

**THE BOARD OF COUNTY COMMISSIONERS OF
THE COUNTY OF SANTA FE
RESOLUTION NO. 2019 - 4**

**A RESOLUTION ADOPTING THE SANTA FE COUNTY OPEN SPACE, TRAILS AND
PARKS STRATEGIC MANAGEMENT PLAN**

WHEREAS, Santa Fe County (County) owns and maintains a network of over approximately 6,600 acres of open space and parks and 60 miles of trails; and

WHEREAS, the County adopted the Open Land and Trails Plan in 2000 which has provided guidance in the acquisition and management of the open space program as it has developed: and

WHEREAS, the 2015 Sustainable Growth Management Plan outlines several core concepts that are important elements in open space, trails and parks planning, including sustainability, protection of open spaces, protection of natural and cultural resources, interconnected trail networks, and community based stewardship and management of open spaces; and

WHEREAS, the Santa Fe County Board of Commissioners and the County Open Land, Trails and Parks Advisory Committee (COLTPAC) support the development of a strategic management plan for the continued implementation of open space, trails and parks programming: and

WHEREAS, sustainable management principles in this plan were developed with community input to guide the development, management, and maintenance of Santa Fe County Open Space and Trail properties in the future; and

WHEREAS, specific management principles were developed for the Open Space, Trails and Parks Strategic Management Plan, which include appropriate public access, minimal maintenance needs, limited capital investments, protection of resources, diverse use opportunities, and increased youth and community participation in site stewardship; and

WHEREAS, a vigorous community planning process for the Open Space, Trails and Parks Strategic Management Plan included numerous meetings with stakeholders, community members, and relevant public entities who assisted County staff to develop a long range vision for the County's open spaces, trails and parks; and

WHEREAS, the Open Space, Trails and Parks Strategic Management Plan prioritizes projects for implementation in the short-term, mid-term, and long-term over a 20 year horizon; and

WHEREAS, the Open Space, Trails and Parks Strategic Management Plan includes implementation phasing timelines and preliminary estimated implementation costs; and

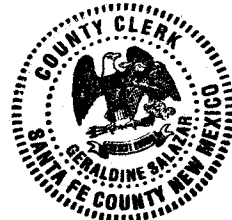
WHEREAS, COLTPAC has reviewed and recommended approval of the Open Space, Trails and Parks Strategic Management Plan.

NOW, THEREFORE, BE IT RESOLVED by the Board of County Commissioners that:

1. The Open Space, Trails and Parks Strategic Management Plan (Strategic Management Plan) attached hereto as Exhibit A is hereby adopted;
2. Staff is directed to implement the Strategic Management Plan to the extent possible with available resources and to request amendment of the plan as needed; and
3. Staff is directed to annually update the Short Range Work Plan and Priorities included in the Strategic Management Plan, as appropriate, with adjustments as work is completed and new open space, trails and park projects and programming opportunities arise.

PASSED, APPROVED, AND ADOPTED this 8th day of January, 2019.

BOARD OF COUNTY COMMISSIONERS



By: Anna Hansen
Chair Anna Hansen

COUNTY OF SANTA FE)
STATE OF NEW MEXICO) ss

BCC RESOLUTIONS
PAGES: 216

I Hereby Certify That This Instrument Was Filed for Record On The 9TH Day Of January, 2019 at 11:01:22 AM And Was Duly Recorded as Instrument # 1876434 Of The Records Of Santa Fe County

Attest:

Witness My Hand And Seal Of Office
Geraldine Salazar
Deputy Estrella Martinez County Clerk, Santa Fe, NM

Geraldine Salazar
Geraldine Salazar, Santa Fe County Clerk

Date: 1-8-2019

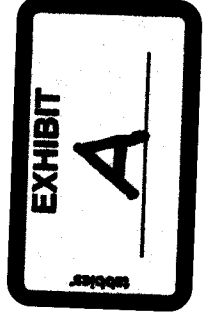


Approved As To Form:

R. Bruce Frederick
R. Bruce Frederick, Santa Fe County Attorney

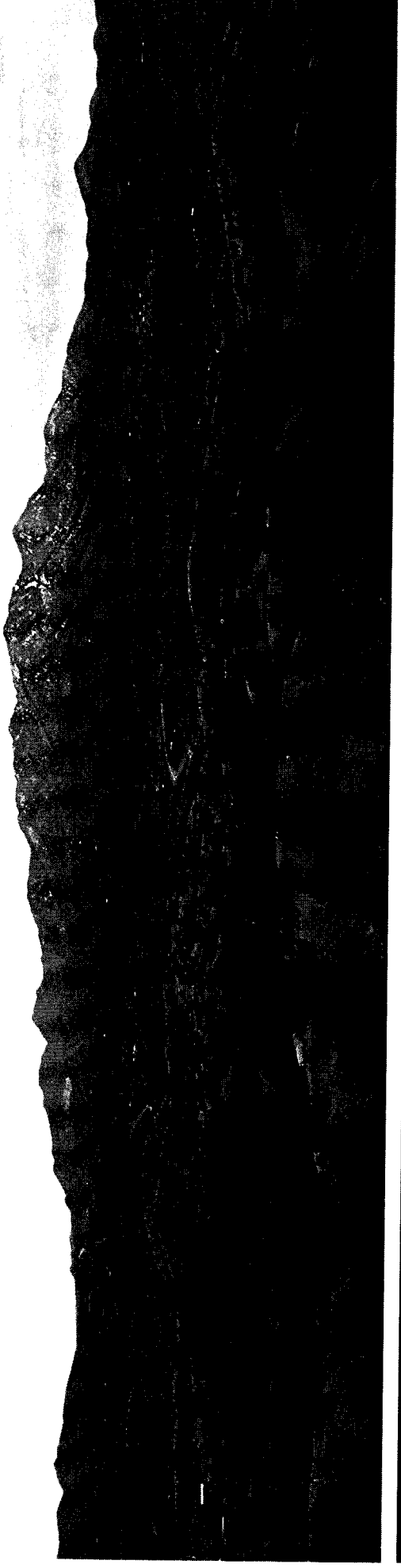
Date: 12/13/18

SFC CLERK RECORDED 01/09/2019



Santa Fe County
Open Space, Trails, and Parks
Strategic Management Plan

2019



6,600 acres
60 miles of trails
20 years of stewardship



REC'D
SFC CLERK RECORDED 01/09/2019 January 8, 2019

Acknowledgments

Santa Fe County Board of County Commissioners

Anna Hansen – District 2, Chair
Henry Roybal – District 1
Robert Anaya – District 3
Anna Hamilton – District 4
Ed Moreno – District 5
Katherine Miller, County Manager
Tony Flores, Deputy County Manager
Penny Ellis-Green, Growth Management Director
Robert Griego, Planning Manager

County Open Lands, Trails, and Parks Advisory Committee (COLTPAC)

Dave Dannenberg, Chair, District 4
John Parker, Vice Chair, District 5
Sandra Madrid Massengill, District 1
Sue Murphy, District 2
Ruben Cedeno, District 3
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Everett Lovato, OSTP Maintenance Technician
OSTP Interns
Leigh Scudder, 2018
Paige Bartine, 2018
Forest Replogle, 2016



Views of the Galisteo Basin, Cerro Pelon

Cover image - Ortiz Mountains, looking south from Cerrillos Hill State Park

Santa Fe County Open Space, Trails, and Parks Strategic Management Plan

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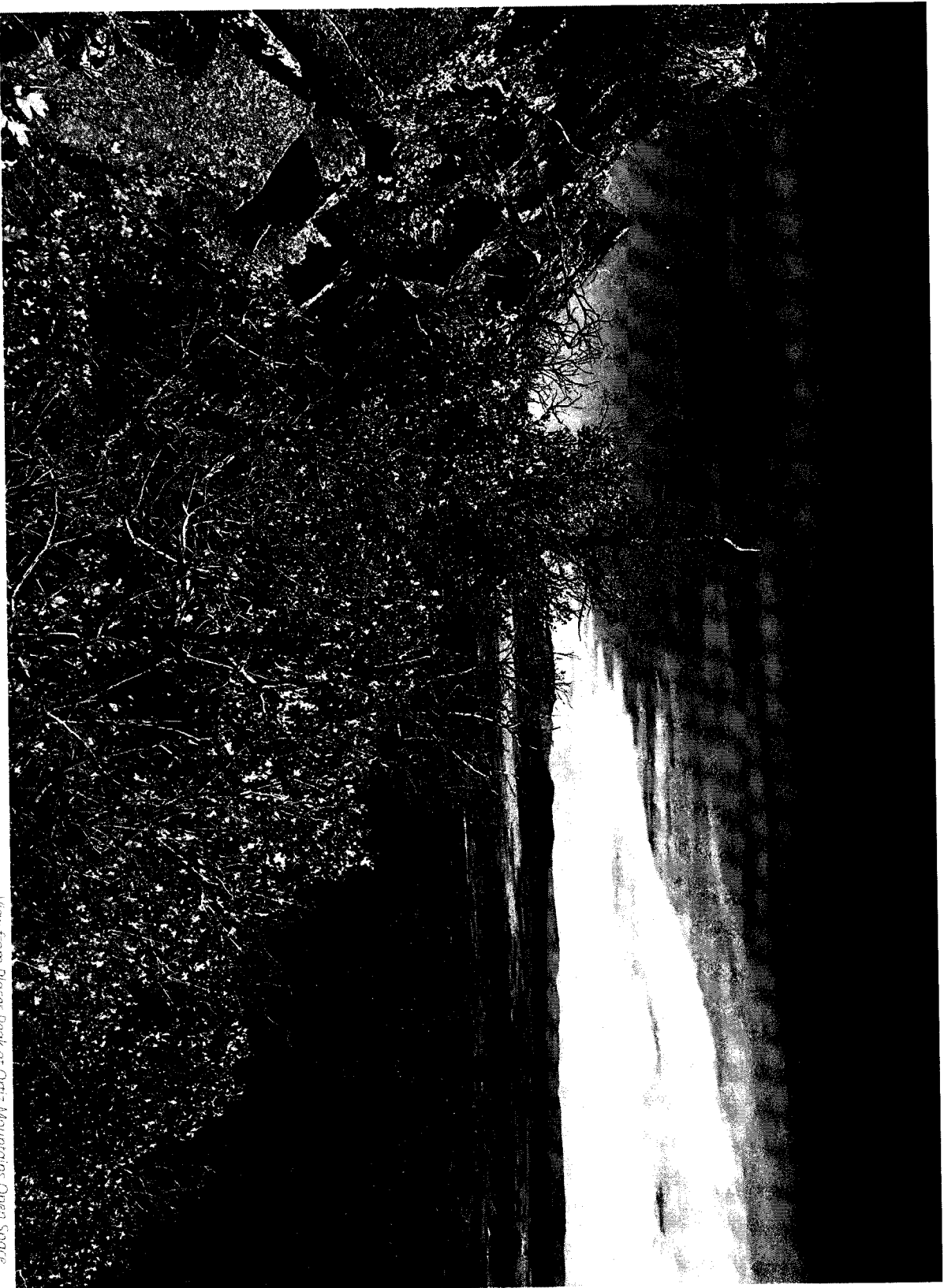
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Madrid Open Space



Los Potreros Open Space



View from Placer Peak at Ortiz Mountains Open Space

Executive Summary

This Strategic Management Plan is intended to be a guidance document from the Board of County Commissioners (BCC) to management, staff and the public for implementation of Open Space, Trails and Parks (OSTP) programs and projects. This plan also provides clear and transparent information for the public regarding the vision and goals of the County's OSTP program. Once adopted by the BCC, this plan will serve as a policy framework and an adaptable guide for future OSTP programming.

In 1998 and 2000, Santa Fe County voters approved \$20 million in bonds to purchase open space for conservation and recreation. Since that time, Santa Fe County has acquired 6,600 acres of open space, and built 60 miles of trails. In 2000, the original members of the County's Open Land, Trails and Parks Advisory Committee (COLTPAC) participated in the development of the Open Land and Trails Plan which outlined a grand vision of open space conservation and recreation opportunities in Santa Fe County. Progress on implementing that grand plan has been gradual, but momentum is building. The focus of this new Open Space, Trails and Parks Strategic Management Plan is to harness that momentum and build on the values that have guided the program for 20 years to significantly contribute to Santa Fe County residents' quality of life.

The purpose of this plan is to establish effective and efficient strategies to implement the short and long term goals for open space conservation and recreation development in Santa Fe County. This plan will guide the County in management of the Open Space, Trails and Parks Program (OSTP). It will also leverage past planning and investments to create a guide for staff, volunteers, partner agencies, and members of the public to implement projects for open space preservation and recreational opportunities.

This plan outlines policies, objectives and measurable actions towards becoming a national leader in landscape-wide conservation, innovative land management, and exceptional recreation opportunities.



Kennedy Site at Thornton Ranch Open Space

This Strategic Plan is organized into four chapters:

Chapter 1: History and Planning outlines past planning and projects; existing conditions and property profiles.

Chapter 2: Strategy describes objectives towards advancing the program; and sets action steps towards reaching those objectives. This chapter sets the framework for the vision and goals for OSTP. The goals inform OSTP Directives and Core Elements that shape the strategy towards effective implementation of the plan.

Chapter 3: Work Plan shows the planned priority projects and tasks for the first five years as well as projected project timelines and resource needs.

Chapter 4: Plan Elements includes additional guiding documents for OSTP operations. This chapter will be amended as future documents are developed and adopted.

The focus of the Open Space, Trails and Parks Program (OSTP) has shifted over 20 years from acquisition to resource management and providing meaningful experiences for County residents. Conservation of open space is still a priority, but so is providing access to open spaces, developing trail connections, providing educational programming and managing property in a sustainable and context-appropriate way.

This OSTP Strategic Plan was developed in accordance with the Sustainable Growth Management Plan (SGMP). The Plan uses the SGMP Principles and Keys to Sustainability as high-level, overarching fundamental principles to implement the SGMP Goal related to open space. The process of developing this plan arose from the need for more detailed guidance towards managing significant landscapes throughout Santa Fe County.

As the OSTP program has grown and changed, management needs to be streamlined and coordinated to effectively execute management goals and strategies. This plan proposes concentrating efforts in key areas to strengthen OSTP management and operations.

- Educational programming and events
- Coordination, messaging and outreach
- Partnership development and enhancement
- Resource management
- Program development and analysis
- Capacity building
- Project development and implementation
- Funding

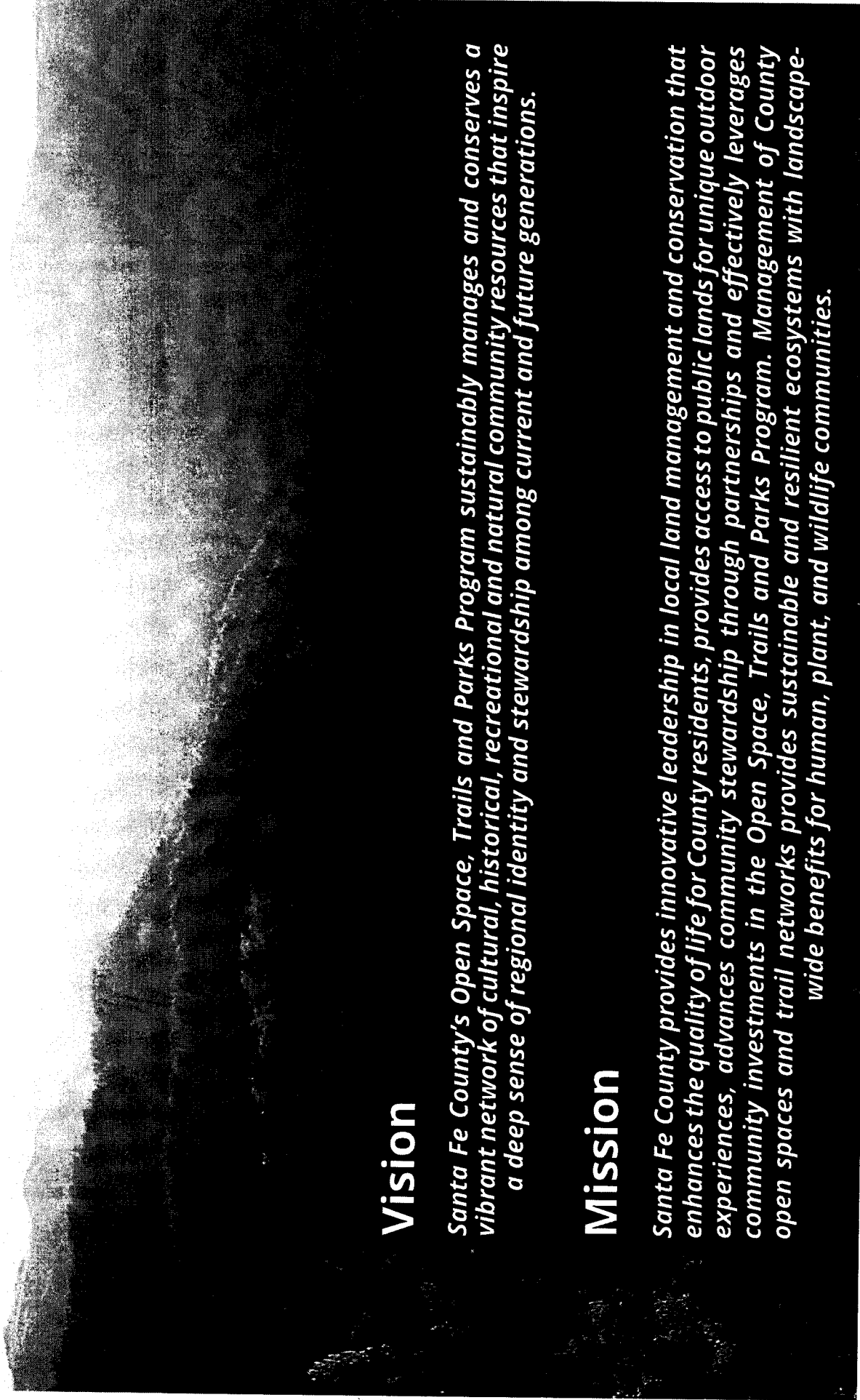
These focus areas guide County staff in program development, project implementation and innovative partnership opportunities to effectively implement conservation and recreation projects, and to manage open space landscapes.

This plan does not recreate the vision and the goals of the Open Space, Trails and Parks Program but rather refocuses and streamlines them in order to move the program forward. This plan leverages considerable community, volunteer, staff and financial investments in Santa Fe County residents' quality of life, and works to continue the legacy of exceptional conservation initiatives and outdoor recreation experiences for the next 20 years and beyond.



Las Potreros Open Space





Vision

Santa Fe County's Open Space, Trails and Parks Program sustainably manages and conserves a vibrant network of cultural, historical, recreational and natural community resources that inspire a deep sense of regional identity and stewardship among current and future generations.

Mission

Santa Fe County provides innovative leadership in local land management and conservation that enhances the quality of life for County residents, provides access to public lands for unique outdoor experiences, advances community stewardship through partnerships and effectively leverages community investments in the Open Space, Trails and Parks Program. Management of County open spaces and trail networks provides sustainable and resilient ecosystems with landscape-wide benefits for human, plant, and wildlife communities.



Grace's Warbler can be found on numerous open spaces, including the Ortiz Mountains. It is one of the least studied bird species in the United States and is rapidly declining. Jamie Scott/ National Park Service.

Chapter 1: History and Planning

This chapter outlines the history of the OSTP program, existing conditions and property background, and significant OSTP milestones.

History outlines the evolution of OSTP from 2000 to 2018.

Program highlights depicts significant program milestones.

Property inventory summarizes current property holdings and describes why each property is special.

Management Landscapes organize how County projects will be viewed and properties will be classified.

Program structure reviews how the program is currently organized.



Cerrillos Hills State Park

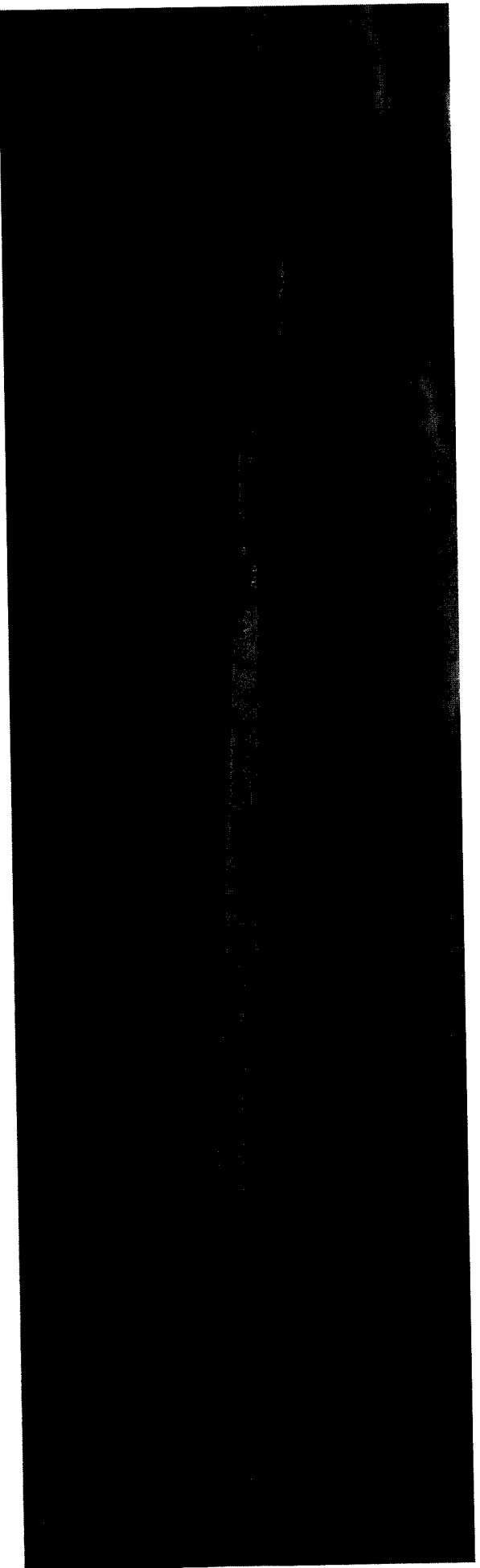
Program History

In 1998 and 2000, Santa Fe County voters approved \$20 million in bonds to purchase open space for conservation and recreation. Since that time, Santa Fe County has acquired 6,600 acres of open space, and built 60 miles of trails.

The Open Space, Trails and Parks Program (OSTP) has grown and changed since 2000 and is now an interdepartmental program in the Growth Management, Public Works and Community Services Departments. The program's focus has shifted from acquisition to resource management of open space properties along with development of access and recreation opportunities for County residents.

Santa Fe County OSTP has had different areas of focus throughout the history of the program. Following voter approval of \$20 million dollars in bonds in 1998 and 2000, the first phase of the program focused heavily on open space property acquisition. An advisory committee, now the County Open Land, Trails, and Parks Advisory Committee (COLTPAC) was formed to assist staff in developing criteria for evaluation and recommendation for purchase of open space. COLTPAC also assisted in developing the Open Land and Trails plan in 2000, which outlined a vision for the Open Space Program at that time.

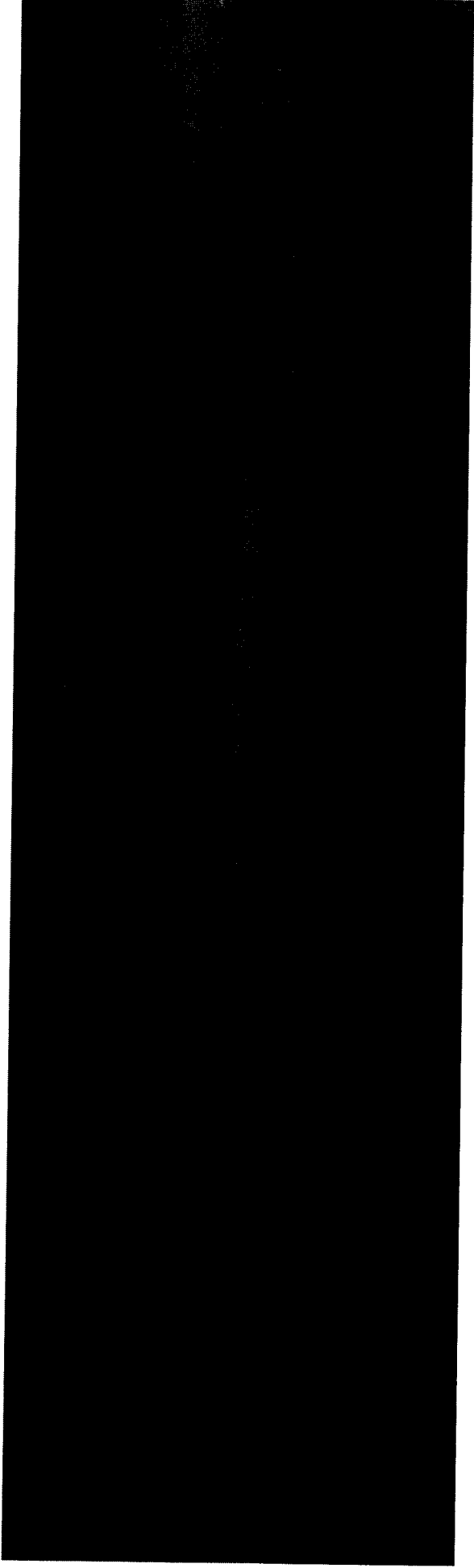
The second phase of the program was initiated by the dedication of 15% of Capital Outlay Gross Receipts Tax (GRT) set-aside for Open Space and Trails. This shifted the focus of the program into capital improvement projects on open space and trail properties. This GRT allocation was reprioritized to other County needs in 2011, again shifting the focus of the Open Space Program.



Santa Fe County OSTP has worked with numerous community, conservation, public and private partners in the development, implementation and continuing care of the open space program. Significant volunteer time has been a constant source of energy and support throughout the history of the program.





OSTP has acquired 26 open space properties that are distributed from Edgewood in the southern part of the County, to Chimayo in the north. Each property was acquired to conserve unique characteristics, landscapes, community connections and to provide educational opportunities for future generations of Santa Fe County residents. The current focus of OSTP is on resource management of Open Space properties in order to understand and protect the special cultural and environmental assets of each property.

In the first 20 years, OSTP has made considerable strides in providing exceptional conservation and outdoor experiences for Santa Fe County residents. Investments in providing an effective Open Space program have demonstrated continuing support, including increasing staff numbers and expanding the operation and projects budget year after year. The total investment over the first 20 years of OSTP for acquisition and project development is more than \$40 million; an additional \$7 million of grants has also been leveraged. Through the evolution of the program, the need to focus on maintenance, operations and stewardship has been identified in the short term; in the long term, there are opportunities to expand property inventory and develop additional facilities.






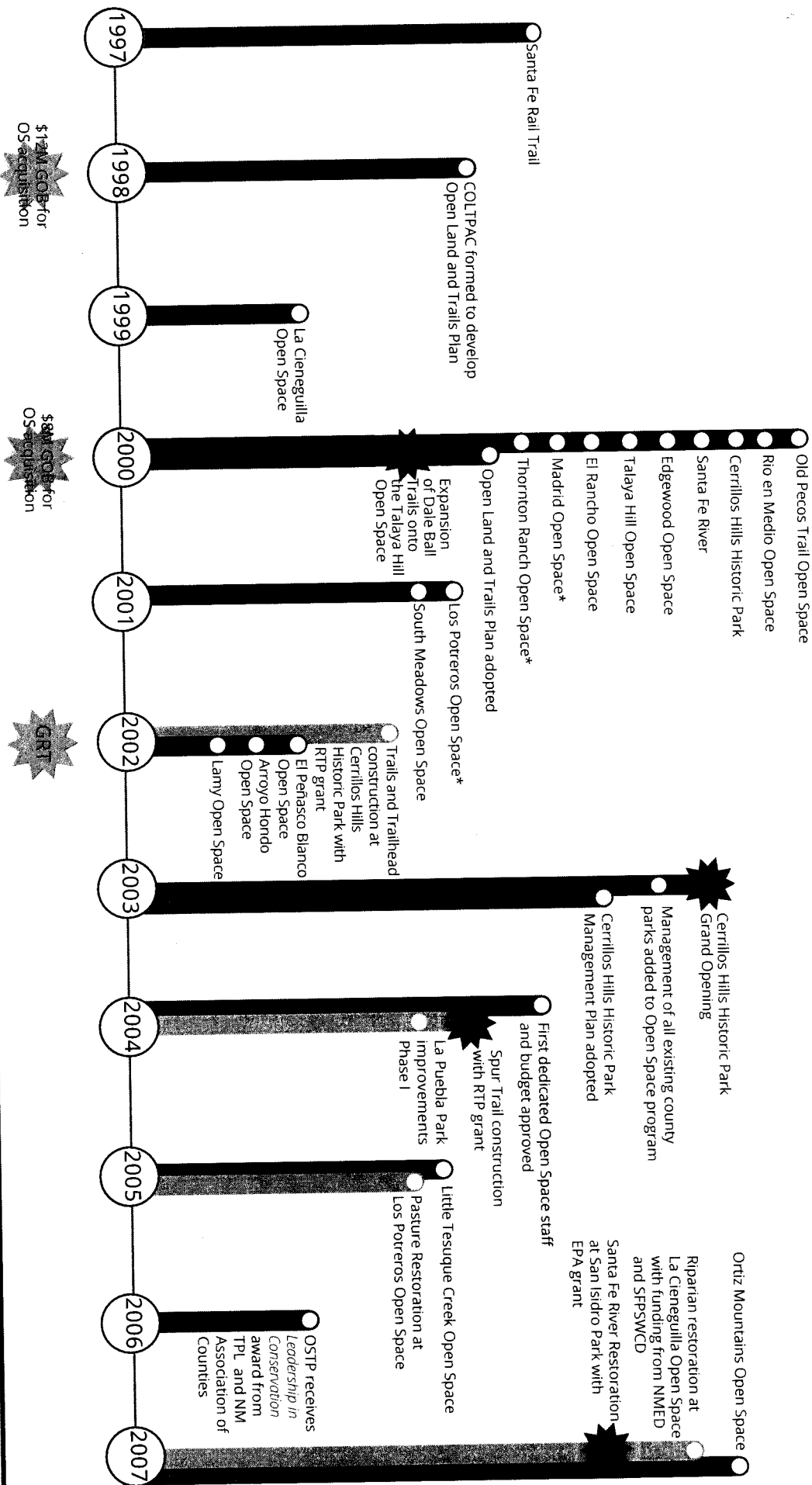
Program Highlights

OSTP has made tremendous progress over the last few decades in conserving open space, developing trails and resource management projects for open space properties.

-  Acquisition
-  Program Milestone
-  Capital Project
-  Planning Project

RTP- Recreational Trails Program
 NMED- New Mexico Environment Department
 SFPSCD- Santa Fe- Pojoaque Soil and Water Conservation District
 TPL- Trust for Public Land
 SFNF- Santa Fe National Forest

-  General Obligation Bond or Gross Receipts Tax influx
-  Initial Acquisition
-  Grand Opening!



\$12M GOB for OS acquisition

\$8M GOB for OS acquisition

GRT

Property Inventory

This table includes all the Santa Fe County Open Space, Trail and Park Properties. This table describes the reason for purchase of open space property, or the vision for the trail connection.

Property	Facility Type	Trail Miles	Total Acres	Property Vision/ Reason for Acquisition	Access Status
Arroyo de la Piedra Open Space	Open Space	1.8	54.4	Trail connection between Dale Ball Trails and Little Tesuque Open Space & SFNF trails	Open
Arroyo Hondo Open Space	Open Space	3	86.8	Conservation, Passive Recreation / Trails	Open
Cerrillos Hills State Park	Open Space	6	1098.2	Cultural Resource Preservation, Passive Recreation, Interpretation and Public Education	Open
Edgewood Open Space	Open Space	3	29.8	Equestrian Arena, Trails for passive recreation	Open
El Peñasco Blanco Open Space	Open Space	---	93.4	Wetlands restoration, Conservation, Critical habitat	Undeveloped
El Rancho Open Space	Open Space	---	5.5	Cultural Resource Preservation	No Public Access
La Cieneguilla Open Space	Open Space	---	150	Conservation, River Restoration, Passive Recreation	Undeveloped
Lamy Open Space	Open Space	---	91.2	Cultural Resource Preservation (Galisteo Basin Archeological Sites), Passive Recreation, Interpretation	Closed for Resource Management
Little Tesuque Creek Open Space	Open Space	1.72	161	Passive Recreation / Trails	Open
Los Caminitos Wilderness	Open Space	---	573	Conservation	Undeveloped
Los Potreros Open Space	Open Space	---	36*	Agricultural Conservation	Closed for Agricultural Management
Madrid Open Space	Open Space	---	57.3	Conservation, Passive Recreation / Trails	Undeveloped
Old Pecos Trail Open Space	Open Space	---	4.8	Conservation	Undeveloped
Ortiz Mountains Open Space	Open Space	6	1350	Conservation, Educational Tours	Guided tours only
Paseo Primero Open Space	Open Space	---	5.1	Conservation	Undeveloped
Rio en Medio Open Space	Open Space	0.5	121.3	Conservation, Passive Recreation	Open
San Pedro Open Space	Open Space	---	160	Conservation, Passive Recreation / Trails, Scenic Byway Preservation	Undeveloped
South Meadows Open Space	Open Space	---	22.2	Community Garden, Outdoor Classroom, Conservation, Public Education	Undeveloped
Talaya Hill Open Space	Open Space	7	290.5	Conservation, Passive Recreation	Open
Thornton Ranch Open Space	Open Space	---	1904*	Conservation, Cultural Resource Preservation, Passive Recreation, Interpretation and Public Education	Closed, Undeveloped
Arroyo Hondo Trail	Regional Trail	1.5	---	Alternative Transportation Corridor, Regional Trail	Under construction
Santa Fe Rail Trail	Regional Trail	12	---	Transportation Corridor / Regional Trail	Open, under construction
Santa Fe River Trail	Regional Trail	1	133.2	Conservation, River Restoration, Regional Trail / Transportation Corridor	Open, under construction
Spur Trail	Regional Trail	3	---	Transportation Corridor / Regional Trail	Open
El Camino Real NHT	Regional Trail	15	---	Regional Trail	Open

* Managed acreage is more

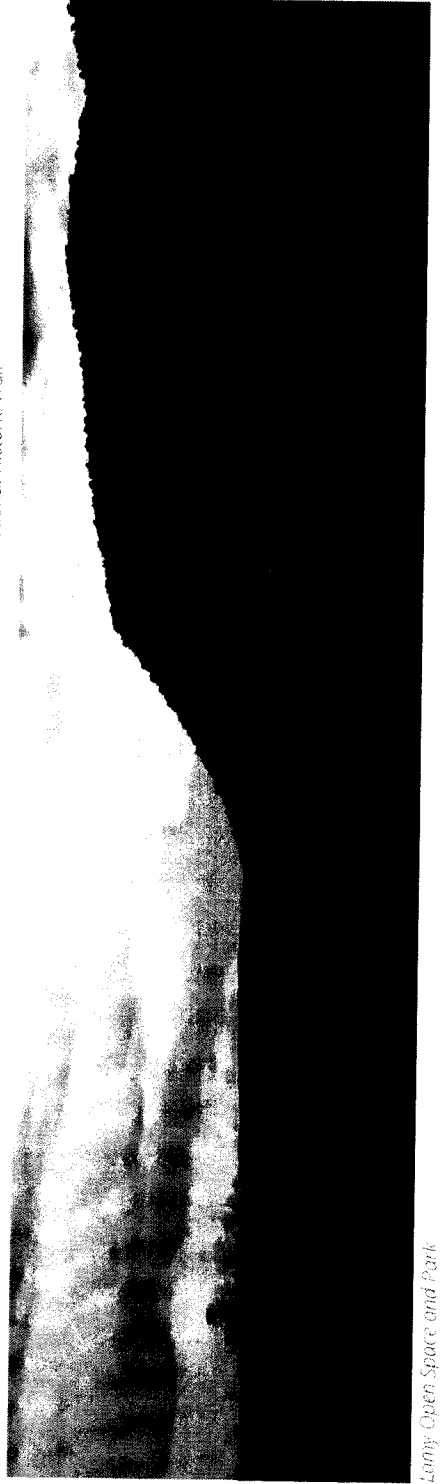
The park table indicates whether a Land, Water, Conservation Fund (LWCF) obligation is present at park properties. This requires Santa Fe County to maintain the park infrastructure at that location in perpetuity.

Property	Facility Type	Total Acres	Park Status	Access Status
Romero Park (Agua Fria Park)	Park	30.00	LWCF, R & PP	Open, under construction
Bennie J. Chavez Community Center Park	Park	0.50	LWCF	Open, under construction
Pojoaque Valley Recreation Complex	Park	11	LWCF	Open, under construction
Stanley Community Park	Park	0.50	LWCF	Open
Lamy Park	Park	50.00		Open
Chimayo Community Center Park	Park	0.20	LWCF, R & PP	Open
Pojoaque Tennis Court	Park	0.20	LWCF	Open
Gallisteo Community Park (Phillip C Watts II Memorial Park)	Park	0.25	LWCF	Open
Burro Lane Park	Park	3.33	R & PP	Open
Leo Gurule Park	Park	4.00	LWCF	Open
La Puebla Park	Park	5.02	R & PP	Open
El Rancho Community Center Park	Park	0.05	LWCF	Open
Rio en Medio Community Center Park	Park	0.25	LWCF	Open
Nambe Community Center Park	Park	1.00		Open
Cerrillos Fire Station Park	Park	0.05		Open
Cundiyo Community Center Park	Park	.02	LWCF	Open
La Cienega Community Center Park	Park	.05		Open

LWCF - Land Water Conservation Fund

R & PP - Recreation and Public Purposes Act patent

NHT- National Historic Trail



Lamy Open Space and Park

What we have and why it's special



Arroyo de la Piedra Open Space

Arroyo de la Piedra Open Space was purchased in 2011 in order to connect the Dale Ball Trails to the Little Tesuque Open Space and the Santa Fe National Forest Trails. La Piedra Trail is a 1.6 mile trail that features strenuous climbs and winds through important piñon-juniper and ponderosa pine forest wildlife habitat. Climb to the top for a spectacular scenic overlook to the west with views of the area mountain ranges.



Arroyo Hondo Open Space

Acquired in 2002, the Arroyo Hondo Open Space conserves scenic hilltop vistas and valuable piñon-juniper and riparian wildlife habitat along the Arroyo Hondo while providing 3 miles of loop trails for outdoor recreation within easy reach of the city. The historic Arroyo Hondo Pueblo site and historic dam can be seen from various points along the trails, as well as beautiful panoramic views of the Galisteo Basin, Cerrillos Hills, and Ortiz Mountains.

