SANTA FE COUNTY OPEN SPACE AND TRAILS PROGRAM

LOS POTREROS OPEN SPACE MANAGEMENT PLAN

APPENDICIES

FINAL DRAFT

SEPTEMBER 13, 2016

SANTA FE COUNTY
OPEN SPACE & TRAILS

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LOS POTREROS OPEN SPACE APPENDICES

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APPENDIX A: OVERVIEW OF MANAGEMENT ACTIVITIES

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, Ailanthus, 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

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

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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 Potreros 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-weighed 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.

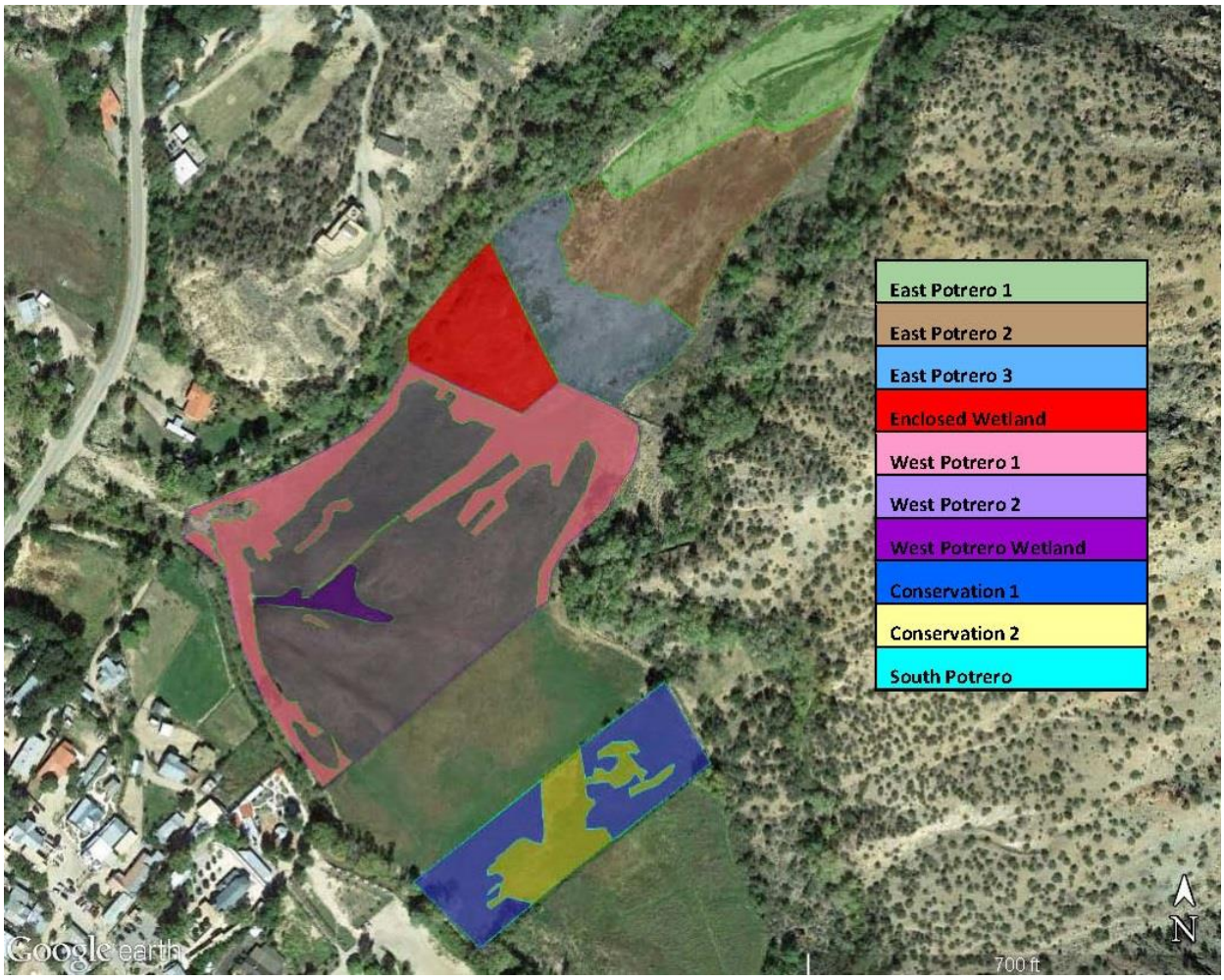

Figure 1. Map of pasture units.

