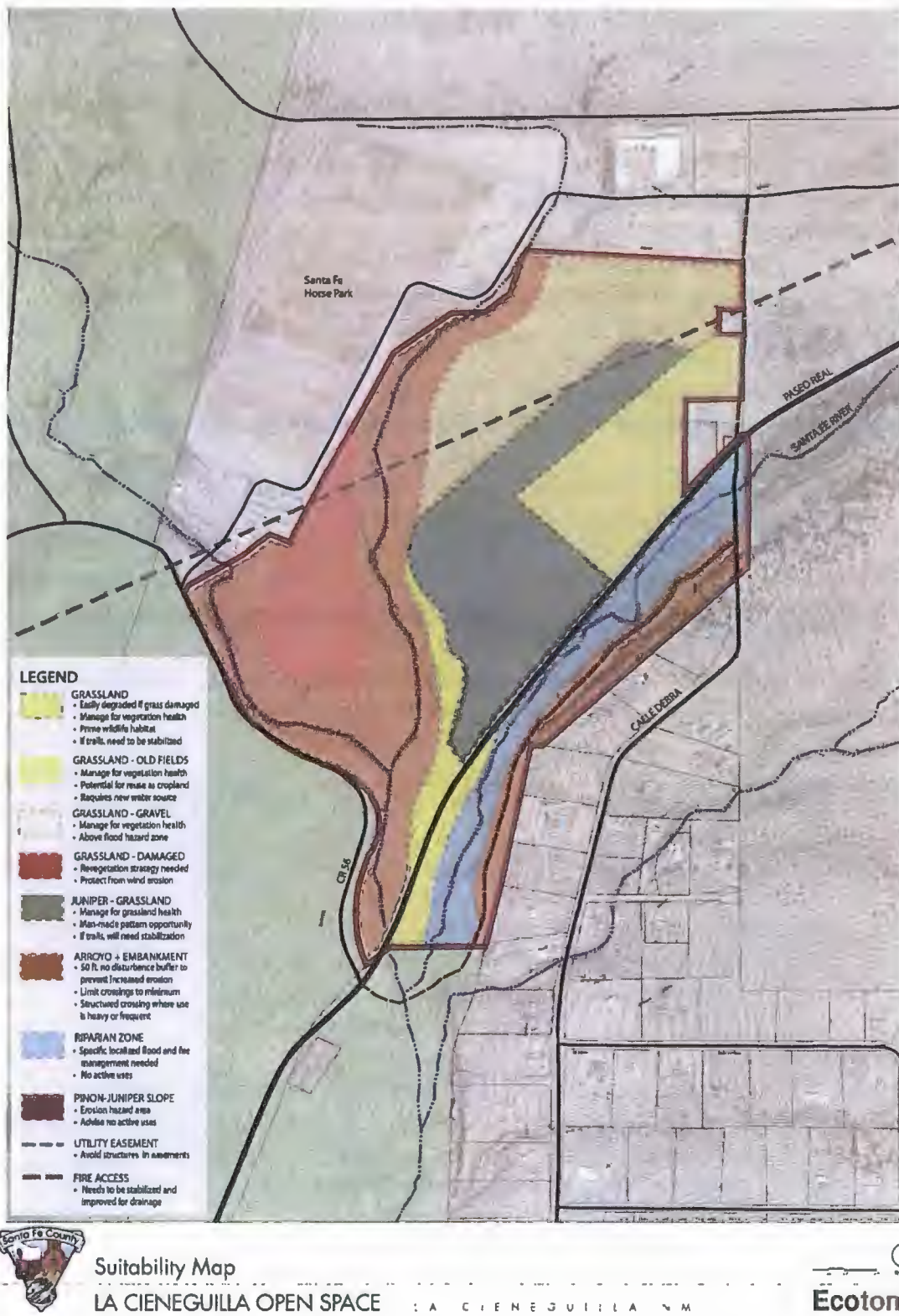


Figure 1. La Cieneguilla Open Space – Land Suitability Map

Table 2. Overview of LCOS Terrain Management Units and their ecological sites, land health conditions and suitability opinions.

Terrain Management Unit	Ecological Site	Land Health Conditions	Suitability Options
1. Grassland – Gravel: upland gravel terrace	“The Pits”, a sandy-gravelly, disturbed soil; well-drained, uneven topography; possible former site of dumping of cut and fill dirt; outside flood zone; Sand dropseed is the dominant grass (23%)	Dry terrain with 21%-41% soil cover of a mosaic of grass, forb, and shrub vegetation; and 10% litter and 14%-15% stone cover; very little erosion risk; some weed proliferation; rodent holes	(1) Park and trail uses (2) Very limited managed grazing (3) Specialized dryland farm crops
2. Piñon-Juniper area	“Delvalle-Urban Land Complex”, loamy sand and sandy loam complex of alluvial soils; Flood zone AE (0.1-0.02%); Sand dropseed is the dominant grass (12%)	Dry terrain with nearly 50% bare ground, 12% litter and 2% gravel; some signs of sheet wash; juniper seem to dry out soils; significant weed proliferation; many rodent holes and nests	(1) Limited park use (2) Trail uses (3) Very limited, managed grazing (4) Ecological restoration opportunities to reduce juniper cover and increase grass cover
3. Grassland – Old Fields: former pastures	“Delvalle-Urban Land Complex”, loamy sand and sandy loam complex of alluvial soils; Flood zone AE (0.1-0.02%); Sand dropseed is the dominant grass (39%-47%)	Dry, locally disturbed terrain (ridges and depressions) with variable (15%-34%) bare ground, 12%-14% litter and 1%-2% gravel in a mosaic of dense grass and shrubs	(1) Limited park use (2) Trail uses (3) Managed grazing (4) Ecological restoration opportunities
4. Grassland: lower grassland strips	“Delvalle-Urban Land Complex”, loamy sand and sandy loam complex of alluvial soils; Flood zone AE (0.1-0.02%)	Strip of fair-quality grassland along arroyo and riparian area with good grass and forb cover and some shrubs and trees (elm)	(1) Trail uses (2) Managed grazing (3) Ecological restoration opportunities
5. Grassland – Damaged: loamy rangeland	“Zepol Siltloam”, loamy and fine sandy soil, mostly flat terrain with poor drainage; Flood	Very poor, weed-covered rangeland with 29% bare ground, 15%-16%	(1) Limited park use (2) Very limited trail uses (3) Restorative grazing

	zone A (undetermined); Kochia, a non-native plant, is dominant (21% cover)	plant litter and 2%-3% gravel; poorly draining soils, and signs of past soil disturbance; wind erosion risks	(4) Ecological restoration opportunities to increase native grass cover in place of Kochia
6. Arroyo Embankment: arroyos with buffer zone	“Walkibout-Innacutt Complex”, sandy drainage strips following incised arroyos with steep banks; Flood zone A (undetermined)	Partly grass-covered, sandy arroyo bottom with steep sandy-loamy banks and many large piles of construction debris; including a 100-ft buffer zone with waste piles and holes (tunnel erosion through subsoil)	Not suitable for use except for a carefully-constructed trail crossing unless reclaimed (safety hazards due to flood risks and waste dumps)

1b: Water Rights for Grassland Irrigation

No water rights are available for irrigation on the grasslands of LCOS. Water rights associated with the Hagerman well are reportedly leased to HIPICO Santa Fe (a.k.a. The Horse Park) in a gentlemen’s agreement. It is unclear when the agreement will end.

Santa Fe County also has no rights to the effluent water piped from the Municipal WWTP. However, Santa Fe County could consider benefiting from the nearby pipeline infrastructure (to HIPICO Santa Fe) and investigate the opportunity of purchasing effluent from the City of Santa Fe for irrigation purposes on LCOS.

1c: Land Suitability of Grassland for Various Uses/Mixed Use

The suitability of various forms of land use (grazing, agriculture, trails, fishing pond, community park, and mixed uses) are determined by suitability goals and criteria described in Appendix C.

Grazing

Suitability for grazing is low. The NRCS WebSoil Survey indicates that in favorable years forage production is around 633 lbs/acre. In normal years, forage production is only 433 lbs/acre. We estimate based on visual observations that the forage biomass volume in the late fall of 2015 was probably above the value of 633 lbs/acre for the sandy grassland outside the juniper-dominated area. The relatively favorable forage production in 2015 is probably related to the record precipitation of the year.



Figure 2. Grassland at the Upland Gravel Terrace with a large proportion of poor quality forage species; view to the east-southeast. (Photo by Jan-Willem Jansens)

Plant diversity is relatively high with 21 species recorded. However, most plants are unpalatable forbs (Figure 2). Only 5 plant species are palatable grass species of moderate forage quality, with Sand dropseed as the dominant grass species throughout the area. The five grass species constitute less than 30% of all the vegetation cover. Grass covers no more than 15% of the soil and bare ground, litter and rock covers 47% of the soil.

Grass cover and forage quality are patchy and highest on the fringes of the juniper area (unit 2), the former pastures (unit 3), and the strips of grass along the arroyos (unit 4). The loamy rangeland and the arroyos are currently unsuitable for grazing because of relatively high potential soil loss from sheet wash and wind erosion and due to sparse forage cover.

The fencing for the property is in moderate to good condition with only a few areas with broken wires. Stray livestock in the area have not been observed and don't present a concern for trespass entry at this time. Land suitability for grazing can most likely be improved after a regime of prescribed, restoration grazing. Such a managed grazing regime is probably best

achieved with initial goat grazing to remove invasive plants and plants with low forage qualities. Selective and gradual juniper removal is also advisable to increase grass cover while minimizing soil loss due to wind and water, especially in dry years.



Figure 3. Arroyo with construction debris in foreground and eroding slopes. (Photo by Rich Schrader)

Orchard, Farm, or Garden

Suitability for the development of an orchard, farm or garden on LCOS is very low due to the absence of water for irrigation and relatively poor soil conditions. Only dryland farming would be possible if a local water harvesting system could be established based on roof-collection systems and an infrastructure of cisterns and drip irrigation, combined with soil preparation and rigorous mulching. A dryland farming or garden system might benefit from Keyline contour plowing to optimize water distribution and infiltration across the variegated topography of the landscape. This land use option would require considerable investments in further research, organizational development of the farming operation, and terrain improvements.

Trails

The upland area is moderately suitable for trail development. The best suitable area is the Upland Gravel Terrace because of its well-drained, stony-gravelly surface. The loamy soil

components of the grasslands and juniper area below the Upland Gravel Terrace unit limit trail development or will increase trail maintenance because of the potential of sheet wash (erosion) and dustiness. These problems can be mitigated with appropriate design but will require a greater upfront investment in trail surfacing and drainage features.

The upland area on LCOS has many subtle assets and points of interest, which offer opportunities for discovery and research. The wide views and many different view lines offer a sense of spaciousness (Figure 4). Most of the area is relatively quiet and peaceful. However, the Upland Gravel Terrace and Loamy Rangeland areas are very exposed to sun, wind, and ambient noise. Some people may experience the powerline crossing the Upland Gravel Terrace and Juniper Area as an eyesore or discomforting feature. Additionally, the smells, noise, and visual impacts of HIPICO Santa Fe may also be uncomfortable for some (Figure 5).



Figure 4. View from Upper Gravel Terrace grassland to the southwest. (Photo by Jan-Willem Jansens).

The arroyo system and the slopes crossing the western side of the upland area are seriously degraded and impacted by construction debris and other waste piles. The area is potentially

hazardous in some locations due to tunnel erosion (piping) and sharp debris objects, and susceptible to further ecological degradation (dumping, wind/water erosion, and invasive plants). This area should be considered not accessible for trail development, except perhaps for a carefully constructed trail crossing, if trails were to be built across the upland terrain units.

Trail development is probably best geared toward low-key recreational use, and take the form of a natural surface foot trail. If there is community interest, the trail could potentially be combined in certain spots with a series of workout stations. The trails could potentially also be lined with an array of interpretive signs related to historical land use and ecology. Over time, it is conceivable that a trail connection could be established to the southern end of the property across Paseo Real (County Road 56) and the Santa Fe River, connecting to the lower trail end of the trail on the terrace on river left at the southeastern side of the riparian area (Figure 6).



Figure 5. View of HIPICO Santa Fe at the northwestern corner of the LCOS property. Drainage from the facility enters the LCOS property in the center of the picture at the location of the willows and the pile of manure. Visual impacts, noise, odors, runoff, and waste from HIPICO Santa Fe impact people's experience of the LCOS property. (Photo by Jan-Willem Jansens)



Figure 6. Location of a possible future trail connection from the southern end of the trail on the terrace on river left across the Santa Fe River and Paseo Real (County Road 56) to potential future trails on the western upland area. (Photo by Jan-Willem Jansens).

Fishing Pond

The suitability of the grassland area for the construction of a fishing pond is low due to the absence of water rights associated with the land. Additionally, besides the costly investment to obtain water rights, investments in engineering and construction of a fishing facility will be costly as well, because soils are highly permeable and will need to be lined to prevent infiltration losses. Water losses from evaporation will also be considerable. The suitability of water from the wastewater treatment plant for a fishing pond is low given high phosphorus concentrations and other pharmaceutical elements that are typically found in the water. A fishing pond will also compete with the interest of the downstream traditional communities to use water for agricultural uses

Community Park

The upland area is moderately suitable for the development of a community park. The Upland Gravel Terrace unit is most suitable from a soils and drainage perspective. However, its exposed location, proximity to the impacts from HIPICO Santa Fe, and uncertainties about access are limiting factors. The Former Pastures and Loamy Rangeland units are also moderately suitable, but have limitations related to uncertain flood hazards and soil erosion risks, while the Loamy Rangeland also has access limitation related to the need to cross an arroyo.

A community park will most likely serve as the trailhead for the trail system mentioned above and may further include a parking area, a shelter canopy, dog run, and/or playground. The need for these uses will need to be corroborated with the community.

Mixed Uses

The various suitable uses described above could be combined next to each other across the land or developed in conjunction with each other over much of the same area. For example, restorative or periodic grazing may be combined with a trail system. A trail system could be logically combined with park facilities; particularly any workout stations or interpretive education facilities would combine well with a community park. Uses could be sequenced in time, and developed in different phases of the development of the open space property.

1d: Needs and Opportunities for Improvements

Maintenance and restoration

There are no immediate needs for maintenance or ecological restoration work in the upland (grassland and juniper) area. However, there are numerous aspects to the grasslands that would require maintenance and restoration over time. These include:

- Grassland improvement: (as discussed above)
 - soil conservation for the protection from wind erosion
 - removal of weeds and invasive species (mostly Kochia, snakeweed, and Russian thistle/tumbleweed)
 - improvement of grass cover
 - juniper removal
 - reclamation of the southwestern loamy rangeland area
- Waste and pollution management:
 - removal and reclamation of construction debris/waste dumps
 - protection from pollutants escaping from HIPICO Santa Fe

- Fencing:
 - fencing improvements would prevent dumping and make the grassland better suitable for grazing
 - fencing along the Paseo Real (County Road 56) could be altered to benefit wildlife crossing between grassland and riparian area (shelter and drinking area).

Restorative, managed grazing could benefit the ecological health of the grasslands, offer some community benefits, and reduce long-term maintenance cost for weed and erosion control. Grassland health conditions are probably best achieved with a combination of managed grazing and gradual juniper removal. After a period of several years of restorative grazing (e.g., with goats), the grassland could from time to time be used as a grazing area for local ranchers.

It will be important to define grassland health goals and annually monitor grassland health conditions. Consequently, grazing will have to be managed well to prevent overgrazing and degradation of vegetation and soils. In absence of water rights, stock tanks refilled by water delivered by the grazing lessee and cross-fencing will need to be brought in to facilitate rotational grazing. Gradually, the juniper area could be converted to grassland as well, but care must be given to evaluate the current ecological benefits of the juniper (esp. wind protection for erosion control), and conversion to grass may require irrigation. Details about how to establish a grazing program in Santa Fe County are outlined in an assessment for Los Potreritos Open Space in Appendix B. More detailed land maintenance and restoration recommendations will be worked out in the final Management Plan for LCOS.

Needs for infrastructure improvements

Any construction work or improvement of infrastructure will be related to the preferred land use alternative that the County chooses to implement on the LCOS upland area. Besides some fence repairs (listed above), there are no immediate needs for construction or infrastructure improvements in the upland area of LCOS.

Land Health of Riparian Area

Stream conditions in the riparian zone of the Santa Fe River change seasonally due to rapid plant growth and annual die off, beaver activity, flood events, debris jams, and subsequent changes in channel patterns. In addition, significant daily and seasonal variations in discharge of water from the municipal wastewater treatment plant (WWTP) causes fluctuations from 1.5 cfs in the morning to 9 cfs in the afternoon (see Figure 7).

The revegetation of the riparian area with willows and cottonwoods started in the late 1990s, and was finished in 2004 by the Wild Earth Guardians. The plantings plus the exclusion of cattle, which had overgrazed the area, resulted in a dense riparian area where there once was a riverbed with very few riparian plants. The fast-growing willows and cottonwoods caught the attention of the USEPA which recognized the revegetation as a “success story” in 2015 (see Figures 8 and 9).

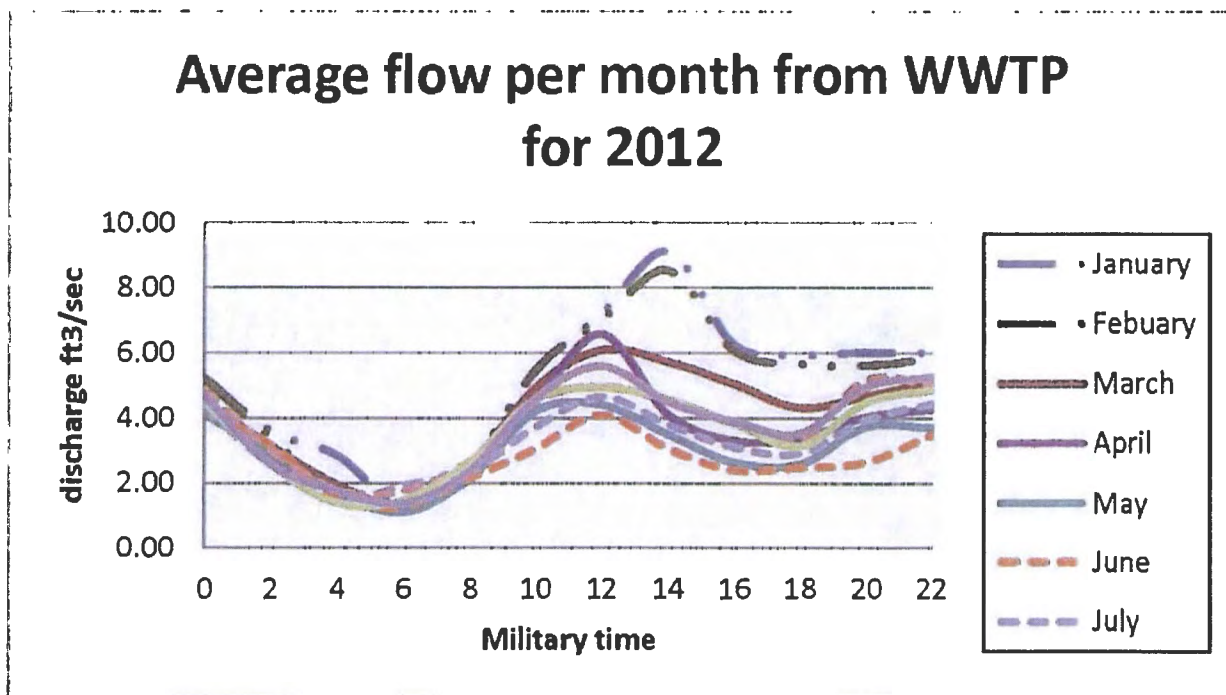


Figure 7. Average recorded flow volumes released by the Municipal Waste Water Treatment Plant upstream from LCOS. (Source: City of Santa Fe WWTP, data for 2012).

The quality of the riparian vegetation with a dominance by native coyote willows, cottonwoods, and Gooding willows is considered to be a "reference" condition, or a model, for good wildlife habitat. The current steady source of water from the WWTP and relatively infrequent large floods creates the conditions for a healthy riparian community that attenuates floods, prevents soil erosion, and supports diverse wildlife.

Beaver, which have migrated up and down the stream corridor, arrived around 2008 and benefited from the newly developed riparian habitat. The riparian plants offer the foundation of the economy for beavers that need the soft wood of willows and cottonwoods to create dams that provide the ponds they need as safe havens from predators

The dense vegetation and saturated soils caused by the beaver ponds create a rich wetland that provides important wildlife habitat. At the same time, the accumulation of woody biomass, both live and dead and rising water table present management concerns for human infrastructure such as the Calle Debra Road crossing which was not designed for year-round wet floodplain conditions. The highly variable WWTP flows, increased water infiltration and evapotranspiration and drought in recent years has led nearby farmers to claim that the beavers have taken the water from them. The County responded by installing several pond leveling devices to suppress the problem of flooding around Calle Debra and allow water to flow downstream more readily.



Figure 8. View of Santa Fe River downstream, April 1997. (Photo by Jim Matison)

The most important maintenance concerns for the riparian zone include debris and log jams and associated flood risks, stream bank stability (including stability of road sides and the Calle Debra bridge), fire hazard, and stormwater and erosion management along the trail on the terrace on river left. Many of these concerns are related to each other and linked to a combination of dense vegetation growth and dead wood accumulation, periodic high flows, and the close proximity and structural qualities of sensitive infrastructure directly surrounding the riparian zone. Below, these concerns will be analyzed in more detail.

Managing the vegetation component, maintaining the pond leveling devices and improving the Calle Debra road crossing will probably be most effective in addressing the majority of management concerns. However, because of its natural, living quality, the riparian vegetation requires recurring management attention. Additionally, roadsides, culverts, and the Calle Debra bridge and roadbed could possibly be improved to increase their sustained stability and resilience and to reduce annual maintenance on these infrastructure facilities.



Figure 9. View of Santa Fe River downstream, repeat photo from August 2004. (Photo by Jim Matison)

2a: Flood Risks, Log Jams, and Bosque Wildfire Hazard

Flooding, bank failure below infrastructure, and wildfire are posing the greatest emergency risks on this open space property. Proper terrain management with frequent inspections and annual maintenance activities can reduce the need for emergency interventions. Table 3 lists specific concerns regarding flooding, bank failure and wildfire which were identified during a field assessment in November 2015.

2b: Stream Flow and Evapotranspiration Processes regarding Downstream Irrigation Needs

The conditions related to flooding and ponding of river water described above contribute to the high quality wetland ecosystem of the riparian area of the LCOS. Yet, downstream water users have voiced concerns that river water used for plant growth and wetland conditions on the LCOS reduces water availability for irrigation downstream.

Santa Fe County has passed resolutions that direct staff to address the concerns from downstream water users. In addition to and outside the context of the Management Plan for LCOS, County staff will continue to work to the best of their ability and jurisdiction with the affected communities to address downstream water needs.

Table 3. Specific Concerns regarding Flooding, Bank Failure and Wildfire.

Location	Concerns	Proposed Solution
Calle Debra bridge	Periodic blockage of culverts. Sink holes beneath pavement.	Periodically remove debris on grates and in culvert. Repair road when needed. Mid-long term: reengineer the bridge support substrate to become more resilient to fluctuating flows and moisture levels
Entire riparian area, esp. northern 1,400 ft of east side and entire west side along Paseo Real	Nearly 16 t/ac of dry wood fuel, mostly in the form of coarse fuel, such as logs and branches. Many stands of willow in which an approx. average of 40%-50% of dead wood.	Maintenance cleanup in a series of phases to remove specific stands of dead standing biomass (dead willow, invasive spp.), non-native trees and junipers. Periodic maintenance thereafter.
Entire area	Beaver impacts on native trees, stream channels, and flow regimes	Large-scale maintenance cleanup (as above), caging of large trees that should be preserved, and maintaining the pond leveling devices on the property
East side of the riparian area, from Calle Debra about 1,300 ft downstream	Overgrown conditions, including dead willow stands, some invasive species (Siberian elm, Russian olive, tamarisk) and juniper	Maintenance cleanup in a series of phases to remove specific stands of dead standing biomass (dead willow, invasive spp.), non-native trees and junipers. Periodic maintenance thereafter.
Over entire west side along stream banks in grass & shrubland between Paseo Real and SF River	Various piles of bucked up elm and other wood: high fuel loads; source of possible debris jam downstream.	Remove or pile and burn.
On various places along Paseo Real	Signs of flooding of road sides, and bank erosion due to ponding in side channel with beaver dam; elm trees fallen on fence in two other locations.	Install flow devices or remove beaver dam, elms, and willows to prevent future beaver dams along the road; stabilize road sides; repair fence.
Southern, dry shrub- and forb-dominated area (3.5-4 acres)	Locally overgrown conditions, invasive plants, and piles of dead and down woody material	One-time thinning and prescribed burn; potentially in collaboration with BLM

A detailed hydrological and hydro-geological study will be needed to arrive at an authoritative conclusion about the wetland conditions. Such a study should specifically address what aspects of the wetland plant and animal activity lead to reduced actual water delivery downstream

compared to any alternative riparian conditions, for example, such as those present at the site prior to 2004 when the stream-side plantings were completed.

A review of existing research and an e-mail exchange with Ms. Peggy Johnson, a hydro-geologist and expert in stream and groundwater flows for the downstream La Cieneguilla and La Cienega area (Appendix F) revealed the following relevant findings and conclusions:

- The river reach on LCOS is a water-losing reach due to the geology of the area. This means that the volume of water flowing in the stream bed at the upstream end of the reach is greater than the volume of water flowing out in the streambed at the downstream end. The reason for this phenomenon is that the net infiltration of river water in the banks and river bed is greater than the amount of groundwater that discharges into the surface flow from the banks and streambed.
- Part of the water that infiltrates at LCOS flows downstream under the surface and resurfaces again as springs at certain points downstream in the Santa Fe River where the net inflow of groundwater is higher than the net outflow. Another part of the water that infiltrates is believed to flow underground in a west-ward direction out of the river's alluvial aquifer. Where and how this happens, how much water is involved in this process, and to what extent the wetland conditions contribute to it is still unclear.
- There are indications, from various studies and field observations, that the wetland ecosystem— with its wet soils and ponding features – leads to an increase of the extent and duration of saturation of the alluvial soils (and alluvial aquifer) beneath the LCOS wetlands. The wetlands likely increase, at least periodically, the volume and duration of surface flows during high flow events, compared with conditions of no significant wetland ecosystem.
- It is reasonable to assume (but not certain) that the volume of water that flows out of the LCOS riparian area is less than what flows in due to evapotranspiration with the current wetland conditions. The evapotranspiration of water is greater now than during the prior drier (non-wetland) stream conditions. The amount of water that is lost to evaporation has not been estimated nor is that amount known to be significant.
- There are no data that indicate whether the conditions described above lead to any annual increases or decreases in outflow volumes in the river channel and in the alluvial aquifer at the downstream end of the river at LCOS compared to conditions without the wetland ecosystem.
- If evapotranspiration and infiltration have in fact increased, it is possible that there has been a slight net reduction of stream channel outflow volumes. It is equally possible that this reduction is (largely or entirely) compensated by increases in sub-surface aquifer recharge and downstream discharges in springs and streambanks in the water-gaining parts of the river as it enters La Bajada canyon.
- It is not clear how seasonal variations and year-to-year differences influence the volumes of downstream discharges of surface and sub-surface flows from the LCOS.

Even if there is no net loss of average annual discharge volume due to the LCOS wetlands, it is most likely that a larger volume of such discharges is happening more often during the winter or during wet years. As a result, water volumes reaching lower La Cieneguilla and the la Bajada box will be relatively low in the spring and summer seasons. Downstream irrigators may experience a seasonally lower amount of available water in the spring and summer months when they most need the water.

- Ms. Johnson affirms that the greatest causes for water losses for agricultural water users downstream are related to upstream water diversions for urban water uses in Santa Fe and to the drier climate conditions we have been experiencing in the past 20 years. Thirdly, she has a sense that evapotranspiration losses along the stream and in general cause some reduction in available water for irrigation. The latter is obviously related to the increases in average annual temperatures over the last half century and to the local increase of riparian vegetation.

In conclusion, it is not clear to what extent, if any, the wetland ecosystem at LCOS leads to any water gains or water losses for agricultural water users downstream. The magnitude of other influences on reduced water availability, such as drought and water input by the waste wastewater treatment plant, indicates that the impact of the LCOS wetlands is rather limited in comparison. Yet, it is understandable that in the context of the already considerably reduced water availability, downstream beneficiaries are concerned about any reductions, however small, that may be caused by the LCOS's wetland conditions. More research will be needed to identify whether the total water delivery from the LCOS to downstream water users is more or less than in non-wetland conditions.

2c: Stream and Floodplain Restoration and Maintenance Needs

A field assessment in November 2015 found that the stream channel and floodplain were in many places covered with dense vegetation, parts of fallen dead trees, material from broken beaver dams, and miscellaneous flotsam. The amount of human debris and trash was surprisingly low. The plant debris has created several log and woody debris jams. About 700-1000 ft downstream from Calle Debra, the debris has split the flows in several places and caused bank erosion and channel bottom scour. The channel erosion seems to have played a role in local channel incision of 2 to 2.5 ft deep. While the erosion is probably only temporary, it indicates that the channel is not efficient enough to move high flows, which leads to flooding. The dense vegetation, combined with the presence of beaver dams, scattered woody debris, and log and debris jams add up to a high level of "roughness", which is an engineering factor in calculating the capacity of a river system to pass a flood flows. High roughness increases the incidence (i.e., risk) of elevated flow levels and related flooding of terrain and adjacent infrastructure.

The Federal Emergency Management Agency (FEMA), the agency mapping anticipated flooding areas, has indicated on its June 2008 map for the region that covers the LCOS property that the Santa Fe River and its immediate banks are in FEMA Zone-AE with a chance of flooding assessed at 1% (Figure 10). Flood zone AE includes the area of the trail on the terrace on river left as well as the pastures and juniper area to the west of the river. A narrow strip on either side of the Zone-AE area is in a 0.2% flood zone, called Zone-X. FEMA maps and regulations offer guidelines to local government agencies and landowners about limitations to construction in flood-prone areas. Santa Fe County's Sustainable Land Development Code (SLDC) includes specific regulations to prescribe the process for studying flood impacts and permitting of land uses in the flood-prone area to reduce the chance of elevated flood levels and increased flood risks in adjacent areas.

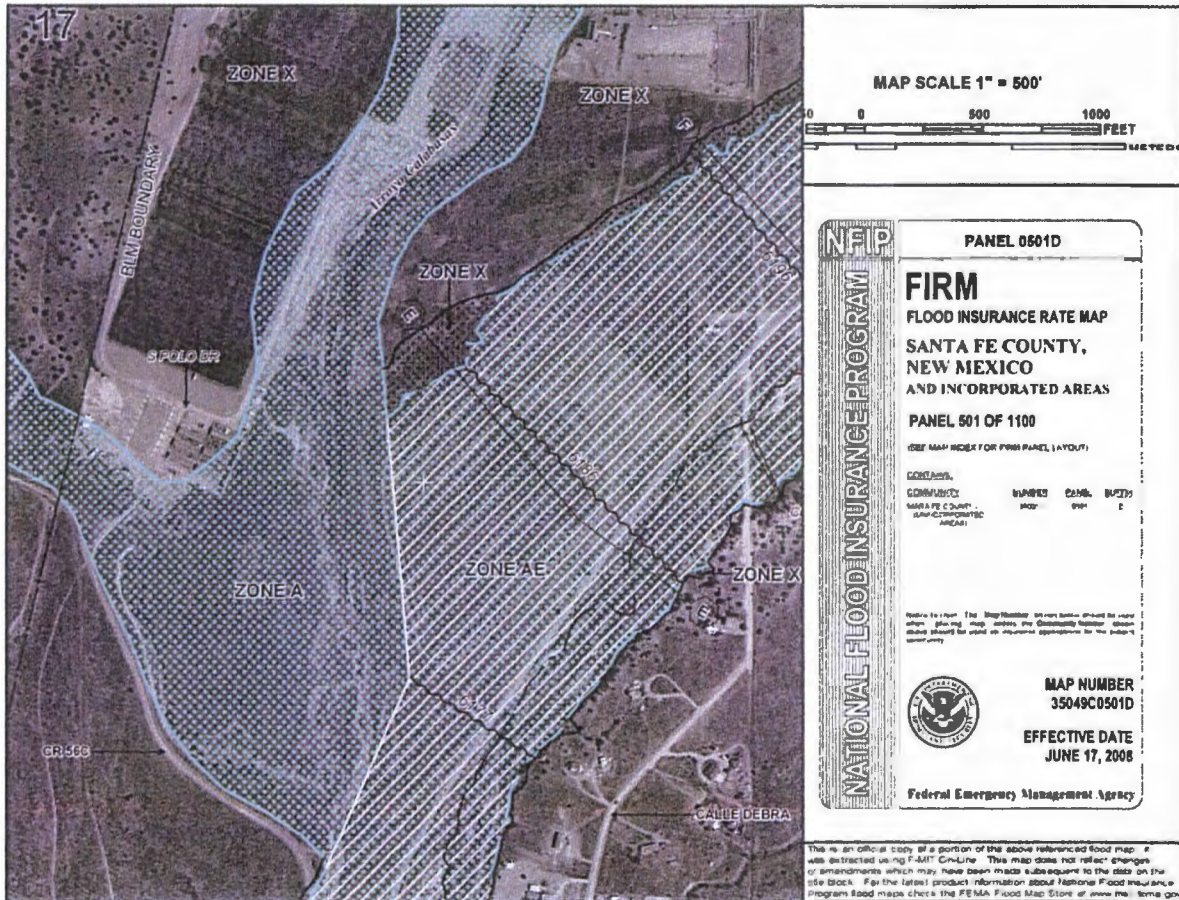


Figure 10. A Firmette map of the LCOS area based on the FEMA FIRM map for the Santa Fe County Area.

While no flood management permitting requirements are directly associated with annual maintenance of the riparian area or even master planning for the LCOS, the FEMA map and the

Flood Prevention and Flood Control section of the SLDC (Section 7.18) offer useful indications for the need for riparian area management. Particularly when in the future Santa Fe County would implement any improvements on the pastures and juniper area west of Paseo Real, maintenance of the riparian area becomes more important in order to reduce the risk of flood damage of infrastructure during unusually large flow events.

As a result of the flood hazard in the riparian zone and the need for frequent maintenance, this area is best suitable for ecological conservation purposes and flood management. The trail on the terrace on river left could officially be made publicly accessible as a multi-purpose trail. Over time, this trail could be connected at the southern end with a simple crossing (stepping stones or a simple bridge) to river right and further to the grassland area.

Final solutions about water management need to be balance with a need to maintain healthy riparian habitat along the Santa Fe River on LCOS, while also meeting goals regarding the protection of critical infrastructure around the area. Practical solutions will likely include maintenance work aimed at keeping the main stream channels clear of plants and debris to optimize channel flows during peak events, particularly during the agricultural growing season. Beaver dams will most likely not need to be removed unless they are threatening to erode or damage critical infrastructure during peak flow events.

KEY ASSESSMENT PROJECTS

Certain topics could not be addressed in the (Phase-2) Inventory and Assessment research due to limitations in project scope and budget. The field inventory work and community meetings in Phase-1 helped identify a list of research and planning projects that need further attention after completion of the Management Plan for the La Cieneguilla Open Space. These projects include, more or less in order of priority over time:

1. Site specific study and planning for improved drainage and erosion control along Paseo Real and along the trail on the terrace on river left, leading to an internal work order or an RFP to implement the improvements.
2. Site specific study and planning for site cleanup and safety measures for the Arroyo de los Calabazas area and its banks, including the dump sites, leading to a phased cleanup and site rehabilitation plan.
3. Specific study and planning for the mechanics and procedures of a restorative grazing program and an ongoing managed grazing program, including fencing, contracting, and monitoring.
4. Study of hydrogeological conditions and processes regarding water discharge from the LCOS to downstream irrigation area under current wetland conditions in comparison with (previous) non-wetland conditions. Seasonal and multi-year influences on water delivery regimes downstream.
5. Identification of access rights on the dirt road extending north from Calle Debra along the northeastern boundary of LCOS and the dirt road approaching from the east to the northeastern corner of the LCOS. Questions include: what rights does the County have and what level of neighbor cooperation would need to be required to use existing dirt roads to access the property?
6. Specific study and planning for the development of a detailed Master Plan for the development of trail and park facilities, leading to a possible phased implementation of trails and park facilities, signage, parking, etc.
7. Specific study and planning for the feasibility and community capacity to engage in small-scale, rain-fed agricultural or gardening activities (perhaps in conjunction with a community park facility).
8. Specific study and planning for the implementation of an interpretive education component at LCOS, possible in conjunction with trail connections to BLM lands.

APPENDIX A – LAND SUITABILITY AND LAND HEALTH OF GRASSLANDS

Detailed field research at LCOS focused on grassland and riparian health conditions to anticipate present land suitability for alternative uses and for restoration and maintenance needs. The field research component was based on the NRCS WebSoil Survey and Ecological Site Descriptions (ESD) for the various types of grasslands at LCOS. Field research consisted of visual field observations during a day-long walk through the grassland area, combined with six 100-ft transects with a total of 60 vegetation sample plots (ten per transect) (Figure LCOS-1).



Figure LCOS-1. Google Earth map of La Cieneguilla Open Space with locations of transects used for grassland vegetation sampling.

A summary of findings for the different terrain types includes the following observations and is summarized in Tables LCOS-A-1 and LCOS-A-2.

1. Terrain types (soil classes) determine the general grassland conditions. The NRCS WebSoil Survey distinguishes four terrain types:
 - a. Pits: a sandy-gravelly soil (mostly graded fill on old river terrace), mostly flat terrain with distinct ridges and closed depressions, draining in westerly direction; located in the most northern and northwestern part of the property along the boundary with the HIPICO Santa Fe

- b. Delvalle-Urban Land Complex: a loamy sand and sandy loam complex of alluvial soils that constitute most of the grassland and terrain with juniper plantings, flat or with a grade of 1%-2%, and draining gently in southwesterly direction, located in the central and southeastern part of the property along Paseo Real (County Road 56)
 - c. Walkibout-Innacutt Complex: sandy drainage strips of incised arroyos with steep slopes of the arroyo banks (Arroyo de los Calabasas) located in the southwestern part of the property
 - d. Zepol Siltloam: a loamy and fine sandy soil between the two arroyo branches, mostly flat terrain with poor drainage, located in the southern part of the property
2. Soils are mostly sandy – varying between alluvial loamy sand deposits and coarse sand and gravel, which is mostly fill material. Soils are fine to coarse in structure and moderately to well-draining. Estimated soil loss is low due to the relatively flat terrain and the permeable soil quality. Soil loss is highest on loamy soils in the southern part of the property and on the slopes of the Arroyo de los Calabasas. Additionally, wind erosion potential is high on exposed soils with a silt and clay component, which occur mostly in the southern and western parts of the property and in the riparian zone.
3. Vegetation cover on the sandy grassland was consistently more than 50% this year, which is surprisingly high, and dominated by sanddrop seed. However, on the more silty and loamy soil on the southern part of the property, between the two tributaries of Arroyo de los Calabasas, vegetation cover was low and dominated by Kochia.
4. The NRCS WebSoil Survey and Ecological Site Description for the area indicates that the currently dominant vegetation may be a result of grazing impacts that have removed the blue grama and Western wheat grass that would form the climax plants for this landscape type. Past grazing and ongoing heavy browse by wildlife (ungulates and rodents) may in fact be the causes of the current grassland conditions. These conditions seem to be further degraded in the juniper dominated area due to the water absorption by the juniper vegetation. Grassland disturbance and ecological stress has led to a co-dominant – and locally dominant – presence of Kochia and snakeweed throughout the property. Locally, especially in the juniper dominated area and the loamy Zepol terrain unit, bare soil patches occur. The bare patches are crusted, which is probably a result of raindrop splash impacts on the silt component of the soil. Crusting stagnates natural land regeneration; it prevents evaporative losses but also reduces infiltration of precipitation and germination of plants.

The dominant grass species on the LCOS grasslands is sand dropseed (*Sporobolus cryptandrus*), a warm season grass with good to fair palatability for livestock and wildlife when it is green. The palatability of the grass drops with maturity. Sand dropseed was the dominant grass on all transects except GT2 which was dominated by Kochia (*Kochia scoparia*), a non-native tumbleweed-like plant that covered 21% of the transect quadrats. Tables LCOS-A2 and LCOS-A3 show summary results from the grassland transect data.

Table LCOS-A1. Summary of findings for bare ground, litter, and rock cover percentages for each transect.

Transect/Site	Bare Ground (%)	Litter (%)	Rock (%)
Transect 1.1 & 1.2 Pits area	31.1	9.7	14.4
Transect 2 -Kochia area	28.9	15.5	2.5
Transect 3-Juniper	49.1	11.9	2.2
Transect 4 - grassland	23.7	11.7	1.1
Transect 5 - grassland	15.4	14.1	1.6
Transect 1.1- Pits (0-30m)	21.2	12.3	11.5
Transect 1.2- Pits (30-60m)	40.9	7	17.3

Table LCOS-A2. Detailed findings of percent cover of species of grass, forbs and woody plants for each transect.