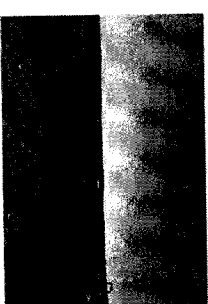
Cerrillos Hills State Park

Cerrillos Hills State Park is located along the scenic Turquoise Trail just north of the Village of Cerrillos. Owned by Santa Fe County and managed by New Mexico State Parks, the Park totals 1,098 acres of important piñon-juniper wildlife habitat. The Cerrillos Hills are remnants of 30-million-year-old volcanoes that have eroded down over time and intruded minerals resulting in gold, lead and turquoise veins. The Park is one of the oldest mining areas in North America, including turquoise mining prior to 1000 AD and Spanish mines in the 17th Century.



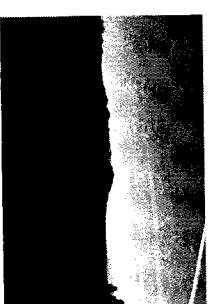
Edgewood Open Space

Edgewood Open Space consists of an equestrian arena and other day-use facilities for horses and their riders. The facility includes a network of recreation trails.



El Peñasco Blanco Open Space

El Peñasco Blanco Open Space is located in the Traditional Historic Community of La Cienega. This 93-acre property was purchased in 2005 for the conservation of critical habitat and restoration of wetlands as well as preservation of community and cultural resources.



El Rancho Open Space

El Rancho Open Space was purchased in 2000 to preserve significant cultural resources. This 5.5-acre open space contains significant puebloan resources, as well as important acequia infrastructure that supports traditional agricultural practices in the area.



La Cieneguilla Open Space

The La Cieneguilla Open Space is a 150-acre County Open Space property along the Santa Fe River in La Cieneguilla. This property was the first open space purchased in the Open Space Program. In addition to a healthy riparian ecosystem, the property also includes juniper savannah and 360 degree views of the Santa Fe County landscape and the rural setting of the La Cieneguilla Land Grant.

Lamy Open Space and Park

Lamy Open Space and Park consists of two adjacent parcels. The 91-acre Open Space was purchased in 2002 to protect significant cultural resources listed in the Gallisteo Basin Archaeological Sites Protection Act. The 50-acre park was developed as a passive recreation and picnic area for the community of Lamy and surrounding area. Lamy Open Space and Park provide spectacular views of the Gallisteo Basin.

Little Tesuque Creek Open Space

Little Tesuque Creek Open Space is approximately 160 acres purchased in 2005. Shaded trails through valuable riparian wildlife habitat along the Little Tesuque Creek connect the adjacent Arroyo de la Piedra Open Space to the Santa Fe National Forest, maximizing conservation of valued landscapes open to the public for hiking, mountain biking, or horse riding.

Los Caminitos Wilderness Open Space

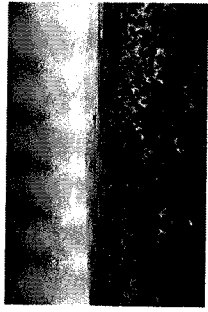
The Los Caminitos Wilderness consists of 573 acres of valuable piñon-juniper wildlife habitat adjacent to the Santa Fe National Forest.

Los Potreros Open Space

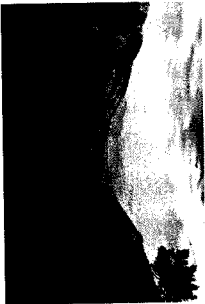
Acquired by the County between 2001 and 2004, the Los Potreros Open Space provides a scenic backdrop to El Santuario de Chimayo and is a present-day working landscape, exemplary of the traditional lifeways and culture of Northern New Mexico. This unique open space property includes diverse ecosystems, and is the confluence site of two perennial rivers. This 40-acre pasture was purchased to preserve traditional agricultural heritage including the traditional acequia system.

Madrid Open Space

The Madrid Open Space consists of 57 acres of open land on three contiguous properties that run through the center of Madrid. The Madrid Open Space is considered the backyard of the Madrid community, with many homes in immediate proximity. The community enjoys the quiet solitude of the open space, and many residents use it for daily walks.

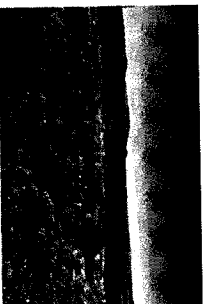


What we have and why it's special



Ortiz Mountains Open Space

The Ortiz Mountains Open Space consists of 1,350 acres in the Ortiz Mountains, including Placer Peak - the highest peak in the Ortiz range - at 8,897 feet elevation. The property contains several historic mine shafts from the New Mexico gold rush in the mid-nineteenth century. Purchased in 2007 with the vision of conservation and preservation, the spectacular ponderosa and piñon-juniper habitat is home to black bears, coyotes, horned lizards, bats, and many species of birds. It is considered one of the most biodiverse and historically and ecologically special Open Space property in Santa Fe County.



Old Pecos Trail Open Space

The Old Pecos Trail Open Space was purchased in 2000 to preserve the landscape and views at this property. This property purchase had broad support from the neighboring communities.



Rio en Medio Open Space

Prime hiking through shady trees and lush green vegetation along the bubbling Rio en Medio, this open space adds over a hundred acres of high-value wildlife habitat and recreational trail lands to the surrounding Santa Fe National Forest. Wildlife and bird-watching opportunities abound. This property provides connection to the Santa Fe National Forest, and the popular Rio en Medio trail that ends at a waterfall in the forest.



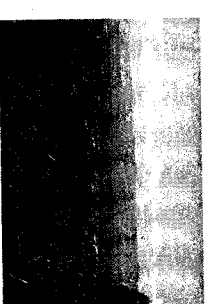
San Pedro Open Space

The San Pedro Open Space consists of approximately 160 acres of piñon-juniper woodland. Acquired in 2011 for preservation of cultural resources, conservation of scenic landscapes and valuable wildlife habitat, the San Pedro Open Space was envisioned to provide a regional trail hub to connect adjacent public lands, including BLM, as well as acreage managed by Bernalillo and Sandoval Counties. The San Pedro Mountains also include numerous historic mining artifacts, and many areas are still used by recreational and amateur miners.



South Meadows Open Space

Slightly over 22 acres, the South Meadows Open Space was purchased in 2001 with visions to become an outdoor space for a rapidly developing area of Santa Fe. Planning for the park includes unstructured play areas, a community garden, a local trail network, and an outdoor classroom for public education and conservation programs.

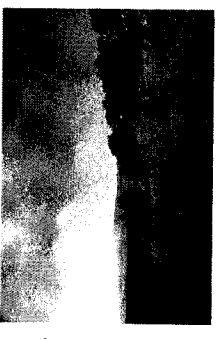


Talaya Hill Open Space

Conveniently located between the eastern foothills of the City of Santa Fe and the Santa Fe National Forest, the Talaya Hill Open Space is one of the most accessible and well-loved of open space properties. Providing nearly seven miles of trails with connections to the Dale Ball and Santa Fe National Forest trails, this space provides ample opportunity for outdoor recreation with outstanding views, while also conserving valuable wildlife habitat.

Thornton Ranch Open Space

The Thornton Ranch Open Space is the largest Santa Fe County Open Space property. The property was purchased to protect the significant cultural resources on the property from private development and to provide opportunities for public interpretation of the unique landscape of the Galisteo Basin. In 2004, the United States Congress passed the Galisteo Basin Archaeological Site Protection Act to protect the nationally significant archaeological resources in the Galisteo Basin including a site within the Thornton Ranch Open Space. The property includes valuable habitat for a variety of wildlife species.



El Camino Real Trail

El Camino Real Trail follows an alignment of El Camino Real de Tierra Adentro, a designated National Historic Trail (NHT). This historic trade route brought sheep, goats, burros, and chickens as well as royal decrees, mail, mission supplies, and private merchandise to the Ohkay Owingeh Pueblo from as far south as Mexico City. This route of El Camino Real de Tierra Adentro connects the Santa Fe River to the visually spectacular Diablo Canyon approximately 15 miles away.



Santa Fe Rail Trail

This shared-use path is mostly within NMDOT along the historic NM Southern Railway. This “rail with trail” project was designed to highlight railroad history. The trail currently connects the historic Santa Fe Depot to Eldorado for a total of 12 miles of trail. There are plans to connect the trail to the community of Lamy as well as the popular Commonweal Conservancy-- Galisteo Basin Preserve trails.



Santa Fe River Trail

The Santa Fe River Trail is a multi-jurisdictional project to restore the Santa Fe River. This important corridor is used by Santa Fe residents and visitors alike for transportation and recreation. To date, 2.7 miles of the Santa Fe River have been restored with plans for six additional miles of river restoration through Santa Fe and the traditional communities of Agua Fria, La Cieneguilla and La Cienega.



Spur Trail

The Spur Trail provides a very important connection from the Santa Fe Rail Trail to the Community College District. Ultimately, this trail will connect to the Arroyo Hondo Trail which will provide important connections east and west in the identified development focus areas known as Sustainable Development Area-1 (SDA-1) for alternative transportation and recreation opportunities.



History

Management Landscapes

Management Landscapes focus project areas and opportunities as well as prioritize areas for collaborative landscape management and partnership development.

Area identification process

Management Landscapes are focus areas that have been identified through this planning process. Project areas direct prioritization of management, projects and programming activities, as well as new infrastructure, including new trail systems, trailheads, visitor centers, etc. The below criteria was used to identify project focus areas. There may be other areas in the County with potential for projects that have not been identified on this map.

Project areas are designated by criteria:

- Criteria 1:** Clusters of Santa Fe County Open Space properties.
- Criteria 2:** Adjacency of public land to existing Open Space properties.
- Criteria 3:** Opportunity for partnerships (with public and private entities).
- Criteria 4:** Opportunity for recreation, trail connections, and expansion of existing networks.
- Criteria 5:** Nearby community support.
- Criteria 6:** Existing project investments, including capital investments and management plans.
- Criteria 7:** Related environmental and habitat factors that have similar management needs.



View of the Galisteo Basin from Cerrillos

Management Landscape and Trail Corridor Descriptions

There are several management landscapes where Santa Fe County will focus activities. Management Landscapes are prioritized because they leverage Santa Fe County assets in areas where preservation and recreation goals can be met by working with partner agencies, community groups and others.

One of the primary ambitions of the 2000 Open Land and Trails Plan (OLTP) was to ensure that open spaces were distributed equally throughout the county. Over the past 18 years of implementing the OLTP, it has become apparent that users and needs for open space opportunities are different in the various areas of the County. The distribution and type of open space, trail and park facilities should reflect the regional needs and user patterns. Reflecting these regional needs is a more efficient and effective way of providing open space and trail opportunities to County residents.

Management Landscapes take into account the different regional needs of each area in the County.

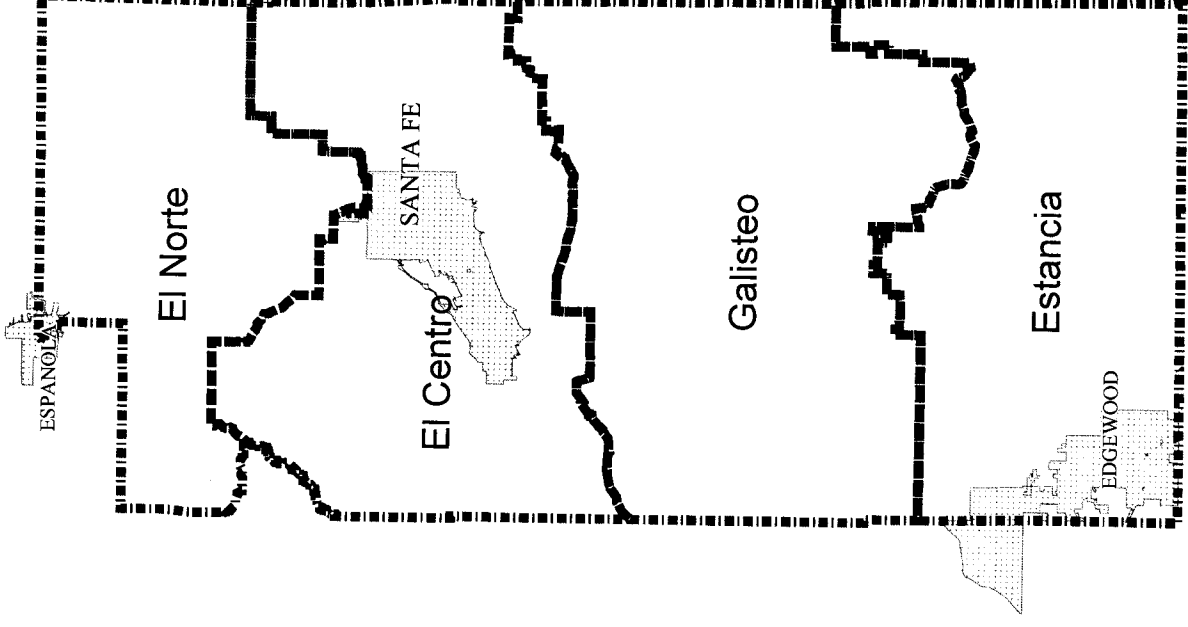
El Norte—there is a desire for parks, active recreation facilities and access to public lands.

El Centro—trails for transportation and recreation, as well as land conservation

Galisteo—landscape-wide conservation and recreation opportunities

Estancia—trails and regional trail connections—especially long distance trails for riding horses

Trail corridors are important features within Management Landscapes. These trail corridors connect Management Landscapes, and provide important recreation and transportation opportunities throughout Santa Fe County.



County Growth Management Areas (GMAs)

Regional Trail corridors

Regional Trail corridors have special designation because they provide regional connections to open spaces and public lands. These are long distance trails that serve all non-motorized users including equestrians, bicyclists and pedestrians.

Santa Fe River Trail

This project is a major river restoration project that includes a trail in an urban and semi-urban context. It provides transportation and recreation opportunities for city and county residents. The trail begins in the heart of the City of Santa Fe and continues along the Santa Fe River. At this time the trail is conceptually designed to the Wastewater Treatment Plant, with plans to continue the trail on a smaller scale into the communities of La Cienega and La Cieneguilla. This is a trail with regional and environmental importance. Coordination with the City of Santa Fe is important in the development of the next phase of planning and construction.

Arroyo Hondo Trail

The Arroyo Hondo Trail is a District Trail as identified in the Community College District Plan. The plan identifies a network of District-wide trail corridors as part of the open space system to make connections to neighborhoods, commercial centers and open space. This trail provides transportation and recreation opportunities that connect the Rail Runner Station at NM 599 to the Santa Fe Community College. This trail is conceptual at this time, but is a focus project for construction in the near term.

Santa Fe Rail Trail

The Santa Fe Rail Trail is a regional transportation and recreation facility that is co-managed by the City of Santa Fe and Santa Fe County. The trail is currently constructed from the Santa Fe Depot along the Santa Fe Southern rail spur to Avenida Eldorado. The trail was designed as a shared-use, bicycle, pedestrian and equestrian trail that follows AASHTO and ADA standards for multi-use transportation trails along an active railway. Conceptual design for this trail exists to Spur Ranch Road. Construction of the trail to Spur Ranch Road is imminent. Additional plans to connect this regional trail to Lamy Open Space and the community of Lamy need to be fleshed out, and are conceptual at this time.

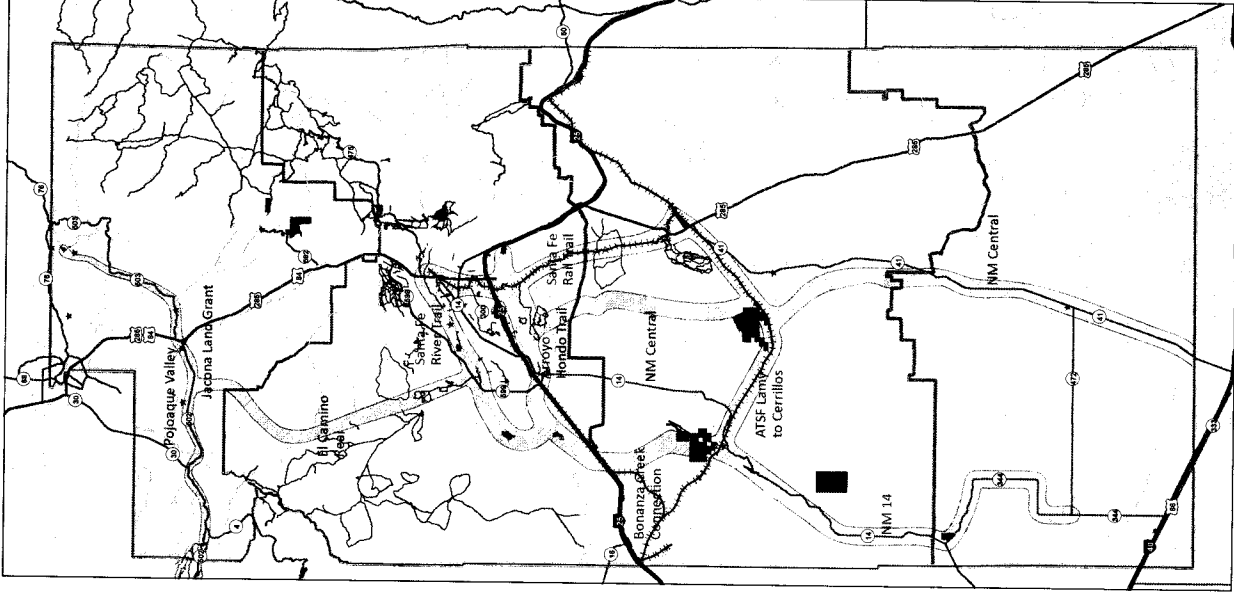
El Camino Real

El Camino Real de Tierra Adentro retracement trail is a National Historic Trail and currently connects the Santa Fe River to Diablo Canyon. Future connections can be made to the Jacona Land Grant as well as the Rio Grande. This regional spine can connect many loops within the Caja del Rio region.

NM Central

The New Mexico Central Rail Corridor is a conceptual idea at this time. The New Mexico Central Railroad (also known as the Frijoles Line) was a standard-gauge railroad that provided freight service (primarily for agricultural products) along with limited passenger services between Santa Fe and Torrance County. The New Mexico Central line was active for only 23 years but has made a lasting impact on the landscape. The abandoned rail grade provides an exceptional opportunity to provide a unique trail experience that connects the City of Santa Fe to Thornton Ranch Open Space, and beyond to connections in Torrance County.

Santa Fe County
Proposed
Management Landscapes
and
Regional Trail Connections



History

ATSF Lamy to Cerrillos

Plans to connect Lamy Open Space to Thornton Ranch Open Space to Cerrillos Hills State Park along the ATSF railroad right of way are conceptual at this time. A segment of the regional trail will be constructed through Thornton Ranch Open Space.

Bonanza Creek Connection

There may be opportunities to connect the Cerrillos Hills Management Landscape to the La Cienega Management Landscape along Bonanza Creek. Plans are conceptual at this time. The San Marcos Community Plan, currently being updated, identifies the desire to have trail connections in the area.

NM 14

There are many open space properties along NM 14. This scenic byway has many recreational cyclists already traveling along the route. Connections to open spaces could be made, as well as connections to the Town of Edgewood for all non-motorized users.

Jacona Land Grant

Working with the members of the Jacona Land Grant, a trail connection could be made from the Caja del Rio area and El Camino Real Trail to a potential alignment of the Rio Grande Trail.

Pojoaque Valley

The Pojoaque Valley has potential to complete an east-west connection along NM 502 and NM 503. This could connect Chimayo and BLM trails in that area to trail networks in Los Alamos County.

Thornton Ranch-Lamy

County owned properties:

- Thornton Ranch Open Space
- Lamy Open Space
- SF Rail Trail

Future County projects

- NM Central Regional Trail
- ATSF Regional Trail

Other Landowners/ Partners

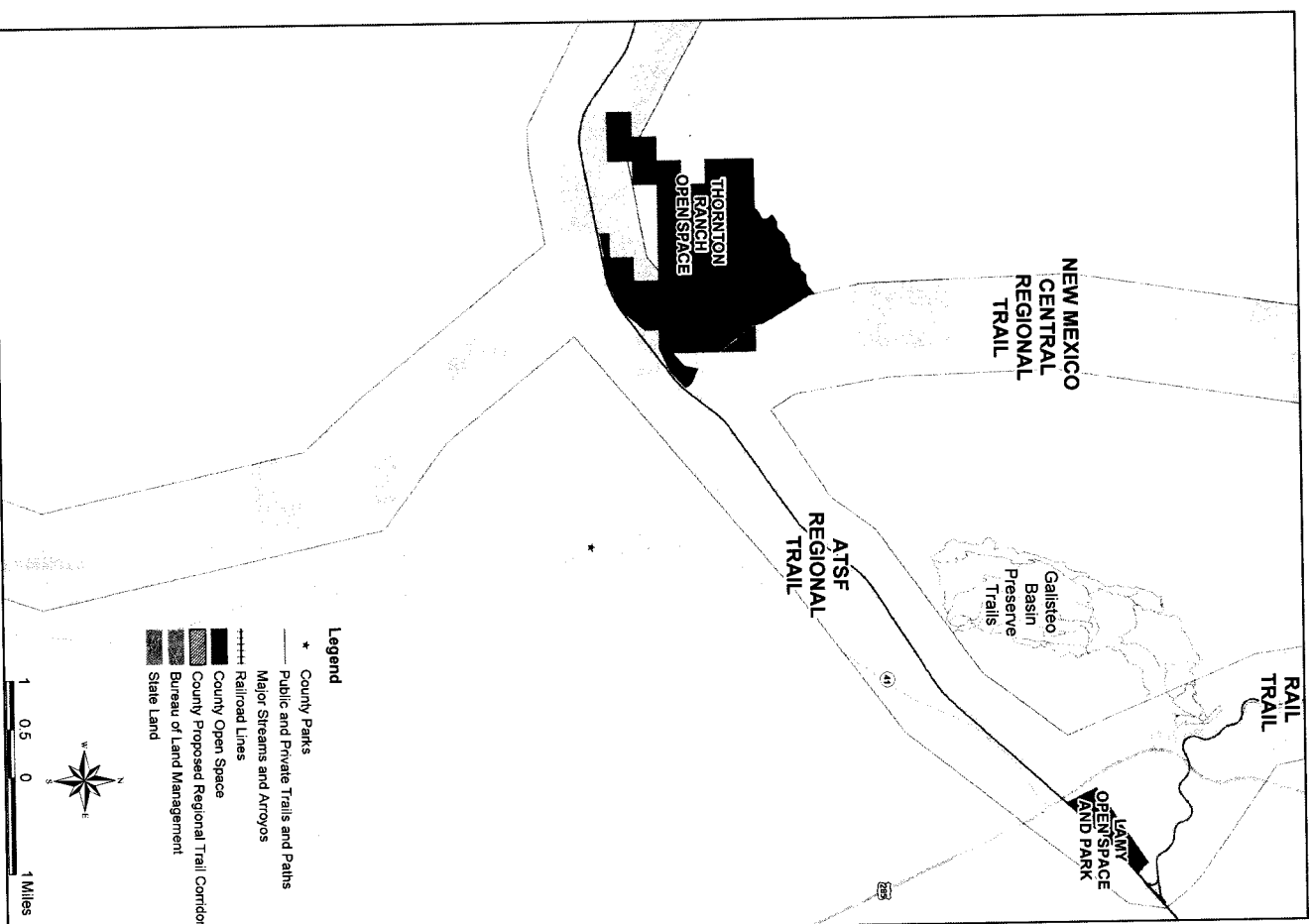
- Commonweal Conservancy--Galisteo Basin Preserve
- Santa Fe Conservation Trust
- BLM
- SLO
- NM DOT Rail Bureau
- SHPO

Management Objective:

This management landscape unit includes the Thornton Ranch Open Space and the Lamy Open Space. Privately owned, publicly-accessible trails at the Commonweal Conservancy--Galisteo Basin Preserve could connect to future regional trails including the Santa Fe Rail Trail, the NM Central Regional Trail, and the ATSF Regional Trail. A trailhead and trail connection from US 285 to the Commonweal Conservancy-- Galisteo Basin Preserve trails will be developed in the near future with segment 6 of the SF Rail Trail.

Santa Fe County will be focusing efforts and investments especially in the Thornton Ranch Open Space and developing the regional trail connections to that property in the near term. Lamy Open Space and Park has a management plan that outlines priority activities there, including citizen science monitoring and community involvement.

From a wildlife management perspective the Thornton Ranch-Lamy and Madrid-Cerrillos management units will be managed similarly. Both units contain similar habitat, are relatively close in proximity, and contain similar species of conservation concern, including Pinyon Jay, a wide-ranging, nomadic species. Additionally, in the future, collaboration with neighboring property owners and agencies for important projects, such as the creation of wildlife corridors between these open space properties, could create even more important benefits for wildlife.



Madrid-Cerrillos

County-owned properties:

- Cerrillos Hills State Park
- Madrid Open Space
- Ortiz Mountains Open Space
- Mt Chalchihuitl acquisition (pending)

Future projects

- ATSF Regional Trail
- Grand Central Trail—County/NMSP/BLM
- Madrid Rail Spur connection
- Bonanza Creek connection

Other Landowners/ Partners

- BLM
- SLO
- NM State Parks
- Madrid Landowners
- Cerrillos Hills Park Coalition
- Santa Fe Conservation Trust

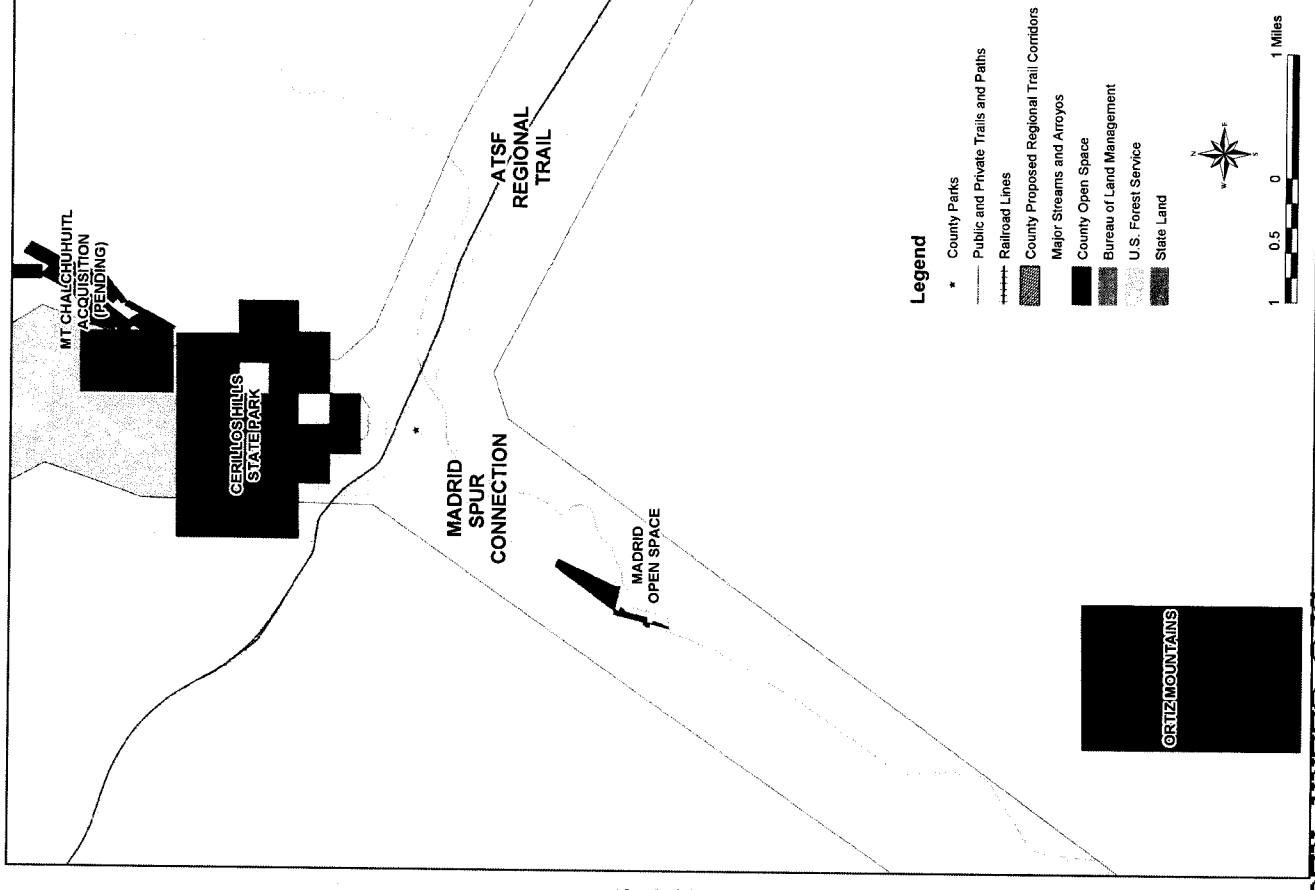
Management Objective:

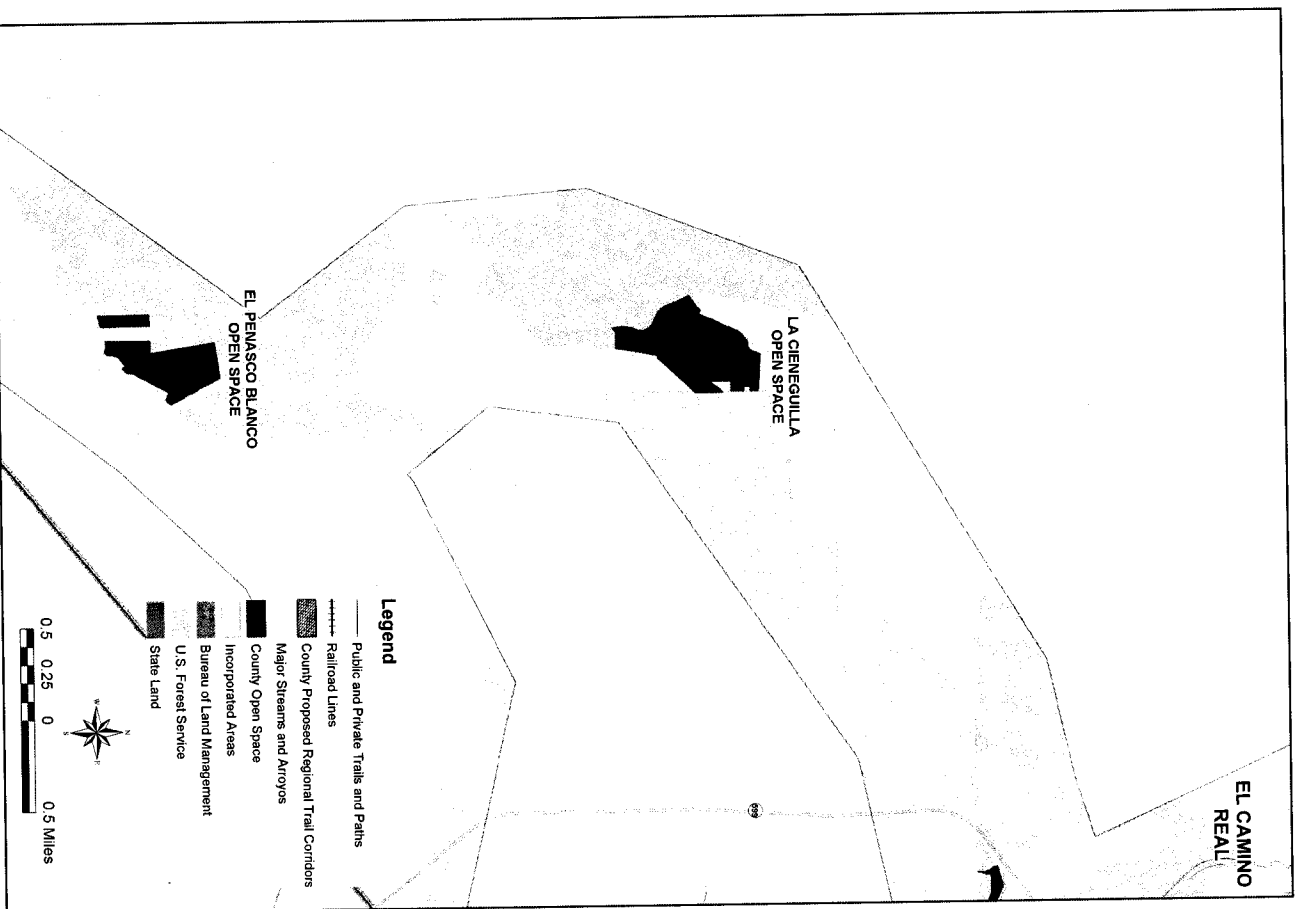
This management landscape unit includes Madrid Open Space, Cerrillos Hills State Park, and the pending Mt. Chalchihuitl Open Space. BLM is adjacent. There are opportunities to expand the area under management of New Mexico State Parks to include the Mt. Chalchihuitl area. There are also private inholdings that Santa Fe County and BLM should coordinate on acquisition to facilitate effective management of the landscape unit. Additional opportunities exist to connect the Cerrillos area to Madrid three miles away via an old rail spur.

Ortiz Mountains

Management Objective:

The Ortiz Mountains Open Space contains wildlife species not found on any other open space property. Given its geographic location, and habitat types, this property contains species with a more southerly range, such as Black-chinned Sparrow. This, combined with its distance from other open space properties, means it is necessary to manage it as its own unit. In the future, collaboration with neighboring property owners in the Ortiz Mountains, including the gold mine, could help accomplish landscape-scale wildlife management and conservation. Access to Ortiz Mountains Open Space needs to be addressed. Property management will be a priority; as management actions are developed projects will be identified including trail development, educational programming, safety and hazard mitigation and ecological improvements.





La Cienega Area

County-owned properties:

- La Cieneguilla Open Space
- El Peñasco Blanco Open Space
- La Bajada Ranch

Future projects

- Santa Fe River Trail extension
- Caja del Rio connections
- Bonanza Creek connection

Other Landowners/ Partners

- BLM
- HIPICO Santa Fe
- SF Girls School
- Las Golondrinas
- City of Santa Fe

Management Objective:

The La Cienega Area Landscape Management Unit includes the La Cieneguilla Open Space, El Peñasco Open Space and La Bajada Ranch. Trail connection opportunities include extending the Santa Fe River Trail through La Cienega and La Cieneguilla to connect to La Bajada Ranch, as well as trails in the City of Santa Fe, creating a trail loop system. Other trail opportunities include providing connections to the Caja del Rio unit of the Santa Fe National Forest and BLM land in the La Cienega ACEC area.

Managing this area for high conservation need species, such as Bendire's thrasher and monarch butterflies, is particularly important.