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 Potreros 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.

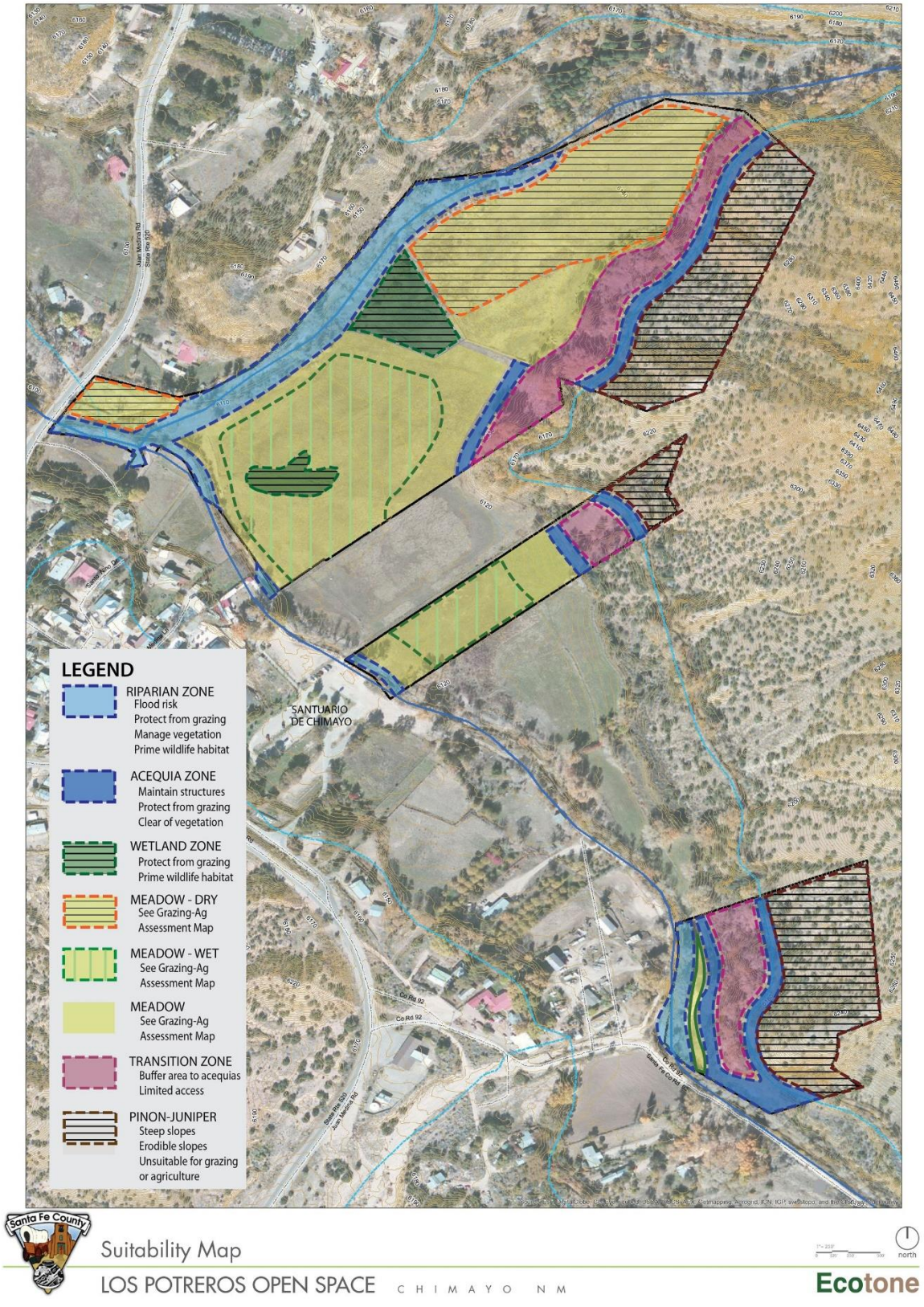

Figure 10. Los Potreros Open Space - Land Suitability Map.

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.