Transect/Site: 1	Pits area	AVG (%)	Total Cover (%)
<i>Sporobolus cryptandrus</i>	Sand dropseed	23.0	46.7
<i>Gutierrezia sarotherae</i>	Broom snakeweed	12.3	
<i>Aristida</i> spp	Threeawn species	4.0	
<i>Ericameria nauseosa</i>	Chamisa	3.3	
<i>Bouteloua gracilis</i>	Blue grama	0.8	
AF-1	Annual forb 1	0.7	
<i>Bidens</i>	<i>Bidens</i> SPP.	0.5	
<i>Heterotheca villosa</i>	Hairy golden aster	0.4	
<i>Chenopodium album</i>	Lambsquarters	0.3	
<i>Elymus elmoides</i>	Bottlebrush squirrel tail grass	0.3	
<i>Eriogonium</i> Spp	Buckwheat SPP.	0.3	
<i>Kochia scoparia</i>	Kochia	0.1	
<i>Muhlenbergia porteri</i>	Ring muhly	0.1	

Transect/Site: 2	Kochia area	AVG (%)	Total Cover (%)
Kochia scoparia	Kochia	21.3	41.7
Sporobolus cryptandrus	Sand dropseed	8.7	
Bouteloua gracilis	Blue grama	5.5	
Gutierrezia sarotherae	Broom snakeweed	4.0	
AF-1	Annual forb 1	1.0	
Muhlenbergia porteri	Ring muhly	1.2	
Transect/Site: 3	Juniper rows area	AVG (%)	Total Cover (%)
Sporobolus cryptandrus	Sand dropseed	12.4	30.2
Kochia scoparia	Kochia	6.6	
Machaerthera canescens	Purple aster var. glabra	4.7	
Gutierrezia sarotherae	Broom snakeweed	3.5	
Heterotheca villosa	Hairy golden aster	1.0	
Ratibida tagetes	Prairie conflower	0.6	
Aristida spp	Threeawn species	0.5	
Juniperus monosperma	One seed juniper	0.4	
Verbesina encelioides	Cowpens daisy	0.3	
Muhlenbergia porteri	Ring muhly	0.2	

Transect/Site: 4	East Grassland area	AVG (%)	Total Cover (%)
Sporobolus cryptandrus	Sand dropseed	39.2	56.0
Machaerthera canescens	Purple aster var. glabra	11.0	
Ratibida tagetes	Prairie conflower	1.6	
Aristida spp	Threeawn species	1.2	
Kochia scoparia	Kochia	1.0	
Panicum obtusum	Vine mesquite	0.8	
Salsola tragus	Tumbleweed	0.5	
Elymus elmoides	Bottlebrush squirrel tail grass	0.4	
Gutierrezia sarotherae	Broom snakeweed	0.1	
Pf-2	Perennial forb 2	0.1	
Pf-3	Perennial forb 3	0.1	

Transect/Site: 5	East Grassland area	AVG (%)	Total Cover (%)
Sporobolus cryptandrus	Sand dropseed	46.6	59.4
Kochia scoparia	Kochia	10.5	
Ratibida tagetes	Prairie conflower	2.3	

APPENDIX B – GEO-HYDROLOGY CONDITIONS IN LA CIENEGUILLA

La Cienega Wetlands Study NMBGMR OFR-569

Response to Inquiry from Jan-Willem Jansens re La Cieneguilla Open Space (LCOS) Groundwater Hydrology

November 9, 2015

Jan-Willem,

Thanks for your email and inquiries regarding the recent La Cienega wetlands study (NMBG OFR-569). You present some very good questions (*italic font*) and my responses are found below. First, I'd like to make the following clarification. Field studies for this report were largely confined to the La Cienega area and the springs and wetlands along Cienega Creek and its tributaries. Data from the LCOS are entirely from a 2003-2005 regional study (NMBGMR OFR-511). In 2011, we visited one well downstream in Cieneguilla for a water-level measurement and a groundwater sample and these data are reported in OFR-569. In general, the LCOS area lacks sufficient data for a robust characterization of the shallow groundwater system, its interconnection with the Santa Fe River, temporal variability in water levels and surface discharges, and seepage losses along the Santa Fe River in the LCOS. Many of your questions can be addressed conceptually, but existing groundwater and surface water data are inadequate to support the level of interpretation you are hoping for.

1. *Is our understanding correct that:*

a. *Groundwater flows in the area of La Cieneguilla Open Space (LCOS) are predominantly originating from the northeast (north of Agua Fria area) and not so much from the east (Arroyo Hondo/Chamisos/Cienega complex)?*

Yes, GW flow in the area of LCOS does originate from the northeast, but **from a mixture of 2 sources**: (1) recent recharge from channel infiltration of runoff (precipitation and snow melt) along the length of the Santa Fe River corridor, not just north of Agua Fria; and (2) up welling of deep groundwater from the regional Tesuque aquifer as flows approach the edge of the basin at the Rancho Viejo hinge zone, which intersects the Santa Fe River valley about 1 mile downstream from the southern boundary of the LCOS. Groundwater flow from the east discharges from the Ancha Formation primarily or entirely into the La Cienega streams, springs and wetlands and does not contribute to groundwater flows in the LCOS. In the LCOS, the Ancha Formation is only saturated along the Santa Fe River corridor. The Santa Fe River in the LCOS is a losing stream that locally recharges the shallow groundwater system.

b. *Groundwater flows in the area of La Cieneguilla Open Space (LCOS) are predominantly flowing to the west/southwest away from the Santa Fe River rather than toward La Cieneguilla and La Cienega?*

Groundwater outflow from the LCOS area is a little more complicated than you are depicting. Focused recharge along the Santa Fe River corridor locally saturates the underlying Ancha Formation and is superposed onto the regional Tesuque aquifer. Conceptually, two things likely occur: (1) some groundwater in the shallow Ancha aquifer flows south-southwest beneath the Santa Fe River channel, within the area of the active floodplain, and down the Santa Fe River canyon; and (2) some groundwater

in the shallow Ancha aquifer is entrained into regional westward flow toward the Rio Grande. As mentioned above, existing data are inadequate to robustly characterize the surface water and shallow groundwater flow systems and the magnitudes and proportions of south-southwestward sub-channel flow and westward regional flow are unknown.

c. Surface water flows in the Santa Fe River in the area of the LCOS are infiltrating rapidly into the water losing reach of the Santa Fe River at LCOS and then flowing underground to the west rather than toward La Cieneguilla?

See response to question 1.b above. The amount and rate of surface infiltration from the Santa Fe River to the underlying alluvium and Ancha Formation is unknown. Historic seepage data are inadequate to quantify infiltration rates or to precisely define where the river channel transitions from losing to gaining conditions. The NMOSE seepage studies noted significant uncertainties in the precise location of this surface-water transition zone (see OFR-569, Fig. 18, page 44), which is estimated to occur near the southern boundary of the LCOS.

Ethan Mamer, a hydrogeologist at the Bureau of Geology, is interested in testing a new method of locating and quantifying surface water infiltration. The method requires digging a shallow trench along a streambed, and burying a pair of fiber-optic cables. An instrument (a Distributed Temperature Sensor) is attached to these cables that can determine the temperature of the cable, every meter, along its entire length. Using the thermal profile of the stream bed collected from the trenched fiber-optic cable we can quantify the rate at which groundwater is infiltrating, and locate where it is occurring. It may be possible to install these paired cables upstream of the WWTP while the stream bed is dry this winter, and prior to spring snow melt. From this record we may be able to infer what the infiltration rate downstream of the WWTP is with better certainty.

d. The role of water flows from the WWTP in surface- and ground water volumes reaching La Cieneguilla and the SF River near La Cienega is insignificant, even in the winter. (If I understand this correctly, what is your explanation for this? Is there hardly any surface water from the WWTP flowing down the SF River to La Cienega?)

This statement is **incorrect** (the SF River does not flow to La Cienega). You are applying to Cieneguilla my statement regarding no contribution of WWTP outflow to discharge at La Cienega. We see no chemical or physical evidence that treated waste discharge contributes to groundwater discharge at springs and wetlands **along Cienega Creek**. However, there is both chemical and physical evidence that WWTP outflow to the Santa Fe River channel provides focused recharge to shallow groundwater beneath the river; and that some shallow sub-channel groundwater flow contributes to downstream discharge along the gaining reach of the river south of LCOS. The physical evidence that WWTP discharge contributes to shallow groundwater beneath the Santa Fe River at Cieneguilla includes the recharge mound along the river corridor and channel-parallel groundwater flow (see OFR-569, Fig. 22, page 52). The chemical evidence includes: (1) elevated chloride, elevated chloride-bromide ratios, and a relatively young groundwater age from ^{14}C and tritium content in Cieneguilla well water (OFR-569, Figs. 33, 35 on pages 72, 75); and (2) a strong evaporation indicator in the stable isotope composition of Cieneguilla spring discharge (OFR-569, Fig. 34, page 73). These chemical data are notably unique from those observed at La Cienega sites and indicate that WWTP discharge contributes significantly to both shallow groundwater and spring discharge at Cieneguilla.

2. *From the point of view of hydrogeology does it make sense to harvest water locally at the LCOS for downstream irrigation uses by:*

I'm not sure I totally understand your vision to "harvest water locally" in light of the complex surface water-groundwater interaction, the influence of regional groundwater flow at the LCOS, and the need for downstream irrigation deliveries (what's "downstream": Cieneguilla? Cañon?). I don't understand the management priorities for surface water and groundwater in the Santa Fe River downstream of the WWTP or locally in the LCOS. A few thoughts on the local hydrology and water balance that may help the discussion are included below.

a. *Establishing systems for water harvesting, infiltration and aquifer recharge (perhaps even reinjection) at LCOS?*

This scenario maximizes aquifer storage and minimizes surface flow. What do you want to achieve in your management plan?

b. *Encouraging and preserving the establishment of beaver ponds on the LCOS?*

This scenario might balance contributions to aquifer storage and surface flows by temporarily holding water in the "waste-watershed" to encourage more infiltration while allowing some (likely less) surface flow to move downstream in the short-term, or maybe more downstream flows in the long-term as groundwater storage is slowly increased below the LCOS. From my limited observations, this scenario seems politically more difficult and hydrologically more uncertain, particularly since beaver are rather independent minded creatures that work outside of management plan objectives.

c. *Maximizing Santa Fe River flows and alluvial infiltration across the flood plain?*

This scenario would also balance contributions to aquifer storage and surface flows. Sounds great! How would you achieve "maximizing Santa Fe River flows" (?), with the options listed in #3 below?

3. *What options might Santa Fe County consider in order to ensure increased surface and subsurface flows in the Santa Fe River to downstream users? For this purpose (in #3), would it make sense to:*

These scenarios require in-depth analyses, which are best done by a private sector hydrologic consultant. I am not comfortable formulating a response to questions 3 and 4.

a. *Reduce evapotranspiration (remove bosque vegetation)? Th*

b. *Eliminate or, instead, increase beaver ponds?*

c. *Capture and pipe rainwater down to the water gaining reach of Santa Fe River in La Cieneguilla?*

4. *Would it make sense to invest in runoff management on the higher grassland ridge to the west and in the Arroyo de Calabasas in an attempt to increase flow volumes downstream in the Santa Fe River, either by*

I will venture a comment here in light of the hydrologic effect of climate change to increase precipitation well beyond the 100-year event. Considering the area of the lower Santa Fe River watershed and the potential for large (100s of cfs or more) flows, the Cieneguilla community would be well served if future management plans were to include ways of accommodating very large, short-term events. Engineering methods that slow down and spread out water, and maximize infiltration, can better manage large flow events while enhancing aquifer storage and moderating downstream flows. Just a thought.

- a. *Slowing down water and forcing it to infiltrate?*
- b. *Speeding up water to flow downstream to the water-gaining part of the river?*

5. *What is the influence (in decreasing order of importance) of the following factors on surface water and groundwater flows through the LCOS?*

All of these scenarios, except perhaps beaver ponds, exist/occur now and always will. These comments are directed only by my sense of how significant each factor may be in the local/regional water budget (groundwater and surface water). Ultimately these factors, and the surface water and groundwater water budgets, need in-depth analysis from consulting or government hydrologists.

- a. *Climate (change)*

CC is the wild card. We don't know what will happen when, but can depend on more extreme wet-dry cycles marked by long-term, severe drought and intense flooding. Precipitation, runoff, recharge potential all increase, but (we anticipate) will be separated by longer periods with minimal to no moisture. Rivers, streams, wetlands, ecosystems and communities will have to accommodate reversals between positive (too much) and negative (too little) water budgets.

- b. *Upstream diversions (city, county, and domestic wells)*

First on the water budget list. This factor encompasses both surface water diversions, past/present groundwater diversions and the transient effects of long-term loss of aquifer storage. This is the primary, long-term negative water-budget impact and requires a regional management strategy.

- c. *The SF WWTP*

Third on water-budget list. WWTP discharge will continue to provide a hydrologic opportunity. For the LCOS and lower Santa Fe River it can provide a steady base-flow supply to help attenuate shifts between extremes.

- d. *Beaver ponds in the SF River on the LCOS*

Natural (beaver ponds) and engineered means of temporarily holding surface water in the lower Santa Fe River above the lower canyon provide long-term management options for local groundwater recharge and for promoting a reduced, but more persistent, long-term downstream surface supply.

- e. *Riparian vegetation (evapotranspiration) in the SF River on the LCOS*

Second on water-budget list. OFR-569 demonstrated that riparian ET is a significant water-budget component in the Leonora Curtin wetlands. However, how effectively ET “losses” can be positively influenced by vegetation management, while maintaining the desired ecological habitats, is still uncertain. Managing riparian ET for a positive hydrologic and ecologic response must be possible, but how to accomplish that and predict the outcomes is outside of my field of expertise.

APPENDIX C – ALL OPEN SPACE PROPERTIES: LAND SUITABILITY GOALS

Primary Goals for Land Suitability Assessment and Master Planning include:

- a. Minimization of Upfront Development Costs and Complexities
 - Length and area of disturbance: costs of road development, paving, fencing
 - Engineering and earth moving requirements: topography, cut&fill, bridges
 - Soil suitability, drainage, vegetation disturbance/removal

- b. Minimization of Mitigation and Restoration Costs due to Resource Disturbance
 - Disturbance of cultural and historical sites
 - In appropriate use (waste) of, disturbance of or cumulative negative effects on natural resources
 - Susceptibility to erosion after disturbance
 - Scenic quality impacts (viewshed disturbance; e.g., views on/over parked cars)

- c. Public Safety Optimization
 - Safe line of sight at road intersections
 - Public visibility of public areas (avoidance of illicit activities; social surveillance and control of nuisance behavior: dumping, shooting, theft, harassment, etc.)
 - Safety regarding terrain features (flood hazard, wildfire hazard, steep or unstable slopes, gullies, dump sites, hazardous mine pits, proximity to shooting areas, etc.)

- d. Experiential Quality Optimization
 - Richness of experiences (e.g., diversity of view shed, and micro-texture of the land, such as vegetation types and specific things to see/experience)
 - Options for different (trail) users (e.g., trail extensions; distance variations, destinations, trail connectivity)
 - Diversity of user groups for which the land use scenario is appealing

APPENDIX C: MAINTENANCE PLA

SFC CLERK RECORDED 10/12/2016

Santa Fe County Open Space Management Planning Initiative

A Maintenance Plan for the La Cieneguilla Open Space Property
Santa Fe County, New Mexico

FINAL DRAFT
June 30, 2016



La Cieneguilla Open Space maintenance needs are highest in the riparian area

Ecotone

Conservation Planning for Landscapes in Transition

1413 Second Street, Suite 5
Santa Fe, New Mexico 87505
505-470-2531
jwjansens@gmail.com

Table of Contents

INTRODUCTION	3
VISION STATEMENT, GOALS AND OBJECTIVES	3
TERRAIN MANAGEMENT UNITS	4
UPLAND MAINTENANCE ACTIVITIES	7
Grassland Improvement	7
Waste Dump Removal	9
RIPARIAN AREA MAINTENANCE ACTIVITIES	9
Woody Debris	9
Tree Thinning & Protection Prescriptions	10
Prescription for removing willows in dead thickets	12
Prescription for thinning the willow patches on the edge of the river.....	13
Disposal of Wood Waste Material	14
PINON-JUNIPER SLOPE AREA MAINTENANCE	16
INSPECTIONS, MONITORING AND ADAPTIVE MANAGEMENT	21
Inspection Protocols	21
Monitoring.....	21
Adaptive Management: Identifying Choices and Making Decisions	21
LABOR REQUIREMENTS AND CAPACITY BUILDING	22
FTEs.....	22
Santa Fe County Capacity.....	22
Community Outreach and Engaging Volunteers	23
Potential Volunteers.....	23
Volunteer Maintenance Activities	24
Community Liaisons.....	24
County Point Person	24
APPENDIX A: Santa Fe County Open Space Inspection Checklist – La Cieneguilla OS	26

INTRODUCTION

This Maintenance Plan documents recommended maintenance activities for the La Cieneguilla Open Space (LCOS) property in La Cieneguilla, in Santa Fe County, NM, based on the analysis of findings and community feedback during a general inventory phase and a more detailed field characterization phase. The purpose of this document is to provide a detailed maintenance plan, which includes projected needs for labor and equipment, as part of the Management Plan for LCOS. This Maintenance Plan also makes strategic recommendations for the frequency, timing, and human capacity options Santa Fe County may want to consider to implement the maintenance activities.

VISION STATEMENT, GOALS AND OBJECTIVES

The following vision statement for the LCOS Management Plan is based on the La Cienega and La Cieneguilla Community Plan (2015), feedback from community meetings, and other input from stakeholders.

In 2025, the La Cieneguilla Open Space is a healthy ecosystem with native grasslands, a flowing river, clean water, irrigation water, and high-quality native wildlife habitats. Wildlife pathways connect to the larger landscape. The open space is managed holistically so that the land and water resources are protected, monitored, and maintained; the cultural resources are protected; and there are educational opportunities for the public to learn about the land, water, ecology, human history, and past and current uses of the place.

It is possible that the LCOS includes one or more trails, including a trail to improve the safety of walkers and bikers. The area may also include family-friendly, safe outdoor recreation opportunities for neighborhood residents and their children. It may also include agricultural activities that protect and regenerate the grasslands.

Local residents, especially youth, are actively involved in the maintenance and stewardship of LCOS.

Based on this vision description, the central management goal for LCOS would be:

Santa Fe County and the community of the Santa Fe River valley around La Cieneguilla collaboratively maintain and enhance the land and water resources of LCOS for wildlife, recreation, education, and other low-impact uses. LCOS is managed in such a way that gradually opportunities are developed for interpretive education, research and public education, and low-impact recreational uses by neighborhood families and the public, at a scale that requires little maintenance, encourages local community stewardship, and protects the land and water.

Specific management objectives in support of this vision and central goal would be:

1. Manage the property in a way that the different values and objectives are balanced as a whole – holistically – (and not one despite another), and that improvements and changes are introduced in a gradual way, and seek and maintain optimal working relationships with neighbors and other local stakeholders
2. Enhance public safety, for example by cleaning up old waste dumps, maintaining appropriate fencing of flood zones and steep slopes, developing a trail along Paseo Real, and installing non-obtrusive lighting when park facilities are developed
3. Control access by maintaining roads, trails, fences, gates, stiles, fords, and other river crossings, and signage
4. Maintain the area’s natural appearance, sweeping scenic views, and cultural-historical qualities, keep maintenance limited, and maintain a rural, natural visual quality by using natural design principles and natural materials, and by choosing deliberately when to let nature run its course
5. Provide and maintain interpretive education, and explore and use educational and research opportunities
6. Develop basic infrastructure such as community gathering areas and play areas that are as natural and low-maintenance as possible
7. Maintain the ecological health, resilience, and productivity of the LCOS uplands and riparian area, and maintain wildlife habitat qualities and connectivity across the landscape
8. Explore and use – when appropriate – managed, restorative grazing practices (and rest periods) as a way to improve grassland health and respond to the need to develop an agricultural use for County Open Space properties
9. Evaluate the removal of some junipers to improve the regeneration of the grasslands while maintaining visual benefits

Management decisions, including maintenance activities, should be made in the spirit of the vision, aimed at meeting the central management goal, and in adherence to the specific objectives for the LCOS.

TERRAIN MANAGEMENT UNITS

Maintenance activities are often strongly related to specific terrain characteristics. The Land Suitability Map developed in Phase-2 for identifying appropriate uses for the different types of terrain was based on the identification of Terrain Management Units, and the Suitability Map describes the Terrain Management Units. The same map will be used in this plan to identify the Terrain Management Units as a basis for identifying maintenance activities (Figure 1). Table 1 lists the Terrain Management Units and their regular maintenance activities.

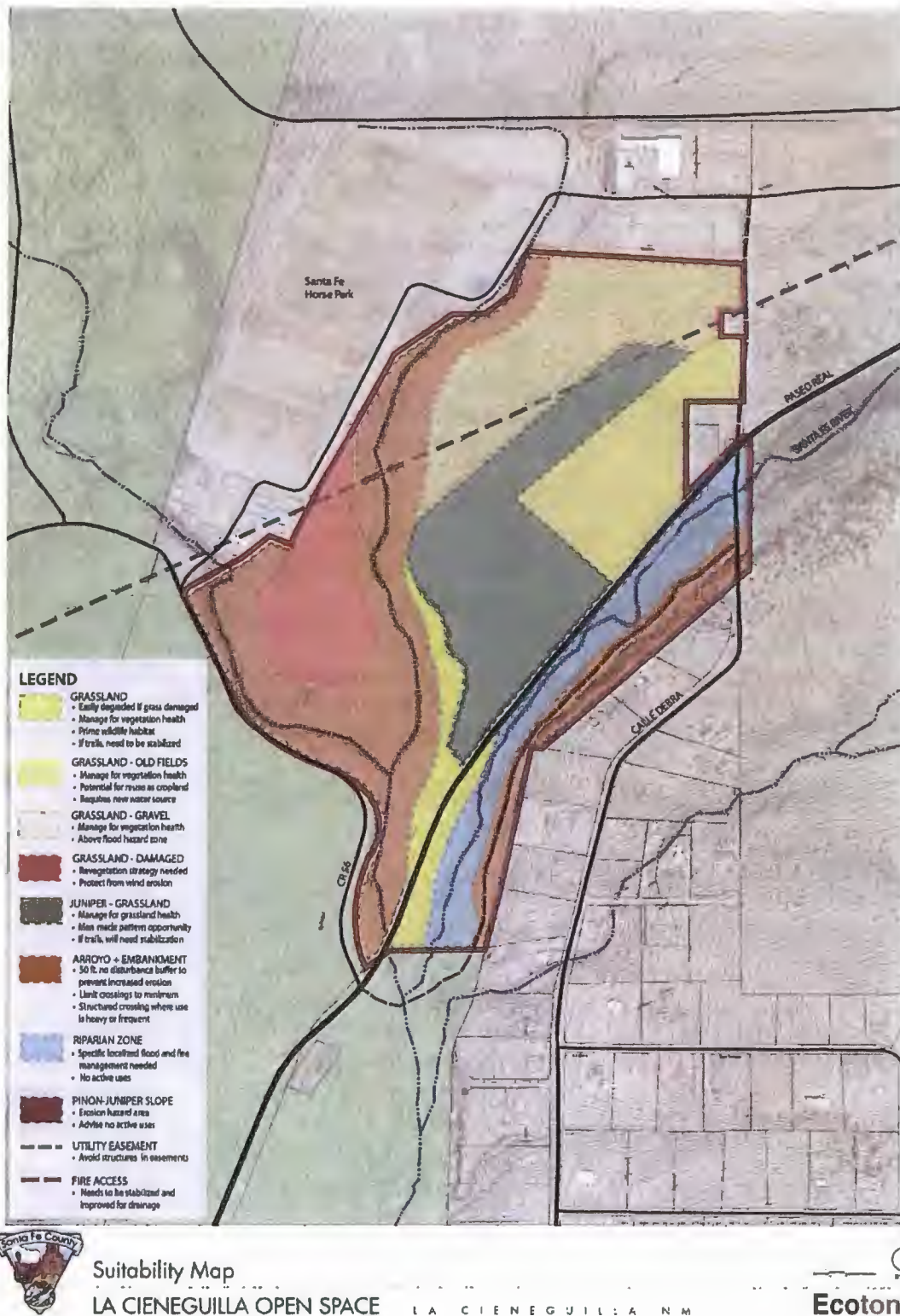


Figure 1. La Cieneguilla Open Space – Terrain Management Units Map

Table 1. Overview of Terrain Management Units and anticipated regular maintenance activities.

Mgmt Goals	Terrain Management Unit	Anticipated Regular Maintenance Activities	Maintenance Frequency
1	All Terrain Management Units	Communication and outreach with neighbors and stakeholders and integrate feedback in planning	Quarterly
2, 3, 5, 6	All Terrain Management Units	Inspection and repairs of: a. Fences, gates, and stiles b. Culverts, stream crossing c. Roads, trails d. Signage	a. Annually b. Monthly c. Quarterly d. Annually
7, 8	Grassland – Gravel Unit: upland gravel terrace (LC-GRA-G)	a. Invasive species inspection b. Managed grazing	a. Annually b. Annually after yr 3
7, 8, 9	Grassland-Juniper Unit: Juniper area (LC-GRA-J)	a. Invasive species inspection b. Managed grazing c. Gradual juniper removal and reseeding	a. Annually b. Annually after yr 3 c. Periodically, after careful planning
7, 8	Grassland – Old Fields Unit: former pastures (LC-GRA-F)	a. Invasive species inspection b. Managed grazing	a. Annually b. Annually after yr 3
7, 8	Grassland-Pasture Unit: lower grassland strips (LC-GRA-P)	a. Invasive species inspection b. Managed grazing	a. Annually b. Annually after yr 3
7, 8	Grassland-Dry/Damaged Unit: loamy rangeland (LC-GRA-D)	a. Invasive species inspection b. Restorative and after that managed grazing and reseeding where necessary	a. Annually b. Annually after yr 3
2	Arroyos Unit: arroyos with buffer zone (LC-ARR)	a. Invasive species inspection b. Cleanup and grading c. Restorative and after that managed grazing and reseeding where necessary	a. Annually b. One-time, and inspect annually c. Annually after yr 3
7	Riparian Unit (LC-RIP)	a. Removal of dead wood b. Removal of invasive plant species c. Channel cleaning; removal of debris d. Culvert cleaning e. Moving / maintenance of	a. Annually for 2-3 years and then as needed by volunteers b. Annually c. Twice annually d. When needed /

		<ul style="list-style-type: none"> pond levelers f. Tree protection g. Fence repair and inspection 	<ul style="list-style-type: none"> at least twice annually e. When needed f. Annually g. Annually
7	Woodland Unit: Piñon-Juniper Slope (LC-WOO)	<ul style="list-style-type: none"> a. Trail on terrace on river left inspection and drainage maintenance b. Thinning/pruning of junipers c. Erosion control (e.g., using slash from thinned and pruned trees) 	<ul style="list-style-type: none"> a. Annually b. Once in 3-5 years c. Once in 3-5 years

UPLAND MAINTENANCE ACTIVITIES

There are no immediate needs for maintenance or ecological restoration work in the upland (grassland and juniper) area. However, there are numerous aspects to the grasslands that would require maintenance and restoration over time. These include:

- Grassland improvement:
 - soil conservation for the protection from wind erosion
 - removal of weeds and invasive species (mostly Kochia, snakeweed, and Russian thistle/tumbleweed)
 - improvement of grass cover
 - juniper removal (gradual)
 - reclamation of the southwestern loamy rangeland area
- Waste and pollution management:
 - removal and reclamation of construction debris/waste dumps (see Figure 2)
 - protection from pollutants escaping from HIPICO Santa Fe (a.k.a. The Horse Park)
- Fencing:
 - fencing improvements would prevent dumping and make the grassland better suitable for grazing
 - fencing along the Paseo Real (County Road 56) could be altered to benefit wildlife crossing between grassland and riparian area

Grassland Improvement

Restorative, managed grazing could benefit the ecological health of the grasslands, offer some community benefits, and reduce long-term maintenance cost for weed and erosion control. Grassland health conditions are probably best achieved with a combination of managed grazing and gradual juniper removal. After a period of several years of restorative grazing (e.g., with goats), the grassland could from time to time be used as a grazing area for local ranchers.



Figure 2. Location indications for the most important waste dump piles along Arroyo de las Calabasas.

It will be important to define grassland health goals and annually monitor grassland health conditions. Consequently, grazing will have to be managed well to prevent overgrazing and degradation of vegetation and soils. In absence of water rights, stock tanks will need to be

refilled with water delivered by the grazing lessee and cross-fencing will need to be brought in to facilitate rotational grazing.

Gradually, the juniper area could be converted to grassland as well, but care must be given to evaluate the current ecological benefits of the juniper (esp. wind protection for erosion control), and conversion to grass may require irrigation. Some stakeholders also appreciate the juniper area for visual quality and as a visual buffer concealing the HIPICO Santa Fe facilities.

A detailed overview of suggested maintenance activities is included in Tables 5 and 6. These tables will be available in spreadsheet format for convenient adjustments and tracking of maintenance and repair activities.

Waste Dump Removal

Numerous large waste dump piles line the Arroyo de las Calabasas and its embankments (see Figure 2). The Ecotone team estimated the total volume of the waste dump material to be at least 1,500 cubic yards. The waste material consists mostly of discarded construction debris, including mixed debris (30% or 453 cubic yards) and concrete debris (70% or 1,055 cubic yards).

The Ecotone team recommends that Santa Fe County focuses debris removal efforts on the four largest piles. Removal work will require heavy equipment, notably a backhoe and dump truck. The area is best accessed with this equipment from the west (County Road 56C). We assume that the waste material would be hauled to the Santa Fe County landfill. In our cost assessment, we assume that there would be no tipping fees to the hauler because this would involve a County activity.

RIPARIAN AREA MAINTENANCE ACTIVITIES

The primary maintenance concern for the riparian zone involves reducing the risks of flooding of Paseo Real and Calle Debra while at the same time preserving the wildlife habitat functions of the river forest. The flow of water from the City of Santa Fe Wastewater Treatment Plant that tends to have high nutrient levels and the relative absence of high velocity flows promotes a riparian forest that becomes overly dense. The maintenance recommendations suggest periodic removal of dead woody debris and thinning of non-native and selected native plants to keep the stream channel open and able to transport larger floods without compromising the nearby roads or the health of the wildlife habitat.

Woody Debris

Woody debris can clog culverts and channels and get caught in the stems of patches of willows near the river channel. When woody debris builds up in specific areas the result can clog up the channels and culverts and cause flooding in nearby areas. Flooding can cause the roads and bridges to be damaged or become unusable.

The culverts under Calle Debra already have grates placed over them to prevent beaver from clogging them and stopping flow. The culverts need periodic visual inspections (1 time per month) and for the grates to be cleared when necessary.

Periodic floods will mobilize woody debris and cause the material to get lodged in the thickets of willows near the river channel in a process called “racking” (see Figure 3). When this material builds up on one side of the flow, the river may concentrate on the opposite bank and / or cause flooding, bank erosion and damage to road infrastructure. Large piles of racked woody debris need to be removed periodically to enable larger floods to pass through the river channel without causing damage to nearby roads. The woody materials can be put in small piles and burned (approximately 6 feet wide and 6 feet tall) or hauled off site. Cutting and burning is best done in the late fall or early winter after the first snowfall.



Figure 3. A 4-foot tall pile of woody debris cause in a stand of willows on the left bank of the Santa Fe River. (photo by R. Schrader)

Tree Thinning & Protection Prescription:

The purpose of thinning the trees is to reduce flooding risk of nearby roads, improve the health of the river forest by removing non-native trees or upland native trees in wetland areas, and help maintain efficient transport of water through the area to downstream water users. The vegetation types and conditions that call for thinning or protective treatment are:

- A. Removal: Non-native Russian olive, tamarisk (saltcedar) and Siberian elm
- B. Removal: Large stands of mostly dead willows (*Salix exigua* or Coyote willow)
- C. Removal: Native upland trees such junipers that have encroached in the riparian area should be removed because they lead to drying of the wetland ecosystem.
- D. Protection: Cottonwoods and Goodding's willow are two tree types that are very important to keep and protect as they are relatively uncommon and are native to the area. Protection should include caging to protect them from beaver.

The Ecotone team suggests that the thinning areas be identified and flagged by a contractor due to the challenge of identifying different tree species, particularly when there are few or no leaves on the trees. In addition, the team suggests a gradual approach for thinning that can happen in several phases rather than a large-scale, one-time thinning project. A phased approach enables Santa Fe County to monitor and adapt the thinning work as it proceeds to make sure visual quality, habitat, and flood control objectives are met.

A. Remove Non-native trees (Russian olive, tamarisk and Siberian elm)

The non-native deciduous trees put out seeds prolifically and have rooting strategies that make them more successful at germinating and growing than some native trees. We suggest the following prescription to remove these trees:

- Cut the trees close to the ground during the fall or winter and lop the branches and stems into 3-4 foot long pieces and create small piles for hauling off site or burning.
- Use a very targeted method to apply herbicide to the cut stump of the tree. This can be done using a paint brush or a squeeze bottle. A non-toxic herbicide is preferred in aquatic areas, such as Santa Fe River floodplain – please see below.
- If conventional herbicides are used, the ideal ones are Roundup (Glyphosate with a half-life of 90 days depending on temperature) or Garlon 4 (Triclopyr with a half-life of 60 days). No or very little herbicide contact occurs with soil, water or non-target plants and organisms may occur when handled carefully.
- Recut and treat resprouts for up to 5 years. Conventional herbicide treatments range from 50 to 90% effective in the first year so retreatment is very important.
- If using herbicides in the floodplain it is suggested to use "aquatic approved" versions, which are considered by the EPA to be safe to apply near or in water without damaging fish or other aquatic species. Aquatic approved herbicides usually cost more than non-aquatic versions.
- The preferred herbicide in areas near streams is a 20% vinegar solution that can be sprayed or brushed on cut stumps. The strong vinegar can be purchased for \$13-\$25 per gallon from a variety of sources including San Jacinto Environmental Supplies, Maestro-Gro or Factory Direct Chemicals. This method's success rate is roughly 50% and will have to be repeated or combined with repeated trimming of sprouts or covering of the stump with 60-mil tarp for lasting success.

- Stumps can be covered with 60-mil black tarp to starve them from sun light and prevent resprouting. This method is not common in New Mexico, but has been used in Europe, and preliminary tests in New Mexico show that it is very effective, though labor intensive.

B. Thin large stands of dead willows and selected stands of live willow (Salix exigua or Coyote willow are the most common)

Willows have grown thick in many places and during drier periods large stands have died off (see Figure 4). Willows have roots that can grow underneath and underlying the river, the benefit of which keeps the bed of the river from eroding but also has a negative effect during drier periods as the channel may become clogged with the plant. Thinning is needed in dense, large stands of willows in two different areas, in the dead or mostly dead thickets and in carefully selected stands of plants on edge of the river.



Figure 4. The dark grey pile consists of mostly dead willows. (Photo by Rich Schrader)

C. Construction of a large pile in a dead thicket

- Remove stems fairly aggressively with 90% to 100% of the stems cut in 30 – 50 foot diameter areas.
- Focus on removing all dead stems. If any stems of willow are left leave the very small diameter willows that have a more reddish color than the darker, grey, larger diameter stems (greater than 1 inch).
- Pile the materials 6 feet wide by 5 feet tall next to or on the trail on the terrace on river left for burning or for hauling away.

B. Riparian trees (willows, cottonwoods, Goodding's willow)

- Remove willow patches that encroach into the channel and narrow the channel and/or tend to cause "racking" (i.e., catch woody debris). In places where the channel is heavily overgrown, remove no more than 50% of stems in alternating lengths of 40 feet along the length of the river. The purpose is to create a patchiness of the thinning and to prevent long lengths of the river from becoming exposed to sunlight which can cause water temperatures to rise excessively and harm fish and aquatic insects.
- Focus on removing the larger diameter (over 0.75 inch diameter stems) and leave more of the small diameter stems.
- Pile the materials 6 feet wide and 5 feet tall for burning or for hauling away.
- The Santa Fe County fire crew has said that they cannot use chainsaws within 6 feet of the river. So, the willows by the channel will need to be cut by hand or with chainsaws by an approved contractor or Open Space staff.

C. Keep and protect Cottonwoods and Goodding's willow trees

The cottonwood and Goodding's willow trees are relatively uncommon and are native to the area. The Goodding's willow is easy to mistake for a Siberian elm in the wintertime. So, it is important to identify the tree and mark them to prevent them from being cut. The cottonwood with its soft bark is the preferred food and building material for beaver. The trunks of some cottonwoods have been surrounded by wire fencing to prevent beavers from cutting down the trees. More fencing needs to be installed. The trees that have already been protected with wire need inspection every 2 years to see if the wire needs to be expanded as the tree grows.



Figure 5. Bark of a Goodding's willow tree.

D. Native upland trees (primarily junipers but possibly chamisa shrubs also)

Juniper and chamisa are plants that generally occur in drier upland areas. Removing them from the riparian area can be appropriate when they are found to be crowding out native riparian trees. When they are not growing densely or are found far away from the river channel removing them is not necessary.

of Wood Waste M

Woody material cut and removed from the riparian area could be disposed of in a variety of ways. It is conceivable that fresh or dried wood material could be (1) offered to the wood cutters as part of the compensation for their work; (2) distributed among local residents in the community; or (3) pile burned once every 3 years. Dead wood from species that are not suitable for firewood should be (1) pile burned every 3 years or (2) hauled to a landfill. The latter option is recommended in particular for root material of invasive species, such as Russian olive, tamarisk, and Siberian elm. Brush and slash from shrubs and branches cut from trees could be (1) chipped for use on trails or (2) piled and burned every 2 to 3 years.

Table 2. Inspection and Maintenance Recommendations for the LCOS Uplands Area (Terrain Management Units LC-GRA-G/J/F/P/D and LC-ARR).

MAINTENANCE ACTIVITY	AREA & LOCATIONS	FREQUENCY	LABOR & COST ESTIMATE
Fence inspection and repair	Exterior fence of upland area (approx. 10,500 ft)	Annually	Annually, 1-2 days for two people
Managed (rotational) grazing	LC-GRA-G/J/F/P	Annually (for a few weeks) after year 5	TBD: based on bid
Juniper removal	LC-GRA-J	Annually (a few acres/yr) after year 5	2 full days for a sawyer and one swamper
Waste dump removal	LC-ARR	Once or in several entries spread over time	115 dump trucks (1,377 cu yards and 12 cu yards per dump truck); @\$150/load > \$17,200

Table 3. Inspection and Maintenance Recommendations for the LCOS Riparian Area (Terrain Management Unit 7).

MAINTENANCE ACTIVITY*	AREA & LOCATIONS	FREQUENCY	LABOR & COST ESTIMATE**
Removal of clumps of dead willow and dead wood and woody debris along channel	Selected areas: approx. 20% (4 acres) yearly	Yearly, starting Yr-1	\$750-\$1,200/ac = \$14,175-\$22,680 (for total area)
Removal of invasive species	Selected sites: where necessary	When need arises	TBD
Piling and burning	Entire riparian area (approx. 18.9 acres)	One time	TBD
Inspections on foot (one person)	Entire riparian area (approx. 18.9 acres)	Weekly x 30; monthly x 5	4 hours for one person each time: 140 hours/year
Annual vegetation management, including pile burning in fall; 4-5 yr rotations	Selected spots across the entire riparian area (approx. 4 ac/yr)	Twice yearly; late winter (Feb-Mar) and fall (Nov)	\$250-\$450/ac = \$4,725-\$8,505 for a contractor; or 5 days for 2 crew members (80 h)
Calle Debra culvert cleanout and repairs	Calle Debra: all culverts	Annually (perhaps 4 times/y)	Based on bid and scope & scale OR approx. 64 h/y for County crew
Calle Debra road repair	Calle Debra road bed and berms	Annually and when needed	Based on bid and scope & scale
Calle Debra road bed redesign and reconstruction	Calle Debra road bed and berms	One time: TBD	Based on bid and scope & scale
Caging of trees + maintenance (initial installation done already on many trees)	Selected spots; 25-40 trees/yr	Check every 2 years in spring if widening is needed	Based on bid and scope & scale; or approx. avg. 1 day/yr for two people (or volunteers/students)
Pond leveling device maintenance	Selected spots	When needed	4-6 crew member days per year; requiring lifting equipment
Beaver dam removal, bank stabilization, and fence repair	4 locations along Paseo Real	One time: TBD	Based on bid and scope & scale (prob. \$4K-\$5K)
Trail on terrace (see below)			

*) Contracts for willow and deadwood removal can be offered to contractors that specialize in riparian or stream restoration work, so that they can benefit from the willows they cut to transplant them elsewhere.

**) Thinning and pile burning costs based on State Forestry rates per acre plus contingency factor of 25%.

PINON-JUNIPER SLOPE AREA MAINTENANCE

The November 2015 field assessment revealed that the trail on the terrace on the east side of the riparian area needs considerable repair at several places to allow it to shed stormwater and to prevent further flooding and erosion. Even after the proposed repairs, the trail will need to be maintained annually.