Foothills Trails Area

County-owned properties:

- Talaya Hill Open Space
- Arroyo de la Piedra Open Space
- Little Tesuque Creek Open Space
- Rio en Medio Open Space
- Los Caminitos Open Space
- Arroyo Hondo Open Space

Future projects

- Rail Trail/ AHOS trail connection
- Enhancement of Rio en Medio trailhead/access
- Connection from SFNF to Los Caminitos Open Space

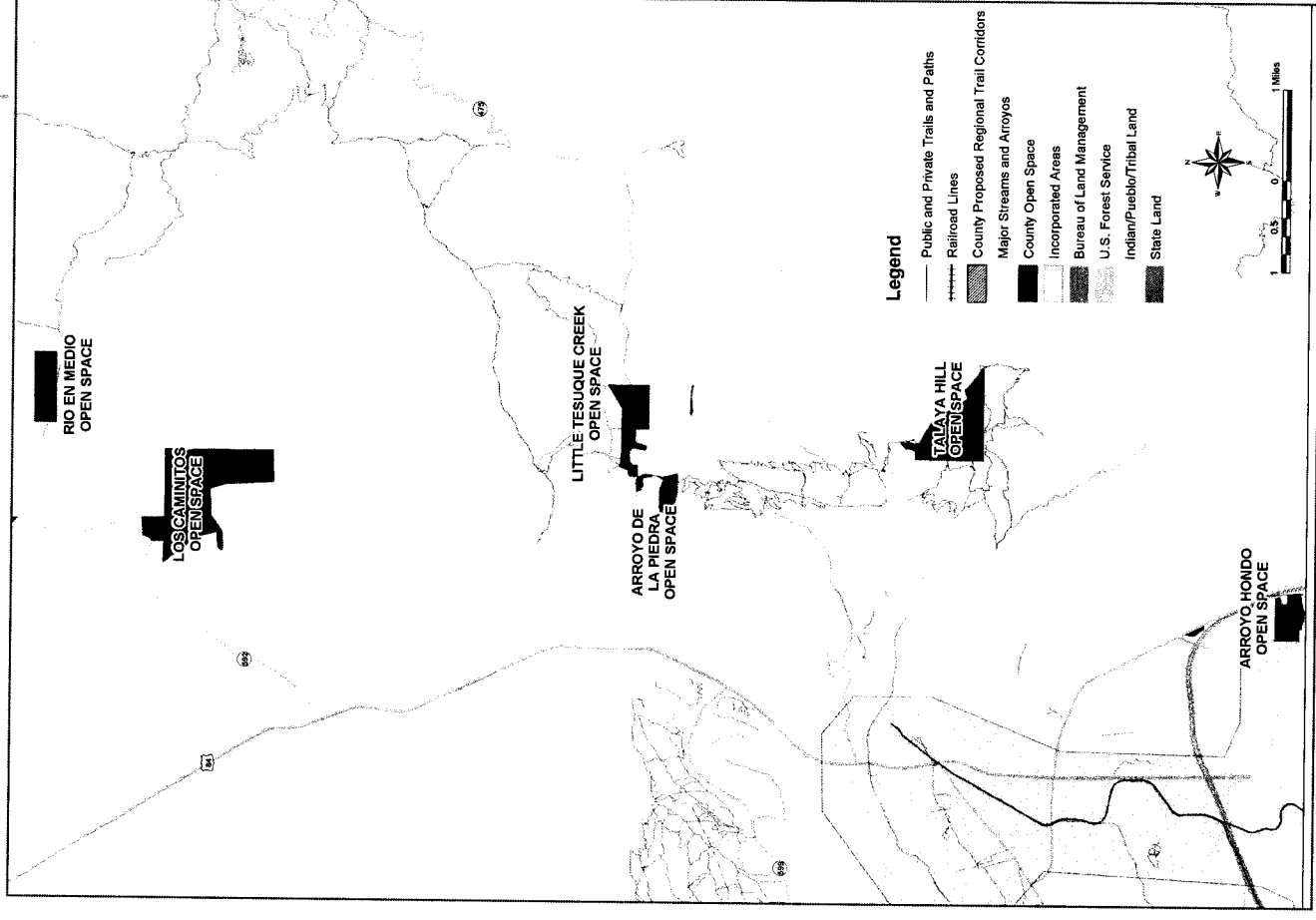
Other Landowners/ Partners

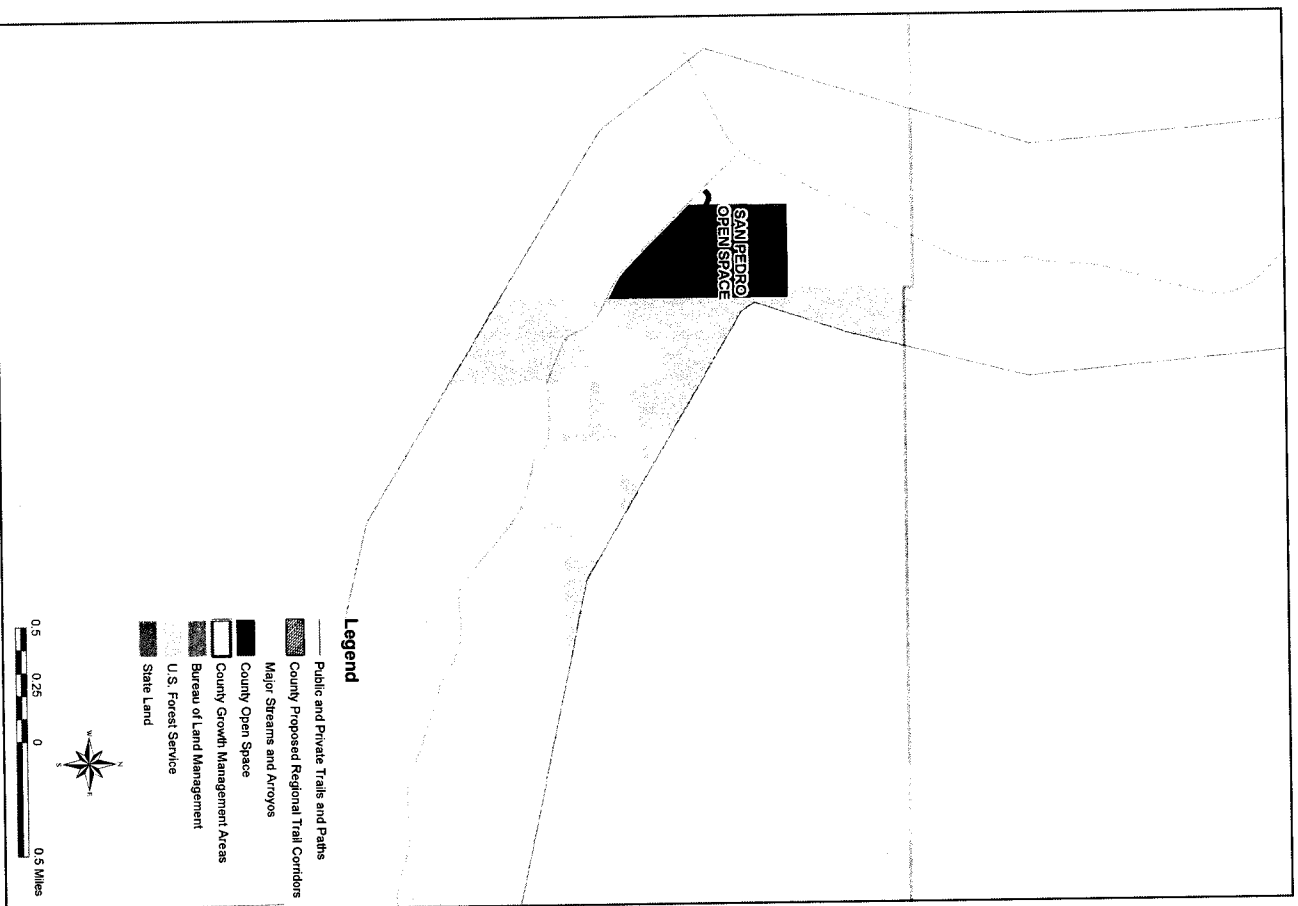
- SFNF
- City of Santa Fe
- Santa Fe Conservation Trust
- The Nature Conservancy

Management Objective:

The Foothills Trails area provides connections to Santa Fe National Forest. Projects should be coordinated with SFNF and neighboring communities in order to effectively provide connections as well as manage user conflicts and traffic impacts in the area. While it is not feasible to connect trail systems at Arroyo Hondo to the other foothills trails, the piñon-juniper hills at Arroyo Hondo contain many of the same species of conservation concern as piñon-juniper habitats in the other foothills properties, including Pinyon Jay, a wide-ranging, nomadic species.

This landscape management unit will be managed especially for wildlife, as well as for recreation opportunities. Collaboration with neighboring property owners for important projects, such as the creation of wildlife corridors, could create even more important benefits for wildlife.





San Pedro

County-owned properties:

- San Pedro Open Space

Future projects

- Connection to BLM
- Regional Trail Planning

Other Landowners/ Partners

- BLM
- City of Albuquerque
- Bernalillo County Open Space
- Sandoval County
- Town of Edgewood
- East Mountains Regional Trails Council (EMRTC)

Management Objective:

San Pedro Open Space was purchased with the intent of becoming a regional trail hub in the southern part of Santa Fe County. This property is adjacent to BLM property where a trail network may be developed. Additional trail systems in the area are managed by City of Albuquerque, Sandoval and Bernalillo Counties and the Town of Edgewood. The East Mountains Regional Trails Council is a community group that coordinates with all the local agencies on open space and trail matters. Trail connections should be explored to connect all the networks in the region.

Landscape-scale wildlife habitat management could be accomplished through collaboration with the BLM, as well as other neighboring property owners.

- Los Potreros**
- County-owned properties:
- Los Potreros Open Space
 - Chimayo Community Center Park
 - Bennie J. Chavez Community Center Park

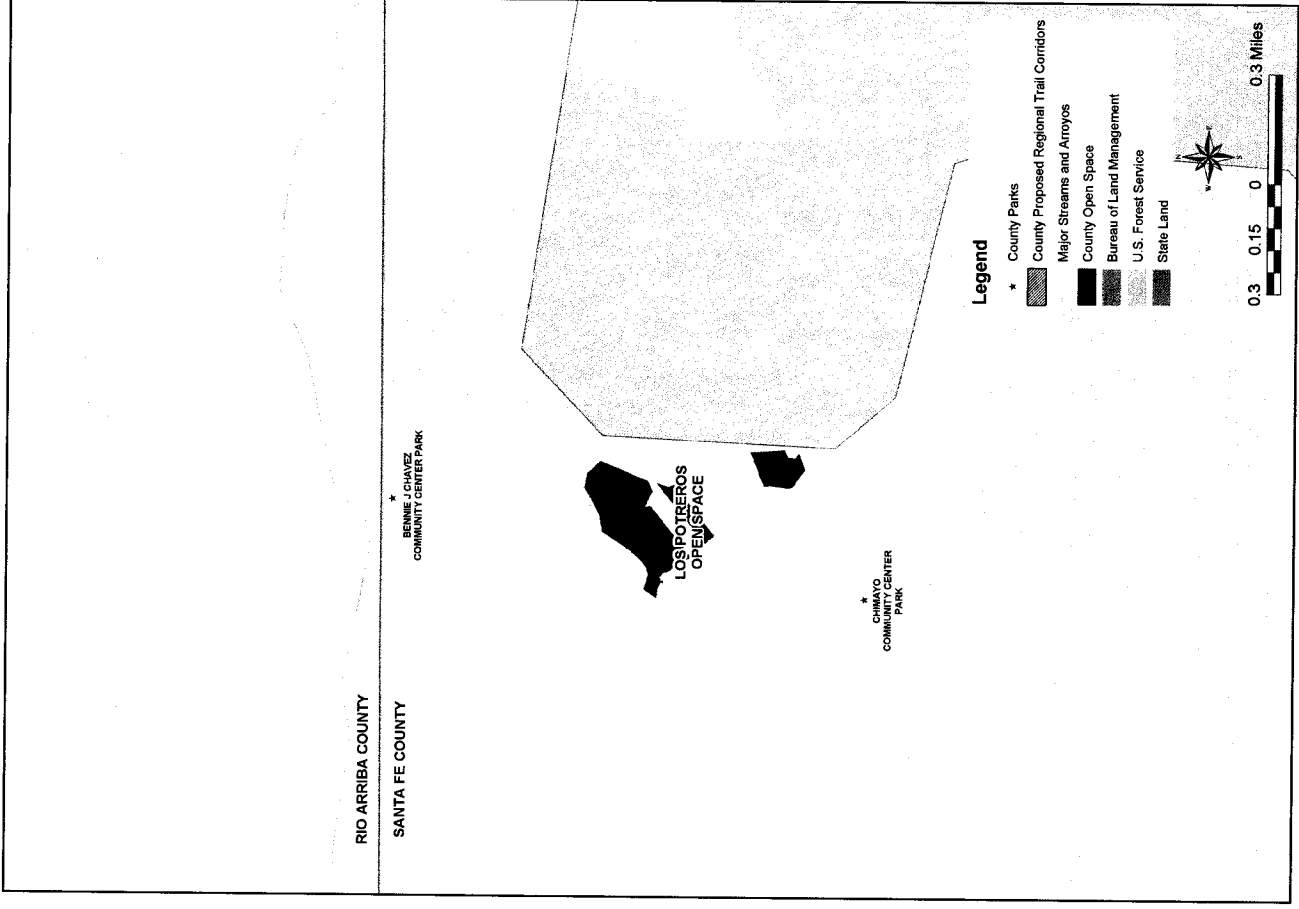
- Future projects
- Connection to BLM

- Other Landowners/ Partners
- BLM

Management Objective:

Los Potreros Open Space is an agricultural property that preserves the rich agricultural heritage of Northern New Mexico and the Chimayo area. Preserving the scenic backdrop to El Santuario de Chimayo in a way that highlights the agricultural heritage of Chimayo is a community priority. Landscape management of El Potrero, 'the pasture,' includes preservation of the grasslands and the associated acequia infrastructure. Trail connections to the adjacent BLM property from both park locations should be considered in the future.

Los Potreros contains highly unique wildlife habitat (compared to all other open space properties) that requires it be managed as its own unit. Its unique wet meadow habitat contains breeding boreal chorus frogs, a species of high conservation concern. Because of the unique habitat and species at Los Potreros, wildlife management actions will differ from all other open space properties. Management actions will also prioritize agricultural practices and opportunities.



Property Classification

The Property Classification begins to address how properties are developed in order to be consistent with the vision of the property when it was acquired. This classification guides how intensely the property will be developed for recreation, but also guides how the public will visit the property, what types of educational programming will be provided, and what resource management needs may be present.

Land in the County's Open Space, Trails and Parks Program has been categorized for management purposes. By classifying the types of open space, the County can better determine appropriate management practices for an area. Land classifications were developed for the three types of facilities in Santa Fe County Open Space, Trails and Parks.

Open Space

Preserve

- Limited access
- Educational programming focus
- Can include sensitive environment, special habitat, endangered species, archaeology, agriculture

Preserves protect the underlying natural or cultural resources of the land. Preserves are lands where public access is limited to protect the resources of the property. These resources could include sensitive habitats with threatened or endangered species, viewsheds, riparian corridors, grasslands, agricultural lands and/or archaeological sites. They have limited, controlled public access points, with public use restricted to designated trails. Off-trail use is limited to occasions when a need for access is scientifically or educationally-based. The County or partners manage the resources to meet the particular management needs of each preserve.

Conservation Area

- Open access, could have seasonal closure
- Passive recreation, some educational programming

Access to conservation areas is open except as needed for special management issues. Conservation Areas may have natural resource management needs that are seasonally related, such as nesting seasons or migratory periods, agricultural uses, or unique cultural or historical features. Public use may be limited in some cases for the protection of rare plants or wildlife, or cultural sites, and are always limited to passive recreation uses such as equestrian use, bicycling, hiking, photography and bird watching.

Class I:

Class I properties are managed to optimize biodiversity and cultural resource protection in areas closed to the public, and to minimize impacts to biodiversity and cultural resources in areas open to the public. In general, any damage to natural or cultural resources should be equally balanced by the benefits of keeping areas open to the public (e.g. health benefits, connection to nature, etc.). Should this balance be majorly disrupted, temporary closures of areas, or redirection of recreation to more suitable areas, may be necessary.

- Limited, controlled access points
- Access is limited to certain parts of the property
- Limited intensity/ scope of development

Class II:

Class II properties are managed to optimize biodiversity and cultural resource protection, and guided tours are designed to create minimal impact; should guided tours start to create a large impact, property may be closed temporarily to allow areas to recover, or the frequency and location of guided tours may be changed.

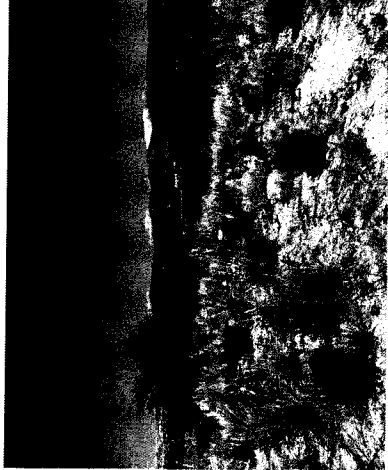
- Closed, except by guided tour
- Limited future infrastructure development
- No current infrastructure that allows access

Class III:

Class III properties are managed to optimize biodiversity and protect cultural resources

- No public access

Some open space properties are unclassified at the time of developing this plan. As plans for each properties are developed, a class will be specified or updated.



El Rancho Open Space, Class I Preserve



Madrid Open Space, Class II Conservation Area



Larry Open Space, Class III Preserve

Preserves have limited access, focus on education, and protect natural or cultural resources of the land.

Conservation areas have open access, recreation opportunities, and educational programming.

Open Space Classification

Property	Facility Type	Land Classification	Class Type	Access/ status
Edgewood Open Space	Open Space	Recreation Facility	I	Open, developed
Lamy Open Space	Open Space	Preserve	III	Limited, undeveloped
Thornton Ranch Open Space	Open Space	Preserve	I	Closed, in development
San Pedro Open Space	Open Space	Preserve	I	Limited, undeveloped
El Peñasco Blanco Open Space	Open Space	Preserve	II	Limited, undeveloped
Los Poteros Open Space	Open Space	Preserve	II	Limited, developed
Ortiz Mountains Open Space	Open Space	Preserve	II	Limited, in development
Santa Fe River Preserve	Open Space	Preserve	II	Limited, undeveloped
El Rancho Open Space	Open Space	Preserve	III	Closed
Arroyo de la Piedra Open Space	Open Space	Conservation Area	I	Open, developed
Arroyo Hondo Open Space	Open Space	Conservation Area	I	Open, developed
Cerrillos Hills State Park	Open Space	Conservation Area	I	Open, developed
Little Tesuque Creek Open Space	Open Space	Conservation Area	I	Open, developed
Rio en Medio Open Space	Open Space	Conservation Area	I	Open, developed
Talaya Hill Open Space	Open Space	Conservation Area	I	Open, developed
Los Caminitos Wilderness	Open Space	Conservation Area	II	Limited, undeveloped
Madrid Open Space	Open Space	Conservation Area	II	Open, undeveloped
South Meadows Open Space	Open Space	Conservation Area	II	Limited, undeveloped
La Cienegulla Open Space	Open Space	Conservation Area	II	Limited, undeveloped
Old Pecos Trail Open Space	Open Space	Conservation Area	-----	Limited
Paseo Primero Open Space	Open Space	Conservation Area	-----	Limited



The Ortiz Mountains, classified as Class II Preserve



Cerrillos Hills State Park, classified as a Class I Conservation Area

Trails

Trails will be designed and constructed in accordance with the following trail types. Where this classification does not provide enough guidance, the Forest Service Trails Management Handbook will be used for rural trails, and AASHTO Guide for the Development of Bicycle Facilities will be used. In urban to rural transitions, special exceptions to the guidelines may be considered. Current ADA Accessibility Guidelines will also be used for appropriate accessible trail designs. When appropriate, trail development may be phased from less intense construction in the short-term with the intention of long-range development to comply with the standards below. Trails may be reclassified as surrounding land uses change, and as demand requires.

Regional Trail

Trails in this category are designated due to their regional scope. These trails are usually wide with both a transportation and recreation function. These major trails are for non-motorized users, including pedestrians, equestrians and bicyclists.

Community Trail

Community trails connect regional trails to local trails.

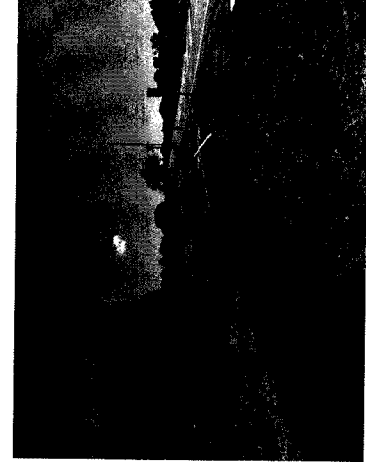
Local Trail

Trails within open space properties are considered local trails. These trails are narrow, natural-surface facilities. Any use restrictions are designated per individual open space property as terrain and environmental conditions dictate.

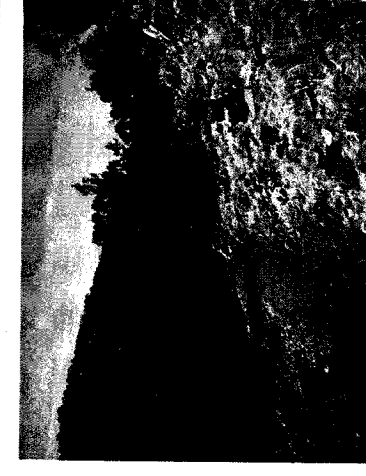
Trail type	Experience	Use	Width	Surface	Setting
Regional Trail	Rural	Transportation and recreation	2' - 4' (6' maximum in special cases)	Natural surface, crusher fines	Natural look
	Urban	Transportation and recreation	10' - 14' (8' minimum in special cases)	Paved, firm and stable	Natural look
Community Trail	Rural	Transportation and recreation	18" - 30"	Natural	Natural look
	Urban	Transportation and recreation	8' - 10'	Firm and stable	Natural look
Local Trail	Rural	Recreation	12" - 18"	Natural, single track	Natural look
	Urban	Recreation	5' - 8'	Firm and stable	Natural look



Santa Fe Rail Trail, a regional trail



A community trail connector to the Santa Fe Rail Trail



Local trail at Arroyo Hondo Open Space

Parks

The parks classification is used as a guideline for amenity development. Parks are currently classified using a regional standard that uses size of the facility as the mechanism for categorization. Given the rural nature of Santa Fe County, service radius and function of the park is a better method for classification of OSTP Park facilities. As additional analysis of the OSTP parks is conducted, park classifications will be refined and properties will be reclassified to include service radius and function of the park.

Regional Park

Regional parks are well developed facilities with active recreational uses such as equestrian activities or programmed sports. These facilities require high levels of amenity development and significant management oversight.

Community Park

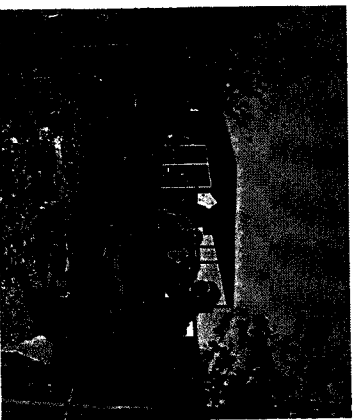
Community parks are larger facilities, usually 20-50 acres. These facilities serve a ½ - 3 mi area and can include facilities such as playground equipment, ball fields and grass areas, organized play areas, gathering and picnic areas and other amenities.

Neighborhood Park

Neighborhood parks are small parks up to 10 acres. They serve a ¼ - ½ mi area, and can include facilities such as playground equipment, community gardens, and gathering space.

Mini Park

Miniparks are services provided in conjunction with county facilities. This type of facility is very small, usually playground equipment or a ball court.



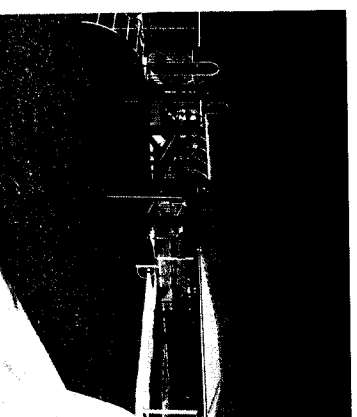
Romero Park, a regional park



Lamy Park, a community park



Burro Lane Park, a neighborhood park



Nambe Community Center Park, a mini park

PARKS AND TRAILS CLASSIFICATION TABLES

Park Type	Size (acres)	Location	Recreation Type Uses	Amenity Types
Regional Park	80-150 acres	Accessible from major roads	Active and passive	Recreation facilities such as ball fields, lighting, lawns, picnic areas, trails and connections, playgrounds
Community Park	20-50 acres	1/2 mile - 3 miles	Active and passive	Ballfields, courts, trails, picnic areas, playgrounds
Neighborhood Park	7-10 acres	1/4 mile- 1/2 mile	Active	Picnic areas, playgrounds
Mini Park	less than 1 acre	1/4 mile- 1/2 mile	Active	Playgrounds

Property	Facility Type	Classification	Total Acres	Park Status	Access Status
Romero Park (Agua Fria Park)	Park	Regional Park	30.00	LWCF, R& PP	Open, under construction
Bennie J. Chavez Community Center Park	Park	Mini Park	0.50	LWCF	Open, under construction
Pojoaque Valley Recreation Complex	Park	Regional Park	11	LWCF	Open, under construction
Stanley Community Park	Park	Mini Park	0.50	LWCF	Open
Larry Park	Park	Community Park	50.00		Open
Chimayo Community Center Park	Park	Neighborhood Park	0.20	LWCF, R& PP	Open
Pojoaque Tennis Court	Park	Neighborhood Park	0.20	LWCF	Open
Galisteo Community Park (Phillip C Watts II Memorial Park)	Park	Mini Park	0.25	LWCF	Open
Burro Lane Park	Park	Neighborhood Park	3.33	R& PP	Open
Leo Gurule Park	Park	Neighborhood Park	4.00	LWCF	Open
La Puebla Park	Park	Neighborhood Park	5.02	R& PP	Open
El Rancho Community Center Park	Park	Neighborhood Park	0.05	LWCF	Open
Rio en Medio Community Center Park	Park	Mini Park	0.25	LWCF	Open
Nambe Community Center Park	Park	Mini Park	1.00		Open
Cerrillos Fire Station Park	Park	Mini Park	0.05		Open
Cundiyo Community Center Park	Park	Mini Park	.02	LWCF	Open
La Cienega Community Center Park	Park	Mini Park	.05		Open

Trail	Classification	Experience	Total Miles	Trail Status	Access Status
Arroyo Hondo Trail	Regional Trail	Urban	3	conceptual, priority for construction	Phase IV under construction, 1.2 miles
Canada Ancha Trail	Community Trail	Rural		conceptual, undeveloped	Open, under construction
Santa Fe Rail Trail	Regional Trail	Urban - rural	12	8 Miles open, 4 miles concept; in development	Segment 5 under construction, 1.2 miles
Santa Fe River Trail	Regional Trail	Urban	9	2 miles open, 12 miles concept; in development	Open, under construction
Spur Trail	Community Trail	Urban	3	constructed, to be included in Arroyo Hondo Regional Trail	Open
El Camino Real	Regional Trail	Rural	15	constructed	Open

* LWCF - Land Water Conservation Fund

** R&PP - Recreation and Public Purposes Act permit

History

Program Structure

The Open Space program is an interdepartmental program with staff and resources in the Growth Management, Public Works and Community Services Departments. The numbers of open space staff have grown since 2000. Currently, the open space program has 12 positions directly dedicated to OSTP activities and 4 staff positions partially dedicated to OSTP in the Growth Management, Public Works and Community Services departments. For planning purposes, this document uses the four OSTP sections to organize objectives, priorities, and work plan projects. The OSTP sections are generally consistent with the four divisions within the County structure. All actions are coordinated within the four OSTP sections.

Resource Management

Public Works- Facilities maintenance:

- Foreman
- 8 maintenance technicians
- Facilities Operations Manager

Educational Programming and Stewardship

Community Services:

- Volunteer Coordinator

Project Development and Implementation

Public Works- Projects:

- Project Manager
- Santa Fe River Trail Project Manager

Planning and Program Development

Growth Management- Planning:

- Senior Planner, Open Space and Trails
- Resource Management Specialist
- Planning Projects Manager



County Staff and non-profit partners at a Civilian Conservation Corps era dam, La Piedra Open Space



Volunteers at Cerrillos Hills State Park

The staff coordination diagram on the next page shows how communications flow between the different sections of the Open Space program. The sections of OSTP include planning, project development, resource management, and stewardship. Communications have to be streamlined in order to effectively implement projects for resource protection and restoration, public access, and daily operations.

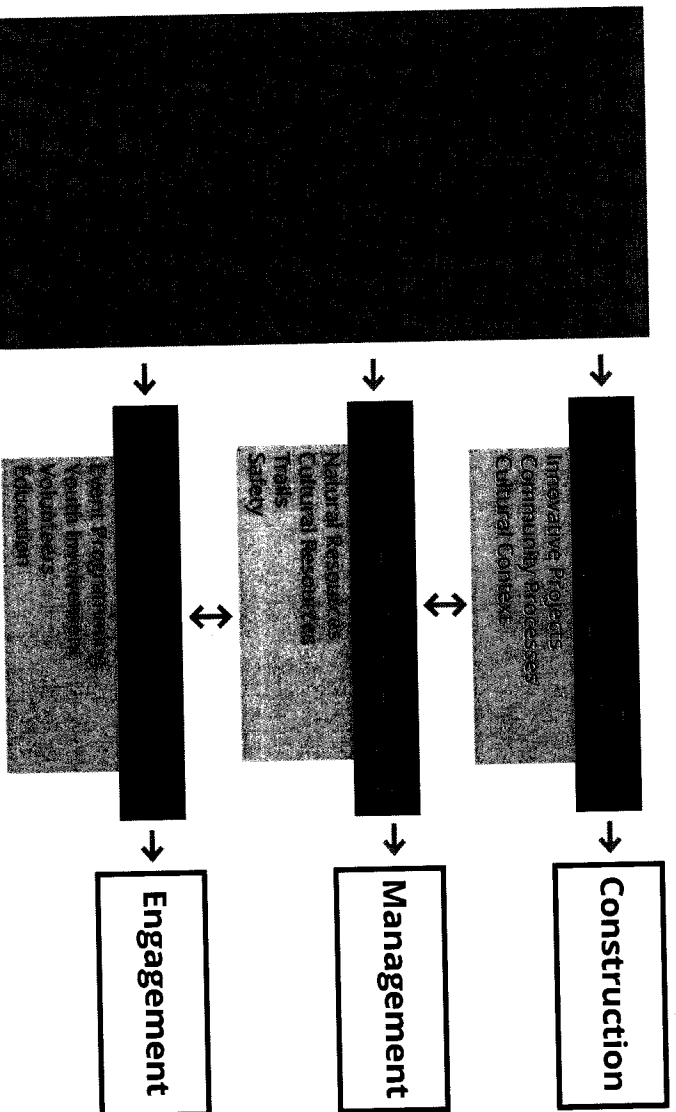
Open Space staff in the planning division coordinate communications with internal staff, outside agencies, and community stakeholder groups. Planning staff use technical analysis; community input and user needs; property vision; and the county policy framework to make decisions relating to new projects and user requests. Open Space planning staff navigate public requests by facilitating and attending collaborative partner and stakeholder meetings. This collaborative planning facilitates the decision making process with internal staff, other agencies and the public, and helps identify community interests and user needs. Staff in the planning division also coordinate program development for the overall program and coordinate with partners on larger, regional aspects of OSTP.



Cactus hike at Arroyo Hondo Open Space



Hike to Placer Peak, Ortiz Mountains Open Space



Staff coordination diagram

Planning staff guides open space staff in project development, resource management and stewardship activities for consistency with the open space plan and community stakeholder input, as well as consistency with best management practices and environmental stewardship.

Project development uses input from planning and the community to expand ideas for projects to take them to an implementable stage. The focus of project development is to create innovative projects to provide access and contextually appropriate solutions to open space needs.

Resource management conserves natural and cultural resources and develops restorative ecological projects for open space properties as needed. Resource management works with planning and project development to develop sustainable trail construction and maintenance projects.

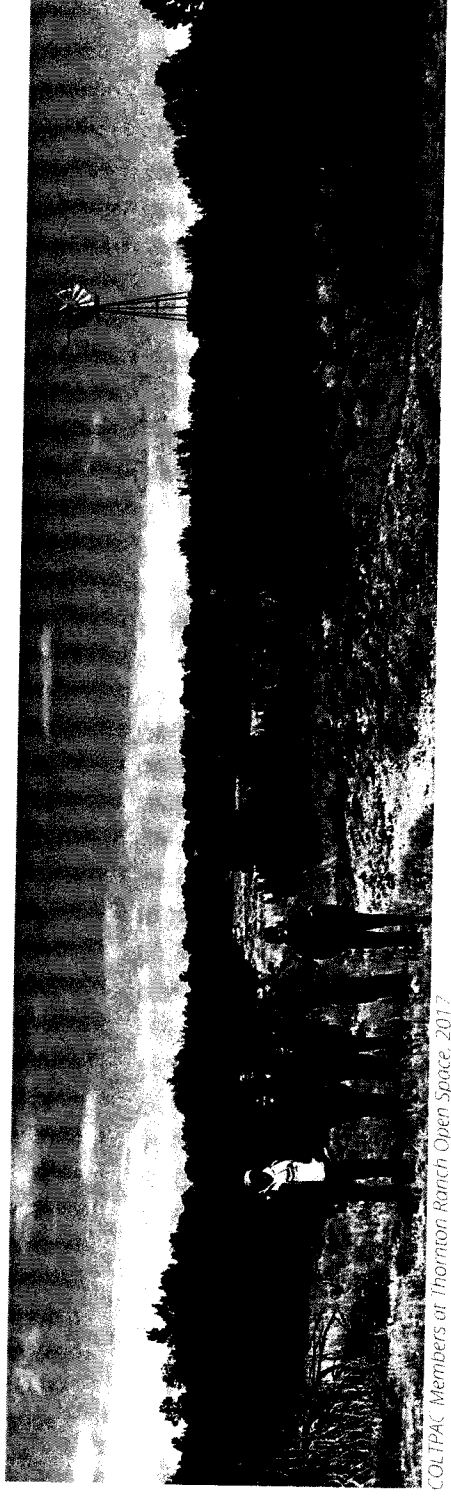
Educational programming and stewardship events are coordinated with planning and resource management to implement appropriate projects with partners, volunteers and other land management agencies. This could include developing and providing educational event programming and working to enhance youth involvement, as well as coordinating volunteers to work with maintenance and resource management staff.

COLTPAC Role

Following the adoption of the 2015 SGMP and the implementation of this Strategic Plan, staff and COLTPAC are recommending a refinement of the role of COLTPAC to better serve the Open Space and Trails Program as it evolves in addressing resource management, property maintenance, and public access. COLTPAC will best serve the County by coordinating with staff to focus on the following roles related to open space, trails, and parks:

- Evaluation and recommendations for county-wide and site-specific planning management of open space, trails and parks;
- Specialized review and study of specific issues relating to open space and trail projects;
- Review and advise on annual work plan;
- Review proposals and recommendations for property acquisition for open space, trails, and parks;
- Assist County staff with developing public outreach, stewardship development and partnering with other organizations and entities to advance Open Space program initiatives.

The BCC determines OSTP policies and goals and directs staff to implement these decisions. The Board appoints COLTPAC to function as an advisory committee on matters related to OSTP. Staff coordinates with COLTPAC to provide input on OSTP. Specialized expertise that will benefit OSTP projects should be considered when appointing COLTPAC members. The focus of the committee should be to advise staff and the Board on planning and development of the OSTP program, and not regarding operations. COLTPAC was not established by the Board as an advocacy committee.



COLTPAC Members at Thornton Ranch Open Space, 2017

Planning History Framework

Many past planning efforts have informed the development of this Strategic Plan. Other agencies and departments have completed plans that are interrelated and consistent with the goals of the Santa Fe County Open Space program. These plans don't need to be reproduced, but include important aspects that should be highlighted in order for effective coordination. The plans and important collaborative items are outlined in this section.

Sustainable Growth Management Plan (SGMP)

The 2015 Santa Fe County Sustainable Growth Management Plan (SGMP) is the comprehensive plan for the unincorporated portion of the County that comprises the future direction over planning, environmental protection, public facilities and services, fiscal planning, land use, housing, resource conservation, renewable energy and green development policies, administrative regulation and development application processes. This plan outlines the strategy that directs the relationship between Santa Fe County, its residents and the environment regarding the SGMP elements.

The SGMP outlines principles which are core concepts for county-wide sustainability. These principles are interrelated: Environmental Responsibility; Economic Strength and Diversity; and Community Livability and Quality of Life. Numerous strategies and goals outlined in the SGMP relate to OSTP including: permanent protection and restoration of open space, creation of an interconnected trail system, development of a community-based stewardship and management program for open space lands, promotion of education and outreach regarding natural and cultural resource protection, and development of strong coordination and partnership with other landowners in the county. The SGMP also provides long-term goals for open space protection in Santa Fe County.

The SGMP describes demographic information throughout the county, and among population centers and communities. The plan provides an outline of the different regions and what types of needs and services, including open space, trails and parks, should be provided as the population grows.

Santa Fe County Open Land and Trails Plan 2000

The Santa Fe County Open Land and Trails Plan (OLTTP), developed in 2000, outlined an ambitious plan to protect open space in Santa Fe County. The OLTTP established long-term strategies for open land and trails conservation, and provided guidance for the developing open space program in matters of evaluating, acquiring, and managing parks, open land and trails. This new strategic plan will build upon the goals of the 2000 plan by building and enhancing a countywide network of open land and trails, promoting landscape-scale open space conservation, developing educational programs for the public, and implementing a resource management and monitoring program for the thousands of acres purchased since the writing of the 2000 plan.

Santa Fe County Economic Development Plan

The Santa Fe County Economic Development Plan identifies six economic growth areas, one of which is ecotourism and outdoor recreation. Within this growth area, mountain biking and equestrian trail riding are identified as the outdoor recreation segments with the most growth potential. This plan also recognizes that economic development comes out of enhanced quality of life. This plan is currently being updated; coordination with this update process should be addressed.

Santa Fe County Agriculture and Ranching Implementation Plan

The Santa Fe County Agriculture and Ranching Implementation (ARI) Plan recognizes a multi-faceted, action-oriented approach to conservation of land and agricultural resources. Sustainable food production and conservation of our natural resources, including land and water are two high priority county goals that aren't always mutually exclusive. The ARI Plan identifies opportunities for collaboration with OSTP; open space properties as potential agro-ecological demonstration sites.

Community Plans

Within Santa Fe County numerous community plans have been developed, all of which feature open space access and environmental protection as important aspects for their respective communities. All community plans include a desire to protect open space and develop an interconnected network of community trails that connect to open space properties as well as outline the importance of wildlife and landscape conservation including protecting and conserving water resources and the natural environment, including local wildlife and native plants. The SGMP lists the adopted community plans in its appendix E.

Santa Fe County Open Space Management Plans

Individual management plans exist for several open space properties including Los Potreros, La Cieneguilla, San Pedro, Madrid, Lamy and Thornton Ranch Open Spaces, and are in development for the remainder. These plans help to implement the broad goals of the Sustainable Growth Management Plan by providing detailed objectives for individual properties. Management plan objectives include such items as: trail development, implementing a monitoring program for natural and cultural resources, conducting habitat restoration, installing educational features, and more.

Santa Fe Metropolitan Bicycle Master Plan

The Santa Fe Metropolitan Bicycle Master Plan coordinates transportation planning and other bicycle-related planning within the Metropolitan Planning Organization (MPO) area which includes a central portion of Santa Fe County. The vision of this plan is to provide convenient bicycle and pedestrian access along a comprehensive network of multi-use trails and complete streets, connecting neighborhoods and communities, parks, open space, schools, and commercial centers for residents and visitors. The Bicycle Master Plan outlines priorities for trail development, and safety improvements of existing bicycle infrastructure. Potential collaborative action between these two plans include: improving bicycling infrastructure for safe transportation, promoting Santa Fe County as a prime outdoor recreation destination, and providing education for bicyclists and motorists. This plan is currently being updated; OSTP staff should coordinate through the update process.

Santa Fe National Forest Plan

The Santa Fe National Forest borders several County Open Space Properties. Like the Santa Fe County Sustainable Growth Management Plan, the Santa Fe National Forest Plan places an emphasis on collaboration. The following areas of collaboration with the Santa Fe National Forest are of particular interest: management of shared borders and their habitats, collaboration regarding research and management for at-risk species, collective invasive species management, and shared management of recreational impacts. The Santa Fe National Forest Plan is currently being revised. As this revision is finalized, collaboration of new or altered management areas should be addressed.

BLM Taos Resource Management Plan

Bureau of Land Management (BLM) property borders several Santa Fe County Open Space properties. Like the County, the BLM places an emphasis on landscape-scale management and the protection of at-risk species. The County will collaborate with BLM to manage larger landscapes for recreational access and biodiversity. Additionally, the county will collaboratively manage at-risk species with the BLM. BLM has shifted the emphasis of recreation from an activity-based approach to one that focuses on recreation experiences and benefit. Several areas have been identified by BLM for special management and recreation opportunities and Santa Fe County should coordinate goals for consistent management across the broader landscapes, including:

La Cienega Area of Critical Environmental Concern (ACEC)—contains important cultural, riparian, and scenic values, including wildlife and plant habitat: El Camino Real de Tierra Adentro National Historic Trail is managed within this unit to protect, and interpret the important cultural and scenic values. This area includes the Cieneguilla Special Recreation Management Area (SRMA)

Galisteo Basin ACEC—manages the area encompassed by the Galisteo Basin Archaeological Sites Protection Act which recognizes 24 cultural sites within the Galisteo Basin as having national significance. The area has removed grazing, and allows trail and recreation development. This area includes the Burnt Corn- Cerrillos SRMA which provides opportunities for coordination at multiple OSTP properties including Cerrillos Hills State Park and Thornton Ranch Open Space. This area also includes the San Pedro Mountains SRMA adjacent to San Pedro Open Space.

Santa Fe Ranch ACEC—includes the area around the Diablo Canyon area to protect cultural resources, unique geological features, visual resources, and wildlife habitat. This area includes the Diablo Canyon SRMA. Additional SRMAs including La Puebla and Santa Cruz Lake are in the area; coordination with OSTP properties in the area (including Los Potreros Open Space) should be considered.



