

THORNTON RANCH OPEN SPACE

MASTER PLAN **2017**

PRODUCED FOR SANTA FE COUNTY

PREPARED BY: **DESIGN OFFICE**

October 2017

THORNTON RANCH OPEN SPACE
MASTER PLAN

PREPARED FOR:

SANTA FE COUNTY

PREPARED BY:

design office
landscape planning urbanism

with
SANTA FE CONSERVATION TRUST . land conservation
ECOTONE . ecology
AOS ARCHITECTS . architecture

Acknowledgements

COUNTY COMMISSIONERS + COMMITTEES

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Katherine Miller

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Patricia Conoway, *At Large*

SANTA FE COUNTY

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Colleen Baker, *Project Manager*

Planning Division
Robert Griego, *Planning Manager*
Paul Olafson, *Planning Project Manager*
Maria Lohmann, *Senior Planner*
Timothy Cannon, *Senior Planner/GIS Division*

Inter Government Liaison
Hvtce Miller, *Inter Government Coordinator*

GIS Division
Amanda Hargis, *GIS Coordinator (former)*
A. Erle Wright, *GIS Manager*
Debra Garcia, *GIS Analyst*

Public Works Department
Michael Kelley, *Public Works Director*
Terry Lease, *Real Property Specialist*

Fire Department
Buster Patty, *Fire Marshal (former)*

AGENCY REPRESENTATIVES

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Sarah Schlanger, *Field Manager*
Jessie Davis, *Conservation and Land Management Botanist*
Merrill Dicks, *Archaeologist*
Brad Higdon, *Planning / NEPA*
Mark Lujan, *Realty Specialist*
Zoe Miller, *Range Ecologist*
Tami Torres, *Recreation Planner*
Valerie Williams, *Wildlife Biologist*

State Land Office
Will Barnes, *Deputy Director*
Jason Lithgow, *District Resource Manager*
David Eck, *Trust Archaeologist*
Craig Johnson, *Director - Commercial Resources Division*

New Mexico Department of Transportation
Rob Fine, *Rail Facilities + Permitting Manager*
Dave Nelson, *Rail Planner*
Jerome Maestas, *Rail Engineering Coordinator*

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Pueblo of Acoma
Chris Garcia, *POA Interpreter / HPO Oversight*
Everett Garcia, *POA HPO Advisory Board*
Kimberly Charlie, *POA HPO*
Juana Charlie, *POA HPO*

Pueblo of Santa Ana
Timothy Menchego, *THPO Cultural Resource Coordinator*
Julian Garcia, *Cultural Resource Technician*

Pueblo of Santa Clara
Danny Naranjo, *Land + Cultural Resources Team*

Pueblo of Tesuque
Mark Mitchell, *THPO Pueblo of Tesuque*
Robert Mora

Pueblo of San Felipe
Ricardo Ortiz, *Land Management Specialist*
Dominic Sandoval, *Pueblo of San Felipe*
David N. Valencia, *Pueblo of San Felipe*

The Hopi Tribe
Joel Nicholas, *Archaeologist, CPO*
Loyd Ami, Sr., *Cultural Preservation Office*
Terry Morgart, *Cultural Preservation Office*

Jicarilla Apache Nation
Jeff Blythe, *THPO, Office of Cultural Affairs*
Joanna Dykehouse, *THPO Technician*

Pueblo of Pojoaque
Jake Viarrial, THIPO *Pojoaque Pueblo*
Ruben Duran, *Pojoaque Pueblo*

Ohkay Owingeh
Anthony Mozumo

Kewa (Santo Domingo) Pueblo
Governor Daniel Coriz, *Governor*
Staff

Pueblo de Cochiti
Jacob Pecos, *Director of Natural Resources*

COMMUNITY REPRESENTATIVES

GBASPA Working Group

Galisteo Community Association
Estelle Berger
Michael Golino
Evelyn Gregory
Wayne King
Barbara Seiler
Roger Taylor
Judy Tuwaletstiwa

Focus Group Representatives

Artist / Educator / Writer
Catherine Harris
Lucy Lippard
Shaun Gilmore Merrick
Nick Merrick

Mountain Biking
Brent Bonwell
Henry Lanman
Bob Ward

Ecology / Natural Resources
Barbara Fix
Sigmund Silber
Kim Sorvig
Mark Watson

Equestrian
Jarratt Applewhite
Julia Belt
Lisa Bessone
Joyce Davis
Karen Denison
Trish Hug
Julia Jarvis
Paige Macfarland
Piar Marks
Elayne Patton
Eldon Reyer
Karen Reyer
Betsy Walker

Hiker / Runner
Margaret Alexander
Gretchen Grogan
Sue Mally
Kathy Mastoras
Jim Owens
Jim Westmoreland

PLANNING TEAM

Design Office, Planning, Public Facilitation
Claudia Meyer Horn, *Principal*
Patrick Sinnott, *Landscape Architect*

Santa Fe Conservation Trust, Conservation Easements
Sarah Noss, *Executive Director*
Charlie O'Leary, *Executive Director (former)*
Melissa Houser, *Land Program Manager*

Ecotone, Ecological Planning
Jan-Willem Jansens, *Principal*

AOS Architects, Architecture
Shawn Evans, *Principal*

CULTURAL RESOURCES TEAM

Parametrix, Archaeology
Berenika Byszewski, *Sr. Cultural Resource Specialist*
Shawn Kelley, *Cultural Anthropologist*
Mike Spears, *Archaeologist*

TamArch, Archaeological Planning
Tamara Stewart, *Historic Preservation Planner*

BIOLOGICAL ASSESSMENT

RCS Southwest
Robert Sivinski, *Biologist*

MINERAL ASSESSMENT

R.T. Hicks Consultants, LTD

Kirk Kempter, *Geologist*

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Acronym List

AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
ADAAG	American Disabilities Act Accessibility Guidelines
AT&SF	Atchison, Topeka and Santa Fe Railroad
ATV	All Terrain Vehicle
BCC	Board of County Commissioners
BLM	Bureau of Land Management
BNSF	Burlington Northern Santa Fe Railway
COLTPAC	County Open Lands, Trails, and Parks Advisory Committee
CR	County Road
FED	Federal
FEMA	Federal Emergency Management Agency
FS	Forest Service
GBASPA	Galisteo Basin Archaeological Sites Protection Act
GIS	Graphic Information Systems
IMBA	International Mountain Bicycling Association
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MRCOG	Mid-Region Council of Governments
MSL	Mean Sea Level
NEPA	National Environmental Policy Act
NCTD	North Central Regional Transit District
NM	New Mexico
NMRX	New Mexico Railrunner Express
NMDOT	New Mexico Department of Transportation
NVC	U.S.National Vegetation Classification
OHV	Off Highway Vehicle
PROWAG	Public Rights of Way Accessibility Guidelines
ROW	Right of Way
RUR	Rural Zoning
SFCT	Santa Fe Conservation Trust
SGMP	Santa Fe County Sustainable Growth Management Plan
SHPO	State Historic Preservation Office
SLDC	Santa Fe County Land Development Code
SLO	State Land Office
SRMA	Special Recreation Management Area
TROS	Thornton Ranch Open Space
USDA	United States Department of Agriculture

Executive Summary

The Galisteo Basin, known for its picturesque setting and natural resources, shows evidence of human occupation for thousands of years. However, the wide open grasslands, sweeping 360° views of surrounding mountain ranges, and sparse development that defines the Galisteo Basin's landscape continues to be threatened by encroaching development and resource extraction proposals.

In response to the gradual development pressure, Santa Fe County recognizes the importance of supporting landscape-wide conservation efforts to preserve open space for view corridors, wildlife habitat, natural resource protection, ecosystem health, and cultural landscapes. Likewise, the County is also committed to opening access to public lands for recreation and experiencing the outdoors.

The Thornton Ranch Open Space, a 2,430-acre area of land, holds not only a central location within the basin but is also a site of significant cultural importance. Many native tribes trace their ancestry or maintain traditional connections with this area. Tribes are particularly concerned with protecting these important cultural resources.

The cultural identity of this place is one marked by passage and movement: the land reveals signs of geological forces, wildlife migration, Pueblo Indian and Plains Indian movements, Spanish trails, sheep and cattle ranching, rail lines, and preservation initiatives. Adding to these layers, the Thornton Ranch Open Space Master Plan will overlay outdoor recreational trails in discreet locations.

Santa Fe County, as the largest landholder of the Thornton Ranch Open Space property, acts as lead agency for this planning effort. The County also manages a portion of BLM lands and leases a portion of NM State Trust land within the property boundary.

Planning Process

As one of three plans regulating the Thornton Ranch Open Space, the Master Plan outlines program elements and physical improvement projects as well as design standards for improvements on the property to enable public access and recreation.

Santa Fe County has proceeded with the planning of the Thornton Ranch Open Space in a careful and deliberate way. Beginning with the gradual acquisition of land, use agreements, and leases over a period of 16 years, the County has assembled the current planning area known as the Thornton Ranch Open Space.

In addition, a series of studies and research initiatives were commissioned to piece together a comprehensive view of what exists within the site. These included cultural inventories, a biological assessment, and a mineral assessment. In 2014, a multidisciplinary team of experts led by Design Office (landscape architect) was selected to lead a planning effort to generate a master plan for the property.

Early planning analysis illuminated the complexity of land ownership, cultural ties, jurisdictional overlays, and stakeholders, sometimes with competing interests. The process acknowledges the full range of these many stakeholders with interests on this land, both those with voices and without: wildlife, plants, tribes, recreationists, land owners, lessees, local community members, and the general public. Extensive research documented information on cultural resources, minerals, biological resources, and geological history.

Although the site could physically accommodate miles of diverse recreational trails, the planning process revealed that this approach was neither needed (given surrounding recreational trail expansions) nor advisable. A moderate, high quality trail system was consciously chosen to preserve the character of the landscape and provide an enriching recreational and educational experience. The proposed plan strikes a balance between purposely planned recreational use and preservation.

Master Plan

The Thornton Ranch Open Space Master Plan acknowledges the culturally and environmentally sensitive resources on the site to propose a plan which emphasizes preservation with limited access for recreation. Hikers, runners, bikers, and equestrians will have access to 12 miles of internal trails and a 4-mile section of regional trail, from two new primary and secondary trailheads. An educational/informational hub introduces visitors to the site. Trail alignments link select historic sites, which are enriched with interpretive information intended to animate history and connect people to the many layers of cultural history present on the site. Ranching stories, railroad expansion, and geological / ecological processes are some of the many stories that visitors can explore on the trails.

Guided hikes in significant areas within the site provide glimpses into the geological, ecological, cultural, and historical aspects of the region. The strategically placed trails provide a broad overview of the site and an enjoyable recreational experience while safeguarding the majority of the site as an open space preserve.

The large area of preserved open space allows migratory birds, mountain lions, bears, coyotes, and other animals a place of refuge and a corridor of free-roaming in an area where open space remains under threat of encroachment and fragmentation. This approach also shelters cultural resources by keeping recreational trails away from sensitive sites.

The plan acknowledges that avoidance alone may not be sufficient to protect sensitive areas on the property. Efforts must be made to curb curious adventurers by providing compelling education reinforced with security measures to protect these areas. A major feature of the plan is the implementation of an educational threshold for visitors to instill respect for the land and instruct them of the importance of staying on trails and preserving resources.

Master Plan Documents

The Thornton Ranch Open Space Master Plan offers a vision and guiding framework to safeguard this public open space property while providing opportunities for recreational trail use. The plan balances public access with preservation and conservation of resources. It outlines the development of a trail network that offers a unique recreational and educational experience. It can be implemented in phases, depending on funding availability and priorities set by the County.

The plan outlines a set of design standards that strengthens the sense of place and creates low-impact, sustainably designed projects that are durable and low maintenance. New construction, materials, and names should clearly relate to the history and resources of this place.

Legacy

A legacy project for Santa Fe County, the Thornton Ranch Open Space trails will be a unique destination in the Galisteo Basin for recreation, education, and preservation. Set within a stunning setting and open space preserve, 16 miles of enjoyable recreational trails will be integrated and enriched with stories of the many facets of history of this land.

Acknowledging that human settlement will continue to impact the distinctive character of the Galisteo Basin, both visually and from a resource standpoint, this project and the stewardship of this open space will protect important wildlife corridors, viewsheds, cultural landscapes, and night skies within the Galisteo Basin and allow recreational enjoyment in this setting for generations to come.



CHAPTER 1
Introduction



Project Background

With stunning vistas and layers of history, the Thornton Ranch Open Space property is part of a unique landscape of significant cultural and environmental resources. Evidence of long-term Native American use, contact period Spanish activity, homesteading and ranching are present on the site. Most recently part of a 17,000 acre cattle ranch owned by the Thornton family of Santa Fe and Texas, this area of land within the Galisteo Basin holds evidence of human passage and use for thousands of years.

Recognizing the importance of conserving this site from encroaching growth and development, early land conservation efforts by the Trust for Public Land helped ensure that portions of the original ranch would be set aside for preservation and protection.

Purpose of Thornton Ranch Acquisition
The goal of the Thornton Ranch property acquisition, as indicated in the Santa Fe County Wildlife, Mountains, Trails and Historic Places Program Application in 2000 was "*..the preservation of the significant archaeological sites on the property.*" This application pointed out that "*[t]here may also be an opportunity for an interpretive trail discussing the archaeological resources of the Basin as well as the unique geologic formations in the area.*"

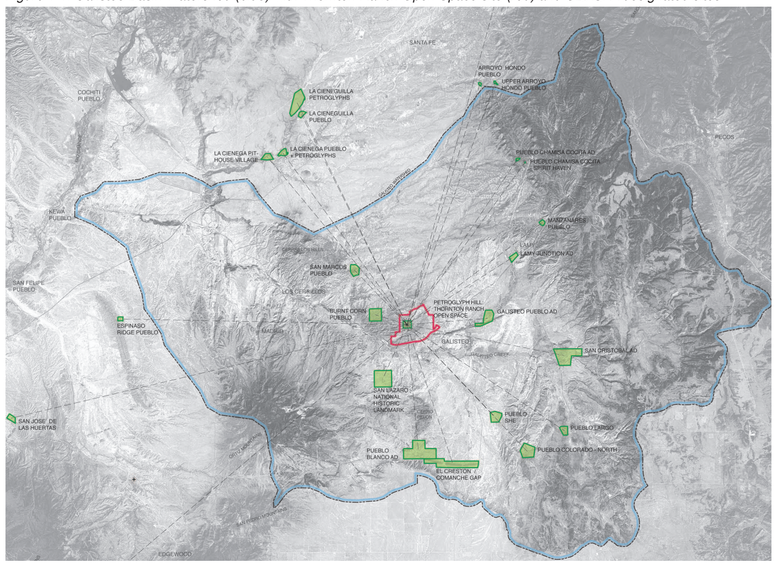
Planning Framework
Two primary documents, one federal and the other regional, establish the framework for the preservation, protection, and interpretation of the cultural landscape on the Thornton Ranch Open Space property.

Galisteo Basin Archaeological Sites Protection Act, 2004 (GBASPA)

On a broader scale, the Galisteo Basin, a 467,200-acre watershed, has long been recognized for its cultural, archaeological, and natural resources. It is a unique cultural landscape with significant large prehistoric and historic pueblos, Native American rock art, and early Spanish Colonial settlements. To protect these resources long-term, on March 19th, 2004 the 108th United States Congress passed the Archaeological Sites Protection Act (Public Law 108-208) which outlines the protection of 24 nationally significant sites on over 4,500 acres within the Galisteo Basin.

"The purpose of this Act is to provide for the preservation, protection, and interpretation of the nationally significant archeological resources in the Galisteo Basin in New Mexico."

Figure 1-1: Galisteo Basin Watershed (blue) with Thornton Ranch Open Space site (red) and GBASPA designated sites



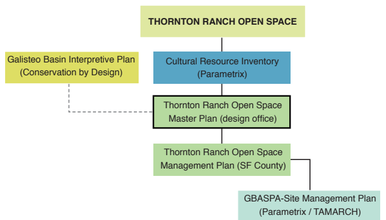
Santa Fe County Sustainable Growth Management Plan, 2015 (SGMP)

The Santa Fe County Sustainable Growth Management Plan sets forth policies to support and require the conservation of open spaces, parks, recreation areas, trails, scenic lands with vistas to meet the needs of County residents, support a healthy natural environment, and preserve the rural, agricultural and scenic character of the County.

As the largest of 35 open space properties owned by Santa Fe County, the Thornton Ranch Open Space accounts for 35% of open space lands managed by the County.

In the 2015 SGMP, the Thornton Ranch Open Space is listed as a high priority open space project for Santa Fe County that will include "*development of interpretive programming and construction of low impact visitor facilities for managed public access* (p. 119, SGMP)." Residents and visitors will be able to access "*... an important new space for hiking, mountain biking, and horseback riding in a scenic and historic part of the County.*" An educational component will "*...add to residents' and visitors' understanding of the prehistory, history, ecology, and geology of the Galisteo Basin* (p. 120)."

Figure 1-2: Thornton Ranch Open Space - Plans



Santa Fe County recognizes the importance of this resource and the need to carefully determine an appropriate approach to conservation and access. For this reason, the careful documentation and planning of the Thornton Ranch Open Space property has been incremental and thorough.

Existing conditions of cultural, biological, and mineral resources have been documented for most of the area, with remaining studies slated for completion prior to plan implementation.

Prior Planning Efforts

Thornton Ranch Open Space Draft Management Plan Report (Design Workshop, 2005)
This report collected stakeholder and community input on potential site planning scenarios to plan for appropriate use and protection of the site.

Current Planning Efforts

Thornton Ranch Open Space Master Plan
This plan identifies the proposed open space program, physical improvements on the land, and outlines the process for implementation.

Management Plan (Santa Fe County)
The TROS Management Plan outlines the operations and maintenance needs and processes for the property.

GBASPA Listed Site - Management Plan (Parametrix / TAMARCH)
Santa Fe County is collaborating with BLM to develop a Management Plan for the GBASPA listed site within the Thornton Ranch Open Space area to support implementation of the Act.

Galisteo Basin Interpretive Plan (Conservation by Design)
An interpretive plan for Galisteo Basin County Open Space properties provides an overview of the cultural, archaeological, and environmental significance of this area. It includes site-specific interpretive information for historic locations.

Existing Conditions Studies

Cultural Resources Inventory (Parametrix)
The update and completion of the cultural resource inventory for the entire project area. Ethnographic investigations are included as part of the background research.

GBASPA - Site Assessment Project (Office of Archaeological Studies / NM Department of Cultural Affairs, 2008)
Systematic assessment of 18 of the 24 archaeological sites listed in the federal legislation to standardize the quality of information and establish valid archaeological boundaries for the sites.

Thornton Ranch Open Space Biological Assessment (Robert Svinski, 2015)
Biological inventory of the project area, including plants and wildlife.

Thornton Ranch Open Space Mineral Assessment (R.T. Hicks Consultants, 2015)
Surface mineral assessment of the project area to determine locatable surface minerals.

Project Area

The Thornton Ranch Open Space property is located 15 miles southeast of Santa Fe, New Mexico, near the town of Galisteo. It is bounded on the east by County Road 42, on the south by the NMRX Railway, on the north by West Basin Ridge Road, and on the west by BLM lands.

The approx. 2,430-acre planning area referred to as the 'Thornton Ranch Open Space' (TROS) is owned by three separate public entities. As the largest open space land holding in Santa Fe County's possession, the property is comprised of 1,904 acres of County-owned land and an additional 527 acres of publicly-owned land. Santa Fe County is working cooperatively with these land owners to plan and manage this resource.

The Thornton Ranch Master Plan area is comprised of the following land holdings:

1,904 acres	Santa Fe County
207 acres	Bureau of Land Management
320 acres	State Land Office
2,431 acres	Total project area

Over a period of nine years (2000-2009), Santa Fe County strategically acquired property, secured lease holdings, and established MOAs to piece together and begin planning the open space area currently known as the Thornton Ranch Open Space (see *Figure 1-1 and Appendix C: Property Agreements for more details*). In 2016, during the process of planning and site investigations, two publicly owned parcels of land were recommended for inclusion in the planning area, leading to the current 2,431-acre project area.

Resources on this property range from ecological to cultural, historical and geological. Existing features on the property include archaeological remnants from the Archaic (1000 B.C.) period to present day and represent the changing cultural landscape in Galisteo Basin. Cultural resources within the property are significant to area tribes in the Rio Grande Valley and the Great Plains.

The site encompasses the historic town site of Kennedy, a railroad camp and staging ground for construction of the New Mexico Central Railroad and the still used New Mexico Railrunner Express Railway (NMRX). These two railways intersect along the site's southeastern edge, east of the Kennedy site.

A drainageway traverses the site diagonally and connects to the Galisteo Creek, a 45 mile waterway that feeds into the Rio Grande near Kewa (Santo Domingo) Pueblo.

Image 1-1: Project Area looking northwest towards the Sangre de Cristo Mountains, the rail line along the south edge is visible



Figure 1-3: Project Area land acquisition history

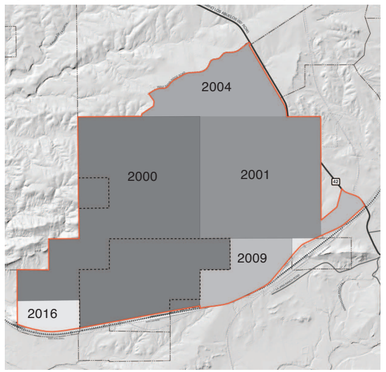
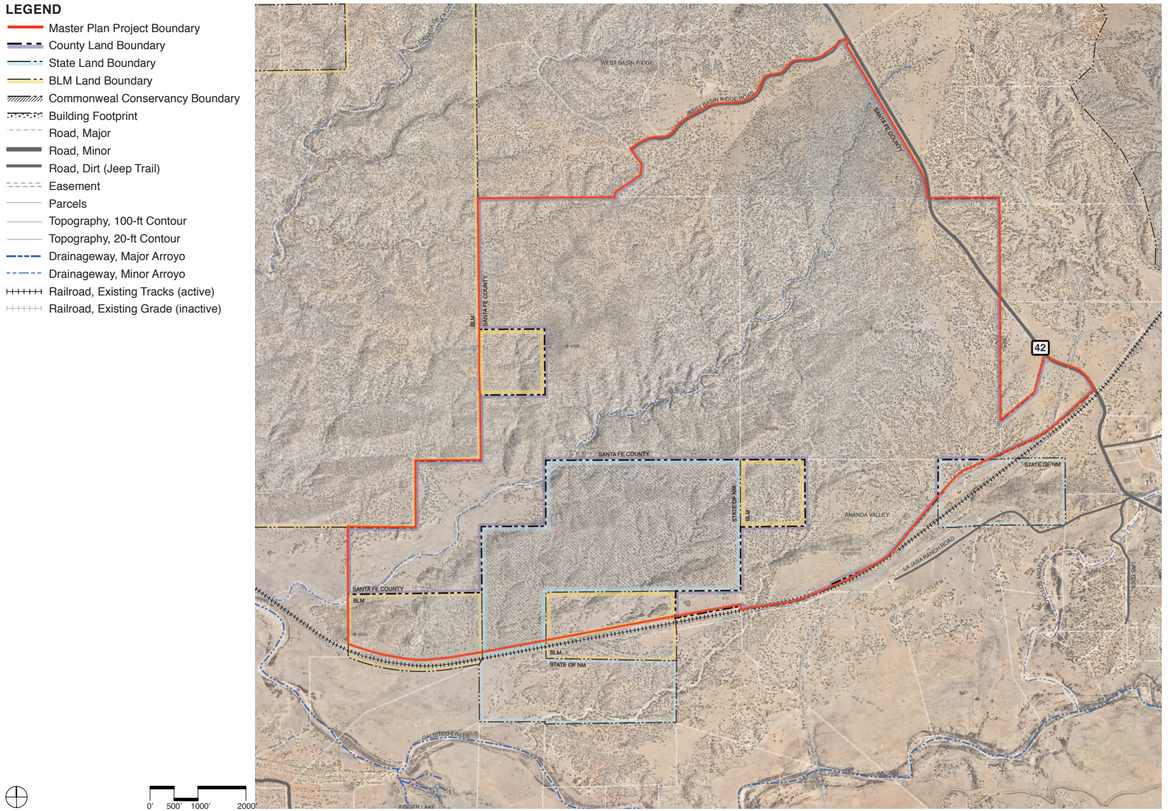


Figure 1-4: Aerial Map of Thornton Ranch Open Space site



Master Planning Process

The Thornton Ranch Open Space Master Plan public process included an incremental and broad input process that paralleled simultaneous data collection efforts on the property. Taking cues from widespread public input for the Draft Thornton Ranch Open Space Management Plan Report (Design Workshop, 2005), with two public meetings and an open space questionnaire, the Master Plan reestablishes the public's desire for appropriate management of the site. The Master Plan public process focused on outlining and refining a recreational program for the site that balances recreation with preservation of cultural and ecological resources.