Table 4. Inspection and Maintenance Recommendations for the Pinon-Juniper Slopes and Terrace on River Left (Terrain Management Unit 8).

MAINTENANCE ACTIVITY*	AREA & LOCATIONS	FREQUENCY	LABOR & COST ESTIMATE**
Remove berm to allow trail to drain off the banks and mitigate ponding after rainstorm and snow melt; import fill and regrade trail bed	Below entrance gate from Calle Debra	One time; annual maintenance	\$500 - \$600 for fill incl. delivery; \$500-\$1,000 for heavy equipment and operator; Total: \$1,000-\$1,600
Remove berm to drain trail; bring in fill dirt; increase trail elevation with 18" over a length of 100 yds (approx. 200 cu yd of fill = 20 short dump trucks); crew work includes grooming, sowing, raking and placing slash for cover	Approx. 1,200 ft down from Calle Debra	One time; annual maintenance	\$5,500 - \$6,000 for fill incl. delivery; \$2,000-\$2,500 for heavy equipment; \$100 for seeding; \$500 for crew; Total \$8,100-\$9,100
Install culvert to drain the arroyo coming from the east under the trail; remove boulder in the channel headcut; rebuild trail and banks and fill part of the channel to the current height of the boulder; regrade to direct flows to another (parallel) channel that runs 10'-15' to the NW of the eroded channel and clean out this channel to enhance flows.*	Approx. 1,350-1,400 ft down from Calle Debra *	One time; annual maintenance	\$4,000-\$5,000 for equipment; \$1,000-\$2,000 for supplies; \$2,000-\$2,500 for. Total cost range: \$7,000-\$9,500.

*) The main problem at this location is that the trail on the terrace on river left is undermined by steep stream banks (2 successive 8'-10' vertical banks, only 4' from trail's edge) and an eroding channel headcut. This situation is aggravated by a boulder that splits incoming flows that gather at headcut, sending one flow in a direction that scours the bank. This erosion condition coincides with a little arroyo channel flowing from east through the steep piñon-

juniper slopes. The job will require the use of an excavator with a thumb-bucket. Supplies include 20' of 12"-culvert pipe and 2 tons of angular rock. A hand crew is needed to lay the culvert, build a culvert inlet protection with rock and an outflow protection with brush matting, and complete grooming, wood removal, seeding, raking, and placing slash for ground cover.

Table 5. Summary of Recommended Maintenance Activities for Different Time Periods.

Location Code	Management Activity	Location & Area Size	YR1	YR2	YR3	YR4	YR5	YR6-10	YR11-20	>YR20	Team	Logistical Needs	Labor & Cost Estimate
Entire property	Fence inspection and repair (all exterior fence)	Entire upland area: approx 10,500 lf									SFC-M (Crew)	Notepad/GPS (Avenza), camera	Annually, 1-2 days for 2 people (16 hours)
LC-GRA-G/P/J/F	Managed grazing (select acreage yearly; a few wks/yr)	Rotations in pastures; area size TBD									Contractor	Community notification	TBD; based on bid
LC-GRA-J	Juniper removal (select area yearly)	Juniper area, unit 2, approx. 25 acres									Contractor or SFC Fire Dep	Community notification	A few acres/y; 2 full days for two people (16 h) or TBD; based on bid
LC-ARR	Waste Dump removal	0.5 ac and 1,377 cu yards along Arroyo Calabasas									Contractor or SFC-M crew	Arrange for backhoe and dumptruck and tipping fees waiver	\$17,200 for heavy equipment and operators
LC-RIP	Field inspection	Entire riparian area; approx. 19 acres									SFC-M (Crew)	Notepad/GPS (Avenza), camera	35 times/y: 4 h for one person: 140 h/y
LC-RIP	Dead willow and woody debris removal	Select area yearly; 4 ac/y									Contractor or volunteers	Chainsaws and equipment for removal	TBD; based on bid (rough estimate: \$14,175-\$22,680/y)
LC-RIP	Invasive spp removal	Select area yearly									Contractor or volunteers	Chainsaws and equipment for removal	TBD: based on bid
LC-RIP	Piling and burning	Select area (once in 4 or 5 yr)									Contractor; with SFC Fire Dep	Community notification	TBD: based on bid
LC-RIP	Prescribed burn	When need arises									Contractor; with SFC Fire Dep	Community notification	TBD
LC-RIP	Tree protection	Select trees for caging									Volunteers	Get supplies	TBD: based on bid; OR approx. 1 day/y for 2
LC-RIP	Pond leveler maintenance or relocation; dam removal	Select locations									SFC-M (Crew)	Need crane?	TBD; perhaps 4-6 crew member days/y (48 person hours/y)
LC-RIP	Bank stabilization along County Road	Select areas when need arises									Contractor	SOW	TBD: based on bid
LC-RIP	Culvert cleanout										SFC-M (Crew)	Tools	TBD: based on bid OR approx. 64 h/y for crew
LC-RIP	County Road repair	When need arises									SFC-M (Crew)	SOW	TBD: based on bid
LC-RIP	Fence repair	Select areas when need arises									SFC-M (Crew)		TBD: based on bid
LC-WOO	Berm removal for proper drainage	Select areas when need arises									SFC-M (Crew) or contractor	SOW	TBD: based on bid
LC-WOO	Drainage and bank stabilization along trail	Select areas when need arises									SFC-M (Crew) or contractor	SOW	TBD: based on bid

Table 6. Summary of Recommended Maintenance Activities for Year-1 for suggested Human Capacity Entities for Implementation.

Location Code	Management Activity	Location	Staff Prep	Volunteer Activity	SF County-M (Crew)	Contractor	Costs
Entire property	Fence inspection and repair (all exterior fence)	Entire upland area: approx 10,500 lf	One time to establish standards and prescription				Annually, 1-2 days for 2 people (16 hours)
LC-RIP	Field inspection	Entire riparian area: approx 19 ac					35 times/y; 4 h for one person: 140 h/y
LC-RIP	Dead wood removal	Select area yearly; 4 ac/y	One time to establish standards and prescription				TBD; based on bid (rough estimate: \$14,175-\$22,680/y)
LC-RIP	Invasive spp removal	Select area yearly					TBD: based on bid
LC-RIP	Piling and burning	Select area (once in 4 or 5 yr)					TBD: based on bid
LC-RIP	Tree protection	Select trees for caging	One time to establish standards and prescription				TBD: based on bid; OR approx. 1 day/y for 2 people (16 h/y)
LC-RIP	Pond leveler maintenance or relocation; dam removal	Select locations					TBD; perhaps 4-6 crew member days/y (48 person hours/y)
LC-RIP	Culvert cleanout						TBD: based on bid OR approx. 64 h/y for crew
LC-RIP	County Road repair	When need arises					TBD: based on bid
LC-RIP	Fence repair	Select areas when need arises	One time to establish standards and prescription				TBD: based on bid
LC-WOO	Berm removal for proper drainage	Select areas when need arises	One time to establish standards and prescription				TBD: based on bid
LC-WOO	Drainage and bank stabilization along trail	Select areas when need arises	One time to establish standards and prescription				TBD: based on bid

LC-GRA-P = Grassland – Pasture Unit

LC-GRA-F = Grassland – Old Fields Unit

LC-GRA-G = Grassland – Gravel Unit

LC-GRA-D = Grassland – Dry Unit

LC-GRA-J = Grassland – Juniper Unit

LC-ARR = Arroyos Unit

LC-RIP = Riparian Unit

LP-WOO = Woodland Unit

INSPECTIONS, MONITORING AND ADAPTIVE MANAGEMENT

Effective maintenance must be grounded in scheduled, periodic field inspections and a rigorous monitoring schedule. Findings from inspections and monitoring must lead to a confirmation of scheduled maintenance, and to specifications and adaptations in the scope and scale and timing of maintenance work. It may also lead to changes in the identification of who should do the maintenance work. Eventually, inspections and monitoring lead to adaptive management of the Open Space property and to lessons learned for all involved. This collaborative learning process will likely have both a practical aspect and an aspect of community building as the interaction of learning together may contribute to people's appreciation for the area and for the different people involved. The latter is important to grow people's interest, care, and respect for the place, and their support for recurring maintenance work.

Inspection Protocols

County staff must establish a regular inspection schedule based on the recommended maintenance tasks and their recommended inspection frequency as described above. Inspections follow a protocol by filling out an inspection form. Information is gathered by using all the senses and if possible by speaking with neighbors, users, or passersby. Santa Fe County already has an adequate inspection form. A template inspection protocol that outlines the communication and verification process and adaptive management for inspections is included in Appendix A.

Monitoring

Monitoring is the rigorous practice of documenting or measuring specific landscape features to verify whether a change of certain indicator factors is achieved or whether threshold levels of indicators are exceeded. Analysis of monitoring data will help ascertain whether the measured or observed changes are meeting management goals or not.

Monitoring can be done by taking photographs at very specific locations and comparing a time series of photographs at each photo point to detect change. Monitoring can also be done by taking specific measurements or documenting qualitative field observations on data logs.

Monitoring work must be based on a study design of the monitoring process, based on selected indicators which, in turn, reflect progress toward a stated goal. Therefore, monitoring protocols are goal and site specific, and it is not useful to present templates of monitoring protocols. However, there are monitoring Best Management Practices, such as those developed for the US Forest Service Collaborative Forest Restoration Program (CFRP), or for EPA and NRCS funded stream measurements. A selection of monitoring BMP references is included in the Santa Fe County Open Space Management Planning Guide.

Adaptive Management: Identifying Choices and Making Decisions

Feedback from inspections and monitoring will offer information that needs to be compared with goals and objectives for the property in order to decide whether the information points

toward progress in meeting goals and objectives or not. No action is needed in most cases if the information supports management goals. However, if the information indicates that the situation in the field is deviating from management goals, choices will have to be made about appropriate action.

Depending on the seriousness of the deviation of terrain conditions from management goals, a choice can be made to deliberately defer maintenance activities and letting nature take its course. This choice may be relevant if a triage is needed to allocate limited County resources to determine where maintenance efforts should be focused, or if County staff would like to experience what the consequences are of deferring maintenance.

Alternatively, County staff will want to make adjustments to either the management goals or to the terrain conditions by organizing maintenance or repair activities. It is useful to evaluate findings in a group of stakeholders and experts in order to learn from each other's viewpoints and arrive at a well-thought-out and broadly supported solution for corrective action. Such an approach also offers optimal collaborative learning opportunities and ensures strong, broadly carried stewardship over time.

LABOR REQUIREMENTS AND CAPACITY BUILDING

FTE

The recommended maintenance and repair work for LCOS would require 0.18-0.27 FTE each year for regular maintenance, and up to 0.31 FTE of planning staff time for planning, coordination, and community outreach. Additionally, it would require approx. 0.04 FTE each year for the County Fire Crew or other chainsaw contractors to remove dead wood.

Santa Fe County

The maintenance work identified in this Maintenance Plan for LPOS will require capacity building among Santa Fe County staff and among volunteers who assist staff with plan implementation. The planning team recommends that capacity building includes:

1. Expansion of County maintenance staff to meet the required FTEs for LCOS maintenance.
2. Workshops and training for higher management on (a) strategies and methods of capacity building, continued education, and leadership development (for planning and oversight staff, supervisors, and crew); (b) content matter aspects of Open Space management, such as agricultural program development, interpretive planning, cultural resource preservation, trail and road management, vegetation management, soil & water conservation, etc.; and (3) the use of electronic (IT) tools, including GIS, for terrain management, labor allocation, budget control, and public outreach services.
3. Staff and crew training workshops, seminars, conferences, and literature on Best Management Practices (BMPs). Essential BMPs for maintenance of LPOS would include:

- a. Vegetation management, including botany and native plants, thinning, pruning, planting, mowing, etc.
 - b. Grazing management and grassland restoration
 - c. Integrated Pest Management, including approaches to weed control, invasive animal management, pathogen/vector management (e.g., mosquitoes)
 - d. Wildlife management
 - e. Riparian area management and restoration
 - f. Soil and water conservation (erosion control, water quality improvement)
 - g. Trail and road management and drainage
 - h. Access management: Fencing, gates, stiles, and signage
 - i. Acequia maintenance
 - j. Inspections and monitoring
4. Collaborative collection and review of periodic inspection reports and monitoring reports, and joint analysis and discussion of corrective action needed or changes in management.
 5. Staff training and guidance for managing community volunteers and site stewards, contractors, contracts and leases aimed at supporting field assessments, maintenance and repair at the Open Space properties.

Community Outreach and Engaging Volunteers

Santa Fe County has more Open Space, Parks and Trails assets and associated maintenance needs than it will likely have staff capacity and funds to address the needs. Therefore, and also in order to grow community buy-in and stewardship of the Open Space properties, Santa Fe County needs to strengthen its community outreach and volunteer engagement services.

Community Stakeholders

LCOS has a diverse spectrum of community stakeholders that are interested in the property and that Santa County can mobilize for volunteer stewardship work. These stakeholder groups include:

- a. Immediate neighbors in La Cieneguilla
- b. HIPICO Santa Fe
- c. Downstream residents, farmers, and ranchers
- d. The Santa Fe River Traditional Communities Collaborative
- e. Area schools and their students, such as the MASTERS Program (high school as Santa Fe Community College), Santa Fe Indian School, the Santa Fe Girls' School, Desert Academy, and nearby elementary schools
- f. Any regional conservation groups (such as Santa Fe Watershed Association), hiking and outdoor organizations, and other entities that could become interested in the LCOS – however, the involvement of such outside groups must be discussed first with local stakeholders in order to ensure good working relationships

4.1.3.3 Maintenance Activities

Maintenance activities that are particularly suitable to be conducted with support from (small) groups of volunteer stewards include:

- Removal of dead wood and woody debris on the ground and in the river channel (during low flows) (in the late fall, early winter to prepare for spring runoff and summer storms)
- Cutting and removal of invasive plants (esp. juniper, elm, Russian olive, and tamarisk) (in the late fall and in the early spring)
- Tree protection: caging willow and cottonwood trees to protect them against beaver (quarterly inspections and repairs)
- Inspections and monitoring (spring and fall, dependent on monitoring goals)

The planning team recommends that volunteer activities are conducted in a regular schedule to establish precedent, leading to an accountable system that after several years may even become a “tradition”. In this way, people will look forward to the maintenance events, and the events become part of the community calendar or the annual schedule of the volunteer groups. These activities also ensure periodic face to face contact between County staff and volunteer stewards. The more the activities include a sense of celebration, fun, sharing, and play, besides getting good work done that builds pride, the more participants will enjoy the events and return any next time.

4.1.3.4 Community Liaisons

Besides developing volunteer stewardship engagement, it may prove essential to cultivate a couple of community liaisons (one leader and several alternates) that can serve on a rotational basis to communicate with Santa Fe County staff and help mobilize and direct volunteer stewards. No liaisons have been identified thus far.

4.1.3.5 Staff Support

Volunteer activities need to be diligently prepared and coordinated to ensure participant safety, work effectiveness, and general enjoyment by all. It will be essential that Santa Fe County identify a staff member for LCOS who serves as the designated point person in the communication with the community liaisons and stewardship volunteers. This staff person would be in charge of fielding questions and alerts from the community, communicating messages from Santa Fe County, and organizing any volunteer stewardship events. This staff person also would need to identify and mobilize, when necessary, any technical experts, either in the community, within Santa Fe County staff, or among contractors, to assist with technical guidance and quality control before, during and after the volunteer stewardship events. Additionally, this person would be in charge of planning and coordination between staff and maintenance crew to assist and to provide equipment and supplies, such as fencing materials and baling wire or twine, or plant stock, soil amendments, mulch, and stone material. Last but not least, this staff person is responsible for any safety instructions and for ensuring that people

work in a safe manner and have adequate protective gear. Finally, Santa Fe County will need to develop a repository of tools, protective gear and supplies to provide during work days. Systems would need to be developed to account for tools and gear that is handed out, and a crew member or the County point person for the community would need to be in charge to account for the supplies and tools at the end of the work day.

APPENDIX A Santa Fe Open Space Management Checklist La Peneguilla OS

Inspected by: _____

Date: _____ Time: _____

Item to be Checked <small>Use a separate page to describe the necessary repairs</small>	OK or FIX = needs work	Comments (corrective action or work needed, who needs to be contacted)
Monthly		
Exterior Fences		
Culverts under Calle Debra for debris		
Beaver pond levelling devices		
Trail drainage and soil erosion		
Arroyo Calabasas culvert under Paseo Real		
Santa Fe County Open Space Signage		
Signs of garbage or illegal dumping		
Signs of illegal off-road vehicle use		
Annually		
Excess build-up of dead willows stands		
Wire protection cages around trees		
Invasive species		
Excess clogging of river channel by live willows		

APPENDIX D: YEAR 1 PROJECT

SFC CLERK RECORDED 10/12/2016

APPENDIX B - Maintenance, Stewardship, and Restoration Projects for Year 1

List of Terrain Management project activities for year-1 aimed at land health restoration.

Location Code	Management Activity	Location	Staff Prep	Volunteer Activity	SF County-M (Crew)	Contractor	Costs
LC-RIP	Piling and burning	Select area (once in 4 or 5 yr)					TBD: based on bid
LC-RIP	County Road repair	When need arises					TBD: based on bid
LC-RIP	Berm removal for proper drainage along fire management road	Select areas when need arises	One time to establish standards and prescription				TBD: based on bid
LC-RIP	Drainage and bank stabilization along Paseo Rael	Select areas when need arises	One time to establish standards and prescription				TBD: based on bid
LC-ARR	Fencing of Arroyo de las Calabasa area	Entire arroyo area	One time to establish standards and prescription				TBD: based on bid
LC-ARR	Cleanup or removal of priority hazard features	Entire arroyo area	One time to establish standards and prescription				TBD: based on bid

List of Terrain Management maintenance and stewardship activities for year-1 aimed at land health maintenance.

Location Code	Management Activity	Location	Staff Prep	Volunteer Activity	SF County-M (Crew)	Contractor	Costs
LC-All TMUs	Fence inspection and repair (all exterior fence)	Entire upland area: approx 10,500 lf	One time to establish standards and prescription				Annually, 1-2 days for 2 people (16 hours)
LC-RIP	Field inspection	Entire riparian area: approx 19 ac					35 times/y: 4 h for one person: 140 h/y
LC-RIP	Dead wood removal	Select area yearly; 4 ac/y	One time to establish standards and prescription				TBD; based on bid (rough estimate: \$14,175-\$22,680/y)
LC-RIP	Invasive spp removal	Select area yearly					TBD: based on bid
LC-RIP	Tree protection	Select trees for caging	One time to establish standards and prescription				TBD: based on bid; OR approx. 1 day/y for 2 people (16 h/y)
LC-RIP	Pond leveler maintenance or relocation; dam removal	Select locations					TBD; perhaps 4-6 crew member days/y (48 person hours/y)
LC-RIP	Culvert cleanout						TBD: based on bid OR approx. 64 h/y for crew
LC-RIP	Fence repair	Select areas when need arises	One time to establish standards and prescription				TBD: based on bid

SFC CLERK RECORDED 10/12/2016



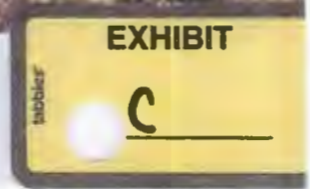
SANTA FE COUNTY OPEN SPACE AND TRAILS PROGRAM

LOS POTREROS OPEN SPACE MANAGEMENT PLAN

FINAL DRAFT
SEPTEMBER 13, 2016



Ecotone



ACKNOWLEDGMENTS

The planning team acknowledges the support and insights offered by the 2015-2016 Santa Fe County Board of Commissioners.

Henry Roybal – District 1

Miguel Chavez– District 2

Robert Anaya – District 3

Kathleen Holian – District 4

Liz Stefanics – District 5

Furthermore, the planning team wishes to acknowledge the support and insights offered by the County Open Lands, Trails, and Parks Advisory Committee (COLTPAC).

The extensive knowledge, effort and guidance from the County Open Space and Trails (OS&T) planning, project development, and maintenance staff was invaluable in developing this plan.

Maria Lohmann, OS&T Senior Planner,

Paul Olafson, Planning Project Manager

Erin Ortigoza, Senior Community Planner

Colleen Baker, OS&T Project Manager

Shane Martinez, OS&T Maintenance Technician
Lead

Approximately twenty different people participated in the stakeholder input process for the Plan. Stakeholder input was particularly important in the planning process to confirm the network of stakeholders, identify critical land conservation issues, understand complicated land and water (acequia) management practices in the area, formulate a vision for the property, identify preferred land uses and management activities, verify Management Plan priorities, and obtain feedback on draft management plan language.

The planning team obtained stakeholder input in a variety of ways:

- Meetings, telephone interviews, e-mail communications, and field walks with approximately ten key-informants in the community
- Three community meetings at the Benny J. Chavez Community Center in Chimayo; between 8 and 14 people participated in each of the meetings
- A public review and input process of the public review draft version of the Management Plan; comments were summarized in a table and responses were formulated behind each one of the comments; six people submitted written comments on the Draft Management Plan.

The Los Potrereros Open Space Management Plan was developed by a planning team led by Ecotone. The Ecotone planning team included:

Ecotone / team lead, ecologist

Jan-Willem Jansens

The Community Store / facilitator

Carl Moore, Jessie Lawrence

River Source / ecological planner

Richard Schrader, Carlos Herrera

Surrounding Studio / land planner

Faith Okuma , Sandra Donner,

Earth Analytics, Inc./ GIS planners

Wetherbee Dorshow, Tonya Fallis,

Kim Kearns

TABLE OF CONTENTS

1.0 INTRODUCTION

- 1.1. Plan Purpose and Need 1
- 1.2. Property Description 2
- 1.3. Management Plan Development Process 6

2.0 LOS POTREROS OPEN SPACE MANAGEMENT PLAN

- 2.1. A Vision + Goals for Los Potreros Open Space 9
- 2.2. Monitoring, and Information Management 11
- 2.3. Conceptual Master Plan 15
- 2.5. Terrain Management 25
- 2.6. Plan Implementation and Financing Mechanisms 28

LOS POTREROS OPEN SPACE APPENDICES

- APPENDIX A: Overview of Management Activities Table for Los Potreros Open Space
- APPENDIX B: A Field Characterization for the Los Potreros Open Space Property Santa Fe County, New Mexico - An Existing Conditions and Inventory Report
- APPENDIX C: Assessment of Grazing Management Conditions and Alternative Grazing
- APPENDIX D: Maintenance Plan for Los Potreros Open Space
- APPENDIX E: Maintenance, Stewardship, and Restoration Projects for Year-1





EXECUTIVE SUMMARY

Los Potreros Open Space (LPOS) is a 40-acre Open Space property in Chimayo acquired by Santa Fe County between 2001 and 2004. Los Potreros Open Space offers a visual connection to a working landscape representative of the traditional lifeways and culture of Northern New Mexico while providing a lush backdrop for the internationally renowned El Santuario de Chimayo.

The acquisition of this property was strongly supported by residents of Chimayo for the preservation of its scenic beauty, connection to public lands, conservation of traditional agriculture and local acequias, along with its connection to El Santuario de Chimayo.

The goal of the Los Potreros Open Space Management Plan is to provide practical and effective management actions to maintain and enhance the natural beauty and cultural qualities of Los Potreros Open Space. This plan was developed in collaboration with community members, adjacent property owners, and Santa Fe County staff. The plan has received strong support from residents of Chimayo.

This unique open space property includes diverse ecosystems and the confluence of two perennial rivers. The management challenges for this site include maintaining the functionality of acequias and irrigation systems, wetland restoration, grassland health, and streambank stabilization. The property's ecological and cultural resources are impacted by natural processes and inconsistent maintenance. Current threats include flooding and erosion, potential for wildfire, proliferation of invasive plant species, overgrazing, and the lack of regular irrigation. This management plan was developed to preserve, protect, and restore the property's valued resources. The plan outlines the vision, regular and scheduled maintenance activities, land improvement priorities, and stakeholder involvement in land stewardship.

The LPOS Management Plan identifies short-term, mid-term, and long-term management priorities for the property. The short-term phase focuses on ecological restoration and maintenance activities related to drainage and irrigation, streambank stabilization, riparian area restoration, and wildfire prevention. In the mid- to long-term, Santa Fe County will work with stakeholders to develop an agricultural program for the restoration of pastures, and improve the area's irrigation system. This plan also identifies the importance of developing a simple interpretive education program at LPOS to help visitors explore and understand the area's unique history, hydrology and ecology.

The Los Potreros Management Plan emphasizes the importance of collaboration regarding stewardship, conservation, and development of this property in the short and mid-long term phases. The plan identifies several opportunities for active public participation in stewardship activities to enhance preservation and restoration of the property to reach the vision for Los Potreros Open Space.

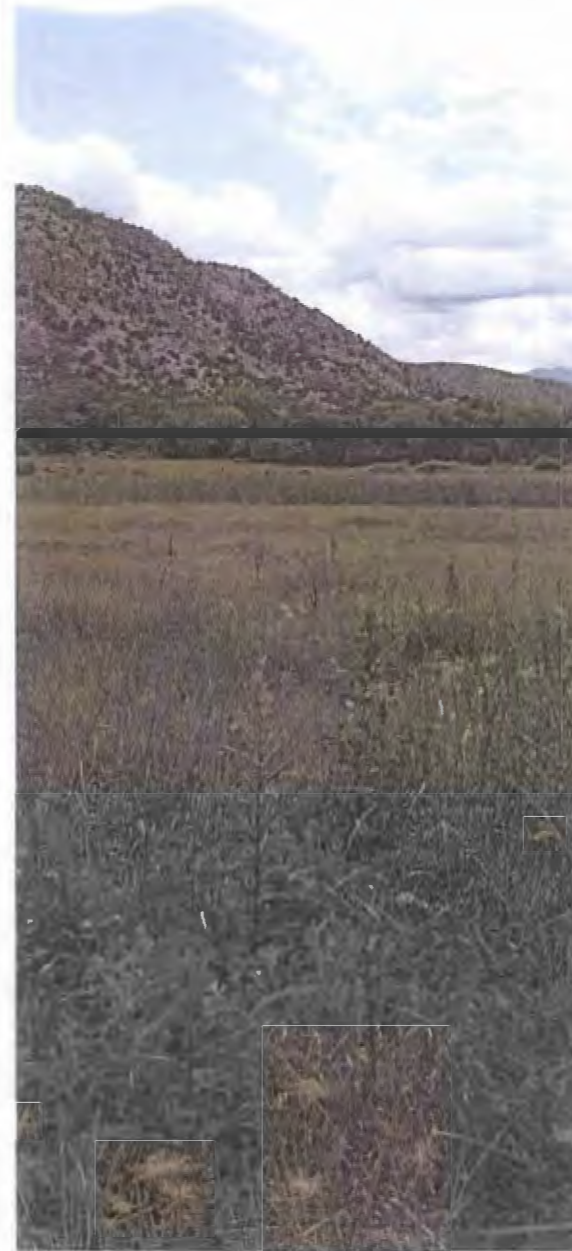




Figure 1. View of Los Potreros Open Space - from south looking to north Source: Google Earth

This Management Plan for the Los Potreros Open Space was developed with community members, neighbors, property owners and other stakeholders from the Chimayo area.

The planning team worked with them to formulate a vision for the Los Potreros Open Space and to verify the final plan components and priorities.

1.1. Plan Purpose and Need

The Los Potreros Open Space Management Plan was developed between June 2015 and May 2016. A Field Characterization report, a detailed Maintenance Plan, and a Planners' Guide for County staff accompany the LPOS Management Plan. The Planners' Guide describes technical planning methods, approaches to County capacity building, best management practices (BMPs), and guidance recommendations for plan implementation.

The LPOS Management Plan outlines a planning direction and specific action priorities, for short-term, mid-term, and long-term phases. The Plan was written for Santa Fe County staff, County policy makers, community stakeholders, and site stewards with the purpose to:

- Describe the vision, goals, and objectives for management of the property;
- Help staff and the public understand terrain conditions and suitability of the land for different uses of the property;
- Clarify priorities for site restoration and maintenance;
- Identify projects for future investment and financing mechanisms to fund them;
- Streamline management protocols within Santa Fe County.

The Plan was developed in response to a recommendation from the County Open Lands, Trails, and Parks Advisory Committee (COLTPAC) and with clear and strong support for enhanced management of open space properties from the Board of County Commissioners (BCC). The Plan arose from a growing need for:

- A strategic management plan that includes community outreach, a conceptual master plan, funding analysis, and maintenance plan to direct County staff in managing LPOS;
- A strong vision with clear objectives and strategies for resource conservation, agricultural preservation, passive recreation, and public access;
- An overview of existing conditions and a site-specific inventory report;
- A detailed maintenance plan with recommendations for labor and equipment needed;
- A concept plan that identifies, prioritizes and estimates timing and costs for key projects;
- An analysis of potential funding mechanisms to implement the plan.

LPOS Management Plan Need

The need to develop a Management Plan for LPOS has been a high priority because of a variety of ecological and functional site conditions that require systematic attention and consistent maintenance and resource management. Additionally, the 2015 Chimayo Community Plan included several recommendations for improvements at LPOS regarding wildfire prevention, water quality improvement, and flood and erosion control.

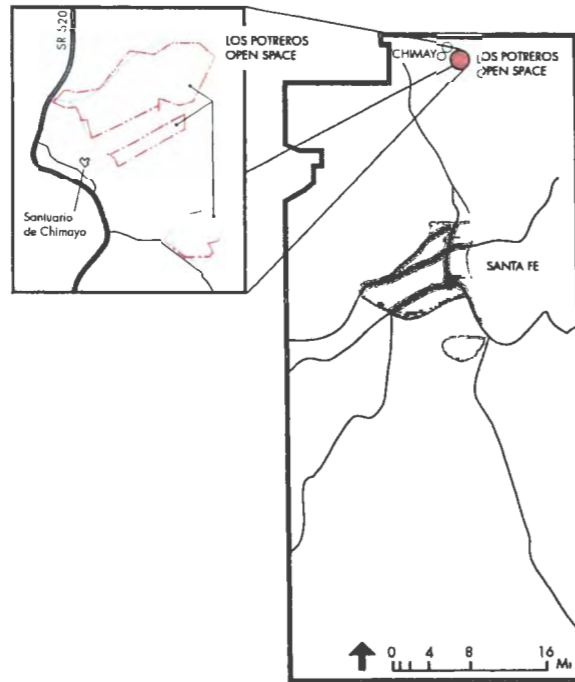


Figure 2. Location Map - Los Potreros Open Space

1.2. Property Description

The Los Potreros Open Space is a 40-acre County Open Space property, at the confluence of the Rio Quemado and Rio Santa Cruz, in Chimayo, in the northern part of Santa Fe County (Figure 2). The LPOS offers a unique scenic backdrop to El Santuario de Chimayo and is strongly connected to the famous church.

More than half of the LPOS property consists of historic grassland, or “Potrero” (foal pasture). The eastern portions consists of wooded foothills through which two acequias run with dry juniper savannah at the higher edges. To the east of the parcels is BLM land. Access to the LPOS is via a locked and gated auto entrance from Juan Medina Road at the west most parcel, and a few informal foot bridges and stream crossings along the Rio Santa Cruz and Rio Quemado.

The LPOS property has a unique wetland and riparian ecosystem associated with the confluence of the Rio Quemado and Rio Santa Cruz. Much of the pastures are wetlands. The rugged hills, wetlands, grasslands, riparian areas, and trees lining the rivers and pastures provide valuable wildlife habitat and unique scenic beauty. The LPOS retains a historic, pastoral character, and local residents strongly advocate for the preservation of these characteristics.

LPOS is comprised of three, non-contiguous parcels in the valley between the confluence of the Rio Santa Cruz and the Rio Quemado. LPOS is bordered by numerous private parcels and the Santuario de Chimayo on the west side of the valley. Santa Fe County, the private landowners of these parcels, and the leadership of the Santuario de Chimayo acknowledge the integrity of the LPOS and the private parcels together in the entire valley landscape. Implementation of this Plan will require coordination and collaboration with neighbors, specifically regarding access and shared landscape resources. Table 1 and Figure 3 identify the key parcels for collaboratively managing the LPOS.

The LPOS Management Plan is informed by a landscape assessment (“A Field Characterization for the Los Potreros Open Space Property Santa Fe County, New Mexico - An Existing Conditions and Inventory Report”) (APPENDIX B) and a detailed analysis of the grazing lease and grazing opportunities at LPOS (APPENDIX C), which were completed in early 2016 as part of the management planning process. These reports document the riparian and wetland conditions at LPOS and the wildlife habitat conditions of the wetlands and surrounding riparian areas of the Rio Santa Cruz, Rio Quemado, and the acequias that flow on the east side of the property.

Current conditions indicate need for resource protection and restoration. Threats to the property's resources include:

- Risks of woody debris jams, flooding, and bank erosion
- Wildfire risk in the riparian zone and on the densely vegetated toe of slopes in the riparian vegetation associated with the acequias
- Proliferation of invasive plant species (elm, tree of heaven, Russian olive, Kochia spp., and knapweed)
- Grassland and wetland plant diversity and forage quality losses due to an ineffective grazing lease system, cattle trespass, and saturated or extremely dry soil conditions
- Acequia ditches and infrastructure requiring ongoing repairs and maintenance, and a piped irrigation system

In 2015-2016, grassland and wetland conditions for grazing were poor due to saturated soils and a predominance of rushes and sedges which represent a low-quality forage. Only yearlings and goats may benefit from these forage conditions. Residents stated that even baling of hay would generate a low value forage product. As a result, the LPOS Management Plan recommends a review and overhaul of the grazing program at LPOS, along with resting the land, restoring ecological and forage conditions, and infrastructure improvements.

The Field Characterization report also documents the conditions of infrastructure, such as access points, fences, gates, stream crossings, and trails. In 2016, the only official access point to LPOS is the gate on the far west side of the property off of Juan Medina Road.

At this location there is only informal, off-site roadside parking for about three vehicles. From the gate a two track trail runs along the Rio Quemado providing vehicle access to the pasture (parcel 6) across two fords in the stream. A narrow foot trail continues on the west side of the river until halfway into parcel 7. Trails developed around 2005 by the Chimayo Conservation Corps have not been maintained and are mostly overgrown.

Santa Fe County purchased the LPOS parcels from several local, private landowners between December 2001 (parcel 7) and 2004 (parcels 1 and 6 and a conservation easement on parcel 4. It took until 2011 to get the water rights transferred from the Santa Cruz Ditch.



Photo 1. Woody debris in Martinez Arriba Ditch



Photo 2. Wetland conditions in West Potrero.



Photo 3. Overgrown conditions at Las Cuevas Ditch



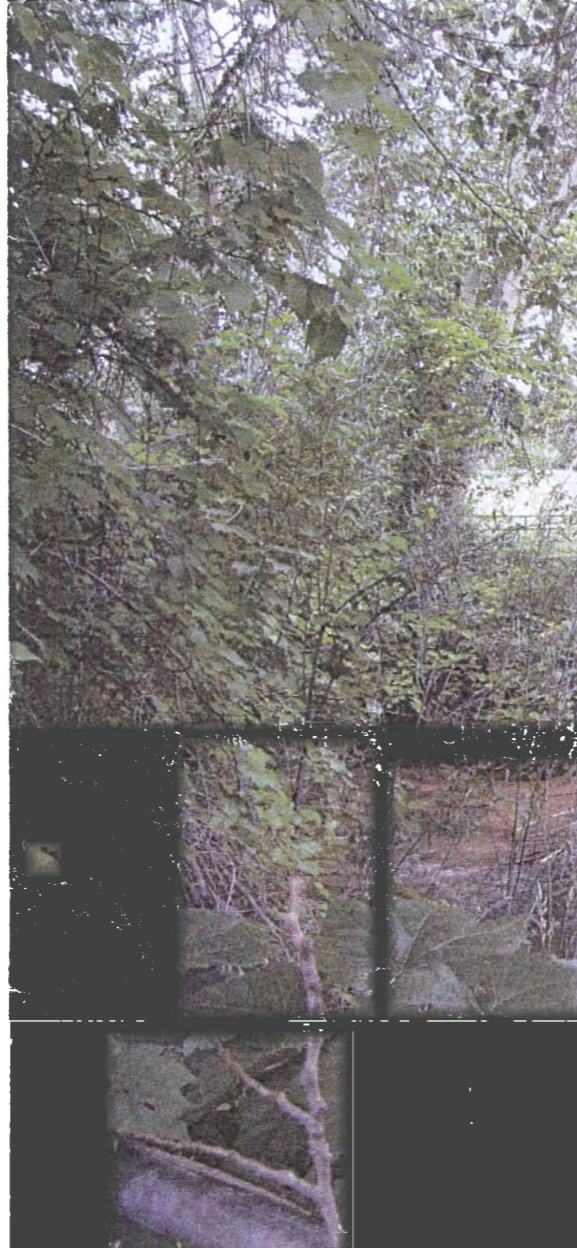
Figure 3. Figure 2. Key Parcels / SFCOS Parcels and Adjacent Parcels

Parcel Number	Parcel Name	Location Description
Parcel 1	Orlando's or South Potrero parcel	Parcel along Rio Santa Cruz and CR92 (0.31 acres of grassland)
Parcel 2	Bal family parcel A	Parcel along Rio Santa Cruz, accessible from driveway off of CR92, with gates into parcels 1+3
Parcel 3	Bal family parcel A	Parcel along Rio Santa Cruz with gates into parcels 2+4
Parcel 4	Conservation Easement pasture, owned by Vigil family	Parcel along Rio Santa Cruz across from El Santuario parking area (2.48 acres of grassland), accessible with gates from parcels 3+5, and a ford across Rio Santa Cruz
Parcel 5	Josefina's or Martinez family parcel	Parcel along Rio Santa Cruz across from El Santuario, with gates to parcels 4+6
Parcel 6	Modesto's or West Potrero pastures	Parcel at confluence of Rio Santa Cruz and Rio Quemado, just east of El Santuario (8.87 acres of grassland and wetland), with gates to parcels 5+7, and a ford and main gate to Juan Medina Road for ingress/egress (approx. 1 acre).
Parcel 7	Orlando's or East Potrero pastures	Parcel upstream along Rio Quemado (6.98 acres of grassland and wetland), with gates to parcel 6 and to the riparian area along Rio Quemado

Table 1. Key Parcels Ownership Descriptions (Green marked properties are part of Los Potreros Open Space)



Photo 4. View from Northeast corner of parcel 7 looking towards potrero.



1.3. Management Plan Development Process

The planning process was informed by the initial goals for the acquisition of the property and a set of planning principles. The planning principles were formulated based on public input and management conditions within Santa Fe County.

INITIAL GOALS FOR ACQUISITION

- Preserve the undeveloped state, viewshed and backdrop of El Santuario de Chimayo
- Develop a gateway to BLM properties via the trails along the Rio Quemado
- Conserve traditional agricultural practices and the historic acequias

PLANNING PRINCIPLES

- Adhere to goals and purpose of Santa Fe County Open Space and Trails Program
- Ensure public access and safety (based on the reasons for acquiring the property)
- Keep maintenance needs to a minimum (commensurate to County capacity and community-based stewardship support)
- Minimize needed investments related to master planning
- Minimize the disturbance of cultural and ecological resources
- Identify and enhance opportunities for agricultural use of Open Space properties
- Involve youth and create educational opportunities

The planning process included three phases:

Scoping and Reconnaissance Phase

- Interviews with key stakeholders, community members, and County staff to develop an initial understanding for engaging the community in the management plan process.
- Review of relevant Santa Fe County plans and policies.
- Site visits to identify specific research needed for this management plan.
- The first public input meeting to develop an initial community vision for the site.

Research Phase

- Follow-up interviews with key stake-holders and community members to refine the approach for the second public input meeting.
- Research on topics identified in the Scoping and Reconnaissance phase.
- Additional site visits to confirm terrain management units and collect data for a land suitability assessment and the development of management recommendations.
- Mapping of findings of the Scoping/Reconnaissance and Research phases.

Planning Phase

- The second public input meeting to present research and land suitability findings and formulate ideas for management of the property.
- Writing the first draft of the management plan.
- Interviews and reviews with County staff to confirm plan coordination and implementation opportunities.
- The third public meeting to confirm the draft vision statement and goals and review the major components of the draft management plan.
- Final draft management plan for review and the approval process.