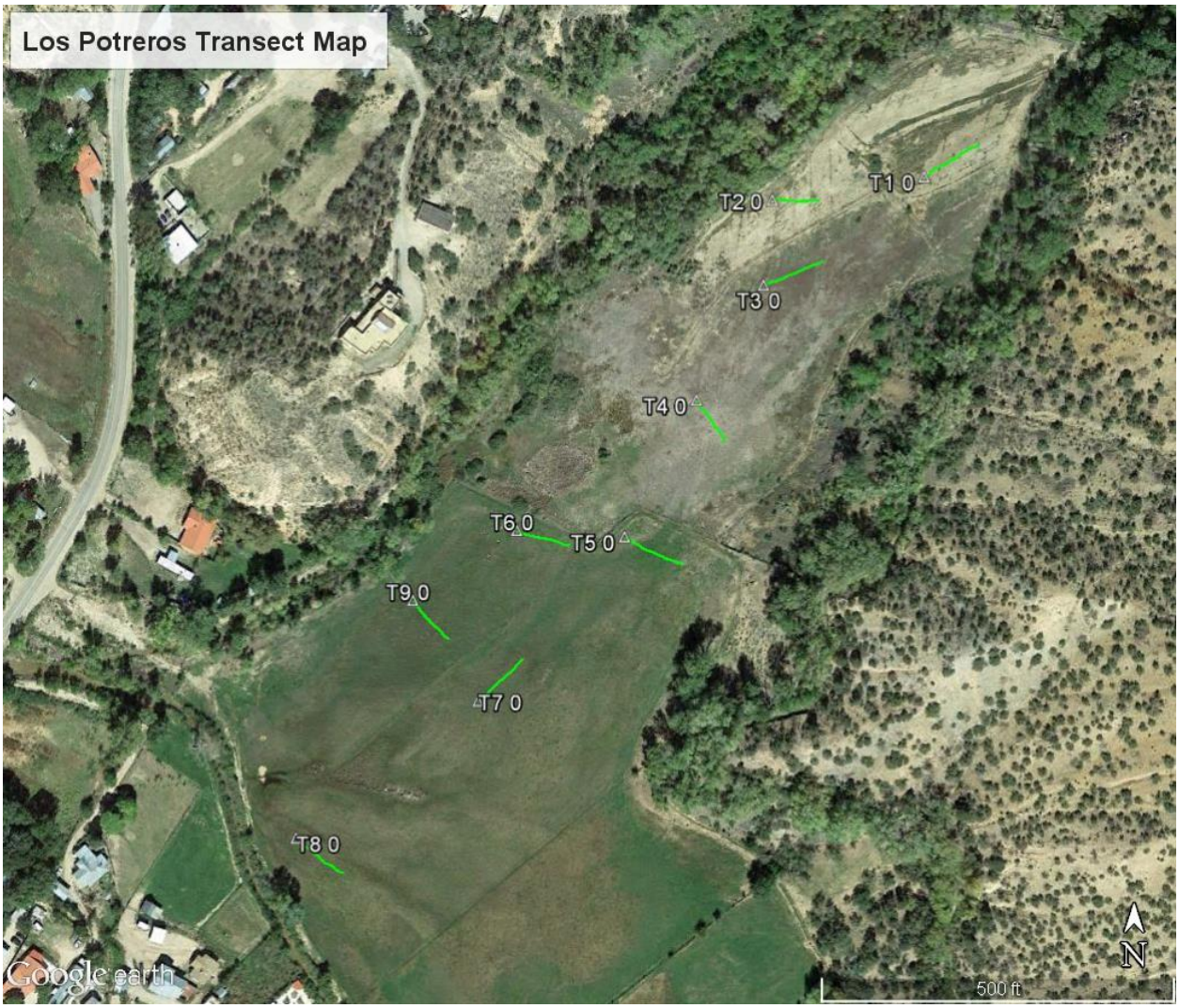

Figure LPOS-A1. Northern contiguous parcels of Los Potreros Open Space with locations of transects.

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.