The Thornton Ranch Open Space Master Plan public process consisted of meetings with diverse interest groups, tribal representatives, agencies, neighboring property owners, neighborhood associations, and the public at large.

A range of electronic, paper, and visual media was used to facilitate attendance (e-mail notices, letters, phone calls). Meetings were held at the Galisteo Community Center close to the project site to allow for site visitation and encourage local attendance. Meetings were recorded and can be found in *Appendix A: Programming / Public Process*.

A significant component of the public process involved asking interest groups for feedback on the potential open space program, access desires, long term goals, trail elements and their arrangement on the site. This input directly impacted the direction of the master plan.

Interest Group Meetings

Informational meetings were conducted with key representatives from user groups affiliated with activities outlined in an initial program set by Santa Fe County. The goal was to acquire preliminary input on how each group might utilize the open space in order to anticipate a range of appropriate uses. Each interest group met with the planning team over the course of two days.

The following interest groups were represented at the meetings:

- Hikers / Trail Runners
- Mountain Bikers
- Equestrians
- Ecologists
- Educators
- Artists

A dominant theme that surfaced from these meetings was the importance of establishing a regional trail through the site that could connect to a larger open space trail system.

Image 1-2: Focus Group Meeting



Tribal Input Meetings

In recognition of the longstanding ties Native Americans have with the Galisteo Basin, a special emphasis was placed on tribal input during the planning process. Tribal representatives were invited to attend three informational meetings to discuss the master plan program, the management plan, and visit the site.

Over these three sessions, representatives from nine area tribes participated and provided valuable insights to help guide the plan. The purpose of the sessions was to acquire input on how Native American groups might use the site and how sensitive areas might be experienced by the public. Some of the main concerns voiced by attendees included:

- Managing public access to cultural sites
- Conferring with tribes to confirm trail alignments and program elements
- Generating policies that protect cultural sites
- Allowing tribal access and facility closures for ceremonial purposes
- Engaging tribes with direct ties to site
- Respecting tribal interests / cultural resources

Image 1-3: Tribal Input Meeting



Agencies

As partners, leaseholders, and neighbors to the property, the following agencies were consulted and included in the planning process:

- Bureau of Land Management (BLM)
- State Land Office (SLO)
- New Mexico NMDOT Rail Bureau
- Santa Fe County

Neighboring Property Owners / Associations

Neighbors of the property were invited to meet and provide insight during early planning stages. On May 18, 2016, the conceptual plan was presented to the Galisteo Community Association for feedback. Some of the issues voiced by attendees to these meetings included:

- Restricting trespassing onto adjacent private land
- Revealing the history and pre-history of the area through interpretive signage
- Generating policies that protect cultural sites

Image 1-4: Public Meeting



GBASPA - Working Group

A draft Master Plan was presented to the Working Group that included background site analysis and public input as well as the proposed program and physical improvements. Feedback from members of this group included:

- Involving the All Pueblo Council of Governors in the decision making process
- Staying away from culturally sensitive sites
- Organizing a "Friends of Thornton Ranch" group to help serve as stewards of the property
- Anticipating the range of potential visitation and its physical impacts to the GBASPA site on the property
- Recognizing the multiple ethnicities on the site and including tribal members in the process

Public Meeting

A public meeting was held on October 20, 2016, at the Galisteo Community Center to collect input on the draft master plan. 55 individuals attended the meeting and voiced some of the following concerns:

- Include equestrians on all trails, except in situations that compromise cultural resources
- Add equestrian trailer parking to primary trailhead parking area
- Provide narrower trail treads to lessen impacts to the site
- Respect tribal concerns and outline how tribal input has been addressed
- Educate trail users on proper trail etiquette to increase safety and awareness between different trail users

Public / Interest Group Involvement

Interest Group Meetings
December 11 + 12, 2015
- input on appropriate use
- desired programming elements
- potential conflicts
- regional context

Tribal Input Meeting 1
Tuesday, July 8, 2015
- project introduction
- tribal concerns

Wednesday, July 9, 2015
- field visit
- discussion

Tribal Input Meeting 2
Wednesday, November 4, 2015
- project introduction
- tribal concerns
- overview of existing conditions analysis
- proposed draft program

Thursday, November 5, 2015
- discussion
- field visit

Tribal Input Meeting 3
Thursday, March 10, 2016
- project introduction
- overview of management plan
- overview of draft open space master plan

Galisteo Community Association
Wednesday, May 18, 2016
- project overview and history
- public question + answer session

GBASPA - Working Group
Tuesday, June 7, 2016
- open space master plan draft presentation

Tuesday, July 12, 2016
- open space master plan draft feedback

Public Meeting
Thursday, October 20, 2016
- open space master plan draft presentation

CHAPTER 2
Existing Conditions



History

PRE-HISTORY (PRE 1500'S)

The Thornton Ranch Open Space lies in a region rich in human history, in which occupation stretches back to 10,500 B.C. and spans the development and arrival of numerous peoples, cultures, and technologies. To date, more than 3,000 archaeological sites and 160 historic structures have been recorded in the Galisteo Basin, likely only a fraction of the cultural resources present in the area.

Large Classic Period (A.D. 1325-1600) ancestral Puebloan settlements and their associated ceremonial and subsistence landscapes (agricultural, resource procurement, processing sites) hold important archaeological information about the dynamic cultural history of the Galisteo Basin. Some of these sites are protected as part of 24 sites identified in the Galisteo Basin Archaeological Sites Protection Act of 2004.

An archaeological survey on the 2,430 acre Thornton Ranch Open Space area was conducted 2014-16. Areas not included in the survey are a few sections of BLM and NM State Trust land that were added later to the planning area. The survey recorded archaeological sites with varying levels of significance on the property.

While no direct evidence exists of pre-historic settlement within the planning area, visible records of human activity on the site span from Archaic (5,500 B.C. to A.D. 200) to present. A high density of Coalition period (A.D. 1200-1325) features and a lesser number of Classic period (A.D. 1325-1600) have been documented across the site. Some of these sites are highly fragile.

Ethnographic research indicates that many Native American tribes maintain traditional connections with this area or trace their ancestry to the basin.

The Galisteo Basin played a key role in the development of American archaeology beginning with Nels C. Nelson of the American Museum of Natural History in New York, who conducted early 20th century excavations at many of the Galisteo Basin's sites. A number of subsequent researchers have surveyed the area and contributed to our understanding of the greater Galisteo Basin's cultural dynamics and associated landscapes.

Image 2-1: View of the Ortiz Mountains from Thornton Ranch



Image 2-2: Rock Art



SPANISH / MEXICAN (1500 -1880)

The beginning of series of arrivals of Spanish explorers and missionaries in New Mexico in the mid-1500s sent the region on a new trajectory, irrevocably altering the existence of native tribes in the Galisteo Basin. While exact accounts of explorations are not readily available, physical evidence of Spanish occupation exists in various forms. Small missions were established at various times at the established nearby pueblos in the basin known as San Lazaro, San Marcos, Galisteo, San Cristobal, and La Cieneguilla.

In the 1600s, tensions between secular rulers beholden to the Spanish kingdom and religious missionaries mounted, adversely impacting native communities forced to provide economic tribute and repress traditional ceremonial practices. Unrelenting demands coupled with a long period of drought in the 1660's and 1670's led the to the coordinated Pueblo Revolt of 1680. For a period of twelve years, Europeans were not to be found within present day New Mexico and Arizona.

Around 1800, large land grants of San Cristobal and Galisteo were established by the Spanish Crown, beginning centuries of ownership disputes. Raiding within the basin by Plains Indians made it a dangerous place.

For a more in-depth history of the Thornton Ranch Open Space site and the Galisteo Basin, see the TROS Cultural Resource Inventory (Parametrix, 2016), and the bibliography.

RANCHING (1700 -1880)

With the arrival of the Spanish, herding and ranching operations became a form of subsistence for growing populations in the area. Sheep served as the dominant livestock in the area until the late 1800's. In 1860 New Mexico was the largest sheep producing territory in the United States, providing mutton and also wool to various markets during the civil war.

Ranching operations fluctuated in response to homesteading, drought, and raiding by the southern Plains Indians. Homesteaders arriving in New Mexico beginning in 1866 as part of the Homestead Act of 1862 limited large ranching operations. Drought forced many homesteaders to leave their cultivated land, opening up contiguous lands for cattle ranching.

Lands granted by Spain, Mexico, and the Homestead Act increased settlement, cultivation, and use of the lands. In the absence of precise documentation, surveying, and oversight, many grants overlap and do not have clear boundaries. Land grants associated with the current Thornton Ranch Open Space parcel are unclear.

The Village of Galisteo was established along a branch of the Santa Fe Trail in the early 1800's.

Image 2-3: Ranch Era Homestead ruins



RAILROAD (1880 - PRESENT)

Like much of rail expansion throughout the west, the laying of tracks in New Mexico was a frenzy to see who could make the most opportune connections first. 1880 marked the beginning of a period with rapid expansion in New Mexico: track distance expanded from 8 miles in 1878 to 3,078 miles in 1915.

The Thornton Ranch site stood at the crossroads of two important lines: the Atchison, Topeka & Santa Fe line and the north/south NM Central line. Still in use today, the AT&SF line abutting the south property edge was completed in 1880 and connected ultimately to Los Angeles and Kansas City. The north/south NM Central line, known locally as the "Pinto Line", connected Santa Fe with Torrance (116 miles south). Only in operation for 26 years (1903-1929), evidence of the rail line is still highly visible in the Galisteo Basin landscape. The Kennedy station town site, its ruins still visible on the property, served as a way station during construction, and for travelers transferring between the two rail lines.

This history is full of multicultural efforts and is directly connected with ranching, facilitating the moving of herds of cattle, sheep, and horses.

(Encyclopedia of Western Railroad History, Donald B. Robertson)

Image 2-4: Active rail line with NM Central flyover berm



PRESENT

With the railroad came a dramatic increase in mining and settlement. Mining operations instigated the growth of many small towns, including current-day Madrid (coal) and Cerrillos (turquoise, lead, silver). Lamy became a town at the junction to Santa Fe. As these operations waned in the 20th century and the automobile became the dominant means of transportation, the populations of these towns diminished.

Nearby communities and isolated developments began to appear in the mid-1900's. The Eldorado subdivision, one of a group of subdivisions north of Lamy, was once part of a 28,614 acre cattle ranch that was developed into a 2,887-home community (2000 US Census).

As the 17,000-acre Thornton Ranch cattle operations ceased at the end of the 20th century, the lands were gradually sold. Local preservationists feared the fate of this ranch would follow others in the area and end up as a sprawling community. They made efforts to conserve the open space areas quintessential to the basin.

The Thornton Ranch Open Space property serves as a reminder of the vast open space and holds remnants of multiple eras of human occupation.

Image 2-5: Kennedy Well active windmill



Ecology

VEGETATION

The dominant vegetation patches are piñon and juniper shrub-tree cover with patches of grass undergrowth, alternated with open grassland meadows. North-facing slopes and outcrops that receive more concentrated precipitation also have herbaceous and woody shrub species not found on drier upland slopes. Arroyo bottoms support a limited quantity of riparian shrubs and trees where roots can take advantage of shallower groundwater. A small seep along the arroyo at the center of the site sustains enough moisture for a small community of willow and cottonwood trees.

The area may have lost a considerable number of pinon trees after 1996, shifting to a dominance of juniper trees, likely due to recent piñon die-off during bark beetle infestation and drought (1996-2002).

Noxious weeds and sparse Cheatgrass growth are not a major problem, but may warrant future mitigation. Siberian Elm trees are stunted and scattered near drainage areas and have not attained problematic densities. A few large-sized Russian Olive trees are established near the riparian woodland areas.

WILDLIFE

Small mammals, reptiles and birds are evident on site and represent a typical sample of dry-woodland, rocky sloped ecosystems of the Galisteo Basin. Deer Mice, Kangaroo Rats, Wood Rats, Desert Cottontail and Black-tailed Jack Rabbits provide a prey base for predators such as snakes, coyotes and raptors. Birds of prey include the Red-tailed Hawk and American Kestral and others depending on seasonal migration patterns.

Smaller bird species utilizing juniper and pinon habitat include: Spotted Towhees, Rock Wrens, Black-throated Sparrows and the Mourning Dove albeit most of the bird activity is located along the central drainageway. Riparian woodland habitat near the center of the site is too miniscule to support a wide diversity of species inherent to cottonwood-willow forests.

Larger mammals include Black Bear and Mule Deer which frequent the two water tanks. The site is also a migratory route for cougar. The site is not viable habitat for pronghorn and no prairie dogs have been found on the open space property.

In July 2015, RCS Southwest inventoried plant and animal species found on site between May 1st and July 26th. Their report includes a list of plant and animals species observed and detected on site as well as a classification of distinct biotic communities inherent to the area. Their findings suggest that:

- Much of the wildlife habitat in the area is dry and homogenous pinon-juniper woodland that does not support an especially diverse vertebrate-animal fauna.
- The area of greatest diversity is located in the central drainage way across the middle of the site.
- There is very little nesting activity of perching birds. Gray Vireo was not detected on the property.
- Small rock outcrops may provide roosting for migratory bats, but none were observed on site. The threatened Spotted Bat is unlikely to breed in the open space area.
- Limited development of trails and roads for management and public access will have an insignificant impact on local biota.

Image 2-6: Prairie Zinnia (Zinnia grandiflora)



Image 2-7: Rattlesnake



Image 2-8: Arroyo with adjacent grassland meadow



SOILS

Soils on the Thornton Open Space land are primarily coarse sandy loam on summits, shoulders, and backslopes of low hills. This type of soil is thin, well drained and has a very low water capacity (Soil Survey of Santa Fe County Area). It has a moderate to severe hazard of erosion and requires over-excavation and importation of engineered soils for construction.

Soil deposits found along valley floors are typically fine sandy loam, which is more fertile and has a deeper soil horizon and water capacity.

Soil types found on the property are moderately to severely susceptible to erosion, typically consisting of deposited sandy, gravely, and cobbly loam. These soils exhibit a distinct gully erosion tendency when disturbed, which can be seen along dirt roads located on site. Steeply eroded gullies as high as 20 ft. highlight the need to deliberately locate program elements in order to mitigate erosion and protect loose soils from foot traffic.

GEOLOGY

Geology, combined with the presence of water figure large in the human interaction with the Galisteo Basin. Beginning as a large inland sea during the Cretaceous period, the basin was pushed up by the Ferilon plate from the west. As the Sangre de Cristo Mountains were formed to the west, rivers left deposits within the basin, forming the Galisteo Formation layer. Volcanic activity to the south and west shaped the Ortiz Mountains and Cerrillos Hills, along with long dikes radiating out from them, forming Cerro Pelon and the Creston. During the ice age (2 mil years ago) the landscape became an erosive basin.

Mining of minerals and metals found in the surrounding hills and mountains has been an attraction for centuries and has shaped the landscape and industry of the basin. Turquoise found in the Cerrillos Hills was collected by Native Americans for centuries. Silver, lead, coal, and gold were mined in the Cerrillos Hills and Ortiz Mountains.

More recently, exploration for oil and gas in the basin has threatened the natural and historic cultural landscape.

CLIMATE

Climate has directly impacted settlement patterns, population counts, and the livelihood of people in the Galisteo Basin. With only intermittent streams in the basin and few springs, the presence or absence of rainfall has resulted in a shifting landscape.

The climate of the Galisteo Basin is marked by little rainfall, large diurnal temperature swings, and a high number of days with clear skies. Water resources are scarce and in summer months during the day, there is little shade.

Some of the average climate statistics for the Galisteo Basin and the Thornton Ranch property in particular are as follows:

- elevation: 5,870 - 6,338 MSL
- latitude: 35.4° North
- rainfall: 12-14 inches / year
- snowfall: 30 days/accumulation
- sunshine days: 300 / year
- high temperature: 86.2°F (July)
- low temperature: 17°F (January)
- first frost: October 1
- last frost: May 15

Image 2-9: Highly erodible soils



Image 2-10: Andecite rock formation with lichen

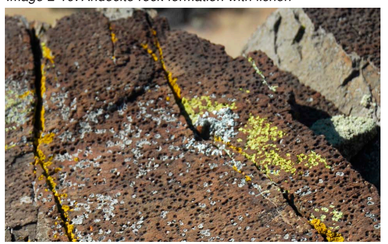


Image 2-11: Prickly pear cactus with fruit



Site Context

A vast and sparsely-populated setting with long vistas and dramatic open skies, the Galisteo Basin is being slowly transformed by expanding adjacent communities, incremental development, and threats of oil and gas extraction. In reaction to this, multiple parallel initiatives have heralded a conservation approach to future development.

Efforts to preserve this cultural landscape and open space area is evident in recently adopted zoning overlays and conservation development initiatives. Preservation-minded private land owners have begun to establish conservation easements on portions of their lands. Federal and county land holdings limit development and allow public access for recreation. While still patchy and incomplete, this emphasis has helped piece together and preserve some significant areas of the quintessential Galisteo Basin landscape.

Within this setting, the Thornton Ranch Open Space property serves as a key land holding to set the stage for balancing open space preservation with recreational development.

NEIGHBORHOOD CONTEXT

The Thornton Ranch Open Space is located in the sparsely populated Galisteo Basin 25 miles south of Santa Fe (pop. 83,875, 2016). The nearest town is the historic village of Galisteo (pop. 260, 2016) 3 miles to the east. Its proximity to Santa Fe, the Eldorado area community (15 miles, population 6,130), Lamy (11 miles, population 218) and Cerrillos to the west (10 miles, population 321) makes it primarily a drive-to destination for most residents and visitors of Santa Fe County (2012 US Census).The low population and scarcely distributed housing contributes to the rural, open feel of the land.

The site is centrally located within the greater Galisteo Basin, just north of the Galisteo Creek at the junction of County Road 42 and the NMRX (New Mexico Railrunner Express) railway.

The Thornton Ranch Open Space borders both private and public land. These include the Galisteo Basin Preserve to the northeast and a large parcel of BLM property to the west. Nearby County open space includes Mt. Chalchihuitl to the west (13 miles, pending acquisition) and Lamy Open Space in the town of Lamy. Cerrillos Hills State Park, near the town of Cerrillos, is owned by Santa Fe County and managed by the state.

Existing Trails

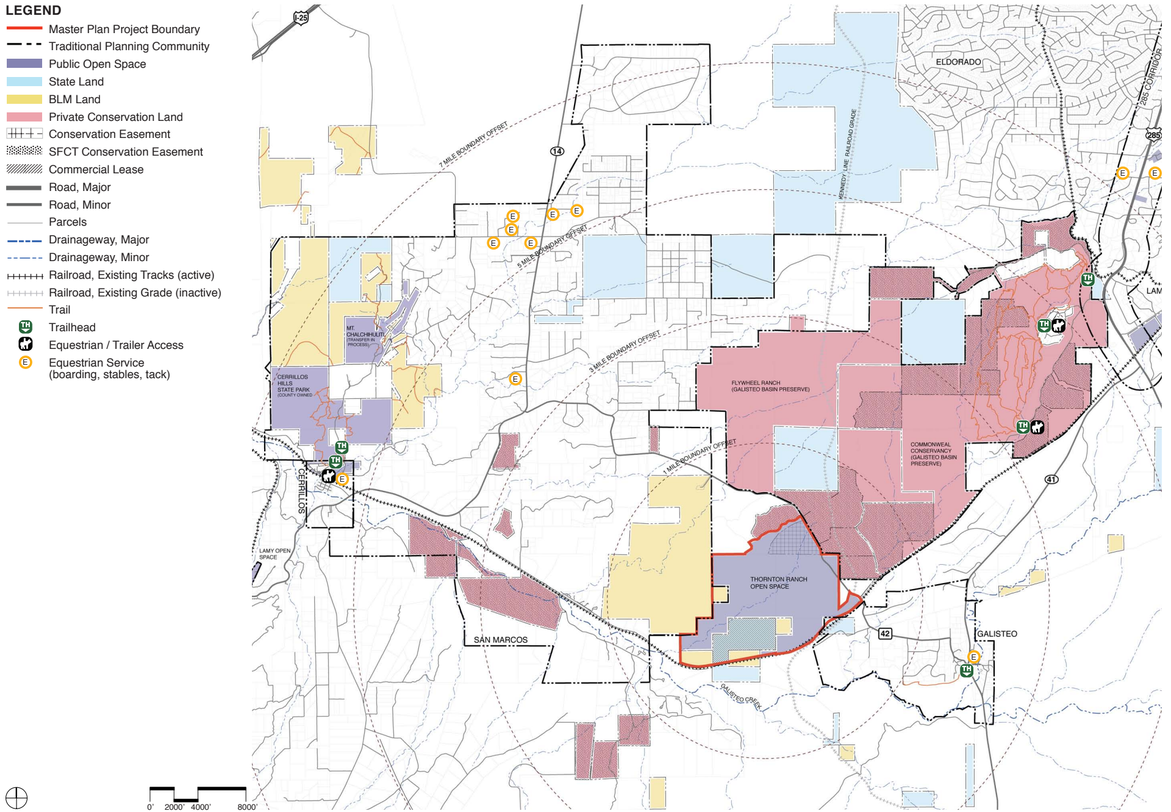
Existing trails within the Galisteo Basin consist of independent recreational trail networks in the Galisteo Basin Preserve, Eldorado subdivision, and Cerrillos Hills State Park, as well as the Santa Fe Rail Trail, a 17-mile multi-use trail extending from downtown Santa Fe to Lamy. While no existing trails currently link to the Thornton Ranch Open Space, a number of plans illustrate future trail connections to this area.