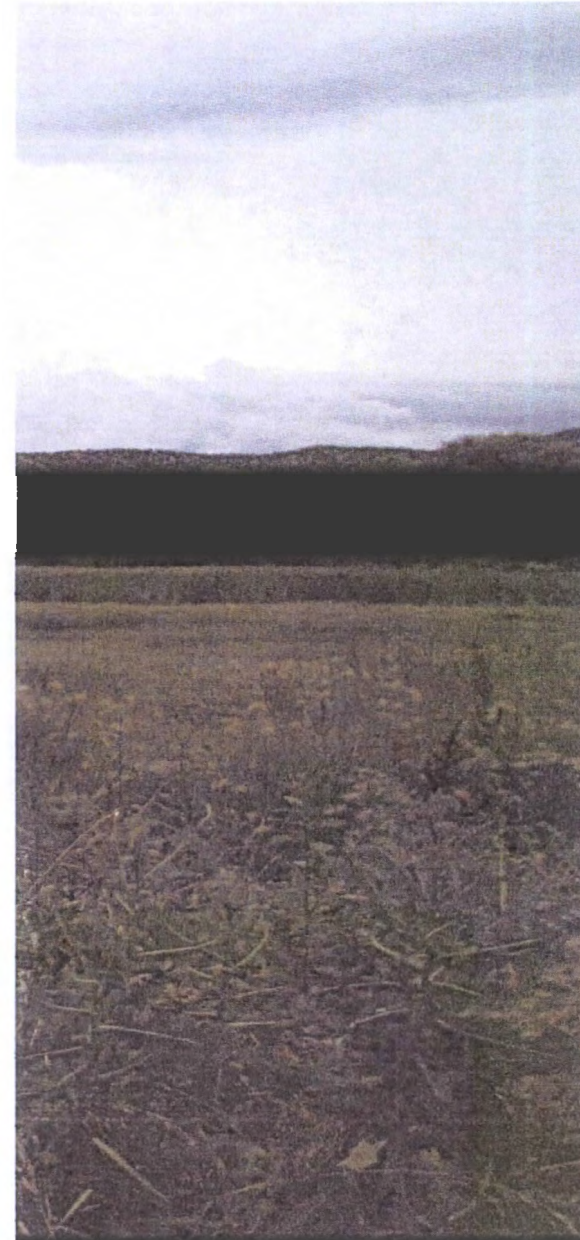
Information Management

Santa Fe County will gradually streamline and enhance the procedures that help staff acquire, store, and share knowledge that is essential for effective resource management of LPOS. Recommendations about County capacity building, knowledge development, information management, plan updates and community involvement methods are described in the Planners' Guide.

Plan Updating

This plan is a living document which will be updated and amended when necessary. The scope of the plan is approximately 15-20 years. Plan information is specific for the short-term (years 1-5), descriptive for the mid-term (years 6-10), and preliminary for the long-term (year 11 and beyond).

Changing community needs, terrain conditions, and County management capacity will inevitably lead to the need for plan adjustments. Priorities and timelines may shift, and objectives for planned projects, maintenance activities, and community relations may change or expand. Following completion and assessment of actions beyond the mid-term span of this plan (10-15 years), this plan may need a thorough updating.





This section describes the Los Potreros Open Space vision, the management goal and specific site management objectives.

Included are recommendations for monitoring and information management, a conceptual master plan with key projects, community stewardship, terrain management and funding options.

2.1. A Vision + Goals for Los Potreros Open Space

Vision Statement

The Los Potreros Open Space vision statement is based on responses from community meeting participants to questions that asked “What would “good” look like?”, “What do you want for the future of this place?”, “What might other people think would be good for this site, but you don’t?”, and “What would worry you if it happened on the site?” The draft vision statement was shared and verified with community members at the third community meeting.

Los Potreros Space Vision Statement

In 2025, the Los Potreros Open Space (LPOS) is a peaceful, passively used open space area, faithful to the local traditions of the Chimayo community. The land expresses the area’s traditional, pastoral scenic qualities and historical characteristics, and is managed to protect its wildlife habitat and corridors. The LPOS is carefully maintained, including the rivers, native trees, and brush.

The LPOS may include some agricultural uses that have been considered carefully and are designed to minimize the impact on the land. The open space may include some grazing activities if reference is provided to historical uses, an equitable lease system, the minimization of fencing, and the consideration of haying as an alternative or addition. The land may also be used for educational opportunities.

The LPOS is managed for use primarily by local residents and youth. Investments on the property are primarily geared to the quality of life for locals. Santa Fe County is active as a steward for the land, a good neighbor, and a parciante on the acequias.

Los Potreros Open Space Management Goal

Based on the vision statement, the central management goal for LPOS is:

Santa Fe County and the community of Chimayo collaboratively maintain and enhance the natural qualities and beauty of the uplands, acequias, wetlands, pastures, and riparian zones of LPOS to reflect the historical use and aesthetic of the place through landscape conservation and traditional uses, such as grazing, haying, wildlife habitat maintenance, and periodic rest periods, with a view toward local enjoyment and education. Traditional uses should be organized in such a way that they are equitable, low-impact, supportive of the qualities of the land, and transparently managed.



Photo 5. Cattails in center of West Potrero (pasture)



Photo 6. View of typical conditions along Martinez Arriba Ditch



Photo 7. Vehicle at-grade crossing to West Potrero

Management Goals + Objectives

Los Potreros Open Space Specific Management Objectives

Specific management objectives in support of the vision and the central goal are:

1. **Holistic & Neighborly.** Manage the property in a way that the different values and objectives are balanced as a whole, and seek and maintain optimal working relationships with neighbors and other local stakeholders
2. **Access.** Control access by managing roads, trails, fences, gates, stiles, river crossings, and signage
3. **Scenic & Interpretive.** Maintain the area's scenic, pastoral, and historical qualities, and provide and maintain locally appropriate interpretive education, which may include simple signage
4. **Ecological Health.** Maintain the ecological health, resilience, and productivity of the LPOS wetlands, pastures and riparian areas, and maintain wildlife habitat qualities
5. **Grazing.** Establish a managed, restorative grazing lease program (and rest periods) as a way to improve grassland and wetland health
6. **Agriculture.** Explore and develop locally appropriate, small-scale agricultural opportunities (e.g. haying) in response to the need to develop agricultural uses for the site, put water to beneficial use, and, therefore, maintain water rights and acequia use
7. **Education.** Explore and use educational and research opportunities

Management Objective #1 is Holistic & Neighborly management. Management of the LPOS property will need to be done in coordination with activities and conditions on the adjacent properties.

Santa Fe County acquired the LPOS to preserve the character of the potrero, as well as, to conserve agricultural and cultural resources. Another original goal was to offer access to adjacent BLM lands. To achieve these goals, the County will need to work closely with the adjacent properties and the local community.

Santa Fe County acknowledges the many connections that LPOS has with the surrounding properties, the Rio Quemado and Rio Santa Cruz, and beyond. The long-term success of the Plan will require coordination and collaboration with adjacent property owners, community stakeholders, acequia associations, and El Santuario de Chimayo

2.2. Monitoring, and Information Management

Monitoring

To ascertain that progress is made toward achieving management goals, County staff together with local community partners will periodically monitor certain indicators of progress (*Table 2*).

A basic set of monitoring activities for LPOS includes first tier of 5 measurements for which a base-line of data was established during the management planning process. These proposed first tier monitoring activities are numbered and their locations are indicated by number on a TMU map (Figure 3). A second tier consists of 8 additional monitoring activities that Santa Fe County staff may conduct in the future if staff time and budget allow. Locations for these second tier activities will need to be established later.

Based on the monitoring overview described below, and as part of plan implementation, Santa Fe County staff will develop a detailed monitoring plan. A detailed monitoring plan enables staff and stakeholders to track progress made toward specific goals and objectives. Ideally, the monitoring plan will be updated annually with community members and stakeholders.

A detailed monitoring plan specifies how the indicators will be measured or documented, when and where this will be done, who will do it, and what equipment or supplies are needed. Additionally, a detailed monitoring plan will establish or estimate numerical thresholds and conditions that serve to indicate whether corrective action will be needed.

Base-line methods and findings are described in “A Field Characterization for the Los Potreritos Open Space Property Santa Fe County, New Mexico - An Existing Conditions and Inventory Report” (2016). Methods for additional monitoring activities are in a list of BMPs in the Planners’ Guide.



Photo 8. Existing stile, overgrown vegetation along Rio Santa Cruz



Photo 9. Traditional style pasture fence



Photo 10. overgrown conditions at southmost parcel.

MONITORING LOCATIONS MAP

Monitoring Example

To improve forage quality and quantity from year to year, a simple threshold could be to set baseline levels based on the Los Potreros Field Characterization Report established in 2015. If monitoring shows that if conditions are not the same as the previous year's conditions, corrective action would be taken. In such a case, causes for the impairment need to be established and addressed. This might mean for example that a pasture must be rested, that the grazing regime must be changed, or that a fence must be fixed.

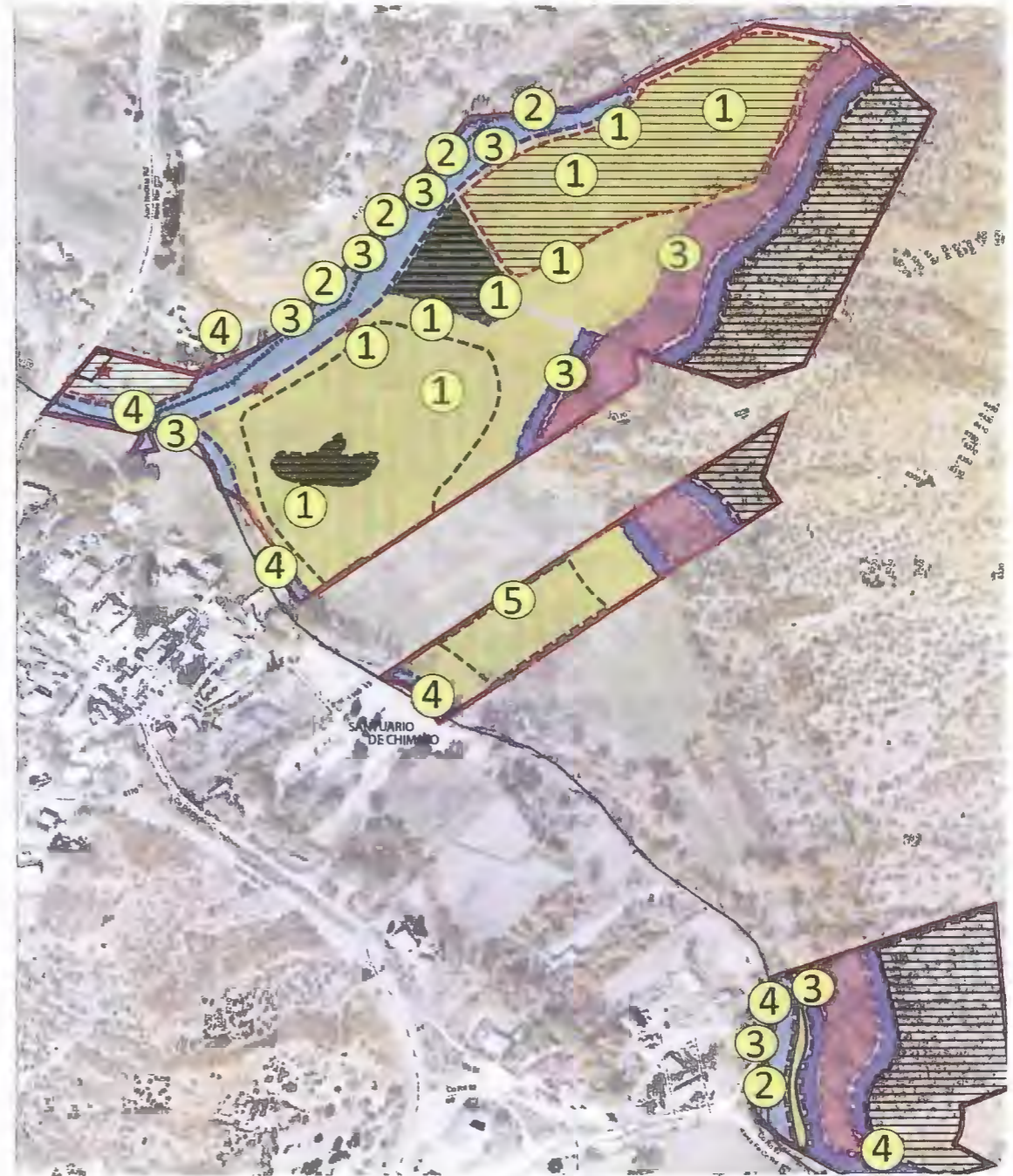


Figure 4. Monitoring Points for Los Potreros Open Space

No.	Conditions Monitored	Mgmt Objectives	Indicators and Monitoring Method	Monitoring Frequency and Season
1	Forage quantity and quality & cover of grasslands	Ecological Health / Grazing	Dry weight of clipped biomass in random sample plots (one plot selected along a transect with 10 plots); measurement of vegetation cover in selected transects; literature review of forage quality of species found in transects	Annually in September or October
2	Fuel load of riparian zone	Ecological Health	"Brown's Line" transects for fuel load estimates	Every 3 years (spring/fall)
3	Dead and down wood and debris in streams, on stream-banks and on slopes	Ecological Health	Visual observation during walk through and photo documentation; tally number of dead branches, tree trunks, and large rock obstacles in channel and nearby adjacent river banks.	Every 3 years in spring or fall
4	Stream channel stability around grade control and diversion structures and diversion efficiency	Ecological Health / Grazing/ Agriculture	Visual observation during walk through and photo point documentation	Annually (spring or fall)
5	Conservation Easement baseline conditions	Holistic & Neighborly / Ecological Health	Visual observation during walk through and photo point documentation	Annually (spring or fall)
6	Neighbor and stakeholder steward-ship and relations	Holistic & Neighborly	Public participation and initiative; public feedback and expressions of support	Annually
7	Scenic quality	Holistic & Neighborly / Scenic & Interpretive	Visual observation during walk through and photo point documentation	Annually (spring or fall)
8	Liability risks to neighboring properties	Holistic & Neighborly / Ecological Health	Visual observation during walk through and photo point documentation	Quarterly
9	Infrastructure conditions; fence effectiveness	Scenic & Interpretive	Visual observation during walk-through and photo point and GPS/Avenza PDF Map documentation of any infrastructure damage	(Bi-)Annually (spring and/or fall)
10	Stream channel morphology, efficiency and bank stability	Ecological Health	Visual observation during walk through and photo point documentation	Annually (spring or fall)
11	Slope stability	Ecological Health	Visual observation during walk through and photo point documentation	Annually (spring or fall)
12	Vegetation health, presence of non-native plants and other invasives	Ecological Health	Plant list comparison with knowledge of native and invasive plants; visual observation during walk through and photo point and GPS/Avenza PDF Map documentation of locations	Annually (late summer or fall)
13	Hydrological terrain conditions: irrigation and drainage effectiveness	Ecological Health / Grazing	Visual observation during walk through and photo documentation	Annually (spring or fall)

Note: The table indicates the minimum suggested monitoring frequency. In some circumstances frequencies may need to be increased if/when staff time and funds allow, or if monitoring activities can be conducted by community volunteers.

Table 2. Monitoring Matrix



The Conceptual Master Plan for Los Potreros Open Space (LPOS) describes proposed land improvement projects and associated investments to support the LPOS vision and management goals. The proposed projects result from stakeholder wishes and planning opportunities as limited by the suitability of the land. The Conceptual Master Plan describes alternates and options for projects, the specific locations of projects, their purpose, priority, as well as a suggested timeline for implementation.

Land Use and Development Plan

The LPOS Conceptual Master Plan aims to conserve scenic beauty and integrity, wildlife habitat, and agricultural uses. The plan also aims to **preserve the specific pastoral, historical and traditional values** local community members treasure about the place. All other uses are subordinate to this predominant use designation and will be in service to achieving the vision for the LPOS.

Land conservation is already the de facto land use. As a result, this plan does not propose any change to this use. The development of other uses in support of the vision will take place gradually during and after the short-term maintenance and restoration phase. The preservation of the scenic qualities supports the continued importance of the area as the scenic backdrop for El Santuario de Chimayo.

The **proposed projects** are designed to **improve grassland health** and productivity for grazing and wildlife habitat. Forage quality needs to be improved for potential future livestock grazing (yearlings and cow-calf) and wild ungulates (mule deer and elk). Grassland/wetland and riparian conditions also need to be improved to benefit reptiles, amphibians, and insects, with an emphasis on pollinators. Projects will focus on:

- Improving the hydrological conditions of the pastures through irrigation and drainage,
- Upgrading fencing,
- Planting stream-side vegetation (i.e., a riparian buffer strip) and relocating fences,
- Locally stabilizing the banks of the Rio Santa Cruz to prevent erosion and flooding,
- Implementing agricultural activities for soil improvement in the northern pastures.

Improvements will also include improving some of the basic infrastructure of trails and river crossings, installing simple signs and a bulletin board and developing one or two observation areas for appreciation of the scenic beauty of the area.





Alternatives for proposed Conceptual Master Plan projects will be developed during the full Master Planning process of each individual project. Alternatives typically vary between (1) No Action, (2) Preferred Solution, and (3) Alternative Solution(s).

No Action Alternative

No Action Alternative has been the default alternative from the time of purchase of the LPOS property. This alternative will likely be ended during the Short Term phase of the Management Plan. No Action will likely lead to increased threats of resource degradation and needs for more costly maintenance and restoration work. This alternative would preclude investments in desired ecological terrain improvements, safety measures, and signage.

Preferred and Alternative Solutions

During the Conceptual Master Plan process for LPOS no need arose to consider fundamentally different alternative solutions for the protection and improvement of conditions of LPOS. Instead, the proposed activities constitute a gradual organic development of activities spread over time.

However, at the level of specific projects (improvement), detailed technical alternatives may apply. These alternatives should be considered when these projects are being planned and designed. The advantages and disadvantages of each alternative and the determination of a preferred alternative is not timely in this Management Plan and is deferred to the Detailed Master Plans.

Exploring Alternatives

Alternatives for proposed LPOS projects will be developed during the plan process for individual projects.

Examples of alternatives that could be examined for drainage improvements and riparian planting are:

Water Management Improvements:

The No Action alternative will be that the current drainage pipe will remain in place and has to be changed and maintained by hand to alter drainage conditions.

One alternative solution may consist of a series of drainage pipes at different elevations (in V-formation) that increase drainage potential if the water table rises.

Another alternative may include the installation of a large outlet box and pipe with a hand-cranked gate, possibly accompanied with a sediment sluice or sediment pond to limit the need to clean the system, and fencing to limit livestock impact on the drainage system.

Riparian Buffer Plantings:

The No Action alternative will be that no buffers are planted and no changes occur to the fencing location. As a result, there will be no habitat gain and no improvement in filtering nutrient-rich water from the pasture into the streams.

One alternative for the buffer plantings may be to create a fenced-out strip of land where native grasses, forbs and shrubs are allowed to grow out (protected from grazing impacts), potentially aided by some minimal plantings of desired species.

Another alternative may include the planting of willows, cottonwoods, and/or other native streamside shrubs and trees in a fenced-out strip of 20'-30' between the pasture and the existing stream-side vegetation.

A third alternative could include the combination of the previous two alternatives on select locations along the streams. Each alternative will have different visual quality impacts and maintenance requirements.



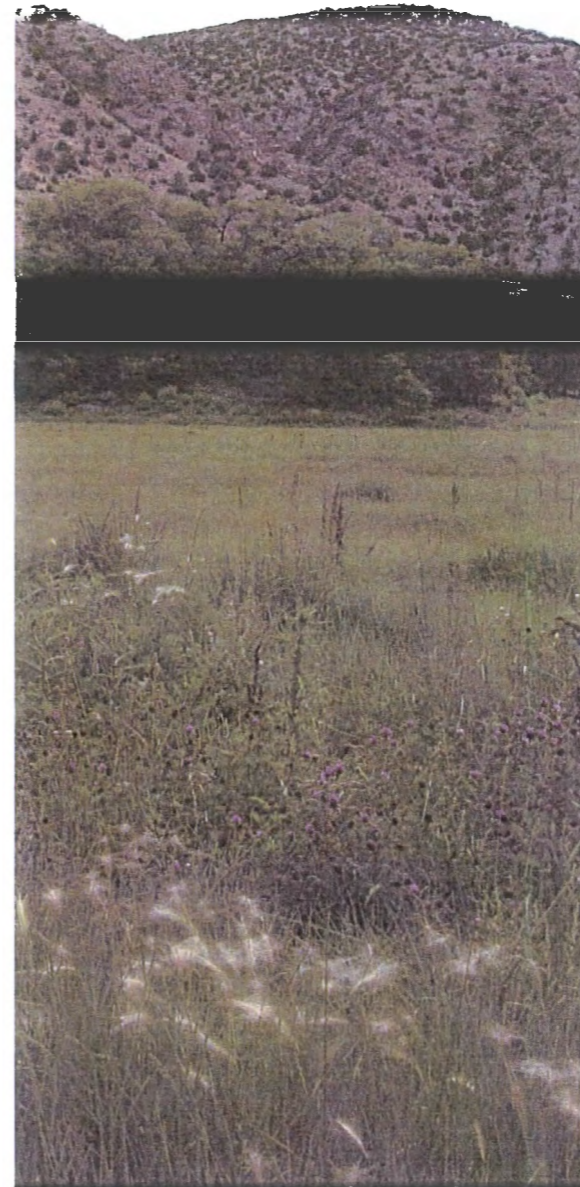


Key Projects for Planning, Research, and Development

Planning and preparation is required for all Conceptual Master Plan improvements. Implementation of improvements will be coordinated with maintenance and repair activities. The following key projects for planning, research, and development are required to prepare maintenance and proposed improvements.

1. Develop protocols for communication and verification about maintenance and land restoration work, mapping, monitoring, and team coordination.
2. Develop and implement a monitoring plan for baseline data for all scheduled activities and associated terrain conditions.
3. Develop a basic signage plan for boundary marking and/or acknowledgment of the LPOS and the conservation easement, along with a bulletin board that will serve to post flyers and announcements. The signage should address public safety rules, leave-no-trace principles, and Santa Fe County contact information. Signage design that is simple and unobtrusive will best meet the vision for the LPOS.
4. Develop a simple grassland and grazing management plan, including pasture management, irrigation and drainage planning, and a short-term plan for haying and baling (with community involvement).
5. Work with the Santa Fe County Legal Department to complete change of water rights ownership, develop a plan to utilize the water rights already allocated through the Martinez Arriba Ditch, the Las Cuevas Ditch, and the Manuel Vigil Ditch, and improve irrigation infrastructure and acequia management systems.
6. Pay dues and making arrangements for laborers and their payment for acequia improvement work.
7. Develop a detailed plan and design for drainage improvements for the West Potrero pasture (parcel 6), with a detailed scope of work for RFP implementation.
8. Redesign the grazing lease process, and create a lease program for managed, restorative grazing, and a managed grazing lease for grassland maintenance.
9. Prepare an RFP for bank stabilization, drainage improvement, and associated arroyo maintenance.
10. Prepare an RFP to plant riparian buffer strip vegetation along Rio Quemado and Rio Santa Cruz on the West Potrero parcel 6.
11. Initiate a cultural/archaeological survey for the entire property.

12. Design a simple trail and observation area on the west side of the West Potrero parcel 6
13. Plan and organize a community-driven restoration project for the dry pastures (parcel 7).
This project should include assessment of the irrigation system, and of opportunities in the community to actively participate; this restoration project may include the planting of cover crops, mulching with mowed crops, and managed, restorative grazing. Sowing and cultivating a forage crop subsequent to restoration efforts would provide soil cover soil restoration capacity, and forage for wildlife and livestock.
14. Research and plan for a simple interpretive education program for the LPOS
15. Replace and remove old, weak, dead and fallen trees.



Prioritization and phasing for LPOS is based on the terrain conditions of early 2016. The baseline site conditions include needed maintenance on acequias, drainage systems, fences, and wooded areas. The proposed Conceptual Master Plan activities follow the prioritization criteria outlined in the Planner's Guide.

- Short-term:
 - All activities focus on land restoration and maintenance to address conditions caused by deferred maintenance.
 - Grazing uses will be paused to rest and improve the land with a focus on ecological restoration and management of the pastures; grazing may resume after several years when grassland health is restored, infrastructure is improved, and the County's lease system is updated.
- Mid-term:
 - Improvement of the dry, northern pastures.
 - Infrastructure upgrades.
 - Possible development of a scenic observation area.

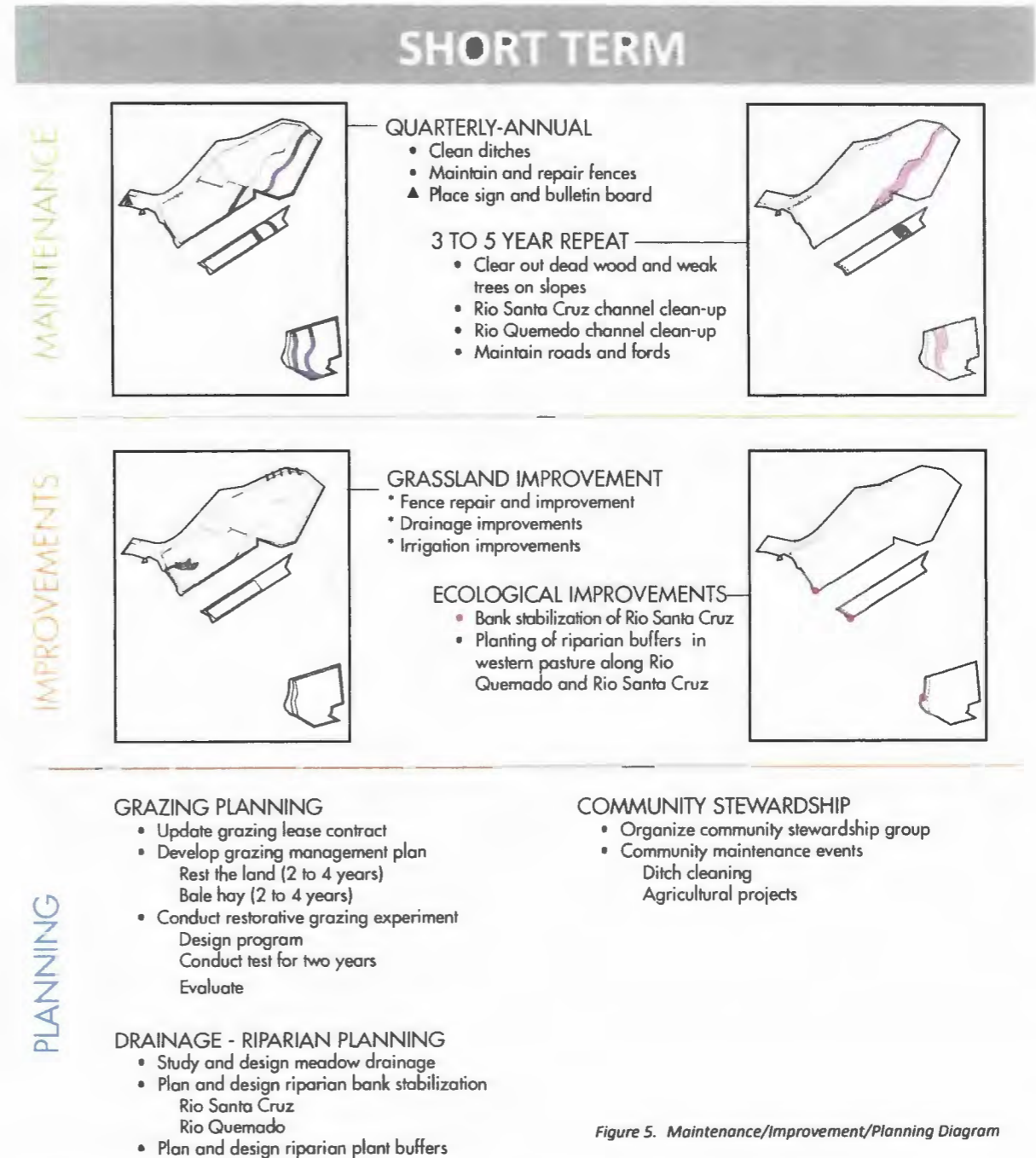
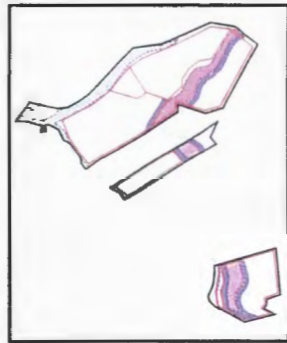


Figure 5. Maintenance/Improvement/Planning Diagram

MID TERM - LONG TERM

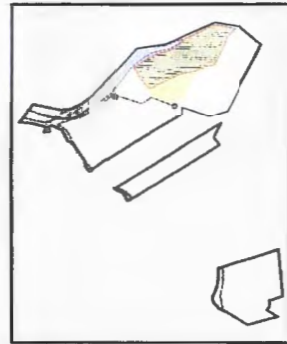


QUARTERLY-ANNUAL / CONTINUE

- Clean ditches
- Maintain and repair fences

3 TO 5 YEAR REPEAT - CONTINUE

- Clear out dead wood and weak trees on slopes
- Rio Santa Cruz channel clean-up
- Rio Quemedo channel clean-up
- Maintain roads and fords



CONTINUE IMPROVEMENT OPPORTUNITIES

- Rehabilitate North Pasture
Irrigate
Sow cover crop
Graze lightly
- Grazing and field access

GRAZING PLANNING

- Implement Restorative Grazing Leases
- Review Restorative Grazing Lease - every 3-5 years

COMMUNITY STEWARDSHIP

- Strengthen community stewardship group
- Continue community events
- Develop educational and research opportunities

AGRICULTURAL PLANNING

- Evaluate further soil improvements for north pasture
- Study and propose options for expanded agriculture
- Study and plan scenic view point and simple access

Long-term:

- o Conceptual Master Plan components, such as the possible ongoing ecological and agricultural development of the irrigated, northern fields.
- o Installation of some educational interpretive education signage.
- o Upgrades of ditches, fences, fords, and trails.

Community involvement is essential to management implementation. Public involvement may include feedback on proposed project details during future planning and design sessions and active engagement in the planning and implementation of the projects. Several maintenance activities will be suitable for community or volunteer participation, which will facilitate community stewardship for open space care and maintenance.

A comprehensive overview of planning activities along with maintenance activities, Conceptual Master Plan projects, and community stewardship activities is included in *APPENDIX A*. The activities are listed by functional group (planning, maintenance, community services, and projects/improvements) relative to Santa Fe County's organization of departments.

Santa Fe County intends to include a diverse group of community stakeholders in volunteer stewardship work. These stakeholder groups include:

- Immediate neighbors and parciantes on the acequias (the Martinez Arriba Ditch, Las Cuevas Ditch, and Manuel Vigil Ditch)
- Representatives on behalf of El Santuario de Chimayo
- Other acequia groups, namely those associated with the Potrero Ditch, Santa Cruz Irrigation District ditch, and the Los Ranchos, Jaramillo, and Epitacio acequias
- Chimayo Historic Preservation Association
- Local youth, and possibly organized through the Chimayo Conservation Corps
- Local farmers
- Local livestock owners
- Area schools and their students, the Chimayo Elementary School, Camino de Paz (agricultural) School, and Northern New Mexico College in Española
- Regional conservation groups, hiking and outdoor organizations, and other entities that could become interested in LPOS

2.4. Community Relations

Santa Fe County intends to develop and maintain productive, neighborly and collaborative relations with the Chimayo community regarding the implementation of the LPOS Management Plan.

Information Exchange

In the short term, Santa Fe County plans to expand and develop several methods for information exchange with community members and stakeholders.

Signage

Santa Fe County will install simple signage to identify the Open Space property. Santa Fe County will also install a sign indicating the conservation easement on parcel #4, as stipulated in the Easement Deed Agreement. Signage will also inform the public about safety, leave-no-trace principles, general care and stewardship behavior, and contact information for Santa Fe County. Boundary markers will be installed for maintenance and access control. A bulletin board will be placed at the gate on Juan Medina Road for public notices, such as specific events, meetings, and terrain management activities.

Website

Santa Fe County will maintain website pages dedicated to the County Open Space & Trails program. The website may be expanded with a specific webpage describing the LPOS landscape and history, management plan information and activities, and planned events at the LPOS.

Community Contact

Santa Fe County will work with the community to identify a communication structure with community members who are available to field comments and questions and contact County staff for follow-up actions. Communication may address signage, grassland management and improved grazing practices, haying and baling activities, collaboration on acequia cleanup, weed management, and wood removal and distribution, among other initiatives, especially in the initial phase of plan implementation.

Santa Fe County and community members understand that it is important to cultivate educational activities at LPOS to raise awareness about the area's unique history, ecology, and traditional agriculture, and to mobilize support for future stewardship. Santa Fe County and community members encourage more youth engagement, such as school groups, in educational activities and site maintenance.

A significant portion of community communication will revolve around maintenance of the open space property, both to announce maintenance work done by Santa Fe County and its contractors and to plan and coordinate maintenance work done in collaboration with community members. All maintenance and restoration activities will be reviewed with affected neighbors and stakeholders prior to implementation, or discussed and coordinated in community meetings. Maintenance activities that are suitable for (small) groups of volunteer stewards include:

- Fence repair (in the fall, to prepare for the winter grazing season),
- Removal of dead wood and woody debris on the ground and in the river (during low flows) (in the late winter and early spring to prepare for spring runoff and summer storms)
- Removal of invasive plants (esp. knapweed, Siberian elm, Tree of Heaven, Russian olive, and tamarisk) (in the late fall and in the early spring)
- Acequia cleaning and brush removal (in the early spring to prepare for the irrigation season)
- Baling of hay (in later summer and fall, in years the pastures are not grazed)

Maintenance activities can provide benefits for the community. Such benefits may include the distribution of dead wood as firewood (e.g., there used to be an "Ancianos" program in Chimayo that distributed firewood to elderly people), maintaining visual contact between the Santuario grounds with the Potrero grassland by trimming vegetation along the Rio Santa Cruz, offering priority to local livestock owners for the managed grazing lease, and organizing haying and baling of grass crops with and for local community members. Other important maintenance activities to involve the community members include acequia maintenance events, and collaboration with neighbors on fence repair and drainage around the pastures.





Collaboration on maintenance activities will be effective by organizing community partners around specific, tangible projects to foster communication and trust, and generate additional objectives, priorities, and creative new ideas for problem solving. The following topics are of interest in the community and may serve as pilot projects for implementation of this plan:

- Grassland and wetland management and traditional grazing
- Other agricultural uses, including haying and baling
- Scenic and spiritual appreciation
- Wildlife habitat conservation
- Public and youth education

A more detailed list of community involvement is included in section 2.6 about short-term Plan implementation activities.

2.5. Terrain Management

For purposes of maintenance and land use suitability, the LPOS Management Plan identifies several Terrain Management Units (TMUs) (Figure 6). Each TMU encompasses an area with similar landscape features and maintenance requirements, and similar land suitability characteristics (i.e., a unique set of options for land use). The identification of TMUs organizes the spatial management aspects of this plan. TMUs continue across the landscape. Santa Fe County will manage each TMU according to its particular needs and terrain characteristics. The TMU map (Figure 6) has been developed for County terrain management purposes only and does not reflect any water rights or hydrographic survey conditions.

Terrain management activities are described in detail in a separate Maintenance Plan for LPOS. The following sections summarize terrain management in the context of the LPOS Management Plan. The proposed terrain management activities also reference specific Best Management Practices (BMPs), which are described in the Planners' Guide.

Maintenance and Restoration Plan Summary

Terrain management includes land restoration, maintenance, and community stewardship. Terrain management activities are specific for each Terrain Management Unit (TMU).

Each TMU requires a discrete set of management activities to maintain their ecological functions in support of the central management goal for the LPOS. An overview of terrain management activities is included in Table 3. A comprehensive Maintenance Plan for LPOS is included in APPENDIX D. Detailed lists of terrain management activities in Year-1 are included in APPENDIX E

The County will face challenges to achieve all the maintenance needs at LPOS that will arise in the future. Strategies that can be useful to optimize maintenance efforts, include:

- Collaboration with adjacent properties, agencies and community stewards to leverage working together to address maintenance needs,
- Invest smaller consistent amounts of time and labor on a well-planned maintenance activities,
- Conduct maintenance activities at the optimum time based on monitoring information or a regular schedule.



TERRAIN MANAGEMENT UNITS

LEGEND

	LP-RIP RIPARIAN UNIT stream channels, banks, riparian vegetation buffer strips
	LP-ACE ACEQUIA UNIT ditches, banks, maintenance paths
	LP-WET WETLAND UNIT permanently water saturated / valley bottomlands
	LP-GRA-D GRASSLAND-DRY UNIT dry grass, forb, and shrub / valley bottomlands
	LP-GRA-W GRASSLAND-WET UNIT low, seasonally wet / valley bottomlands
	LP-GRA-P GRASSLAND-PASTURE UNIT relatively dry, high-quality pasture / valley bottomlands
	LP-TOE TOE OF SLOPE UNIT ecological transition zone on lower slopes (below Santa Cruz ditch)
	LP-WOO WOODLAND UNIT higher, rugged uplands with piñon-juniper vegetation
	PROPERTY BOUNDARY
	PUBLIC GATE
	PARKING
	FLOWLINES
	TRAIL

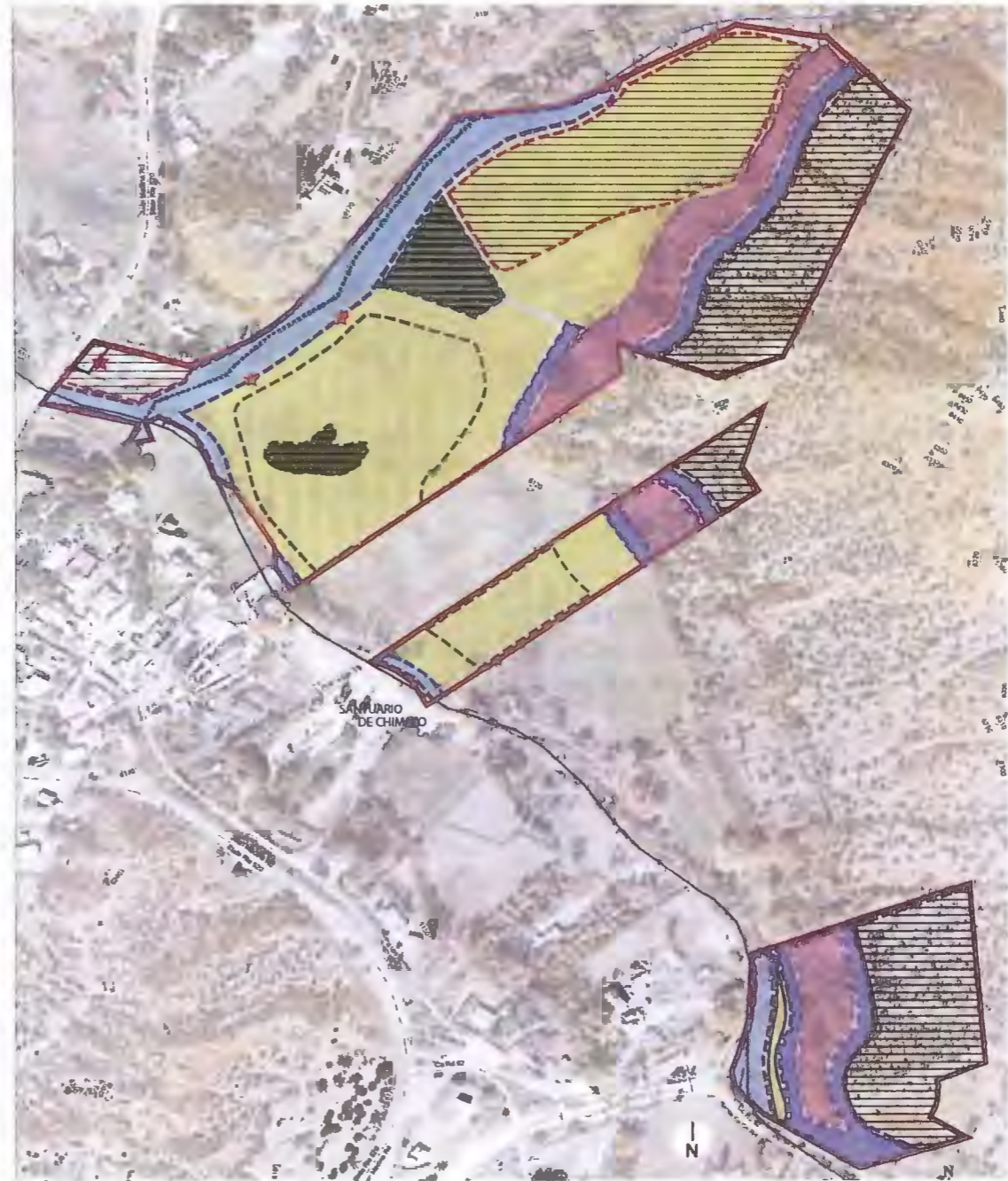


Figure 6. Los Potreros Open Space - Terrain Management Units Map

Where	What	Why	When
TMUs	Anticipated Regular Maintenance Activities	Objective	Maintenance Frequency*
All TMUs	Dialogue about maintenance with neighbors and stakeholders and integrate feedback in planning	Holistic & Neighborly	Annually
All TMUs	Inspect and expand property boundary markers, especially at corner points, with labeled Carsonite fiberglass posts, if necessary reinforced with T-posts	Access	One time (year-1) and when needed
All TMUs	Inspect and repair:	Access / Scenic & Interpretive / Ecological Health	a. Annually
	a. Fences, gates and stiles		b. Annually
	b. Stream crossings		c. Annually
	c. Roads and trails (esp. drainage fixes along CR 92)		d. Annually
	d. Signage		
LP-RIP	a. Remove fallen trees, dead wood, woody debris	Ecological Health	a. Annually
	b. Remove vegetation encroaching on the stream channel in specific locations		b. Once in 2-3 years
LP-ACE	a. Acequia cleaning, tree thinning, bank repair (la limpia y la jara)	Ecological Health	a. Annually (spring)
	b. Infrastructure repairs		b. Annually (spring)
	c. Gopher and mole control		c. Annually
LP-WET	a. Remove periodically of dead wood and invasive plants	Ecological Health	a. Every 2-3 years
	b. Clean drainage structures		b. Annually
LP-GRA-D	a. Inspect irrigation system	Ecological Health / Agriculture	a. Annually once water rights are secured
	b. Cover crop and weed management		b. Annually
LP-GRA-W	a. Irrigation and drainage management	Ecological Health / Grazing	a. Monthly
	b. Grazing management		b. Monthly-Quarterly
LP-GRA-P	a. Irrigation and drainage management	Ecological Health / Agriculture / Grazing	a. Monthly
	b. Grazing management		b. Monthly-Quarterly
LP-TOE	a. Remove dead wood	Ecological Health	a. Annually
	b. Remove invasive plant species		b. Annually
	c. Soil conservation		c. Annually

* Note: The table indicates the minimum suggested frequency. In some circumstances frequencies may need to be increased if/when staff time and funds allow, or if maintenance activities can be conducted by community volunteers.