Increasingly rare Round-tailed Horned Lizards frequent many OSTP properties including Thornton Ranch Open Space. © 2010 Joshua Emms

The plans below will guide resource management and implementation of best practices for open space management.

New Mexico Rare Plant Conservation Strategy

The 2017 New Mexico Rare Plant Conservation Strategy, produced by the Forestry Division of the New Mexico Energy, Minerals, and Natural Resources Department (EMNRD), identifies much of Santa Fe County as an Important Plant Area. Goals and objectives of the Rare Plant Conservation Strategy include: protection and restoration of rare plant species on county open spaces, and increased education and outreach directed at rare plants.

New Mexico State Wildlife Action Plan

The 2016 State Wildlife Action Plan (SWAP), written by the New Mexico Department of Game and Fish, is an assessment of New Mexico's wildlife and habitats. Santa Fe County contains four of the six ecoregions identified in the plan: Southern Rocky Mountains, Colorado Plateaus, High Plains and Tablelands, and Arizona/New Mexico Mountains. For each ecoregion, the plan identifies Species of Greatest Conservation Need (SGCN), as well as habitat threats. The SWAP will be used by Santa Fe County to account for SGCN habitat needs when managing properties, as well as to address identified habitat threats.

New Mexico Bird Conservation Plan

The New Mexico Bird Conservation Plan was written by the New Mexico Avian Conservation Partners (NMACP), which is the state chapter of Partners in Flight. As part of this plan, an evaluation regarding the vulnerability of all bird species in New Mexico was conducted using a slightly modified Partners in Flight method. Santa Fe County will use this plan to identify bird species of concern on open space properties, and will conduct habitat management and monitoring for high priority species identified in the plan, such as pinyon jay and Grace's Warbler.

Partners in Flight Landbird Conservation Plan

Partners in Flight (PIF) is a collaborative organization with the mission of “keeping common birds common and helping species at risk through voluntary partnerships”. The 2016 revision of the Landbird Conservation Plan identifies a watchlist of bird species of highest conservation concern in the United States and Canada. Watchlist species are identified through a rigorous, peer-reviewed scientific assessment process. Santa Fe County open space properties contain numerous watchlist species, including pinyon jay and gray vireo. This strategic plan will use the PIF Landbird Conservation Plan to identify, manage, and conserve birds of high conservation concern. The county will also use the Landbird Conservation Plan to prioritize monitoring and research efforts on species of highest conservation concern.

North American Monarch Conservation Plan

The monarch butterfly is a species of high conservation need that occurs on numerous open space properties. This plan will guide management for monarch butterflies on OSTP properties.

Conserving Bumblebees: Guidelines for creating and managing Habitat for America’s Declining Pollinators

This plan will guide management for the declining western bumblebee and other bee species on OSTP properties.



Townsend's big-eared bat, a species of conservation concern. J. Scott Allenbach.

HISTORY



Gumbison's prairie dog has declined up to 98% across its range, and is a species of conservation concern. Fish and Wildlife Service.



Pinyon jay, a watchlist species of high conservation concern found on Santa Fe County Open Spaces. Wallace Keck/National Park Service.

Chapter 2: Strategy

This chapter describes the planning framework, OSTP Directives and Core Elements, and outlines key issues, identifies objectives that address the issues and describes the actions to reach the objective.

Planning Framework outlines how this plan coordinates with other planning documents.

OSTP Directives specifically determine and direct all implementation actions of this plan.

OSTP Core Elements are fundamental concepts for implementation of the OSTP directives.

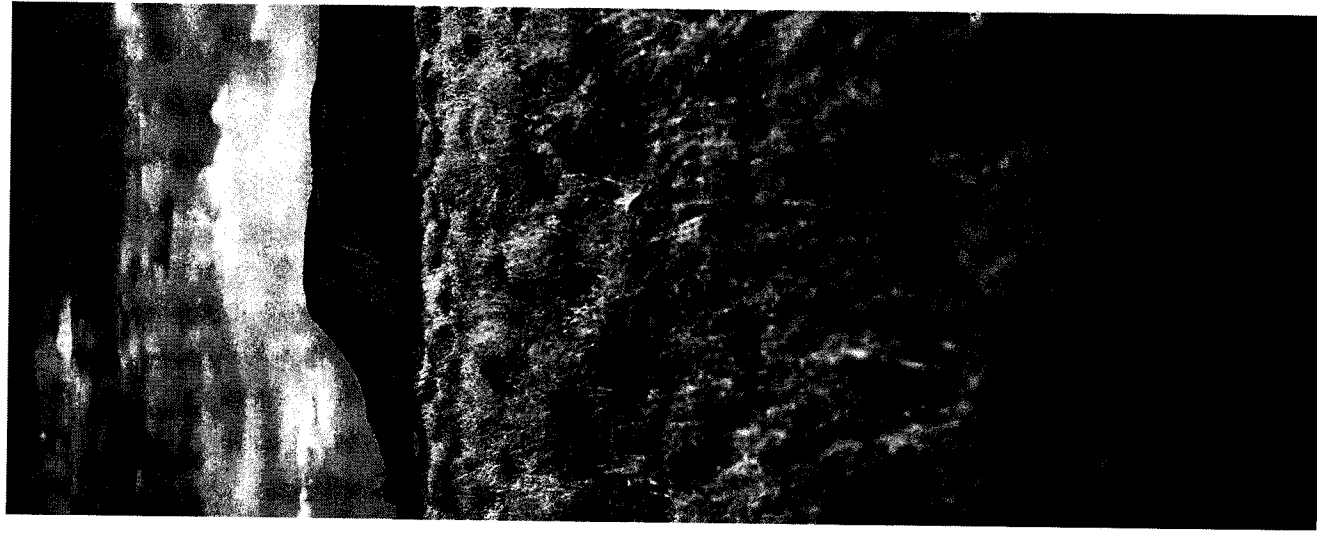
Issues, Objectives and Actions:

Key issues identify needs and challenges that have slowed progress towards accomplishing the vision of the OSTP program.

Objectives identify the approach to address the issue.

Actions are tools used to make progress towards meeting the objective.

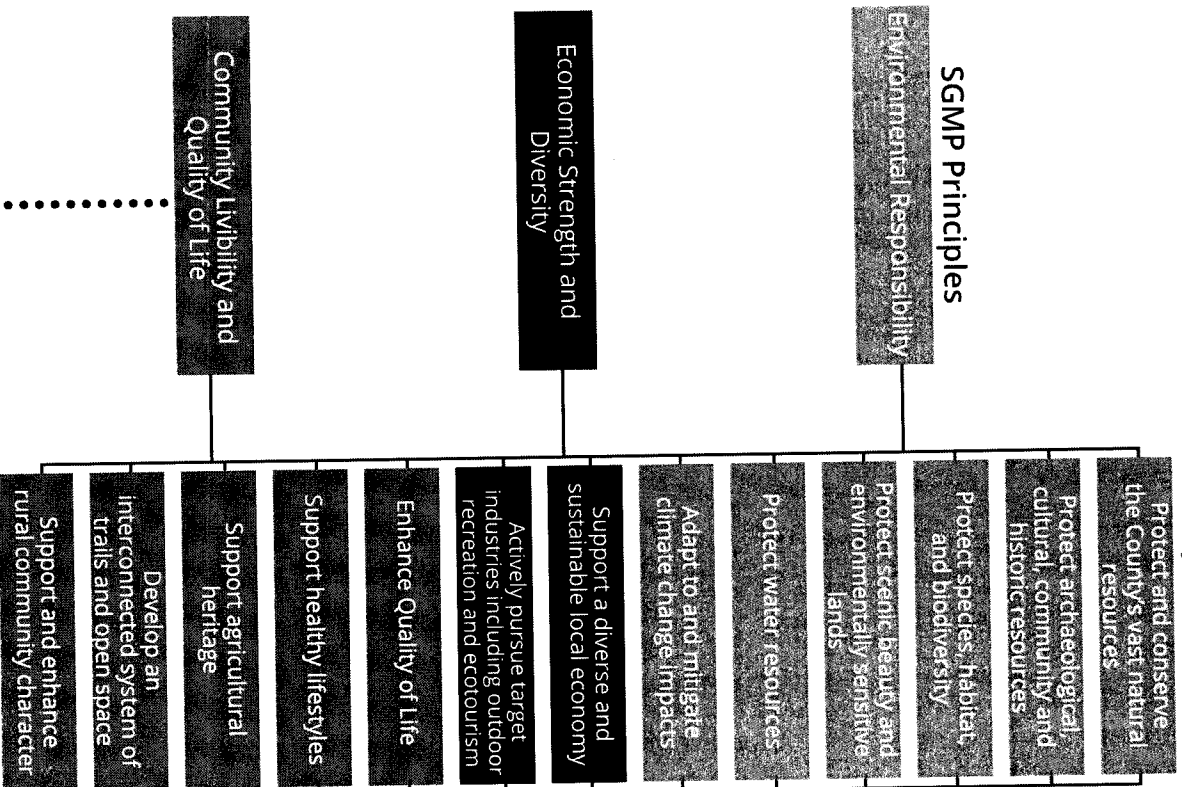
Objectives and actions are organized by OSTP section, Planning and Program Development; Resource Management, Educational Programming and Stewardship; and Project Development and Implementation.



Cerro Pelon in the distance, from Thornton Ranch Open Space

SGMP Framework & OSTP Directives

SGMP Keys to Sustainability

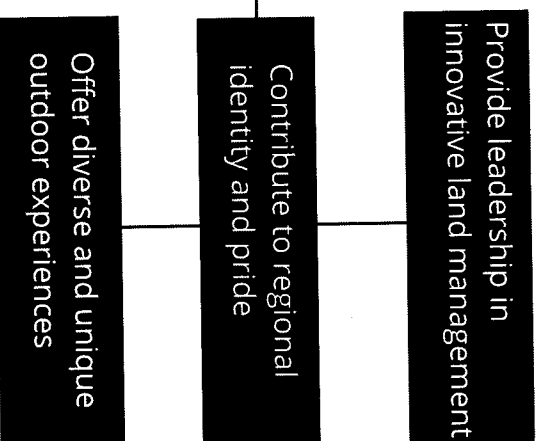


This strategic plan has been developed in alignment with the Sustainable Growth Management Plan (SGMP) framework. The **OSTP Directives** were developed using the **SGMP Principles** and **Keys to Sustainability**, as well as communications with residents, stakeholders, COLTPAC, volunteers, outside agencies and county staff.

This OSTP Strategic Plan uses the **SGMP Principles** and **Keys to Sustainability** as high-level, overarching fundamental principles to implement **SGMP Goal 22** to "Acquire, preserve, and maintain a significant amount of land to support a network of public and private open space, trails and parks through the County."

This SGMP Goal as it relates to OSTP is very broad and has been streamlined and targeted into three distinct **OSTP Directives** which guide the goals for the OSTP program.

OSTP Directives



OSTP Directives specifically determine and direct all implementation actions of this plan.

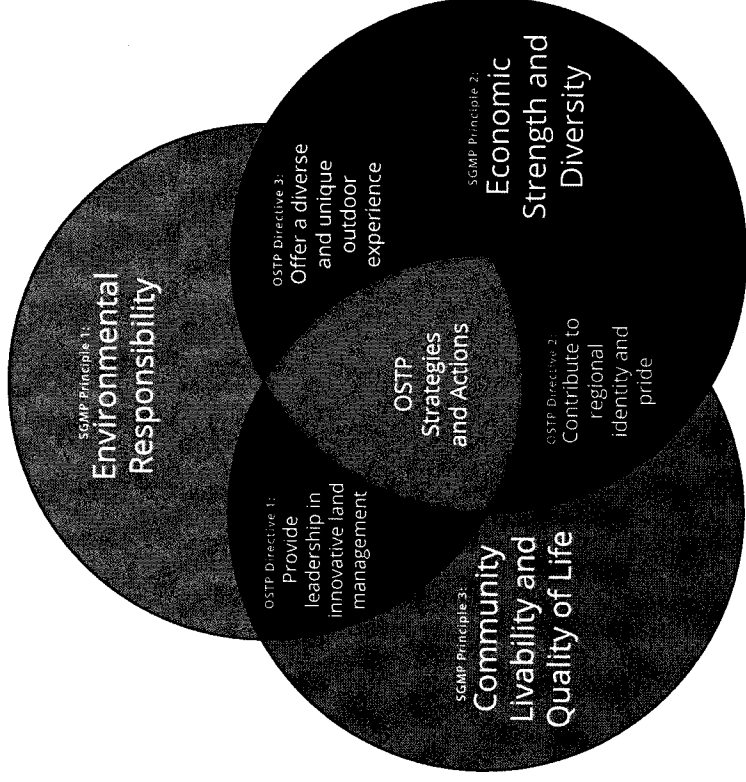
The **OSTP Directives** are unique to Santa Fe County and clearly communicate how the program will lead by example to sustainably manage landscapes, and to provide unique and innovative outdoor experiences that inspire stewardship of open land for current residents, visitors, and future generations. The OSTP directives are interrelated and found throughout this Plan.

OSTP Core Elements are fundamental concepts for implementation of the OSTP directives. Core Elements are detailed on page 51.

The **OSTP Core Elements** were adapted and expanded to reflect Santa Fe County values and needs from the SHIFT (Shaping How We Invest For Tomorrow) Principles adopted by Colorado Parks and Wildlife and outlined by The Center for Jackson Hole.

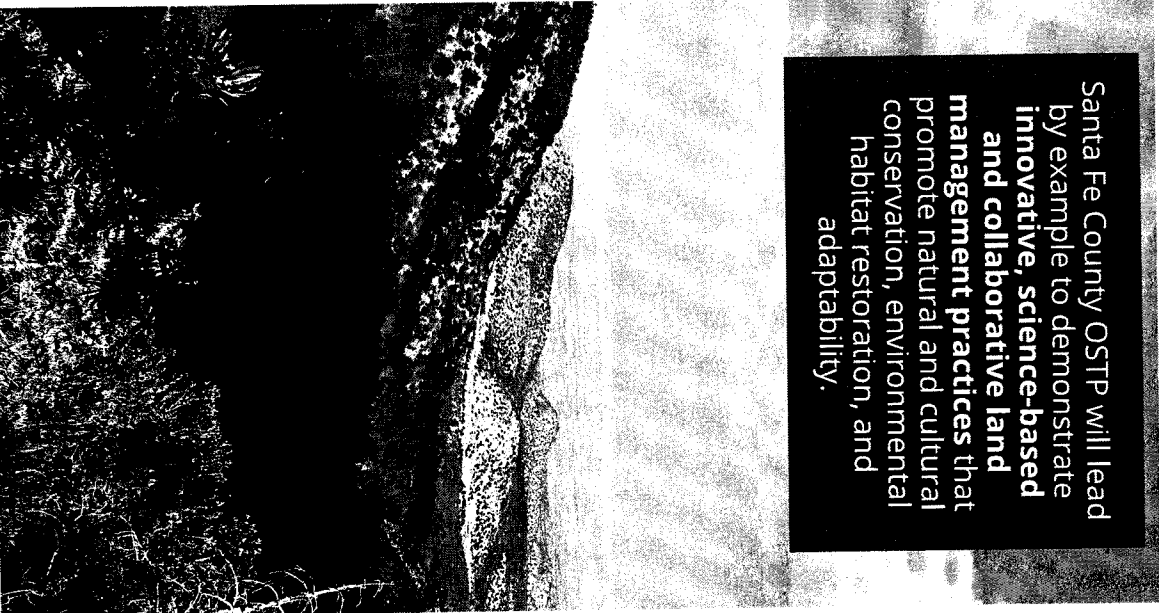
The OSTP Core Elements promote an outdoor ethic in thoughtful conservation and recreational enjoyment of Santa Fe County's unique landscapes. By adopting the SHIFT Principles as the Santa Fe County OSTP Core Elements, OSTP is aligning with leaders in the conservation and outdoor recreation movement to promote conservation stewardship for current and future generations.

The SGMP Principles and the OSTP Directives are interrelated concepts that guide the development and management of projects and properties. The Strategies and Actions outlined later in this plan are a product of the intersection of all the goals as illustrated in the graphic, left.

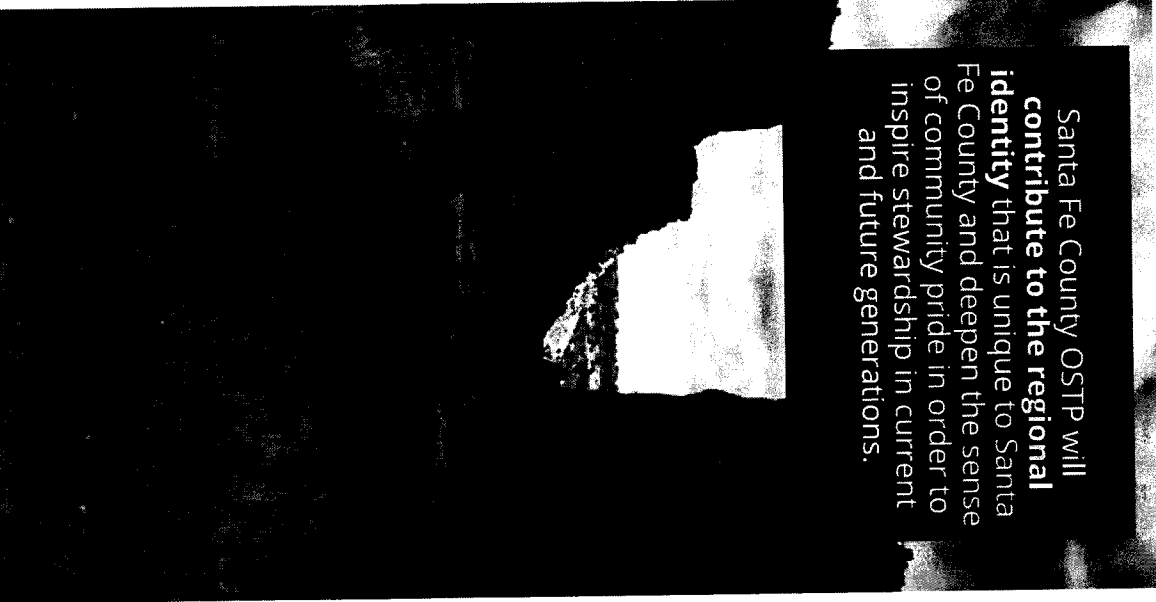


Interrelated roles of SGMP and OSTP

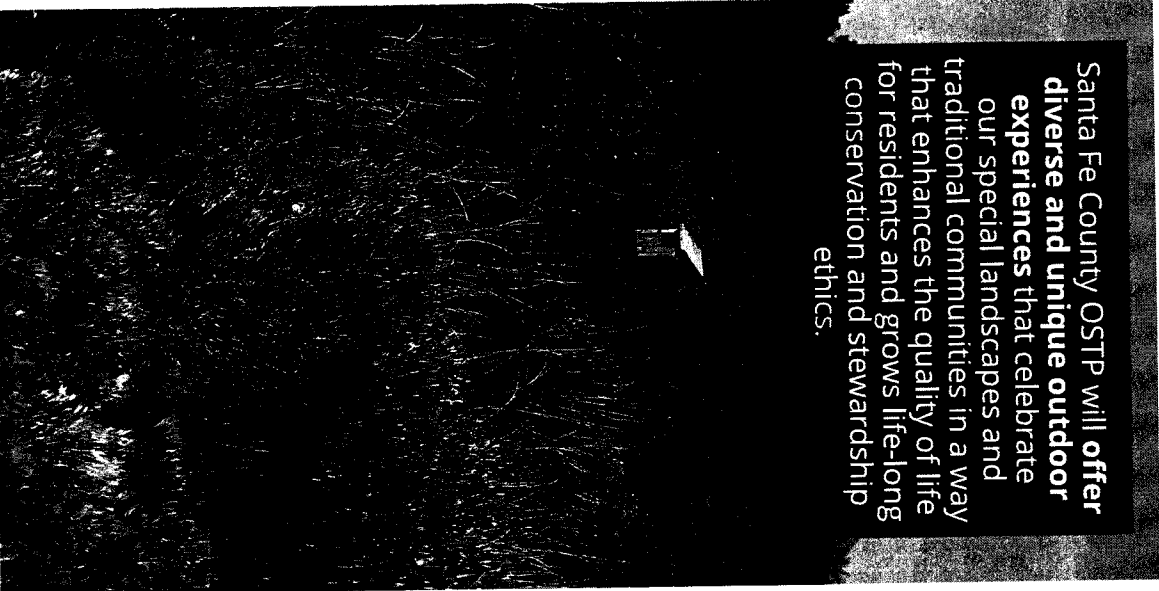
OSTP Directives



Santa Fe County OSTP will lead by example to demonstrate **innovative, science-based and collaborative land management practices** that promote natural and cultural conservation, environmental habitat restoration, and adaptability.



Santa Fe County OSTP will **contribute to the regional identity** that is unique to Santa Fe County and deepen the sense of community pride in order to inspire stewardship in current and future generations.



Santa Fe County OSTP will **offer diverse and unique outdoor experiences** that celebrate our special landscapes and traditional communities in a way that enhances the quality of life for residents and grows life-long conservation and stewardship ethics.

Looking west from the Ortiz Mountains

El Camino Real Trail at Diablo Canyon

Santa Fe Rail Trail

OSTP Core Elements

Chapter 2

- 1. Working Together** - Conservation and outdoor recreation require that a diversity of lands and resources be available for public access, and cared for properly. Public and private groups working together play a critical role in conserving the ecological integrity of a functional landscape that is necessary for robust and meaningful landscape-wide conservation.
- 2. Mutually Beneficial** - Both conservation and recreation are needed to sustain quality of life in Santa Fe County. Both are beneficial to local economic well-being, for personal health, and for sustaining Santa Fe County's natural and cultural resources by building support for protection and stewardship.
- 3. Diverse Support** - Conservation and recreation in Santa Fe County must reflect, respect and value the many demographics and diversity of our communities and be culturally relevant to each of those different groups.
- 4. Minimize Impact** - All recreation has impacts. Santa Fe County residents have an obligation to minimize these impacts across the places they recreate and the larger landscape through responsible and ethical outdoor behavior that respects the value of connecting all people to the outdoors for future generations.
- 5. Stewardship and Education** - Proactive management solutions, combined with active public education are necessary to care for land, wildlife and cultural resources and to provide the protections needed to maintain quality conservation lands.
- 6. Cultural Values** - Creating unique outdoor experiences requires working with communities to develop place-based design that captures cultural relevancy, honoring the identity of each unique region of Santa Fe County and developing connections that honor cultural traditions.
- 7. Science-Based Management**- Management should be grounded in the best available physical, biological and social science. This science must inform the management of OSTP properties to ensure the protection and the sustainability and resiliency of resources while maintaining and enhancing the quality of outdoor experiences.
- 8. Stable Funding** - Stable, long-term, and diverse funding sources are essential to protect the environment and support outdoor recreation.



COLTPAC members visit Thornton Ranch Open Space

Strategy

Issues, Objectives and Actions:

From the Planning Framework and Directives, the following issues, Objectives, and Actions have been identified and organized by OSTP section to guide staff in implementing the tasks.

Planning and Program Development

Issue 1: Internal coordination and communication within Santa Fe County departments is challenging and limits program effectiveness.

Objective 1: Enhance interdepartmental coordination and communication to ensure effective operations through the following actions:

- Action 1.1: Develop a communications protocol
- Action 1.2: Develop and update annually an OSTP work plan
- Action 1.3: Build and maintain an e-file database for each property in a centralized location for access by all OSTP staff
- Action 1.4: Define chain of command and decision making process
- Action 1.5: Refine COLTPAC role
- Action 1.6: Develop a property classification system that identifies resource protection objectives and development limitations
- Action 1.7: Coordinate with other County departments with shared goals, including Community Health, Economic Development and Sustainability.

Issue 2: Need County staffing and expertise regarding natural resource management, trail building, historic and cultural resource management, interpretive and educational programming, as well as grounds and landscape maintenance.

Objective 2: Enhance staff capacity, expertise and capability in order to better protect and manage open space program resources through the following actions:

- Action 2.1: Determine appropriate levels of maintenance for all OSTP properties
- Action 2.2: Determine needed expertise for open space, trail and park/landscape maintenance and identify applicable trainings
- Action 2.3: Build staff capacity and capability in order to focus expertise on natural resources, trail building, historic and cultural resource management, interpretive and educational programming, and stewardship
- Action 2.4: Train staff in safe herbicide application
- Action 2.5: Develop Best Management Practices for OSTP properties

Issue 3: Regular presence by law enforcement and interpretive staff is needed at all properties.

Objective 3: Enhance OSTP presence at properties to proactively address concerns including maintenance, user concerns, enforce laws, and provide education through the following actions:

- Action 3.1: Train staff for interpretive role and provide enforcement capability
- Action 3.2: Develop a volunteer trail patrol program with a protocol for safety and user concerns
- Action 3.3: Explore opportunities for cross-deputization with BLM, tribal, sheriff's posse, Forest Service, etc.
- Action 3.4: Develop dedicated law enforcement ranger with educational/interpretive focus
- Action 3.5: Develop emergency response plan for each property

Issue 4: Conservation and recreation needs are regionally different throughout the County.

Objective 4: Develop a strategic conservation strategy and a facilities analysis that helps guide staff in conservation, recreation, and acquisition planning by completing the following actions:

- Action 4.1: Determine appropriate levels of service to guide where open space, trail, park and recreation facilities are provided in the county according to regional needs
- Action 4.2: Develop a regional trail analysis to identify needed trail connections in the County
- Action 4.3: Develop a park and recreational facility analysis to determine what existing facilities need to be improved
- Action 4.4: Update SLDC Official Map to reflect analysis and new priority trail connections
- Action 4.5: Continue to build trail connections to provide an interconnected network of trails
- Action 4.6: Develop a targeted acquisition strategy focused on connectivity between existing trails and facilities along with long-range conservation goals, and to achieve conservation goals
- Action 4.7: Develop an open space and conservation plan for each of the four County regions (GMAs)

Issue 5: Internal and external communications regarding goals and expectations are inconsistent.

Objective 5: Create a consistent and straight forward approach to communicate goals and expectations for each property, project, and the overall OSTP program by completing the following actions:

- Action 5.1: Update OSTP work plan annually to clearly communicate with the public yearly focus of projects and OSTP activities
- Action 5.2: Align annual budgeting process to implement OSTP work plan
- Action 5.3: Develop useful and realistic metrics to show success of OSTP goals and projects and that aligns the program with other leaders in the nation

Action 5.4: Publish an annual report to clearly articulate successes and complete projects to the public

Resource Management

Issue 6: Shifting climate patterns will have long term effects on managing habitats and ecosystems.

Objective 6: Develop long-range management planning which addresses future impacts of climate change and demonstrates adaptability by completing the following actions:

- Action 6.1: Demonstrate innovative, simple, effective strategies for land management on large and small scales.
- Action 6.2: Research carbon sequestration projects and opportunities for land restoration
- Action 6.3: Conserve and increase diversity of native flora and fauna to help with erosion control
- Action 6.4: Incorporate best management practices of stormwater retention and infiltration of precipitation into open space project planning and implementation.
- Action 6.5: Develop and implement forest prescriptions to improve open space fire resiliency

Issue 7: Natural Resource management is an ongoing activity that requires flexibility and regular continuous monitoring and maintenance.

Objective 7: Develop natural resource management planning which addresses the ongoing needs to achieve desired environmental conditions and demonstrates adaptability by completing the following actions:

- Action 7.1: Develop and implement a regular monitoring protocol
- Action 7.2: Conduct baseline surveys on all OSTP properties
- Action 7.3: Develop an ongoing resource management protocol
- Action 7.4: Develop adaptive management planning
- Action 7.5: Develop and enhance staff capacity for long term adaptive resource management and environmental restoration

Issue 8: Maintaining unique conservation characteristics, cultural resources and habitat diversity on OSTP properties and evaluating appropriate recreation opportunities requires staff time and resources.

Objective 8: Develop appropriate management and access strategies to conserve each property's unique characteristics, cultural resources, and habitat diversity through the following actions:

- Action 8.1: Develop and implement management plans for all OSTP properties that highlights specific resource needs
- Action 8.2: Develop protocols for coordination with Tribal partners
- Action 8.3: Work with internal County groups to adopt and consistently apply OSTP BMPs

Educational Programming and Stewardship

Issue 9: The public is not engaged in stewardship opportunities on OSTP properties.

Objective 9: Enhance stewardship opportunities for the public, including youth programs and existing groups and that build on volunteer opportunities at OSTP properties through the following actions:

- Action 9.1: Actively tailor outreach to diverse groups and demographics within the community
- Action 9.2: Incorporate Master Naturalist Volunteers into stewardship work
- Action 9.3: Develop a Citizen Science Program
- Action 9.4: Develop a volunteer training program
- Action 9.5: Develop a volunteer work plan
- Action 9.6: Work with youth groups as part of stewardship outreach

Issue 10: OSTP program has not been able to adequately provide education and interpretation of important resources within properties

Objective 10: Enhance education and interpretation for the public at OSTP properties through the following actions:

- Action 10.1: Develop education programs and interpretive material that highlight conservation goals for OSTP properties
- Action 10.2: Establish consistent social media presence to highlight property resources and qualities
- Action 10.3: Develop consistent messaging for OSTP program
- Action 10.4: Create interpretive and education plans County-wide, for geographic areas, or for specific properties
- Action 10.5: Work with schools to provide student opportunities

Project Development and Implementation

Issue 11: Coordination between public land management agencies and other conservation organizations in the region is inconsistent and limits integrated project development/ implementation.

Objective 11: Ensure that multi-jurisdictional coordination between land management agencies and other conservation organizations furthers conservation, recreation, access and educational goals through the following actions:

- Action 11.1: Participate in regional conservation and recreation planning initiatives and activities
- Action 11.2: Adopt and implement OSTP BMPs with external partners
- Action 11.3: Engage with existing user groups to increase stewardship opportunities
- Action 11.4: Participate in local and regional initiatives with mutually beneficial goals, including public health and economic development

Issue 12: Once a project need is identified in a plan, there is no established process to evaluate the cost/benefit of the project and to further develop the project concept to define the scope of work and budget for design and construction of the project..

Objective 12: Ensure that a clear process is applied in project development in order to maximize resources and eliminate inefficiencies through the following actions:

- Action 12.1: Formalize the project development process in order to implement projects through a streamlined, consistent and community-based process.

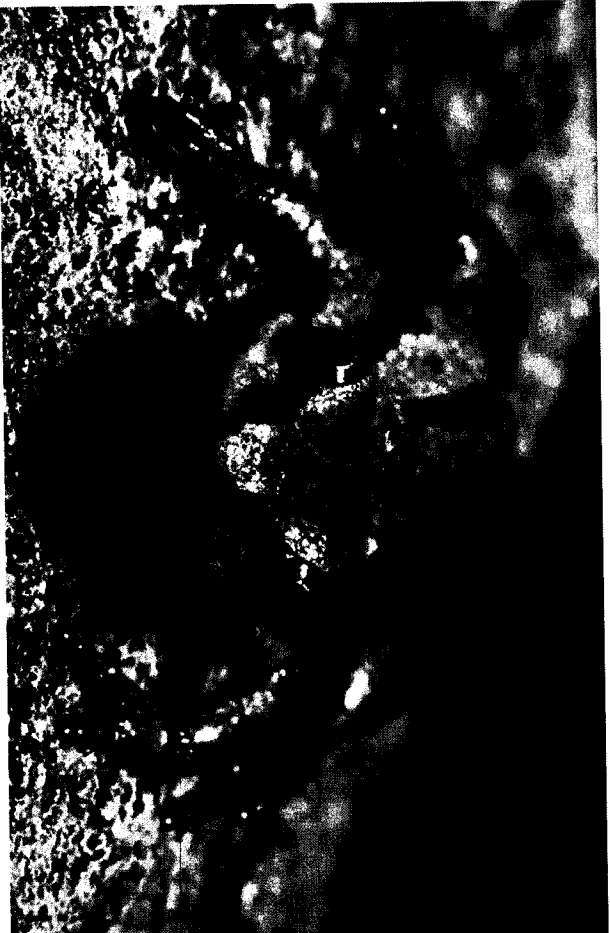
Issue 13: Funding for property and trail maintenance, capital development and operations of the Open Space Program is limited.

Objective 13: Develop alternative funding options to diversify and enhance OSTP programming and project development.

- Action 13.1: Leverage other sources of funding including grants
- Action 13.2: Look into developing a "Friends Group" to assist with fundraising activities
- Action 13.3: Develop a funding strategy for new projects and acquisitions



Strategy



The boreal chorus frog is a species of conservation concern in New Mexico, and has been found at Los Poteros Open Space. Gary Nafis/National Park Service.

Chapter 3: Work Plan

This chapter includes priority actions for years 1-5, as well as program project actions for OSTP for the next 20 years. This section of the Plan is considered a “living document” and will be updated every year in order to clearly outline and communicate OSTP priority projects and focus areas.

The **Short Range Work Plan** outlines planned projects and tasks to be completed in years 1-5. These tasks are specific in year 1 and 2, and broader in years 3-5.

Priorities have been identified in the short range work plan with specific measurable deliverables and timeframes.

The **Long Range Work Plan** is organized by OSTP section and guides staff in planning resource and capacity needs for each fiscal year.

This information is for planning purposes only and does not obligate budget or capital investments in either time or amount.



A County Intern entering GPS data at Talaya Hill Open Space.

Short Range Work Plan and Priorities

In the next five years, the focus of projects will be streamlining operations in order for OSTP to excel in conservation leadership and to provide the best outdoor experiences to Santa Fe County residents. Tasks and projects are organized by OSTP section to streamline completion of tasks. Priority projects for each OSTP section have been highlighted, and associated measurable deliverables and timelines have been listed.

Year 1:

Planning and Program Development

- Priority project goal: Develop policies relating to Tribal communications and concerns including trail development and inadvertent discoveries of sacred items adopted by December 2019
- Priority project goal: Develop an assessment for recreation and park facilities needs in each GMA in the County, and ability to provide related services and infrastructure Assessment completed by December 2019
- Determine chain of command and decision maker for OSTP
- Determine appropriate level of maintenance for OSTP properties and facilities
- Revisit LOS in SLDC
- Develop analysis of long-range regional trail opportunities
- Work with local and regional trail planning collaboratives to prioritize coordinated projects

Resource Management

- Priority project goal: Conduct baseline wildlife surveys on each OSTP property for all properties by October 2019
- Priority project goal: Complete Ortiz Mountains OS Management Plan by July 2019
- Complete Ortiz Mountains OS Management Plan
- Continue to implement existing management plans
- Develop emergency response plan for each property, which could include a volunteer bike patrol for monitoring safety of users and facilities
- Work with internal groups to adopt OSTP BMPs, including Wildland Fire
- Build a database for each property in a centralized location for access by all OSTP staff
- Develop a regular monitoring protocol
- OSTP staff trained in OSTP Best Management Practices
- Determine needed expertise for open space management and grounds keeping, and identify applicable trainings
- Work with Santa Fe County Wildland Program to implement forest thinning on priority properties for ecological and wildlife health
- Work with partners to implement Northern New Mexico Master Naturalist program for volunteer training
- Focus staff expertise on natural resources, trail building, historic and cultural resources, as well as interpretive and educational programming, and stewardship
- Work with partners for avian monitoring and research
- Work with partners for native seed collection and native plant research on OSTP properties
- Work with partners in the Bring Back the Pollinators campaign
- Develop and implement an invasive species management protocol
- Perform erosion control actions

Educational Programming and Stewardship

- Develop branding, messaging and education material relating to OSTP program generally
- Develop volunteer training program
- OSTP 20 year anniversary celebration
- Stewardship events including habitat restoration projects along the SF River
- Streamline communications
- Develop an annual report that clearly communicates accomplishments, yearly focus projects and OSTP work plan

Priority project goal: Develop message material ready for release by Dec 2019

Priority project goal: Develop and use volunteer training program by June 2019

Project Development and Implementation

- SF Rail Trail Segment 5
- Pojoaque Valley Recreation Complex Phase 3
- Arroyo Hondo Segment 4
- Santa Fe River Trail segment 2 design and acquisition
- Romero Park Phase 2
- Bennie J. Chavez Community Center Park

Priority project goal: Construction complete by December 2019

Priority project goal: Construction complete by December 2019



Thornton Ranch Open Space

Year 2:

Priority project goal:
Analysis report and maps
completed by Dec 2020

Planning and Program Development

- Develop a trail analysis specific to trails needs in each GMA region and determine high priority and social trail connections for "low hanging fruit" trail development
- Work with partners to establish OSTP Interpretive Rangers program
- Update SLDC Official Map
- Develop a conservation strategy that specifically guides future acquisitions and areas of conservation need

Resource Management

- Conduct surveys on properties for bats, frogs, nocturnal birds, Bendire's Thrasher, Pinyon Jay nesting colonies, horned lizard, rare plants and additional baseline surveys
- OSTP staff trained in sustainable trail design and construction
- Develop a Citizen Science Program and implement numerous citizen science efforts
- Continue to implement existing management plans
- Implement monitoring and research program
- Install border fencing on OSTP properties as needed

Educational Programming and Stewardship

Priority project goal: Material
developed for up to 3
properties in 2020

Priority project goal: List
of schools interested in
participating in 2020

- Develop branding, messaging and education material relating to specific properties and programs
- Identify schools or teachers to involve in outdoor education programs
- Involving youth by developing school outreach programs
- Develop a social media presence
- Revise annual work plan

Project Development and Implementation

- Thornton Ranch Open Space
- Mt. Chalchihuitl Acquisition and Remediation
- Arroyo Hondo Trail Segment 3

Priority project goal:
Designs complete by
December 2020



Cholla species flower at Old Pecos Trail Open Space



Cigar cup cactus at Arroyo Hondo Open Space



Broadleaf milkweed are essential for monarch butterfly

Years 3-5:

The categories for priorities in years 3-5 are focused broadly on providing educational programming and events on OSTP properties; branding and messaging OSTP initiatives; developing partnerships with local groups; resource management; policy development and analysis for OSTP needs county-wide; and capacity building and expanding skillsets among OSTP staff and volunteers. Some known activities for each category have been identified.

This section of the Plan is considered a “living document” and will be updated every year in order to clearly outline and communicate OSTP goals. Each category will be refined annually as this section is updated.