Proposed Trails

Area communities have expressed interest in expanded recreation trail networks as well as longer regional trails and improved connectivity between trail systems to address current and future needs. Currently boasting a total of 25 miles of recreational trails, the Galisteo Basin Preserve has plans to build a total of 50 miles of hiker, biker, and equestrian trails. Efforts are underway to secure a trail connection to the eastern corner of the TROS in a easement paralleling the NMRX active railway.

Santa Fe County long range plans illustrate off-road trail connections between the villages of Lamy, Galisteo, and Cerrillos and the Eldorado community. These plans identify a north/south regional trail along the abandoned New Mexico Central railway and an east/west regional trail parallel to but outside the ROW of the active NMRX railway. Crossing both private and public land holdings, these regional trails are long-term planning efforts that will require ROW acquisition prior to development.

Figure 2-1: Context Map



LAND OWNERSHIP

The 2,430-acre Thornton Ranch Open Space site encompasses land owned by three separate entities: Santa Fe County, the Bureau of Land Management, and the NM State Land Office. The site is being planned and managed by Santa Fe County, in cooperation with the other land holders, as a single site.

Santa Fe County
Santa Fe County owns 1,904 acres within the Thornton Ranch Open Space, its largest and most significant open space land holding. Santa Fe County has taken the lead on preparing a master plan and management plan for the Thornton Ranch Open Space.

NM State Land Office
Santa Fe County holds a lease for a 320-acre parcel of New Mexico State Trust Land that lies centrally within the Thornton Ranch Open Space planning area. In 2017, the lease agreement with the NM State Land Office was transitioned from a grazing lease to a business lease (see *Appendix C: BL-2351*) to allow for recreational use of the land by the public and to facilitate the protection of its natural and cultural resources. The proceeds from this lease benefit the New Mexico Public Schools.

The lease of an additional approximate 7-acre tract of state land along the rail line is being considered to provide a contiguous management area bounded on the south by the rail line.

Bureau of Land Management
The BLM owns a 4,811 acre recreation area to the west of the Thornton Ranch Open Space designated as the Galisteo Basin - Cerrillos Hills / Burnt Corn SRMA (Special Recreation Management Unit). A portion of this area (207 acres) lies in four separate parcels within the Thornton Ranch Open Space planning boundary and is intended to be jointly managed with Santa Fe County (pending MOU).

A MOA (Memorandum of Agreement) between the BLM and SF County exists to "*work jointly on planning, preservation, protection, resource management, and other matters, including preparation of a site assessment, site management plan, and a general management plan.*" (see *Appendix C: MOA No. 2016-0059-PW/BT*).

The management objective of the Cerrillos Hills / Burnt Corn SRMA is "*to provide access to trails and open space, opportunities for routine exercise and escape, and learning local history and prehistory in this front country and middle country setting*" (BLM Taos Resource Management Plan, May 2012, p.74). This area is closed to motorized access, shooting and is also unavailable for livestock grazing.

Figure 2-2: BLM SRMA Land Area



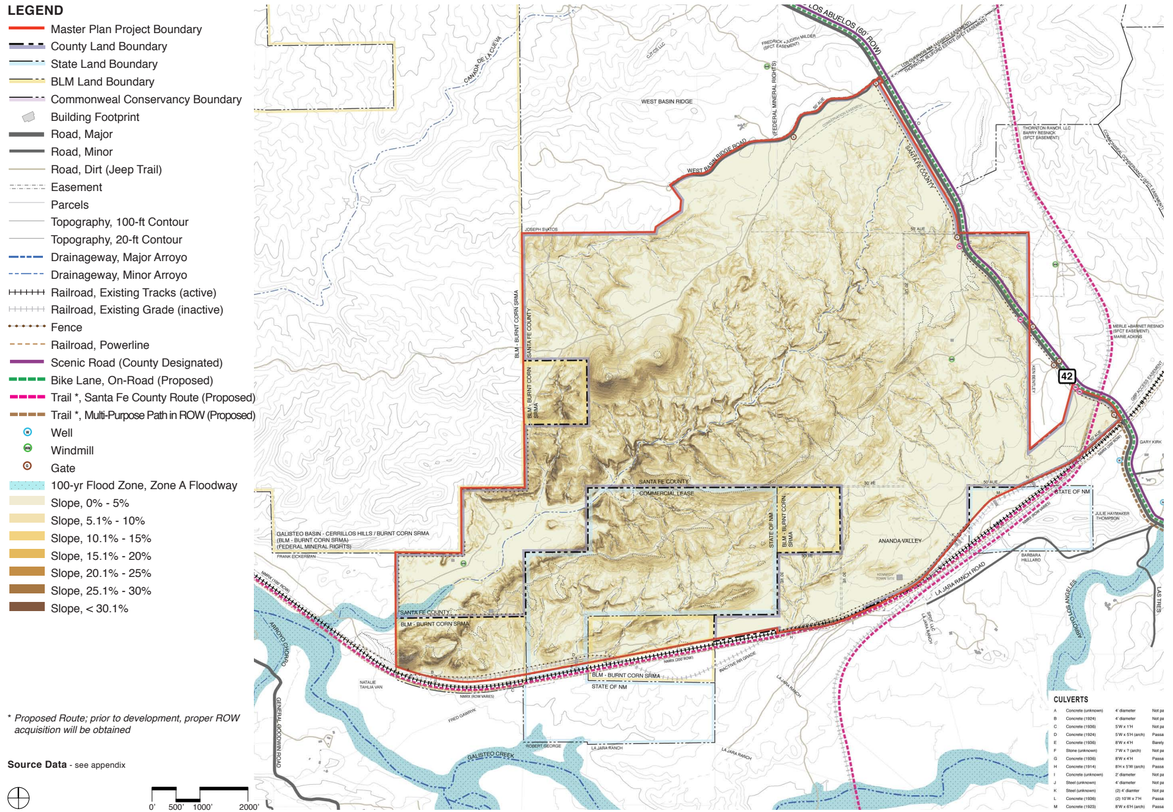
Adjacent Land Ownership

Land holdings adjacent to the Thornton Ranch Open Space site include a mix of public and private lands. BLM, State Land Office, and NMRX parcels abut most of the western and southern edges. Land along the northern and eastern boundary is privately held. With the exception of one existing residence north of West Basin Ridge Road, there are no other residences on private properties adjacent to the site.

Railway
The NMRX (New Mexico Railrunner Express) railway forms a distinct southern boundary to the Thornton Ranch Open Space planning area. The New Mexico Department of Transportation (NMDOT) owns the track, infrastructure, and fenced right of way along this line. BNSF railway has trackage rights for freight trains and Amtrak has trackage rights for the Southwest Chief Train along this line.

Private Inholding
One privately held inholding off of County Road 42 is a 30.6-acre residential parcel with a dedicated building site and remaining land held in a conservation easement. With the exception of a fence and access gate along its border with CR 42, no other improvements have been made on this parcel.

Figure 2-3: Site Analysis Map



LAND USE AND ZONING

In an effort to preserve the character of the Galisteo Basin, zoning and regulatory overlays dictate development rules and density.

Santa Fe County
The Thornton Ranch Open Space site is designated as Santa Fe County Open Space as part of the official 2015 Sustainable Land Development Code map series. Zoning for county-owned property is primarily “Agricultural / Ranch” (A/R) with a small portion to the east zoned ‘Rural’ (RUR). Improvements on Santa Fe County land are subject to the Santa Fe County Sustainable Land Development Code (SLDC). BLM and SLO parcels are not under the jurisdiction of County zoning.

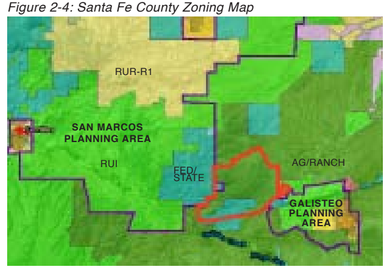
The San Marcos Community Planning District overlays the Thornton Ranch Open Space minimally on its western edge.

By ordinance, Santa Fe County prohibits the use of projectiles of all forms and motorized vehicles on open space properties.

Zoning Key

FED/STATE	Federal or State Land	AG/RANCH	1 dwelling unit / 160 AC
RUI	1 dwelling unit / 40 AC	RUR-R1	1 dwelling unit / 10 AC

Figure 2-4: Santa Fe County Zoning Map



State
New Mexico state lands are subject to the conditions of the lease agreement (see Land Ownership, p. 16). All improvements on these lands must follow state designated regulations.

Federal
BLM-owned parcels are subject to the regulations set forth in the BLM SRMA for BLM lands and the conditions of the MOU with Santa Fe County (see Land Ownership, p. 16).

An additional federal overlay on the TROS land includes those areas designated in the Galisteo Basin Archaeological Sites Protection Act.

Galisteo Basin Archaeological Sites Protection Act
The Galisteo Basin Archaeological Sites Protection Act (GBASPA) is a federally mandated act “*to provide for the preservation, protection, and interpretation of the nationally significant archaeological resources in the Galisteo Basin in New Mexico*” (Public Law 108-208, HR 506, adopted March 19, 2004). The Act requires the development management plans for the 24 protected sites listed in the act in consultation with the Governor, Land Commissioner, affected Native American pueblos, and other interested parties.

The General Management Plan - GBASPA (2012, BLM, Taos Field Office) sets the broader management framework for the preservation and protection of the sites identified in the Act. Santa Fe County, in cooperation with BLM is developing a site-specific management plan for the GBASPA site within the planning area in compliance with the Act. The management of the site as a whole will be coordinated with this management plan.

Overlays and Encumbrances

In addition to use and management guidelines established by the BLM and SLO lease agreements for those parcels, other overlays and encumbrances exist within the Thornton Ranch Open Space site. These include easements that allow for access / utilities and dictate conservation encumbrances as well as regulations that prescribe use and management requirements and outline zoning regulations.

Conservation Easement
As part of the 2004 purchase of the 263.63-acre Tract 10 parcel on the north corner of the site, a conservation easement encumbers a 186-acre portion of the tract. The easement permits the development of trails, a parking area, and a visitor center with the goal of minimizing their impact on the viewshed of the West Basin Preserve parcels. Originally held by Commonweal, a New Mexico non-profit corporation, the easement was transferred to Santa Fe County.

Access / Utility Easements
There are a number of access and utility easements on the edges and internal to the site (see Appendix B: Site Analysis Maps).

- County Road 42: 60’ public access and utility easement.
- West Basin Ridge Road: 50 ft. non-exclusive private access and public utility easement.
- CR 42 heading west into the site (2 locations): 50 ft. access / underground utility easement.
- Southeast corner (Section 33): 30 ft. ingress and egress easements along N/S and E/W section lines
- Section 28: 20 ft. north/south utility easement

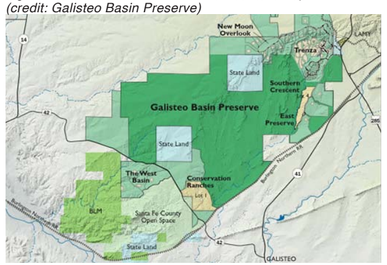
LAND FEATURES

Adjacent Land Planning Context

Traditional settlement in the Galisteo Basin is marked by the small village housing clusters of Galisteo, Lamy, Madrid, and Cerrillos. Modern day rural settlement is gradually spreading at very low densities across this landscape leaving little open space for public access. The exception to this is the Galisteo Basin Preserve.

Galisteo Basin Preserve Master Plan
The Galisteo Basin Preserve is a 13,522-acre conservation-based master-planned community adjacent to TROS on the east. As the original 17,000-acre Thornton Ranch was being sold, efforts were made by the Commonweal Conservancy, a nonprofit conservation-based community development organization, to prevent encroaching development and provide an emergent “regenerative development” that concentrates density in select areas and preserves large sections of land with conservation easements. At full buildout, the community is intended to have 50 miles of trails, 275 homes, up to 71,000 sf of commercial / civic, and 13,000 acres of preserved open space.

Figure 2-5: Galisteo Basin Preserve - context map (credit: Galisteo Basin Preserve)

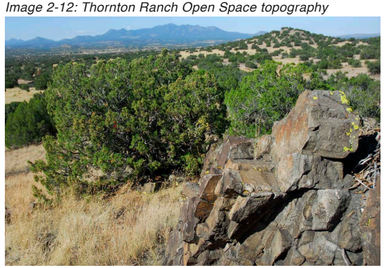


Topography

The site is marked by gentle sweeps of ridge lines and valleys that traverse the site from east to west. Elevations range from 5,870 MSL (mean sea level) at the base of the primary drainageway on the western boundary to a high of 6,338 MSL. The most prominent land forms are a pair of conical volcanic plugs rising ca. 400 ft. above the adjacent valley floor, the summit of the one to the west slightly higher than the other to the east. Parallel with the railway, an intermittent basaltic dike extends for miles further east and is locally referred to as the northern “Creston”, or “Hogback”.

A site analysis map (see Figure 2-3) illustrates slope classifications in 5% increments. Darker colors reveal steeper slopes that are more prone to erosion. Gently sloping terrain exists along much of the northern, eastern, and southern areas of the site with steep and difficult terrain occurring at volcanic outcroppings and along the major central drainageway.

Image 2-12: Thornton Ranch Open Space topography



Drainage
An unnamed arroyo running northeast to southwest serves as a distinct feature and the primary drainageway for the property. It begins as a gentle drainageway that gradually gives way to a deep canyon until it opens up to a wide grassy valley. Numerous smaller drainageways and tributaries flow into this central arroyo. The lower 1,000 feet of this arroyo on SF County property is mapped as a FEMA flood zone.

Stormwater falling on the southern section of the property drains south toward the rail berm and exits the site through a series of culverts that range in size from 2 ft. diameter to (2) 10 ft. x 7 ft. wide concrete culverts. A total of 14 culverts exist along the rail berm south of the property.

All arroyos and drainageways are intermittent streams that lead to the Galisteo Creek, the basin’s primary waterway, located just west of the property which continues to its confluence with the Rio Grande near Kewa Pueblo, 22 miles downstream. The Galisteo Creek, a ca. 54-mile waterway, drains the 730-square mile (467,000-acre) Galisteo basin land area.

Image 2-13: Thornton Ranch Open Space drainage



CIRCULATION / ACCESS

Currently, public access to the site is allowed only by limited guided tours conducted by Santa Fe County staff. Periodic access is granted to members of Site Watch, a volunteer organization that monitors archaeological sites. Unauthorized access to the site has been curbed since Santa Fe County assumed ownership / management of the property and implemented perimeter security and access control measures. However, there is still evidence of unauthorized access to the property from the south in locations where large drainage culverts and trestles along the railroad tracks intersect with major drainageways.

Roads

Due to the site's relative remoteness, vehicular roadways currently serve as the primary means of access to the property.

Access Roads
County Road 42 (CR 42) along the site's eastern edge is designated as a "Major Collector - Rural" road and serves as the main access to the site. Paved in July 2010, the two lane CR 42 connects to major regional roadways and serves as the Galisteo Basin's primary east-west route between Cerrillos, Galisteo and Lamy. West Basin Ridge Road, a gated private unpaved road, runs along a portion of the site's northern property boundary and provides access to private residential lots north of the site.

Internal Roads
A network of unpaved utilitarian ranch roads traverse the site providing rugged vehicular access to the site's interior. They were constructed for ranching purposes to access livestock, structures, windmills / water tanks. Sections of these road alignments were not designed or constructed sustainably, have not been maintained, and are causing soil degradation and point source erosion.

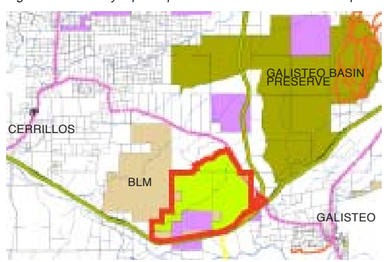
Trails

While no regional trails currently exist that serve the Thornton Ranch Open Space property, Santa Fe County SLDC identifies a N/S regional trail corridor along the NM Central railway that enters the east corner of the site and an E/W regional trail corridor running parallel with the NMRX ROW. The Galisteo Community Plan also illustrates a multi-use trail along CR 42 that would connect the town of Galisteo with the Thornton Ranch Open Space property.

Recreational Trails
There are no recreational trails on site. Santa Fe County leads periodic tours of culturally significant areas along unimproved routes.

Bike Routes
As a Priority 3 project, the 2015 Santa Fe County SLDC identifies adding on-road bike lanes on CR 42. It is envisioned that this improvement would be accomplished as a retrofit through widening the roadway. This route along CR 42 currently serves as the official route for the annual Santa Fe Century bike race (half-century route).

Figure 2-6: County Open Space and Trails Resources Map



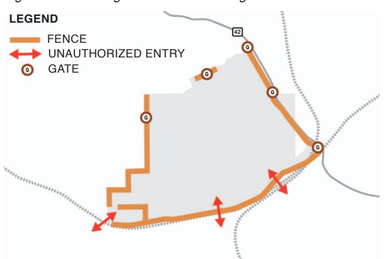
Public Transit

No public transit stops exist along or in close proximity to the site, but regional connections are available.

Bus
Since September 2011, the North Central Regional Transit District (NCRTD) operates a commuter bus route serving the communities of Edgewood, Moriarty in Torrance County, Stanley, and Galisteo with stops in the City of Santa Fe. The 290 Edgewood NCRTD bus service to Galisteo (ca. 5 miles southeast of site) runs Monday through Friday with a north-bound morning run into Santa Fe and an evening south-bound run stopping in Galisteo before continuing to communities in southern Santa Fe County.

Train
Amtrak operates the Southwest Chief, a high speed passenger train, on the NMRX railway that runs along the southern border of the property. Trains run daily between Los Angeles, CA and Chicago, IL with stops in Albuquerque and Lamy (ca. 10 miles northeast of the site). Trains pass the site twice a day (northbound at approx. 1:17 p.m., southbound at approx. 2:24 p.m.).

Figure 2-7: Existing Access Control Diagram



Fencing

Fences and gates along the property perimeter identify property boundaries and help control unwarranted access to the site.

Perimeter Fencing
The site is fenced with a 5-strand barbless fence along County Road 42 and is marked periodically with "No Trespassing" signs. Along the entire southern property edge, the site is bounded by an old barbed wire fence located approximately on the edge of the NMRX railway right of way (ROW), parallel with the tracks. This fence is well maintained by MRCOG on behalf of NMDOT to restrict public access within the high-speed railway ROW.

Shared borders with BLM land have some sections of old barbed-wire fence intact, but not along the entire length. Some of these existing fence sections are dilapidated and provide access into the site from the west.

Gates
Two locked ranch gates along CR 42 provide access to the site's interior and are controlled by Santa Fe County. The southern-most gate provides access to the railroad easement. Along the private gated West Basin Ridge Road, a cable barrier with a combination lock serves as an access point from the north. A locked ranch gate along the site's western boundary provides access to the BLM inholding from BLM lands to the west. No gates exist along the NMRX railway ROW.

UTILITIES

Due to the rural location of the Thornton Ranch Open Space, typical urban utility infrastructure is not available, nor is service planned in the near future. Area residences rely on localized utilities.

Electric / Gas / Telephone
Electrical, gas, and telephone service is not present on the Thornton Ranch Open Space site or in its vicinity. At higher points of elevation cellular service is available inconsistently depending on the carrier.

Water

Municipal water line connections are not present in the vicinity of the Thornton Ranch Open Space. However, the property has rights to both domestic water and livestock water.

Santa Fe County is eligible for 3 acre/ft. of water with a Section 72-12-1 NM State Water Permit on the Tract 10 land situated in the north portion of the property. Water could be used for irrigation, domestic, and limited institutional uses. These water rights have not been claimed to date.

Two wells exist on the property that are associated with previous ranching efforts and have 72-12-1 Livestock Watering water rights. Each well consists of a metal windmill pumping water into a nearby stock tank with an overflow pond downhill.

- Kennedy Well - RG 58669 (east side well)
- Canyon Well - RG 58678 (west side well)

The stock tanks and ponds attract wildlife such as birds, coyote, antelope, and deer, which have been observed via a County wildlife camera mounted on the east side windmill.

Wastewater / Solid Waste

There is no sanitary sewer infrastructure located on or near the site. All area homes have septic or other localized systems.

The land owner is responsible for disposing of solid waste. The San Marcos Waste Convenience Station run by Santa Fe County is located 1.5 miles north of the site along CR 42. This station accepts payment for waste and is free for recyclables.

SERVICES

Fire / Emergency Response

Fire and emergency response service for the Thornton Ranch Open Space property is provided by the Galisteo Volunteer Fire District located 4.5 miles southeast along CR 42 in Galisteo. This station houses 4 response vehicles with the support of 16 members (11 with medical training). The district assists and receives aid from other local, state, and national agencies.

The nearest hospital, Saint Vincent's Hospital, is located approx. 25 miles north in Santa Fe.

Police / Sheriff

Public safety and law enforcement for the Galisteo area is conducted by Santa Fe County Sheriff officers.

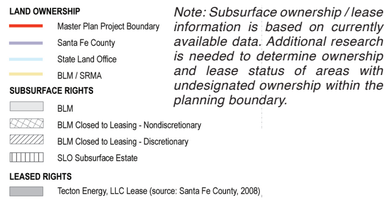
Schools

The Thornton Ranch Open Space site lies within the Santa Fe Public Schools district and is serviced by El Dorado Community School for grades K-8 (approx.12 miles away) and the Turquoise Trail Charter School for pre K-6 (approx. 15 miles away). Santa Fe High School is located 23 miles north of the site for grades 9-12.

NATURAL RESOURCES

The Galisteo Basin has historically been a location rich in natural resources, whether for livestock grazing or mining. Regionally there have been a variety of mining operations, including for turquoise, gold, silver, lead, zinc, uranium, coal and iron ore. No mining or mineral extraction operations have occurred on the Thornton Ranch Open Space site. Of recent concern, however, is oil and gas exploration in the area which has raised awareness by local inhabitants about the protection of natural and cultural resources from potential petroleum hydrocarbon extraction.

Figure 2-8: Subsurface Mineral Rights



Note: Subsurface ownership / lease information is based on currently available data. Additional research is needed to determine ownership and lease status of areas with undesignated ownership within the planning boundary.

Mineral Rights

Surface rights within the Thornton Ranch Open Space planning area are controlled by the land owner. Subsurface mineral rights within the Thornton Ranch Open Space property are dominantly controlled by the federal government (see *Figure 2-8*). Within the subsurface estate administered by Federal agencies, mineral rights govern the rights to leasable, salable, and locatable minerals (see definitions this page).

Within the site boundaries protected by the GBASPA, all mineral extraction (leaseable, salable, and locatable) is prohibited (Taos RMP, BLM 2012). On BLM Burnt Corn SRMA lands (allotments 917 + 926) only leasable mineral extraction is prohibited. On State Trust lands, the state owns the mineral rights and administers leases for mineral extraction. Santa Fe County does not own subsurface rights, but controls surface access. According to Ordinance No. 2001-1 (Rules and Regulations for County Parks, Trails, and Open Space Areas), the unauthorized removal of any natural or man-made object from open space areas is prohibited.