Table 3. Terrain Management Units - Maintenance Activities



2.6. Plan Implementation and Financing Mechanisms

Plan implementation will start by identifying priorities and timelines among staff for activities regarding maintenance, planning and project preparation, community outreach, and community stewardship involvement. Prioritization will be based on balancing the tasks at hand, and the staff and funds available to accomplish the tasks.

First Year Implementation

Implementation of this plan will start upon approval of the plan by the County .

Recommended Year-1 implementation activities include:

1. Periodic community meetings to explain the planned implementation activities with an emphasis on:
 - a. Terrain inspections, baseline data collection, priority maintenance activities, and planning activities for key projects for repairs and improvements,
 - b. Identifying community interest and capacity to assist with the planned activities,
 - c. Developing outlines for collaborative projects between Santa Fe County and neighbors and other local stakeholders,
 - d. Coordinating specific community involvement for the selected projects,
 - e. Annual review of prior year activities and next year implementation planning.
2. Implementation of selected terrain inspection, base-line data collection (for future monitoring), and maintenance activities by County maintenance staff, assisted by neighbors and local volunteers; inspections, data gathering and priority maintenance will include:
 - a. Delineation and marking of boundaries,
 - b. Inspecting and repairing all interior and exterior fence conditions,
 - c. Weed removal, especially invasive tree species,
 - d. Removal of dead wood, fallen trees, and debris in the streams,
 - e. Removal of dead wood, fallen trees, and dead brush on stream banks and on the LP-TOE TMU, including wood or wood chip distribution in the community or wood disposal elsewhere,
 - f. Acequia cleanout and small repairs.

3. Planning, collaboration, and community organizing to implement priority projects; possible projects may include:
 - a. Development and placement of signs and a bulletin board,
 - b. Drainage improvements at the wetland drainage point of the West Potrero pasture,
 - c. Fence repair work that would require consideration of the historical and cultural visual quality of the area and/or the improvement of gates, and/or fence improvements along the streams,
 - d. Drainage improvements at the intersection of CR92, an arroyo, a driveway and Rio Santa Cruz, at a river bend on parcel 1,
 - e. Structural improvements to the channel of Rio Santa Cruz, especially in the river bend on parcel 1,
 - f. Haying and baling of grass and forbs.
4. Research and planning for the preparation of larger initiatives to be implemented at a later date, including:
 - a. Development of protocols for communication, staff development, and coordination,
 - b. Development of a signage plan that includes site specific signs, public outreach and communication strategies,
 - c. Grassland management planning and the updating of a grazing lease,
 - d. Completion of water rights ownership change and reconciliation of irrigation planning (19.18 acres of irrigation rights and potentially irrigable acres of land) with grassland management and grazing management planning (11.6 leased acres and 8.61 grazed acres),
 - e. Development of a drainage plan and design,
 - f. Development of a plan and design for streambank improvements on the Rio Santa Cruz,
 - g. Development of a plan and design for expanded riparian vegetation buffer strips,
 - h. Evaluation of the Year-1 and adapt planning for subsequent years.





Financing Mechanisms, Funding Sources, and Partners

Santa Fe County owns and manages more than 6,600 acres of open space properties and parks, but it has insufficient funding and staff resources to meet the acquisition and management goals for the properties. Santa Fe County will be able to implement this plan if it successfully continues to develop new funding mechanisms, identify new funding sources, and cultivate collaborative relationships with neighbors, local stakeholders, and other interest groups.

To implement this plan, Santa Fe County will include neighbors, stakeholders and other partners to help with planning, maintaining, and data collecting for the purposes of monitoring, planning, and developing projects. This collaborative approach will help build neighborly relationships and increase buy-in from and stewardship by the people with the greatest interest in the property and it will reduce the need for outside funding for property management.

Santa Fe County will pursue funding sources and explore creative funding mechanisms to ensure the financial viability of managing the LPOS according to the recommendations of this management plan (*Table 4*).

POTENTIAL FUNDING SOURCES	PURPOSE	ACQUISITION TIME FRAME
General Fund (Santa Fe County)	Staff costs	Annual budgeting process
Grants	Staff and consultants for various tasks, such as:	Dependent on funding source timelines
	Fencing	
	Signs, bulletin board	
	Grazing plan update	
	Monitoring program	
	River bank stabilization	
	Riparian buffer planting	
	Acequia association and water rights use and management	
	Ag program development	
	Interpretive education research and implementation	
	Wildfire prevention; riparian area thinning	Ongoing (Short-Long term)
CIP funds	For the same as above	Annual budgeting process
FFS (Fee for Service)	Grazing contract	On a contract basis
POTENTIAL FUNDING MECHANISMS & COLLABORATIONS	PURPOSE	DEVELOPMENT TIME FRAME
Hiring a grant writer for OS funding	Pursue more grant funding	Short-term
Cultivating community stewards	Delegating work to local community stakeholders	Short-mid term
Organizing social/cultural (fund raising) events with non-profit partners	Generating discretionary income and public outreach	Mid-long term
Establishing a "Friends of LPOS" group	Generating discretionary income and public outreach	Mid-long term
Collaboration with non-profit entities for co-management activities	Sharing the burden with organized stakeholders	Mid-long term
Voter-approved Revenue Initiatives	Providing a dedicated annual revenue stream for OS, Parks and Trails	Long-term
Establishing an NGO for overarching support to OS property management	Sharing the burden with organized stakeholders	Long-term

Table 4. Potential Funding Sources and Mechanisms



LOS POTREROS OPEN SPACE APPENDICES (separate document)

APPENDIX A: Overview of Management Activities Table for Los Potreros Open Space

APPENDIX B: A Field Characterization for the Los Potreros Open Space Property Santa Fe County, New Mexico - An Existing Conditions and Inventory Report

APPENDIX C: Assessment of Grazing Management Conditions and Alternative Grazing

APPENDIX D: Maintenance Plan for Los Potreros Open Space

APPENDIX E: Maintenance, Stewardship, and Restoration Projects for Year-1





SANTA FE COUNTY OPEN SPACE AND TRAILS PROGRAM
LOS POTREROS OPEN SPACE MANAGEMENT PLAN

APPENDICIES
FINAL DRAFT
SEPTEMBER 13, 2016



Ecotone



LOS POTREROS OPEN SPACE APPENDICES

APPENDIX A: Overview of Management Activities Table for Los Potreros Open Space

APPENDIX B: A Field Characterization for the Los Potreros Open Space Property Santa Fe County, New Mexico
- An Existing Conditions and Inventory Report

APPENDIX C: Assessment of Grazing Management Conditions and Alternative Grazing

APPENDIX D: Maintenance Plan for Los Potreros Open Space

APPENDIX E: Maintenance, Stewardship, and Restoration Projects for Year-1



APPENDIX A: OVERVIEW OF
MANAGEMENT ACTIVITIES

SFC CLERK RECORDED 10/12/2016

LPOS	# (Term and Priority)	Project or Management Activity	Objective or Purpose	Location Code	Actor	Timeline	Recurring (R) or Not Recurring (NR)	Labor and Cost Estimates	Funding Source
Maintenance	1.1	Communication & outreach with neighbors and stakeholders; integrate feedback in planning	Holistic & Neighborly Management	Entire property	SFC-M (Crew) and Planning staff	ST-MT-LT	R	Annually (or more often)	GF
	1.2	Fence inspection and repair (all interior and exterior fences), also gates and stiles	Access Management / Grazing	Entire property: approx 5,780 lf	SFC-M (Crew)	ST-MT-LT	R	Annually: up to 2 days for 2-person crew (16 h/y)	GF
	1.3	Inspect and expand property boundary markers, especially at corner points, with labeled Carsonite fiberglass posts, if necessary reinforced with T-posts	Access Management	Entire property	SFC-M (Crew)	ST-MT-LT	R	Annually: 1 days for 1-person crew (8 h/y)	GF
	1.4	Fence repair of in-effective boundary fences on SE and E sides of pastures	Public Safety / Access Management	LP-GRA-P, LP-GRA-W: SE and E side of parcel #6: 1,350 lf	Contractor or SFC-M (Crew)	ST	NR	TBD: Based on proposal (one-time investment); possibly around \$1,500-\$2,500 depending on material and labor costs and special features	GF
	1.5	Drainage improvement: sediment pond, drainage pipe, fence	Ecological Health	LP-WET, LP-GRA-W: Drainage channel of wetland in parcel #6: 500 sq ft	Contractor or SFC-M (Crew)	ST	NR	5 days for 2-person crew (80 h); Cost based on proposal (one-time investment); possibly around \$5,000 depending on material and labor costs and special features	GF
	1.6	Weed control: removal of elm, Allanthus, knapweed, Kochia, etc.	Ecological Health	LP-GRA-D, LP-TOE: (and entrance area): 6.75 ac	Contractor or SFC-M (Crew)	ST-MT-LT	R	up to 3 days/year for 2-person crew (48 h/y)	GF or CIP
	1.7	Fence inspection and small repairs - Rio Santa Cruz and Rio Quemado	Ecological Health	LP-RIP: 1,900 lf + 1,500 lf = 3,400 lf	SFC-M (Crew)	ST-MT-LT	R	2 days/year for 1 crew member (16 h/y)	GF
	1.8	Removal of trees fallen into river and woody debris that obstructs flow	Public Safety / Ecological Health	LP-RIP: Stream channels, incl. along southern parcel (#1): 500 lf + 1,500 lf = 2,000 lf	Contractor or volunteers or SFC-M (crew)	ST-MT-LT	R	up to 4 days/year for one sawyer and one swamper (64 h/y) or for a group of volunteers	GF, VOL
	1.9	Removal of invasive species, Juniper or willow encroaching on channel, and woody debris on banks	Public Safety / Ecological Health	LP-RIP: 1,900 lf + 1,500 lf = 3,400 lf	Contractor or volunteers or SFC-M (crew)	ST-MT-LT	R	Every 3 years, 5-6 days (96 h/every 3 y; possibly less over time) for one sawyer and one swamper or for a group of volunteers	GF, VOL

LPOS	# (Term and Priority)	Project or Management Activity	Objective or Purpose	Location Code	Actor	Timeline	Recurring (R) or Not Recurring (NR)	Labor and Cost Estimates	Funding Source
Maintenance	1.10	Removing dead wood and leaning trees from river banks and terraces	Public Safety / Ecological Health	LP-RIP: 3 acres	SFC-M (crew) or contractor	ST	NR	Annually and in case of emergencies: about 5 days for one sawyer and one swamper (80 h/y) or for a group of volunteers	GF, CIP
	1.11	Drainage improvement on driveway off of CR92	Access Management / Ecological Health	LP-RIP: 500 sq ft	Contractor or experienced SFC-M operator	ST-MT-LT	R	once in 3-5 years: 1 day for experienced operator: \$1,000-\$1,500, including base coarse	CIP or GF
	1.12	Acequia cleanout, channel leveling, irrigation gates, desagues; gopher and mole control	Holistic & Neighborly / Scenic & Intepretive / Grazing / Agriculture	LP-ACE: Approx. 2.630 lf (incl. neighbor properties)	SFC-M (Crew) or contractor	ST-MT-LT	R	Annually: 2-3 days for 2-person crew (48 h/y)	GF, CIP
	1.13	Removal of dead wood, leaning and fallen trees, and invasive plants	Public Safety / Ecological Health	LP-ACE, LP-TOE: Approx. 1.5 acres	SFC-M (Crew) or contractor or volunteers	ST-MT-LT	R	Every 3 years, 2-3 days (48 h/every 3 y; possibly less over time) for one sawyer and one swamper or for a group of volunteers	GF, CIP, VOL
	1.14	Inspect and repair stream crossings, roads, trails, and signs	Access Management / Scenic & Interpretive	Entire property	SFC-M (Crew)	ST-MT-LT	R	Annually: 1 days for 1-person crew (8 h/y)	GF
	2.1	Pile burning	Ecological Health	TBD	Contractor; with SFC Fire Dep	ST or MT-LT	R	TBD: when need arises	CIP or GF
	2.2	Structural bank protection	Ecological Health	LP-RIP: next to southern parcel: 50 lf of stream	Contractor	ST or MT	NR	TBD: Based on proposal (one time investment); possibly around \$50,000	CIP
Improvements	1.1	Drainage improvements	Ecological Health / Grazing (Increase land productivity and grazing potential)	LP-GRA-P, LP-GRA-W: West Potrero pasture (parcel 6)	SFC-M (Crew) or contractor	ST	NR	TBD, based on plan and bid	CIP, grant
	1.2	Acequia irrigation system upgrades and rehabilitation	Scenic & Interpretive / Grazing / Agriculture (Increase land productivity, scenic quality, and grazing potential)	LP-ACE: Las Cuevas Ditch and Manuel Vigil Ditch	SFC-M (Crew) or contractor	ST	NR	TBD, based on plan and bid	CIP, grant
	1.3	Riparian vegetation buffer fencing and planting	Scenic & Interpretive / Ecological Health (Filter drainage water and increase water quality in stream; improve habitat)	LP-GRA-P, LP-RIP: West Potrero pasture (parcel 6), along the streams	SFC-M (Crew) or contractor	ST	NR	TBD, based on plan and bid	CIP, grant

LPOS	# (Term and Priority)	Project or Management Activity	Objective or Purpose	Location Code	Actor	Timeline	Recurring (R) or Not Recurring (NR)	Labor and Cost Estimates	Funding Source
Improvements	1.4	Fence upgrades and fence relocation (incl. stiles, gates)	Scenic & Interpretive / Access Management / Grazing (Improve managed grazing practices, wildlife use, and scenic quality)	Entire property	SFC-M (Crew) or contractor	ST	NR	TBD, based on plan and bid	CIP, grant
	1.5	Bank stabilization and flood control	Public Safety / Ecological Health (Control flooding and bank erosion and reduce maintenance)	LP-RIP: Southern parcel (1) in Rio Santa Cruz	Contractor	ST	NR	TBD, based on plan and bid	CIP, grant
	1.6	Install of signs and bulletin board	Scenic & Interpretive / Education	Juan Medina Rd gate	SFC-M (Crew) or contractor	ST	NR	TBD, based on plan and bid	GF, CIP, grant
	2.1	Piped irrigation system upgrades: removal and replacement	Agriculture (Test and improve system functionality to support future agricultural activity)	LP-ACE, LP-GRA-D: Northeastern pasture (parcel 7)	SFC-M (Crew) or contractor	MT	NR	TBD, based on plan and bid	GF, CIP, grant
	2.2	Cover crop planting	Ecological Health / Agriculture (Manage vegetation cover, and improve soil structure, water holding capacity, and productivity)	LP-GRA-D: Northeastern pasture (parcel 7)	Contractor + community group	MT	NR	TBD, based on plan and bid	CIP, grant, VOL
	2.2	Observation area(s)	Scenic & Interpretive	LP-RIP, LP-GRA-P: West Potrero pasture (parcel 6)	Contractor	MT	NR	TBD, based on plan and bid	CIP, grant
	2.4	Periodic upgrades of fences, stiles, gates, signs	Scenic & Interpretive / Access Management / Grazing (Improve managed grazing practices, wildlife use, and scenic quality appreciation)	Entire property	Contractor	MT-LT	NR (or phased)	TBD, based on plan and bid	CIP, grant
	3.1	Agricultural improvements (river crossings, trails, irrigation systems)	Access Management / Scenic & Interpretive / Agriculture (Improve managed grazing practices, wildlife use, and scenic quality appreciation)	Entire property	Contractor (+ community group?)	LT	R	TBD, based on plan and bid	CIP, grant, VOL

LPOS	# (Term and Priority)	Project or Management Activity	Objective or Purpose	Location Code	Actor	Timeline	Recurring (R) or Not Recurring (NR)	Labor and Cost Estimates	Funding Source
Improvements	3.2	Installation of interpretive education signs	Scenic & Interpretive / Education (Improve public, awareness, understanding, appreciation, and care)	LP-RIP: Selected locations along periphery of property	Contractor	LT	NR	TBD, based on plan and bid	CIP, grant
	3.3	Tree planting for replacement of old and dead trees	Scenic & Interpretive / Ecological Health (Improve wildlife habitat and scenic quality)	Selected locations on property	SFC-M (Crew) or Contractor	LT	R	TBD, based on plan and bid	GF, CIP, grant
Planning	1.1	Develop and implement protocols for maintenance work, team coordination, and ongoing fund identification and acquisition	All management goals (effective management)	Entire property	Planning staff	ST-MT-LT	R	TBD (20 h/y)	GF
	1.2	Develop a monitoring plan and gathering base-line data	All management goals (effective management)	Entire property	Planning staff	ST	NR	TBD (60 h/y)	GF
	1.3	Develop a basic signage plan	Education	Entire property	Planning & Projects staff	ST	NR	TBD (25 h/y-1 only)	GF
	1.4	Develop signs and bulletin board for LPOS entrance (at Juan Medina Rd) and establish a fund for signs and bulletin board maintenance and replacements	Holistic & Neighborly Management / Education	Entrance area	Planning & Projects staff	ST	NR	TBD (25 h/y)	GF
	1.5	Develop a grazing management plan (including a pasture management and irrigation plan)	Scenic & Interpretive / Grazing	LP-GRA-P, LP-GRA-W	Planning & Projects staff	ST	NR	TBD (60 h/y)	GF
	1.6	Plan and implement community stewardship structure and events	Holistic & Neighborly Management	Entire property	Planning & Community Services staff	ST-MT-LT	R	TBD (125 h/y)	GF
	1.7	Plan haying and baling in 2016 or 2017 (when conditions allow)	Ecological Health / Agriculture	LP-GRA-P, LP-GRA-W	Planning & Projects staff	ST-MT-LT	R	TBD (20 h/y)	GF
	1.8	Plan for improvements to drainage of pastures	Ecological Health / Grazing	LP-WET, LP-GRA-W	Planning & Projects staff	ST	NR	TBD (20 h/y)	GF
	1.9	Update Grazing lease	Grazing	LP-GRA-P, LP-GRA-W	Planning & Projects staff	ST	NR	TBD (20 h/y)	GF
	1.10	Plan for bank stabilization along Rio Santa Cruz	Public Safety / Ecological Health	LP-RIP	Planning & Projects staff	ST	NR	TBD (20 h/y)	GF
	1.11	Launch and manage grazing pilot program	Scenic & Interpretive / Grazing	LP-GRA-P, LP-GRA-W	Planning & Projects staff	ST	NR	TBD (40 h/y)	GF
	1.12	Design of riparian buffers	Scenic & Interpretive / Ecological Health	LP-RIP, LP-GRA-P	Planning & Projects staff	ST	NR	TBD (40 h/y)	GF

LPOS	# (Term and Priority)	Project or Management Activity	Objective or Purpose	Location Code	Actor	Timeline	Recurring (R) or Not Recurring (NR)	Labor and Cost Estimates	Funding Source
Planning	1.13	Design a simple trail and observation area	Access Management / Scenic & Interpretive	LP-RIP, LP-GRA-P	Planning & Projects staff	ST	NR	TBD (20 h/y)	GF
	1.14	Develop community-driven rehabilitation program for the dry pastures	Scenic & Interpretive / Agriculture	LP-GRA-D	Planning & Projects staff + Community	ST-MT	R	TBD (20 h/y)	GF
	1.15	Evaluate and manage new grazing program	Scenic & Interpretive / Grazing	LP-GRA-P, LP-GRA-W	Planning & Projects staff	ST-MT-LT	R	TBD (40 h/y)	GF
	1.16	Initiate cultural/archaeological survey of property	Scenic & Interpretive	Entire property	Planning & Projects staff	ST-MT	NR	TBD (20 h/y)	GF
	2.1	Develop an interpretive education program along with educational and research opportunities	Scenic & Interpretive / Education	Entire property	Planning staff	MT	NR	TBD (20 h/y)	GF
	2.2	Update and manage the grazing program	Scenic & Interpretive / Grazing	LP-GRA-P, LP-GRA-W	Planning & Projects staff	ST-MT-LT	R	TBD (20 h/y)	GF
	2.3	Manage restoration program for the dry pastures and check water rights for parcel 7 (associated with local ag program development)	Scenic & Interpretive / Agriculture	LP-GRA-D	Planning & Projects staff + Community	MT-LT	R	TBD (20 h/y)	GF
	2.4	Develop and participate in an acequia association and protect water rights	Holistic & Neighborly Management / Grazing / Agriculture	Entire property	Planning & Projects staff	MT-LT	R	TBD (40 h/y)	GF
	3.1	Update and adaptive management of the dry pastures/ag development program	Scenic & Interpretive / Agriculture	LP-GRA-D	Planning & Projects staff + Community	LT	R	TBD (40 h/y)	GF
	3.2	Coordinate the implementation of a pilot project of simple trails	Scenic & Interpretive	LP-RIP, LP-GRA-P	Projects staff	LT	NR	TBD (40 h/y)	GF
	3.3	Guide the implementation of phase-1 of an interpretive education program	Scenic & Interpretive / Education	Entire property	Planning & Projects staff	LT	NR	TBD (40 h/y)	GF

**APPENDIX B: EXISTING CONDITIONS
AND INVENTORY REPORT**

SFC CLERK RECORDED 10/12/2016

Santa Fe County Open Space Management Planning Initiative

A Field Characterization for the Los Potreros Open Space Property Santa Fe County, New Mexico An Existing Conditions and Inventory Report

February 19, 2016



Los Potreros Open Space behind the Santuario de Chimayo.

Ecotone

Conservation Planning for Landscapes in Transition

1413 Second Street, Suite 5
Santa Fe, New Mexico 87505
505-470-2531
jwjansens@gmail.com

Table of Contents

INTRODUCTION	3
Research Topics and Methods	3
Scope of Research	4
Summary of Findings	4
Land Suitability, Water, and Improvements.....	4
Boundaries, Riparian Areas, Stream and Floodplain Management Needs	9
Slope Management	11
Trails, Access, and Views	14
KEY ASSESSMENT PROJECTS	19
APPENDIX A – GRAZING ASSESSMENT	20
APPENDIX B – ADDITIONAL LAND SUITABILITY OBSERVATIONS	25
APPENDIX C – RIPARIAN AND WOODLAND AREA CONDITIONS.....	27
APPENDIX D – ALL OPEN SPACE PROPERTIES: LAND SUITABILITY GOALS	31

INTRODUCTION

This report provides an overview of field characterizations, including existing conditions, and a list of key assessment (research) projects to be addressed at a later date for the Los Potros Open Space (LPOS) property in Chimayo, in Santa Fe County, NM. The report describes the findings of the second phase – Inventory and Assessment – of the 2015 Santa Fe County Open Space Management Planning Initiative.

The purpose of the (Phase-2) Inventory and Assessment research is to collect more in-depth data on selected issues to have the minimally needed information to proceed with Master Planning, to develop Maintenance Plans and to complete Management Plans for the LPOS property. Findings of the Inventory and Assessment phase will also play a directing role in structuring community input for Master Planning for the community of LPOS stakeholders.

Research Topics and Methods

The Ecotone project team conducted the research for this project phase from October through December 2015. The research scope focused on selected issues identified in phase-1. A summary of the selected research issues during the Inventory and Assessment phase is listed at the top of the Findings section.

Research activities included two terrain visits, supported by web- and literature research, and fact-checking and interviews with experts. The project team collected detailed terrain data along a series of grassland and wetland vegetation transects and documented specific observations through photography and GPS documentation of the locations of the issues observed. Vegetation assessments at LPOS also included sampling of grassland/wetland plants for the purpose of weighing the dry matter and calculating forage production. Additionally, the project team conducted an in-depth study of managed grazing options for the LPOS and other open space properties, including an evaluation of the current LPOS grazing lease and studies of alternative lease options and contract templates.

The project team also developed a set of goals and guidelines for land suitability planning which was used in the assessment of the suitability of various forms of land use for each property.

While this report focuses on findings, it also includes some conceptual conclusions and recommendations. Detailed maintenance and ecological restoration recommendations will be formulated in Phase 3 of the Open Space Management Planning initiative and included in the final Management Plan.

FINDINGS OF EXISTING CONDITIONS: LOS POTREROS OPEN SPACE - CHIMAYO

Scope of Research

Table 1: Listing of Phase-2 Research Topics

#	Research Topics
1a	Land suitability study (esp. land health assessment of meadows)
1b	Id water rights information (for irrigation LPOS)
1c	Id Improvements: current conditions, needs & opportunities
2a	Id additional boundary survey needs
2b	Id riparian vegetation management needs
2c	Id stream and floodplain conditions and restoration needs
3	Id needs and costs for slope stabilization and vegetation mgmt.
4a	Id trails plans and access conditions and needs
4b	Id viewshed enhancement opportunities

Summary of Findings

Land Suitability, Water, and Improvements

1a: Land Suitability (land health assessment of meadows)

The suitability of various forms of land use (grazing, agriculture, wildlife habitat, and recreational uses) are determined by suitability goals and criteria described in Appendix E.

Grazing

Soil and drainage conditions across the 18.64 acres of valley bottom limit the terrain suitable for grazing to about 13 acres. Table 2 describes the pasture size and forage productivity based on cut and dry-weighted grass in the most productive pasture units. Figure 1 shows different pasture units based on grassland and hydrologic characteristics. The main areas that are suitable for grazing are units West Potrero-1, East Potrero-3, Conservation-1, and South Potrero. Other terrain units could be used for grazing only seasonally and subject to the year-to-year variability of soil moisture conditions and forage quality and availability.

Pasture units	Acres	Lbs/Acre
East Potrero 1	1.75	n/a
East Potrero 2	2.40	n/a
East Potrero 3	1.60	2807.52
Enclosed Wetland	1.23	n/a
West Potrero 1	2.75	3427.20
West Potrero 2	5.86	3009.86
West Potrero Wetland	0.26	n/a
Conservation 1	1.60	3427.20
Conservation 2	0.88	3009.86
South Potrero	0.31	3427.20

Table 2. Overview of pastures with sizes in acres and dry matter production in lbs/acre for LPOS grassland and wetland units in 2015.

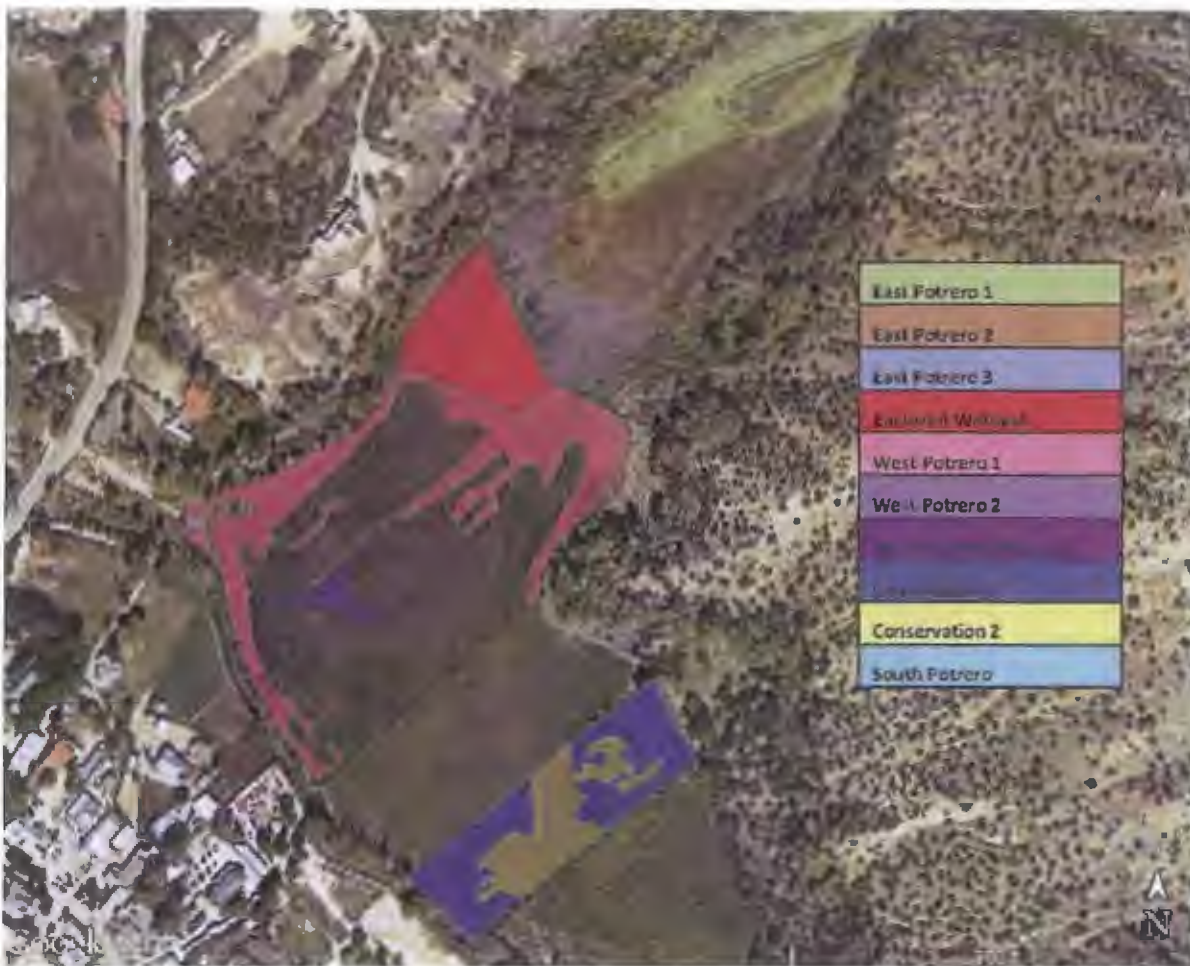


Figure 1. Map of pasture units.

The 18.64 acres of grasslands and wetlands of LPOS are all fenced with 3- or 4-strand barb-wire fencing on the boundaries of the property and with some cross-fencing to delineate parcels with different terrain conditions. Fencing conditions vary, and at several locations neighboring livestock is able to enter into County parcels. The fence between West Potrero 2 and the adjoining landowner to the south allows cows owned by neighbors to easily cross onto County land.



Access across fences includes stiles, narrow fence openings (V-shaped passages), traditional roll-away fencing, and steel gates. A steel gate system on the Conservation Easement unit along Rio Santa Cruz offers cattle access to water in the river, while a separate steel gate system at that location is set up as a holding pen for cattle.



Figure 2. View east across the Conservation Easement unit which is fenced with steel gates along Rio Santa Cruz to allow cattle access to water, July 2015. (Photo by Jan-Willem Jansens)

It appeared to the project team that roll-away gates are often left open. This allows cattle to roam between pastures, including from neighboring pastures onto County Open Space, and also into the riparian areas and onto the eastern slopes outside the valley bottom pastures. It is not clear whether a deliberate grazing system or arrangements with Santa Fe County direct this open-gate practice. However, there are indications that the open-gate practice leads to degradation of forage conditions on the wetlands and grasslands (i.e., overgrazing).

The infrastructure for grazing is limited and in need of improvement. Fences and gates need repair, irrigation systems need to be repaired to maintain wetland and pasture conditions during periods of drought, livestock watering systems need improvement to reduce the impact of cattle on the wetland ecosystem where the animals currently go to drink, and access points into the pastures need improvement to limit tread impacts on saturated soil conditions. The lease will need to be updated and improved to require managed grazing and improve arrangements for infrastructure maintenance, repairs, and resource stewardship.



Figure 3. Entry gate on northwest corner of Los Potreros meadow looking east, June 2015. (Photo by Rich Schrader)

It would be beneficial to formulate land health goals and criteria that need to be achieved as a result of the grazing practice. Annual monitoring would allow for adaptive management. A detailed assessment of pasture conditions is included in Appendix A. A detailed assessment of the grazing lease and grazing management options for LPOS is described in a separate report, entitled "Assessment of Grazing Management Conditions and Alternative Grazing Management Options for Los Potreros Open Space" (February 20, 2016).

Cropland/Orchard

The terrain suitability for cropland and orchard development is limited to about 4 acres in the northern part of the Potrero and 1 acre at the entrance of the West Potrero pasture. Access to the northern area is highly limited and access development will likely be costly and require sacrifices to the wetland area and the riparian ecosystem of the Rio Quemado. Periodic maintenance and repairs to infrastructure would be considerable. The productivity of agricultural development in this area may be disappointing due to the cold micro-climate on this site, the wildlife impacts, and the vagaries of natural water supplies, including flood damage. Fencing and several other, relatively costly, protective measures may be necessary to

prevent impacts from wildlife, flooding, drought, and frost damage on crops. It will be necessary also to put simple, clear, and effective community-based stewardship agreements in place to ensure the ongoing care of investments in agricultural use. Agricultural use would open various opportunities for education, community capacity building, and small scale support of local livelihoods and economic development.

Wildlife

LPOS is already an important wildlife foraging area. Improving the plant diversity through managed grazing (including rest periods for natural plant recovery) to achieve natural reference conditions as formulated by the NRCS (Ecological Site Description) across the grassland and wetland would benefit wildlife forage supplies and general biodiversity and resilience. Additionally, maintaining saturated soils and high water levels to protect the natural wetland conditions in LPOS is essential for wildlife and water fowl. Furthermore, the continuation of the present conditions of very limited human and dog access and the absence of trash are of great importance to maintain wildlife habitat qualities.

Recreation

Any development of recreational use of LPOS needs to be balanced with the current pristine qualities of this landscape and the many ecological and scenic benefits the current conditions offer. Further scenario development and evaluation during a Master Planning process would need to reveal in what ways restricted, small-scale improvements could be made for access, scenic view points, and interpretive facilities to enhance the experience of local residents and visitors without compromising the present qualities of LPOS. Additional findings and observations regarding land suitability are included in Appendix B.

1b: Water Rights

Santa Fe County has acquired determinations for surface water diversion rights for irrigation relevant to the LPOS. The diversion rights comprise a total of 27.02 acre feet/year from three different adjudications:

- 19.88 acre feet/year from the Las Cuevas Ditch
- 6.888 acre feet/year from the Las Cuevas Ditch
- 0.252 acre feet/year from the Manuel Vigil Ditch

Both ditches that provide the wet water for these water rights lease the water from the Santa Cruz Diversion District (via the Martinez Arriba Ditch, a.k.a. the Santa Cruz Ditch). However, neither of the two local ditches is a member of the Santa Cruz District. The water rights transfer documentation shows that the irrigation rights pertain to 19.18 acres of land. This acreage corresponds within an acceptable margin of error with the 18.64 acres of wetland and grassland identified during the field survey.

1c: Improvements: Current Condition, Needs & Opportunities

Throughout 2015 the Las Cuevas Ditch and Manuel Vigil Ditch seemed to have been left unused. The diversion dam and channel were in disrepair and internal ditch gates were removed or silted. The acequias' channels were also in need of maintenance. Due to favorable rainfall and ground water conditions, however, it seemed that no surface irrigation was needed in 2015. The project team observed that after closure of the Santa Cruz Ditch and retention of river water at the Santa Cruz Dam for construction work in the river still a considerable amount of water continued seeping into the LPOS wetlands and grasslands, suggesting that much of the wetland conditions are caused by groundwater flows and natural seepage from the hill sides.

Drainage of the LPOS wetlands and grasslands is largely controlled by a single dam at the lower end of the "West Potrero" wetland unit. A single, approx. 10-inch diameter pipe set in the dam forms a spillway that controls the water level in the wetlands and grasslands upstream and drains excess water to a lower channel that drains into the Rio Santa Cruz just to the east of the Santuario. Upstream from the dam and drainage pipe, a wetland pond collects water from two small drainage ditches that dissect the wetland from the northeast to the southwest and from the east to the west. However, major saturated areas with standing water exist across the West Potrero pasture out of reach of these drainage ditches.

Around 2010, Santa Fe County installed an irrigation system at the northern end of the East Potrero pasture unit that consists of a diversion structure on the Santa Cruz Ditch, a gravity-fed pipe to a distribution box in the pasture, and approximately 8 distribution outlets for water that have valves to open and release water. To date this system appears to never have been used.

Boundaries, Riparian Areas, Stream and Floodplain Management Needs

2a: Additional Boundary Survey Needs

Property boundaries have recently been flagged and staked in relation to stream restoration work. With an accurate map in hand and some additional flagging maintenance should be possible without confusion about boundary lines. As a result, our field assessments revealed that no additional boundary survey work appeared necessary for the land health assessment.

2b & 2c: Riparian Vegetation Management Needs and Stream and Floodplain Conditions and Restoration Needs

Riparian vegetation conditions along both the Rio Santa Cruz and Rio Quemado (sub-task 2b) are directly related to stream and floodplain conditions (sub-task 2c). As a result, this report addresses vegetation management and any needed stream and floodplain restoration together. A full, detailed description of riparian conditions is included in Appendix C.

At several locations along both the Rio Santa Cruz and Rio Quemado there are piles of fallen trees, densely overgrown vegetation of willow and cottonwoods, and log and debris jams.

These conditions can slow stream flow and increase the risks of bank erosion, scour of the channel bottom (deepening of the channel), and flooding. Additionally, the dead plant material and logs constitute a fuel load and increase the risk of wildfire.



Figure 4. Debris jams and overgrown willow vegetation are causes of streambank erosion and flooding along Rio Santa Cruz, July 2015. (Photo by Jan-Willem Jansens)

Important maintenance interventions would include woody vegetation removal in the channel, on the banks, and in the meadow, some fencing improvements, improvements for foot traffic access, and periodic maintenance follow-up. Urgent maintenance should focus on the removal of trees that have fallen in the stream and that may cause bank erosion and flooding during any next bankfull or larger flow event. Removal of dead wood, log jams, and thickets of willow and other vegetation will be important to reduce the chance of catastrophic wildfire, reduce flood risks, and reduce bank and channel erosion. In the mid-long term, some bank protection and stabilization in the stream may be of importance to prevent undercutting of banks and to move sediment through the stream system. The multiple ownerships along the stream will require close collaboration with neighbors to address these issues.



Figure 5: Fallen cottonwood on the Rio Santa Cruz channel across from the South Potrereros parcel. (Photo by Rich Schrader)

Slope Management

3: Needs and Costs for Slope Stabilization and Vegetation Management

The higher slopes, above the Santa Cruz Ditch, consist of granite rock and decomposed granite gravels. They are stable and vegetated with sparse native grass (mostly blue grama), cholla and prickly-pear cacti, Apache plume, and chamisa, between clumps of one-seed juniper and piñon. Parts of these higher slopes are paddocked with old barbed-wire fencing on juniper posts. These higher slopes are nearly inaccessible. There is no need of maintenance of these slopes at this time.

The slopes between the pastures and the Santa Cruz Ditch (i.e., Martinez Arriba Ditch) appear to be stable despite signs of past disturbance. The slopes are well vegetated with native grasses, forbs, and shrubs, and a combination – often in patches – of invasive species, such as Siberian elm.

The slopes of the southern parcel are heavily overgrown and include dead and dying trees of various ages, leaning trees, and much dead and down material. Thinning and removal of dead woody material would reduce wildfire risks and allow natural regeneration of native species.

Logs placed on contours and slash spread on bare ground in open spaces will be effective to stabilize the slopes and reduce erosion.



Figure 6. Dense vegetation on the slope below the Santa Cruz Ditch, July 2015. (Photo by Jan-Willem Jansens)

Similar conditions occur on the slopes to the east of the East Potrero pastures, and similar maintenance work would help improve ecological conditions on these slopes. Additionally, there are several patches of elm of approx. 0.1 acre in size on these slopes. These patches would need to be monitored to determine whether they will be spreading into the pastures below, and to what extent they are effective in stabilizing the soil by allowing an undergrowth of grasses. Santa Fe County may decide to thin them out or remove them when these elm patches spread too aggressively, cause bare, erosive soil conditions, or die out and increase wildfire risks.

The slopes east of the East Potrero pastures are not entirely fenced at the bottom end, and cattle has free roaming opportunities on the slopes. During dry years, livestock access may increase slope instability and overgrazing of the slopes, leading to soil erosion and the potential

proliferation of weedy plant species. Periodic monitoring of the vegetation cover and erosion conditions are needed over time.