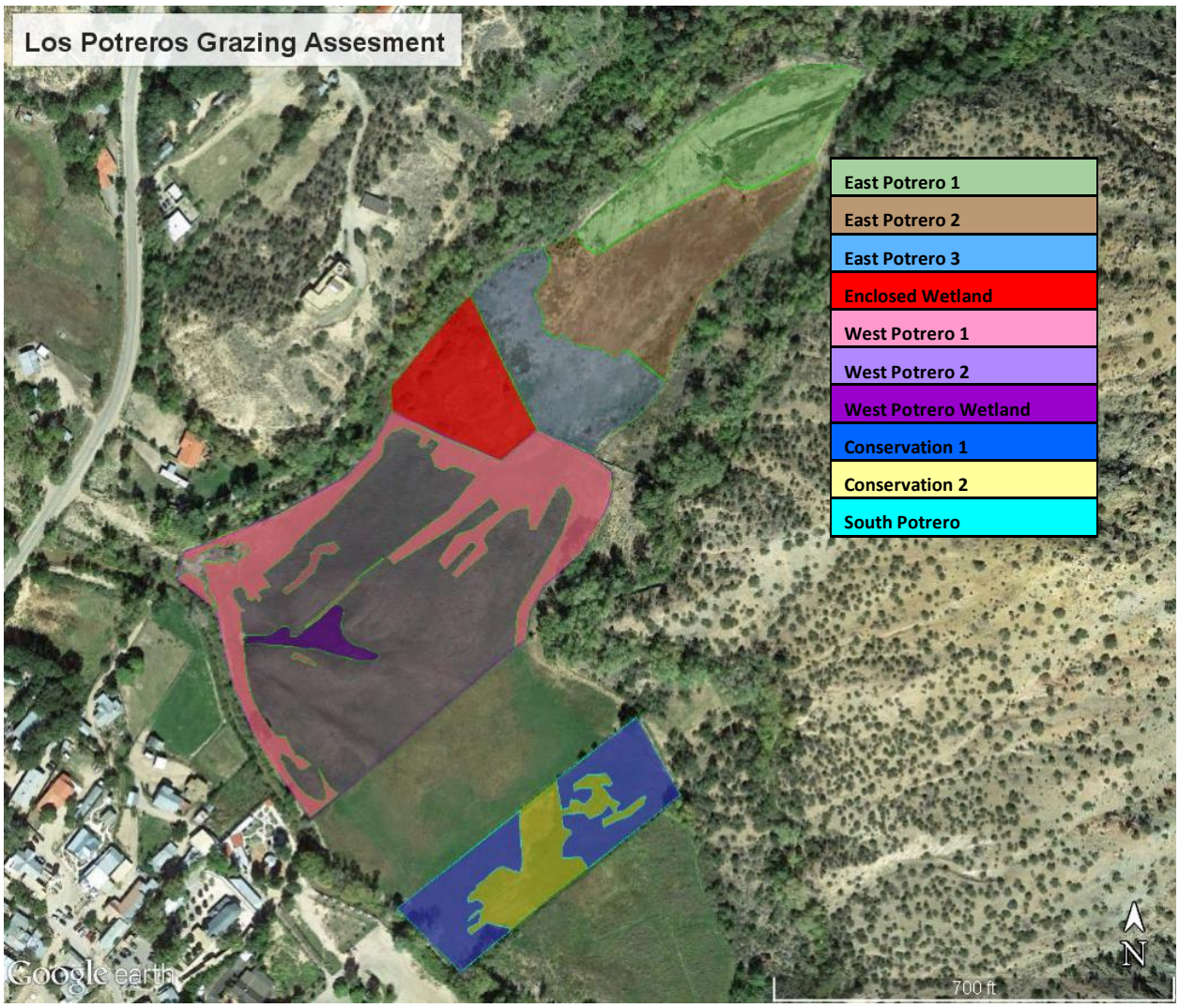

Figure LPOS-A2. Map of LPOS grassland and wetland units.

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 SUITABLITY 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 style 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, end 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 SUITABLITY 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

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

(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 contacting 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 if 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:

a. 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?

b. 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?

c. 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 story 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 pastures[1].

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

CONLCUSIONS:

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 overgazing.
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:

- 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

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 an 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 though 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 on 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

APPENDIX D: MAINTENANCE PLAN

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

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Table of Contents

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.