Subsurface mineral right ownership for ca. 350 acres within the TROS planning area is unknown (not controlled by Federal or State agencies) and should be researched. County data (2008, Santa Fe County) indicates that 126 acres of subsurface mineral rights on the property within TROS are leased to Tecton Energy LLC.

***Leasable** minerals include oil and gas, oil shale, geothermal resources, coal, among others.*

***Salable** minerals are common varieties of minerals and building materials such as sand, stone, gravel, pumice, clay, rock, and petrified wood.*

***Locatable** minerals are typically mined and include gold, silver, copper, gemstones, among other minerals.*

Mineral Assessment

In order to identify the potential for mineral extraction on the TROS, a locatable mineral assessment was conducted on the property for Santa Fe County in 2015. This mineral assessment concluded that "*the probability of extraction or removal of minerals by any surface mining method or drilling method...is so remote as to be negligible*" (RT Hicks Consultants, 2015). A liquid or gaseous petroleum hydrocarbon evaluation was not conducted for this property.

While mining for metals and minerals exists in areas 8-12 miles away, similar subsurface layers with these resources either do not exist below this site or are too deep for mining. The mineral favorability rating, or potential for a favorable geologic environment for mineral occurrence, as documented by RGIS.com of TROS is low.

While no salable mineral assessment was conducted for TROS, geologic maps indicate the presence of several varieties of salable minerals within the site boundary. Extraction of salable minerals is regulated by the SLDC (*Section 10.19 and Chapter 11.10*).

Grazing and Rangeland

The Taos Recreational Management Plan makes the BLM Burnt Corn SRMA lands and GBASPA sites unavailable to grazing (Taos RMP, BLM 2012). Santa Fe County lands within the Thornton Ranch Open Space site are also closed to grazing. With the new business lease arrangement between Santa Fe County on State Trust lands executed in 2017, grazing is not a permitted use on the SLO parcel.

Figure 2-9: Geological Map

LEGEND

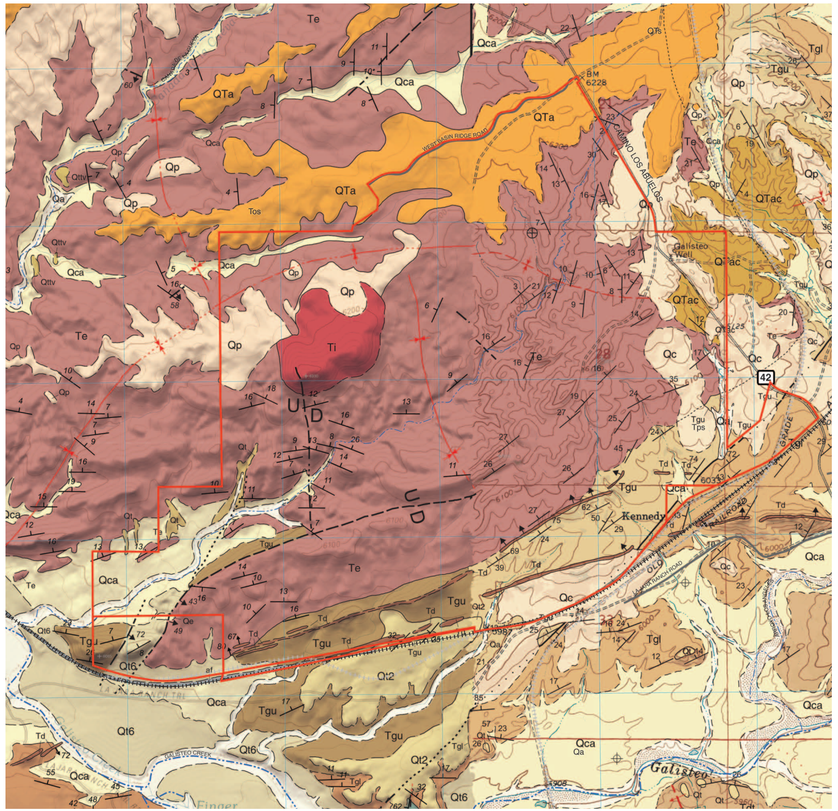
- Master Plan Project Boundary
- Building Footprint
- Road, Major
- Road, Minor
- Road, Un-paved
- Topography, 20-ft Contour
- Topography, 100-ft Contour

Geologic Formations

- Qc, Sedimentary, Colluvium, unconsolidated sand, silt and clay deposits along upper hill slopes + flat crests.
- Qca, Sedimentary, Colluvium / alluviaum-sand, silt and clay in abandoned stream channels, flood plains and lower valley slopes.
- Qp, Sedimentary, Pediment deposits, cobble, pebble, sand and silt lying upon remants of surface cut to a former Galisteo Creek channel level.
- Qt, Sedimentary, Terrace deposits of Galisteo Creek, terrace alluvial deposits formed by Galisteo Creek.
- QTac, Sedimentary, Ancha or Tesuque channel, calcite cemented arkose or arkosic limestone over very coarse arkosic sand and red silt. Formed by former groundwater.
- QTa, Sedimentary, Ancha, buff to moderate orange and gray-pink poorly sorted sand, gravel and cobble. Derived from Precambrian metamorphic sedimentary terrains.
- Td, Igneous, Galisteo Dike, dark fine grained mixture of plagioclase, potassium, feldspar, titan-augite, titaniferous biotite and opaque grains. Brown, stands as wall.
- Te, Sedimentary, Espinaso Volcanics, grayish purple and reddish brown beds of tuff, volcaniclastic sandstone of alluvial fan origin. Source, Cerrillos Hills + Ortiz Mtns.
- Tgu, Sedimentary, Galisteo Formation Upper Unit, Tan to white, massively bedded, friable, well sorted cross bedded sandstone and interbeds of red, rose, tan and gray-green mudtone. Contains silicified logs to four ft diameter and 30ft. lengths.
- Ti, Igneous, Intrusive rocks, undivided.

Source Data - see appendix

0' 500' 1000' 2000'



Attributes

VIEWS

The Thornton Ranch Open Space site's central location within the Galisteo Basin and within the larger array of adjacent mountains, combined with its series of elevated landforms, afford spectacular 360° views across the basin floor to the surrounding mountain ranges. From this vantage point, the site's position within the cultural and natural landscape becomes clear.

The highest point on the Thornton Ranch Open Space land is in the northwest part of the site at 6,338 MSL and the lowest, at 5,870 MSL. Viewshed corridors should be kept intact to preserve this area's scenic identity, and support the area's qualities in attracting tourism.

Figure 2-10: Views Map - Surrounding Mountain Ranges

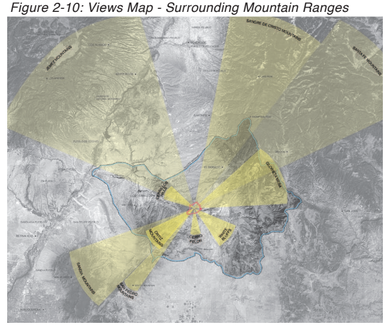


Image 2-14: View northeast to the Sangre de Cristo Mountains



Image 2-15: View west to the Ortiz Mountains

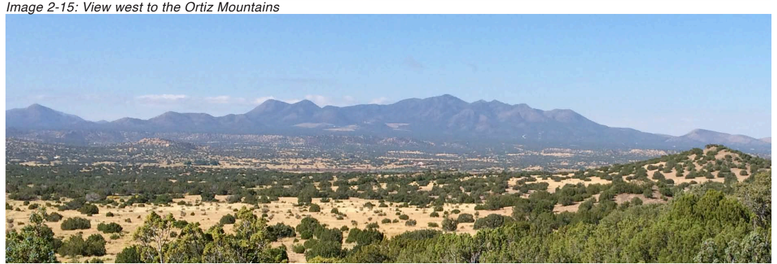


Image 2-16: View south to Cerro Pelon

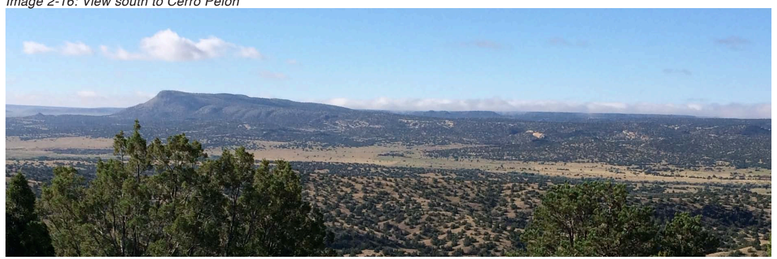


Image 2-17: Milky Way visible within the Galisteo Basin (photo: Peter Lipscomb)



NIGHT SKIES

The Thornton Ranch Open Space site's central location affords 360° views to mountain ranges across the horizon, evoking an understanding of the dome of the night sky. Sparse development and low adjacent light levels still allow high visibility of night skies.

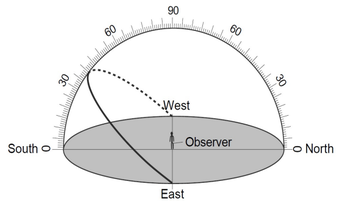
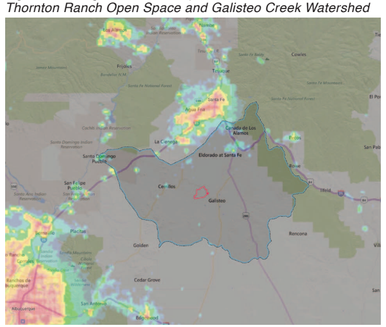


Figure 2-11: Light Pollution Map (www.lightpollutionmap.info, July 2016) *with Thornton Ranch Open Space and Galisteo Creek Watershed*



CHAPTER 3
Master Plan



Master Plan

The Thornton Ranch Open Space Master Plan offers a vision and guiding framework to safeguard this public open space property while providing opportunities for recreational trails use. The Plan is intended to guide the development of a trail network that offers a unique and enriching recreational and educational experience. It balances public access with the preservation and conservation of significant cultural resources. It can be implemented in phases, depending on funding availability and priorities set by the County.



THE VISION

Within the culturally significant landscape of the Galisteo Basin, the Thornton Ranch Open Space offers a destination for outdoor recreation and education within a scenic natural and cultural resource. The large-scale site provides an inspiring setting for the health and wellbeing of a broad constituency of users - as an area that can collectively serve as a cultural heritage center, wildlife habitat and linkage area, open space preserve, and recreation area.

Vision

The Thornton Ranch Open Space will become a recreation destination that supports the health and well-being of our people in balance with a respect for the land, our cultural heritage, and the environment.

GUIDING PRINCIPLES

PRESERVE

Preserve environmental and cultural resources for future generations.

- Avoid sensitive cultural and archaeological resources and continue regular site monitoring to preserve existing assets.
- Mitigate impacts to historical sites through careful design and educational interpretation.
- Restore, maintain, and enhance the native ecology.
- Outline materials, design standards, and construction practices that touch the land lightly, blend with the existing site, and limit disturbance.

CONNECT

Connect the land, people, history, and ecology.

- Link to off-site roads and regional recreational trails so the site becomes part of a larger network.
- Provide a diversity of user experiences for people of all skills and ages to recreate and experience nature.
- Accommodate a range of low-impact enjoyable recreation on foot, bike, or horseback.
- Educate visitors about the wealth of history, culture, ecology, and geology of the site through interpretive materials.
- Establish and instill trail users with a strong sense of stewardship and personal responsibility for the land.
- Enable wildlife to traverse the site and its borders and benefit from the natural resources.
- Involve individuals and entities with direct ties to the land in the design and construction process, so construction occurs thoughtfully and respectfully.

TRAILS MASTER PLAN

The Thornton Ranch Open Space Master Plan outlines the components of a publicly accessible trail system for recreation, education, and open space preservation. To enhance the trail experience for all recreational trail users, the master plan proposes both internal trail improvements and external connections to the trail system from future regional trails.

The Master Plan emerged with thoughtful input and participation of representatives from local tribes, trail user groups, local community members, and special interest groups. Of particular importance to American Indian tribes, only a limited area of this site will be open for use by hikers / trail runners, mountain bikers, equestrians, artists, archaeologists, and scientists / ecologists. 16+ miles of constructed trails provide entry into a stunning landscape that preserves over 99% of the site to allow the natural wildlife and ecology to flourish.

New trailheads with short access roads are placed at strategic locations to connect to the trails. All trails are intended to include some measure of interpretive information as an opportunity to educate the users of the trails of the historical and natural significance of the land within the Galisteo Basin.

Paramount to the success and use of the trail system will be the implementation of a signage and wayfinding system which will allow users to orient themselves, learn of the trail system, and plan their routes.

As the Master Plan is adopted and improvements are made according to the plan, the Thornton Ranch Open Space will be recognized as one of many gems the residents of Santa Fe County have at their doorstep for wilderness trail recreation and open space preservation.

USER EXPERIENCE

The Thornton Ranch Open Space Master Plan provides a framework for a broad range of user experiences: from enjoying trails in a stunning setting, to learning about the evolution of human inhabitation in the Galisteo Basin, to taking part in guided tours on special topics. The goal is for visitors to access the site's amenities, respect the site, and have a safe, engaging, and enjoyable experience.

Recreational Trails

The Thornton Ranch Open Space trail system offers an array of recreational trails for different users of varying abilities. Trails are designed to provide a recreational experience for users including hikers, trail runners, mountain bikers, and equestrians. Trails are organized into four types: Regional Trail, Multi-Use Trail, Accessible Trail, and Backcountry Trail. A majority of the trails are beginner and intermediate level trails. Each trail will be designed, constructed, and maintained to meet standards outlined in Chapter 4 *(see Trails, p. 48).*

Hikers / Trail Runners / Snow-shoers / XC Skiers
Hikers in the Thornton Ranch Open Space will be able to access 16+ miles of trails from the primary trailhead and at two locations along the Regional Trail. Hiking routes provide recreation options of varied length that range from easy to moderate difficulty and suit users of all ages and adventure levels. Routes are designed on varied terrain to highlight natural features, landscape typologies (eg. meadow, pinon forest, arroyos), history, and spectacular views of the surrounding mountain ranges.

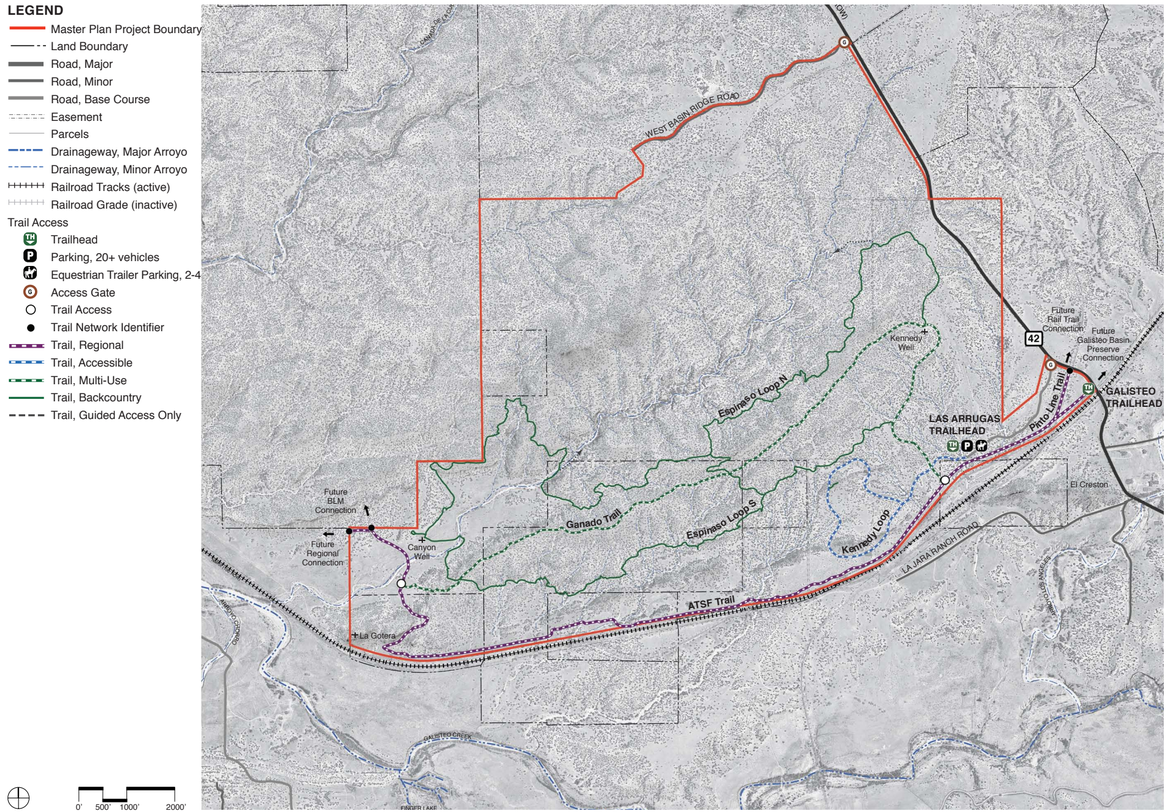
Mobility Challenged
Individuals who are mobility challenged are able to access 1.5 miles of trails from the primary trailhead. This trail is intended for individuals with sight or mobility issues, families with children in strollers, or for those who have little time and would like an introduction to the Open Space property.

Mountain Bikers
Mountain bikers will have access to 16+ miles of trails from the primary trailhead and at two locations along the Regional Trail. Proposed trails connecting to the Regional Trail will allow mountain bikers the opportunity to bike into the trail system from future regional trails, and other locations within Santa Fe County.

Equestrians
Equestrians will be able to access 16+ miles of trails at two locations along the Regional Trail and park a limited number of trailers at the main trailhead. Once connector trails are in place, equestrians can access the Regional Trail from area stables or park their trailers in off-site locations and ride to the Thornton Ranch Open Space trails. Existing historic windmill structures / water tanks along the trails will be refurbished to serve as watering locations for horses and wildlife.

Motorized Vehicles
Motorized vehicles are not permitted on trails or within the open space. Motor vehicle site access is limited to designated access roads and trailhead parking areas. Only in emergency and maintenance situations will limited motorized access be permissible.

Figure 3-1: Trails Master Plan



ELEMENTS OF THE PLAN

Rules of Use

The Thornton Ranch Open Space will specific rules that establish allowed users and how they can and cannot interact with the open space. The intent is to allow respectful recreational trail use by a broad spectrum of non-motorized users, but also to establish guidelines to preserve the wildlife habitat, cultural landscape, and sensitive features for future generations.

The following guidelines are general rules of use to which each trail user should adhere. A full list of rules can be found in *Chapter 4: Master Plan Implementation*.

- Trail users must respect trail signage and only follow trails that are designated for their particular trail use.
- Trail users must stay on the trail and yield to other users.
- Trail users must walk / ride trails at their own risk.
- Motorized recreation vehicles are not allowed on the trails or within the open space.
- Dogs are not allowed on the trails or within the open space.
- Leave No Trace: all trash and foreign material should be removed and disposed of properly.
- Collection or removal of materials from the site are not permitted.
- No camping
- No firearms
- Trails / Trailhead open from dawn to dusk

Trails and trail access comprise the main elements of the master plan. The plan proposes the strategic siting of these elements and limits their extent in order to provide satisfying recreational areas for all trail users as well as to sustain quality natural environments for existing wildlife. These improvements are outlined in Chapter 4 *(see Design Standards, p. 44).*

Access to the Trails

Trail access in the Thornton Ranch Open Space Master Plan consists of trailheads, regional trail access points, and internal trail system access points.

Trailheads serve as important junctures or 'transfer points" between public roads, trails, parking, and access areas to the trail network. As the user's first impression of the trail system, the trailhead should provide necessary information where needed, be physically attractive and inviting to use. The proper location, design, and collection of amenities can help orient the trail user to provide a safe and pleasurable recreational experience.

The Master Plan identifies two types of trailheads: primary trailheads with trail access, larger parking areas (up to 40 spaces), horse trailer parking (up to 4 spaces), and enhanced amenities; and secondary trailheads with trail access, parking (up to 20 spaces), and basic amenities. Once off-site regional trail connections are made, equestrians will be able to park horse trailers in off-site equestrian trailheads and access the property on horseback along regional trails.

Primary Trailhead

One primary trailhead will serve as the access point for the majority of trail users. The thoughtful siting, sequencing, design, and detailing of this trailhead will help transition visitors from their vehicle and prepare them to enter a sensitive cultural landscape that commands their interest and respect.

- Parking / trailer parking area is located in low-lying terrain to reduce the visibility of vehicles from within the open space area.
- Parking is nestled within existing vegetation to mask its visibility and provide a sense of enclosure; a perimeter fence designates its limits.
- Site amenities may include restroom facilities, seating, shade structure(s), or basic signage sited between the parking area and trail.
- A winding, processional trail leads from the parking area to the trailhead.

Threshold

While each location where trail users can enter the Thornton Ranch Open Space trail system is considered a threshold, the one located west of the primary trailhead is envisioned to welcome a majority of visitors and will receive special attention.

Here the visitor is introduced to the site and welcomed with informational signage and incredible views of the surrounding landscape. Information is presented in variety of media to broaden the extent of the information, including, print, sound, web access. An amphitheater / gathering area is tucked into the natural terrain to provide seating for up to 50 people and serve as a location for informal talks and educational events.

Figure 3-2: Las Arrugas Trailhead - Conceptual Layout

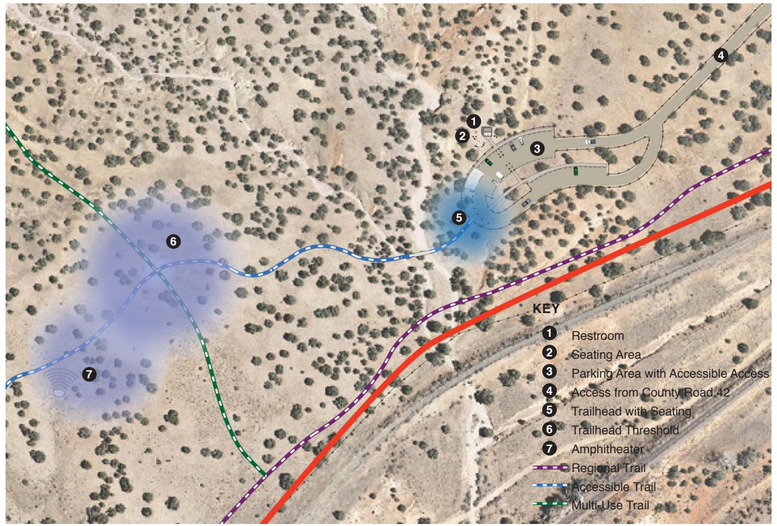
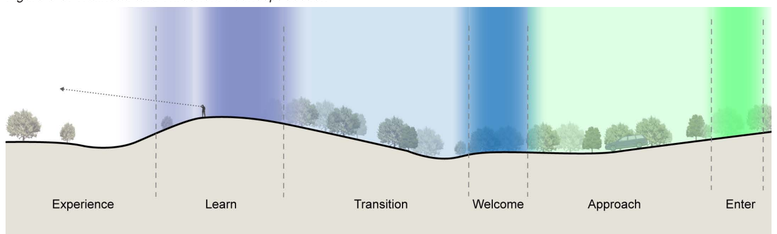


Figure 3-3: Trailhead and Threshold - concept section



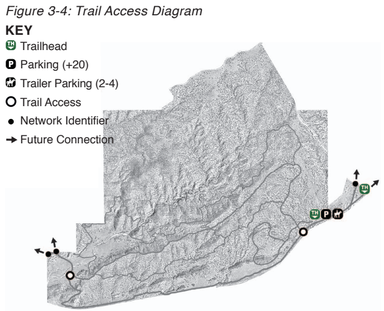
Secondary Trailhead

One secondary trailhead is located near a major access road and will provide parking for up to 20 cars and basic amenities (environmental signage, trail access). The secondary trailhead will be fenced and gated.