Higher up the slope, at the toe of the Santa Cruz Ditch, the slope angle is very steep, and locally eroded and incised by shallow gullies that extend from the higher slopes across the ditch to the slopes below the ditch. Seepage and leaks from the ditch seem to have added slightly to the gully erosion below. However, gully stabilization can be achieved easily by repositioning some of the dead wood (logs) that is plentiful at the toe of the ditch.

At the southern end of the slopes east of the East Potrero pastures, an old road profile climbs the slope to the east toward the Santa Cruz Ditch. This road profile seems to be an effective access route for ditch maintenance and repair and for any potential maintenance of the slope area. It would be useful if Santa Fe County could maintain this road profile and keep it free from young trees sprouting up.



Figure 7. Invasive vegetation on slope below Santa Cruz Ditch on the east side of the pastures, July 2015. (Photo by Jan-Willem Jansens)

Trails, Access, and Views

4a: Trails Plans and Access Conditions and Needs

The LPOS area is bounded by the Rio Quemado to the northwest, the Rio Santa Cruz to the southwest and south, and steep hillsides bordering BLM land to the northeast and east. The streams and slopes serve as natural boundaries to the wet meadows between them that constitute much of the open space property. As a result, access to much of the LPOS is very limited.

Around or before 2006, the Chimayo Conservation Corps reportedly constructed and restored several trail alignments along the Rio Quemado on the west and northwest side of the open space property. A two track trail is still accessible from Juan Medina road to the rock cliff along Rio Quemado, including a ford and entry path in the West Potrero pasture. A foot trail continues for about 1,000 ft along the Rio Quemado but becomes invisible where the Rio Quemado intersects with the property boundary. There are no maintained trails within the open space property, except a faint trail along the Acequia de las Cuevas.



Figure 8. Gate on the west side of Los Potreros Open Space. (Photo by Jan-Willem Jansens).



Figure 9. View west along the maintenance tracks leading to the gate on the west side of Los Potreros Open Space, July 2015. (Photo by Jan-Willem Jansens)

No trail connections exist on BLM land. The BLM reportedly has no intention to develop trails adjacent to the LPOS. However, connecting trail access to the BLM lands has been one of the goals of the purchase of the property.

In collaboration with local community members, the remaining trail alignments could be closed or improved. This would require vegetation removal and the repair and construction of simple stream crossing gates, fences, and stiles.

Potential trail alignments – mostly aimed at local users – could be developed off of the two track along Rio Quemado. One simple trail could provide access to a vantage point along the western edge of the West Potrero wetland pastures. Another trail could possibly cut across along the fence line to the toe of the eastern slopes, and perhaps connect with a trail along the Acequia de las Cuevas and northward along the toe of the slope on the east side of the dry East Potrero pastures to connect to an old trail alignment along the Rio Quemado on the northern end of the property.

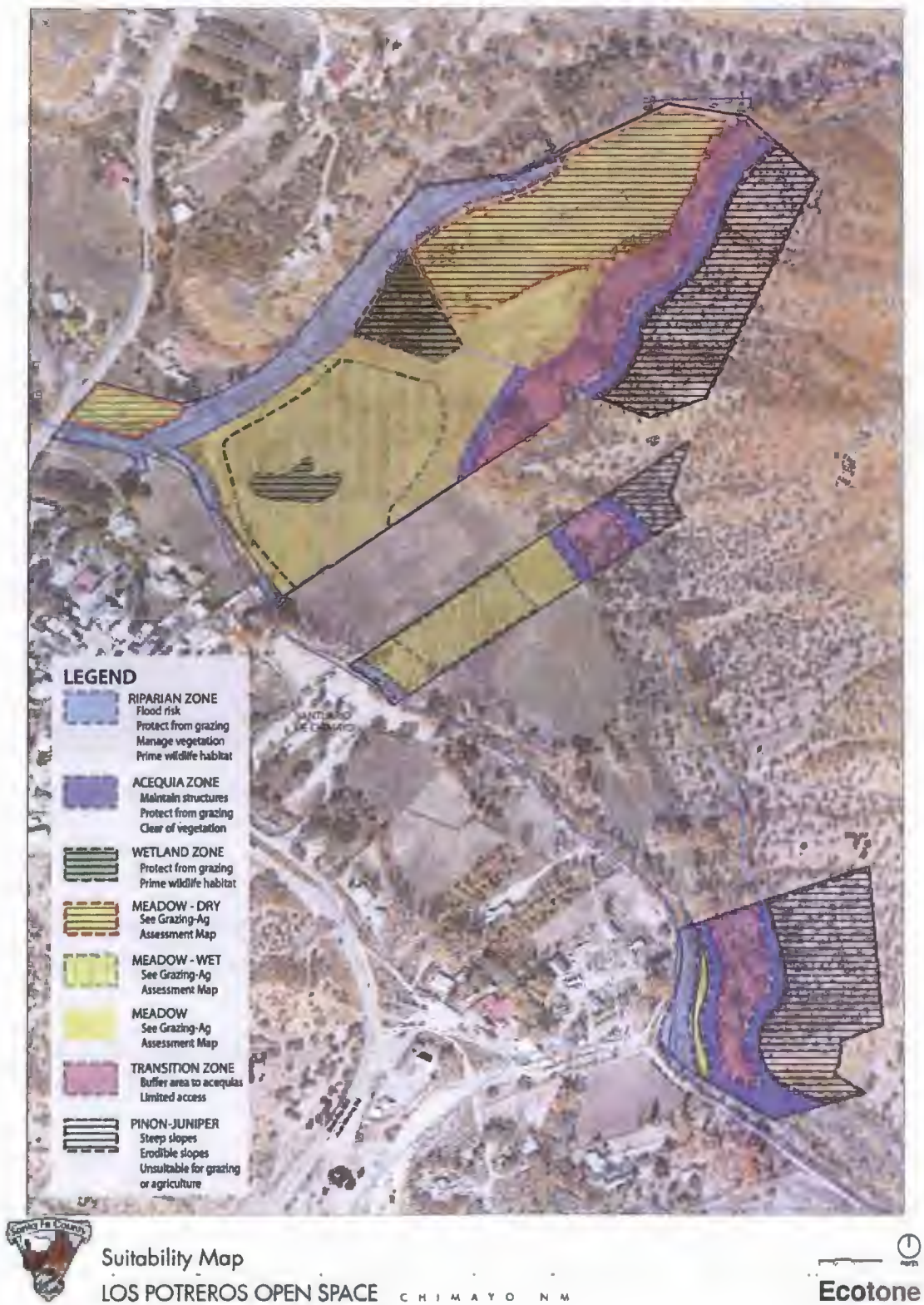


Figure 10. Los Potreros Open Space - Land Suitability Map.

4b: Viewshed Enhancement Opportunities

There are interesting viewpoints at all the corners and sides of the LPOS property. Particularly appealing views are from the western side near the ford and entrance tracks into the pasture. Additionally, the lower slopes on the east side of the pastures offer a few promising view points, including a point at the northern end of the western conservation easement parcel (around a clump of old cottonwoods), and on the slopes below the maintenance road profile that climbs the eastern slope. These locations offer great vantage points for views across the pastures toward the west, southwest, and south, particularly at sunset. These areas could conceivably be developed as destination points for a mowed or natural surface trail across the pastures.



Figure 11. View from the northeast across Los Potreros Open Space to the Santuario de Chimayo, June 2015. (Photo by Jan-Willem Jansens)

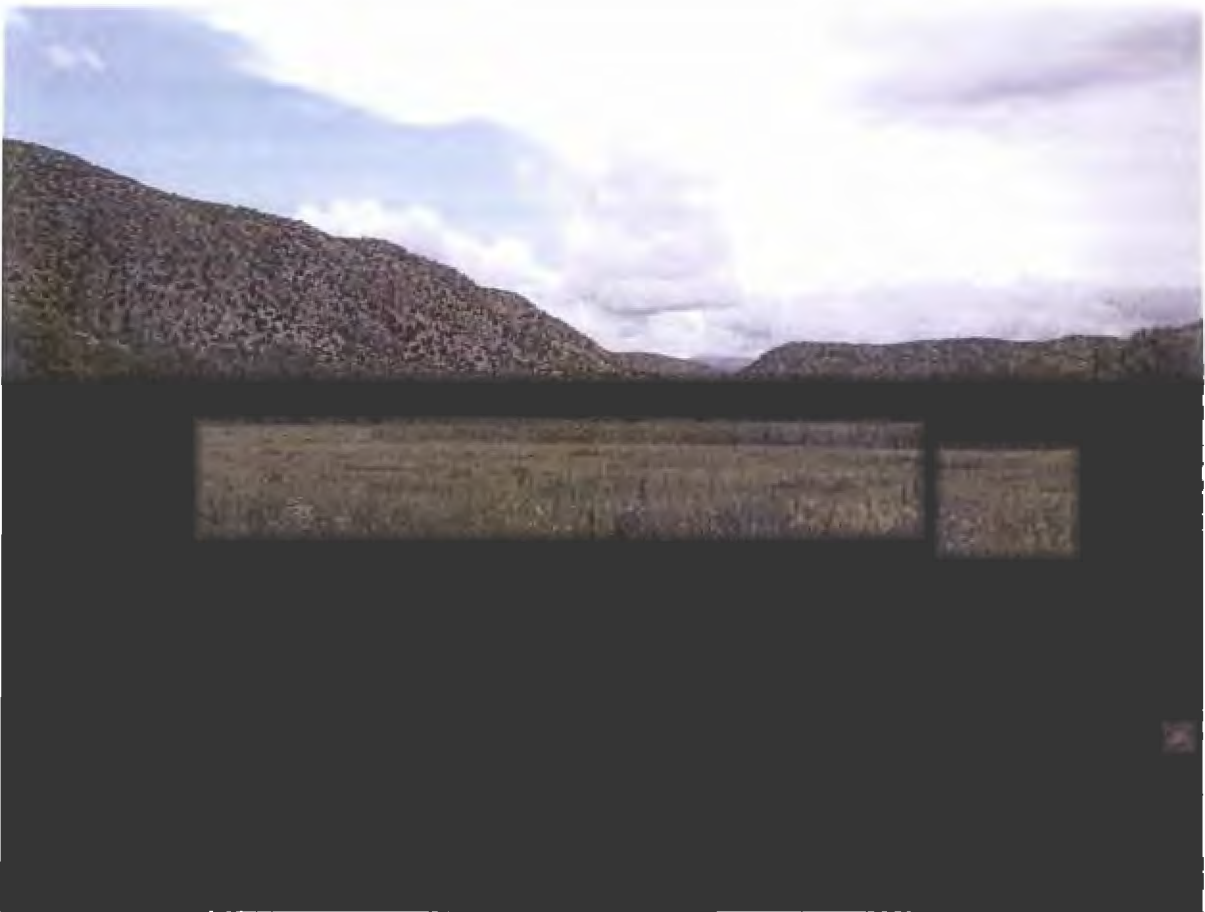


Figure 12. View from the west side of Los Potreros Open Space across the pastures to the southeast, July 2015. Potential location of a small observation deck. (Photo by Jan-Willem Jansens)

KEY ASSESSMENT PROJECTS

Certain topics could not be addressed in the (Phase-2) Inventory and Assessment research due to limitations in project scope and budget. The field inventory work and community meetings in Phase-1 helped identify a list of research and planning projects that need further attention after completion of the Management Plan for the Los Potreros Open Space. These projects include:

1. Development of a simple grazing management plan, redesign of the grazing lease process, and development of a lease program for restorative grazing for years 1-3, and a managed grazing lease for grassland maintenance for years following.
2. Development of a scope of work for bank stabilization along the Rio Santa Cruz.
3. Development of a drainage plan and design for the West Potrero pastures, and scope of work for implementation.
4. Verification on maps and in the field of the trail alignments that were developed by CCC.
5. Research, planning, and design for a simple trail and observation deck on the west side of LPOS.
6. Testing of the functionality of the irrigation system for the dry northern pastures, and research of the opportunities in the community to actively participate in a pasture rehabilitation project. Such a project would possibly include the planting of cover crops and mulching with mowed crops, and/or managed, restorative grazing, and eventually sowing and cultivating a forage crop to provide soil cover, soil restoration capacity, and forage for wildlife and livestock. It would be important to also consider pollinator plants.

APPENDIX A – GRAZING ASSESSMENT

Land Suitability of Grassland and Wetland Areas for Grazing

Grassland and Wetland Forage Assessment

Detailed field research focused on general terrain conditions and in particular on forage quantity and quality in order to provide detailed input for updated terrain management, and particularly for grazing management through the County's grazing lease at LPOS. Figure LPOS-A1 indicates the location of nine transects across the north-eastern and south-western parcels of the largest contiguous part of LPOS. The southwestern parcel with transects T5.0, T6.0, T7.0, T8.0 and T9.0 is subject to the grazing lease.



Figure LPOS-A1. Northern contiguous parcels of Los Potreros Open Space with locations of transects.

A summary of findings includes the following observations and is illustrated in Figure LPOS-A2:

- a. The NRCS WebSoil Survey classifies the grasslands and wetlands of Los Potreros as the Mirada-Bosquecito soil complex, consisting of silt loam and very fine sandy loams on loamy sand and gravelly coarse sand, and generally flat with slopes up to 2%. The WebSoil Survey's Ecological Site Description for this terrain unit is the Marshy Ecological Site (R36XB138NM). Vegetation surveys conducted by the project team generally confirm the terrain characterization offered by the Ecological Site Description.
- b. The most western parcel, which is subject to the grazing lease (adjacent to the Santuario), is largely a wetland (see Figure 2, map unit "West Potrero 2" and West Potrero Wetland") and contains a limited acreage of palatable and productive grassland (see Figure 2, map unit "West Potrero 1"). Sedges and rushes dominate in the wetland portions of this parcel, which the Ecological Site Description attributes to heavy grazing pressure under permanent wet conditions.
- c. Comparing our vegetation survey, in which biomass was cut, dried and weighed, with the Ecological Site Description, it appears that the grassland and wetland biomass production per acre in 2015 was exceptionally high: roughly 3,000 lbs/acre/yr while NRCS data shows 1,632 lbs/acre/yr during a favorable year. According to the NRCS, in a normal year the average biomass production (of all pastures) would be 1,316 lbs/acre/yr, while during an unfavorable year the average production would be around 916 lbs/acre/yr.
- d. Especially the vegetation in this western parcel shows a high biomass production, which is most likely due to the plentiful availability of water due to alluvial sub-irrigation, seepage from the Santa Cruz District Ditch, and perhaps some supplemental acequia irrigation.
- e. The north-eastern parcel (see Figure LPOS-A2, map unit "East Potrero 1, 2, and 3") is largely a derelict grassland that is overgrown with forbs with low forage quality. This area is much drier and experiences less sub-irrigation and seepage. While there is a flood irrigation system in place for this area, it seems not to have been effectively irrigated in the last few years.
- f. By inference (no on-site data were collected), the narrow parcels under the conservation easement (see Figure 2, map units "Conservation 1 and 2") to the southeast of the main grazing parcels contain a mixture of wetland and high-quality grassland. This area also seems to be sub-irrigated by the alluvial groundwater flows in the valley, and can be irrigated with water from the Las Cuevas ditch during dry years.
- g. Similarly by inference and comparison, the grassland on the most south-eastern parcel along the Rio Santa Cruz (see Figure 2, map unit "South Potrero") contains high-quality grass forage. This pasture is apparently thriving due to alluvial sub-irrigation from the Rio Santa Cruz and seepage from the Santa Cruz District Ditch.

- h. We found a total acreage of grassland and wetland vegetation of 18.64 acres, which does not include the grassy areas on the slopes to the east of the valley bottoms. Only 13 acres of this area is suitable for grazing (see also Table LPOS-A1), and only 11.6 acres is included in the lease.
- i. The largest pasture of the grazing lease area (“West Potrero”) is approximately 8.87 acres. However, only 2.75 acres of grassland at the edges of this pasture (31%) are suitable for grazing; the remainder consists of a pure wetland ecosystem that is largely saturated or inundated most of the year and consists nearly exclusively of poorly palatable rushes and sedges.
- j. Similarly, mapping unit “Conservation 2” is a wetland ecosystem that is in principle unsuitable for grazing.
- k. Dry matter forage production per acre is very high on the suitable grasslands and on the wetland units thanks to plentiful water and a dense stocking rate of plants per square foot.
- l. Forage quality and palatability range from high to very low. The “West Potrero 1”, “Conservation 1”, and “South Potrero” units have estimated ratios for Dry Matter Intake (DMI) as a percentage of body weight of 2.5% to 3%, which is high. Unit “East Potrero 3” is a second choice pasture with an estimated DMI as a % of body weight ratio of 2%, while the wetland units “West Potrero 2” and “Conservation 2” are low quality forage areas with an estimated DMI as a % of body weight ratio of 1.5%. Only the rushes in these wetland pastures offer some forage quality. The DMI goes down when the roughage (fiber content) percentage in the forage increases, because it takes ruminants more energy (and time) to digest such forage, reducing their opportunity to eat more nutritious forage.
- m. From a forage quality point of view, the LPOS pastures could offer nearly year-round grazing because the available forage offers a combination of protein-rich grass and roughages (Acid Detergent Fiber and Neutral Detergent Fiber), both of which are essential for ruminants within a certain range of balance between the two. However, whether the quantity of available forage is sufficient depends on access conditions (including standing water on the pastures), whatever forage volume grows each year, the extent to which the forage is also grazed or browsed by wildlife, the number of livestock animals, the average body weight of the animals, whether they are lactating or dry, and the grazing system (e.g., whether the herd is rotated in some manner or not). A managed grazing system could help increase forage regeneration rates and prevent degrading grazing effects on forage diversity and quantity, leading over time to increased forage production, palatability, and forage quality.
- n. The derelict grassland and high quality wetlands contain plants that offer low quality DMI forage. However, the plants still offer roughage that can be useful as additional supplemental forage. However, these area are easily overgrazed or animals may

incur negative health effects from the saturated soil conditions and the many plants with sharp seeds and burs.

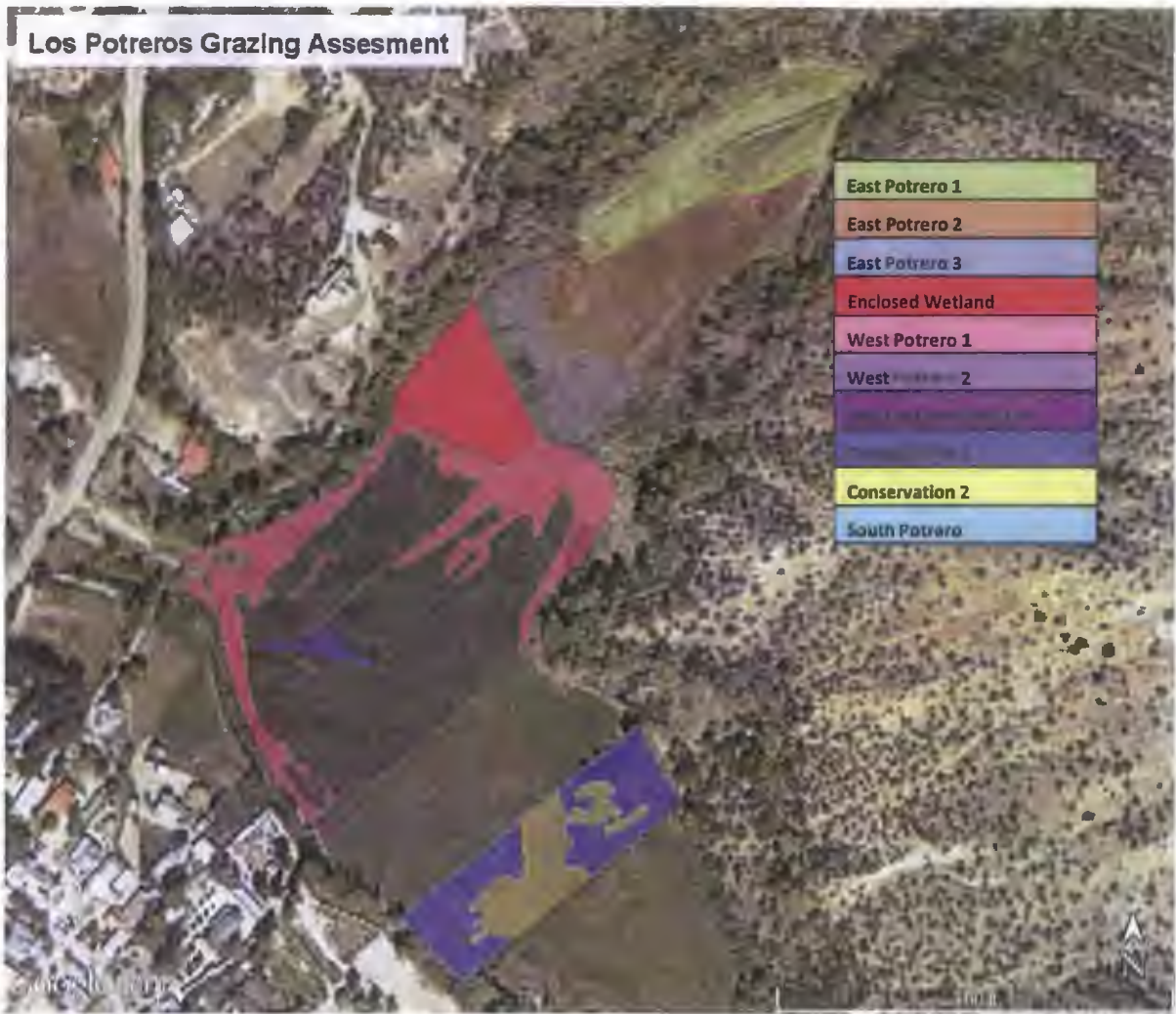


Figure LPOS-A2. Map of LPOS grassland and wetland units.



Table LPOS-A-1. Overview of pastures with sizes in acres and dry matter production in lbs/acre for LPOS grassland and wetland units in 2015.

Summary	Acres	Lbs/Acre
East Potrero 1	1.75	No grazing
East Potrero 2	2.40	No grazing
East Potrero 3	1.60	2807.52
Enclosed Wetland	1.23	No grazing
West Potrero 1	2.75	3427.20
West Potrero 2	5.86	3009.86
West Potrero Wetland	0.26	No grazing
Conservation 1	1.60	3427.20
Conservation 2	0.88	3009.86
South Potrero	0.31	3427.20
TOTAL	18.64	

A grassland management example. Based on the measured forage production of 2015, a herd of ten dry cows or steers with an average body weight of 500 kg (1102 lbs) per animal, would be able to graze 222 days (32 weeks) on all suitable LPOS pastures (13 acres), if they were available for grazing. A managed grazing system (e.g., rotation between pastures) would be required to prevent grazing impacts (grassland degradation) over time. The same herd of ten would be able to graze for 156 days (22 weeks) on the “Potrero 1 and 2” pasture units (the 8.87-acre grazing lease), under the same management and forage circumstances. During the growing season, rotations should be more frequent in order to leave about 50% of the grass crop in the field to stimulate regrowth and prevent degradation. This may mean that additional feeding of roughages (e.g., hay) is necessary. However, under conditions of average forage production as described by the Ecological Site Description (which is about 50% of the 2015 field findings), combined with the permanent wetland conditions in this pasture and the labor intensity of managed grazing, the herd size or period of grazing would have to be about 50% of what is suggested in this example. For example, the grazing period should, therefore, not exceed 11 weeks per year.

APPENDIX B – ADDITIONAL LAND SUITABILITY OBSERVATIONS

Suitability of the Potrero for uses other than grazing vary between types of use are generally limited to specific areas and seasons due the extent of the wetland conditions of the area and limited access opportunities. The greatest “use opportunity”, which in fact already exists, is the function of the area as **wildlife habitat**, especially as foraging and drinking grounds for wild ungulates and waterfowl. Conditions that further favor this use include the current exclusion of human access to and activities in the area, the absence of hunting and dogs due to the wetland conditions (and presumably people’s behavior), the immediate adjacency of wildlands to the north and east, the availability of wooded cover all around the Potrero, and the relative ease of access for wildlife and fowl to enter into and escape from the area. Local residents have mentioned that they observe lots of wildlife on the Potrero and enjoy their presence.

A localized opportunity may exist for the development of **cropland and an orchard** on East Potrero-1 and -2. On these terrain units soils are sandier, better drained, and drier than in most other parts of the Potrero. Also, the terrain is graded for irrigation and drainage, and there is a piped flood irrigation system in place. However, access to this part of the Potrero is limited to a poorly maintained footpath along the Rio Quemado and a footpath behind the Rancho de Chimayo restaurant. Currently, vehicles or equipment can only reach the area by entering into the Potrero from the western entrance (State Road 520 - Juan Medina Road), fording the Rio Quemado, and driving at the edges of the wetland across the Potrero to the northern terrain units. Access improvements will most likely have a considerable footprint because they have to be connected to Juan Medina Road along the western side of the Potrero and lead to sacrifices to the wetland and riparian ecosystem along the Rio Quemado. Drainage conditions of the wetland and in the Rio Quemado will require a high maintenance budget for the infrastructure and a considerable repair fund to maintain stream crossing and road conditions after heavy storms and flow events. Additionally, investments will be necessary for soil improvements and irrigation and drainage improvements in order to establish viable crops. Smart crop development and protection strategies may need to be employed to prevent wildlife impacts on the crops, be it bear accessing an orchard or deer and rodents raiding a field of produce or grain crops. Micro-climate conditions, particularly early and late frost and summer heat may be other factors to contend with in this location.

An alternative location for cropland or an orchard is the entrance area to the West Potrero pasture area off of Juan Medina Road. However, this area is only about an acre in size. The area currently is traversed by irrigation infrastructure and tracks to access the West Potrero pasture. Irrigation opportunities for this location are unclear at this time.

Finally, the Potrero has great potential to offer various kinds of **outdoor recreation**. The scenic value of the area to local residents, pilgrims, and other visitors is widely known. The area’s visual qualities were one of the key reasons for its preservation as County Open Space in 1998. Annually, hundreds of thousands of pilgrims and tourists pass through Chimayo and experience the Potrero’s pastoral landscape as a special and peaceful setting for the Santuario. Yet, due to

limited access, many qualities are left untapped or are only discovered by occasional visitors. The area offers many intimate and picturesque panoramic views from different vantage points around the perimeter as well as from various possible pathways across the property. The contrasting visual textures of the grassland and wetland valley floor, the uprising riparian vegetation, and the rocky hillsides, combined with the curving topography, changing light throughout the day, and the simple and colorful small-scale structures of the village and Santuario are unusual and potentially of great interest to photographers and painters. Some residents have expressed that this landscape offers a deeply spiritual experience. For others, the Potrero evokes an exotic feeling, not dissimilar to remote, traditional mountain villages in Latin America and Asia. Yet, this pristine character is easily damaged if the area were made more accessible and were developed for outdoor recreational use. Due to the high visitation of Chimayo and the Santuario, which reported exceeds 300,000 people a year, even low-key access and trail development may readily become overused and require either abandonment or hefty investments to accommodate users and prevent ongoing need of repairs. There is a considerable chance that opening the area to visitors may lead to a tragedy of the commons or a “loving it to death” effect on the resource. This is well understood by local residents who are opposed to public recreational use of the Potrero. Opening the area for even limited and low-footprint recreational use may also impact wildlife habitat qualities, water quality, and the pristine scenic values related to the total absence of people, modern artifacts, and even trash.

APPENDIX C – RIPARIAN AND WOODLAND AREA CONDITIONS

Rio Santa Cruz: Riparian management conditions along Rio Santa Cruz pertain to three river reaches that intersect over short distances with the Open Space property and Conservation Easement. The non-contiguous river reaches split over different lots, coinciding with diagonal boundary lines crossing the stream and riparian area complicate maintenance. Effective maintenance will require collaboration with neighbors. It appears that currently lot lines are surveyed and staked. With an accurate map in hand and some additional flagging vegetation maintenance should be possible without confusion about boundary lines.

At the most upstream, southern Open Space parcel, the Rio Santa Cruz intersects over a length of approx. 200 ft with the southwestern corner of the lot. The stream enters the property at a point along CR 92, located approx. 150 ft SE from the intersection of CR 92 and a private driveway that runs north on the western banks of the river, and the stream leaves the property at a point along the private driveway, located approx. 175 to the north of that intersection. The intersection of CR 92 and the driveway hugs the south side of the confluence of a large arroyo flowing from the west into the reach of the Rio Santa Cruz that intersects with the Open Space property. The arroyo has created a large gravel and sand bar in the outer bend of the river (river left) where the channel curves north, moving the channel to river right. This confluence was also the location of a now abandoned ford that connected CR 92 to a gate that gave access to the southern lot. Currently, banks on river right are too steep to allow vehicular access at this point. No other access points for vehicles are functional at this time.

The riparian area of the southern Open Space parcel includes banks on river left, the stream channel and sand bar, banks on river right, a wooded riparian buffer strip, and a narrow and long wet meadow. Terrain conditions in the riparian area of this lot are characterized by overgrown, senescent woody vegetation and invasion of woody species into the wet meadow. Some tree encroachment includes non-native Russian olives. However, overall there is a remarkably high presence and diversity of native plants.

Access to the property is currently limited to foot traffic, which requires wading the stream, climbing the bank, and using an overgrown stile across the fence, crawling over or under the fence, or using a poorly operable roll-away fence some 50 ft upstream from the confluence. Alternatively, access by foot is possible from the north side across a neighboring meadow and through a simple gate in the fence.

Current densities of woody biomass fuel on the ground are relatively low (4.9 t/ac or 0.22 t/100 linear feet for 10 ft riparian buffers on both sides of the stream). These fuels constitute a low-risk (spot) fire hazard if a fire were to ignite nearby and reach this area. However, there is in places 4"-5" of leaf litter on the ground that could carry a ground fire through the vegetation in dry and hot weather conditions.

Important maintenance interventions would include woody vegetation removal in the channel, on the banks, and in the meadow, some fencing improvements, improvements for foot traffic access, and periodic maintenance follow-up. Urgent maintenance should focus on the removal of trees that have fallen in the stream and that may cause bank erosion and flooding during any next bankfull or larger flow event. In the mid-long term, some bank protection and stabilization in the stream may be of importance to prevent undercutting of banks and to move sediment through the stream system.

More downstream, the Rio Santa Cruz intersects over a length of approx. 180 ft with the southwestern edge of two parcels that are under a Conservation Easement held by Santa Fe County as part of the Los Potreros Open Space property. The boundary of the western parcel appears to be in the center of the channel over a length of about 100 ft. The boundary of the eastern parcel appears to be on the southern banks (river left). Access is offered only by wading the river from the parking lot of the Santuario to a gate in the western parcel. The lots are well fenced on the outside, including steel gate and fencing systems to direct cattle. There is no internal fence dividing the lots, except a small steel enclosure in the southern corner.

The river channel is slightly entrenched where it enters the property upstream due to densely overgrown woody vegetation on the banks and a series of woody debris jams and sharp, short stream meanders, approx. 100 ft upstream. These upstream vegetation conditions and log jams appear to have caused flooding and bank scour on the upstream property (probably owned by the Bal family) which also seem to cause bank erosion and very wet conditions in the meadow along the stream of the Conservation Easement parcels. A gabion revetment shores up the vertical banks of the stream on river right along the upstream half of the channel across southern lot. The channel hugs the revetment due to an overgrown willow patch on the banks on river left that push the channel to the opposite bank. Over time this condition may lead to undermining of the gabion structure. Additionally, there are many dead and dying trees along this stream reach. The cottonwoods are old, dying or dead. They have clearly been severely trimmed or cut off entirely.

Important maintenance interventions would include the removal of overgrown and dead woody material, log jams, and dead and leaning trees. Despite the overgrown conditions, care must be given not to remove protective roots and shrubs that hold the banks and channel in place and prevent bank erosion on the side of the Santuario parking lot. Collaboration with upstream neighbors would be essential to accomplish these improvements at this location.

Just upstream from the confluence with the Rio Quemado, the Rio Santa Cruz runs along the western side of the West Potrero lot – just east of the Santuario – and intersects over a length of approx. 70 ft with the southern corner of this lot. The boundary then jumps back on the right bank and follows the fence line for about 300 ft where it crosses the stream again to the southern bank. From there on, the stream flows on County property over a length of about 500 ft to the confluence with the Rio Quemado, and from there over a little more than 200 ft to the western boundary of the property at the bridge with State Road 520 (Juan Medina Road). The

riparian zone in this area consists of the stream, its banks, and a very narrow strip (in places only a few feet wide) on top of the banks which hold woody buffer vegetation.

Stream conditions in this reach are relatively stable and healthy. However, the willow vegetation is overgrown. Where willow vegetation has been removed on river left, the channel has eroded and undermined the banks on river left due to the a-symmetrical stream profile with heavy vegetation on river right. The dense vegetation also obscures some potential views from the Santuario garden onto the Potrero wetlands. Access to this stream reach is limited to wading the stream on foot (from accessible points upstream or downstream) or crossing the boundary fence from within the Potrero wetland on the northeast side of the stream.

Below the confluence, there are some dead and down logs on the banks that may add to current log jams in the stream and at the mouth of the bridge culverts downstream. The banks on river left are steep and eroding. Access with heavy equipment to these banks is complicated and perhaps only possible from the right bank by breaching a levee.

Important maintenance interventions would include the removal of dead willow and all Russian olives. Despite the overgrown conditions, care must be given not to remove protective roots and shrubs that hold the banks and channel in place and prevent bank erosion on the side of the Santuario and downstream properties on river left. Urgent maintenance would include the removal of woody debris and log jams below the confluence and at the mouth of the bridge culverts to prevent flooding and bank erosion upstream.

Rio Quemado: Riparian management conditions along Rio Quemado pertain to a reach of approx. 1,800 feet upstream from the confluence with the Rio Santa Cruz. In this reach the river runs along the western side of the Potrero wetlands and pastures. Access to this area is offered by a track that runs from State Road 520 (Juan Medina Road) along the stream. After about 500 feet, a shallow ford just above a diversion structure leads the track to the left bank (east side), where it disappears between overgrown riparian vegetation. A foot path continues on the western banks (river right) but ends at the boundary of private property where the stream flows from the private land onto the County property. It appears that currently lot lines are surveyed and staked. With an accurate map in hand and some additional flagging vegetation maintenance should be possible without confusion about boundary lines.

The stream flows onto County property with a stream profile that is slightly incised and includes multiple terraces. The terraces are heavily vegetated with riparian trees (cottonwoods, willows, and Rocky Mountain juniper) and littered with heavy woody debris (logs and piles of dead brush and vines). More downstream, the terraces widen and high flows spread out to river right (onto private land). Here, there also is much dead and down wood and leaning and dead standing trees, mixed with dense clumps of willow.

Current densities of woody biomass fuel on the ground are relatively high (62.7 t/ac or 2.9 t/100 linear feet for every 10 ft of riparian buffer width on both sides of the stream). These fuels includes large amounts of logs, combined with fine fuels and thick leaf litter, and

constitute a high-risk fire hazard if a fire were to ignite nearby and reach this area. Just the leaf litter and brush on the ground could carry a ground fire through the vegetation that would readily erupt in a crown fire in dry and hot weather conditions.

Approximately half-way the river reach on County property, a rock cliff on river right seems to define the elevation of the river bottom, constrain flows on river right, and direct flows to river left. As a result, the riparian area on river left extends into a wetland parcel that separates the wet southern part of the pastures and the drier northern part. This area shows signs that it is permanently sub-irrigated and experiences periodic flooding. The banks are heavily overgrown with willow. Dead trees cover the banks and have fallen into the stream.

The reach downstream from this point is characterized by patches of dense willow vegetation and patches of log debris and dead brush. At several points logs have fallen across the stream. Just below the ford that gives access to the western pastures of Los Potreros, a log diversion dam is undermined, causing a localized deep incision of the channel. More downstream, the flows have access to the floodplain and are likely to cause periodic flooding, which is probably exacerbated by heavy woody debris along and across the channel. Reportedly, Santa Fe County has retained a contractor to implement certain improvements in the channel and riparian area of the Rio Quemado in the winter of 2015-2016.

APPENDIX D – ALL OPEN SPACE PROPERTIES: LAND SUITABILITY GOALS

Primary Goals for Land Suitability Assessment and Master Planning include:

- a. Minimization of Upfront Development Costs and Complexities
 - Length and area of disturbance: costs of road development, paving, fencing
 - Engineering and earth moving requirements: topography, cut&fill, bridges
 - Soil suitability, drainage, vegetation disturbance/removal

- b. Minimization of Mitigation and Restoration Costs due to Resource Disturbance
 - Disturbance of cultural and historical sites
 - In appropriate use (waste) of, disturbance of or cumulative negative effects on natural resources
 - Susceptibility to erosion after disturbance
 - Scenic quality impacts (viewshed disturbance; e.g., views on/over parked cars)

- c. Public Safety Optimization
 - Safe line of sight at road intersections
 - Public visibility of public areas (avoidance of illicit activities; social surveillance and control of nuisance behavior: dumping, shooting, theft, harassment, etc.)
 - Safety regarding terrain features (flood hazard, wildfire hazard, steep or unstable slopes, gullies, dump sites, hazardous mine pits, proximity to shooting areas, etc.)

- d. Experiential Quality Optimization
 - Richness of experiences (e.g., diversity of view shed, and micro-texture of the land, such as vegetation types and specific things to see/experience)
 - Options for different (trail) users (e.g., trail extensions; distance variations, destinations, trail connectivity)
 - Diversity of user groups for which the land use scenario is appealing

APPENDIX C: GRAZING ASSESSMENT

SFC CLERK RECORDED 10/12/2016

Santa Fe County Open Space Management Planning Initiative

From: Jan-Willem Jansens
To: Maria E. Lohmann, SFCO Project Manager
Date: February 20, 2016
Subject: Assessment of Grazing Management Conditions and Alternative Grazing Management Options for Los Potreros Open Space

INTRODUCTION

When the grazing lease on the Los Potreros Open Space (LPOS) in Chimayo ends in June 2016 Santa Fe County will have an opportunity to reconsider how to manage the lease and the grazing area. This memo offers a vision for a managed grazing program, a review of current resource conditions and analysis of the existing lease at LPOS, and suggestions for developing a grazing program by the County. A detailed analysis of the LPOS lease document is included in Appendix I.

The grasslands of LPOS and those on several other County open space properties would benefit from managed grazing to optimize the use and public benefits from these properties and improve land health conditions of the grasslands. Some of the benefits of managed grazing include:

- Preventing future ecological degradation and associated maintenance and costs, such as reduced forage, invasive weed development, and excessive soil erosion
- Improving water quality by reducing runoff and sediment transport
- Increasing soil productivity and carbon sequestration in soils
- Increasing community connections, buy-in, economic gain, and enjoyment of the County Open Space properties.

In addition, a well-developed grazing program by Santa Fe County would improve agricultural uses of public open space areas and increase the health of land, water and grassland resources on the open space properties.

Field assessments by the Ecotone team at LPOS revealed a series of problematic terrain conditions and grazing management concerns.

1. Forage quantities are very high in wet years, such as 2015, as a result of plentiful natural water supplies. Forage quality of the pastures appears to be lower than what should be expected on nearly 70% of the 11.6-acre lease area, based on the Ecological Site Description of NRCS WebSoil Survey. The relatively low forage quality can be explained as being a result of high grazing impact and alternating very high water levels

Ecotone

jwjansens@gmail.com

(inundation) or drought conditions. The most important causes of the high grazing impacts and reduced forage conditions include trespass cattle and wildlife use of the pasture, inadequate fence repair, lack of cross-fencing for paddocking and managed (rotational) grazing, and inadequate irrigation and drainage management given the natural hydrological conditions of the pastures.

2. Areas outside the grazing lease area show signs of grazing and cattle trespass which will likely result in degraded ecological conditions without proper protection. Cattle trespass from neighboring properties is probably caused by ineffective fencing and unchecked opening of gates by community members.
3. Some community members expressed that the LPOS pastures are not optimally used for grazing. Additionally, it seems that neighboring cattle owners use the pastures of LPOS or allow their cattle to enter the LPOS pastures due to ineffective fencing, the lack of oversight, and the lack of community support for County management of the grazing lease.

Many of these problematic conditions and management concerns can be alleviated if Santa Fe County would have a more effective system of grazing management and oversight. Such a system would need to include the establishment of explicit ecological and social-economic goals for the grazing activity. The lease could then be used as a management tool to achieve the goals. Additionally, a monitoring program would guide County staff with targeted inspections, oversight, and procedures for adaptive management.

Ecotone developed a vision, goals and objectives for grazing at LPOS which is presented in Appendix II. Ecotone also invested significant time learning about other grazing programs run by county governments (shown in Appendix III) and collected example grazing leases presented in Appendix IV. The Ecotone team aims to provide this information as a reference for developing managed grazing on LPOS and other Santa Fe County Open Space properties.