Planning and Program Development

- Secure access to trails already in use
- Develop interpretive and education plans for each property
- Continue interconnected trail projects
- Develop strategy to continue open space acquisition funding options
- Develop a process for development of new trails and integration of social trails

Resource Management

- Develop management plans for each property

Educational Programming and Stewardship

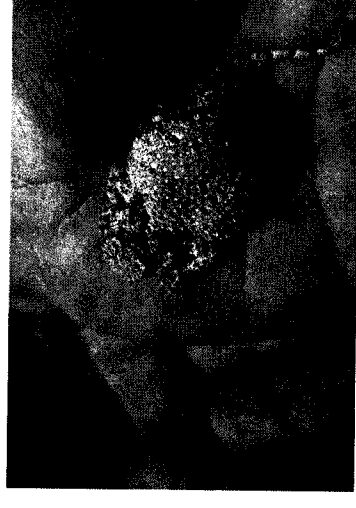
- Explore a “Friends of Open Space” program to assist with fundraising

Project Development and Implementation

- Rail Trail Segment 6 and Segment 7 and 285 Trailhead
- Arroyo Hondo Trail Segments 2, 5 and 1

Pending funding cycles and availability

New projects not included on this list may arise. In order to not limit opportunities, new projects will be evaluated on the capacity of staff and volunteers, alignment with resource management goals, and securing access to existing social trails.



Round-tailed horned lizard, at Thornton Ranch Open Space.

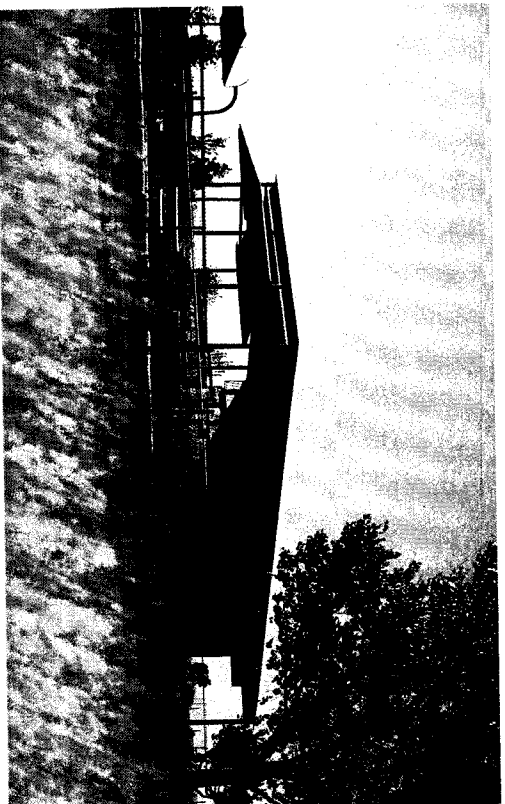
Funding

Capital funding for OSTP is limited and must be considered in balance with multiple needs and priorities throughout the County. This plan aims to identify and leverage alternative funding sources, including grants, to assist the County in completing various OSTP capital improvements. Additionally, staff will work to identify new funding options to augment existing sources in order to complete projects. The table on the following pages identifies potential funding sources and timelines for long-range capital planning. This table is not meant as a budgeting or fund allocation tool, but rather as a planning mechanism.

Along with identifying capital funds, staff will continue to work with local partners to leverage other opportunities, and develop projects that include volunteer participation to accomplish project objectives. Finally, staff has identified the option of creating a non-profit entity which could assist the County with long-term fundraising and stewardship for OSTP.

Funding Cycle

Various funding cycles influence the timelines for implementation of OSTP capital projects. Typically, the County asks voters to approve General Obligation Bond funds on a four year cycle. The County's various Gross Receipt Tax revenues are collected annually and support County-wide capital needs. Grant monies may be available annually or as the funding agencies determine. Taking these timelines into account, the long range work plan and priority project tables on the following pages outline potential options for how projects can be programmed through the next 20 years. The priority projects table (on page 69) identifies potential leveraging opportunities for projects, especially trail construction. It is essential to identify and secure additional non-County funds in order to complete and accelerate capital project completion. By securing non-County funds, the County is able to build upon its investments in OSTP assets while implementing projects in a timely manner.



Romero Park



Historic ruins of Thornton Ranch Open Space

Long Range Work Plan

The following work plan tables (on pages 66, 67, and 68) outline planning and projects needs projected out for 20 years in accordance with budget and other funding cycles. This long range work plan guides OSTP staff in each department in planning resource and capacity needs for each fiscal year. This information is for planning purposes only and does not obligate staff time or operational or capital budget.

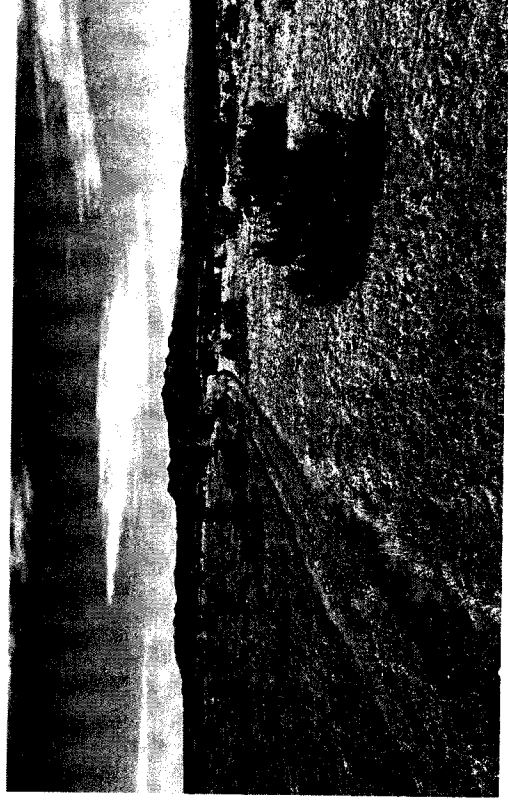
The four categories used to organize the long range work plan correspond to how OSTP is currently organized. Each category represents a section of OSTP and their associated budget category. This table will help organize potential projects along with which OSTP section will implement them, and when they are anticipated to be completed.

Planning and Program Development tasks will be conducted through the Planning Division.

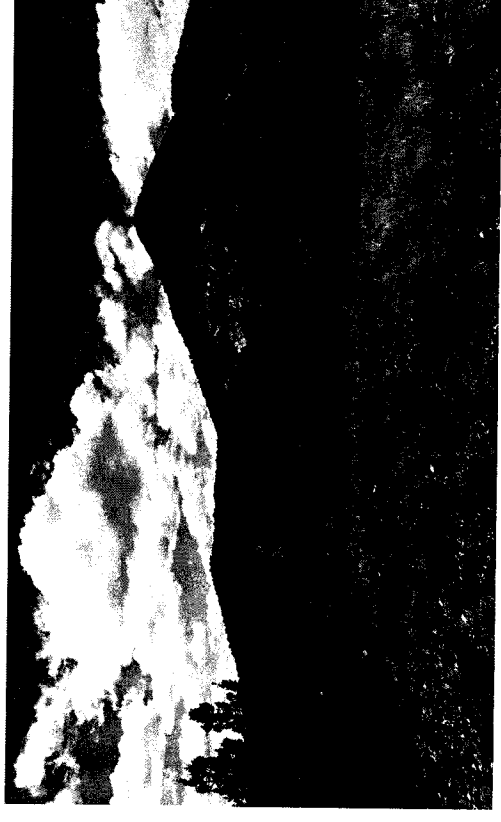
Resource Management is implemented through the maintenance and operations budget in coordination with Planning.

Educational programming, outreach and stewardship projects are facilitated through Community Services and the Volunteer Coordinator in very close coordination with Planning.

Project Development and Implementation tasks are completed through the Projects Division in coordination with Planning.



New Mexico Central Rail alignment, a conceptual regional trail alignment





Mt. Chalchihuitl in the foreground, Grand Central mountain in the background

Work Plan

Long Range Work Plan-Planning and Program Development

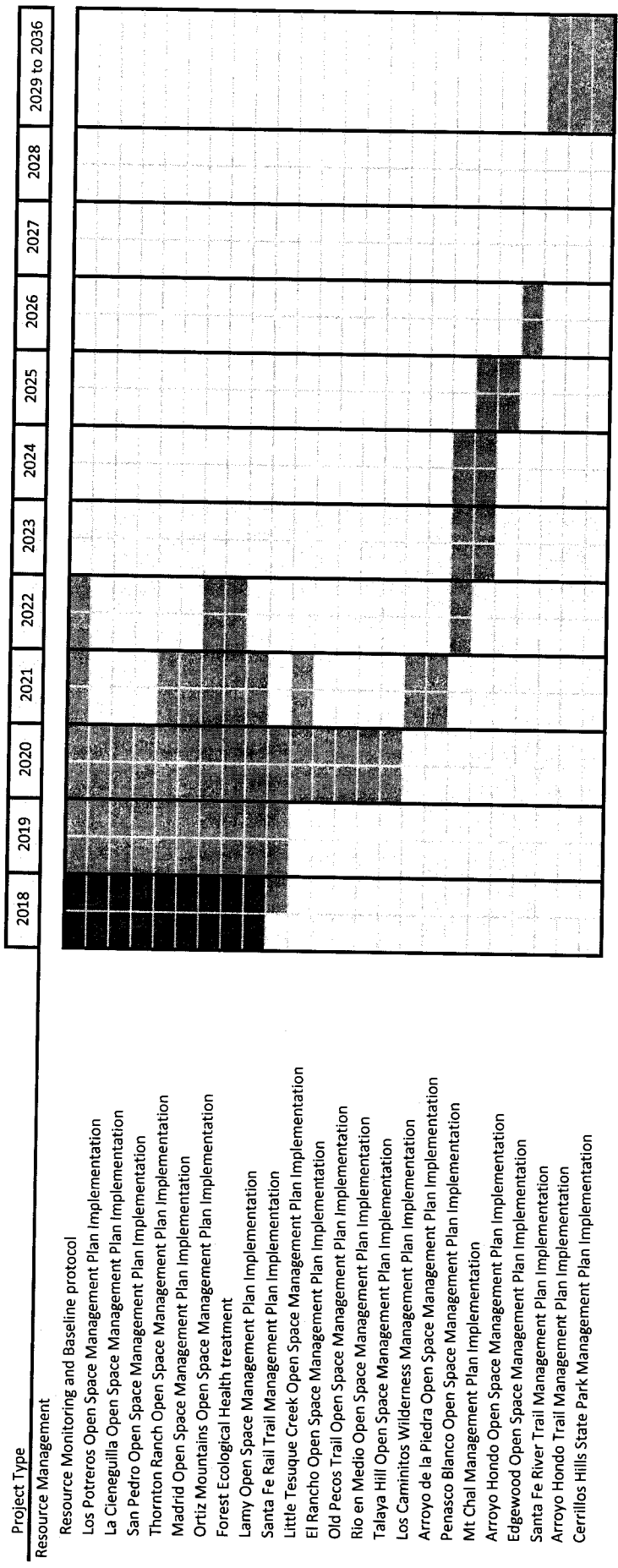
Project Type	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029 to 2036
Planning and Program Development												
Best Management Practices												
Communications (work flow, data and file management etc.)												
LOS for active recreational parks												
Acceptable Level of Maintenance												
Land Access Protocols for Tribal Partners												
Ortiz Mountains Open Space Management Plan												
NM Central Trail Conceptual Design												
Madrid Open Space Preliminary Engineering												
FS Comprehensive Recreation Plan for the Greater Santa Fe Area												
Talaya Hill Open Space Management Plan												
Trail Acceptance Policy												
Emergency Response Protocol												
Estancia Basin/South County Trail Planning												
Filming and Special Use Policy and Protocols												
Stats/Performance Measures												
Mapping of trail easement and open space dedications												
Rabbit Rd. Sidelpath from Richards Ave. to Santa Fe Rail Trail												
El Rancho Open Space Management Plan												
Little Tesuque Creek Open Space Management Plan												
Old Pecos Trail Open Space Management Plan												
Rio en Medio Open Space Management Plan												
Arroyo de la Piedra Open Space Management Plan												
Los Caminitos Wilderness Management Plan												
Law enforcement												
Trail Patrol												
Trail analysis for easement acquisition												
User request protocol and CIP/CIP coordination												
Update SLDC official map												
Integrate Open Space and Trails components of Community Plans												
El Penasco Blanco Open Space Management Plan												
Develop Conservation Strategy												
Mt. Chalhuhuitl Management Plan												
Develop Interpretive Plans												
Rio Grande/Chile Line/Jacona Trail												
Arroyo Hondo Open Space Management Plan update												
Edgewood Open Space Management Plan												
ATSF Trail												
Tres Arroyos del Poniete												
Santa Fe River Trail Connections												
Santa Fe River Segment 7: Paseo Real to La Cienega												
State Trust Lands trade												
Santa Fe River Trail Management Plan												
Arroyo Hondo Trail Management Plan												

 Current project/ funded contract
 Future project

The projects and timelines identified may be subject to change as conditions evolve and opportunities arise

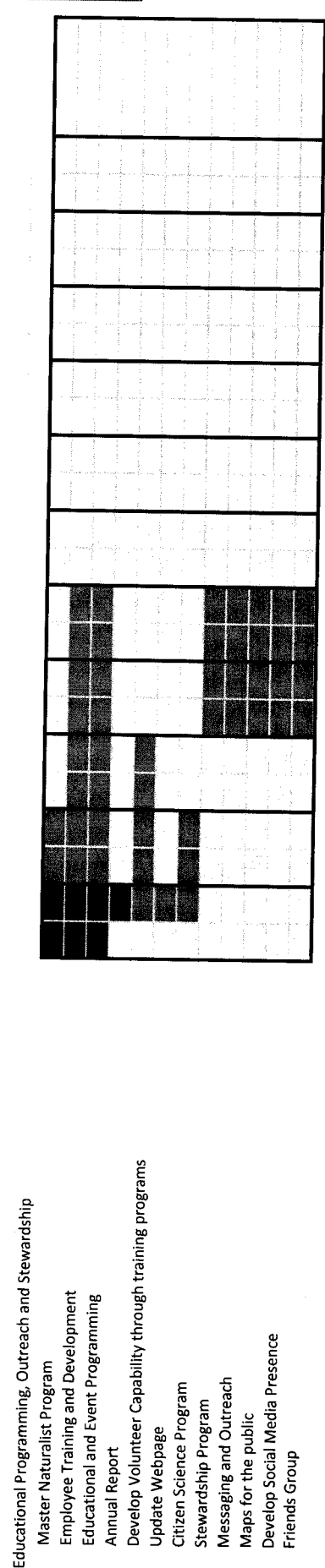
Long Range Work Plan-Resource Management and Educational Programming

Chapter 3



■ Current project/ funded contract
 ■ Future project

Work Plan



■ Current project/ funded contract
 ■ Future project

The projects and timelines identified may be subject to change as conditions evolve and opportunities arise

~~CONFIDENTIAL~~ **CONFIDENTIAL**

Long Range Work Plan-Planning and Program Development

Project Type	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029-2036
Project Development and Implementation												
Santa Fe Rail Trail Segment 5 - Construction	D	\$455,363										
Santa Fe Rail Trail Trailhead Construction	D	\$120,000										
Santa Fe River Segment 1 - Construction	D	\$4,461,900										
Santa Fe River Segment 2 - Design/Acquisition	D	\$7,500,000										
Arroyo Hondo Trail Segment 4 - Construction	D	\$1,450,000										
Romero Park Phase 2 - Design/Construction	D	\$2,600,000										
Pojoaque Valley Recreation Complex Phase 3	D	\$1,200,000										
Mt Chalcihuitl Acquisition/Remediation	D	\$1,044,487										
Bernie J. Chavez Senior Center Park	D	\$259,000										
Thornion Ranch Open Space - Design/Construction	D	\$2,600,000										
Santa Fe Rail Trail Segment 6 - Acquisition	D											
Santa Fe Rail Trail Segment 6/285 Trailhead - Construction	D											
Santa Fe Rail Trail Segment 7 - Design	I											
Santa Fe Rail Trail Segment 7 - Acquisition	I											
Santa Fe River Segment 2 - Construction	C		\$6,563,070									
Santa Fe River Segment 2 - Construction	C											
Santa Fe River Segment 4 - Design/Acquisition	C											
Santa Fe River Segment 4 - Construction	C											
Santa Fe River Segment 6 - Design/Acquisition	C											
Santa Fe River Segment 6 - Construction	C											
Santa Fe River Segment 7 - Design/Acquisition	I											
Santa Fe River Segment 7 - Construction	I											
Arroyo Hondo Trail Segment 3 - Construction	D											
Arroyo Hondo Trail Segment 2 - Construction	D											
Arroyo Hondo Trail Segment 1 - Construction	D											
Arroyo Hondo Trail Segment 5 - Construction	D											
Arroyo Hondo Trail Segment 6 - Construction	D											
Romero Park Phase 3 - Design/Construction	C											
Romero Park Phase 4 - Design/Construction	C											
Romero Park Phase 5 - Design/Construction	C											
Romero Park Tennis Courts - Design/Construction	C											
Romero Park Equestrian Arena - Design/Construction	C											
Mt Chalcihuitl Master Plan	C											
Mt Chalcihuitl Open Space - Design/Construction	P											
Madrid Open Space - Design/Construction	C											
Rabbit Rd Sidepath	I											
NM Central Trail - Acquisition/Design	C											
NM Central Trail - Construction	P											
ATSF Trail - Acquisition/Design	I											
ATSF Trail - Construction	I											
ATSF Trail Lamby Trailhead	I											
Lamby Depot Visitor Center	I											
Chili Line	I											
Chimayo Community Center Park	I											
Leo Gurule Park	I											
Rio en Medio Community Center Park	I											
Santa Fe Rail Trail Arroyo Crossings	I											
South Meadows Open Space	C											
Edgewood Open Space - Arena Cover	C											
Edgewood Open Space - Equestrian Rest Stop	C											
Projects Total												\$2,448,122
Funded Total												\$852,366
												\$1,595,756

Projects Total \$60,941,664
Funded Total \$16,690,750

SANTA FE COUNTY OPEN SPACE, TRAILS AND PARKS STRATEGIC MANAGEMENT PLAN

The projects and timelines identified may be subject to change as conditions evolve and opportunities arise

Priority Projects	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029-2036	Project Total	SFC Investment
Thornton Ranch Open Space		\$2.6 M											\$2,600,000	\$2,600,000
Santa Fe River Trail													\$28,578,401	\$35,540,301
Seg. 1 - Construction	\$4.5 M													\$4,461,900
Seg. 2 - Design/Acquisition	\$2.5 M													\$2,500,000
Seg. 2 - Construction		\$6.6 M												\$6,563,070
Seg. 4 - Design/Acquisition							\$4.2 M							\$4,232,486
Seg. 4 - Construction											\$12 M			\$11,769,032
Seg. 6 - Design/Acquisition/Construction												\$5.5 M		\$5,548,813
Seg. 7 - Design/Acquisition/Construction												\$465 K		\$465,000
Arroyo Hondo Trail													\$6,276,386	\$941,458
Seg. 4 - Construction		\$1.5 M												\$217,500
Seg. 3 - Construction														\$302,134
Seg. 2 - Construction														\$207,048
Seg. 1 - Construction														\$206,971
Seg. 5 - Construction														\$710,000
Seg. 6 - Construction														\$15,305
Rail Trail													\$2,532,108	\$1,069,621
Seg. 5 - Construction	\$455 K													\$68,304
9 Mile Trailhead Construction	\$120 K													\$120,000
Seg. 6 - Acquisition		\$130 K												\$130,000
Seg. 6 - Construction														\$101,729
Seg. 7 - Design/Acquisition							\$460 K							\$460,000
Seg. 7 - Construction														\$189,587
Mt. Chalechihuitl													\$2,462,851	\$2,462,851
Acquisition and Remediation	\$1.0 M													\$1,044,487
Master Plan							\$803 K							\$803,114
Design/Construction														\$615,250
Madrid Open Space													\$60,000	\$60,000
Stormwater Drainage Study	\$60 K													\$60,000
Construction														****
Romero Park													\$4,056,815	\$4,056,815
Phase 2 Design/ Construction	\$1.0 M													\$1,044,487
Phase 3 Design/ Construction							\$3.0 M							\$3,012,328
Pojoaque Valley Recreation Complex													\$1,200,000	\$1,200,000
Phase 3 - Design/Construction	\$1.2 M													\$1,200,000
Bennie J. Chavez Senior Center Park													\$259,000	\$259,000
Design/Construction	\$259 K													\$259,000

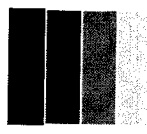
*assume 15% match

*assume 15% match

**State and federal funding may be leveraged to assist with remediation costs; federal funding opportunities exist for trail development

***Construction costs unknown at this time. There are opportunities for funding through partner agencies.

D = Fully Designed/Ready for Construction
 C = Conceptual Plan/Needs Final Design/Engineering
 P = High Level Plan/Needs Preliminary Design to reach Conceptual Plan
 I = Idea Not Yet Planned



 Funded project
 Needed prior to grant
 Project identified for potential grant funding (match amount anticipated 15%)
 Project identified for potential bond funding

The projects and timelines identified may be subject to change as conditions evolve and opportunities arise

6-10-2019 **RECORDED** **11-10-2019** **FILED**



Monarch butterflies can be found on numerous County Open Spaces, including the wetlands at Arroyo Hondo Open Space and along the Santa Fe River at La Cieneguilla Open Space. Jim Hudgins/USFWS

Chapter 4: Plan Elements

The following section outlines actions that address the objectives in the previous section. These items, called plan elements are described in the following pages. Plan Elements are additional guiding documents for OSTP operations. Additional plan elements will amend this plan as they are developed and adopted.

- Best Management Practices
- OSTP Signage Plan
- Open Space Property Management Plans



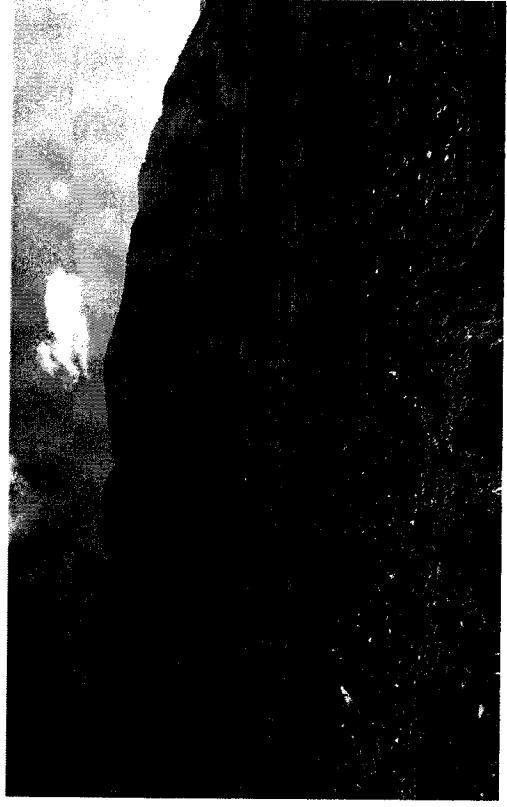
Ortiz Mountains Open Space

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Best Management Practices

Open Space management requires extensive work covering numerous specialties; from habitat management for optimum biodiversity, to correct placement of trails, OSTP staff must work across multiple disciplines to responsibly manage open space landscapes. Because of the broad scope of necessary work, it is essential to have a document covering best practices across all disciplines. The best practices manual provides detailed information on all essential open space activities including monitoring, adaptive management, decision making, wildlife management, habitat management, regulatory requirements, and trail building.

The following document is the Best Practices Manual for Santa Fe County OSTP.



Open Space maintenance crew at Los Potreros Open Space



El Rancho Open Space

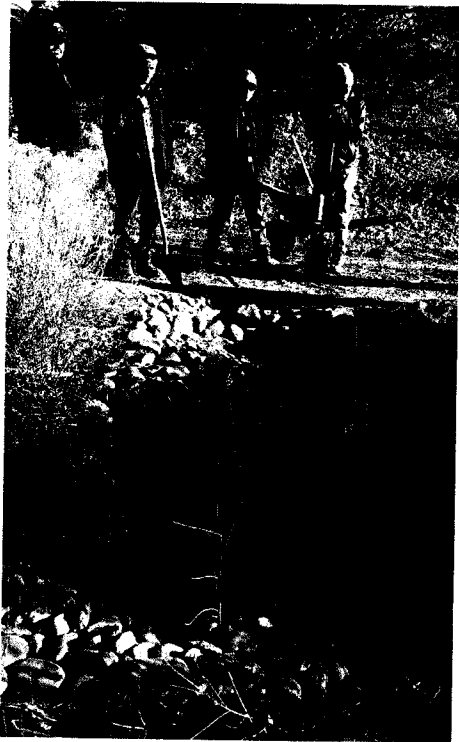
Action

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SANTA FE COUNTY OPEN SPACE BEST PRACTICES MANUAL



ERK



Ecotone
Landscape Planning, LLC

draft version 1 - February 2, 2018
prepared by Ecotone Landscape Planning LLC



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SFC CLERK RECORDED 01/09/2019



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Anna Hansen – District 2
Robert Anaya – District 3
Anna Hamilton – District 4
Ed Moreno – District 5

—and the **County Open Lands, Trails, and Parks Advisory Committee (COLTPAC)**.

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INTRODUCTION

Purpose and Need

This Best Practices (BP) Manual describes a selected series of practices for managing the cultural and ecological landscape of Open Space (OS) properties in Santa Fe County (SFC). The selected practices and their implementation guidelines, procedures, and protocols conform to many common practices in the region and in the western US. Source materials for BPs and additional details on the practices are referenced in appendices.

The purpose of this manual is to provide SFC OS staff, county maintenance personnel, and wildland fire personnel with reference materials for training, implementation, and oversight regarding terrain management activities, such as regular maintenance, land restoration, improvement projects, and monitoring.

Definitions

The BP Manual's information is organized around *standards*, *practices*, and *guidelines*. The Manual also addresses specific *procedures* and *protocols*, which describe standardized sequences of activities to guide practices and result in desired administrative outcomes.

The manual uses the term **Best Practices** to distinguish desirable and appropriate practices for Santa Fe County from the technical term *Best Management Practices* (BMP), which is typically used for specific land management and regulatory settings. Unfortunately, the term BMP has taken on many different meanings and can therefore be confusing or construed as too broad for the purposes of this manual. For example, the term BMP is sometimes used to indicate certain construction techniques for soil conservation. The term BMP is also often used for specific practices to avoid pollution or damage during implementation of work that would require additional mitigation in addition to the implementation practices. This use leads to confusion of terms and is therefore avoided in the manual.

Definitions of key terms used in this manual are:

Standard: A desired condition or policy goal that OS staff adopt to ensure excellence in OS property management.

Practice: An activity that is conducted in support of a standard. Practices include varieties or sequences of administrative activities for information exchange or regarding physical alterations to a terrain and its structural improvements. Such activities include procedures, protocols, (treatment) prescriptions, and construction techniques.

Guideline: A suggested procedure, protocol, or action that clarifies or facilitates a practice.

Procedure: The prescription for a detailed sequence of activities and/or criteria that, when followed, leads to a desired outcome or the implementation of a practice.

Protocol: The prescription for a detailed sequence of activities, interactions, or communications that, when followed, leads to a desired outcome.



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A. PROPERTY MANAGEMENT, MONITORING, REGULATORY REQUIREMENTS

A1. INSPECTIONS, DATA GATHERING, AND MONITORING

STANDARD A1.1. Data Gathering and Sharing

Santa Fe County Open Space (SFC OS) follows a system for data gathering and sharing to guide staff in effectively communicating and applying Best Practices (BPs) across all OS properties.

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A1.1.1. Data Forms

Santa Fe County maintains a series of forms for documentation and communications about OS property conditions and maintenance or restoration work to be performed at each OS property. For the purposes of OS management, the following forms are to be used:

- *Standard Maintenance Work Order* forms are generated by the county's Public Work's Department's Maintenance Connection (MC) software program; these forms serve to document work orders and completed work, and are mainly used by the maintenance team.
- *Field Inspection* forms (separate from and unrelated to the MC software, unless incorporated in the future) serve to document general and resource-specific observations and communications with people at an OS property. They are used by OS staff and maintenance staff to document findings and communicate between different departments, in addition to or separate from work-related documentation on the MC work order form.
- *Bullseye Monitoring* forms (separate from and unrelated to the MC software, unless incorporated in the future) serve to document periodic monitoring observations, guided by the rubrics of the Bullseye monitoring methods, which allow for a rigorous comparison of conditions between different monitoring events. This set of forms is used by any SFC staff to conduct monitoring work (see under Standard A1.2).

A1.1.2. Maintenance Work Order

At a visit to an OS property for maintenance work, county OS maintenance personnel complete a Maintenance Work Order form (of any specific kind produced by the MC system) to document completed work and any observations associated with that work.

A1.1.3. Field Inspection

At each visit to an OS property, county OS staff and/or maintenance personnel complete a general Field Inspection/Communication form to document observations and personal interactions with people regarding conditions of an OS property. Evaluation of the documented conditions on a Field Inspection form may lead to a maintenance work order or to other follow-up work upon the discretion of OS staff.



GUIDELINES AND REFERENCES

- Field Inspection Forms: See samples in Appendix A1.1.3.

STANDARD A1.2. Monitoring of Terrain Conditions

The Santa Fe County OS staff tracks critical conditions at OS properties to produce reliable data for assessing whether property conditions require management actions. Decisions about management actions are based on the comparison of past and new data, provided by monitoring critical OS property conditions in comparison with desired conditions for the property. The results of monitoring to detect change should trigger decisions for adaptive management (including decisions for “no action”).

PRACTICES

Monitoring is conducted to track changes in ecological conditions over time. Monitoring protocols should be designed to identify stressors (e.g., drought, overuse, roads, etc.) and track changes (whether positive or negative) in response to stressors, maintenance, management activities, and restoration failures or successes.

A1.2.1. Establishing Baseline information for Monitoring

The first step in a monitoring process is to establish *baselines* (information about terrain conditions when starting the monitoring process) by referencing existing *baseline information* or collecting *baseline data*. For example, for rangelands (lands that naturally produce forage plants suitable for grazing but where rainfall is too low or erratic for growing crops [Collins English Dictionary, 2017]) and forestland, the Natural Resource Conservation Service (NRCS) publishes Ecological Site Descriptions (ESDs) that may be used as baselines for comparing site conditions. The grasslands on Santa Fe County OS properties fall into the rangelands category for these site assessments. Riparian areas may fall into either the rangeland or forest category, based on the ecosystem type where the river, stream, or creek occurs.

The time slider in Google Earth Pro (available for free download) is a good tool for seeing changes in land condition from the 1990s to present, based on availability of satellite images. Its best use is tracking changes over time in grassland (rangeland) systems because in forest systems tree cover can hide many ground issues.

GUIDELINES AND REFERENCES

- Websoil Survey: <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.
- NRCS Ecological Site Descriptions: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/ecoscience/desc/>.



A1.2.2. The Bullseye Method

The recommended ecological monitoring technique selected for SFC OS properties is the Bullseye Method. This method was first designed for rangelands, but has been adapted for use as well on riparian and forested ecosystems on SFC OS properties. It allows for a *qualitative* assessment, which is more user-friendly for land managers who may not have in-depth botanical knowledge and/or do not have time for quantitative data analysis. The Bullseye Method for rangeland monitoring was developed by Gadzia and Graham (2013), and is described in the document *Bullseye! Targeting Your Rangeland Health Objectives* (Appendix A1.2.2). It should be used in conjunction with Ecological Site Descriptions (ESDs) from the National Resource Conservation Service (NRCS). The Bullseye Method allows for the assessment of a variety of ecological functions and may be used for each of the habitat types on SFC OS properties.

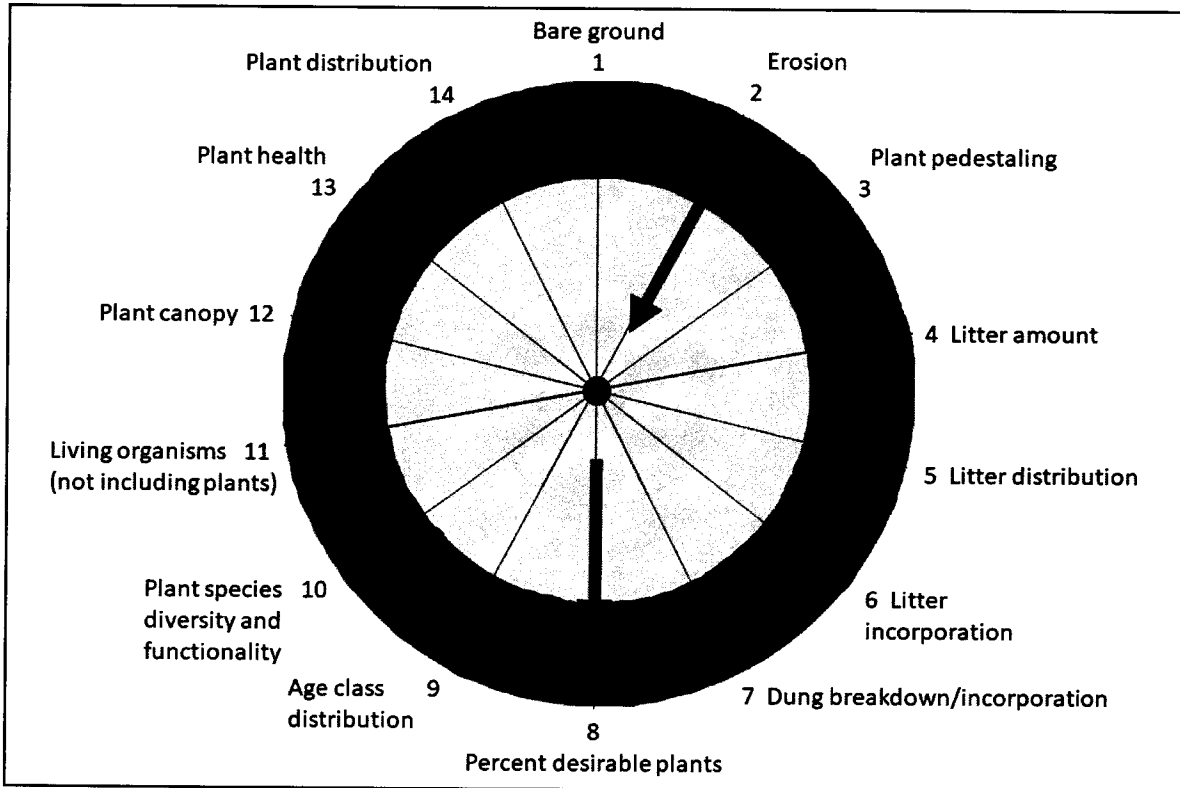


Figure 1. Bullseye Method. The green arrow shows that the assessment for the amount of erosion at a particular site is moving in the right direction (e.g., decreasing from 2016 to 2017). The red arrow indicates that groundcover is moving in the wrong direction (e.g., desirable plants decreasing from 2016 to 2017).

The Bullseye Method allows a land manager to make a judgement about a certain aspect of land health based on a bronze (needs to improve), silver (decent but could improve), or gold (good condition) rating. The monitoring form is a single page and can be used to compare conditions between years and before and after land management activities. The goal is to keep land within the gold range to ensure its optimum health (e.g. its good ecological function). If the land is

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rated bronze or silver, Best Practices should be undertaken to try to shift ecological function toward the gold range. Using the Bullseye monitoring method annually will allow land managers to determine if the land is maintaining good ecological function (holding steady at gold) or moving away from good function (moving from gold to silver or silver to bronze) (see the green and red arrows in Figure 1 above).

Each ecosystem type (grassland, forest, and riparian) has its own scoring criterion and data sheet (Appendix A1.2.2). A baseline will be set to compare against once the first round of Bullseye monitoring is completed by county staff. If observation shows a value that moves toward bronze, adaptive management should be triggered.

GUIDELINES AND REFERENCES

Bullseye Method forms and scoring guides for the following sources: Appendix A1.2.2

- Gadzia and Graham (2013). *Bullseye! Targeting Your Rangeland Health Objectives*.
- Ecotone Landscape Planning (2017). *The Bullseye of Riparian Sites! Aiming at Riparian Health*.
- Ecotone Landscape Planning (2017). *The Bullseye of Woodland and Forest Sites! Aiming at Woodland and Forest Health*.

A1.2.3. Photo Monitoring for Adaptive Management

Photographs are an excellent way to qualitatively document changes that occur on an OS property. Successful photo documentation requires that individual photos from one vantage point in a photo time series can be compared to discern differences over time. Various standard procedures have been published for successful photo documentation. Yet, because photo documentation requires rigorous administration and organization of the photo archive, it can be tedious and time consuming.

A new photo monitoring method called Picture Post can provide a more appropriate technology for repeat photo monitoring at Santa Fe County OS properties. Monitoring the local environment with a Picture Post can reveal a wealth of information and data useful to land managers, the community, policy makers, and scientific researchers. Appendix A1.2.3 Picture Post Guidance enables users to easily set up and take photos at locations such as the preliminary Picture Post locations at La Cieneguilla Open Space and Los Potreros Open Space.

GUIDELINES AND REFERENCES

- Digital Earth Watch Network Picture Post at University of New Hampshire, official guidance: https://picturepost.unh.edu/taking_photos.jsp.
- Picture Post at the Digital Earth Watch Network, more information at <https://picturepost.unh.edu/index.jsp>.
- A different, more involved photo monitoring procedure, adapted from the procedure developed by the Arizona Water Protection Fund, is described in Bill Zeedyk and Van



Clothier (2009), *Let the Water Do the Work: Induced Meandering, an Evolving Method for Restoring Incised Channels*, pp. 212-216, Quivira Coalition, www.quiviracoalition.org.

A1.2.4. Vegetation Transects

A detailed vegetation sampling method using a 1-meter quadrat frame, called Quadrat Sampling, may be used for quantitative monitoring of grassland conditions (BLM 1999). This method was used in 2015 to estimate grassland forage quantity and quality on the SFC Los Potreros Open Space (LPOS), La Cieneguilla Open Space (LCOS), and San Pedro Open Space (SPOS) properties. The Quadrat Sampling technique is a rapid method for recording the number and percentage cover of different species. The basic steps are explained in Appendix A1.2.4.

GUIDELINES AND REFERENCES

- Bureau of Land Management (1999). *Sampling Vegetation Attributes: Interagency Technical Reference*," BLM/RS/ST-96/002+1730, <https://www.blm.gov/nstc/library/pdf/samplveg.pdf>.
- Additional information on different vegetation monitoring techniques may be found at <https://jornada.nmsu.edu/monit-assess/manuals/monitoring>.

A1.2.5. Measuring Grassland Biomass

The direct method for measuring grassland biomass for Santa Fe County involves simply removing and weighing all the biomass occurring in selected small quadrats (e.g., a 1 meter squared area) and then multiplying to estimate biomass that occurs across the landscape, site, or pasture. The basic steps for this practice are explained in Appendix A.1.2.5.