Trail Access

Trail access points allow trail users (hikers, mountain bikers, equestrians) to enter the Thornton Ranch Open Space trail system in a number of locations. They are located along the perimeter of the property at locations where the regional trail extends beyond the site boundary and also at junctions between the regional trail and the internal trail system. These trail access points will be controlled by gates or other measures in order to prevent motorized users from entering the trail system.

Figure 3-4: Trail Access Diagram



Trail Types

The Thornton Ranch Open Space trail system is comprised of four primary trail types: Regional, Multi-Use, Accessible, and Backcountry. Each trail has specific characteristics (alignment, width, surface treatment, view distance, clearance) and designated allowed trail users. While additional trail users not indicated are allowed on trails, such as trail runners, snow-shoers, cross country skiers, no motorized vehicles are allowed on the trails, except in emergency and maintenance situations.

The Thornton Ranch Open Space internal trail system connects to the regional trail in two locations. It is envisioned that trail users will access the regional trail from on-site trailheads as well as from regional connections.

Access to non-designated routes for guided tours are permitted only with permission by the land manager.

Figure 3-5: Trail Etiquette



SHARE THE TRAIL:

The Thornton Ranch Open Space will adopt the National Forest's "Share the Trail" policy, which asks bikers to yield to both hikers and equestrians and hikers to yield to equestrians.

Regional Trail

3.90 miles, 150 ft. elevation change

The Regional Trail will be a major throughway along the southern edge of the site parallel with the NMRX railway. Once connected to future regional recreational trails to the west and the east, it will provide access to Thornton Ranch Open Space internal trails and serve as part of a long distance trail for runners, bike riders and equestrians. It is a non-motorized trail with a soft surface that is 4-8 feet wide (at full build-out). Prior to connecting with adjacent regional trails, it will follow Multi-Use Trail standards.

Figure 3-6: Regional Trail Layout, Section, and Allowed Users



Multi-Use Trail

3.25 miles, 280 ft. elevation change

The Multi-Use Trail will be a centrally located internal trail that provides a connection to the internal trail system from two locations from the Regional Trail for hikers, mountain bikers, and equestrians. Much of its alignment follows an existing old 2-track ranch road. It is a non-motorized trail with a soft surface that is 5-6 feet wide in existing sections and 12" - 24" wide in new sections and traverses valleys and ridge lines.

Figure 3-7: Multi-Use Trail Layout, Section, and Allowed Users



Accessible Trail

1.5 miles, 55 ft. elevation change

The Accessible Trail will offer access to a limited area of the site and some of the property's archaeological features on a gently sloped accessible path. Families can accompany children in strollers, people in wheelchairs, sight and accessibility challenged individuals along this trail. It is a non-motorized trail with direct access from the trailhead with a compacted surface that is 5-6 feet wide. A parallel 18" wide soft-surface trail provides a location for equestrian access.

Figure 3-8: Accessible Trail Layout, Section, and Allowed Users



Backcountry Trail

7.0 miles, 290 ft. elevation change

The Backcountry Trail will be an internal trail loop north and south of the central dominant ridge line. This trail is a narrow, single track trail that will weave in and out of minor drainages and foothills and provide a fun experience for hikers, trail runners, bike riders, and equestrians. It traverses a diverse range of ecologies. It is a 12" - 18" wide trail built of compacted dirt.

Figure 3-9: Backcountry Trail Layout, Section, and Allowed Users



Guided Trail - out of system

Unmarked or lightly marked trails to see specific features or areas of t he site will be located off of trailheads or established trails. These access points will not be marked and can only be accessed by joining a scheduled guided tour. As an undeveloped trail, users are expected to wear proper gear and be comfortable walking on unstable terrain.

Figure 3-10: Guided Trail Section and Allowed Users



Education

The Thornton Ranch Open Space Master Plan outlines a strategy for enriching the visitor experience through education, interpretation, and guided exploration. Interpretive themes and messages will align with those presented in the Galisteo Basin Interpretive Plan.

The goal is for visitors to understand, appreciate and learn to respect the intrinsic qualities of this place so they are inspired to take personal responsibility for the care and preservation of these highly significant resources. (*Goal 4, Thornton Ranch Open Space Management Plan*).

Trail layouts have been designed to expose the breadth of educational topics available for interpretation while preserving the vast majority of the site. In certain locations, trail routes encroach on designated historic archaeological sites in a deliberate way to reduce impacts to the site while providing opportunities for education.

EDUCATIONAL THEMES

With evidence of human occupation in the Galisteo Basin that spans centuries and a geological history that extends well before then, there are many stories to tell about this landscape and how people interacted with it and with each other.

Educational opportunities can range from more passive to active: from site-specific interpretive signage, to self-guided tours, to ranger / specialist talks, to guided tours, and to specially programmed events. Some points of interest that could serve as interpretive opportunities include the railroad, ranching, and natural features that highlight particular geological or ecological environments (see *Figure 3-11: Points of Interest Diagram*).

Railroad
Along the southern edge of the site, the existing active railway serves as a reminder of the role this infrastructure served to transform the west. The now abandoned rail bed of the NM Central illustrates how temporal some of these lines were. The Kennedy station and remnants of the town site are still visible today.

Ranching
For years a working cattle ranch, there are many remnants of ranching within the property. Walls of old homesteads and temporary dwellings mark locations for those tending herds; windmills and ranch roads illustrate the infrastructure needed for working ranches.

Geology / Ecology
Many distinct locations exist to view and recount the stories of geology and ecology. In particular, the site's central drainageway shows evidence of multiple geological formations and ecological typologies.

EDUCATIONAL PROGRAMS

The Master Plan enables programmed activities to occur on the Thornton Ranch Open Space site that align with the core objectives of preservation and connecting people to the land.

Programs could be developed for the study and interpretation of topics including:

- stargazing / night sky preservation
- dryland restoration
- geology
- ecology
- wildlife counts + vegetation / monitoring
- history
- water
- impacts of ranching
- land use / land tenure

Activities which do not support the objectives of the plan are not recommended within the open space area. Unless special permission is granted, the following uses are prohibited:

- sporting events (eg. races) - on internal trails
- camping
- movies (film production and/or projection)

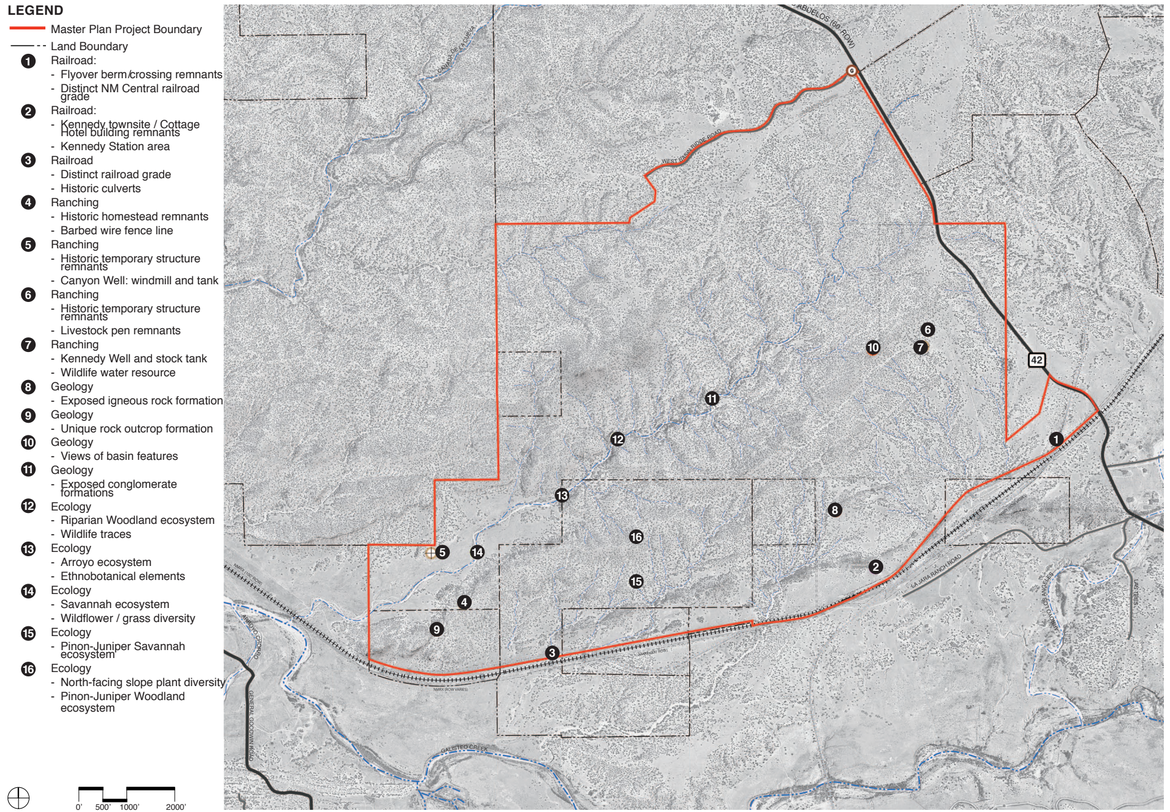
Guided Hikes

Designated experts or docents may conduct tours within the open space area both on and off-trail to provide more in-depth educational information on various topics. Off-trail guided hikes will be located on unmarked or discreetly marked trails.

Research

Research topics and site-specific art projects will be allowed with permission, especially as they relate to the goals of preserving and educating people about this cultural landscape. (*See management plan guidelines for research projects.)*

Figure 3-11: Points of Interest Diagram



Interpretation

Historic windmills, stone structures, and other visible artifacts are some of the features that can be explained with interpretive signage to evoke the different eras of this cultural landscape. Signage should be informative, yet subtle, not overshadowing the setting but allowing visitors to relate to issues and challenges of times past and present.

Trail alignments within archaeological sites are intended to provide good overviews of sites and the surrounding context to enrich the breadth of interpretation while minimizing site disturbance. Respect for maintaining sites in their current state will be encouraged through defined trail limits and signage.

Image 3-1: Trail Access and Interpretive Signage at a Historic Site (Conceptual Montage)



Ecological Monitoring / Restoration

Recreational use will impact soils, flora, and fauna. As part of a preservation initiative, a baseline assessment of existing ecological systems and wildlife patterns would serve as a benchmark for monitoring change and managing the property for wildlife habitat / connectivity. Areas that harbor invasive or non-native plant species will be restored to a re-disturbance state to promote a balanced ecosystem. Similarly, eroded and degraded soils will be restored and stabilized to optimize cover and productivity.

Watering troughs and tanks will be repaired and modified to make them more wildlife friendly. Protecting seeps from human access will retain their status as important refuge areas for wildlife.

Restoration and monitoring initiatives will be conducted with small groups on a limited basis to restrict further disturbance of the property.

Image 3-2: Ecological Survey Documentation (Conceptual Montage)



History

Visible features in the landscape can be used to relay historical information about the land's natural resources, how it was used, what effect climate has had, and how it has changed over time. With evidence of human use across the landscape, many opportunities exist to tell the stories of this place from a range of perspectives.

The trail network provides access to some of these features and views of others. A critical location for revealing the broader history and context of the site is at the trailhead threshold, where interpretation will be provided at a central viewing platform.

Guided tours will enable more in-depth conversations on specific aspects of area features and history.

Image 3-3: Kennedy Well Watering Hole and Interpretive Signage (Conceptual Montage)



Resource Protection

Natural resources on the Thornton Ranch Open Space and within the Galisteo Basin are in danger of being impacted by encroaching development. Protective measures to preserve certain resources have been and continue to be enforced for sensitive areas within the Thornton Ranch Open Space. Additional management measures are needed to preserve night skies, wildlife habitat / corridors, viewsheds, and other cultural and archaeological sites.

Limited infrastructure will be provided as part of the plan to protect resources. A central gathering area near the trailhead provides for ranger talks and night sky viewing.

Image 3-4: Star Gazing / International Dark Skies Protection (Conceptual Montage)



Preservation

The Thornton Ranch Open Space serves as an opportunity for modeling preservation-minded practices in keeping with other preservation-focused initiatives in the Galisteo Basin. This focus will help ensure the land retains its cultural, ecological, and wildlife-habitat function while preserving its use for the enjoyment of future generations.

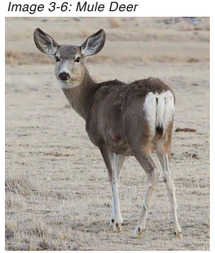
The first step in resource protection is conducting a detailed ecological assessment of existing conditions to establish a baseline, much like the Cultural Resource Inventory accomplishes for archaeological sites. Based on this assessment, Santa Fe County will develop a natural resource restoration and management plan for ongoing landscape stewardship.

Archaeological / Cultural Resource Preservation
The Thornton Ranch Open Space Master Plan limits site access, avoids archaeological and cultural resource sites, and dictates the mitigation of impacted archaeological sites. These measures help preserve the cultural landscape and significant archaeological resources on the Thornton Ranch Open Space.

Image 3-5: Mourning Dove



Image 3-6: Mule Deer



RESOURCE PROTECTION

Resource protection in the Thornton Ranch Open Space begins with preservation and includes enhancing wildlife habitat and facilitating animal movement. Declining or sensitive species within key habitat areas include the mourning dove (*Zenaida macroura*) and mule deer (*Odocoileus hemionus*).

Measures to restrict disturbance to wildlife habitats and culturally sensitive areas include the following use restrictions:
- no dogs
- stay on designated trails
- no hunting / shooting
- off-trail use only with special permit

Measures to protect wildlife habitat and movement include:
- wildlife-friendly fencing
- animal-friendly watering tanks
- trail closures during breeding seasons

A majority of the site is Pinon-Juniper / Grama Woodland and Savannah (NVC). However, two small locations of Cottonwood / Willow Woodland (NVC) exist in the central drainageway where groundwater is closer to the surface and should be protected since it is a relatively rare biotic community in an arid setting.

Image 3-7: Riparian Woodland



RESTORATION

Aided by the ceasing of ranching operations on the property around 2000 and recent years with adequate rainfall, native plant regeneration, and rehabilitation has occurred naturally.

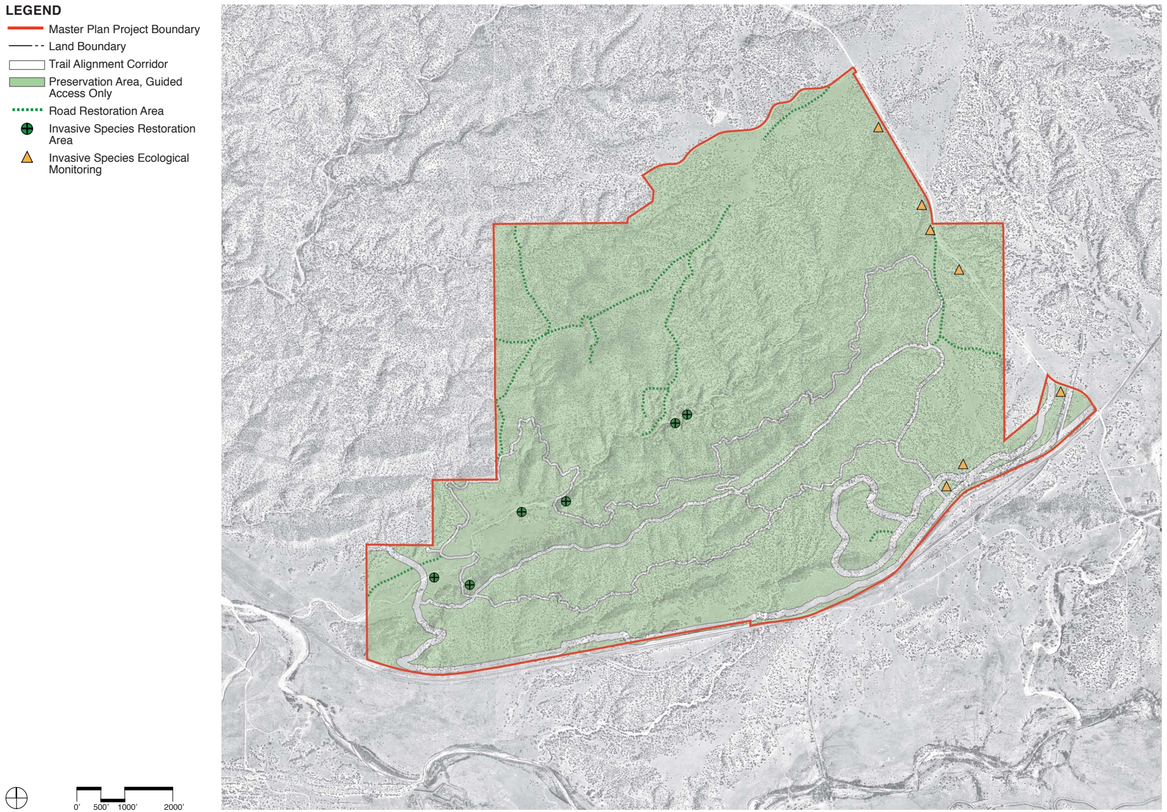
Overall, the property has relatively undisturbed soils. This, combined with little rainfall contributes to a landscape inhabited dominantly by native species.

In a few locations, however, Class C noxious weeds exist (Cheatgrass, Russian Olive, Siberian Elm). Implementing the following measures to manage these non-native species would help reestablish native plant communities:
- remove invasive species (Russian Olive) within the riparian woodland areas;
- remove Siberian Elm trees along west drainageway;
- document, remove, and monitor Cheatgrass and evidence of other invasive weeds along drainageways entering the site off of CR 42;
- revegetate non-system ranch road sections and degraded areas;
- monitor new trailhead / parking area construction, equestrian trails, and associated drainageways as new vectors for noxious weeds;
- and monitor internal trails for new weed vectors.

Image 3-8: Pinon / Juniper Savannah



Figure 3-12: Preservation / Restoration Diagram



CHAPTER 4
Master Plan Implementation



Implementation

As the Thornton Ranch Open Space is opened to public access as set forth in this Master Plan document, a series of projects have been identified and prioritized. The projects outlined in *Figure 4-1, Implementation Projects List* and *Figure 4-2 Implementation Projects Map* represent the major projects recommended to be completed by Santa Fe County in order to realize the plan.

Projects are listed according to the following categories: access control, master plan, signage, restoration, and connections. Within each category, priority projects are generally listed at the top. These projects stand out in part because they help establish safe access to the property and align with project goals of preservation and restoration.

Projects identified for implementation list associated cost estimates and are subject to adjustment as projects, approvals, and construction timelines are finalized.

Depending on the exact location of the project improvement on County, BLM, or state trust lands, approval processes, construction procedures,and construction timelines will vary.

Figure 4-1: Implementation Projects List

IMPLEMENTATION PROJECTS

No.	Project Type	Project		Jurisdiction SF County	BLM	SLO
ACCESS CONTROL						
1	Fencing	Perimeter Fencing + Access Control Secure perimeter of site along east property line (new fence installation + fence repairs), install no trespassing signage.		x		
RESTORATION						
1	Restoration	Restoration		x	x	x
		Invasive plant removal / restoration	Erosion Control			
		Existing ranch road segment reclaimation	Soil stabilization and Improvement			
		Windmill restoration / new water tank installation	Drainage improvements			
MASTER PLAN						
1	Trailhead	Las Arrugas Trailhead (primary trailhead) New ca. 0.5 mi access road and trailhead parking (40 vehicles, 2-4 horse trailers) for access to trails. The new trailhead will have a perimeter fence, signage, trail access, restroom, and site amenities. The new entry gateway will have a monument sign, access drive, and gate. This trailhead will be installed with a smaller parking capacity (20-25 vehicles, 2 horse trailers) and expanded as warranted.		x		x
2	Threshold	Site Orientation / Education Area New threshold / education area west of primary trailhead to educate visitors about the site, the history, and access.		x		
3	Trailhead	Galisteo Trailhead (secondary trailhead) New trailhead northwest of CR 42 / NMRX railway with parking area for up to 20 cars, trail access, signage, and site amenities.		x		
4	Trail	ATSF Trail (Regional Trail) New ca. 3.75 mi connector regional trail along south property boundary. This trail will be initially installed as a hard-packed 18"-24" wide trail. When offsite regional trail connections are made, this trail will be upgraded to a 4-8' wide crusher fines surface trail and a .25 mile extention will be made to connect to regional multi-use off-site trails to the west.		x	x	x
5	Trail	Kennedy Loop (Accessible Trail) New ca. 1.5 mi accessible trail loop with parallel equestrian path internal to site originating from the new trailhead with 1 historic site.		x		x
6	Trail	Ganados Trail (Multi-Use Trail) Existing / new ca. 3.5 mi connector trail (2.25 mi existing / 1.25 mi new) between regional trail and existing ranch road with 2 historic sites.		x	x	x
7	Trail	Espinaso Loop (Backcountry Trail) New ca. 8.00 mi single track trail with 2 historic sites.		x	x	x
SIGNAGE						
1	Signage	Orientation / Regulatory Signage Fabricate and install wayfinding signage for the Thornton Ranch Open Space area. This includes orientation and regulatory signage as proposed in the draft signage master plan. The family of signs includes trailhead kiosks, trailhead signs, internal regulatory signs, internal orientation signs, and internal trail markers.		x	x	x
2	Signage	Interpretive Signage Interpretive signs at major trailheads, historic sites, nature areas, and vantage points will provide information on the native ecology, geology, history of the site, etc.		x	x	x
CONNECTIONS						
1	Trail	Regional Trail - northeast connection (NM Central) New ca. 0.25 mi segment on/along NM Central rail berm connecting to off-site regional trail along NM Central.		x		
2	Trail	Regional Trail - northwest connection (BLM) New ca. 0.30 mi segment to BLM property connecting to off-site regional trail within Burnt Corn SRMA.		x	x	
FUTURE TRAIL PROJECTS - OFF-SITE						
1	Trail	Regional Trail - BLM Galisteo Basin - Cerrillos Hills / Burnt Corn SRMA New regional trail on BLM Burnt Corn SRMA to connect north to CR42 and west to future connection to Cerrillos				
2	Trail	Regional Trail - NM Central (Pinto Line) New regional trail on/along NM Central rail grade north to Rancho Viejo with future connection to Santa Fe Rail Trail				
3	Trail	Regional Trail - ATSF New regional trail parallel with ATSF (NMRX) rail line northeast with future connection to Lamy and Santa Fe Rail Trail				

Figure 4-2: Implementation Projects Map

LEGEND

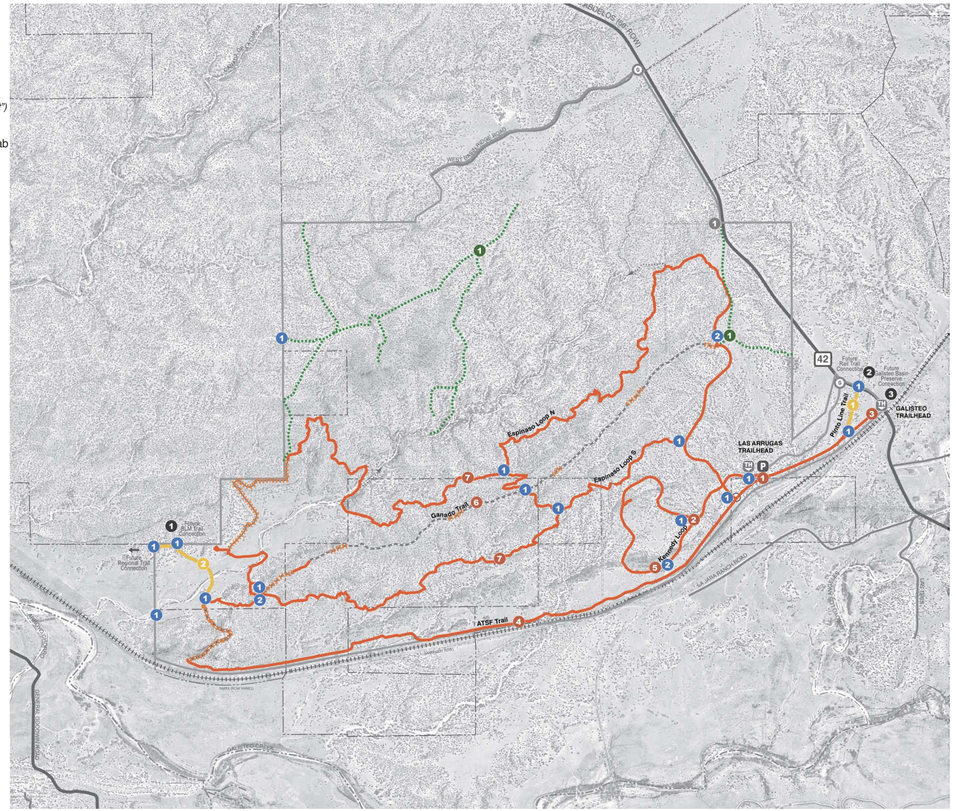
- Master Plan Project Boundary
- Land Boundary
- Road, Major
- Road, Minor

Proposed Improvements *(See "Projects List")*

- Road, Proposed Restoration
- Trail, Proposed Realignment/Rehab
- Trail, Proposed New Segment

Proposed Projects *(See "Projects List")*

- Access Control Projects
- Restoration Projects
- Master Plan Projects
- Trail Signage Projects
- Trail Connection Projects
- Off-site Future Trail Projects



IMPLEMENTATION PROCESS

Projects will be implemented under the direction and administration of County staff. In all cases, applicable codes and procedures shall be followed regarding environmental clearance, design *(see Design Standards, p. 45)*, approvals, and construction.