STEPS TOWARD A MANAGED GRAZING PROGRAM

Step 1. Develop a vision and goal for desired future conditions of the land

Effective open space management requires the formulation of a vision and goal that define desired future conditions for which the open space area is managed. Such goals typically are a careful balance between (a) community wishes for access and use of the open space property, (b) terrain conditions that need to be maintained to support the suitability of the land and meet community wishes, and (c) maintenance and other management costs that need to be kept to a minimum, on a year to year basis and in the long term.

Specific management activities, such as maintaining the ecological health and productivity of grasslands or wetlands, preserving cultural and historical landscape features, or maintaining a desired aesthetic of the area, must follow subordinate goals or objectives to meet the overall

management goal. The development of a vision and land management goal and any subordinate goals is best achieved through a planning session with managers and other stakeholders, such as neighbors and community members. Suggestions for a vision, goals, and objectives, based on the Chimayo Community Plan (2015), community meetings and terrain assessment for the LPOS Management Plan, are included in Appendix II.

Step 2. Select management practices or "tools"

In order to meet these specific terrain management objectives, a land manager employs selected management practices (or "tools"). For the purpose of maintaining the ecological health and productivity of grasslands or wetlands, such tools include grazing, resting, burning, mowing, baling, irrigating and drainage, fencing, and managing wildlife access, to name the most important ones.

Step 3. Select a contracting arrangement as a mechanism to work with outside operators

Managed grazing can be achieved in various different ways. One could (1) own livestock and use it to graze or (2) collaborate or contract with third party contractors. In the case of Santa Fe County, the latter option is the current operational model. The relationship with the third party can be structured through various different arrangements:

1. Grazing lease (as is operational for the LPOS)
2. Grazing permit
3. Grazing stewardship contract

Additionally, Santa Fe County could contract out the planning and oversight aspects of the managed grazing activities. More detailed descriptions and examples of these different contracting arrangements for managed grazing are included in Appendix III. Several template lease agreements are included in Appendix IV.

Step 4. Monitor the resource as well as the effectiveness of the management tools (step 2) and contracting arrangement (step 3) in relation to the management goals (step 1)

Santa Fe County will need to monitor the resource (grassland forage quantity and quality as well as water sources), evaluate the effectiveness of the contracting arrangement with a grazing contractor, and evaluate whether overall goals for the land are met. These activities should offer sufficient information for staff and managers to adaptively manage the land and the grazing program and make adjustments from year to year. The Ecotone team set up nine 30-meter transects in the LPOS pastures with a view toward continued (annual) monitoring under direction of Santa Fe County to assess ecological conditions.

Step 5. Evaluate findings for the resource and management tools and mechanisms and decide about adaptive management measures (redesign steps 2-4 for the next period)

The land manager may decide to offer shorter-term leases (one- or two-year) to be able to adapt grazing practices from year to year particularly given significant variability in climate and in ecologically sensitive sites. The land manager may also choose for a year-to-year lease accompanied with a simple but detailed grazing management prescription if the “market” of potential grazing lessees or permittees is limited. In situations with stable grass land conditions and experienced grazing contractors, the land manager may choose for longer term (e.g., 5-year) leases. These longer-term leases will require detailed grazing management plans, proper monitoring and annual adaptation schemes, with annual stocking updates, annual fee updates, and fee credits for maintenance or stewardship work performed by the lessee. Longer leases offer more incentives for lessees to invest in the land and their grazing practices and be better stewards. Finally, sharing monitoring and evaluation findings with contractors and local stakeholders helps build mutual understanding and insight in the need for adaptive management, and emphasizes that collaboration in land management is a learning process for all involved.

GRAZING MANAGEMENT RECOMMENDATIONS FOR LOS POTREROS

1. Management Capacity Development:

Santa Fe County has a choice to develop staff capacity in house or hire a consultant with expertise in managed grazing and associated monitoring, evaluation and adaptive management. Yet, Santa Fe County would at a minimum need to have one point person on staff to oversee the work of the consultant and the grazing contractor and to interact with the local community.

If Santa Fe County chooses to develop its own staff capacity, the County division that will be in charge of terrain management of LPOS needs to develop protocols and staff capacity (staff time, knowledge, skills, and tools) for oversight of and intervention in the grassland management program. These resources and activities should offer sufficient information for staff and managers to adaptively manage the land and the grazing program and make adjustments from year to year. At a minimum, the oversight and management capacity would need to include:

- a. Goals and specific targets for managing the pasture(s) as a resource (plant diversity, cover rate, forage volume, invasive weed control, water supply, and access and fencing conditions)
- b. Management systems for contractor (lessee) oversight, such as an effective lease document, an inspection schedule and protocols with associated protocols for follow-up, and conflict-resolution protocols

- c. Planning and decision making procedures, such as procedures for annual monitoring of grassland conditions, data management protocols, evaluating the grazing operations, administering the lease, annually adapting program practices, maintaining fences, and enforcing cattle trespass protocols
- d. Periodic staff training, such as opportunities to attend workshops and conferences
- e. Annual fund allocations for infrastructure improvements, ongoing staff training and updates of protocols.

2. Understanding of Land Management Alternatives and Consequences:

County staff will need to grow its understanding of terrain management alternatives for the LPOS grassland and wetland and what the consequences may be of various alternatives.

- a. No action alternative: Santa Fe County has a choice to stop grazing the pastures. The consequence would be that those in the community opposed to grazing are satisfied while those in favor of maintaining the grazing tradition are disappointed. It may also mean that Santa Fe County's water rights could be challenged in the future, because they would no longer be used. Wildlife use of the pastures would probably increase. In wet years, biomass production will be very high and may lead to large amounts of senescent plant material that chokes regenerating grasses in following years. In dry years, the absence of grazing may not have much impact other than an increase of grasses over wetland plants. Over time, the absence of grazing may lead to a gradual decline of plant diversity.
- b. Haying instead of grazing: Santa Fe County also has the choice to dispense with grazing but contract with local residents to harvest hay from the ripened pastures in the late summer or early fall, if forage production allows. This practice would support the traditional use of the area and generate some modest local economic benefit from the land, continue the need for and use of the existing water rights, and keep the pastures healthy and productive. The need to maintain fences would be reduced, which would reduce maintenance costs. However, this option would not help regenerate the pastures that are currently overgrown with invasive weeds or unpalatable plant species.
- c. A spectrum of managed grazing strategies: Santa Fe County has several options for managed grazing. The options vary between goat grazing to remove unpalatable forbs and shrubs and invasive weeds, sheep grazing to remove annual grasses and stimulate perennial grass growth, grazing with yearlings for broad spectrum grazing of roughage, and the use of cow-calf units for grazing during years that have produced high quality forage. Additionally, Santa Fe County can apply these different livestock types in different prescriptions for grazing intensity (number of animals grazing per acre), duration (e.g., a few animal units with longer durations or higher stocking rates with shorter durations), combined with rotational prescriptions, and rest periods in between the grazing periods. Each different combination of these

factors in a grazing strategy will have a different impact on the land. Scientific information and experiential knowledge among grazing experts and ranchers should be combined to arrive at the best approach to meet the goals and objectives the County has developed, as described above. The managed grazing options will require the development of County capacity and infrastructure described elsewhere in this report.

3. Cultivating Community Support:

Santa Fe County will need to improve relationships with the local community to increase local buy-in and ultimately some assistance with oversight of the grazing conditions and practices. This includes at least:

- a. Effective communication with key-informants and concerned residents.
- b. Local community education about annual (monitoring) findings, management changes, and the leasing process.
- c. Public outreach and education about the benefits of managed grazing to increase people's understanding about and support of grazing practices; this may also include visitor education about interacting with livestock and keeping dogs leashed in the presence of livestock.
- d. Developing contracting mechanisms that give priority to local livestock operators as contractors for managed grazing.
- e. Some form of local stewardship support by volunteers or neighbors.
- f. Acequia management initiative. Taking a leadership role in organizing the management structure of the Las Cuevas Ditch.
- g. Educating elected officials. It is useful to make elected officials aware of the program and the benefits to the land and the community.

4. Restoration and Infrastructure Upgrades of the Pastures:

Investments in pasture restoration and infrastructure upgrades would offer incentives for the lessee to be a good steward. Needed improvements on the land include:

- a. Repair and/or replacement of ineffective boundary fences, gates and signage. The fences could be repaired using the same kinds of materials to retain the cultural/historical qualities such as juniper posts rather than T-posts. Identification of elk crossings in order to accommodate the elk protect the fencing from damage and reduce maintenance and repairs.
- b. Establishment of corner post systems to encourage cross fencing of paddocks for rotational grazing would improve the grazing efficiency and the ecological conditions by keeping certain areas from being overgrazed.
- c. Repair and improvement of the Acequia de las Cuevas (Las Cuevas Ditch), including its diversion, head-gate, pasture gates, and *desagues* (drains).

- d. Improving the LPOS pasture's drainage by constructing a small sediment pond just upstream of the inlet of the drainage pipe in the West Potrero wetland pond, lowering the inlet of the pipe by approx. 8-12 inches (allowing enough flow to prevent it from silting up), and installing a simple, controllable inlet gate to enable increased drainage management of the entire lower wetland pastures.
- e. Restorative grazing of the East Potrero pastures (more upstream along Rio Quemado). In order to remove the invasive weed component in these pastures, restorative grazing with goats during several weeks a year for about 3-5 years combined with reseeding or cultivating cover crops could help restore the grass cover and diversity of these pastures and render them more productive as part of the LPOS grazing system and lease program. Restorative grazing is best contracted out to a contractor who is experienced with restorative goat grazing strategies.
- f. Consideration of additional, alternative weed management strategies, such as tilling the land and cultivating cover crops, improving the irrigation and drainage regimes, and curtailing the use of hay for feed (which often carries weed seeds) are of importance as well. Such strategies are best developed in collaboration with the lessee, potentially with help from the County Extension Agent.

5. Updating the Lease Document and Lease Process:

The lease document could be improved by:

- a. Clarifying the grazing period and area under lease. The lease document is too rigorous and rather unclear about the grazing period and area under lease. Instead of prescribing an 8-week grazing period, it would be better to leave the grazing duration open and allow the lessee to graze any time during the year, within guidelines that prohibit overgrazing and depending on forage quantity and quality and other terrain conditions. The area under lease could include all pastures of LPOS, except the pure wetland pastures. This would increase the leased area to 17.15 acres. This area must be mapped clearly, and a map must be appended to the lease document. Forage estimates indicate that in favorable years, 10 AU (especially yearlings) will be able to eat as much as they physically can digest in 8 weeks on the present 11.6-acre lease area without overgrazing. In normal and unfavorable years, the animals will need to be rotated to other pastures or taken off the land before the end of 8 weeks in order to prevent overgrazing.
- b. Adjusting the fee system. The lease should include language that offers annual fee restitution for portions of AUM (animal unit months) that the lessee did not use the pastures. This encourages the lessee to not overgraze. The lease should include language that allows for fee credits (especially after the first year) for restoration work on infrastructure and other terrain maintenance based on special agreement with County staff. The lease document could over time also enable annual updates of the fee in comparison with New Mexico sales prices of beef or yearlings.

- c. Including language that refers to specific requirements concerning grazing systems and management adjustments to which the lessee will adhere. The language could emphasize the managed grazing goals and the purpose of grazing toward improving and maintaining the pasture as a resource and clarify protocols regarding inspections, monitoring, and adaptive management (see attached templates for examples). Such requirements could include (a) cross fencing and rotational grazing and avoidance of continuous winter grazing (associated with specifications on the grazing period and the annual pasture map update in the lease document), (b) drainage and irrigation instructions, (c) early withdrawal of livestock, etc. It is important to observe that open communication is as important as clarity in documented objectives and management guidelines. While some additional language is useful to clarify the current lease documents, flexibility is paramount. Highly prescriptive lease documents are often not as effective as building a mutual understanding through good personal communication.
- d. Adjusting the lease period. After several years when proper management systems are in place and a reliable group of effective, potential permittees has been identified, the lease period could be increased to 3 or even 5 years.
- e. Targeting local lessees. In collaboration with key-stakeholders, Santa Fe County may consider a lease offering process that would give a preference to the selection of local-area lessees (grazing contractors). This can be realized by listing explicit qualifications that are best met by locals familiar with the land and local fencing, irrigation, and drainage infrastructure.

See also Appendix I for an analysis of the lease agreement.

ATTACHMENT I – ANALYSIS OF ANTHONY TAFOYA LEASE AGREEMENT AT LPOS**OVERVIEW:**

Lessee:	Anthony Tafoya, Santa Fe, NM
Lease Duration:	June 13, 2013 – June 12, 2014 + extension until June 9, 2016
Termination:	Upon cause of breach of terms by Lessee OR if/when SF County states that it needs the property for public purposes (both with 30-day notice period)
Lessor Rights:	Entry for consultation with Lessee, inspection, pasture quality assessment, repairs, or improvements
Fees:	\$10/AU monthly + any acequia association dues
Area Leased:	11.608 (irrigated) acres of Los Potreros (*1)
Allowed Uses:	Graze livestock and maintain the irrigated use
Animal Unit Limits:	10 AUM (10 animal units per month) at any time; 1 AU = cow + calf
Grazing Period(s):	8 weeks (as of May 2013) [terms in lease are unclear and ambiguous in this regard]
Management goals:	Maintaining (traditional uses of) livestock grazing and acequia irrigation; and specifically: conserving health and sustainability of property, conserving the value and future use of property, and preventing all unnecessary waste, loss and damage to property.

QUESTIONS:

- What constitutes the 11.608 irrigated acres of LPOS? The South Potrero wetland and the Conservation Easement lands are irrigated and are about 11.32+ acres. Are these the leased parcels?
- What is the grazing period? How has the lease language been interpreted at this regard? What was the initial intention and purpose to describe it as it is stated in the lease?
- Did SF County develop specific targets for the management goals? Are these targets used during inspections or evaluations with the lessee?

- d. How often does SF County staff inspect the site? How are inspections documented and reported? What is the usual communication with the lessee about inspections and findings? Is corrective action taken and followed up on?
- e. What is the process (if any) for conflict management and resolution? E.g., regarding fence maintenance and repair, trespassing of other livestock, gates left open, failures in water supplies, irrigation maintenance and use problems, water levels in the pasture that cause livestock health issues or terrain degradation, etc.
1. What are lessee responsibilities and how well does the Lease hold the lessee accountable?
- Monthly advance payment of \$10/AU to be kept on the land
 - Stocking no more than 10 AU per month
 - Not allowing the land to get overgrazed
 - Keeping up to the maximum allowable AUM “for such a period of time so as to reduce (sic!) the pasture to a healthy and sustainable condition, but such period shall not exceed eight (8) weeks from May 15, 2013.”
 - 8 weeks of stocking after May 2013
 - Follow commonly accepted ag practices: conserve health and sustainability of property, reasonably conserve the value and future use of property and prevent all unnecessary waste, loss and damage to property;
 - Prevent overgazing;
 - Use water rights associated with property for irrigation
 - Pay annual dues to Las Cuevas ditch association
 - Provide labor or pay for labor for annual acequia cleaning
 - Make all necessary improvements: maintain fence and irrigation associated with use and lessee’s maintenance of property
 - Do not allow trash and debris to accumulate
 - Do not use herbicides or pesticides without approval
 - Do not store equipment without approval
 - Timely report incidents of vandalism or damage
 - No hunting or recreational shooting allowed
 - Accountability only if/when County staff visits for inspection
2. How does the lease offer SF County opportunities to correct lessee’s actions and manage the resource?
- Only through inspection and feedback

- If lessee does not satisfy County concerns, County can proceed to terminate lease with notice period
 - There is possibly some leeway through informal negotiation with lessee, but this is not described in lease agreement
3. What incentives does the lease offer for the lessee to be a good steward? How is the lease beneficial for the lessee?
- While the pasture area is very small, it is very productive because of ample water availability (both groundwater and acequia irrigation). The data collected by the Ecotone team shows an average production of forage between 2,800 and 3,400 pounds of dry matter per acre (October 2015 sampling).
 - At a sustainable rate of grazing, the lessee would leave 60% of forage for regeneration and offer 40% to the livestock, assuming that no other animals would graze the pasture. With forage levels of 2015, 40% of the standing forage across 11.6 acres in lease equates to nearly 14,000 lbs of forage.
 - In 8 weeks, 10 animal units (AUs) can eat about 11,000 to 14,000 lbs of forage (based on standard dry matter intake data). Based on the previous observation, this volume would approximate the max they should eat to keep the pasture in good health.
 - A lessee would benefit most if he/she puts yearlings on the land instead of lactating cattle (conventional cow-calf "units"), because these animals have the most efficient digestive system for relative body weight increases during the lease duration, and therefore, would generate the greatest financial benefit. Yearlings also are best at digesting the relatively low quality forage of the LPOS pastures¹.
4. What are drawbacks or disincentives for the lessee to be a good steward?
- The pasture is small and the grazing period is limited and unclear
 - Forage quality is variable in space and between years, and appears to be degraded (lots of roughage)

¹ The available forage of LPOS pastures is of relatively low quality. As a result, the "gross feed efficiency" (GFE, the ratio of Live Weight Gain to Dry Matter Intake, or LWG/DMI) of the pasture is low. If the lessee wants to optimize GFE, putting young animals on the land is best because they have a more efficient GFE than older or lactating cattle. Yearlings are around 0.75 AU and their DMI is around 500 lb/month (or 667 lb/AUM). Therefore, 10 AUM equates to about 6,667 lbs/month. Under grazing conditions with young animals and a relatively low GFE of 0.1333 (one AU needs 7.5 lbs (DMI) to grow 1 lb in body weight (LWG)), each AU would grow about 89 lbs/month based on this forage during the lease period. This would provide a very good benefit/cost ratio for the lessee.

- Pasture is usually too wet between April and December; irrigation often not needed; in some years, drainage is needed, but existing drainage infrastructure is poorly developed.
 - The LPOS pastures are reportedly grazed/browsed by wild ungulates. Additionally, neighboring livestock appear to graze year round on LPOS before the lessee has a chance to graze; productive forage is largely gone by winter
 - Due to the wet terrain conditions, the lessee is nearly obliged to use the lease between late November and March. Consistent grazing during this period, with mostly roughage and very little high quality forage on the land, leads to overgrazing, because the livestock will first eat the most palatable and nutritious forage (grasses). As a result, after several years, no grass is left in the wet meadows. The Ecotone team's field assessment findings indicate that these signs of overgrazing (absence of palatable and nutritious forage) are present on nearly 70% of the LPOS pastures.
 - Some of the fencing is apparently of cultural/historical significance, and may require a cultural resource survey before it can be replaced or repaired.
 - Acequia community is very small and is not organized
 - Acequia infrastructure is in need of maintenance and repair
 - If lessee uses the pasture at a maximum level, the fee would be 2 month x 10 AUM x \$10 = \$200/yr. Additionally, the lessee has to pay for transportation, water, fencing, any supplemental feeding, any livestock health related costs, and acequia dues.
 - There is little flexibility in the lease fee. If the lessee wants to remove any animals mid-month, the lease does not offer any restitution of fees for the actual numbers of AUMs and periods of use within a month. This then is an incentive for the lessee to continue grazing, even if terrain conditions would advise removal of livestock, e.g., due to drought, exhaustion of the forage supply, fencing problems, water supply issues, flooding, etc.
5. How well does the Lease help the lessor (SF County) manage the grassland/wetland resource?
- There seem to be no specific measurable targets set to ensure that the uses of grazing and irrigation meet management goals and that the pasture is not degrading, that grazing potential is feasibly sustained over time, and that irrigation potential is sustained over time
 - The lease allows monitoring and inspection, which would be important for adaptive management
 - The one-year lease duration potentially helps lessor manage the property, but the two-year extension may in certain years be too long for adaptive management in times where annual updates on grazing regimes and irrigation are necessary
 - The grazing period is inadequately clear and unnecessarily limited

- The lease does not help the lessor prescribe grazing management prescriptions, such as the use of pens and night enclosures, fencing strategies such as cross fencing, rotational grazing and pasture rest requirements, drainage needs, and livestock species and their numbers to be considered for the lease (lease might want to specify horses, cow/calves, calves, heifers, steers/yearlings, bulls, goats, sheep, etc.)
- The fee is sufficiently high to use it as a negotiation tool for lessee to do some additional land stewardship work in lieu of fee payments

CONCLUSIONS:

1. The lease document offers simple but adequate provisions for Santa Fe County to manage the pastures of LPOS. While the stocking rates and duration seem right for the long-term use of the pastures without risks of resource degradation, other provisions combined with terrain conditions appear to increase the risk of resource degradation.
2. The lease document includes a few words and phrases that currently lead to ambiguous management conditions and that need clarification for better management. Additionally, it is unclear which pastures fall under the lease.
3. The lease area is relatively small, the lease duration short and the stocking rate low. As a result, the economy of scale and incidental costs to the lessee are relatively high, which are an economic disincentive to the lessee to be a good steward of the land.
4. Fee levels are relatively low and would in most years allow the permittee a good benefit/cost ratio in relation to the forage quality of the pastures.
5. The fee structure is somewhat rigid and does not allow for credits or fee restitution in lieu of maintenance or stewardship work or reduced AU days of grazing. A more flexible fee structure may offer incentives to the lessee for better pasture management.
6. There are insufficient grazing management conditions in the lease document to mitigate negative terrain conditions (e.g., excessive wet terrain that leads to winter grazing, lack of cross fencing for paddocking and rotational grazing), which together may lead to overgrazing.
7. Physical infrastructure, particularly fencing, drainage and acequias, are in very poor condition. The resulting wet or dry terrain conditions and trespass by neighboring cattle contribute to overgrazing and are a disincentive to the lessee to be a good steward of the resource.
8. Santa Fe County will need to develop and implement improved management systems regarding the lease (as a business arrangement and as a land resource management tool), such as terrain management goals, inspections, conflict resolution procedures, and maintenance schedules, in order to better manage the lease and the pastures as a resource.

ATTACHMENT II – A SUGGESTED VISION, GOAL, AND OBJECTIVES FOR GRAZING MANAGEMENT AT LOS POTREROS OPEN SPACE

The following preliminary vision statement for the LPOS Management Plan is based on the Chimayo Community Plan (2015), feedback from community meetings, and conversations from stakeholders.

The LCOS:

- *Expresses the area's traditional, pastoral scenic qualities and historical characteristics. The LPOS is a peaceful open space area, without any active use, and with minimal changes to the land. Any passive uses protect the land and are faithful to local traditions.*
- *Maintains optimal wildlife habitat qualities.*
- *May include some agricultural uses that have been considered carefully and are designed to minimize the impact on the land.*
- *May include some grazing activities, but only if great care and reference is provided to historical uses, a more equitable grazing lease system that benefit locals, the use of minimal fencing, and the consideration of haying as an alternative or additional use to grazing.*
- *Has active acequias based on maintenance of water rights attached to the land for irrigation and grazing.*
- *Is used for educational opportunities in relation to all uses and management activities.*
- *Has some subtle and simple signage that recognizes public landmarks and spaces.*
- *Is used primarily by local residents and youth and investments on the property are primarily geared to the quality of life for locals.*
- *Is cared for through a system of local, community driven stewardship.*
- *Is actively managed by Santa Fe County. The County is a good neighbor and steward for the land and plays an active role as parciante on the acequia.*
- *Shows that it is carefully maintained, including the rivers, cottonwoods, and brush at its boundaries. Riparian buffer strips are maintained to improve water quality in the rivers.*

This listing also constitutes a vision description for grazing and management decisions associated with grazing and grassland management at LPOS. Based on this vision description, one could propose that the central goal for grazing and its management at LPOS would be:

Santa Fe County and the community of Chimayo collaboratively maintain and enhance the natural qualities and beauty of the wetlands, pastures, and riparian buffers of LPOS to reflect the historical use and aesthetic of the place through traditional uses, such as grazing, haying, wildlife habitat maintenance, and periodic rest periods, with a view toward local enjoyment and education.

Subordinate goals (objectives) in support of this vision and central goal would be:

Ecotone

jwjansens@gmail.com

- Manage the property in its integrity, i.e., a way that the different values and objectives are balanced as a whole (and not one despite another)
- Maintain the ecological health, resilience, and productivity of the LPOS wetlands, pastures and riparian areas
- Maintain the area's scenic, pastoral, and historical qualities
- Maintain wildlife habitat qualities
- Maintain water rights and acequia use
- Explore and use educational opportunities
- Explore and develop locally appropriate, small-scale agricultural opportunities
- Provide and maintain locally appropriate interpretive education
- Seek and maintain optimal working relationships with neighbors and other local stakeholders

Management decisions should be made in the spirit of the vision, aimed at meeting the central management goal, and in adherence to the specific objectives for the LPOS.

EXAMPLE OF GOAL-ORIENTED MANAGEMENT ACTION:

Need or request: Fence on the southeast side of the southern pasture is in disrepair. Neighboring livestock enter the leased pasture. Lessee livestock can escape also.

Process: County Planning staff visits with lessee and neighbor to assess the situation, listen to concerns, and discuss potential solutions. Planning staff writes a work order with a prescription that outlines the scope of work, timeline, and other considerations discussed with the local stakeholders. Planning staff sends work order to County Maintenance Crew or others selected to conduct the repairs. Planning staff schedules a joint site visit with maintenance workers to explain the work and receive feedback from maintenance workers, and finalizes implementation details. Planning staff updates the work order and prescription accordingly. Planning staff makes sure at all times that the work order details adhere to the vision, central management goal, and specific management objectives, and reconciles any conflicting elements in the work order in coordination with maintenance staff and local stakeholders.

For example:

- If wet terrain conditions preclude the use of a truck with equipment driving up to the work site, it is important to either postpone the work to when soil conditions are more solid or stipulate that supplies will have to be carried by hand or on horseback to the work site.
- When selecting supplies, it is important to choose materials that are visually compatible with the historical character of the landscape. For instance, juniper posts would fit the scenic character of the site more than t-posts in highly visible areas. Additionally, older fencing materials may need to be reused or kept on-site while newer supplies are used

Ecotone

jwjansens@gmail.com

in an unobtrusive way to reinforce the older fencing material. The detailed selection of supplies should be determined together with the lessee and neighbor(s) and prescribed in detail for the maintenance workers.

- In solving the problem, County staff will need to address the root cause of the problem. When the fence is broken as a result of natural conditions (e.g., poles rotten due to prolonged presence in saturated soil, or fence broken due to wildlife or rough livestock behavior), the choice of solutions and supplies needs to be appropriate in response to the root cause of the problem. For example, replacing fence posts with wooden material may be short-lived, because they may rot again in a few years' time. Instead, County Planning staff may want to also address drainage conditions of the pasture, reinforce the post hole with mortar or concrete, or choose for posts that look old but are rot-resistant. Just repairing the fence without considering wildlife behavior will most likely also be short-lived, because wildlife will most likely damage the fence again. Instead, fence repair may need to include the construction of elk crossing bars to protect the fence. Many other options may exist, and a process of negotiation and creative, collaborative problem solving with all parties involved will likely offer the best solution.

Inspection: After completion of work, County Planning staff will need to inspect the work and sign off on its satisfactory completion. Follow up with the lessee and neighbor would confirm the quality of work over time. Photo documentation and documentation of process and cost components will help with organizing similar repairs in the future, while providing evidence for reporting and any future communication or justification of the work. In the documentation, reference should be made to what extent the relevant management goals and objectives were met through this work.

ATTACHMENT III – DESCRIPTIONS AND EXAMPLES OF LEGAL GRAZING ARRANGEMENTS

Grazing Lease: A grazing lease is a legal arrangement through which a grazing operator (lessee) is offered the use of grazing land under certain conditions. Leases are typically exclusive agreements between a lessor and one lessee. The lease terms define the duration (which is usually for multiple years), maximum stocking rate, and periods of grazing. A lease may also specify details about responsibilities for gates, fencing, land conditions, water supplies, etc. Usually, leases follow standard legal language. Leases offer a relatively unencumbered use to the lessee. Land use and land maintenance are often delegated to the lessee. As a result, the lessee has relatively a lot of freedom to determine the use of the grazing area. Leases vary from one-year (year-to-year renewable) to multi-year durations, and from fairly simple and unrestricted to detailed and restrictive. Several lease agreement templates are attached as examples.

Grazing Permit (or Special Use Permit): A permit is a legal arrangement through which one or more permittee(s) receive the right to graze under specific conditions and guidelines regarding duration, stocking rates, grazing areas, rotational grazing, and grazing periods. A permit, however, does not constitute an exclusive contract between two parties. A permit may specify details about responsibilities for gates, fencing, land conditions, water supplies, etc. However, the land management agency typically keeps the lion share of the land management and maintenance responsibilities and can revoke a permit at any time if weather, land conditions, or other circumstances lead the land manager to decide to suspend the grazing activity. Permits are often offered through a specific application process or request for proposals or bids. Permits can be multi-year or annually renewable. A permit process allows a land manager to set a minimum bid price, but also to negotiate land stewardship services in lieu of permit fee reductions. In this way, a land manager can use permits as tools to manage resources.

Grazing (or Resource) Stewardship Contract: A stewardship contract is a legal arrangement through which a land restoration and stewardship contractor enters into an agreement with the land manager to benefit from the land (e.g. through grazing) and in exchange also to perform specifically prescribed land maintenance and restoration activities. The exchange can be a zero-net sum arrangement or an exchange in which a balance in services is compensated in a monetary way to either the landowner or to the contractor. A stewardship contract is usually defined for a specific time period and for very specific activities with prescribed details on the performance process and achievement targets. A stewardship contract is in a way a hybrid between a lease and a permit. The contract follows a proposal or bidding process, and the successful bidder (often the most qualified applicant) is selected for the job. It allows the land manager to manage the resource in great detail toward the achievement of goals of a future desired condition of the land, while offering the contractor a certain amount of freedom and contractual clarity of responsibilities and benefits.

EXAMPLES

Bay Area Open Space: See template grazing lease attached

Bernalillo County Open Space: See template agriculture leases attached

Forest Trust: See template grazing lease attached

Las Vegas National Wildlife Refuge: The US Fish & Wildlife Service manages a series of wildlife refuges in eastern NM as part of the Las Vegas National Wildlife Refuge. The agency uses Special Use Permits to invite grazing permittees on selected grasslands and wetlands to meet agency goals for managing the resource. Resource management targets and prescriptions are defined annually based on monitoring results. Subsequently, the agency selects which areas and specifically what pastures need to be grazed in the coming year, and with what intensity and during what season. In order to achieve the planned grazing, the agency issues a request for quotes (with a minimum bid amount) to invite bidders to submit proposals. The successful bidder receives a one-year Special use Permit for grazing. The bid package spells out in detail the location, specific pastures, pasture rotation schedules, grazing periods in the year, stocking rates, and infrastructure details for the permit. This allows the agency to use the permittee's activities as a tool to manage the resource toward specific goals and evaluate every year how to allocate the grazing in the following year based on land conditions, weather, water availability, etc.

US Forest Service and BLM: The US Forest Service and BLM hold many acres of grazing lands that are traditionally managed as allotments with multi-year grazing permits. In fact, these permits function as leases with durations of 10 years or more and sometimes up to 99 years. This has resulted in the perception among permittees that the grazing right is an entitlement. In this format, the agencies try to combine their mandate of sustained resource use and economic support to adjacent communities with the mandate to manage the resource in perpetuity and for the greatest common good. In some cases, individual resources managers in certain areas are able to manage more toward land health, while in other cases, the system does not help to achieve land health goals and leans more toward the support of rural user needs, often to the detriment of long-term resource health.

ATTACHMENT IV – TEMPLATE GRAZING LEASES

Ecotone

jwjansens@gmail.com

APPENDIX D: MAINTENANCE PLAN

SFC CLERK RECORDED 10/12/2016

Santa Fe County Open Space Management Planning Initiative

A Maintenance Plan the Los Potreros Open Space Property Santa Fe County, New Mexico

FINAL DRAFT
June 30, 2016



Los Potreros Open Space maintenance activities will focus on vegetation and grazing management, riparian area management, and water management

Ecotone

Conservation Planning for Landscapes in Transition

1413 Second Street, Suite 5
Santa Fe, New Mexico 87505
505-470-2531
jwjansens@gmail.com

Table of Contents

INTRODUCTION	3
VISION STATEMENT, GOALS AND OBJECTIVES	4
TERRAIN MANAGEMENT UNITS	5
RIPARIAN AREAS AND LOWER SLOPES	8
Stump treatment and use of herbicides	10
Disposal of Wood Waste Material	11
GRASSLANDS AND WETLANDS	11
Maintenance of Grassland and Wetland Resources and Infrastructure	11
Inspections of Gates and Stiles	13
The Property’s Historic and Scenic Qualities	13
Riparian Edges and Buffers	13
ACEQUIAS AND SLOPES	14
INSPECTIONS, MONITORING, AND ADAPTIVE MANAGEMENT	19
Inspection Protocols	19
Monitoring	19
Adaptive Management: Identifying Choices and Making Decisions	19
LABOR REQUIREMENTS AND CAPACITY BUILDING	20
FTEs	20
Santa Fe County Capacity	20
Community Outreach and Engaging Volunteers	21
Potential Volunteers	21
Volunteer Maintenance Activities	22
Community Liaisons	22
County Point Person	22
APPENDIX A. Grazing Lease and Pasture Management	24
APPENDIX B. Santa Fe County Open Space Inspection Checklist – Los Potreros OS	26

INTRODUCTION

This Maintenance Plan documents recommended maintenance activities for the Los Potreros Open Space (LPOS) property in Chimayo, in Santa Fe County, NM, based on the analysis of findings and community feedback during a general inventory phase and a more detailed field characterization phase. The purpose of the document is to provide a detailed overview and timeline of maintenance activities, along with projected needs for labor and equipment, as part of the LPOS Management Plan. This Maintenance Plan also makes strategic recommendations for the frequency, timing, and human capacity options Santa Fe County may want to consider to implement the maintenance activities.

The LPOS includes 3 parcels that Santa County holds in fee simple, and one parcel for which Santa Fe County holds a conservation easement. Conforming to the parcel numbering at the time of the purchase of the property, the parcels are identified in detail in Figure 1 and Table 1.



Figure 1. Parcel identification for Los Potreros Open Space.

Table 1. Parcel identification and descriptions for Los Potreros Open Space.

Parcel Number	Parcel Name	Location Description
Parcel 1	South Potrero parcel	Parcel along Rio Santa Cruz and CR92 (0.31 acres of grassland)
Parcel 4	Conservation Easement pasture	Parcel along Rio Santa Cruz across from El Santuario parking area (2.48 acres of grassland)
Parcel 6	West Potrero pastures	Parcel at confluence of Rio Santa Cruz and Rio Quemado, just east of El Santuario (8.87 acres of grassland and wetland)
Parcel 6	Gate area	Parcel between Juan Medina Road and grassland/wetland parcel (approx. 1 acre of land)
Parcel 7	East Potrero pastures	Parcel upstream along Rio Quemado (6.98 acres of grassland and wetland)

Each parcel also includes a riparian buffer strip. However, the acreages listed for the parcels pertain to the grassland and wetland vegetation components of the parcels.

VISION STATEMENT, GOALS AND OBJECTIVES

The following vision statement for the LPOS Management Plan is based on the Chimayo Community Plan (2015), feedback from community meetings, and other input from stakeholders.

In 2025, the Los Potreros Open Space is a peaceful, passively used open space area, faithful to the local traditions of the Chimayo community. The land expresses the area's traditional, pastoral scenic qualities and historical characteristics, and is managed to protect its wildlife habitat and corridors. The LPOS is carefully maintained, including the rivers, native trees, and brush.

It is possible that the LPOS includes some agricultural uses that have been considered carefully and are designed to minimize the impact on the land. The open space may also include some grazing activities if reference is provided to historical uses, along with an equitable lease system, the minimization of fencing, and the consideration of haying as an alternative or addition. The land may also be used for educational opportunities.

The LPOS is managed for use primarily by local residents and youth, and investments on the property are primarily geared to the quality of life for locals. Santa Fe County is active as a steward for the land, a good neighbor, and a parciante on the acequias.

Based on this vision description, the central management goal for LPOS is:

Santa Fe County and the community of Chimayo collaboratively maintain and enhance the natural qualities and beauty of the uplands, acequias, wetlands, pastures, and riparian zones of LPOS to reflect the historical use and aesthetic of the place through landscape conservation and traditional uses, such as grazing, haying, wildlife habitat maintenance, and periodic rest periods, with a view toward local enjoyment and education. Traditional uses should be organized in such a way that they are equitable, low-impact, supportive of the qualities of the land, and transparently managed.

Specific management objectives in support of this vision and central goal are:

1. Manage the property in a way that the different values and objectives are balanced as a whole (and not one despite another), and seek and maintain optimal working relationships with neighbors and other local stakeholders
2. Control access by maintaining roads, trails, fences, gates, stiles, fords and other river crossings, and signage
3. Maintain the area's scenic, pastoral, and historical qualities, and provide and maintain locally appropriate interpretive education, which may include small and simple signage
4. Maintain the ecological health, resilience, and productivity of the LPOS wetlands, pastures and riparian areas, and maintain wildlife habitat qualities
5. Establish a managed, restorative grazing lease program (and rest periods) as a way to improve grassland and wetland health
6. Explore and develop locally appropriate, small-scale agricultural opportunities (e.g. haying) in response to the need to develop an agricultural use for County Open Space properties, and, therefore, maintain water rights and acequia use
7. Explore and use educational and research opportunities

Management decisions, including maintenance activities, should be made in the spirit of the vision, aimed at meeting the central management goal, and in adherence to the specific objectives for the LPOS.

TERRAIN MANAGEMENT UNITS

Maintenance activities are often strongly related to specific terrain characteristics. The Land Suitability Map developed in Phase-2 for identifying appropriate uses for the different types of terrain was based on the identification of Terrain Management Units, and the Suitability Map describes the Terrain Management Units. The same map will be used in this plan to identify the Terrain Management Units as a basis for identifying maintenance activities (Figure 2). Table 2 lists the Terrain Management Units and their regular maintenance activities.

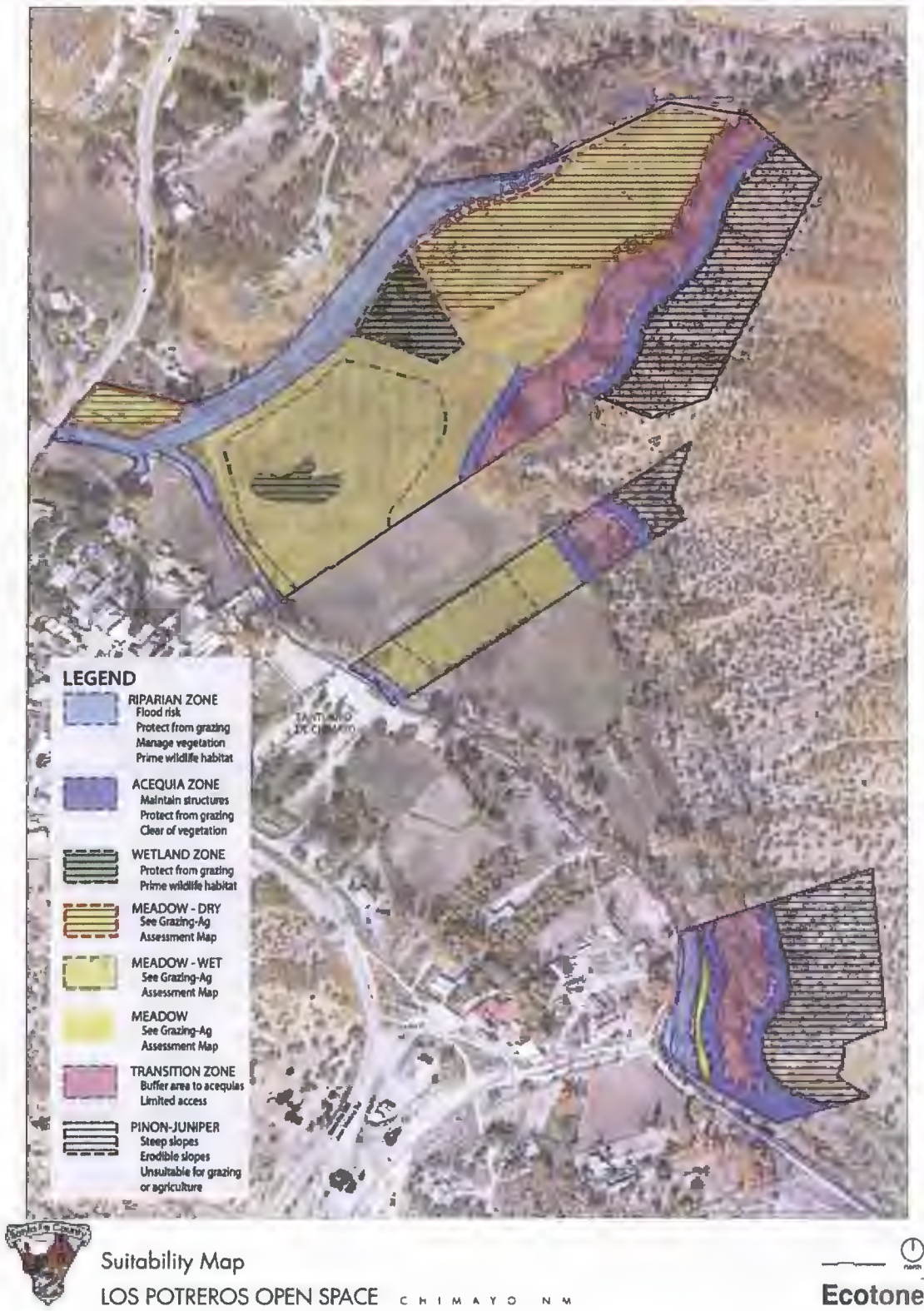


Figure 2. Los Potreros Open Space – Terrain Management Units Map

Table 2. Overview of Terrain Management Units and anticipated regular maintenance activities related to subordinate management goals for the property.