GUIDELINES AND REFERENCES

- The grassland biomass measuring method described above is from the University of Idaho, [http://www.webpages.uidaho.edu/veg_measure/Modules/Lessons/Module%207\(Biomass&Utilization\)/7_3_Direct%20Methods.htm](http://www.webpages.uidaho.edu/veg_measure/Modules/Lessons/Module%207(Biomass&Utilization)/7_3_Direct%20Methods.htm).

A1.2.6. Wildfire Hazard Assessment

Santa Fe County has several appropriate BP tools for assessing wildfire hazard on any property. The Santa Fe County Fire Department's Wildland Division, in collaboration with partners in the Greater Santa Fe Fireshed Coalition (GSFFC), has developed a "wildfire hazard assessment" tool to rate the wildfire risk on a private property and its surrounding landscape. The Wildfire Hazard Assessment tool also applies to SFC OS properties, especially those with woodland and nearby structures, infrastructure, or other valuable land improvements. Additionally, a Bullseye method for Forest Health has been developed specifically to assess forest health conditions and fire hazard on OS properties. A copy of the SFC Wildfire Hazard Assessment form is included in Appendix A1.2.6 and the forest health Bullseye Method is included in Appendix A1.2.2.

The Wildfire Hazard Assessment tool is available as a two-page questionnaire form and as an app for portable digital devices, such as a smartphones or tablets. The form is made available by



the Santa Fe County Fire Department, and the app is available from Wildfire Network, a non-profit member of the GSFFC (info@wildfirenetwork.org, <https://wildfirenetwork.org/>). The assessment form addresses (a) site conditions, such as access and visibility, woodlands conditions, flammable materials on site, and any external hazards, (b) conditions of structures, such as roofing materials, foundations, walls, vents and eaves, attachments, and fuel traps, and (c) hazard reduction factors. The protocol for completing the assessment also requires photographic documentation of the most important findings of fire risk.

The Bullseye Method for forest health is similar in its format to the one described for grassland assessments (A1.2.2.), but its scoring guide has been specifically designed for the county's woodland and forest conditions (Appendix A1.2.2).

The recommended Best Practice is to use both methods in annual assessments of fire prone and valuable OS properties or properties with nearby, external sites that are susceptible to fire and pose a liability risk for the county. Repeated assessments over time will offer managers insight into whether fire risk is increasing or decreasing at monitored OS properties.

A1.2.7. Fuel Load Estimates with “The Brown’s Line”

Surface fuels like logs and branches can burn hot and carry fires into tree crowns. The amount of dead and down surface fuel is an important measure of how vulnerable the forest is to crown fire. Measuring fuel loads at a location can indicate whether fuel is accumulating or diminishing. This applies to all forest types, including ponderosa pine forests, pinon-juniper woodlands, and cottonwood and willow bosques. Non-native trees, such as Russian olives in bosques, can also produce large amounts of dead and down wood that increase the risk of wildfire, which can rapidly develop into catastrophic crown fire.

The reduction of surface fuels is an important restoration goal. However, some dead and down wood needs to be left on the ground to provide wildlife habitat and shelter, incubate understory growth, and prevent soil loss (erosion).

A useful tool for estimating fuel loads is the planar intercept method (a.k.a. Brown’s transect or “Brown’s Line” method), based on Brown (1974). A popularized form of this method is described in a publication from Northern Arizona University (2009) for the Collaborative Forest Restoration Program in New Mexico. The NAU-Brown’s Line practice is described in Appendix A1.2.7 in the form of an excerpt from the 2009 NAU publication. The practice consists of three steps, including data collection, data analysis, and data interpretation.

Field Measures and Arid Lands Innovations have developed a handy app, called “Fuels Measure,” for Brown’s line data entry and management via a hand-held device (access it at <http://fieldmeasures.org/product/fuels-measure/>). The Fuels Measure Data Portal can be accessed at data.fuelsmeasure.org.



Fuels Measure helps scientists use the planar intercept method to measure woody surface fuels. It calculates the volume and weight of downed woody material to estimate fire behavior, smoke production, biomass, carbon storage, and wildlife habitat, and it provides a step-by-step approach to tallying fuels by size class, entering log diameter and decay class, and recording litter and duff depths in either metric or U.S. units. Fuels Measure is fully functional in remote locations; user data are stored locally and backed up to the cloud as soon as the device connects to the internet. Fuels Measure assigns meaningful names and relationships to data and georeferenced photos within .csv files which are recognized by Excel or database programs. Photos and data are easy to share with flexible output formats throughout the application.

GUIDELINES AND REFERENCES

- James K. Brown (1974). "Handbook for Inventorying Downed Woody Material," USDA Forest Service General Technical Report INT-16, https://www.fs.fed.us/rm/publications/titles/int_gtr.html.
- Fuels Measure app for Brown's Line data entry and management via hand-held device: <http://fieldmeasures.org/product/fuels-measure/>.
- Fuels Measure Data Portal: data.fuelsmeasure.org.
- Ann Moote, M. Savage, J. Abrams, T. Derr, E. Krasilovsky, and M. Schumann (2009). "Multiparty Monitoring and Assessment of Collaborative Forest Restoration Projects: Short Guide for Grant Recipients," pp. 54-59 (amount of surface fuel), https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5274477.pdf.

STANDARD A1.3. Monitoring of Conservation Easements

Santa Fe County OS staff and land trust organization staff jointly conduct annual monitoring visits of each conservation easement (CE) property in order to verify that the stipulations of a CE agreement are being followed and that the conditions of the land and the associated conservation values remain of high quality.

PRACTICES

A1.3.1. Annual Conservation Easement Inspection Visits

Santa Fe County OS staff, in coordination with land trust representatives, annually monitor SFC conservation easement (CE) properties using documentation protocols, such as Field Inspection forms, Picture Posts, or land trust specified means of documentation. Monitoring protocols follow at least the standards and practices of Land Trust Alliance (LTA) and of the land trust organizations holding the CEs.

A1.3.2. SFC OS Staff Accompaniment

Santa Fe County OS staff member(s) accompany land trust representatives when the latter undertake monitoring visits of OS properties for which the land trust holds a CE.



GUIDELINES AND REFERENCES

- Several Santa Fe County Open Space properties include conservation easements (CEs). Most CEs are held by independent Land Trust organizations, such as the Santa Fe Conservation Trust. At the time of this report, at least two CEs are reportedly held by Santa Fe County itself (on the Thornton Ranch OS and the Los Potrereros OS).
- The Land Trust Alliance has published a document that describes standards and practices for good stewardship of areas under a CE (Land Trust Alliance (2017), *Land Trust Standards and Practices: Ethical and Technical Guidelines for the Responsible Operation of a Land Trust*). An excerpt from this document regarding stewardship and monitoring is included in Appendix A1.3.1.



A2. ADAPTIVE MANAGEMENT, PLANNING, AND DECISION MAKING

STANDARD A2.1. Adaptive Management, Planning, and Decision-Making Procedures

Santa Fe County OS uses and shares data and information effectively and follows effective internal communication methods and public outreach, notification, and information exchange methods for good decision making about OS management. SFC OS staff periodically adapt their management of certain conditions on OS properties based on data provided by monitoring.

PRACTICES

A2.1.1. No Action

One choice for managing open spaces is to consider the “no action” alternative. Some of the benefits of doing nothing in the short term (1-2 years) include saving money and staff time and also preserving options for the future. In the medium time frame (3-5 years), however, the cost of no action can become higher than the cost savings, by resulting in poor natural resource conditions and, in some cases, lost opportunities. Local residents may begin to perceive a lack of commitment on the part of county staff. One example involves doing the maintenance work to remove noxious weeds, such as diffuse knapweed (as found near the roadside entrance to Los Potreros Open Space) or Russian olives in a riparian area. The no action approach will result in both of these invasive plants taking over (replacing native plants) and allowing the noxious weeds’ seeds to spread to other areas through seed transport by people, animals, and wind.

Ultimately the cost to address the problem will be more expensive by year 5, when the weeds have monopolized not just the first location of invasion, but other areas as well. The no action alternative always needs to be examined in comparison to proactive alternatives in order to fully understand the benefits and costs.

A2.1.2. Internal County Staff Communication

Efficient information flow and effective communication methods and styles are critical to the implementation of data management procedures and other Best Practices described in this manual. Much of the work regarding management of OS properties requires collaboration between people within a department and between different departments, and even between Santa Fe County entities and third party entities, the public, or local stakeholders.

A2.1.3. Data Time Series

SFC OS staff maintain data time series (written documentation, photographs, Google earth time series, and/or mapping) for comparison and checking of findings with property goals and vision (desired conditions) in order to ascertain whether adaptive action (change of course or intervention) is needed.



A2.1.4. Monitoring Frequency for Adaptive Management

OS properties should be monitored annually using the Bullseye monitoring protocol or an adaptation of the method. The results of the monitoring should trigger a response by Santa Fe County staff. The response could be to continue to monitor or could result in an action to address a problem with a previously identified adaptive management response. For example, an increase in bare ground should trigger a management response.

A2.1.5. Information Sharing

SFC OS must maintain a clear process for sharing information with staff members who will participate in implementing the necessary adaptive management action. Figure 2 (next page) includes a data sharing flow chart that clarifies the desired information flow.

In certain circumstances, time is of the essence in sharing information. As part of the information flow process, critical information must be shared immediately. For example, trespass, fire danger, and presence of noxious weeds should be immediately communicated to a supervisor.

A2.1.6. Community Notification and Involvement

SFC OS adheres to its internal protocols for timely community and neighbor notification of any significant maintenance, restoration, and improvement activities at OS properties, and seeks to include local community members in the implementation of management and BPs as much as is reasonable for a successful outcome.



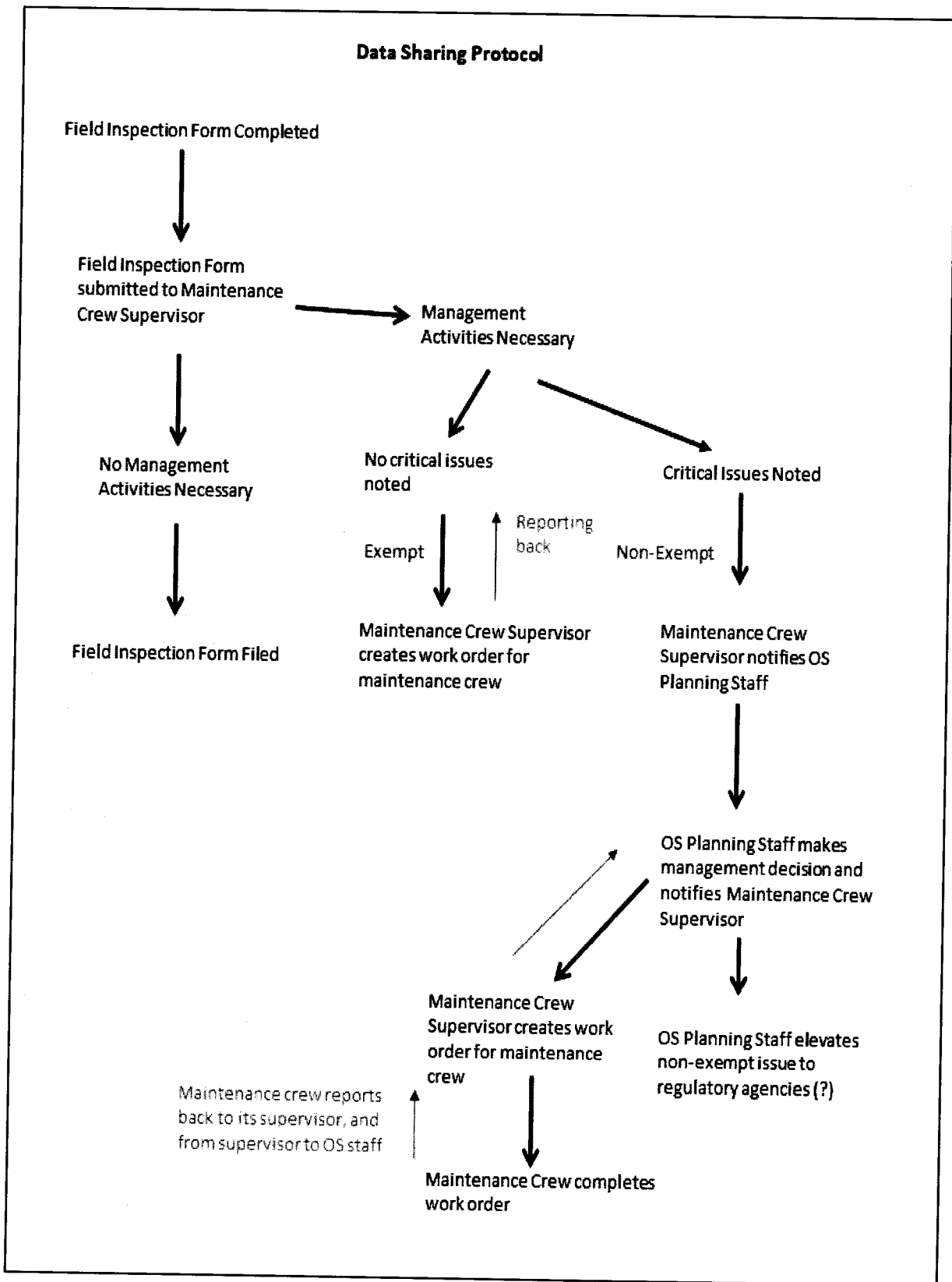


Figure 2. Data sharing flow chart for SFC OS management. Source: Ecotone Landscape Planning.



A3. PROCESS TRACKING FOR PROPERTY MANAGEMENT

STANDARD A3.1. Process Tracking for Property Management

For each activity regarding OS property maintenance, restoration, or improvement—not including exempt activities—Santa Fe County OS staff follow and maintain a check list for project implementation procedures to ensure adherence to the vision, management goals, and values of each property and to federal, state, and county regulations and special agreements and easements.

PRACTICES

A3.1.1. Exempt Activities

Periodic inspections and low-impact maintenance work (e.g., activities that do not lead to any significant ground disturbance, such as hand pulling weeds or small-scale hand work on erosion control and drainage) are exempt from coordinated planning and tracking through the Check List for Project Implementation Procedures, which is included in Appendix A3.1.2. (see also Figure 2). Exempt activities are further defined as those which do not impact listed artifacts and cultural sites, deteriorate improvements or ecological conditions, impair access, impair visual quality, or degrade functionality of the OS property.

A3.1.2. Tracking of Non-Exempt Activities

For activities that are not exempt (i.e., that do not qualify under A3.1.1.), SFC OS staff follows and maintains the Project Tracking Form by filling out a copy of the list, identifying relevant items and crossing out irrelevant items for the project. The Project Tracking Form should be used as a guide in meeting and scheduling of project steps, including approvals (see Appendix A3.1.2.).

GUIDELINES AND REFERENCES

- Project Tracking Form: Appendix A3.1.2.



A4. REGULATORY REQUIREMENTS

STANDARD A4.1. Regulatory Requirements

Santa Fe County OS staff follow and fulfill any and all statutory and regulatory requirements as well as private agreements for any particular project. These requirements and agreements have been established under rules of open government and cultural and ecological conservation for the common good, and as bilateral or multilateral agreements with concerned stakeholders for land management and conservation.

PRACTICES

A4.1.1. Santa Fe County Land Use Requirements: The Sustainable Land Development Code

As the foundation for rules, standards, and practices for land use and terrain management in Santa Fe County, OS staff will adhere to the Sustainable Land Development Code (SLDC) and the latest guidelines for its application in managing OS properties across the county.

A4.1.2. Easement Requirements

Several SFC OS properties have access easements, utility easements, drainage easements, and possibly other easements and rights involving neighboring properties or third parties. Prior to implementing any non-exempt activity, SFC personnel need to familiarize themselves with all easements and title requirements concerning the property in order to ascertain that proposed activities meet easement requirements and any other rights of third parties that exist on or in connection to the property. It is good practice to list, describe, and map such easements and requirements prior to seeking access or undertaking work and to inform third party title holders of the planned access across, or work in or near, the easement area. If the easement requirements and other rights are impairing access, proper management, or implementation of BPs, staff may need to seek contact with the parties holding titles in order to negotiate the interpretation of the easement or right in relation to accessing the easement area and/or the implementation of any planned work.

A4.1.3. Stakeholder Notification and Agreements

Depending on the scale and impact of any proposed management practices on OS properties, SFC staff uses its discretion and sense of maintaining good neighborly relationships to decide if there is a need to notify neighbors and other stakeholders of the proposed work. This is of particular importance when certain verbal or written agreements are in place between SFC and any neighbors or stakeholders regarding access or work on the OS property. In some cases, it may be advisable that SFC staff organize meetings with neighbors or formal community meetings to present and discuss the proposed activities as a way to gather feedback and entertain ideas for potential community participation in the planned work. SFC staff adhere in this regard to the internally agreed upon procedures under the Sustainable Land Development Code (SLDC) for community involvement (see also A4.1.1).



A4.1.4. Cultural and Historical Resource Protection

If adaptive management and project planning recommendations indicate (as per standards A2 and A3 and their relevant practices) that cultural and historical resource protection regulations may apply to the proposed activity, OS staff will consult the cultural resource protection regulations and follow the protocol described below to ascertain what regulatory actions are required. If questions arise or action is required, OS staff will contact appropriate agency personnel to complete the required actions prior to commencing the proposed project.

In the long term, a Best Practice would be for Santa Fe County to develop a memorandum of understanding (MOU) with the New Mexico Department of Cultural Affairs Historic Preservation Division (HPD). HPD is interested in developing an MOU with Santa Fe County regarding cultural resources guidelines for Open Space parcels. This must be considered and crafted carefully, but could potentially streamline the cultural resources consultation process by including a list of exemptions, ensuring consistency throughout staff changes, and facilitating protection of cultural resources.

In the short term, applicable cultural resource protection regulations and guidelines mandate the following protocol:

1. *For all projects, check with the Archeological Records Management System (ARMS) at the Museum of New Mexico/Laboratory of Anthropology.*
2. *If no ground-disturbing activities (see definition below) are planned for the Open Space property and an archaeological survey has not been completed to current standards, the County is not obligated (but is encouraged by the state) to hire an archaeologist from HPD's list of approved archaeologists to undertake a survey of the property to contemporary standards (survey completed within last 10 years).*
3. *If ground-disturbing activities are or may be planned for the Open Space property and an archaeological survey has been completed to current standards, check the results section of the required survey report to determine if the property contains or is within a state- or nationally-registered cultural property and if any significant archaeological sites were identified.*
4. *If ground-disturbing activities are planned in a Registered Cultural Property within the Open Space property, and no modern archaeological survey has been completed for the parcel, a survey conducted to current standards must be undertaken for the property, or at least for the portion considered for development. Consult with HPD regarding the best way to proceed.*
5. *If proposed ground-disturbing activities will or may affect a Registered Cultural Property or significant archaeological site, hire a qualified archaeologist to prepare a report regarding the proposed development, describing in detail the proposed changes and effects to the property.*



Table 1 summarizes the BP protocol for cultural resources preservation. Detailed clarifications for each of the five items in this protocol for cultural resource protection, as well as a list of Cultural Resources Survey Priorities (as of February 2018), are described in Appendix A4.1.4.

Table 1. Summary Overview of Best Practices regarding Cultural Resource Preservation.

	No Ground-Disturbing Activities	Ground-Disturbing Activities Possible or Certain
No Modern Cultural Resource Survey Done	Proceed with activity (and consider hiring a certified archaeologist to complete a survey)	Hire a certified archaeologist to complete a survey and consult with HPD on proper process; document likely effects*
Modern Cultural Resource Survey Available	Proceed with activity (and consult the survey for any relevant recommendations)	Proceed with activity (and consult the survey to assess potential effects and any relevant recommendations on avoidance and preservation strategies); document likely effects*

* If there are any likely effects of proposed ground-disturbing activities, hire an archaeological consultant to study and document the likely effects and needed changes to the Registered Cultural Property.

Ground disturbance is defined as any activity that compacts or disturbs the ground within a project area (from Section 106 of the National Historic Preservation Act). Ground disturbance can be caused by the use of hand tools (shovels, pick axe, posthole digger, etc.), heavy equipment (excavators, backhoes, bulldozers, trenching and earthmoving equipment, etc.), and heavy trucks (large four-wheel drive trucks, dump trucks, tractor trailers, etc.). Trenching, bulldozing, excavating, scraping, and plowing are typical examples of ground disturbance activities.

Project types that usually involve ground disturbance include: acquisition, demolition, and/or relocation of structures; vegetation management; landslide stabilization; and infrastructure projects such as utilities, stormwater management, and flood control. However, any projects that include the installation of utilities, culverts, temporary roads or structures, permanent roads, and foundations and footers all typically involve ground disturbance activities.

Possible ground-disturbing activities that may take place within Santa Fe County Open Space properties could result from: soil testing; excavation and mineral exploitation; facilities construction, operation, or maintenance; erosion control activities; road or trail construction, maintenance, or use; grazing; fence post repair, maintenance, or replacement; fire suppression or control; tree planting; tree thinning (excavation or dragging and removal of downed wood);



recreation (traffic on and off trails and roads by means of foot, bike, horse, automobile, etc.; camping, etc.); and sign installation and maintenance.

Ground disturbance could potentially impact significant cultural resources and can cause direct effects, such as breakage or other damage to artifacts and features, or can disturb their physical integrity and context by moving them from their original location. Ground disturbance can reduce the integrity of a cultural resource by affecting its ability to convey significant scientific information and may also result in indirect effects. For example, erosion caused by vehicle tracks may result in damage to a cultural resource not directly affected by the vehicle.

GUIDELINES AND REFERENCES

- New Mexico Department of Cultural Affairs, Historic Preservation Division:
<http://www.nmhistoricpreservation.org>.
- Santa Fe County Sustainable Land Development Code (Adopted by Ordinance 2013-6, December 10, 2013), section 7.16 "Protection of Historic and Archaeological Resources," pp. 155-159, www.santafecountynm.gov/userfiles/SLDC/ClickableSLDCwithOrdinance.pdf.

A4.1.5. Biological Resource Protection

If adaptive management and project planning (as per the Standards and Practices under A2 and A3) indicate that biological resource protection regulations may apply to the proposed activity, OS staff will consult the following biological resource protection regulations to ascertain what regulatory actions are required. If questions arise or action is required, OS staff will contact appropriate agency personnel to complete the required actions prior to commencing the proposed project. Applicable biological resource protection regulations include:

- Protection of Threatened and Endangered Species: the Federal 1973 Endangered Species Act.
- Protection of Migratory Birds: the Federal Migratory Bird Treaty Act
- Protection against Dissemination and Persistence of Noxious Weeds: Federal Plant Protection Act and Noxious Weeds Management Act of New Mexico

A4.1.5.1. Endangered Species Act

Threatened and endangered plant and animal species are protected by the 1973 Endangered Species Act (ESA) which is implemented primarily by the U.S. Fish and Wildlife Service (USFWS) and the U.S. Commerce Department's National Marine Fisheries Service (NMFS). The purpose of the act is to protect and recover imperiled species and their critical habitats. By definition, when a species is endangered it is in danger of extinction throughout or in a large portion of its range; a threatened species is one that is likely to become endangered in the near future.

The term "Critical Habitat" was defined under the ESA to specify geographic areas that require determined management and protection. These are defined for each species listed



under the ESA. These critical habitats may include areas that a species will need in the future for recovery.

Species and their critical habitats should be taken into consideration before any management activities are conducted on lands owned by the county in potential zones of critical habitat. The 2009 "Santa Fe County Wildlife Habitat GIS Modeling: Workshop and Conservation Priorities," prepared for Santa Fe County by the Center for Applied Spatial Ecology at New Mexico State University, gives insight about potential wildlife corridor and connectivity (Appendix A4.1.5c).

A4.1.5.2. Migratory Bird Treaty Act

Additional protections for bird species are provided by the Federal Migratory Bird Treaty Act (MBTA) which makes it "illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations." The migratory bird species protected by the Act are listed in 50 CFR 10.13.

Birds that are considered game birds such as species of ducks, geese, doves, and some shorebirds may be hunted in season. Non-native bird species, such as the Eurasian collared dove, house sparrows, and starlings, are not protected, <https://www.fws.gov/birds/policies-and-regulations/laws-legislations/migratory-bird-treaty-act.php>.

For Santa Fe County properties crossed by power transmission lines, there should be an Avian Protection Plan (APP) on file at the power transmission company to comply with the protections provided by the MBTA, <https://www.fws.gov/birds/management/project-assessment-tools-and-guidance/guidance-documents/electric-utility-lines.php>.

A4.1.5.3. Noxious Weeds

The term "noxious" carries a legal definition under the Federal Plant Protection Act. A noxious weed includes, "any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment," https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ct/technical/ecoscience/invasive/?cid=nrcs142p2_011124.

The United States Department of Agriculture maintains a list of federally recognized noxious weeds and prohibits their transfer across state lines. Each state has its own list of noxious weeds that must be controlled by state law, per the New Mexico Noxious Weeds Management Act. In New Mexico, the list of noxious weeds is determined by the New Mexico Department of Agriculture (NMDA). NMDA is mandated to educate the public and



coordinate weed management among private, local, state, and federal land managers. The most current list of noxious weeds for New Mexico is included in Appendix A4.1.5d.

GUIDELINES AND REFERENCES

- K. G. Boykin, K. G., R. K. Guy, and M. T. Calkins (2009). "Santa Fe County Wildlife Habitat GIS Modeling: Workshop and Conservation Priorities," New Mexico Cooperative Fish and Wildlife Research Unit Technical Assistance Report, New Mexico State University.
- New Mexico Department of Game and Fish – BISON-M information: <http://www.bison-m.org/speciesreports.aspx>.

A4.1.6. Forest Resource Protection

In managing forests and woodlands on OS properties, Santa Fe County staff must follow the regulations outlined in chapter 20 (Natural Resources and Wildlife), of the New Mexico Administrative Code, Title 19 (NMAC Title 19). The publication *New Mexico Forest Practices Guidelines* (2008 or later versions), published by the New Mexico Energy Minerals and Natural Resources Department (EMNRD) Forestry Division (aka New Mexico State Forestry), includes this state forest management code, along with detailed descriptions of Best Practices for forest management on private and municipal land in the state (<http://164.64.110.239/nmac/title19/T19C020.htm>).

However, many exceptions and exemptions to this code apply for municipalities. County staff should carefully consult NMAC Title 19 in order to discern whether a proposed forest management activity is exempt or not from certain State forest protection requirements. For example, NMAC Title 19 states that municipalities (such as Santa Fe County) are exempt from the regulations under this state statute, as per 19.20.4.2 NMAC – SCOPE. Furthermore, as per 19.20.4.8 NMAC – Harvest Permits, there is an exemption to obtain a permit for cutting firewood for personal use or even for sale (in compliance with 19.20.4.9 NMAC), and for pre-commercial thinning or harvest for Wildland-Urban Interface (WUI) projects, among other exceptions.

Despite these regulatory exceptions, it is advisable that, as a general Best Practice, County staff and contractors follow the standards and practices for forest treatments and terrain management described in the *New Mexico Forest Practices Guidelines* document, which includes NMAC Title 19, chapter 20. Excerpts of this document are included in Appendix A4.1.6.

Due to the exceptions from NMAC Title 19, certain forest management activities, such as obtaining permits with New Mexico State Forestry, are in many cases not required. Also firewood cutting and harvesting on OS properties are not regulated by the State of New Mexico and only require adherence to any county regulations, such as those in Section 7 Terrain Management of the SLDC. Therefore, County staff has ample discretion to set incidental or general guidelines for such activities if desirable under site specific circumstances.



Regarding fire protection, the SFC Sustainable Land Development Code states in section 7.5 (Fire Protection) that “all development shall comply with the New Mexico Fire Code (or other applicable fire code as established by 10.25.5.18 NMAC), and the Santa Fe County Fire Code.”

County staff must comply with Federal Clean Air Act regulations monitored by the New Mexico Environment Department (NMED) Air Quality Bureau when planning and implementing prescribed fire. Additionally, it is advisable that county staff collaborate with the Santa Fe County Wildland Fire Division when planning and implementing any form of burn activity, such as pile burns, broadcast burn, and any other prescribed burns of excess fuels on the land.

A4.1.7. Water Resource Protection and Flood Management

Santa Fe County OS staff use their discretion to consult, follow, and apply any applicable water resource protection and flood management regulations to the management of OS properties. The following is a listing of the most prevalent regulatory requirements to consider for water resource protection and flood management. The Sustainable Land Development Code, Section 7.18. Flood Prevention and Flood Control, and Section 7.19. National Pollutant Discharge Elimination System (NPDES), describe water resource protection and flood management regulations in the county.

A4.1.7.1. Federal Emergency Management Agency (FEMA)

Santa Fe County has a flood insurance agreement with the Federal Emergency Management Agency (FEMA) that renders the county eligible for monetary compensations in case of damage from flooding emergencies, but also requires SFC to manage flooding in streams across the county. Santa Fe County has described its flood management regulations in SLDC Section 7.18 (Flood Prevention and Flood Control).

If a project affecting a stream and its flood prone area leads to a rise of floodwaters (base flood elevation or BFE) of 1 foot or more above pre-project circumstances, special notification to FEMA is required. An engineering study with a hydraulic and hydrological modeling analysis is needed to calculate the effects of proposed projects on streams and their flood prone areas.

Upon submitting the hydraulic and hydrological modeling analysis report to FEMA, the agency will consider issuing a Conditional Letter of Map Revision (CLOMR). The CLOMR is FEMA's comment on a proposed project that would, upon construction, affect the hydrologic or hydraulic characteristics of a flooding source and thus result in the modification of the existing regulatory floodway, the effective BFEs, or the Special Flood Hazard Area (SFHA). The letter does not revise an effective National Flood Insurance Program (NFIP) map. Rather, it indicates whether the project, if built as proposed, would be recognized by FEMA. FEMA charges a fee for processing a CLOMR to recover the costs associated with the review. Building permits cannot be issued based on a CLOMR, because a CLOMR does not change the NFIP map. Once a project has been completed, Santa Fe County



must request a revision to the Flood Insurance Rate Map (FIRM) to reflect the project. "As-built" certification and other data must be submitted to support the revision request. When approved by FEMA, the agency will issue a Letter of Map Revision (LOMR), which officially revises the FIRM for the affected stream reach.

A4.1.7.2. NPDES Regulations

Under Section 7.19 (NPDES) of the SLDC, Santa Fe County upholds the Federal Environmental Protection Agency (EPA) regulations regarding the prevention and elimination of point-source pollution discharges in local water courses as promulgated under the National Pollutant Discharge Elimination System (NPDES). The planning tools utilized at a county level, such as by Santa Fe County Land Use, in relation to proposed terrain modifications (grading, development, land restoration, etc.), are the Stormwater Pollution Prevention Plan (SWPPP) and Spill Prevention Control and Countermeasures (SPCC). SWPPPs and SPCC plans are both authorized under the Federal Clean Water Act to prevent water quality impacts from any form of development. It is a responsible and required Best Practice for SFC OS maintenance and terrain restoration projects to adhere to the NPDES regulations through SWPPP and SPCC planning.

Most applications for SWPPP and SPCC can be completed online. EPA websites offer plan templates and explanations of exemptions to submittal of SWPPP and SPCC plans. OS planning staff can also consult specialized staff at the NMED Surface Water Quality Bureau for support if necessary. If projects do not disturb more than five acres of terrain and if the cumulative rainfall index for the project implementation period is 5 or less (this index is a coefficient without a unit of measurement), project managers and their contractors can apply for a Low Erosivity Waiver (LEW) that documents their exemption from preparing a SWPPP. The LEW application and approval process is entirely automated through the EPA online services portal. Entering LEW through a web browser will lead users to a series of links that address this topic and will help with the completion of this procedure.

A4.1.7.3. Federal Clean Water Act

Section 404 of the Federal Clean Water Act (CWA) protects wetlands from dredging and filling through a regulatory program administered by the US Army Corps of Engineers (ACE). When Santa Fe County intends to do river restoration, bank stabilization, removal of berms in the floodplain, or any alteration of a site with aquatic habitat, a "404 permit" is required. Some kinds of work are exempt from permitting, and other projects, such as river bank stabilization, may qualify under existing nationwide permits (nationwide permit 27 for aquatic habitat restoration or nationwide 13 for bank stabilization), as long as the work meets specific criteria.

The proposed floodplain access project on Rio Santa Cruz and the river stabilization project on the Rio Quemado will fall under nationwide permit requirements. It is suggested that



telephone or email communications with ACE staff should be scheduled to determine if permits are required prior to completing the permit applications.

If required by the ACE, Santa Fe County will need to complete permit applications and project designs, and submit the applications to staff at the ACE Albuquerque District office. Project work cannot start before the 404 permits are secured. The ACE staff may request site visits to discuss the applications and plans. The permits may require Best Practices such as stormwater management, monitoring, and reporting for up to five years after project completion.

Section 401 of the CWA gives states the authority to veto or place conditions on federally permitted activities, such as the ACE 404 permit, to ensure that state rules for protecting water quality and aquatic habitat protection and for preventing stream degradation are followed. The regulatory process, called "401 water quality certification," is managed in New Mexico by the staff in the NMED Surface Water Quality Bureau. Typically, the application for the state certification is automatically coordinated with the 404 permit application and requires the same information as for the 404 permit application, though NMED has the authority to ask for more details. Like 404 permitting, obtaining 401 certification is required before project work can begin.

GUIDELINES AND REFERENCES

- ACE Section 404 permitting checklists, forms, and guidelines for nationwide permits: <http://www.spa.usace.army.mil/Missions/Regulatory-Program-and-Permits/NWP/>.
- Federal Emergency Management Agency (FEMA) Conditional Letter of Map Revision (CLOMR) information: <https://www.fema.gov/conditional-letter-map-revision>.
- NMED Section 401 water quality certification guidelines for nationwide permits: <http://www.spa.usace.army.mil/Portals/16/docs/civilworks/regulatory/Water%20Quality%20Certification/2017%20NWP%20WQC/2017%20NWP%20NMED%20cert.pdf?ver=2017-03-17-160907-277>.
- Santa Fe County SLDC, Section 7.18. FLOOD PREVENTION AND FLOOD CONTROL and 7.19 NPDES.

A4.1.8. Air Quality Requirements

Several land and natural resource management practices can impact air quality. Such practices include activities that disturb dry, silty soils, which may cause the release of dust into the air; activities that generate smoke, such as prescribed fire; and activities that emit greenhouse gases.

A4.1.8.1. Dust Management Regulations

Dust in the air, or particulate matter, is a type of air pollution that can be created when winds are at high speeds. The U.S. Environmental Protection Agency (EPA) sets standards for particulate pollution, and the New Mexico Environment Department (NMED) is



responsible for monitoring and enforcing those standards. The NMED Air Quality Bureau has developed recommendations for Best Practices (called Best Available Control Measures, BACM) for dust control (see <https://www.env.nm.gov/air-quality/dust-main-page/> and also Section B1.1.3).

A4.1.8.2. Burning Regulations

The New Mexico Environment Department Air Quality Bureau regulates and monitors activities that impact air quality. The agency has regulations for (a) small burning activities, regulated under Open Burning Regulations, which consist of burning of vegetative material at a scale of 10 acres or less of non-piled material per day, or when the amount of piled material burned per day is 1,000 cubic feet or less of pile volume; and (b) larger burns (exceeding these limitations), which are regulated under Smoke Management Regulations.

Open Burning Regulations

- Permits for open burning are not required, although burners must know and follow the requirements for the particular type of burning they are doing.
- Open burning of household waste (not including yard waste, weeds, etc.) is prohibited.
- All burning of vegetative material has the same requirements, regardless of the purpose or who is doing the burning. This includes small-scale prescribed and agricultural burning as well as burning of yard waste by individual householders.
- See 20.2.60 NMAC Open Burning for full details and the official legal wording.

Smoke Management Regulations

- A minimum distance of 300 feet must be maintained between an open burn and any neighbor(s).
- The time-of-day window for burning is from one hour after sunrise to one hour before sunset.
- The local fire department or appropriate firefighting authority must be notified prior to burning.
- If the planned burn is larger than one acre per day, or 100 cubic feet of piled material, the burner must notify neighbors within one quarter mile prior to burning.
- See 20.2.65 NMAC - Smoke Management for full details and the official legal wording. See also the NMED Smoke Management page for forms, maps, links and other information.

In addition, several other regulations apply:

- Recreational and ceremonial burning, campfires, fireplaces, and other kinds of burning are unrestricted, with one exception: burning of explosive materials that cannot be safely removed is covered by the New Mexico Administrative Code (NMAC) Title 19 section on emergency burning.



- Restrictions on burning issued by fire safety authorities to prevent wildfires will supersede any permission to burn in the Open Burning regulation.
- Burning of structures for firefighter training requires prior notification to NMED to ensure that asbestos-containing material has been removed.
- Open burning of hazardous waste is allowed only when authorized by Resource Conservation & Recovery Act (RCRA) rules or permits, which include analyses of environmental effects and provisions for due process and public notice. Explosives and propellants are the only types of hazardous waste that can be disposed of by open burning under RCRA regulations.
- Emergency burning is allowed when there is an imminent danger and rapid response is needed. This is intended to cover true emergency-response situations such as tanker spills, etc.

For prescribed fire, Santa Fe County OS staff will need to collaborate with the County Wildland Fire team. The County Fire Department will develop a burn plan with details and procedures specific to the prescribed burn. The burn plan will have restrictions on ventilation. Every morning and evening the burn boss will request a spot weather forecast which includes the ventilation quality as good, poor, excellent etc. Burning will not be allowed during consecutive poor ventilation days, although one can apply for a waiver. Precautions can be taken to limit smoke, such as choosing burn days that are conducive to smoke lifting and dispersing in a preferred direction and techniques associated with treating piles and ashes.

A4.1.8.3. Greenhouse Gas Emissions Regulations

The New Mexico Environment Department (NMED) Air Quality Bureau regulates emissions standards and activities that may impact air quality, such as those related to greenhouse gas emissions, on behalf of the Federal Environmental Protection Agency. At the time of this writing (early 2018), regulations for greenhouse gas emissions in the US and the State of New Mexico are in flux. However, certain operations that may emit greenhouse gases require permitting. Currently the only permitted facility in Santa Fe County is the Caja del Rio landfill and quarry site.

A Best Practice for SFC OS staff in this regard is to contact the NMED Air Quality Bureau if common sense indicates that a proposed activity may lead to emissions. Contact information and information about the responsibilities of the Air Quality Bureau can be found at <https://www.env.nm.gov/air-quality/ghg-climate/>.