New projects completed as part of the Trails Master Plan will need to follow all County, State, and Federal guidelines for archaeological review and clearance prior to construction. Review and approval processes for improvements may differ between County, BLM, and State lands.

Gradual Implementation

It is assumed that as funding is allocated for project implementation in the Thornton Ranch Open Space, improvements will be gradually implemented. The plan recommends full implementation of some measures and gradual implementation of others (see *Figure 4-1, Implementation Projects*). All phases must address site and user safety and security comprehensively prior to opening access of that phase to the public.

Trail Construction - Cultural Resource Review

While the Master Plan outlines a recreational trail plan for the site that follows the above guidelines, we recognize that this approach is based upon mapped sites and may not fully address culturally sensitive viewsheds or unmapped features. In this case, we propose a construction review process that enables tribal input in order to make adjustments to proposed trail alignments.

The process for finalizing trail alignments is envisioned as follows:

- mark / flag proposed trail alignment in the field,
- allow an agreed-upon window of time for tribal review (ca. 45 days),
- collect comments / realignment suggestions,
- mark / flag adjusted alignment in field,
- complete regulatory approvals as required,
- begin construction (tribal representative / qualified archaeological consultant present as required),
- minimize disturbance to areas outside the construction zone, and
- restore / reseed disturbed areas.

CHANGES TO THE PLAN

The Thornton Ranch Master Plan document guides the design and implementation of improvements in the planning area. This plan has emerged with conscientious input from representatives of area tribes, agencies, user groups, neighbors, community members, interested individuals, and staff. In the event changes are proposed to the plan after adoption by the Board of County Commissioners, a process for review and approval of changes is required.

For minor changes, approvals can be granted at an administrative level. For major changes affecting site program or operations, review and approvals should be conducted in coordination with the land manager(s), area tribal representatives, agency representatives (if applicable), and county staff. Major changes would require BCC approval.

Some of the following conditions could arise that would constitute minor changes to the plan:

- changes in site management triggered by resource protection, species or habitat protection
- adjustments in trail access locations along perimeter access points in response to final off-site trail alignments
- additional signage and/or educational materials on site

Some of the following conditions could arise that would constitute major changes to the plan:

- increased regular site visitation that exceeds the capacity of the provided infrastructure and triggers a reevaluation of site infrastructure, visitation protocol, etc.
- a determination that the on-site presence of staff (eg. ranger) and a location to house staff is necessary

CONSTRUCTION GUIDELINES

In the spirit of preserving cultural and natural resources on the property, construction projects to implement the Thornton Ranch Open Space Master Plan shall preserve existing conditions and minimize site disturbance to the greatest extent possible.

Construction internal to the property shall be performed with a minimum disturbance to the existing site. Materials should be transported by hand, mule, or wheelbarrow to the greatest extent possible; no motorized vehicle access is permitted, except with express approval.

Construction bid documents shall outline project-specific information and rules regarding site access, vehicle restrictions, limits of disturbance, revegetation, construction review processes, and field adjustments. Strict adherence will be required. Non-compliance will result in fines or other measures as determined by Santa Fe County.

Vegetation

Native vegetation along all natural open space trails shall be preserved to the greatest extent possible to protect the aesthetic quality of the trail. Clearing of vegetation for trails, especially along embankments, should be minimized.

Locally appropriate soil and water conservation techniques and/or plantings to stimulate native plant growth should be used for stabilization and restoration of all disturbed areas to prevent erosion or for screening purposes. Construction techniques and trail routing techniques that preserve vegetation should be used to minimize visual intrusion.

Landscape + Revegetation

- Topsoil removed from the parking area and vehicular spaces should be stockpiled and used for restoration and revegetation of cuts, fills and site disturbance.
- Clear limits of construction should be staked and fenced to minimize disturbance to existing vegetation.
- Areas surrounding the trailhead and parking area disturbed during construction should be restored with native vegetation. (*see Revegetation at right*)
- All disturbed areas should be covered with slash from thinned trees or with coarse wood chip mulch or compost to prevent wind and water erosion during and after construction to facilitate soil development.

Tree Trimming - Clearing Limits

It is important for all trail building and maintenance crews to properly trim branches and vegetation out of the trail corridor. Saw branches and brush back to the trunk or base of the tree or plant rather than cutting too deep into the tree; or the opposite, cutting limbs only to attain the clearance limit. If a tree requires excessive pruning to accommodate the trail corridor, it may need to be removed. (USDA FS Standards)

Revegetation

Revegetating and restoring areas disturbed during construction or areas not utilized by trail users serves the important function of stabilizing erosion-prone soils, providing greater wildlife habitat areas, and minimizing the loss of valuable top soil.

Revegetation projects should occur during the rainy season and prime growing season (July 1 - September 15) to take advantage of natural rainfall. Proper soil preparation and application of mulch, soil amendments, and hydromulch with reseeding is important to the overall success of revegetation. To ensure greater success with revegetation, maximum side slopes of disturbed areas should be less than 3:1 slope. Areas with slopes steeper than 3:1 should utilize natural jute netting over the hydroseeding or drill seeding / hydromulch to help with embankment stabilization.

Best management practices should be used to ensure the successful dryland restoration of the native vegetation. Areas undergoing reseeding and/or revegetation should have signs to inform the public of the process.

Design Standards

The Thornton Ranch Open Space Master Plan Design Standards are intended to ensure that construction of plan elements results in a distinct recreational destination that harmonizes with existing natural features, is executed to minimize site disturbance, and is constructed sustainably to reduce maintenance demands. Design standards are specified for all trails, trailheads, and amenities of the Thornton Ranch Open Space so that the quality of the recreation and open space area can be sustained.

Standards for proper design and sound construction will ensure that improvements withstand the wear of time, weather, and trail users. Master Plan improvements implemented with these standards will also provide trail users better interface with the trail system to foster an appreciation for the trails, understand proper interaction with other users, and recognize the importance of preservation of the natural environment.

The following Design Standards outline requirements and best practices particular to special conditions of the Thornton Ranch Open Space. This information is intended to serve as a basis for which improvements to the trail system and open space areas are made. Reference documents and/or standards are cited to serve as guidelines where items are not covered in these standards and should be used in conjunction with information included in these standards. These standards include:

- AASHTO (for regional trails)
- ADAAG American Disabilities Act Accessibility Guidelines (for accessible facilities)
- PROWAG Public Rights of Way Accessibility Guidelines (for accessible trails / facilities)
- Santa Fe County, Sustainable Land Development Code
- USDA Forest Service, Standard Trail Plans and Specifications
- IMBA (International Mountain Bicycling Association), *Trail Solutions*

All new construction should follow local, state, and national applicable codes.

PLACEMAKING AND MATERIALS

The proposed material palette for designed elements within the Thornton Ranch Open Space evokes the geology, industrial history, and natural materiality of the Galisteo Basin. In the spirit of preserving the quality of this place, the construction materials are natural materials that harmonize with the site.

Expressed in both vernacular and contemporary ways, the master plan seeks to use this material palette to link the constructed elements of the open space into a cohesive design language. The material expression and detailing clearly distinguish new construction from historic and natural site elements.

Weathering steel, weathered zinc finished metals and concrete evoke a connection back to the railroad and the site's ranching heritage.

The use of site-harvested juniper, and locally sourced gravels will also draw on local vernacular for many trail and trailhead related site elements.

Stone features and detail elements communicate the geology and permanence of the Galisteo Basin, especially at the major entrances and thresholds within the park.

Figure 4-3: Materials Palette



ROADS

Access Roads

Limited new roads link existing area roads to designated new trailheads and set the stage for how visitors engage with the Thornton Ranch Open Space. Roadway layout and design should lead the visitor from the public roadway, introduce them to the setting, and set the tone for the County's approach to this natural resource.

Standards

The following standards should be utilized when designing and detailing access roads:

- Mark the vehicular main entry at local roadways with monument signs, basic visitor information, and gates to explicitly announce the entry (see signage standards).
- Meander the road alignment to follow grades, preserve existing stands of vegetation, and slow the approach.
- Surface the road with basecourse material that matches the color of existing site soils.
- Grade the roadway and adjacent swales to manage stormwater runoff and facilitate site drainage, provide culverts with rock headwalls, if necessary.
- Fence (or other access control) off the access road to prevent off-road access to the open space, while conveying the sense of the vast open space area.
- Road width shall be the minimum allowable width and shall conform to Santa Fe County standards for layout and construction, including fire access.

TRAILHEADS

Trailheads

Trailheads serve as important junctures or 'transfer points" between public roads, trails, parking, and access areas to the trail network. As the user's first impression of the trail system, the trailhead should provide necessary information, be physically attractive, and inviting to use. Their proper location, design, and collection of amenities can help orient the trail user to provide a safe and pleasurable recreational experience.

Trailhead and parking locations as indicated on the Master Plan are general and should be refined as more detailed design occurs. Each trailhead, parking area, and associated amenities should be designed specific to site conditions.

Standards

The following standards should be utilized when designing trailhead areas:

- Tie the trail and vehicular space together.
- Anchor the transfer point and trailhead area to the site using natural vegetation or features.
- Use gateway effects at the transfer point and beyond.
- Provide trail information for users.
- Make the trailhead area safe and accessible for users.

Resources

"Trails Design and Management Handbook" Pitkin County Open Space and Trails, 1994.

2009 International Fire Code; Appendix D: Fire Apparatus Access Roads, Figure D103.1: Dead-end Fire Apparatus Access Road Turnaround

Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds, FHA, 2007.

Trailhead Parking Areas

Trailhead parking areas have three transition zones that should be considered to ensure a smooth and pleasant transition from road to trail: between the main road and parking entry area, where you park and exit the car, and at the entry point to the trail system.

Siting and Layout

- Parking lot locations should be sited on flatter sites and be configured to meet suggested parking counts with a minimum of impact to the site and disturbance to existing vegetation.
- Parking area layouts should be rational and customized to each site. Utilize curved edges whenever possible and appropriate.
- Parking areas should follow the existing grades of the land as much as possible. Stormwater runoff should be managed toward centrally located or perimeter vegetated swales and away from trails.
- Parking spaces and parking lot circulation should be organized in a logical and space-saving way.
- Parking spaces should be located to permit safe, unobstructed access to the trail gates and entry points. Wheelstops or natural barriers can be used to designate pedestrian areas from vehicular or parking areas. Spaces should not block access to trails located at the trailhead.
- A user information area should be included along the pathway adjacent to the trail access gate. Trailhead amenities and signage can be located in this area.

Visibility

- All trailheads should be marked and clearly visible from a distance.
- Where possible, trail kiosks or signs at the trail entrance should be visible from the road. Where this is not feasible, a monument sign for motorists should be placed at the entrance to the trailhead access road.
- The trail entrance, or transfer point, should be highly visible and utilize natural anchor points and gateway effects to attract users.

Materials

- Parking area surface should be gravel or base course to match the color of existing soils in non-accessible areas.
- Wheelstops can be colored concrete, kiln-dried wood timber, or railroad ties.
- Bollards, boulders, or other natural elements such as vegetation can be used to delimit circulation zones or serve as anchoring devices.

Amenities

- Trailhead amenities should be tailored for the users of the particular trailhead. At a minimum, each trailhead should have a trash receptacle and signage.
- Recycling receptacles should be provided at all trailheads with parking.

Emergency Access

- Roadways and trailhead parking / turnaround locations shall be designed per Santa Fe County code at least 20 ft. wide.
- Access to the trails with 4- or 6-wheel ATV vehicles must be accommodated to extract injured persons from remote locations. Locked side gates at trail entry locations is an acceptable option for providing emergency access.
- At dead-end access roads with parking lots, parking lot areas should comply with the 96' diameter cul-de-sac design in *Appendix D of the 2009 International Fire Code, Figure D103.1 "Dead-end Fire Apparatus Access Road Turnaround".* This will require a 96 foot diameter turning area within the parking area.

Fencing + Gates

- Trail user access should be controlled through perimeter fences and gates to access the trail system.
- Fencing and gate layout in parking areas should be designed with safety in mind to prevent short-cutting and direct users to the transfer point. (see *Fencing + Access Control, p. 52).*

Trail Entry Points

Trail entry points are locations where a main trail meets a road, continues beyond the property boundary, or connects to the internal trail system.

- The transfer point should be easily visible from the road or major trail intersection. Signs should be placed along the road warning drivers of upcoming trailheads and/or at grade crossings.
- The transfer point should have good sight lines along the road or major trail in each direction.
- The level of development should fit the context of the surrounding area.
- Fence sections or vertical elements can be used to direct users and draw attention to the trailhead, or transfer point.
- A user information area or wayfinding signage should be included in the layout to direct and inform trail users.
- Gate access should follow standards outlined in *Fencing + Access Control, p. 52*. Gate type, location and setback should conform to the users and type of trail.

TRAILS

The proposed trail typologies of the Thornton Ranch Open Space system are based on intended users' needs, educational opportunities, and site specific conditions. Each trail type shall meet the guidelines as outlined in this document. New trail construction and existing trail maintenance shall conform to these guidelines to ensure that the quality of the trail system is sustained.

Intent

The trail layout and design standards in this document identify techniques to design and construct a sustainable trail system that is intended to minimize maintenance needs, reduce ecological impact, provide positive user experience, and promote safety. Through proper layout and construction, trails can shed water and be more resistant to the destructive impacts of precipitation, freeze/thaw, and frequent or improper trail use. The following standards and guidelines are designated based on a trail's expected user type, user volume, and area drainage patterns.

Standards

New trail construction and realignments should consider existing topography, natural features, cultural resource avoidance, user type, recreational experience, skill level, and sustainable trail construction in the layout and execution of the trails.

When laying out recreational trails, the following standards shall be used:

- USDA (US Department of Agriculture) Forest Service *Standard Trail Plans and Specifications*,
- IMBA (International Mountain Bicycling Association), *Trail Solutions, "*The Principles of Sustainable Trails", and "Trail Construction"
- *Natural Surface Trails by Design*, Troy Scott Parker, Natureshape LLC

For accessible multi-use trails, in addition to the national accessibility standards, the following standards shall be used:

- AASHTO (American Association of State Highway and Transportation Officials), Bike Guide

Trail Components

Intersections

Trail intersections should be clearly marked (see *Environmental Signage, p. 56*), have adequate lines of sight, and be designed for continuous flow. To clarify designated routes and minimize trail migration, techniques should be utilized such as: installation of edging material (stones, branches, etc), surface clearing of trail route, and revegetation of non-trail areas.

Arroyo / Drainage Crossings

Trails that cross arroyos and drainages should be designed for minimal impact to arroyo banks. It is assumed that internal trails will not have constructed crossings and will descend into sandy arroyo bottoms. At access points with these crossings, warning signs should caution trail users of variable trail conditions ahead.

At intersections between the regional multi-use trail and major drainageways, bridges can be installed, particularly in locations where the trail utilizes the historic rail bed. In these locations, wood timber trestle structures or crossing beds of retired railroad cars may be used to evoke traditional railroad structures. Bridge designs will vary depending on the length and height of the crossing and on the type and amount of trail use. Bridge designs should meet accessibility requirements, if applicable, and be easily passable by horses. On open space trails, a simple wooden bridge may be used. Professional assistance should be sought to design and install bridge and culvert crossings.

On accessible trails, paved low water crossings should be designed for ease of use and minimal impact on the flow of stormwater. Exposed aggregate colored concrete should be used to match the adjacent surface material and blend into the landscape.

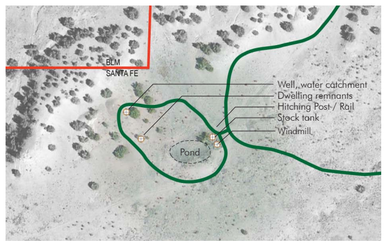
Materials

Materials used for construction of trails, trail elements and adjacent site restoration should be natural, locally sourced materials that approximate the colors of site materials to the greatest extent possible (see *Materials Palette, p. 45*). Imported materials should be kept to a minimum in order to retain the natural wilderness area. Imported materials for erosion control should be used sparingly and should be biodegradable.

Image 4-1: Accessible Low-water Crossing



Figure 4-4: Trail Layout Example at a Historic Ranching Site



Trails Near Archaeological Sites

In general, trails and other construction within the Thornton Ranch Open Space will avoid archaeological sites and, if possible, views of archaeological sites to preserve documented cultural resources. However, in some cases features are highly visible. These features have vertical components (windmill, ruin, etc.) that are still visible in the landscape and are difficult to hide. For the most part, these sites have a dominantly historic component. In lieu of attracting unwarranted visitation, it is recommended to encroach on these sites and mitigate the effects.

Standards

- Avoid sensitive features.
- Orient the public away from and out of the viewshed of sensitive features.
- Remove mention of sensitive feature names from maps and literature.
- Place informational signs at major access points to notify users about general rules of access and fines for non-compliance (include information on non-collection, leaving artifacts in place).
- Introduce visitors to the site, and review general rules through an orientation talk given by a ranger or volunteer.

Guidelines

- Provide interpretive information to educate visitors about the feature, its historical context, and how things have changed.
- Design interpretive signage to provide information, but not detract from the view and overall experience of the site.
- Identify clearly defined walking paths with edging material / barrier (rock edge, rock curb, low wall, signage, etc.) to distinguish paths from site features.
- Locate paths within view of feature and surrounding landscape but out of reach of features.
- Restore / reseed unused visible paths / ranch roads not designated as part of the trail system to limit off-trail exploration.
- Utilize boardwalks or grade-separated paths to clarify the distinction between current access and past use and to protect sensitive cultural sites, ecologies, and wet areas.
- Warn visitors of the effects of picking up or removing artifacts from the feature (in an effort to encourage respect).
- Provide designated seating adjacent to path to prevent visitors from sitting on features.
- Provide hitching rails a short distance from features for equestrians to tie their horses and approach on foot.
- Repair feature components (eg. windmills) so they operate and can be used to help tell the story.
- Install new features to facilitate access that clearly indicates the construction is new, yet is a component of a historic site (eg. railroad trestle for trail access).

Regional Trail

The Regional Trail is a wide, primary trail connecting to regional recreation areas and trail systems. Road crossings along this trail type should be avoided or minimized to allow the user a vehicle-free trail experience.

Standards

Tread Surface: Hard, packed, crusher fines surface; free of large cobbles; occasional short bridges or paved at-grade drainage crossings.

Features: Above-grade and at-grade drainage crossings.

Trail Tread (width):	4 - 8 feet
Trail Corridor (clearing width):	12 - 14 feet
Trail Ceiling (clearing height):	10 - 14 feet
Cross Slope:	2-5% maximum
Percent Grade:	5% max (where possible)
Turning Radii:	50 feet (where possible)
Sight Distance:	100 feet

**Note: Initial trail buildout to follow Multi-Use Trail standards. Once regional connections are made, the above standards shall be implemented.*



Figure 4-5: Regional Trail Section

Accessible Trail

The Accessible Trail is a designated loop that meets ADA accessibility requirements to the greatest extent possible and has a soft surface side path for equestrian use.

Standards

Tread Surface: Hard, packed, stabilized surface, paved in some sections; paved low water drainage crossings.

Features: At-grade accessible arroyo crossings.

Trail Tread (width):	5 - 6 feet
side path (width):	18 inches
Trail Corridor (clearing width):	12 - 14 feet
Trail Ceiling (clearing height):	10 - 14 feet
Cross Slope:	2% maximum
Percent Grade:	5% max (where possible)
Turning Radii:	10 feet minimum
Sight Distance:	50 feet



Figure 4-6: Accessible Trail Section

Multi-Use Trail

The Multi-Use Trail type provides the easiest, widest trails within the trail system. These trails have a wide clearing distance between vegetation and gentler grade changes, allowing ample sight lines and passing space. Overall, these trail characteristics provide the safest trail routes for all trail users.

Standards

Tread Surface: Hard, packed, stable dirt; free of large cobbles with occasional drainage crossings with sandy bottoms.