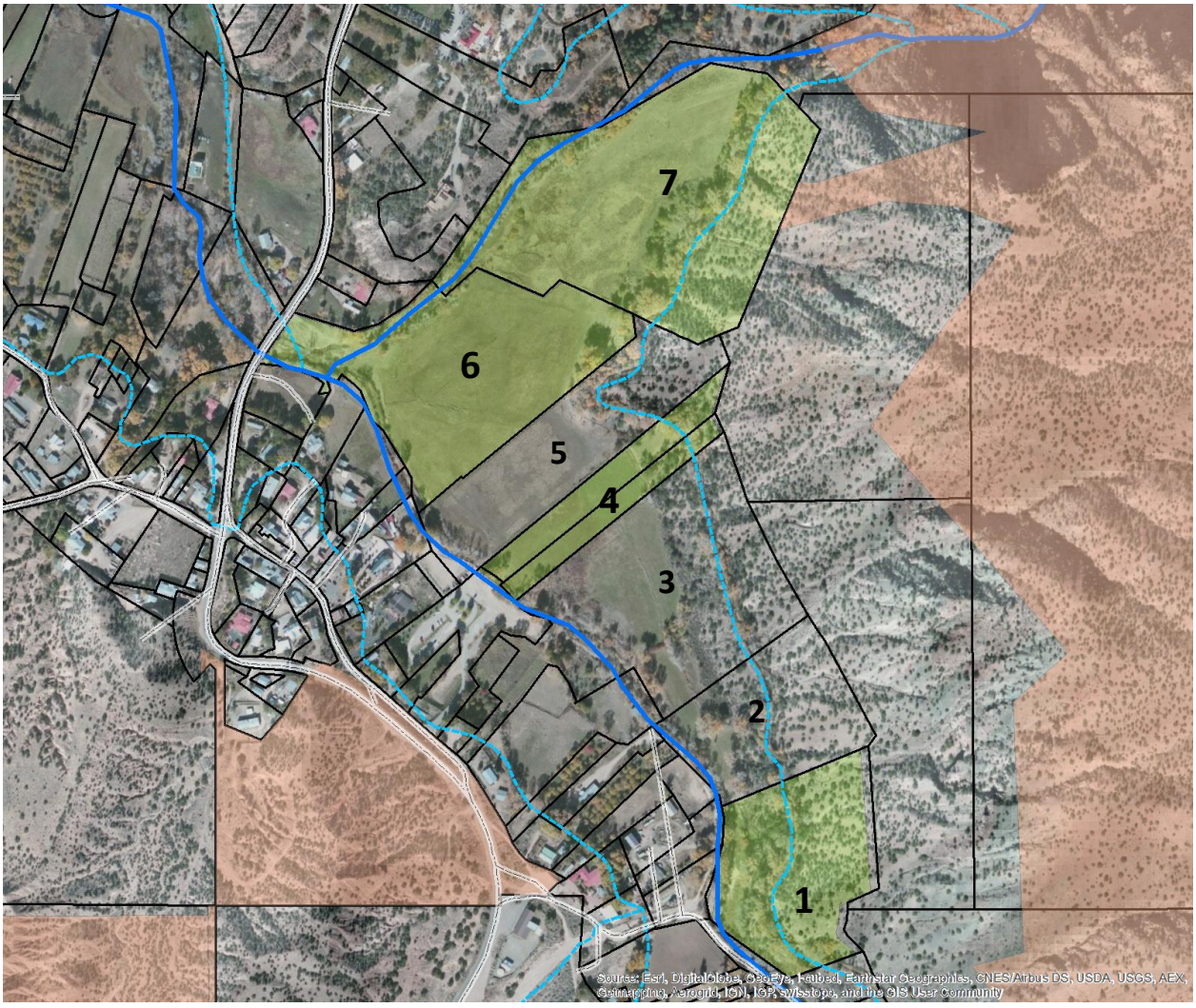

Figure 1. Parcel identification for Los Potreros Open Space.

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.