Mgmt Goal Ref #	Terrain Management Unit [Hispanic Name]	Anticipated Regular Maintenance Activities	Maintenance Frequency
1	All Terrain Management Units	Dialogue about maintenance with neighbors and stakeholders and integrate feedback in planning	Quarterly
2	All Terrain Management Units	Delineation and inspection of property boundary markers, especially at corner points with T-posts combined with a Carsonite fiberglass post that is labelled	One time (year-1) and when need arises
2, 3, 4	All Terrain Management Units	Inspection and repairs of: a. Fences, gates and stiles b. Fords and stream crossings c. Roads and trails (esp. drainage fixes along CR 92) d. Signage	a. Annually b. Annually c. Annually d. Annually
4	1. Riparian Area: stream and streamside terraces [<i>el rio, el bosque, y la ribera</i>]	a. Fallen trees, dead wood, woody debris removal b. Removal of vegetation encroaching on the stream channel in specific locations	a. Annually b. Once in 2-3 years
4	2. Acequia Zone: irrigation ditch, berms, and infrastructure [<i>las acequias</i>]	a. Acequia cleaning, tree thinning, bank repair [<i>la limpia y la jara</i>] b. Infrastructure repairs c. Gopher and mole control	a. Annually (spring) b. Annually (spring) c. Annually
4	3. Wetlands: permanently saturated soils [<i>la cienega</i>]	a. Periodic removal of dead wood and invasive plants b. Cleaning of drainage structures	a. Every 2-3 years b. Annually
4, 6	4. Meadows – dry: sandy, non-irrigated grassland [<i>la vega</i>]	a. Inspection of irrigation system b. Cover crop and weed management	a. Annually once water rights are secured b. Annually
4, 5	5. Meadows – wet: periodically saturated, loamy grassland [<i>el prado</i>]	a. Irrigation and drainage management b. Grazing management	a. Monthly b. Monthly-Quarterly
4, 5, 6	6. Meadow (or hay land): somewhat higher, high quality irrigated grassland or cropland [<i>la joya</i>]	a. Irrigation and drainage management b. Grazing management	a. Monthly b. Monthly-Quarterly

Mgmt Goals	Terrain Management Unit <i>[Hispanic Name]</i>	Anticipated Regular Maintenance Activities	Maintenance Frequency
4	7. Lower Slopes – Transition Zone: sandy, gravelly and rocky soils with mixed grass-shrub vegetation, sub-irrigated <i>[los altitos]</i>	a. Removal of dead wood b. Removal of invasive plant species c. Soil conservation	a. Annually b. Annually c. Annually

The rural character of LPOS is of central importance to this landscape and the neighbors and Chimayo residents are keen to keep this rural character intact. Santa Fe County's maintenance work will need to keep these values in consideration. This might mean making choices that make maintenance slightly more cumbersome or costly.

County maintenance crews, groups of volunteers, and contractors will need to access the property and conduct their work in the least intrusive way. Heavy trucks and maintenance equipment such as backhoes can impact the fragile, wet soil of the area and contribute to the spread of noxious weeds. For the important scenic value of the property to be sustained, access by County maintenance vehicles need to avoid developing tracks and visible roads. It would be advisable to consult neighbors on appropriate ways to work the land with the least lasting impact.

RIPARIAN AREAS AND LOWER SLOPES

More detailed, recommended maintenance activities for the riparian area, stream channel, and flood-prone area for the Rio Santa Cruz, Rio Quemado and the lower slopes between the irrigation ditches are included in Table 3. No permits are needed for most regular stream and riparian maintenance and improvement activities. However, a Nationwide Permit (Section 404) from the US Army – Corps of Engineers, and the associated Section 401 certification from the NM Environment Department – Surface Water Quality Bureau will be required for the construction of bank stabilization and channel improvement projects.

Table 3. Detailed Stream and Floodplain Maintenance and Restoration Needs, with Labor Estimates and Implementation Timelines and Prioritization

Rio Santa Cruz

LOCATION	MAINTENANCE ACTIVITY	AREA	FREQUENCY	LABOR
Entire length of Rio Santa Cruz	Fence inspection and repairs	1900 lf	Annually	1 (or less) day for one crew member
Stream channel along parcel 1	Removal of trees fallen in the river and woody debris that obstructs the flow	500 ft	Annually and in case of emergencies (fallen trees)	A few days in year-1; probably approx. 1 day/yr after that
Entire length of river	Removal of dead & down and leaning woody debris from river banks and slopes between acequias; @ up to 50% of all dead biomass (or approx. 2.4 tons)	0.5 acre	Annually and in case of emergencies (fallen trees)	2-3 days for one sawyer and one swamper (incl. loading)
Parcel 4: East side of Santuario parking lot	Remove specific willow stand that is causing stream flow to create excessive erosion	50 lf	Once	½ day for sawyer and helper
Entire length of river	Thinning of overgrown willows by 20% of stems.	1900 lf	Once every 3 years	1-2 days for one sawyer and one helper
Entire length of river	Removal of Russian olives from river banks (see note on use of non-toxic herbicide use)	1900 lf	Once every 3 years	1-2 days for one sawyer and one helper
On road next to parcel 1	Drainage improvements along CR92: rolling dip in driveway running along the river and improving channel flow in arroyo	500 sq ft	One time and annual inspection and maintenance	1 day for experienced operator with skidsteer to build, 20 minutes for annual inspection
In stream bend of parcel 1	Structural bank protection (e.g., rock/post vanes) (Section 404/401 permit required)	50 ft	One time	Based on design proposal

Rio Quemado

LOCATION	MAINTENANCE ACTIVITY	AREA	FREQUENCY	LABOR
Entire length of Rio Quemado	Fence inspection and repairs	1500 lf	Annually	1 (or less) day for one crew member
	Removal of trees fallen in the river and woody debris that obstructs the flow	1500 lf	Annually and in case of emergencies (fallen trees)	A few days in year-1; probably approx. 1 day/yr after that
	Removal of dead & down and leaning woody debris from river and banks	2.5 acres	Every 3 years	Initially about 5 days; then 2-3 days for one sawyer and one swamper (incl. loading)
	Pile burning of fuel (in collaboration with County fire department)	N/A	Once every 3 years + in case of emergencies (fallen trees)	Initially 2-3 days; then 1 day (incl. assistance from fire department)
Entire length of river	Thinning of overgrown willows by 20% of stems	1500 lf	Once every 3 years	2-3 days for one sawyer and one helper
Entire length of river	Removal of Russian olives from river banks	1500 lf	Once every 3 years	1-2 days for one sawyer and one helper

Stump treatment and use of herbicides

For the removal of non-native Russian olives, it is recommended that non-toxic herbicides are used. We suggest the following prescription to remove these trees:

- Cut the trees close to the ground during the fall or winter and lop the branches and stems into 3-4 foot long pieces and create small piles for hauling off site or burning.
- Use a very targeted method to apply herbicide to the cut stump of the tree. This can be done using a paint brush or a squeeze bottle. A non-toxic herbicide is preferred in aquatic areas— please see below.
- The preferred herbicide in areas near streams is a 20% vinegar solution that can be sprayed or brushed on cut stumps. The strong vinegar can be purchased for \$13-\$25 per gallon from a variety of sources including San Jacinto Environmental Supplies, Maestro-Gro or Factory Direct Chemicals. This method's success rate is roughly 50% and will have to be repeated or combined with repeated trimming of sprouts or covering of the stump with 60 mil black tarp for lasting success.
- Stumps can be covered with 60-mil black tarp to starve them from sun light and prevent resprouting. This latter method is not common in New Mexico, but has been used in Europe, and preliminary tests in New Mexico show that it is very effective, although labor intensive.

- If conventional herbicides are used, the ideal ones are Roundup (Glyphosate with a half-life of 90 days depending on temperature) or Garlon 4 (Triclopyr with a half-life of 60 days). No or very little herbicide contact occurs with soil, water or non-target plants and organisms when handled carefully.
- Recut and treat resprouts for up to 5 years. Conventional herbicide treatments range from 50 to 90% effective in the first year so retreatment is very important.
- If using herbicides in the floodplain it is suggested to use "aquatic approved" versions, which are considered by the EPA to be safe to apply near or in water without damaging fish or other aquatic species. Aquatic approved herbicides usually cost more than non-aquatic versions.

Disposal of Wood Waste Material

Woody material cut and removed from the slopes and riparian area could be disposed of in a variety of ways. It is conceivable that fresh or dried pinon and juniper wood could be (1) offered to the wood cutters as part of the compensation for their work; (2) distributed among acequia parcientes or among elderly people in the community; or (3) pile burned once every 3 years. Dead wood from species that are not suitable for firewood could be (1) pile burned every 3 years or (2) hauled to a landfill. The latter option is recommended in particular for root material of invasive species, such as Russian olive, tamarisk, elm, and tree of heaven. Brush and slash from shrubs and branches cut from trees could be (1) chipped for use on trails in the community or (2) piled and burned every 2 to 3 years.

GRASSLANDS AND WETLANDS

Maintenance and restoration of grasslands and wetlands includes an administrative component and a terrain management component. The administrative component concerns the management of the grazing lease and the associated administrative activities, such as grazing planning, contracting, inspections, and monitoring. Suggested management changes to the grazing lease are included in Appendix A. Terrain management includes activities related to the maintenance and improvement of land resources and infrastructure, such as vegetation management through resting, grazing, weed control, irrigation, drainage, and access control (e.g., fencing). Management of the legal and social aspects and the terrain features and infrastructure of the acequia irrigation system are related to management of grasslands and wetlands, but are described in a separate section.

Maintenance of Grassland and Wetland Resources and Infrastructure

In order to create incentives for the lessee to be a good steward, Santa Fe County must invest in pasture restoration and infrastructure upgrades. Needed maintenance activities and improvements on the land are included in Table 4. No permits are needed for any of the grassland and wetland maintenance and improvement activities.

Table 4. Detailed Grassland and Wetland Maintenance and Restoration Needs, with Labor Estimates and Implementation Timelines and Prioritization

LOCATION	MAINTENANCE ACTIVITY	AREA	FREQUENCY	LABOR
Parcels 6-7 (West-East Potrero)	Fence inspections and small repairs: all exterior + interior fences	5,780 lf	Annually	1-2 days for 2-person crew
Southeastern, eastern and northern sides of West Potrero	Repair / replacement of ineffective boundary fences, gates, and corner post systems to encourage cross fencing for rotational grazing	1,350 lf	Once and when need arises	3-4 days for 2-person crew
Parcel 6 (West Potrero pasture)	Drainage improvements: construction of a small sediment pond, lowering of the drainage inlet pipe, and constructing controllable inlet; fencing out the structures	500 sq ft	Once and when need arises	4-5 days for 2-person crew with skidsteer (incl. fencing work)
Parcels 6-7	Restorative grazing of the Potrero pastures	14.65 ac	Annually	About 8 weeks throughout year
Entrance (gate) area and northeastern parcel (Parcel 7)	Weed control, such as removal of knapweed at the entrance gate area, removal of Kochia and other weeds in the drier, northern pastures, and removal of Siberian elm and Tree of Heaven (<i>Ailanthus altissima</i>) on the eastern boundary of the pastures	6.75 ac	Annually	Depending on the treatment type
Along Rio Santa Cruz and Rio Quemado in lower pasture (West Potrero)	Fencing and planting of a riparian buffer strip along the Rio Quemado and Rio Santa Cruz; the buffer strip could be approximately as wide as the higher sandy banks between the stream channel and the wet meadow area, or the small drainage ditch that runs in the meadow along the Rio Santa Cruz (approx. 20-30 ft wide). Smooth rather than barbed wire is recommended for the top strand of the fence to help with wildlife passage.	1,120 lf (= 0.64 ac)	Once	TBD, depending on bid for project

Inspections of Gates and Stiles

Additional maintenance related activities include inspections of gates and stiles. If gates are left open, neighboring cattle may trespass onto LPOS or livestock on the leased land may trespass on neighboring property. Communication and collaboration will need to be developed with neighbors to ensure that rules are set regarding gates and that these rules are collectively upheld. Over time, such collaboration between neighbors could be expanded to encompass other maintenance tasks and to include joint projects and work days.

The Property's Historic and Scenic Qualities

The historical scenic qualities of the LPOS are in part determined by the design, size, shape, and colors, and materials used in specific landscape features, such as fences, gates, tree rows, water drinkers, etc. It is important for community members that these historical features are maintained. Therefore, careful choices will need to be made at times of repairs and improvements. For example, modern features of metal t-post fences can be combined with wooden stays made from juniper boughs, and perhaps alternated with juniper posts, to maintain a more rustic, rural look. Similarly, commercial, treated corner posts and H-braces could be stained dark brown or black to make them blend into the landscape. Areas along fences where deer or elk tend to cross could be reinforced with thin wooden beams or juniper posts alongside the wire to protect them from the damage caused by wildlife jumping the fence. Site-specific best management practices will need to be developed and documented for the property to ensure that the character of the place is maintained.

Riparian Edges and Buffers

Residents mentioned that the western edge of the West Potrero pasture (parcel 6, along Rio Quemado) used to be actively irrigated. This area is slightly elevated above the wet meadows, and the stream has incised about 3 to 4 feet below the banks, leaving these bank strips higher and drier than the surrounding landscape. This may have led to a more rapid die back of the riparian vegetation in this area. In order to maintain the riparian vegetation and be able to effectively enlarge the riparian buffer in this location, irrigation water will need to be "pushed" pro-actively toward that area by digging and maintaining ditches that run across the meadow. County staff may want to consult local residents and ask how this was done in the past.

The proposed expansion of the riparian buffer strips along the Rio Santa Cruz and Rio Quemado in the West Potrero pasture (parcel 6) was first recommended in the 2015 Chimayo Community Plan to use enhanced buffers strips for filtering water from the pasture for the purpose of water quality improvement in the streams. These riparian buffers will also help drain the pasture and serve as a (FEMA) flood zone delineation – absorbing moderately high floods in both rivers. Additionally, these riparian buffer zone will serve an important purpose as wildlife habitat and connective corridors.

ACEQUIAS AND SLOPES

In association with maintenance of the grasslands and wetlands, the irrigation system requires maintenance in order to provide for an effective irrigation system for the grasslands.

Maintenance activities for the irrigation system and the surrounding slopes are listed in Table 5. No permits are needed for any of the acequia maintenance and improvement activities though consultation with *parciantes* that share the ditch is essential.

Table 5. Detailed Acequia and Lower Slope Maintenance and Restoration Needs, with Labor Estimates and Implementation Timelines and Prioritization

LOCATION	MAINTENANCE ACTIVITY	AREA	FREQUENCY	LABOR
Northeast side of Rio Santa Cruz valley	Repair and improvement of the Acequia de las Cuevas (Las Cuevas Ditch): channel leveling and cleanout, pasture gates, and desagues	Approx. 2,630 lf (incl. other properties)	Annually between February and April	2-3 days for 2-person crew, or for community event
Slopes between ditches on east side of LPOS	Remove dead wood (leaning or fallen trees and dead and down logs, and invasive trees)	Approx. 1.5 ac	Once every 2-3 years	Initially about 5 days; then 2-3 days for one sawyer and one swamper (incl. loading)

Specific acequia cleanout activities include:

- Organizing and coordinating collaborative events with neighbors (*"parciantes"*) on the ditch; the neighbors are Raymond Bal, Victor Vigil, and Josephine Martinez; maintaining the ditch administration together; annually identifying a ditch rider (*"mayordomo"*) who is in charge of inspections, organizing emergency repairs, collecting fees, and coordinating between *parciantes*
- Organizing between *parciantes* should ideally also include outreach to other acequia groups, and especially the Potrero Ditch that runs on the southwest side of LPOS, parallel to Juan Medina Road (SR 520), to coordinate about water use, acequia cleaning, and potentially sharing hired crews of workers
- Maintaining grade and flow (cleanout while acequia is running, or using laser level)
- Annual removal of sediment, debris, leaf material, etc. (*"la limpia"*)
- Annual pruning of trees, removal of willows and other brush that grow into the acequia channel and inhibits flow (*"la jara"*)
- Cutting or pruning of old trees that on the banks that may fall in the next year
- Installing, removing or repairing field-level gates and drains (return-flow channels from the field to the river, a.k.a. *"desagues"*).

Table 3. Summary of Recommended Maintenance Activities for Year-1 for suggested Human Capacity Entities for Implementation.

Location Code	Management Activity	Location	Staff Prep	Volunteer Activity	SF County-M (Crew)	Contractor	Labor & Cost Items
Entire property	Fence inspection and repair (all interior and exterior fence)	Parcels 6+7: Entire grassland + wetland area: approx 5,780 lf	One time to establish standards and prescription				Annually: 1-2 days for 2-person crew
LP-GRA-P, LP-GRA-W	Fence repair of in-effective boundary fences (esp. on SE and E sides of pastures)	Parcel 6: 1,350 lf	One time to establish standards and prescription and to choose form of labor source				TBD: Based on proposal (one-time investment); possibly around \$1,500-\$2,500 depending on material and labor costs
LP-WET, LP-GRA-W	Drainage improvement: sediment pond, drainage pipe, fence	Parcel 6: Drainage channel of wetland in West Potrero pasture: 500 sq ft	One time to formulate RFP and standards				5 days for 2-person crew; Costs TBD: Based on proposal (one-time investment); possibly
LP-GRA-D	Weed control: removal of elm, Ailanthus, knapweed, Kochia, etc.	Parcel 6-gate area + Parcel 7: Dry pastures and entrance area: 6.75 ac	One time to establish protocols and methods				2-3 days/year for 2-person crew
LP-RIP	Fence inspection and small repairs - Rio Santa Cruz and Rio Quemado	All parcels: 1,900 lf + 1,500 lf = 3,400 lf					2 days/year for 1 crew member
LP-RIP	Removal of trees fallen into river and woody debris that obstructs flow	All parcels: Stream channels: 500 lf + 1,500 lf = 2,000 lf	One time to establish standards and prescription				3-4 days/year for one sawyer and one swamper or for a group of
LP-RIP	Removal of invasive species, juniper or willow encroaching on channel, and woody debris on	All parcels: 1,900 lf + 1,500 lf = 3,400 lf	One time to establish standards and prescription				Every 3 years, 5-6 days (possibly less over time) for one sawyer and one
LP-RIP	Removing dead wood and leaning trees from river banks and terraces	All parcels: 3 acres	One time to establish standards and prescription				Annually and in case of emergencies: about 5 days for one sawyer and
LP-GRA-D	Pile burning	All parcels: When need arises	Prep burn and coordinate with Fire Dep				TBD
LP-RIP	Drainage improvement on driveway off of CR92	Parcel 1: 500 sq ft	Plan SOW and specs and choose labor source				1 day for experienced operator: \$1,000-\$1,500, including base coarse

Location Code	Management Activity	Location	Staff Prep	Volunteer Activity	SF County-M (Crew)	Contractor	Cost Items
LP-RIP	Structural bank protection	Parcel 1: 50 lf of stream	Plan SOW and specs and hire contractor				TBD: Based on proposal (one time investment); possibly around \$50,000
LP-ACE	Acequia cleanout, channel leveling, irrigation gates, desagues	All parcels: Approx. 2.630 lf (incl. neighbor properties)					2-3 days for 2-person crew or community volunteers
LP-TOE	Removal of dead wood, leaning and fallen trees, and invasive plants	All parcels: Approx. 1.5 acres	One time to establish standards and prescription				Every 3 years, 2-3 days (possibly less over time) for one sawyer and one swamper or for a group of

LP-GRA-P = Grassland, Pasture Unit

LP-GRA-W = Grassland, Wet (meadow) Unit

LP-GRA-D = Grassland, Dry Unit

LP-RIP = Riparian Unit

LP-ACE = Acequia Unit

LP-TOE = Toe of Slope Unit

Table 4. Summary of Recommended Maintenance Activities for Different Time Periods.

Location Code	Management Activity	Location & Area Size	YR1	YR2	YR3	YR4	YR5	YR6-10	YR11-20	>YR20	Team	Logistical Needs	Labor & Cost Estimate
Entire property	Fence inspection and repair (all interior and	Entire grassland + wetland area:									SFC-M (Crew)	Notepad/GPS (Avenza), camera	Annually: 1-2 days for 2-person crew
LP-GRA-P, LP-GRA-W	Fence repair of ineffective boundary fences on SE and E	1,350 lf									Contractor or SFC-M (Crew)	Fencing supplies	TBD: Based on proposal (one-time investment); possibly
LP-WET, LP-GRA-W	Drainage improvement: sediment pond, drainage pipe, fence	Drainage channel of wetland in West Potrero pasture: 500 sq ft									Contractor or SFC-M (Crew)	Skidsteer	5 days for 2-person crew; Costs TBD: Based on proposal (one-time investment); possibly around \$5,000
LP-GRA-D	Weed control: removal of elm, Ailanthus,	Dry pastures and entrance area: 6.75 ac									Contractor or SFC-M (Crew)	Herbicide, mulching, mowing +	2-3 days/year for 2-person crew
Entire property	Fence inspection and small repairs -	1,900 lf + 1,500 lf =									SFC-M (Crew)	Notepad/GPS (Avenza),	2 days/year for 1 crew member
LP-RIP	Removal of trees fallen into river and woody debris that obstructs flow	Stream channels, incl. along southern parcel (#1):									Contractor or volunteers or SFC-M (crew)	Saws, hand tools, ropes, wood storage / staging area	3-4 days/year for one sawyer and one swamper or for a group of volunteers
LP-RIP	Removal of invasive species, juniper or willow encroaching on channel, and	1,900 lf + 1,500 lf = 3,400 lf									Contractor or volunteers or SFC-M (crew)	Saws, hand tools, ropes, wood storage / staging area	Every 3 years, 5-6 days (possibly less over time) for one sawyer and one swamper or for a
LP-RIP	Removing dead wood and leaning trees from river banks and terraces	3 acres									SFC-M (crew) or contractor	Saws, hand tools, ropes, wood storage / staging area	Annually and in case of emergencies: about 5 days for one sawyer and one swamper or for a
LP-GRA-D	Pile burning	When need arises									Contractor; with SFC Fire Dep	Community notification	TBD

Location Code	Management Activity	Location & Area Size	YR1	YR2	YR3	YR4	YR5	YR6-10	YR11-20	>YR20	Team	Logistical Needs	Labor & Cost Estimate
LP-RIP	Drainage improvement on driveway off of CR92	500 sq ft									Contractor or experienced SFC-M operator	Skidsteer (to build rolling dip); base coarse if	1 day for experienced operator: \$1,000-\$1,500, including
LP-RIP	Structural bank protection	next to southern parcel: 50 lf of stream									Contractor	Based on proposal	TBD: Based on proposal (one time investment);
LP-ACE	Acequia cleanout, channel leveling, irrigation gates, desagues	Approx. 2.630 lf (incl. neighbor properties)									SFC-M (Crew) or contractor	Handtools	2-3 days for 2-person crew or community volunteers
LP-TOE	Removal of dead wood, leaning and fallen trees, and invasive plants	Approx. 1.5 acres									SFC-M (Crew) or contractor or volunteers	Saws, hand tools, ropes, wood storage / staging area	Every 3 years, 2-3 days (possibly less over time) for one sawyer

LP-GRA-P = Grassland, Pasture Unit

LP-GRA-W = Grassland, Wet (meadow) Unit

LP-GRA-D = Grassland, Dry Unit

LP-RIP = Riparian Unit

LP-ACE = Acequia Unit

LP-TOE = Toe of Slope Unit

INSPECTIONS, MONITORING, AND ADAPTIVE MANAGEMENT

Effective maintenance must be grounded in scheduled, periodic field inspections and a rigorous monitoring schedule. Findings from inspections and monitoring must lead to a confirmation of scheduled maintenance, to specifications and adaptations in the scope and scale and timing of maintenance work. It may also lead to changes in the identification of who should do the maintenance work. Eventually, inspections and monitoring lead to adaptive management of the Open Space property and to lessons learned for all involved. This collaborative learning process will likely have both a practical aspect and an aspect of community building as the interaction of learning together may lead to people's appreciation for the area and the different people involved. The latter is important to grow people's interest, care, and respect for the place, and their support for recurring maintenance work.

Inspection Protocols

County staff must establish a regular inspection schedule based on the recommended maintenance tasks and their recommended inspection frequency as described above. Inspections follow a protocol by filling out an inspection form. Information is gathered by using all the senses and if possible by speaking with neighbors, users, or passersby. Santa Fe County already has an adequate inspection form. A template inspection protocol that outlines the communication and verification process and adaptive management for inspections is included in Appendix B.

Monitoring

Monitoring is the rigorous practice of documenting or measuring specific landscape features to verify whether a change of certain indicator factors is achieved or whether threshold levels of indicators are exceeded. Analysis of monitoring data will help ascertain whether the measured or observed changes are meeting management goals or not.

Monitoring can be done by taking photographs at very specific locations and comparing a time series of photographs at each photo point to detect change. Monitoring can also be done by taking specific measurements or documenting qualitative field observations on data logs.

Monitoring work must be based on a study design of the monitoring process, based on selected indicators which, in turn, reflect progress toward a stated goal. Therefore, monitoring protocols are goal and site specific, and it is not useful to present templates of monitoring protocols. However, there are monitoring Best Management Practices, such as those developed for the US Forest Service Collaborative Forest Restoration Program (CFRP), or for EPA and NRCS funded stream measurements. A selection of monitoring BMP references is included in the Santa Fe County Open Space Management Planning Guide.

Adaptive Management: Identifying Choices and Making Decisions

Feedback from inspections and monitoring will offer information that needs to be compared with goals and objectives for the property in order to decide whether the information points toward progress in meeting goals and objectives or not. No action is needed in most cases if the

information supports management goals. However, if the information indicates that the situation in the field is deviating from management goals, choices will have to be made about appropriate action.

Depending on the seriousness of the deviation of terrain conditions from management goals, a choice can be made to deliberately defer maintenance activities and letting nature take its course. This choice may be relevant if a triage of allocation of County resources is necessary to determine where maintenance efforts should be focused, or if County staff would like to experience what the consequences are of deferring maintenance.

Alternatively, County staff will want to make adjustments to either the management goals or to the terrain conditions by organizing maintenance or repair activities. It is useful to evaluate findings in a group of stakeholders and experts in order to learn from each other's viewpoints and arrive at a well-thought-out and broadly supported solution for corrective action. Such an approach also offers optimal collaborative learning opportunities and ensures strong, broadly carried stewardship over time.

LABOR REQUIREMENTS AND CAPACITY BUILDING

FTEs

The recommended maintenance and repair work for LPOS would require 0.09-0.16 FTE each year for regular maintenance and 0.22-0.29 FTE in year-1, plus considerable staff time (up to 0.2 FTE) for planning, coordination, and community outreach.

Santa Fe County Capacity

The maintenance work identified in this Maintenance Plan for LPOS will require capacity building among Santa Fe County staff and among volunteers who assist staff with plan implementation.

The planning team recommends that capacity building includes:

1. Expansion of County maintenance staff to meet the required FTEs for LPOS maintenance.
2. Workshops and training for higher management on (a) strategies and methods of capacity building, continued education, and leadership development (for planning and oversight staff, supervisors, and crew); (b) content matter aspects of Open Space management, such as agricultural program development, interpretive planning, cultural resource preservation, trail and road management, vegetation management, soil & water conservation, etc.; and (3) the use of electronic (IT) tools, including GIS, for terrain management, labor allocation, budget control, and public outreach services.
3. Staff and crew training workshops, seminars, conferences, and literature on Best Management Practices (BMPs). Essential BMPs for maintenance of LPOS would include:

- a. Vegetation management, including botany and native plants, thinning, pruning, planting, mowing, etc.
 - b. Grazing management and grassland restoration
 - c. Integrated Pest Management, including approaches to weed control, invasive animal management, pathogen/vector management (e.g., mosquitoes)
 - d. Wildlife management
 - e. Riparian area management and restoration
 - f. Soil and water conservation (erosion control, water quality improvement)
 - g. Trail and road management and drainage
 - h. Access management: Fencing, gates, stiles, and signage
 - i. Acequia maintenance
 - j. Inspections and monitoring
4. Collaborative collection and review of periodic inspection reports and monitoring reports, and joint analysis and discussion of corrective action needed or changes in management.
 5. Staff training and guidance for managing community volunteers and site stewards, contractors, contracts and leases aimed at supporting field assessments, maintenance and repair at the Open Space properties.

Community Outreach and Engaging Volunteer

Santa Fe County has more Open Space, Parks and Trails assets and associated maintenance needs than it will likely have staff capacity and funds to address them. Therefore, and also in order to grow community buy-in and stewardship of the Open Space properties, Santa Fe County needs to strengthen its community outreach and volunteer engagement services.

Potential Partners

LPOS has a diverse spectrum of community stakeholders that are interested in the property and that Santa County can mobilize for volunteer stewardship work. These stakeholder groups include:

- a. Immediate neighbors and parciantes on the acequia
- b. Representatives on behalf of El Santuario de Chimayo
- c. Other acequia groups, namely those associated with the Potrero Ditch and the Martinez Arriba (Santa Cruz) Ditch
- d. Local youth, and possibly organized through the Chimayo Conservation Corps
- e. Local farmers
- f. Local livestock owners
- g. Area schools and their students, such as the Chimayo Elementary School, Camino de Paz (agricultural) charter school, and Northern New Mexico College in Espanola
- h. Any regional conservation groups, hiking and outdoor organizations, and other entities that could become interested in the LPOS – however, the involvement of such outside

groups must be discussed first with local stakeholders in order to ensure good working relationships

Volunteer Maintenance Activities

Maintenance activities that are particularly suitable to be conducted with support from (small) groups of volunteer stewards include:

- Fence repair (in the fall, to prepare for the winter grazing season)
- Removal of dead wood and woody debris on the ground and in the river (during low flows) (in the late winter and early spring to prepare for spring runoff and summer storms)
- Cutting and removal of invasive plants (esp. elm, Ailanthus, Russian olive, and tamarisk) (in the late fall and in the early spring)
- Acequia cleaning and brush removal (in the early spring to prepare for the irrigation season)
- Baling of hay (in September, in years that the pastures are not grazed)

The planning team recommends that volunteer activities are conducted in a regular schedule to establish precedent, leading to an accountable system that after several years may even become a “tradition”. In this way, people will look forward to the maintenance events, and the events become part of the community calendar or the annual schedule of the volunteer groups. These activities also ensure periodic face to face contact between County staff and volunteer stewards. The more the activities include a sense of celebration, fun, sharing, and play, besides getting good work done that builds pride, the more participants will enjoy the events and return any next time.

Community Liaison

Besides developing volunteer stewardship engagement, it may prove essential to cultivate a couple of community liaisons that can serve on a rotational basis to communicate with Santa Fe County staff and help mobilize and direct volunteer stewards. Santa Fe County already recognized Raymond Bal as one such liaison. However, it would be important to identify and engage a few alternates that could support him.

County Staff Support

Volunteer activities need to be diligently prepared and coordinated to ensure participant safety, work effectiveness, and general enjoyment by all. It will be essential that Santa Fe County identify a staff member for LPOS who serves as the designated point person in the communication with the community liaisons and stewardship volunteers. This staff person would be in charge of fielding questions and alerts from the community, communicating messages from Santa Fe County, and organizing any volunteer stewardship events. This staff person also would need to identify and mobilize, when necessary, any technical experts, either in the community, within Santa Fe County staff, or among contractors, to assist with technical

guidance and quality control before, during and after the volunteer stewardship events. Additionally, this person would be in charge of planning and coordination between staff and maintenance crew to assist and to provide equipment and supplies, such as fencing materials and baling wire or twine, or plant stock, soil amendments, mulch, and stone material. Last but not least, this staff person is responsible for any safety instructions and for ensuring that people work in a safe manner and have adequate protective gear. Finally, Santa Fe County will need to develop a repository of tools, protective gear and supplies to provide during work days. Systems would need to be developed to account for tools and gear that is handed out, and a crew member or the County point person for the community would need to be in charge to account for the supplies and tools at the end of the work day.

APPENDIX A. Grazing Lease and Pasture Management

We must be aware that the term “lease” means different things in different contexts. The term “lease” is often used to address (1) the document of the legal arrangement, (2) the business arrangement and legal mechanism, (3) land management tool for the grassland, and (4) area under lease. This Maintenance Plan for LPOS will clarify the meaning of the word “lease” where necessary.

A detailed review of the current grazing lease (in all its meanings) and grazing conditions at LPOS is described in the report “Assessment of Grazing Management Conditions and Alternative Grazing Management Options for Los Potreros Open Space and other Open Space Properties in Santa Fe County”. This document also includes various examples of grazing lease templates. Findings from this assessment lead to the following summary of findings and conclusions:

1. The lease document offers simple but adequate provisions for Santa Fe County to manage the pastures of LPOS. While the stocking rates and duration seem right for the long-term use of the pastures without risks of resource degradation, other provisions combined with terrain conditions appear to increase the risk of resource degradation.
2. The lease document includes a few words and phrases that currently lead to ambiguous management conditions and that need clarification for better management. Additionally, it is unclear which pastures fall under the lease.
3. The lease area is relatively small, the lease duration short and the stocking rate low. As a result, the economy of scale and incidental costs to the lessee are relatively high, which are an economic disincentive to the lessee to be a good steward of the land.
4. Fee levels are relatively low and would in most years allow the permittee a good benefit/cost ratio in relation to the forage quality of the pastures.
5. The fee structure is somewhat rigid and does not allow for credits or fee restitution in lieu of maintenance or stewardship work or reduced AU days of grazing. A more flexible fee structure may offer incentives to the lessee for better pasture management.
6. There are insufficient grazing management conditions in the lease document to mitigate negative terrain conditions (e.g., excessive wet terrain that leads to winter grazing, lack of cross fencing for paddocking and rotational grazing), which together may lead to overgrazing.
7. Physical infrastructure, particularly fencing, drainage and acequias, are in very poor condition. The resulting wet or dry terrain conditions and trespass by neighboring cattle contribute to overgrazing and are a disincentive to the lessee to be a good steward of the resource.
8. Santa Fe County will need to develop and implement improved management systems regarding the lease (as a business arrangement and as a land resource management tool), such as terrain management goals, inspections, conflict resolution procedures,

and maintenance schedules, in order to better manage the lease and the pastures as a resource.

The lease document could be improved by:

- Changing the grazing period to year-round and increasing the area under lease to 17.15 acres and documenting this on a grazing map.
- Adjusting the fee system by including annual fee restitution (for portions of AUM (animal unit months) that the lessee did not use the pastures) and fee credits (for restoration work on infrastructure).
- Including language that refers to specific requirements concerning grazing systems and management adjustments that the lessee will need to follow (e.g., cross fencing and rotational grazing, drainage and irrigation instructions, and early withdrawal of livestock).
- Adjusting the lease period to 3 or 5 years.
- Targeting local lessees. In collaboration with key-stakeholders, Santa Fe County may consider a lease offering process that would give a preference to the selection of local-area lessees (grazing contractors).

Additional specific recommendations for the administrative aspects of the grazing program at LPOS are included in the Assessment document.

APPENDIX B. Santa Fe County Open Space Inspection Checklist Los Potreros OS

Inspected by: _____

Date: _____ Time: _____

Item to be Checked Use a separate page to describe the necessary repairs	OK or FIX = needs work	Comments (corrective action, work needed, who needs to be contacted)
Monthly		
Exterior boundary fences		
Interior pasture fences		
Gates are closed, in good condition		
Santa Fe County Open Space Signage		
Signs of garbage or illegal dumping		
Signs of illegal off-road vehicle use		
Annually		
Acequias are operational		
Arroyo over County Road 92 runs into the Santa Cruz River and not running down driveway		
Invasive species		
Excess clogging of river channel by live willows		
Drainage pipe clear for the wetland		
Fallen trees and large woody debris are not clogging stream or acequias		

APPENDIX E: YEAR 1 PROJECTS

SFC CLERK RECORDED 10/12/2016

APPENDIX E – Maintenance, Stewardship, and Restoration Projects for Year-1

List of Terrain Management project activities for year-1 aimed at land health restoration.

Location Code	Management Activity	Location	Staff Prep	Volunteer Activity	SF County-M (Crew)	Contractor	Labor & Cost Items
LP-GRA-P/W	Fence repair of ineffective boundary fences (esp. on SE and E sides of pastures)	Parcel 6: 1,350 lf	One time to establish standards and prescription and to choose form of labor source				TBD: Based on proposal (one-time investment); possibly around \$1,500-\$2,500 depending on material
LP-WET	Drainage improvement: sediment pond, drainage pipe, fence	Parcel 6: Drainage channel of wetland in West Potrero pasture: 500 sq ft	One time to formulate RFP and standards				5 days for 2-person crew; Costs TBD: Based on proposal (one-time investment); possibly
LP-RIP	Fence inspection and small repairs - Rio Santa Cruz and Rio Quemado	All parcels: 1,900 lf + 1,500 lf = 3,400 lf					2 days/year for 1 crew member
LP-RIP	Bank stabilization & drainage improvement on driveway off of CR92	Parcel 1: 500 sq ft	Plan SOW and specs and choose labor source				1 day for experienced operator: \$1,000-\$1,500, including base coarse
LP-RIP	Structural bank protection	Parcel 1: 50 lf of stream	Plan SOW and specs and hire contractor				TBD: Based on proposal (one time investment); possibly around \$50,000

List of Terrain Management maintenance and stewardship activities for year-1 aimed at land health maintenance.

Location Code	Management Activity	Location	Staff Prep	Volunteer Activity	SF County-M (Crew)	Contractor	Labor & Cost Items
LP-GRA + LP-WET	Fence inspection and repair (all interior and exterior fence)	Parcels 6+7: Entire grassland + wetland area: approx 5,780 lf	One time to establish standards and prescription				Annually: 1-2 days for 2 person crew
LP-GRA + LP-WET	Weed control: removal of elm, Ailanthus, knapweed, Kochia, etc.	Parcel 6-gate area + Parcel 7: Dry pastures and entrance area: 6.75 ac	One time to establish protocols and methods				2-3 days/year for 2-person crew
LP-RIP	Removal of trees fallen into river and woody debris that obstructs flow	All parcels: Stream channels: 500 lf + 1,500 lf = 2,000 lf	One time to establish standards and prescription				3-4 days/year for one sawyer and one swamper or for a group
LP-RIP	Removal of invasive species, juniper or willow encroaching on channel, and woody debris on banks	All parcels: 1,900 lf + 1,500 lf = 3,400 lf	One time to establish standards and prescription				Every 3 years, 5-6 days (possibly less over time) for one sawyer and one swamper or
LP-RIP	Removing dead wood and leaning trees from river banks and terraces	All parcels: 3 acres	One time to establish standards and prescription				Annually and in case of emergencies: about 5 days for one sawyer
LP-RIP	Pile burning	All parcels: When need arises	Prep burn and coordinate with Fire Dep				TBD
LP-ACE	Acequia cleanout, channel leveling, irrigation gates, desagues	All parcels: Approx. 2.630 lf (incl. neighbor properties)					2-3 days for 2-person crew
LP-RIP + LP-TOE	Removal of dead wood, leaning and fallen trees, and invasive plants	All parcels: Approx. 1.5 acres	One time to establish standards and prescription				Every 3 years, 2-3 days (possibly less over time) for one sawyer and one swamper or for a group of volunteers

August 3, 2016

Mr. Miguel M. Chavez
Chairperson
Santa Fe County Board of County Commissioners
PO Box 276
Santa Fe, NM 87504-0276

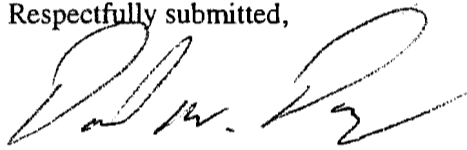
Dear Chairperson Chavez,

In 2015, the Santa Fe County Planning Division / Open Space Planning initiated the creation of Management Plans for the San Pedro, Los Potreros and La Cieneguilla Open Space properties. These management plans were completed with significant public engagement and support from the community members, adjacent property owners, stakeholders, County staff, and relevant public agencies.

On June 1, July 7 and August 3, 2016, the County Open Land, Trails, and Parks Advisory Committee (COLTPAC) reviewed drafts of these management plans at the committee's regular monthly meetings. Based on the review of these documents, COLTPAC approves of the planning process, management strategies and actions steps outlined in these plans and recommends implementation of the San Pedro Open Space Management Plan, the Los Potreros Open Space Management Plan and the La Cieneguilla Open Space Management Plan.

COLTPAC looks forward to continuing to work with staff in the on-going development and implementation of the open space management planning process.

Respectfully submitted,



David Dannenberg
Chairperson
County Open Land, Trails, and Parks Advisory Committee (COLTPAC)