Trail Tread (width):	5 - 6 feet(existing) 18 - 30 inches (new)
Trail Corridor (clearing width):	6 - 12 feet
Trail Ceiling (clearing height):	8 - 10 feet
Cross Slope:	2-5% maximum
Percent Grade:	5% or less (avg); 10% (max)
Turning Radii:	10 feet (min)
Sight Distance:	100 feet



Figure 4-7: Multi-Use Trail Section

Backcountry Trail (single-track)

The Backcountry Trail type provides more difficult trail segments off the wider multi-use trails. These trails have multiple elevation changes, denser vegetation, and tighter switchbacks.

Standards

Tread Surface: Hard, packed, mostly stable dirt; occasional loose rocks, drainage crossings with sandy bottoms.

Trail Tread (width):	12 - 18 inches
Trail Corridor (clearing width):	4 - 6 feet
Trail Ceiling (clearing height):	8 - 10 feet
Cross Slope:	5% - 10%
Percent Grade:	5% - 15% (max)
Turning Radii:	4 - 5 feet
Sight Distance:	15 feet, typ.; varies (depending on density of vegetation)

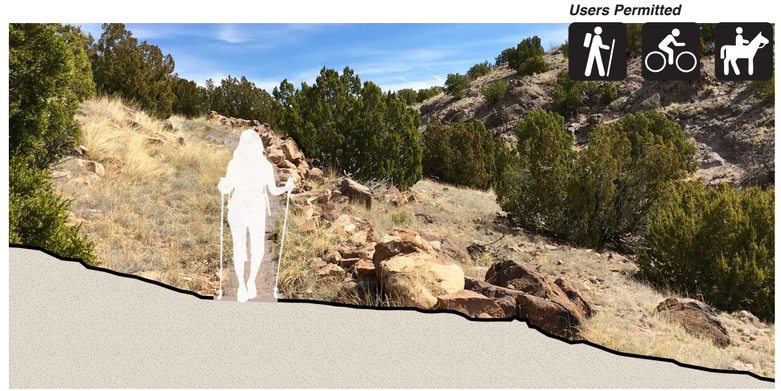


Figure 4-8: Backcountry Trail Section

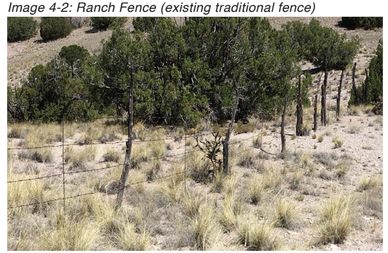
FENCING + ACCESS CONTROL

The Thornton Ranch Open Space Master Plan calls for perimeter access control to regulate types of users entering the trail system and safeguard users and the property itself. Access control includes fencing or other barriers combined with logically placed points of entry designed to permit access by users of the trail system and prevent unauthorized access.

Just as fencing and access control is intended to regulate unauthorized access, it also should allow wildlife mobility. Fencing and barriers should be placed selectively to minimize habitat fragmentation and connect contiguous areas of open space. Riparian corridors are especially recognized locations for wildlife vegetative cover and animal movement.

At trailheads and trail access points, fencing and gates will frame a formal gateway, or entry, into the trail. Access gate type and location will be dictated by the type of trail and trail users that are allowed access at those locations. Typical trail access points will prevent OHV and motorized vehicle access. Where maintenance and emergency vehicles require access, locked gates can be installed adjacent to or a short distance from designated trail access points.

Image 4-2: Ranch Fence (existing traditional fence)



Materials

Intent

In keeping with the rural aesthetic of the Thornton Ranch Open Space, all access control materials shall be constructed of natural, durable materials that blend in with the landscape and can withstand the local climate with minimal maintenance.

Standards

- Fence materials shall be weathered steel, wood, or a combination thereof.
- Gate materials shall be weathered steel, wood, or a combination thereof to complement adjacent fence types and materials.
- Access control barriers shall be of natural materials such as boulders or steel posts.

Image 4-3: Fence across Drainageway w/ suspended wood barrier



Fencing

Intent

The primary objective of fencing the Thornton Ranch Open Space property is to secure the perimeter to prevent illegal access, overnight campers, and unregulated motorized vehicular use. Fencing should still permit large and small migrating animals to pass through the area. Fencing or perimeter access control measures should also allow water to flow freely within drainageways without holding up debris.

Standards

Designated perimeter areas shall be fenced with a five-strand barbless wire fence or ranch fence. In order to allow wildlife crossing, the fencing should maintain the following requirements:

- Bottom wire/bar should be at least 16” above the ground.
- Top wire/bar should be 40” above the ground or lower.
- Top two wires should be at least 12” apart.

** Reference: “Fencing with Wildlife in Mind”*

Guidelines

- At large arroyos where designated trail access points are located, fencing should terminate along the embankment of the arroyo and trails should be accessed following standards set in *Barriers, p. 53*. At large arroyos that are not access points, appropriate access control measures should be implemented to prevent unauthorized motorized access into the site.
- At small drainageways that are not designated access points, the water gap areas may be spanned with fences using either large rocks supported by heavy gauge wire or line posts as anchor points.

Barriers

Barriers help prevent unwarranted access along drainageways, trails, thresholds, and other locations where less obtrusive but effective access control is needed. In locations where major drainageways extend beyond the site boundary, and fencing is impractical, a combination of grade control structures, arroyo bottom barriers, and selective fencing may be better suited to prevent unlawful vehicular access. In locations where trail users need reminders to stay on trails or where trails are located in proximity to sensitive areas, barriers can be placed to define the limits of the trail and guide users.

Intent

Along the property boundary at arroyo beds it is important to use a barrier that will not limit stormwater or wildlife movement yet prevents vehicular access.

Standards

Boulders, drop structures, or other approved elements may be used to prevent vehicular traffic from accessing the open space area through arroyo corridors. Boulders, if used, should follow the following specifications:

- Spacing between boulders and fenceline: 36” max.
- Height of boulder: between 16” and 30”
- Width of boulder: at least 24”
- Drop structures to be designed to accommodate projected flows

Electronic surveillance may be used selectively along the property perimeter to monitor illicit entry. Surveillance systems must be discreetly sized and located out of view, powered by battery or solar panels (not hard wired), and linked to a centralized notification system.

Non-Motorized Trail Access Openings / Gates

Gates or fence openings shall be selected and sited to permit easy entry for allowed users and prevent entry by unlawful users of the trail or area. Gates and opening types have been identified for selected trail types. Other opening types not identified shall be reviewed by County staff prior to installation.

Multi-Use Trail Access

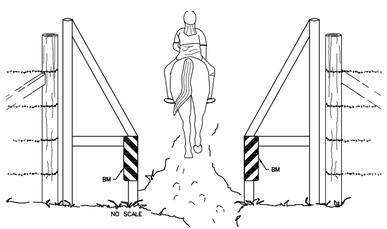
Intent

Multi-use trails are intended for all non-motorized users and their equipment. Access gates to these trails will serve to control motorized vehicles from entering the site, but must allow access for trail users of various sizes, including hikers, people in wheelchairs, strollers, bikers with their mountain bikes, and equestrians with their horses.

Standards

All trailheads and trail access points with entry into regional trails and multi-use trails shall have a 32" wide clear opening to allow equestrian passage as well as wheelchair accessibility (see *Image 4-4)*.

Image 4-4: Multi-Use Trail Access - Horse/Wheelchair Accessible



Backcountry Trail Access

Intent

Backcountry trail access gates or openings, if needed, should effectively restrict ATV access into the trail system, but should allow comfortable passage of hikers, mountain bikers, and equestrians with their horses through the entry-point. Mountain bikers may need to dismount before going through backcountry trail access gates.

Standards

Trail access shall be 'V' style gates with a bottom style or log 12" maximum above finish trail grade (see *Image 4-5: Backcountry Trail Access Opening*). Clear opening at the base shall be no wider than 24".

Image 4-5: Backcountry Trail Access Opening



OPEN SPACE AMENITIES

The primary objective regarding selection of site furnishings and amenities within the Thornton Ranch Open Space is to provide an enjoyable user experience while maintaining a cohesive and consistent aesthetic throughout the open space area.

Selections should be guided by durability and minimal maintenance and should be made of natural, recycled materials that can be locally sourced or fabricated, where possible. Simple materials such as steel, wood, stone, and concrete as identified in the *Figure 4-3, Materials Palette* resonate well with the site's existing features. Site furnishings, once selected, should be used as the standard for all similar type furnishings.

Restroom

A permanent one-room (unisex) restroom facility should be installed and clad in materials that harmonize with other site amenities and constructed elements. Design style should be simple and unobtrusive to reduce its visual impact and utilize the same exterior cladding materials as other structures and site elements. Restroom facilities should be sited next to trail access points at major trailhead / parking areas and nestled within existing vegetation.

- Restrooms should be either a waterless with an underground vault or a composting-type facility.
- Restroom siting to be located discreetly at trailhead and to consider access for both users and for maintenance.
- Doors to be self-locking on a timer.
- Restroom amenities to be vandal-resistant and low maintenance.

Storage / Office

If needed to facilitate the management of the property, a storage area or small office for a site ranger can be attached to and integrated with the restroom building. Any utilities needed for the operation of the restroom and adjacent facility shall be hidden from view and integrated with the building or surrounding landscape. Building operations shall emphasize sustainability and use renewable resources where possible.

Shade Structures / Shelters

Shade structures and shelters shall be custom fabricated in metal or heavy timber (or a combination thereof), simple in form, and located in high use areas. Design style and material shall be similar for each structure.

Educational Area

An educational threshold will capture the attention and imagination of visitors and trail users to orient them to the facility and introduce them to the many facets of the property. This transitional space will reveal the fragility of the place and help instill respect for the land and its treatment.

- Installations should address a broad range of audiences using different media.
- A multitude of senses should be engaged (sound, visual, tactile) in order to be engaging and transformative.
- The area should be a place of transition where the visitor actively passes through it and can interact with it.
- An artist or multiple artists should be involved in the design of this area.

Art

The Santa Fe region is recognized internationally as a creative arts community with a rich history of art fundamental to its culture. This legacy should be reflected in the educational public spaces of the Thornton Ranch Open Space. Artwork will be encouraged to be provocative, visually beautiful, intellectually stimulating, and respectful of the environment.

- Public art should relate to its physical / cultural context and contribute to the concept of education.
- All public visible art work and its placement must be reviewed and approved by the land manager to ensure it is in keeping with the overall image of the Thornton Ranch Open Space and does not interfere with the goals and purpose of the project.
- Temporary installations (eg. 6 months) could become permanent with approval.

Seating

In deference to the sacred nature of the site, seating shall be limited and will be located only in designated interpretive sites, educational areas, and at major trailhead locations. Seating may also be sited internal to the open space area, at key lookout points of major trail intersections.

- Locate seating in shaded areas when possible.
- Install seating adjacent to trail surfaces, provide access to the seating area, and allow clearance between the trail and seating to avoid conflicts.
- Seating to be made of stone boulders or other materials as outlined in the materials palette.
- Seating for larger audiences to be configured in amphitheater-style and nestled into the existing terrain.

Image 4-6: Animal Proof - Trash / Recycling Receptacle



Trash Receptacles / Recycling Receptacles

Trash receptacles and recycling receptacles shall be placed at all primary trailheads, secondary trailheads, and parking areas in order to maintain a clean and tidy trail system and open space area.

- Receptacles shall be freestanding, a minimum of 32 gallon size, wildlife proof, and of steel construction.
- Secure receptacles to the ground in open areas.
- Provide internal plastic liners to facilitate trash collection.
- Receptacles shall be of the same style and in a neutral color to harmonize with other site furnishings.

Access Control Barrier

Bollards or other barriers shall be used to prevent vehicular access into the trail system.

- Bollards shall be 6" diameter weathered steel posts with flat tops and reflective markings visible from all sides.
- Barriers can be made of large boulders, rocks, or other approved materials.
- Space bollards or other barrier with min. 32" and max. 44" clear opening.
- Bollards / barriers should be able to withstand minor vehicle impacts.
- Provide removable bollards or lockable side access gates where emergency or maintenance vehicle access may be needed.

Lighting

To keep the Thornton Ranch Open Space area as an open space preserve that adheres to international dark skies, lighting will not be provided as a site amenity. Where lighting is deemed necessary for security or other reasons, light fixtures and poles should be simple, durable, complement other site furnishings, and utilize renewable energy (such as solar). In all cases, lighting shall meet Dark Skies code requirements.

Amenities Not Included in Plan

Certain amenities found in typical recreation areas are not being considered for the Thornton Ranch Open Space in order to retain the area as an open space preserve. These include:

- Picnic tables
- Dog waste receptacles
- Lighting
- Drinking water / water fountains

Image 4-7: Trailhead with amenities, fencing, and boulders



ENVIRONMENTAL SIGNAGE

Proper signage and wayfinding is key to an enjoyable, enriching, and safe recreational experience. In the Thornton Ranch Open Space, the signage program will consist of regulatory signs, directional, wayfinding, and interpretive signs.

Included in this section is a schematic signage program for internal directional and wayfinding signage for recreational users to navigate the open space area. All other signs, such as required regulatory and traffic signs will be selected and installed according to applicable codes.

Sign designs should conform to the Santa Fe County signage plan and complement any signage design standards in place for adjacent properties (BLM, etc.).

An interpretive sign program will be developed for the Thornton Ranch Open Space in coordination with the master plan and the Galisteo Basin Interpretive Plan.

Wayfinding Signage Master Plan

The signage plan for the Thornton Ranch Open Space introduces a family of signs that will be placed throughout the trail system to help users interface with the recreational trail system. The signage system is intended to orient users, establish rules of use, provide panels with additional information, and assist with orientation for emergency responders.

The sign hierarchy includes a gateway monument sign, trailhead kiosks at all major trailheads, secondary trailhead signs at minor trailheads/ access points, and trail markers at internal junctions and along trails. Regulatory signs will inform users of rules, regulations, or best practices for trail use.

All signs within the Thornton Ranch Open Space should be designed and placed with consideration to surrounding materials, resource preservation, circulation patterns, lines of sight, and other factors that affect the legibility, use, and experience of the place.

Brand

A distinctive logo or brand identity for the Thornton Ranch Open Space system should be developed and adopted, and used to identify the Thornton Ranch Open Space.

Roadway Directional Signs

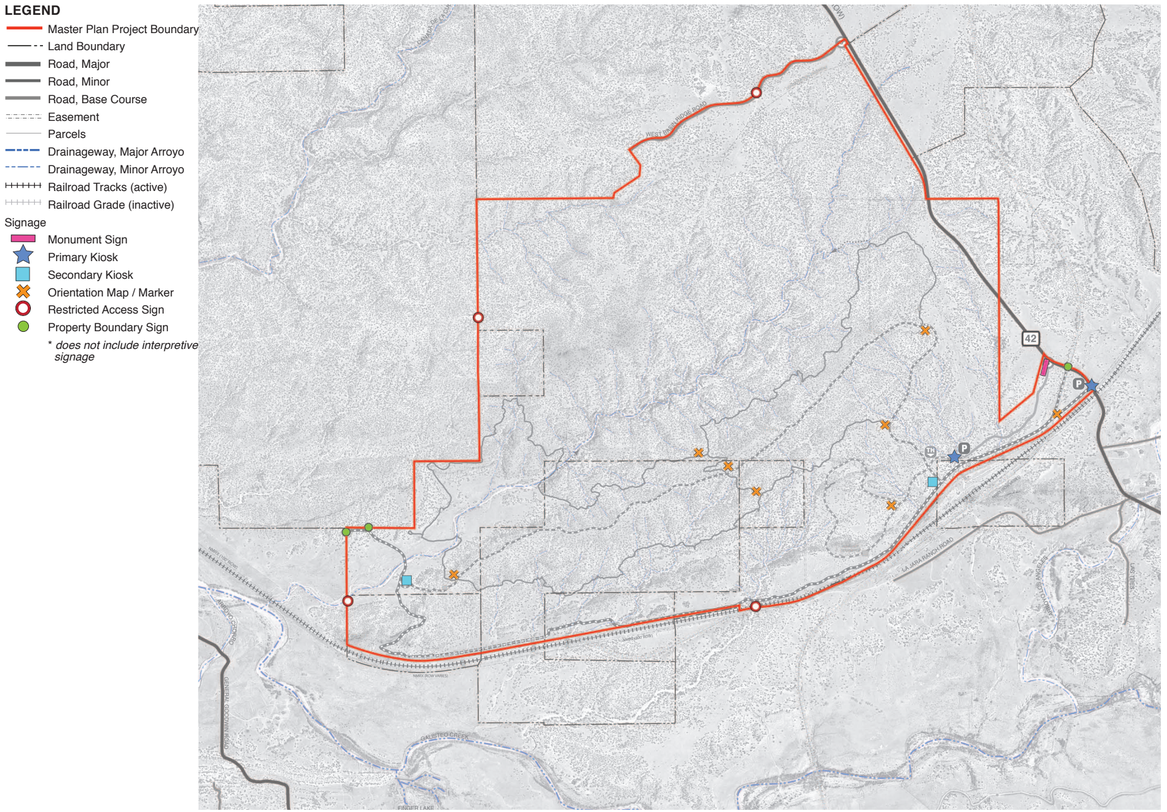
Directional signs for the Thornton Ranch Open Space will indicate directions to the facility and also to nearby destinations or support facilities. Directional signs should be placed on approaches to the trail along roadways within the adjacent community and at major connection points, to direct people to the Thornton Ranch Open Space. Directional sign design should utilize the Thornton Ranch Open Space logo and brand identity and meet the applicable signage standards within that jurisdiction (eg. MUTCD).

Intersections and Crossings

The Thornton Ranch Open Space system is intended to provide safe routes separate from roadways. However, the trails abut CR 42 on the east edge of the property. Path approaches to these crossings should be signed with Stop or Yield signs to minimize conflicts with vehicles. Crossing signs should be placed in advance of path crossings along the roadway to alert motorists. If needed, traffic control devices on roadways should be used to slow down traffic in the vicinity of crossings.

In general, all signs should be located two to four feet from the edge of the trail or paved surface, and have a minimum vertical clearance of 8.5 feet when located above the path surface and be a minimum of four feet above the path surface when located on the side of the path. All signs should be oriented so as to not confuse trail users.

Figure 4-9: Environmental Signage Master Plan



The family of signs for Thornton Ranch Open Space is meant to be easily legible, durable, and complement the natural surroundings. The expression of the sign mounting as well as the detailing of the Thornton Ranch Open Space brand identity and wayfinding should reference the unique history and materials of the site in a way that creates an experience for visitors and connects them to the place.

The following sign family illustrates the recommended informational content to be included in each sign type, and does not illustrate a final design.

Monument Sign

Gateway sign indicating arrival to the site at the main entry off of CR 42. This sign sets the tone for the materials and character of the facility. The entry monument sign and sign base should be integrated with the entry gate(s) and adjacent fencing and consider vehicular access and turnaround.

The entry sign should be properly scaled for the landscape so it is clearly visible but does not interfere with the expansive views of the property. Information will be provided on ownership, partner agencies, opening hours, and contact information.



Figure 4-10: Monument Sign Example

Primary Kiosk - Trailhead

Orientation, regulatory, best practices, and informational maps in an expandable kiosk format at major trailhead locations. Space will be provided for the community to post information for trail users.

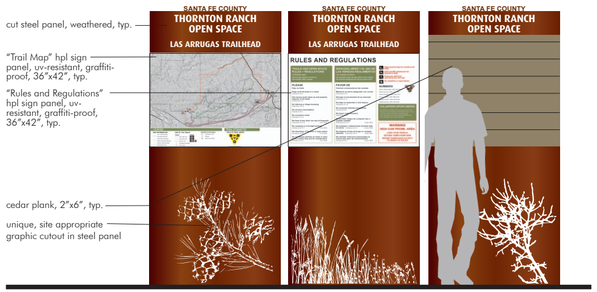


Figure 4-11: Primary Kiosk Example

Secondary Kiosk

Orientation and regulatory map series at secondary entry points to the trail system, typically from off-site trails or open space areas.

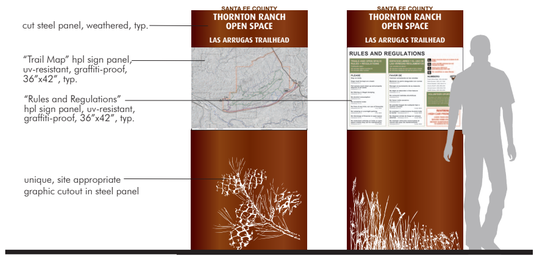


Figure 4-12: Secondary Kiosk Example

Orientation Map / Interpretive Panel

Orientation map / interpretive sign (reduced size) series at trail intersections.

Interpretive sign panels may be integrated with existing features (eg. windmills, stock tanks, etc.) and other signs where feasible.

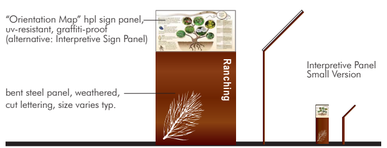


Figure 4-13: Orientation Map / Interpretive Panel Example

Trail Marker

Trail marker sign series at trail intersections to designate trail name and direction. Trails are named for ease of wayfinding.

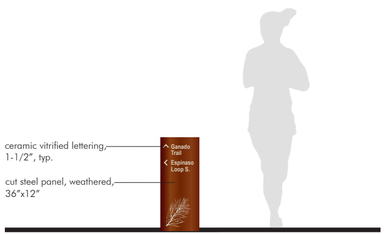


Figure 4-14: Trail Marker Example

Regulatory Sign

Regulatory sign series at edges of property, entrances to technical trails/areas, etc.

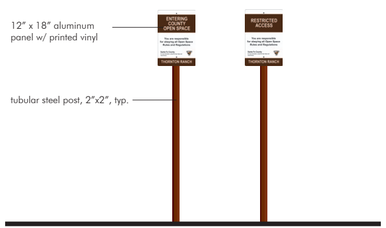


Figure 4-15: Regulatory Sign Example

Maintenance and Operations

The maintenance and operation of the Thornton Ranch Open Space will be guided by the Thornton Ranch Open Space Management Plan, a separate document that accompanies this plan. The Thornton Ranch Open Space has been designated by Santa Fe County as a preserve. Accordingly, the best management practices adopted by the County for preserves will ultimately determine how the property will be managed.

The following information provides an overview of some of these best practices to help ensure goals outlined in the management plan are met.

Providing a thorough ongoing maintenance program will benefit the basic physical, aesthetic, and environmental qualities of the facility, and result in many other benefits:

- A high standard of maintenance is an effective way of helping advertise and promote the facility as a local and regional recreational resource.
- The psychological effects of good maintenance can be a deterrent to vandalism, litter, and encroachments.
- Good maintenance is necessary to preserve positive public relations between adjacent land owners and between public agencies.
- Good maintenance can help make enforcement of regulations more efficient. Local clubs, interest groups, and neighbors will take pride in the facility and will be more apt to assist in its protection.
- A proactive maintenance policy will help improve safety.
- Regular, routine maintenance on a year-round basis will prolong the life of the facility.

MAINTENANCE AND OPERATIONS

Identifying the appropriate strategy for management, maintenance and site operations is a critical component to a well-planned open space and trail system. A program that addresses maintenance and operations will encourage the use of the facilities and deter problems such as vandalism, littering, trespass, and unauthorized trail use.