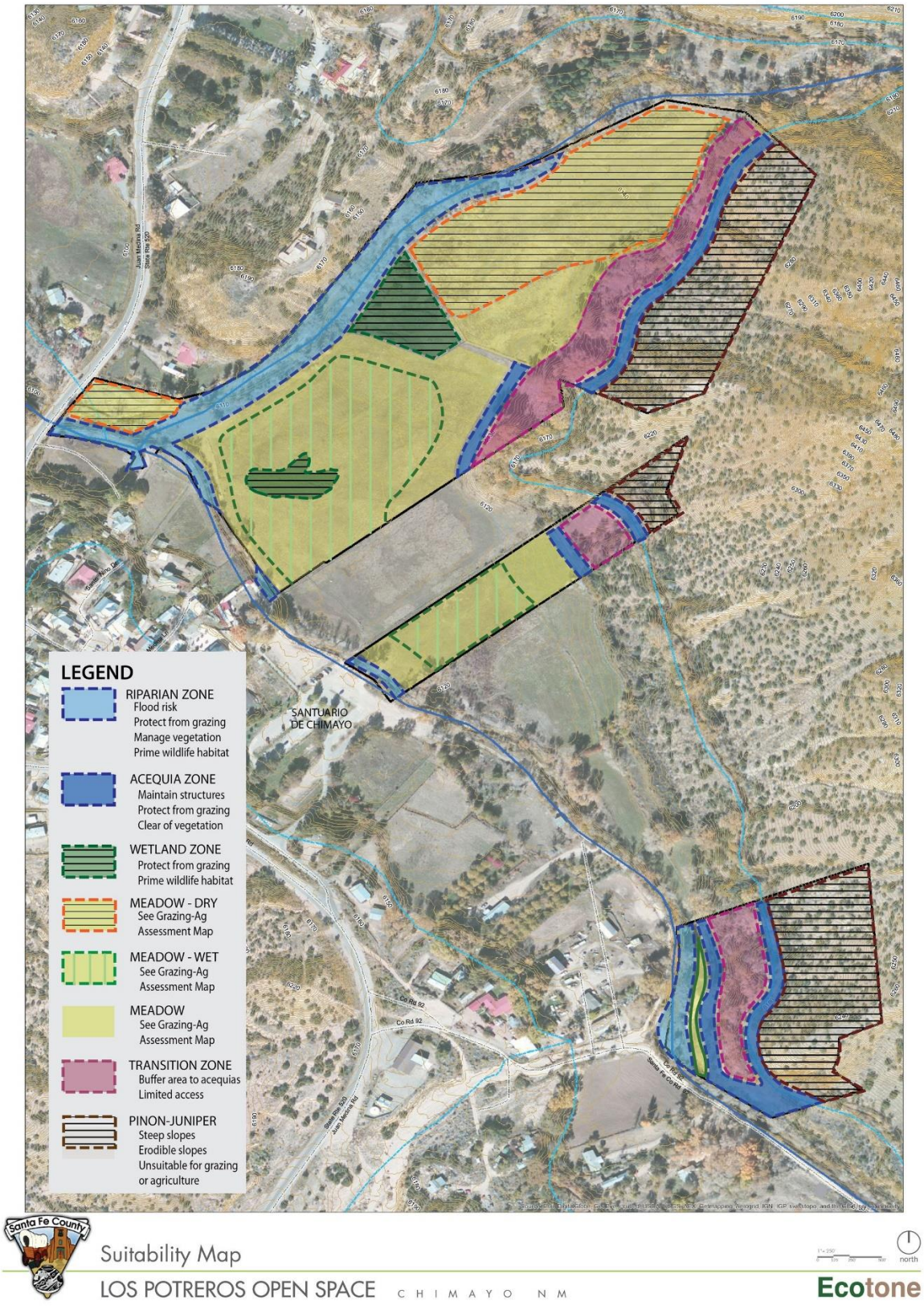

Figure 2. Los Potreros Open Space – Terrain Management Units Map

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 *[el rio, el bosque, y la ribera]*	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 *[las acequias]*	*a.* Acequia cleaning, tree thinning, bank repair *(la limpia y la jara)* b. Infrastructure repairs c. Gopher and mole control	a. Annually (spring) b. Annually (spring) c. Annually
4	*3.* Wetlands: permanently saturated soils *[la cienega]*	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 *[la vega]*	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 *[el prado]*	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 *[la joya]*	a. Irrigation and drainage management b. Grazing management	a. Monthly b. Monthly-Quarterly

Mgmt Goals	Terrain Management Unit *[Hispanic Name]*	Anticipated Regular Maintenance Activities	Maintenance Frequency
4	7. Lower Slopes – Transition Zone: sandy, gravelly and rocky soils with mixed grass-shrub vegetation, sub-irrigated *[los altitos]*	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 parciantes 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 (Ailanthus altissima) 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 in 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 in-effective 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, Aillanthus,	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 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

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 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 Raymond Bal as one such liaison. However, it would be important to identify and engage a few alternates that could support him.

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 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

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, Aillanthus, 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