In addition, the Santa Fe County Sustainable Land Development Code addresses air quality and emissions in section 7.21.3. – Air Quality. It states: “If an air quality permit is required by the regulations of the NMED, a permit shall be obtained and a copy presented at the time of application. The applicant shall comply with the permit at all times.” Air quality impacts can also be construed as part of the concept of and county regulations for Developments of



Countywide Impact (DCI), as defined in the code in sections 1.4.2.17 and 1.4.2.28, and chapter 11.

GUIDELINES AND REFERENCES

- Additional information on burning regulations: <https://www.env.nm.gov/air-quality/open-burn/>.

A4.1.9. Traffic Safety Requirements

When OS management operations are conducted from a road or right of way or when management activities affect traffic on public roadways, SFC staff and contractors will need to follow safety regulations and practices from the agency with authority over that road section. Timely communication and coordination with road safety officers for either Santa Fe County or the NM Department of Transportation is useful to obtain all necessary instructions and permits, and prepare any logistics, such as staffing, supplies, signage, and community announcements, for the implementation of the safety precautions.



A5. WORKING WITH COMMUNITY STEWARDS AND OTHER VOLUNTEERS

STANDARD A5.1. Community Stewardship

Santa Fe County OS maintains programs for community stewardship groups and volunteers that offer meaningful, educational activities for these constituent groups regarding the natural world and cultural history of the OS areas. The goal of these activities is to develop capable and committed volunteers who will give back to the community through service projects that involve OS property maintenance and restoration, and citizen science.

PRACTICES

A5.1.1. Educational Programs and Facilities

Open Space properties offer excellent opportunities for educational programs and outdoor classrooms. BPs for developing educational programs include:

- Inviting existing organizations to offer education programs
- Engaging schools in outdoor learning
- Inviting schools and organizations to participate in monitoring and stewardship work
- Providing trails and sites for outdoor classrooms, and providing interpretive information
- Collaborating with the Northern New Mexico Master Naturalist program

A5.1.2. Citizen Science Monitoring and Applied Research

Local residents and school groups have the interest and the capacity to be eyes and ears on the ground at SFC OS properties. Nationwide, inclusion of residents and school groups is a Best Practice for monitoring and applied research, for gaining support for property maintenance, and for offering outdoor education opportunities.

There is particular potential for citizen science monitoring and applied research on properties with wetlands, rivers, and forests that support important wildlife habitat or water resources. Existing organizations that conduct research on natural resources with which the county can partner include the Watershed Watch program of River Source (focusing on wetland and rivers), the New Mexico Chapter of the Native Plant Society and the Institute for Applied Ecology (focusing on native plants), and Audubon New Mexico (focusing on birds). Examples of citizen science include monitoring of streamflow, turbidity, water temperature, total phosphorus, nitrates, and several other measurements of water quality. Data may be uploaded to a publicly accessible webpage. A local example is <http://watershedwiser.org/santa-fe-river-santa-fe-county-open-space-calle-debra>.

Specific citizen science projects from which Santa Fe County can benefit include:



- Presence/absence of beavers on the Santa Fe River and the impact on shallow groundwater levels near Calle Debra
- Grassland ecological health at several properties, including Los Potreros and the grassland portions of the La Cieneguilla and San Pedro open spaces.
- Photo monitoring on several properties using Picture Posts

A5.1.3. Engaging Volunteers in Maintaining Open Space Areas

Engaging volunteers, such as neighbors, community groups, and youth, in maintenance of OS properties is a recognized Best Practice nationwide. Bernalillo County Open Space has developed effective practices for recruiting, training, and providing ongoing support and acknowledgement of volunteer Master Naturalists.

The Master Naturalists of Northern New Mexico is a program being developed in northern New Mexico specifically for this purpose. A Master Naturalist is a citizen volunteer who has completed a minimum of 58 hours of training and 30 hours of service and continues to provide ongoing volunteer service at one or more natural areas or open spaces. The Master Naturalists program is being developed by Audubon New Mexico and Santa Fe Botanical Garden, and is based on the successes achieved by the Bernalillo County Open Space Program. Master Naturalists have provided service in the areas of ecological restoration, education and outreach, research and monitoring, and program administration. A draft version of the developing program's policies and practices is included in Appendix 5.1.3a.

In another example, The City of Albuquerque has an active volunteer program that involves training of Trail Watch volunteers for monitoring trails, gatherings of volunteers for spring trailhead cleanups, and planting projects. Several of the city's open spaces have buildings and picnic facilities that residents are able to reserve and use. Examples for the Santa Fe Area include local partnerships for open space and trail management with the Trails Alliance of Santa Fe, Fat Tire Society, and the Santa Fe Conservation Trust (SFCT), which have partnered to care for trails in Santa Fe County.

Working with volunteers requires coordination and training. Therefore, a staff coordinator associated with the SFC OS and Trails Program or a contracted entity is critical to maintain an effective volunteer program. Santa Fe County currently has a volunteer coordinator in the Community Services Division who provides support for volunteer engagement in maintaining SFC OS properties and trails through special projects and the Adopt-an-Open-Space project (<https://www.santafecountynm.gov/open-space-and-trails-program/adopt-and-open-space>).

Developing a volunteer cadre may include:

- Identifying and training trail masters (or trail stewards) as liaisons for inspecting trails, coordinating maintenance, and representing or interacting with constituents on specific trail sections or open space areas



- Identifying and training groups and individuals in neighborhoods, organizations, youth groups, schools as liaisons for inspections, coordinating maintenance, and representing or interacting with constituents on specific trail sections or open space areas
- Mobilizing existing trail stewardship organizations, equestrian groups, biker associations, associations of outdoor enthusiasts, watershed groups, and other existing organizations, in coordinating and implementing stewardship work
- Organizing an adopt-a-trail or adopt-an-open-space group
- Establishing and offering training for a docent program at specific sites
- Developing award programs for excellence in inspections, monitoring, specific stewardship (e.g., innovative weed control, trail maintenance, or erosion and drainage management), and public education or docent work
- Community cleanup days and work days
- Annual appreciation celebrations and trainee certification celebrations
- Public “show-me” trips and excursions

Specific activities that volunteer stewards can help with include:

- Trail monitoring (see example monitoring form by volunteers in Appendix A5.1.3b)
- Identification and management of certain noxious weeds, such as bull thistle
- Trail maintenance
- Photo and water quality monitoring
- Small erosion control and water harvesting projects
- Maintaining a clearing of vegetation in access areas to recreation sites on the banks of rivers
- Monitoring for the presence/absence of beaver
- Placing wire protective cages around cottonwood trees to prevent cutting by beaver

Encouraging volunteers and access for open space users from diverse backgrounds, skills, and capabilities meets SFC goals to make resources available for everyone. Attention should be paid to inclusivity, opening access to the land for youth, people with disabilities, and people from a variety of cultural backgrounds. This means using language in interpretive signs and educational materials in Spanish, Keres, and Tewa, as well as English, if possible.

A5.1.4. Appreciation Activities

Recognizing the service of volunteers and acknowledging their contribution to community and the natural health of open spaces is a critical way to sustain, recruit, and cultivate leadership by community members in open space stewardship. Annual celebrations at which volunteers receive certificates of appreciation, or in the case of Master Naturalists, certificates of completion, are good ways to recognize volunteers. Awards can be given for maximum number of hours volunteered, completing complex tasks such as removing a patch of bull thistle, or completing a training certification.



A5.1.5. Site Specific Outreach, Community Engagement, and Land Uses

Each SFC OS property is unique in terms of a variety of interested constituents, the land uses desired by people, and even the dominant languages spoken, whether it be English, Spanish, or even Tewa. Some land uses may be compatible and others could be in conflict (such as a group shelter next to swings or a group shelter with barbecue grill next to a footpath through a natural riparian area). SFC OS staff will determine for each property whether it is appropriate to offer access to the public and what public uses make most sense. The following practices are useful for balancing public interests and uses with protection of the values and goals for which Santa Fe County purchased the property.

- Evaluate the goals and qualities for each property to determine if public access makes sense or would harm the property. For example, properties with the sole quality of protecting archaeological sites may be inappropriate for any public access.
- Determine the extent to which the SFC can adhere to the Americans with Disabilities Act (ADA) regulations on a case-by-case basis, depending on the character and values of the property and based on where conditions permit ADA accessible facilities such as trails, gates, bathrooms, and viewpoints.
- Solicit input and feedback from interested users of the property to define specific accommodations, signage, and facilities to develop. Certain properties may require phased development, with selected sites or even small park areas that go beyond traditional definitions of open space properties to accommodate specific user groups.
- Tailor outreach and engagement based on the interests of local neighbors in balance with the importance of serving residents county-wide as well as volunteer stewards.

GUIDELINES AND REFERENCES

- Albuquerque Open Space: Jim Sattler, jsattler@cabq.gov.
- Bernalillo County Open Space: Colleen McRoberts, calangan@bernco.gov.
- Master Naturalist Program Information for Bernalillo County Open Space: Appendix A5.1.3c.
- Trail Monitoring form for Bernalillo County Open Space: Appendix A5.1.3b.
- Santa Fe Botanical Garden has led the development of the Northern New Mexico Master Naturalist program (<https://santafebotanicalgarden.org/>). For more information, contact Mollie Parsons, mollie@santafebotanicalgarden.org. See a draft copy of the program policies and practices in Appendix A5.1.3a.

STANDARD A5.2. Protecting Volunteer Safety and Rights

All Santa Fe County OS program activities with community stewardship groups and volunteers adhere to worker safety, non-discrimination, rules for user ethics, and other county, state, and federal regulations that aim to protect volunteers' rights and safety.



PRACTICES

A5.2.1. Posting of Information on this Standard

In compliance with relevant federal, state, and county regulations, it is a Best Practice for OS staff and volunteer coordinators to inform volunteers and stewardship groups of non-discrimination rules, trail or open space user ethics, and rules and practices for safety during volunteer work. Such rules and practices can be posted online and on bulletin boards along trails and open space entrance ways. Handouts can be offered to volunteers and their organization leaders for posting in the offices of these organizations, if appropriate.

A5.2.2. Safety Briefings before Public Activities and Volunteer Work Events

Facilitating a safety talk with volunteers before participants begin doing service work is a very important Best Practice to help prevent injuries and reduce accident risks. A common way to start this procedure is to gather all volunteers for a conversation that begins with the question, "What kind of safety hazards could cause an injury?" This gives everyone a chance to contribute and brainstorm regarding what concerns exist, how to avoid problems, and what to do if a hazard presents itself. The person facilitating the discussion can add to the conversation to cover all potential concerns and reinforce the idea that if people are not careful and a person gets injured, everybody's experience at the event will be impacted. Have a plan in place to address how to reach first responders and to stay in communication if the group is going to different places on the property. Ensure that a first-aid kit is available to address small injuries such as blisters and scrapes.

A5.2.3. Liability Waivers

Open Space programs commonly ask volunteers to sign liability waivers, particularly if they are working with tools or doing service that involves the risk of injury. School groups nearly always have existing liability release forms signed by parents prior to field trips, so getting each student and their parents to sign a liability release may not be as high a priority as getting releases from adults. Two examples of liability releases, from Santa Fe County and from Jefferson County, Colorado, are shown in Appendix A5.2.3.

A5.2.4. Open Space and Trail User Ethics

Signage that encourages users of open spaces to leave the land as they find it when they arrive is a common Best Practice. The main elements of an educational sign are as follows:

- Provide a specific request, such as "Pack it in, pack it out."
- Explain why following the request is important, for example: "Removing natural items and cultural artifacts deprives other visitors of a complete experience of this land."

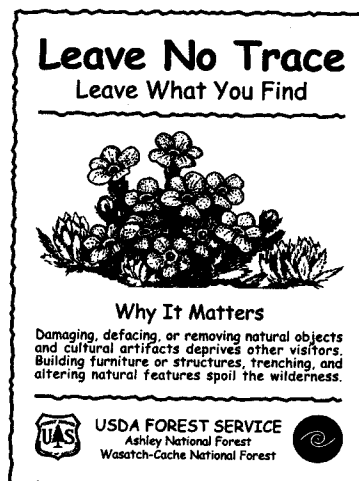


Figure 3. Example of a "Leave No Trace" Sign.



Another Best Practice is to post signs about trail ethics regarding who yields for whom on multi-use trails, how to interact with or avoid wildlife, what hazardous conditions to anticipate and avoid, how to act in cases of emergencies, how to respect cultural and biological resources, and why it is important to stay on trails and not trespass on neighboring land.

Numerous examples of signs addressing these issues are available on the internet.



B. NATURAL RESOURCE MAINTENANCE AND RESTORATION

B1. ECOLOGICAL DISTURBANCE PROCESSES

STANDARD B1.1. Staff Education about Ecological Processes

Santa Fe County OS staff stays educated about maintaining ecological disturbance processes on all OS properties. This means that besides management of ecological conditions, OS staff should also consider the natural changes and flow processes of nature, such as water flows, erosion, wind, dust, invasive plants, wildfire, plant pathogens, and climate change vulnerability, and carefully consider the impacts of these processes on resource resilience, visitor and user experience and safety, and maintenance needs.

OS staff realize that disturbance processes are not only negative factors that need to be curtailed. In fact, ecological disturbance processes can be considered management tools to rejuvenate ecological terrain conditions and increase landscape resilience, diversity, and visual quality.

PRACTICES

B1.1.1. Reading the Landscape

The first step in determining Best Practices for land management is to learn how to read the landscape. The questions that should be asked when doing an initial assessment include:

What processes are at work? For example, if plants are in poor condition, that is a symptom and not a cause. Causes could include lack of water, disease, or overgrazing by herbivores. In any assessment, rather than simply monitoring the symptoms, the assessor should determine the causes. Often in land management this means addressing the stressors that are contributing to the symptoms. Removal of the stressors should be the first step attempted when addressing land health issues.

Is the system resilient? Ecological resilience is an ecosystem's ability to recover from disturbance without shifting to a new ecosystem state (Figure 4). A grassland ecosystems, for example, may shift from grass-dominated plant communities to those dominated by shrubs or even to bare ground. If grassland ecosystems are not in a healthy state, their resilience is lower. Healthy grassland can recover from a disturbance (human made or natural) and still be grassland. Unhealthy grassland that has lost its resilience might shift to a bare-earth or shrub-dominated state after the same disturbances. Once the (eco)system is in a new state, it has crossed an ecological threshold, which makes it very difficult or unlikely that it can be returned to the previous state—even with expensive management intervention.



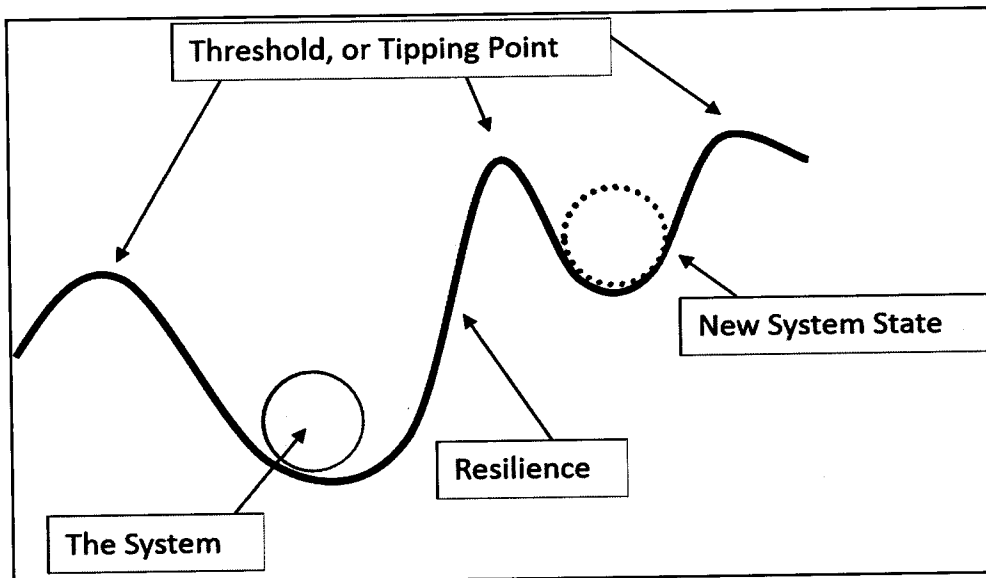


Figure 4. Process diagram of (eco)system states and their resilience to change.
Source: The Conservation of Change.

What interactions between biotic and abiotic processes affect resilience (or lack of resilience) in the ecosystem? For example, a biotic disturbance could be invasive and/or noxious plant species, (insect) pest species, or overuse by a particular animal species, while abiotic disturbances could be drought, fire, flooding, extreme heat or cold, or wind.

If the site is in a degraded condition, what forces altered the conditions to cause the site to become degraded? Identify the stressors in the system and determine if these can be removed or managed. If overgrazing is occurring, removal of livestock addresses the stress on the system. If the stress is drought, management becomes more complicated, because either water will need to be provided or other adaptations must be made, which will likely entail attention to many technical and legal requirements. A healthy system is resilient. Keeping systems in good health increases their resiliency and makes them more able to withstand disturbances and stressors that are beyond the management capabilities of SFC OS staff.

What are some realistic actions that might be taken to slow or halt degradation? If degradation is occurring or has already occurred, more active management should be undertaken to slow down or stop the cycle of degradation. The following Best Practices are actions for increasing resiliency and reversing the cycles of land degradation that may be present.

GUIDELINES AND REFERENCES

- Process diagram source: The Conservation of Change (Phil Loring, PhD), <http://www.conservationofchange.org/resilience/>.



B1.1.2. Soil Health and Soil Cover

Productive, stable soil is usually the foundation for a functioning ecosystem and productive landscape with limited maintenance requirements. When soils are productive, stable, and biologically active, we call them healthy. Such soils exhibit a top layer of coarse organic matter, such as leaves and twigs, called the O-Horizon. Beneath it is a layer of actively decomposing, fine organic matter with a presence of insects and earthworms. Below this layer there typically is a layer of very fine organic matter particles mixed in with mineral soil. This very fine, decomposed organic matter is also known as humus, and is essential for plant growth, biological activity, and water infiltration and retention in the soil. The depth of this layer with humus is telling for the productivity and health of the soil. Together, these two layers with decomposing organic matter are called the A-Horizon or topsoil (see Figure 5).

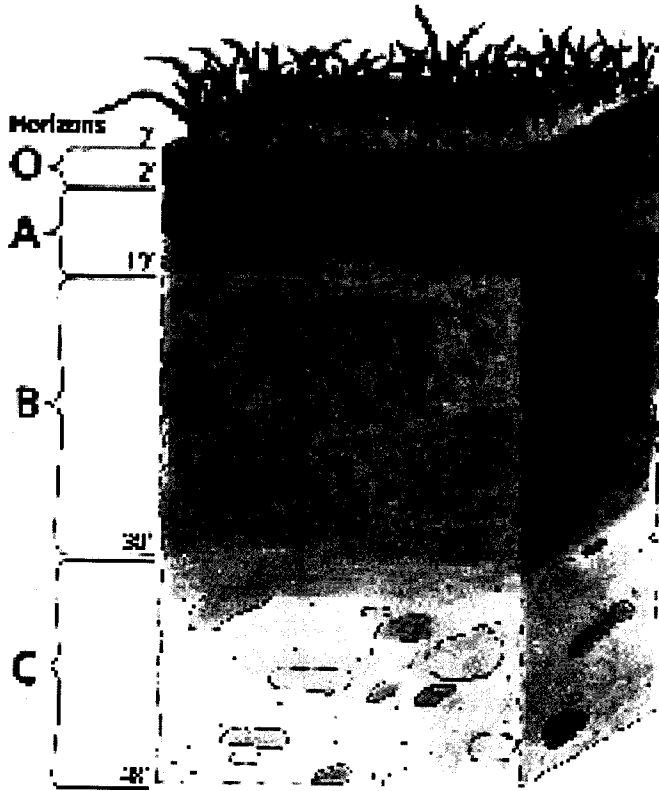


Figure 5. Diagram of typical soil Horizons. Source: NRCS Soil Profile Gallery.

Below the A-Horizon is a layer with much more mineral soil and far less organic matter, called the B-Horizon. This soil layer still includes biological activity of microbes, fungi, and root mass associated with plant roots and animal holes and tunnels. It is possible to see small pockets of humus along the roots. Further down is a layer, called the C-Horizon, which consists exclusively of mineral soil, where no biological activity is present. However, it is possible in some soils to see layers of historical biological activity in the C-Horizon, indicated by black bands of ashes, coal, or compressed and mineralized plant material.



A critical ecological Best Practice is to maintain and, wherever possible, grow the topsoil layer. This means that covering bare soil is essential to prevent it from eroding away to expose the B- or C-Horizon, where plant regeneration will be much more difficult. Soil cover Best Practices include:

- Cultivating a permanent plant cover (cover crops, permaculture, etc.)
- Applying an abiotic (non-organic) mulch, such as gravel or rock
- Applying a biotic (organic or plant-based) mulch, such as hay, straw, leaves, twigs, cardboard or paper, or old compost
- Applying slash and branches through lop & scatter techniques (see Appendix B3.1.1).
- Composting

Care should be given with all these practices to ensure that the applied cover material does not leach contaminants into the soil and does not include noxious weed seeds.

GUIDELINES AND REFERENCES

- NRCS Soil Profile Gallery: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/office/ssr7/profile/?cid=nrcs142p2_047970.

B1.1.3. Wind Erosion Control and Dust Management

Exposed (uncovered) soil subject to severe wind can lead to wind erosion, which is the removal of soil particles under the influence of air movement. Wind erosion degrades soil health and the Natural Resources Conservation Service (NRCS) has recognized it as the most serious form of soil erosion in New Mexico, with an annual average soil loss of over 14 tons per acre. Wind erosion often also leads to dust storms and safety hazards from lack of visibility on roads. Dust also leads to crop contamination and discomfort for people and animals.

The New Mexico Environment Department (NMED) Air Quality Bureau lists Best Practices for dust control (called Best Available Control Measures, BACM) at (<https://www.env.nm.gov/air-quality/dust-main-page/>). The NMED Air Quality Bureau recommends the following methods and also provides a pdf with Best Practices (or BACM; Appendix B1.1.3). These Best Practices include:

B1.1.3.1. Sprinkling and Irrigation

Sprinkling the ground surface with water until it is moist is an effective dust control method for haul roads and other traffic. This practice can be applied almost anywhere.

B1.1.3.2. Vegetative Cover

In areas not expected to handle vehicle traffic, vegetative stabilization of disturbed soil is often desirable. Vegetative cover provides coverage to surface soils and slows wind velocity at the ground surface, thus reducing the potential for dust to become airborne. A healthy



vegetation community feeds the soil. Soil microorganisms thrive in the root zone of plants. These soil microbial communities bind individual soil particles into soil aggregates, which are in themselves resistant to erosion by wind. Minimizing bare ground (but not completely eliminating, because wildlife species need some bare soil), by supporting a healthy plant community is key to reducing the amount of windborne soil particles. A diversity of plant species may insure that vegetative cover is adequate in any season.

B1.1.3.3. Mulch

In the absence of a healthy plant community, other ground covers that could reduce windborne soil particles include either plant-based or rock mulch. Keeping the soil covered with mulch is one of the most basic and most important ecological conservation and restoration measures in the Southwest. Mulching can be a quick and effective means of dust control for a recently disturbed area, and in most locations can reduce wind erosion by up to 80 percent. In addition, mulch helps build top soil and protects plants from adverse climate effects, leading to greater plant productivity and greater success in ecological restoration of disturbed sites.

B1.1.3.4. Windbreaks

Windbreaks are barriers (either natural or constructed) that reduce wind velocity and therefore reduce the possibility of suspended particles. Windbreaks can be trees or shrubs left in place during site clearing or a constructed barrier, such as a wind fence, snow fence, tarp curtain, hay bale, crate wall, or sediment wall. For each foot of vertical height, an 8-to 10-foot deposition zone develops on the leeward side of the barrier. The permeability of the barrier will change its effectiveness at capturing windborne sediment. A permeability of about 40-50 percent affords optimal effectiveness at capturing windborne sediment and providing a sheltered area with reduced wind speed.

B1.1.3.5. Tillage and Keyline Ploughing

Deep tillage in large open areas of loamy and clayey soils brings soil clods to the surface, where they rest on top of dust, preventing it from becoming airborne. Roughening the soil can reduce soil losses by approximately 80 percent in some situations. However, this practice is no longer considered a "best" practice because it results in loss of soil fertility. An alternative practice that has been tested and is being evaluated as a Best Practice by the NM Department of Transportation and other entities is the use of Keyline ploughing to increase terrain surface roughness while stimulating water infiltration and soil health

B1.1.3.6. Stone

Stone may be an effective dust deterrent for construction roads and entrances or as mulch in areas where vegetation cannot be established. The sizes of the stone can affect the amount of erosion to take place. In areas of high wind, small stones are not as effective as 8-inch stones.



B1.1.3.7. Spray-on Chemical Soil Treatments

Examples of chemical adhesives include anionic asphalt emulsion, latex emulsion, resin-water emulsions, and calcium chloride. Chemical palliatives should be used only on mineral soils. When considering chemical application to suppress dust, consideration should be taken as to whether the chemical is biodegradable or water-soluble and what effect its application could have on the surrounding environment, including water bodies and wildlife. Polymer stabilization methods range from 70 percent to 90 percent effective, according to limited research.

B1.1.4. Drainage and Erosion Control

Soil Erosion is defined as the movement of soil particles by wind or water. Loss of the top layer of the soil (a.k.a. "soil loss") often reduces the resilience of the ecosystem to recover from disturbance. Soil loss negatively impacts the ability of land to produce vegetation. Water driven soil loss also has implications for water pollution, as increased sediments from soil erosion enter water bodies and creeks, streams and rivers. Overland flow is called sheetflow, while flow captured in rills, gullies, and streams is called channelized flow. Both carry sediment in the form of eroded soil particles (Figure 6).

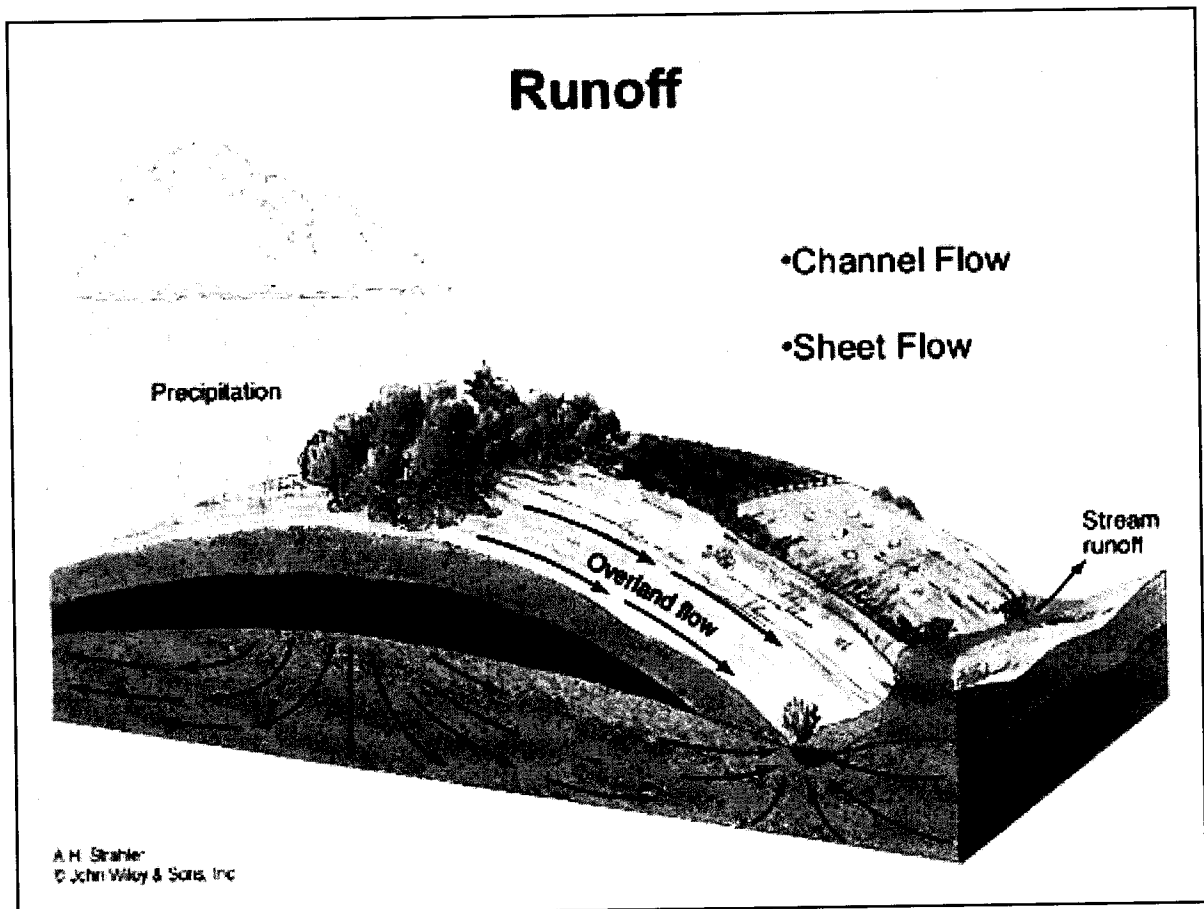


Figure 6. Sheet flow and channelized flow over a landscape.



The amount of precipitation that falls cannot be controlled by any land manager. What can be controlled is the amount of bare ground that is subject to the forces of wind and water. Managing the landscape to have the highest amount of ground cover possible is the best way to prevent soil erosion. Live vegetation (Figure 7) is the best way to slow soil movement. In arid and semi-arid environments, 100 percent ground cover is rarely possible, and is not recommended for wildlife management (wildlife need some open spaces for movement, foraging, etc.). Plant litter (mulch) spread over the interspaces also helps slow soil loss. Even rock cover prevents soil loss.

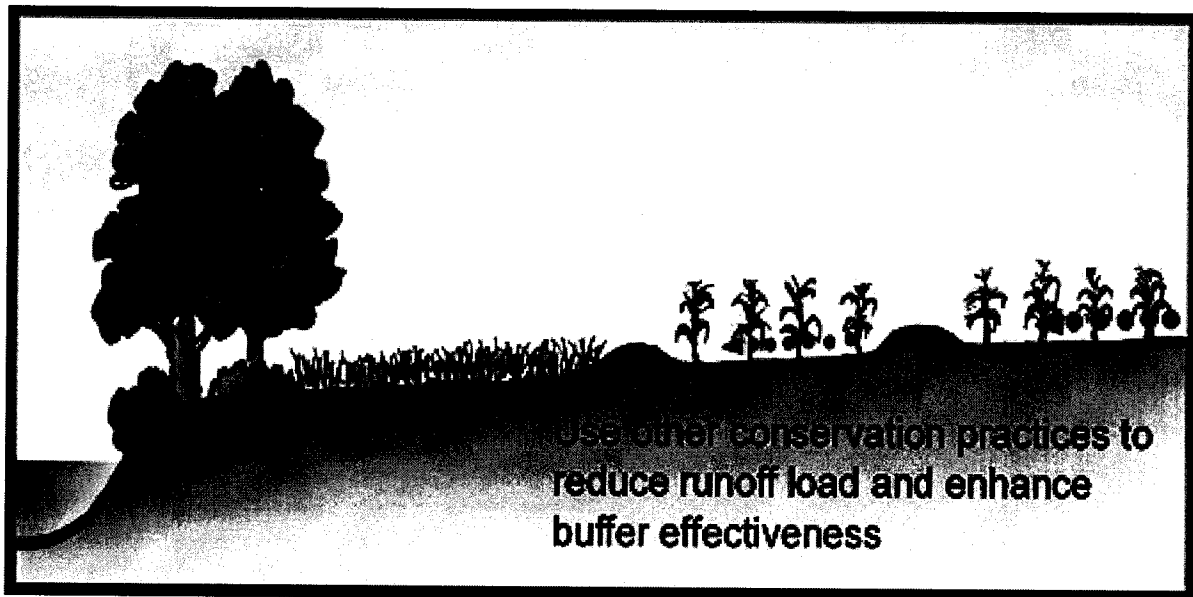


Figure 7. Vegetation slows movement of soil particles and keeps soil sediment and other pollutants from entering streams.

Once soil erosion problems are observed, there are many ways of stabilizing the landscape. In cases where erosion has progressed to the stage of channelized flow in rills and gullies, more intensive stabilization and remediation techniques are necessary.

There are many Best Practices used for soil stabilization. Bill Zeedyk has pioneered a bio-technical engineering approach based on the use of local materials (Zeedyk and Clothier, 2014). Watershed Artisans, Inc. has created a laminated booklet with erosion control structures which is a useful guide to building structures on-site (Appendix B1.1.4).

There are many other techniques that use a more geo-technical engineering approach, based on the use of inert and synthetic materials that are typically brought in from outside the work area. Some of these Best Practices are required for stormwater management on construction sites. The New Mexico Department of Transportation follows the National Pollutant Discharge



Elimination System (NPDES) Manual produced by the Environmental Protection Agency (EPA). Many BPs are discussed in detail in this document. (See also Section A4.1.7.)

There are many ways to prevent soil erosion. Ensuring that the plant community is healthy and minimizing the extent and connectivity of bare soil is the best prevention. Ground cover prevents soil erosion by wind and water. Once vegetative cover is diminished enough that erosion becomes a problem, an expert in erosion control and site stabilization should be consulted. (The SFC Sustainable Land Development Code addresses some Best Practices in various sections of its chapter 7).

B1.1.5. Invasive Plant Management

Invasive plant management practices comprise a set of strategic steps with the following components:

- Knowledge about invasive plants, and especially regulated noxious weeds
- Planning weed management interventions
- Implementing appropriate weed management interventions

B1.1.5.1 Knowing about Invasive Plants

A weed is a wild plant growing where it is not wanted and in competition with cultivated plants. A *noxious* weed is a plant that is considered harmful to animals or the environment and is required by law to be controlled by all landholders in an area. Weeds and noxious weeds are invasive plants.

Invasive plant problems are a consequence of bare ground, and thus the best prevention to an invasion is ground cover. Weed species ensure their success by taking advantage of site characteristics, such as exposed or disturbed soil and range, and/or pasture or groundcover that is weakened by disease, pests, or poor management. Weed plants are very competitive; they grow well in spite of interference from other plants. Once unwanted species have invaded an ecosystem, they will persist and will return year after year. They reproduce vigorously and spread seeds effectively.

It is important to control invasive plant populations while the invasions are small. Once the invasion has passed a certain threshold, control becomes more difficult and expensive. The invasion curve figure below (Figure 8) shows the chronology of an invasion by an unwanted species.

The most important reason to control invasive species is that they can change the basic ecology of a system. Once a threshold or tipping point is crossed, it is almost impossible to restore a system to its original biodiversity and function. According to a study in the journal *Invasive Plant Science and Management*, when invasive plants spread, they can leave behind a legacy of alteration in the native soil. Even after an invading species has been controlled,



its effects can inhibit the regrowth of native plant species. Some noxious weeds form a monoculture, which excludes native plant species. The causes of this process are still being investigated and may involve changes in soil food webs, soil microbial communities, and mutualistic fungi.

Woody species such as Russian olive (non-native) and juniper (native) are often invasive. Invasion without set-back disturbances, such as wildfire to set back juniper invasion into grasslands, can result in the change of a system from grassland to shrubland, which means that the system has crossed a threshold or tipping point (Figure 9). Non-woody noxious weeds can also cause a system to cross a tipping point.

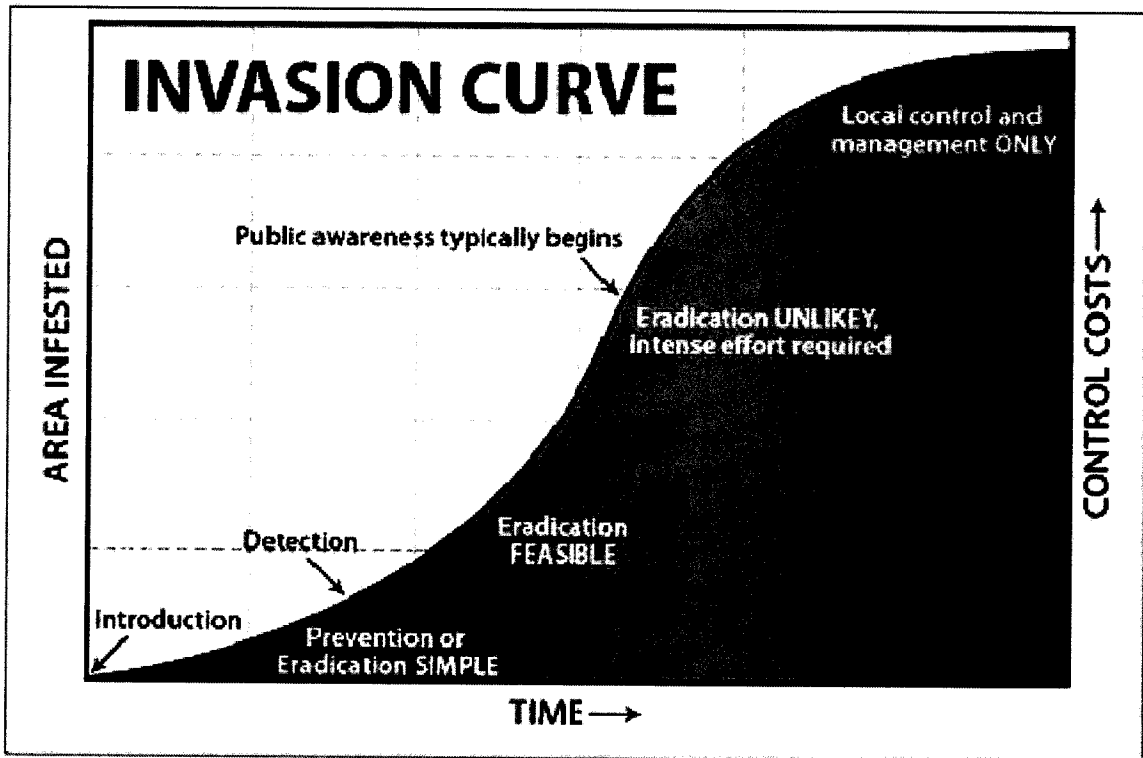


Figure 8. Diagram of the chronology of an invasion by an unwanted species.