Such programs require the right level of staffing and realistic funding allocations. It is anticipated that the maintenance and management arrangement for the Thornton Ranch Open Space will involve a combination of agency staff, partnerships between agencies, tribal involvement / oversight, and support from organized, ongoing volunteer groups.

Basic management and maintenance-related design objectives for open space facilities include:

- Provide a suitable design to support intended uses, minimize conflicts and impacts, and maximize safety, while accommodating access for maintenance and emergency purposes.
- Provide durable vandal and weather resistant design and materials appropriate to the setting that minimize maintenance needs.
- Provide adequate fencing, gates, stiles, signage and other access control to the trail routes to clarify rules of use, minimize conflicts between users and impacts on adjacent land uses.
- Provide adequate informational, traffic control, regulatory, and wayfinding signage.
- Provide clear site monitoring, reporting, and restoration guidelines to manage open space areas and cultural resources.

PERSONNEL

Staffing the Thornton Ranch Open Space with the proper personnel and clarifying job descriptions can help ensure the smooth operation of the facility and protect resources.

Some tasks required to ensure the proper operation of the facility and protection of resources include:

- Administration: includes establishing rules, administering special permits / events, performing inspections, managing changes to open space operations, updating management plans, coordinating with citizen involvement groups, and tracking visitation
- Maintenance: includes routine facility / preventative / corrective maintenance, cleanup of restrooms, picking up and hauling garbage, and caring for landscape areas
- Protection: includes basic law enforcement, public contact and visitor services, administering first aid, coordinating emergency procedures, and facility protection
- Resource management: resource protection, monitoring, reporting, and management

Some additional tasks to set apart the Thornton Ranch Open Space facility and promote its more unique attributes include:

- Visitor services: includes interpretation, organizing and administering park programs, public communication (written, electronic)
- Cultural services: includes coordinating / administering temporary art installations, interpretive information rotation / updates, advertising and marketing
- Environmental services: environmental monitoring and documentation; environmental interpretation

RULES OF USE

In order for the vision of the Thornton Ranch Open Space Master Plan to be realized, all users of the trails and open space area must be responsible for using the area respectfully, so their own enjoyment of the natural area does not hinder another's enjoyment of the same space.

The following guidelines are key rules of use to which each trail user should adhere:

- Open Space Hours: dawn to dusk, no parking after dark.
- Do not dump or litter; remove all trash.
- Trail users must respect trail signage and stay on designated trails for their particular trail use. No backcountry access.
- Trail users must stay on the trail and yield to other users.
- No ATVs or motorized vehicles are allowed on the trails or within the open space area.
- Dogs are not allowed within the open space and internal trail system.
- Equestrian riders and mountain bikers must be responsible to determine if trail conditions are appropriate for riding; if trail conditions are too wet, the trail tread may be degraded.
- Do not remove or destroy any objects.
- No camping or ground fires.
- No firearms, weapons or fireworks allowed.
- No alcoholic beverages on premises.

Figure 4-16: Trail Etiquette



SHARE THE TRAIL:
The Thornton Ranch Open Space will adopt the National Forest's "Share the Trail" policy, which asks bikers to yield to both hikers and equestrians and hikers to yield to equestrians.

GENERAL AND DAILY USE

In addition to recreational use by permitted users, the Thornton Ranch Open Space is managed by Santa Fe County and has several different land owners, an array of land leases, and diverse security needs.

Recreational Use

Daily access to the trails will be supported through trailheads and perimeter trail access locations. The trails and trailheads will be open to the public daily from dawn to dusk according to Santa Fe County Open Space and Trails Regulations.

No motorized vehicles, with the exceptions of open space maintenance and emergency vehicles will be permitted within the Thornton Ranch Open Space area.

Emergency Use

At times there may be an emergency on the trails. In the case of an injury or accident, emergency responders will locate the injured person and identify an extraction plan. Depending on the injury, responders may access the trails with a 4- or 6-wheel ATV and transport the person to emergency vehicles parked at trailhead locations. In extreme cases where injured persons cannot be transported over rough terrain, a helicopter will land in the nearest safe location as determined by emergency responders.

In the event of a wildland fire, emergency responders will access the site in a logical location to address the situation in the most expedient manner possible.

Maintenance Use

On a regular basis, the trails, trailheads, parking areas, and site fencing will be inspected, maintained, and at times repaired. The maintenance crew, site stewards, or trail stewards may need to access the site with appropriately sized trail maintenance equipment in order to bring supplies or tools to a specific location within the trails. These parties will be able to enter the site from designated restricted-access locations with permission from the land manager, who will be responsible for supervising vehicular access.

Internal Property Owners

Landowners interior to the Thornton Ranch Open Space with lease agreements with Santa Fe County will access their properties from existing gates to monitor their resources. These include the Bureau of Land Management (3 parcels) and New Mexico State Land Office (2 parcels). As Master Plan implementation moves forward, Santa Fe County will work toward a formal agreement for finalizing trail access, use, maintenance, and restoration efforts on leased land.

Tribal Use

In accordance with agreements to be finalized between Santa Fe County and local tribal entities, tribes will have access to Thornton Ranch Open Space lands.

Stewardship

VOLUNTEER INVOLVEMENT

Efforts will be made by the County to work with volunteer organizations and individuals to help implement some of the projects and assist with stewardship and maintenance. This serves a dual purpose: it builds community appreciation and support for the project, and supplements limited staff resources.

Image 4-8: Volunteers performing Trail Maintenance



In order to sustain the vision of the Thornton Ranch Open Space Master Plan, the open space and trails must be monitored and cared for on a regular basis. Opportunities exist for Santa Fe County to work with dedicated local citizens, interested individuals and trail users in order to create a sustainable and cooperative management plan for the Thornton Ranch Open Space.

Santa Fe County has an active program that coordinates volunteers to assist with maintenance and rehabilitation projects. Led by a County staff member, Santa Fe County both organizes independent volunteer efforts or partners with local non-profit stewardship-minded entities that focus on stewardship and preservation of public open space areas.

Likewise, cultural resources must also be monitored and protected. Volunteers with SiteWatch, a program administered by the New Mexico Historic Preservation Division, are trained to assist land management agencies to protect New Mexico's cultural resources. The Santa Fe-Galisteo Basin / Pecos NHP chapter of SiteWatch organization visits sites within the Galisteo Basin to monitor and report on their condition. With training, these volunteers can also assist agency archaeologists to monitor maintenance and management activities.

Purpose of a Stewardship Plan

As population growth pressures increase the demands placed on public lands, and agency budgets are not able to keep pace with increased growth and human impacts, public land management agencies are becoming more reliant on trained volunteers to help fill a variety of important roles.

Open space and trail stewards can provide the labor and expertise needed to assist with trail maintenance and open space monitoring and restoration. Tasks may include:

- Trail monitoring
- Trail maintenance (clearing obstructions, clean up, replacing markers, repairs, etc.)
- Trail building
- Ecological restoration
- Invasive species / noxious weed management
- Environmental education / interpretation

Many public land agencies are not prepared to manage volunteer projects or provide the necessary resources for project planning, design, and oversight. Through volunteer-based non-profit organizations, volunteer coordinators can successfully build local capacity and organize volunteers.

Volunteers provide extra eyes and ears for public land agencies. They may extend scientific understanding of the system or aid staff responsible for resource management decisions. They enhance visitors' experience, understanding, and appreciation of our lands and community. They help conserve the biodiversity of local ecosystems. Service organizations, schools, businesses, families and individuals can aid staff on short and long term projects including area clean-ups, trail and area maintenance and construction, facility work, habitat restoration and greeting and educating the public. All of these help provide care and restoration of our lands.

It is critical that agencies approve volunteer efforts, monitor and facilitate volunteer participation on public lands.

To help ensure the long-term success and sustainability of the Thornton Ranch trails system and open space resources, the following actions are recommended for Santa Fe County:

1. **Designate a "Land Manager" for trails / open space areas:**

   Over time, a diverse range of issues and needs will present themselves that need to be addressed regarding the maintenance and operation of trails and open space areas. These can include emergency issues, clean-up or repairs, promotional marketing, or new project coordination. To direct these efforts efficiently and effectively, the County should designate:

   - a single point of contact for all preserve trails/open space area related issues as a member of the county staff (multi-disciplinary).
   - require regular reporting as appropriate (COLTPAC, Public Safety, etc.).

2. **Allocate funding for trails / open space area management, maintenance and operations:**

   While the proper design and construction of trail elements and facilities should minimize maintenance requirements, routine maintenance will be needed to retain a safe recreation area. Funding should be allocated as follows:

   - recurring funding for management, maintenance, operations, small improvements
   - typical rule of thumb $1,200 / linear mile of trail per year ($19,200 per year for proposed trails); costs should be monitored annually and adjusted

3. **Adopt the Thornton Ranch Open Space Management Plan as a framework for managing the trail system, open space area, and cultural resources:**

   The Thornton Ranch Open Space Management Plan provides a framework and platform to manage the open space area:

   - routine and remedial maintenance
   - user safety and risk management
   - enforcement of rules of use
   - programming and event process
   - marketing and promotion
   - oversight and coordination with volunteer groups

4. **Develop guidelines for volunteer involvement:**

   To maximize the benefits of volunteer and community involvement, a clear and concise process should be outlined and implemented that fits the Santa Fe County community:

   - outline process for identifying and implementing projects
   - structure a volunteer protocol (eg. trail maintenance, cultural resource monitoring, ecological monitoring, fundraising)
   - develop a checklist for maintenance of trails and trail amenities

CHAPTER 5
Conclusions

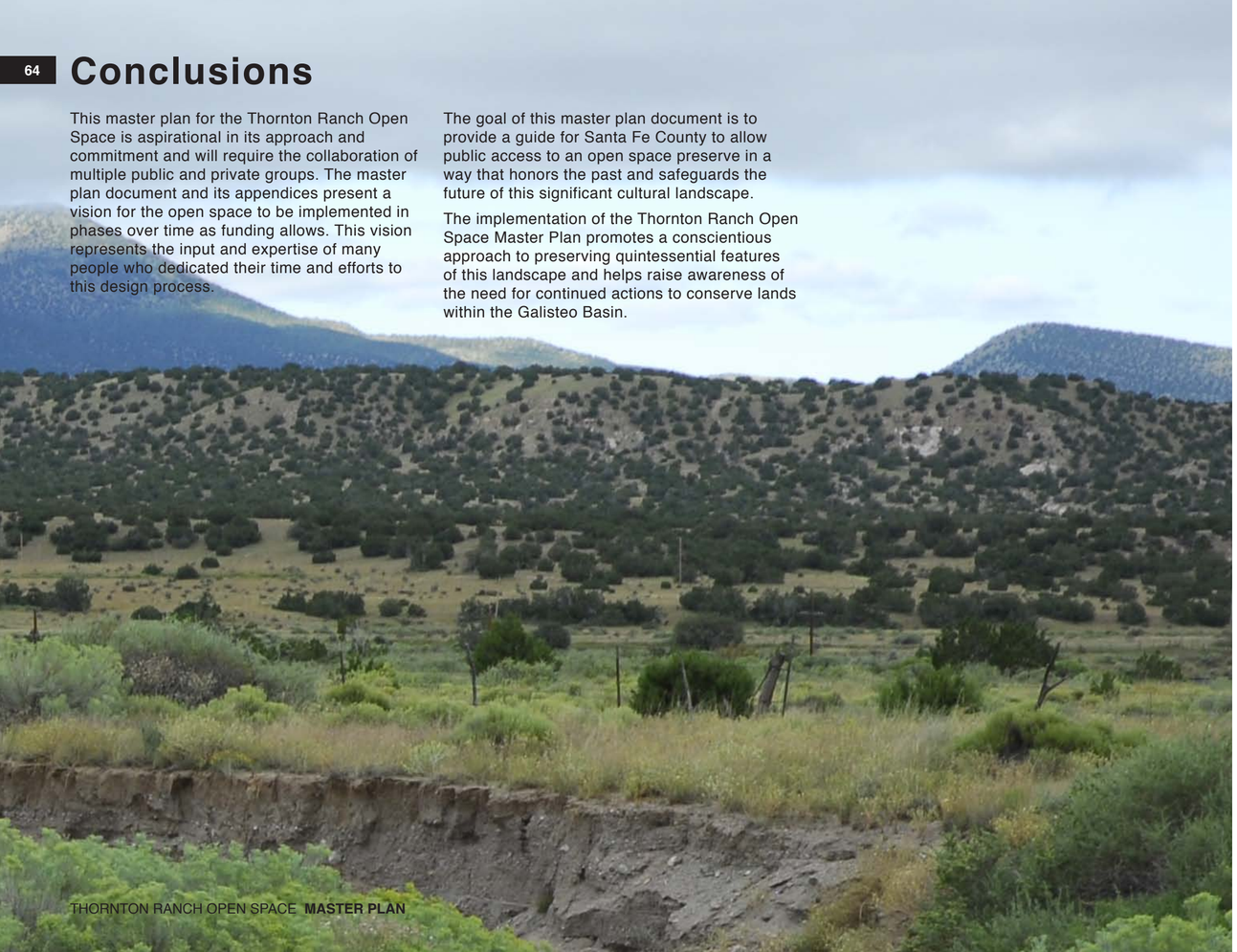


Conclusions

This master plan for the Thornton Ranch Open Space is aspirational in its approach and commitment and will require the collaboration of multiple public and private groups. The master plan document and its appendices present a vision for the open space to be implemented in phases over time as funding allows. This vision represents the input and expertise of many people who dedicated their time and efforts to this design process.

The goal of this master plan document is to provide a guide for Santa Fe County to allow public access to an open space preserve in a way that honors the past and safeguards the future of this significant cultural landscape.

The implementation of the Thornton Ranch Open Space Master Plan promotes a conscientious approach to preserving quintessential features of this landscape and helps raise awareness of the need for continued actions to conserve lands within the Galisteo Basin.



Recommendations

As a result of the planning process, the following series of recommendations are brought forth to help realize the goals and objectives of the Thornton Ranch Open Space Master Plan.

Land / Easement Acquisition

- Purchase inholdings to preserve a complete contiguous open space area and establish a buffer to residential development within close proximity to area resources.
- Purchase buffer properties to provide a larger buffer around the open space area to protect cultural resources.
- Purchase adjacent properties that serve as access points to control access into the site, provide an additional perimeter buffer to the open space, and enable regional trail connections.
- Coordinate re-alignment of existing railroad right of way fence on actual right of way property line in southwest corner of planning area to ensure unencumbered regional trail alignment and interpretation.
- Explore a land trade / purchase with State Land Office for State Trust lands within the project area.

Mineral Rights

- Conduct a title search for subsurface ownership and determine status of subsurface leases (if any) on lands where mineral rights are not owned by the federal or state government. Take steps towards removing mineral extraction on these lands to conserve subsurface resources in perpetuity.
- Work with BLM to remove permits for salable and locatable mineral extraction on Federal subsurface estate within TROS.

Off-site Trail Connections

- Secure regional scale trail connections north along the New Mexico Central Railway grade to connect through Rancho Viejo to Santa Fe.
- Work with the Galisteo Basin Preserve and private land owners to secure a regional trail connection east parallel with the NMRX Railway to connect to GBP trails and Lamy Junction.
- Explore regional trail connections from TROS west to Cerrillos.
- Continue planning efforts with BLM on Galisteo Basin - Cerrillos Hills / Burnt Corn SRMA to provide regional trail connections to the east and to the north to connect to County Road 42.

Additional Studies / Surveys

- Conduct NEPA EA including a biologial survey on BLM sites. Survey to be conducted in June when the Galisteo Sand Verbena (class 3 series protected plant) is in bloom.
- Conduct a full survey of locations of invasive species and provide direction on species removal / restoration of native plant species.
- Conduct cultural resource inventory for additional BLM land in southwest corner and SLO corner along NMRX Railway.
- Prepare a baseline biological assessment of wildlife / wildlife movement, and ecological systems. Include recommendations for soil rehabilitation, habitat restoration, grassland restoration, invasive species removal, erosion control, and landscape-wide wildlife habitat / corridor protection measures.

Restoration / Preservation Efforts

- Restore the windmill at the southwest windmill site, build a functional equestrian and wildlife drinking area.
- Remove invasive trees from the area, largely located in drainageways; restore and monitor perimeter locations with invasive weeds.
- Reclaim and revegetate existing ranch roads not designated as trails.
- Install security cameras / sensors at major breach points into the Thornton Ranch Property through drainageways along the rail line.
- Notify NMRX of major breach points along the south property line where trespassers are entering the rail right of way.
- Submit the Thornton Ranch Open Space as a designated International Dark Sky Park or Reserve (as designated by the International Dark-Sky Association). Coordinate with other Galisteo Basin landowners to participate.
- Map significant corridors, landscapes, and viewsheds in need of preservation within the Galisteo Basin.
- Pursue opportunities to establish large land areas within the Galisteo Basin for conservation as part of the BLM Conservation Lands program.

Site Management

- Pursue an MOU with BLM so Santa Fe County can manage BLM inholdings within the open space area.
- Adopt site management and operations plans.
- Do not allow dogs within the TROS to allow for a user experience that instills respect and appreciation for cultural significance, natural qualities, and environmental integrity of the area.

Photography Credits

All photography by Design Office unless otherwise noted

Chapter 2 - Site Analysis

pg.19, bottom left..... www.galisteobasinpreserve.com
pg.25, left..... Peter Lipscomb
pg.25, right..... www.lightpollutionmap.info

Chapter 3 - Master Plan
pg.38, bottom far left..... www.wikipedia.org
pg.38, bottom left..... www.wikipedia.org

Chapter 4 - Master Plan Implementation
pg.45, top right..... www.canadian-architects.com
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Taos Resource Management Plan - (2012, BLM)

The Village at Galisteo Basin Preserve Master Plan

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Glossary

biological assessment - *A scientific study or inventory of organisms to assess the condition of an ecological resource.*

cultural landscape - *Cultural properties that represent the combined works of nature and of man and a landscape which may be valued because of the religious, artistic or cultural associations of the natural element.*

cultural resources - *Physical evidence or place of past human activity: site, object, landscape, structure; or a site, structure, landscape, object or natural feature of significance to a group of people traditionally associated with it.*

encumbrance - *A right to, interest in, or legal liability on real property that does not prohibit passing title to the property but that diminishes its value.*

exposed aggregate concrete - *A concrete surface with the aggregate (fragments of stone) exposed, formed by applying a retarder to the surface before the concrete has set and subsequently removing the cement to the desired depth.*

inholding -*A tract of land under private ownership within a larger portion of land*

interest group - *A group of people with voluntary association that seeks to publicly promote advantages for its cause.*

interpretive planning - *The initial step in the planning and design process for informal learning-based institutions like museums, zoos, science centers, nature centers, botanical gardens, heritage sites, parks and other cultural facilities where interpretation is used to communicate messages, stories, information and experiences.*

invasive species
A plant, fungus or animal species that is not native to a specific location (an introduced species), and which has a tendency to spread to a degree believed to cause damage to the environment, human economy or human health.

kiosk signage - *A small to medium stand-alone sign that provides information about services.*

locatable minerals - *The General Mining Law of 1872, as amended, opened the public lands of the United States to mineral acquisition by the location and maintenance of mining claims. Mineral deposits subject to acquisition in this manner are generally referred to as “locatable minerals.” Locatable minerals include both metallic minerals (gold, silver, lead, copper, zinc, nickel, etc.), nonmetallic minerals (fluorspar, mica, certain limestones and gypsum, tantalum, heavy minerals in placer form, and gemstones) and certain uncommon variety minerals.*

master plan - *To develop or improve (land, a community, a building complex, or the like) through a long-range plan that balances and harmonizes all elements.*

management plan - *The process of assessing an organization’s goals and creating a realistic, detailed plan of action for meeting those goals. A management plan takes into consideration short and long-term strategies.*
natural resources - *Resources that exist without actions of humankind.*

open space - *A piece of land that is undeveloped (has no buildings or other built structures) and is accessible to the public.*

outcropping - *A visible exposure of bedrock or ancient superficial deposits on the surface of the Earth.*

placemaking - *A multi-faceted approach to the planning, design and management of public spaces. Placemaking capitalizes on local community’s assets, inspiration, and potential with the intention of creating public spaces that promote people’ health, happiness, and well being.*

recreationists - *Someone who engages in a recreation, especially an outdoor leisure activity.*

regulatory signage - *traffic signs intended to instruct users on what they must or should do (or not do) under a given set of circumstances.*

restoration, ecological - *The return of a landscape, ecosystem, or other ecological entity to a predefined historical state; the practice of renewing and restoring degraded, damaged, or destroyed ecosystems and habitats in the environment by active human intervention.*

salable minerals - *In 1947, Congress passed an act allowing the disposal of sand, stone, gravel, and common clay through a contract of sale. In 1955, another act of congress removed common varieties of sand, gravel, stone, pumice, pumicite, and cinders from the 1872 mining law and placed them under the 1947 act. Since these mineral materials are available only by sales contract, they are termed “salable” minerals.*

site amenities - *Feature on a site that provide comfort, convenience, or pleasure (seating, drinking fountains, restrooms, etc.).*

stakeholder - *Refers to an individual, group, or organization who may affect or be affected by , or perceive itself to be affected by a decision, activity, or outcome of a project.*

sustainable trail - *A trail that avoids sensitive ecological areas, provides a buffer to protect ecologically sensitive and hydrologic systems, follows best practices of stormwater management, limits tread erosion through design and construction, and follows topography to minimize erosion. Trails often follow areas already influenced by human activity to minimize impact.*

viewshed - *A geographical area that is visible from a location. It includes all surrounding points that are in line-of-sight with that location and excludes points that are beyond the horizon or obstructed by terrain and other features (e.g., buildings, trees). Conversely, it can also refer to area from which an object can be seen.*

wayfinding signage - *Signs or markers that encompass the ways in which people orient themselves in physical space and navigate from place to place.*

Appendix

APPENDIX

A PROGRAMMING / PUBLIC PROCESS
- Interest Group Meeting (Hikers) - Record
- Interest Group Meeting (Bikers) - Record
- Interest Group Meeting (Equestrians) - Record
- Interest Group Meeting (Educators) - Record
- Interest Group Meeting (Artists) - Record
- Tribal Input Meeting 1 - Record
- Tribal Input Meeting 2 - Record
- Tribal Input Meeting 3 - Record
- Public Input Meeting - Record

B SITE ANALYSIS MAPS
- Context Map
- Context Map: Open Space and Trails
- Context Map: Light Pollution
- Aerial Map
- Ownership Map
- Zoning Map
- Circulation Map
- Site Analysis Map
- Relief Map
- Geologic Map
- Soils Map
- Vegetation Types Map
- GBASPA Site Map
- Viewshed Map
- Views Map

C PROPERTY AGREEMENTS
- BLM GBASPA Sites MOA
- SLO Business Lease
- Grant of Easement 1 (Access)
- Grant of Easement 2 (Access)
- Grant of Temporary Easement (Access)
- Deed of Conservation Easement
- Thornton Ranch OS - Boundary Surveys

D ESTIMATE OF PROBABLE COSTS

E PUBLIC REVIEW COMMENTS
- Summary of Public Comments / Response
- Agency Comments
- COLTPAC Memorandum
- Public Comments
- Tribal Comments