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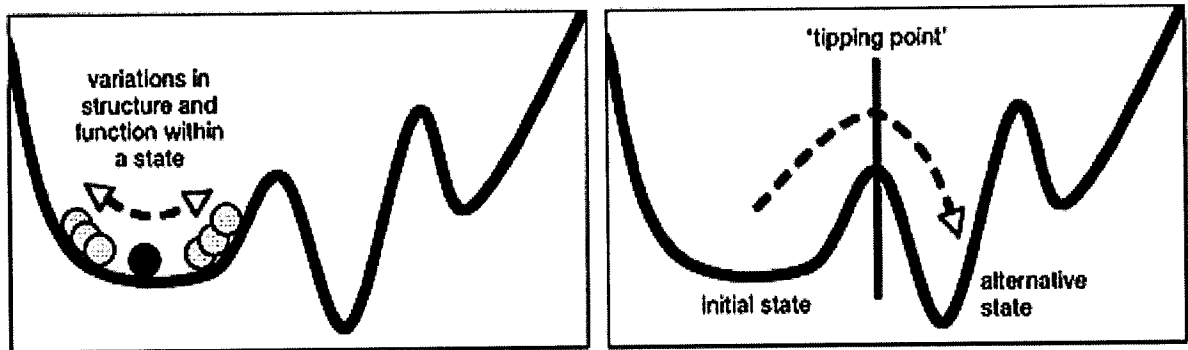


Figure 9. Diagram illustrating ecosystem tipping points. The balls represent the range of possible conditions that normally exist in any given year. If the system is disturbed beyond its resilience capacity, it tips to a new state (for example, shrubland to desert).

B1.1.5.2. Weed Management Plan

The best way to combat invasive plants is to develop a weed management plan that includes partners and neighbors. The New Mexico Department of Agriculture (NMDA) is tasked with helping land owners combat noxious weeds. Cooperative Weed Management Areas (CWMAs) in New Mexico are formed of partner groups and land owners working together to control noxious weeds. There is a CWMA for Santa Fe County. Contact information for all New Mexico CWMAs is provided by NMDA. This information, weed identification guides, and specific weed control measures are included in Appendix B1.1.5.2.

B1.1.5.3. Best Practices for Invasive and Noxious Species Control

The United States Department of Agriculture (USDA), National Invasive Species Information Center provides in-depth information on Best Practices for control of noxious weeds. Best Practices are listed below. Often multiple practices are necessary for long-term control and eradication. A comprehensive management plan from the United States Department of the Interior, National Invasive Species Council is included in Appendix B1.1.5.3.

- *Biological control* methods include grazing, introduction of insects to feed on noxious weeds, and the use of pathogens to manage weed infestations. Use of non-native biological control agents is NOT recommended, as many times these species can become invasive themselves.
- *Chemical control* is the use of herbicides, which must be administered by a licensed applicator. Chemicals can be selective (targeted at a specific weed population and not harmful to other vegetation) or non-selective (resulting in a complete eradication of all vegetation). Chemical control can be expensive, sometimes harms desirable vegetation or insects or other animals, and should only be used on small or recent weed infestations. Use of chemical requires a thorough understanding of the pesticide label, which contains information about proper use of the herbicide as



a well as personal safety requirements. Read the pesticide label before applying chemicals to control unwanted vegetation.

- *Cultural control* methods can be applied to reduce the suitability of the soil for weed growth. Some of the components of cultural control include applying fertilizer to encourage wanted vegetation, increasing the plant canopy cover to limit light to weed seedlings, and revegetation of an infested area with native species to compete with weed species.
- *Mechanical control* methods are often the most time and labor intensive but the benefits include avoiding the use of pesticides. Various forms of mechanical control include hand pulling or cutting, tilling, mowing or weed-eating, and burning. Several effective tools have been designed for mechanical control, including the weed wrench, a sample of which is shown in Figure 10 (next page).

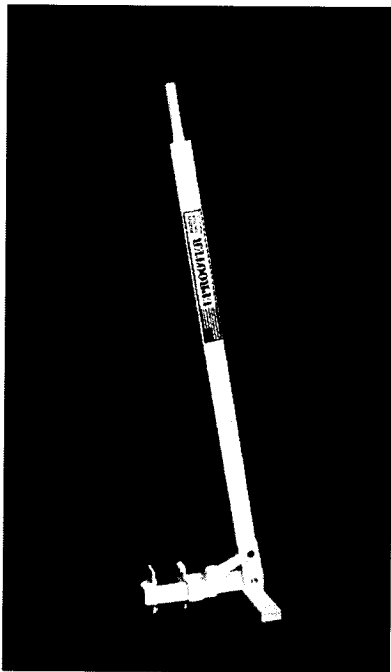


Figure 10. Typical weed wrench

GUIDELINES AND REFERENCES

- Weed wrench reference: <https://www.theuprooter.com/>.

B1.1.6. Pest Management

Similar to managing weeds and noxious weeds, plants and entire ecosystems can become infested with an overpopulation of undesirable and harmful insects, micro fauna, or microbial life forms that cause the destruction of plants or animals and may even present a potential



hazard to people. Pest management practices comprise a similar protocol as that for weed management:

- Knowledge about pests
- Planning pest management interventions
- Implementing appropriate pest management interventions

Pest management requires expert advice, and Santa Fe County will need to hire pest management expertise when pests are suspected or detected. Typically a combination of multiple pest management practices, aka Integrated Pest Management (IPM), are necessary for long-term control and eradication in ways that are least harmful to people, wildlife, and crops. As with combined approaches to weed management, IPM combines biological, chemical, cultural, and mechanical control methods.

In both pest management planning and implementation of IPM, collaboration with institutional partners, landowners, and community groups is important for effective results. There are examples of successful community-based programs for IPM in various other counties around the country, such as in Marin County, CA. Excerpts of examples of community-based collaboration on IPM are included in Appendix B1.1.6.

GUIDELINES AND REFERENCES

- Integrated Pest Management (IPM) and Pesticide Safety Education Program: <http://pep.wsu.edu/wp-content/uploads/sites/7/2015/05/learningaboutlabels.pdf>.
- USDA, National Invasive Species Information Center, Manager's Tool Kit: <https://www.invasivespeciesinfo.gov/toolkit/preventionbmp.shtml>.

B1.1.7 Fuel Build Up and Wildfire Management

Following annual or less frequent assessments of fire hazard in woodlands and forests on OS properties, OS staff may feel the need to decide to reduce the wildland fire risk. OS staff will want to coordinate such activities with the Wildland Division of the Santa Fe County Fire Department and also with any adjacent landowners, in particular those with fire management capabilities, such as the US Forest Service and the City of Santa Fe. In a residential area, outreach to private landowners about fire risks may be of importance to reduce the potential spread of wildfire from adjacent private properties onto OS property and to inform neighbors of planned fire risk reduction treatments on the OS property. Partners in the Greater Santa Fe Fireshed Coalition may be of assistance in this outreach work.

BPs for the reduction of fuel load build-up and wildfire management vary between ecological types and even between specific terrain units. In some cases, treatments would require the reduction of stem densities in woodland or forest stands, the reduction of fine fuels on the forest floor, or the reduction of senescent grass and shrub vegetation in and around the woodland and forest areas. A variety of factors play a role in the detailed development of a



treatment prescription, such as tree vigor, age classes among trees, vigor of undergrowth, aspect and slope, soil loss hazards, wildlife habitat needs, visual quality aspects, and the desire to return forest conditions to a state that can accommodate natural, low-intensity fire.

OS staff has a choice between the use of template or standard treatment prescriptions developed for the majority of smaller OS properties with limited fire risk or the use of more detailed approaches. OS staff can rely on specific treatment prescriptions developed by or for Santa Fe County or by neighboring public forest management agencies. Consultation with the Wildland Fire Division will be important to ascertain the appropriateness of any older prescriptions or prescriptions from neighboring agencies for use on the OS property. For complex situations and for forest conditions with unknown or a large number of variables, OS staff would be well advised to hire a consultant to conduct a fire hazard assessment and develop site specific prescriptions for fuel load reduction, forest health improvement, and wildfire prevention.

Proposed BPs should always meet the State Forestry regulations for New Mexico in their design and implementation (NMAC Title 19, chapter 20).

GUIDELINES AND REFERENCES

- Greater Santa Fe Fireshed Coalition: (<http://www.santafefireshed.org/>).
- New Mexico forestry regulations: New Mexico Administrative Code Title 19, chapter 20: <http://www.emnrd.state.nm.us/SFD/ForestMgt/documents/ForestPracticesGuidelines2008.pdf>.

B1.1.8. Climate Vulnerability and Adaptation

The Southwestern United States, including New Mexico, is already realizing the effects of climate change in reduced snowpack and stream flows, agricultural losses due to a reduction in the quantity of irrigation water, increased threat of high intensity wildfire, and rising temperatures. Good land management changes are crucial for surviving a changing climate in New Mexico.

A system that is more resilient is less vulnerable to the effects of climate change. For SFC OS properties, decreasing the amount of bare ground and soil erosion by increasing grass and forb species cover will make the landscapes more resilient. Healthy and resilient systems also have the advantage of mitigating atmospheric carbon dioxide (CO₂) by sequestering soil carbon at the local level.

Any treatments planned should take into consideration a site's resilience (biodiversity and good ground cover) that affect its ability to adapt to variable conditions. When possible, drought resistant species should be chosen for revegetation activities to make the site less vulnerable to the more variable rainfall and higher temperatures.



For any land management and maintenance activities, the question should be asked, *How will predicted changes in climate affect desired results?* Is the system vulnerable to the effects of climate change (e.g. drought)? Will the system have the ability to adapt to the more harsh conditions that are predicted under advancing climate change?

GUIDELINES AND REFERENCES

- New Mexico forestry regulations: New Mexico Administrative Code Title 19, chapter 20:
<http://www.emnrd.state.nm.us/SFD/ForestMgt/documents/ForestPracticesGuidelines2008.pdf>.
- The Nature Conservancy, New Mexico Conservation Science Projects:
http://nmconservation.org/projects/nes_mexico_climate_change.



B2. WILDLIFE MANAGEMENT

STANDARD B2.1. Protection of Listed Wildlife Species

Santa Fe County OS adheres to all state, federal, and international regulations regarding the protection of any listed threatened and endangered species, species of greatest conservation need, and species of special concern to indigenous communities. The SFC OS Program prioritizes work to protect these species in all its wildlife conservation activities for OS management. A list of wildlife species of high conservation need in Santa Fe County may be found in Appendix A4.1.5a.

PRACTICES

B2.1.1. Wildlife Species Identification

SFC OS staff maintains a list of listed species and engages in ongoing self-training and training of maintenance personnel in wildlife species (including birds, insects, etc.) identification by sight, sound, track, and sign. Identifying wildlife species is the first step in wildlife management and in protecting listed species. A next step is learning about species' preferred habitat, their behavior, seasonality, life cycles, and other characteristics. The use of wildlife guide books, web apps, tally charts, binoculars, and cameras, etc. is of great use in the ongoing learning process.

B2.1.2. Wildlife Documentation

SFC OS staff document wildlife sightings and observations of tracks and other signs of wildlife. Documentation can be done with tracking forms as well as with hand-held cameras and stationary wildlife camera traps.

B2.1.3. Wildlife Research

Listed species of concern and their habitats are relatively well documented. However, in many cases more research is necessary. Research begins with studying maps and reports to identify the possible presence of listed species on County OS properties or its vicinity. When more information is required for proper management, SFC OS staff may need to consult experts with government agencies, non-profit entities, and or consulting businesses, or hire consultants to conduct a biological survey.

GUIDELINES AND REFERENCES

- New Mexico Avian Conservation Partners: <https://www.avianconservationpartners-nm.org>
- New Mexico Department of Game and Fish, BISON-M information: <http://www.bison-m.org/speciesreports.aspx>.
New Mexico State Wildlife Action Plan: <http://www.wildlife.state.nm.us/download/conservation/swap/New-Mexico-State-Wildlife-Action-Plan-SWAP-Final-2017.pdf>.
- Partners in Flight: <https://www.partnersinflight.org>
- UNM Natural Heritage New Mexico: <https://nhnm.unm.edu/>



STANDARD B2.2. Management of Wildlife Habitat

Santa Fe County OS maintains the most up-to-date practices for management of wildlife habitat, providing safe passage of wildlife across roads and developed areas, and maintaining viable connective pathways between core habitat areas to maintain species diversity and viable population sizes.

PRACTICES

B2.2.1. Identifying and Enlarging Habitat through Terrain Management

Wildlife habitat can be identified by field observations, described above, and by study of plans and documents that describe existing and proposed habitat. Based on habitat research, it is possible to identify areas that could serve to expand the protected area for wildlife. Measures for wildlife habitat expansion include:

- Fencing out people and dogs
- Constructing wildlife-friendly fencing
- Educating landowners about species of concern, dog management, and access limitations
- Identifying areas as restricted and protected through signage, closing roads and trails, and ending active-use activities
- Constructing water sources and restoring wetland habitat
- Restoring forage, such as grass, forbs, pollinator plants, tubers, berry plants, and shrubs
- Managing and restoring cover by planting trees and shrubs and restoring riparian habitat
- Maintaining and protecting roosting trees, downed logs, brush piles, and caves from human interference
- Restoring and protecting connective corridors beneath (or over) roadways (by clearing or building underpasses and large culverts), across the land, or along streams and riparian areas to connect core habitat areas
- Conducting forest health thinning, when appropriate
- Delaying, or limiting, mowing to benefit certain species
- Managing and preventing wildlife diseases and infections, such as white-nose syndrome (for bats), and chytrid fungus (for amphibians)
- Making every effort to avoid removing prairie dog colonies; when relocation is necessary, prairie dogs should be live-trapped and relocated to appropriate habitat, which may include on County open space property, as suitable to the site and management plans.



B2.2.1.1. Management of Underpasses and Culverts for Wildlife

Roads can block important wildlife pathways and can be lethal for animals that try to cross them. Animal populations can become fragmented, or are forced to cross a road, leading to accidents that can create lethal situations for people and wildlife. Fortunately there are many techniques to make road crossings and culverts wildlife friendly. Maintaining and upgrading road underpasses or culverts will improve wildlife observation opportunities, hunting and fishing, and ecological diversity on open spaces.

Culverts can be upgraded particularly where they are undersized and restrict stream flow, causing scouring, erosion, and clogging. Terrestrial wildlife like deer, bear, and elk prefer to have natural surfaces and a clear line of sight from the beginning to the end of the crossing in order to use it. Undersized culverts lead to isolating animal populations by fragmenting populations of fish and wildlife. Bridges or open arch and large oval-shaped culverts are preferred because they allow the stream to retain many of its natural characteristics and are able to handle a wider variety of flow conditions. At the same time, larger structures get clogged less frequently and require less maintenance. Figure 11 (next page) is an example of an undersized culvert that causes a barrier to wildlife migration and erosion problems, shown in comparison to a wide oval culvert that is wildlife friendly.

Best Practices for culverts or underpass installation include:

- Culverts wide enough to carry baseflows without altering the depth of the stream
- Additional culverts on floodplain terraces (at bankfull elevation) to allow higher flood flows to spread over the floodplain rather than concentrate in high velocity flows in the center of the channel
- Culverts or underpasses tall enough to allow larger terrestrial animals, such as deer or bear, to pass along the river channel
- Culverts or underpasses that are bottomless to allow natural river substrate to fill the bottom and enable aquatic organisms to use or colonize the area
- Culverts that do not have drop inlets and thus provide a good line of site, allowing animals to see to the end of the culvert



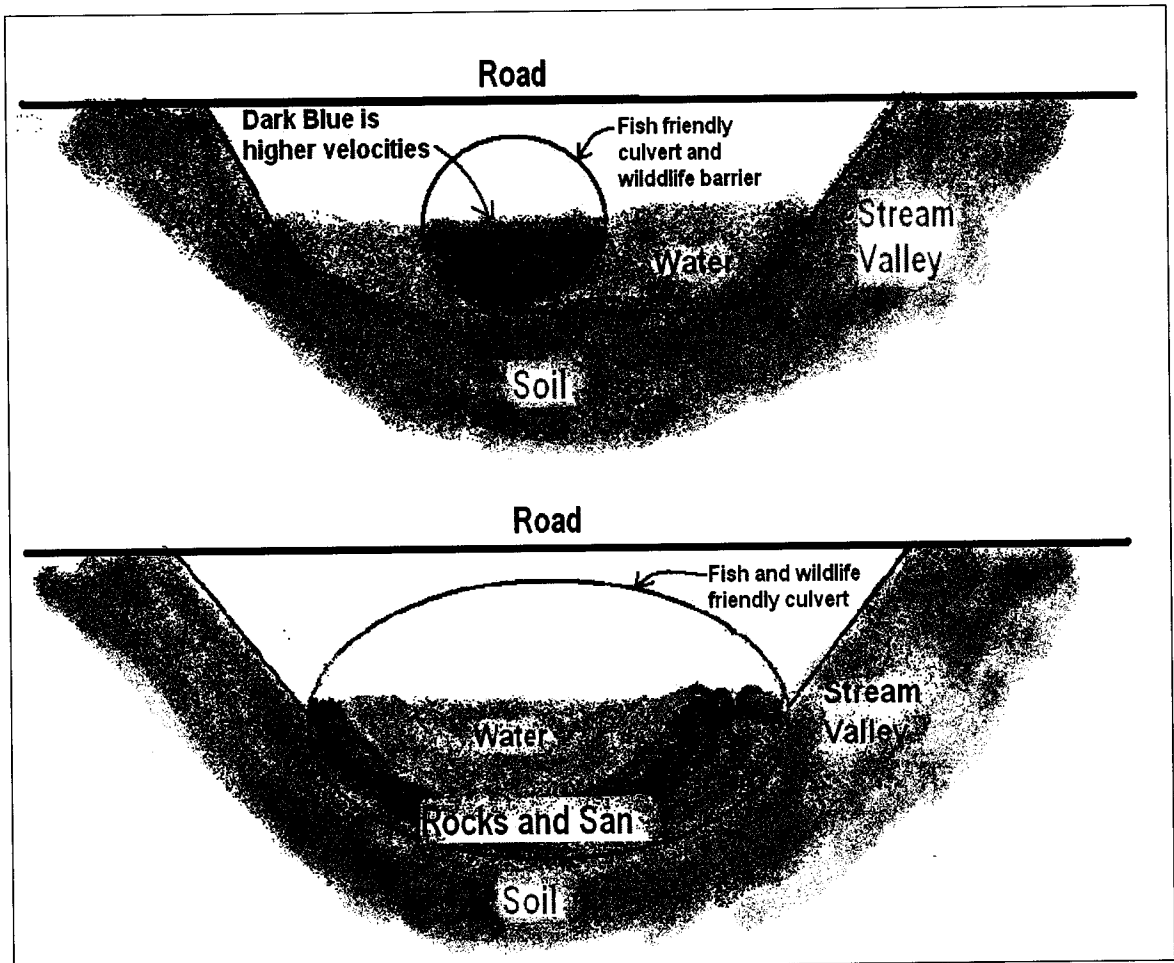


Figure 11. Diagrams of an undersized wildlife barrier culvert shown above and an oval culvert that is wildlife friendly shown below.

B.2.2.1.2. Signage for Wildlife Management

Clear communication of messages and expectations is essential for management of open space in general, and also where it pertains to protection of wildlife and its habitat. Signs may serve to inform people of site hazards, give information about where the public is allowed, set boundaries on what is allowed in the open space, and be educational or interpretive. The following images provide some examples (Figure 12, next page).

While signs are important ways of imparting information at sites where no SFC staff is available to answer questions or provide direction, it is also important to preserve the scenic value of open space by minimizing the number and size of signs. Sign locations and visibility must be well planned in order to preserve the scenic quality of the landscape.





Figure 12: Samples of signs for wildlife management.

B2.2.1.3. Supplemental Water Sources

Water is critical for wildlife and there are many innovative Best Practices for providing water for wildlife, as well as ensuring that water sources are safe for smaller animals. Recommendation for water distribution for wildlife species according to animal group have been recommended by Texas A&M University AgriLife Extension.

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Recommended Water Distribution According to Animal Group

- Large Mammals – 1 per 320-640 acres
- Medium Size Mammals – 1 per 320 acres
- Smaller Mammals – 1 per 80-160 acres
- Wild Turkey/Mourning Dove – 1 per 320-640 acres
- Quail and Most Song Birds – 1 per 80 acres

There are many models for wildlife waterers that, unlike laying pipe or drilling wells, do not require extensive infrastructure. Figure 13 illustrates a wildlife waterer that harvests rainwater.

Once the type of supplemental water is chosen, specific considerations for the safety of smaller animals is necessary. Bat Conservation International (BCI) provides a guide for installing escape ramps and discussing wildlife access needs (Figure 14), they also provide details for design of wildlife waterers for bats, which have very specific, important needs.

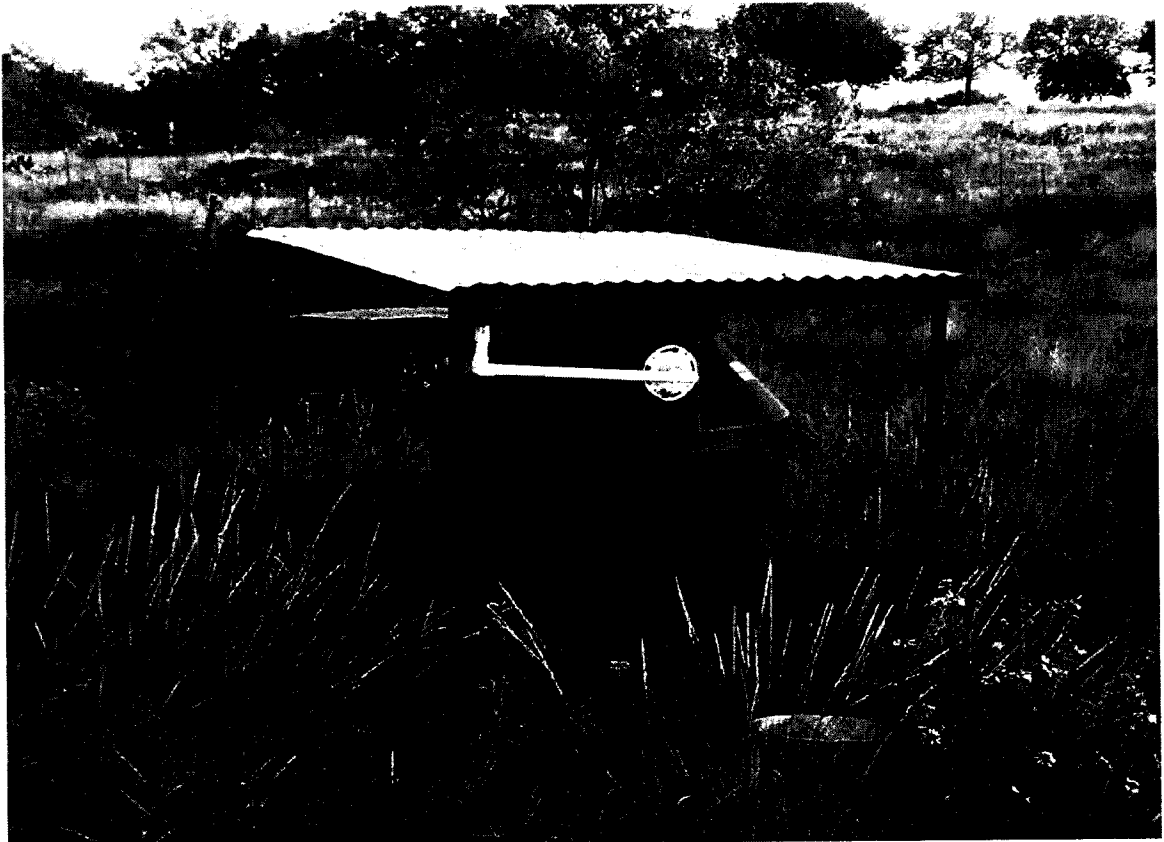
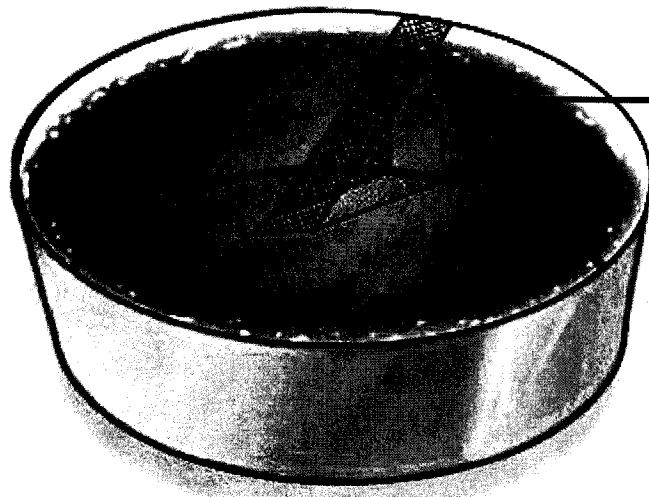


Figure 13. Wildlife waterer that harvests rainwater. Source: Bat Conservation International.



LIVESTOCK WATER TANK WITH ESCAPE RAMP



Expanded metal (1/2 inch) can be used as an escape ramp for small animals and birds. Ramp sides should extend to side of tank.

(Note: No obstructions or obstacles should be present on the surface to allow birds and bats to skim water.)

Figure 14. Diagram of a livestock and wildlife water tank with escape ramp. Source: North Dakota Game and Fish Department.

B2.2.1.4. Wildlife-Friendly Fence Design

Fences are necessary to achieve land management objectives. Fences have to be well placed and robust enough to prevent trespass, contain or exclude livestock, and avert undue hazard for wildlife species access and movement.

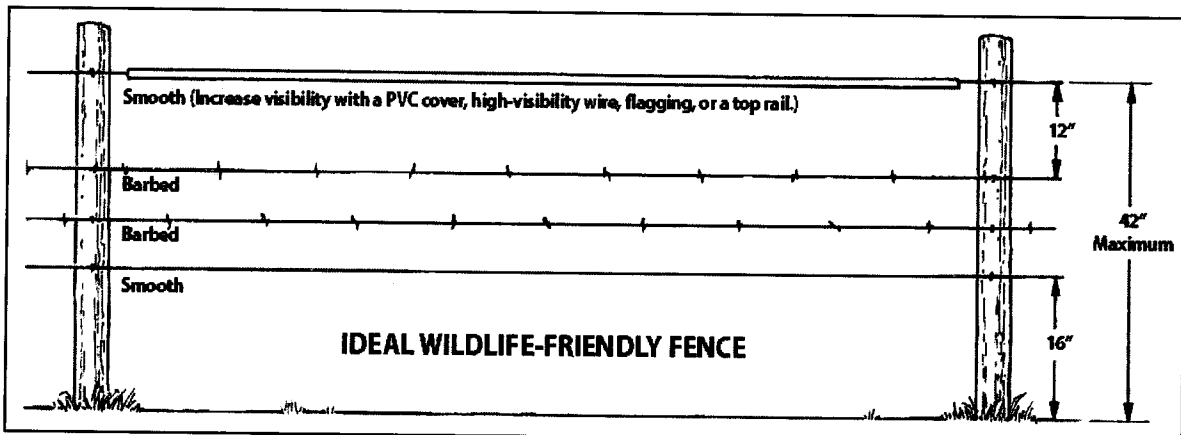


Figure 15: Ideal wildlife-friendly fence. Source: Colorado Parks and Wildlife.

There are many Best Practices manuals for construction of wildlife friendly fences, particular to the needs of specific wildlife species. The height of the bottom wire is important for pronghorn species, which are likely the species most impacted by fences



constructed to contain livestock. Raising the bottom wire is important for many wildlife species and will still function to contain livestock and exclude ATV trespass. For new fence construction, BPs for wildlife friendly fencing should be followed and include replacing the use of barbed wire with smooth wire for top and bottom strands in order to avoid injury or fatality to wildlife species seeking to cross a fence (see Figure 15, previous page). There are many good and detailed BPs for constructing or modifying existing fence, including “Fencing with Wildlife in Mind,” from Colorado Parks and Wildlife.

B2.2.1.5. Sheltering Vegetation

Wildlife habitat is composed of four elements; food, water, cover, and space. Different wildlife species will have specific requirements based on their needs. Sheltering vegetation provides wildlife cover, which species need for protection from wind, heat, cold, precipitation, and predators. Wildlife species will not remain in areas where there is no cover provided by sheltering vegetation or terrain features such as large rocks. Brush piles and slash retention may also provide wildlife cover, as may trees and shrubs growing in fence lines in more open habitats. Whenever possible, dead trees (snags) should be left standing to provide habitat for cavity nesting species.

Maintaining a diversity of plant species will enhance wildlife habitat. Ground cover is important, but vertical structure is important as well. The multiple tiers of vegetation in riparian zones are an example of a diverse vertical structure of wildlife habitat. The herbaceous vegetation layer, the shrub layer, and the tree canopy prove sheltering vegetation for a multitude of different species.

In grassland and wetland habitats, the diversity of grass species and the occasional shrub species provide the complexity of habitat necessary to host a diversity of native wildlife species. Plant diversity also provides the diversity of food sources, necessary to maintain a diversity of wildlife. All forest and woodland thinning projects should take into account the effect of removing sheltering vegetation. Where possible, thinning projects should leave big trees and small clumps of trees and maintain a certain number of dense groups as well as snags.

B2.2.1.6. Nesting and Roosting Places

Santa Fe County is habitat to hundreds of species of birds. Many of these bird species depend, for their nesting and roosting places, on diverse tree species with dense canopies and open canopies, in forest edges and hedgerows, as isolated tree specimens, and as snags. Other species use bridge beams, eaves on buildings, caves, cliffs, rock ledges, and other hidden places in and on inert surfaces for their nests and roosts.

Open space maintenance personnel and managers must be aware of these critical terrain characteristics and are advised to maintain a diversity of such vegetation and structural elements on the SFC OS properties. This is particularly critical near water bodies and in



undisturbed areas (away from human habitation), where the habitat value of the land is likely to be high.

B2.2.1.7. Pollinator Habitat

In recent years, pollinators have been decreasing in number and diversity. Pollinators are extremely important to humans and other species because they are responsible for pollinating approximately two thirds of all agricultural crops and 85 percent of native plant species. Limiting or eliminating pesticide use is important for maintaining pollinator populations and providing them with good habitat. Native vegetation is important and provides nectar from flowering plants as well as protection from wind (Figure 16). An assessment protocol for pollinator habitat is included in Appendix B2.2.1.7, along with a guide to pollinator biology and habitat from the NRCS.

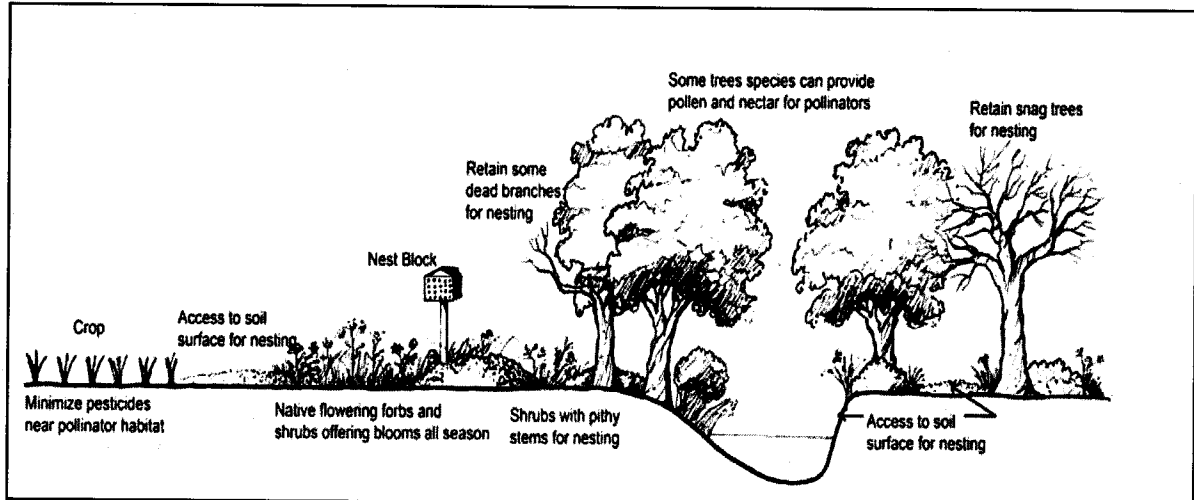


Figure 16: Pollinator habitat requires native vegetation as some bare ground for ground nesting pollinators.

GUIDELINES AND REFERENCES

- Bat Conservation International, "Water for Wildlife – A Handbook for Ranchers and Range Managers": <http://www.batcon.org/pdfs/water/bciwaterforwildlife.pdf>.
- Bird roosting and nesting habitat: <https://www.for.gov.bc.ca/hfp/training/00001/module03/wildlife-trees.htm>.
- Colorado Parks and Wildlife, "Fencing with Wildlife in Mind": <http://cpw.state.co.us/Documents/LandWater/PrivateLandPrograms/FencingWithWildlifeInMind.pdf>.
- North Dakota Game and Fish Department: <https://gf.nd.gov/plots/landowner/food-plots>.
- Practices for common wildlife management: 2018 State Wildlife Action Plan: <http://www.wildlife.state.nm.us/conservation/state-wildlife-action-plan/>.
- Texas A&M University AgriLife Extension: <https://agriflifeextension.tamu.edu/>
- Wildlife Friendly Culverts: <http://wildlfc1.webs.com/>.
- Xerces Society (information on pollinators and their importance to other species): <https://xerces.org/pollinator-conservation/>.



B3. FOREST AND WOODLAND MANAGEMENT

STANDARD B3.1. Forest and Woodland Management

Santa Fe County OS maintains the most up-to-date practices for forest and woodland management as stipulated or required by the State of New Mexico. SFC could voluntarily adopt more demanding standards and practices from entities promoting excellence in forestry, such as universities, the New Mexico Forest and Watershed Health Institute, the Forest Stewards Guild, the Sustainable Forestry Initiative, and the Forest Stewardship Council.

PRACTICES

B3.1.1. Forest Health and Stewardship Treatments

Forests are complex, multidimensional ecosystems that require expert management support. Detailed recommendations for treatment prioritization, monitoring, and suggested treatment practices are included in the 2018 Forest Health Thinning Prescriptions and Monitoring Plan for Santa Fe County Open Space Properties. Samples from this report regarding a template prescription, recommendations for Best Practices regarding thinning, and lop and scatter treatments are included in Appendix B3.1.1.

A practical list of BPs in forest and woodland management which are applicable to most OS properties, which OS personnel will be able to perform, and which address constituents' most important concerns regarding forest and woodland management include:

1. Maintaining plant (tree) diversity and structural diversity (alternating openings and dense forest)
2. Maintaining views beneath, between, and over the trees
3. Maintaining accessible trails by clearing them of overhanging brush, branches, and fallen limbs and logs
4. Maintaining safety in publicly accessible forest areas by removing old and leaning trees
5. Halting soil loss and stabilizing headcuts, eroding slopes, and drainages (rills and gullies); preventing wind erosion and sheet erosion by keeping the ground covered
6. Preventing high-intensity and catastrophic wildfire by thinning forest and woodland areas, removing fuels, and maintaining defensible space between forest land and infrastructure and buildings
7. Preserving large trees and "releasing" them from impacts from brush and smaller trees that grow beneath their canopies by removing most or all woody vegetation beneath their canopies

Other useful Best Practices, which are more of ecological and silvicultural than public concern include:



1. Maintaining general tree health by following thinning prescriptions and tree selection strategies that maintain healthy clumps and remove diseased trees that are positioned to spread the disease further throughout the forest
2. Removing primarily small trees (below 8" in diameter at the root collar)
3. Keeping the limbs on leave trees, i.e. trees that are to be left in the forest (not limbing up any remaining trees)
4. Retaining dead standing trees (snags) with a diameter at the root collar of 10 inches or more and 15 feet in height or higher
5. Applying contour felling so that logs help retain soil on slopes
6. Spreading all slash by lop and scatter, and piling excess slash for pile burning
7. Avoiding the piling of slash on or within 3 feet of existing, large diameter dead and down logs and standing snags greater than 12 inches in diameter

For more details see Appendix B3.1.1.

B3.1.2. Individual Tree Maintenance

Best Practices for individual tree maintenance are the domain of expertise of dendrologists, arborists, and orchardists. This work constitutes skills that are centuries old but are largely unknown by contemporary land managers and farmers. Instead, this work is relegated to highly specialized professionals, and thus a Best Practice for SFC OS staff is to consult an expert if an individual tree needs specialized maintenance. Even an activity that many seem simple, such as pruning or staking, requires highly developed skill and insight. Other individual tree maintenance practices may include watering, transplanting, coppicing, pest control measures, and other tree health treatments.

Fortunately, natural processes often provide for a dynamic equilibrium in life forms and ecological communities, leading to resilience and self-healing. If trees need a little help, the following practices may be of use to SFC personnel.

B3.1.2.1. Watering

During droughts, watering can save valuable tree specimens in open space and park environments from death caused by drought stress and associated diseases. Watering is best done in the entire area beneath and immediately around the tree, and not only near the stem. The reason for this is that an intricate symbiotic system of rootlets and associated fungi (together called mycorrhizae) that take up the water stretch out far away from the stem. Water is taken up at the tips of tree roots, through mycorrhizal fungi networks (mycelium), associated with the roots. The symbiotic system of a host plant's mycorrhizal fungi and mycorrhizal root hairs is called mycorrhizae (Michael Phillips, 2017). Most trees' rootlets and mycorrhizal fungi are close to the surface, stretching out at least as far as the outer edges of the their canopies. Some trees have deep tap roots and are able to obtain water from great depths. Because mycorrhizae are connected with each other between all



plants around a tree specimen, the entire assemblage of plants works together to take up the available water and help each other stay hydrated.

Water losses from watering would lead to inefficiencies and potentially to erosion and soil crust forming. Therefore, it is important that the watering area be covered with herbaceous vegetation and/or mulch (leaves, twigs, and duff) to prevent puddles and runoff. Additionally, it is important to build a water well around a tree. This is a low berm of dirt in a circle around the tree, more or less at the dripline of the canopy. This berm will keep stormwater and water provided by hand watering enclosed near the tree and prevent it from running off. Finally, it is important to give trees a good soak, followed by a period of rest without any watering, instead of more frequent smaller helpings of water. See also Section C2.1.6 for information on special tree care for planted trees.

B3.1.2.2. Pruning

While pruning trees requires skill and experience, particularly with fruit trees and ornamental specimens, there are general BP guidelines available that may guide OS maintenance personnel. Such work would apply to fruit trees at the Los Potreritos Open Space, individual trees at Lamy Open Space and Park, some trees in the riparian area of Tesuque Creek Open Space, and several of the smaller open space and park properties.

Appropriate references for pruning techniques from NMSU are included in Appendix B3.1.2.2.

GUIDELINES AND REFERENCES

- Michael Phillips (2017). *Mycorrhizal Planet: How Symbiotic Fungi Work with Roots to Support Plant Health and Build Soil Fertility*, Chelsey Green Publishing.
- Santa Fe County (2018). "Forest Health Thinning Prescriptions and Monitoring Plan for Santa Fe County Open Space Properties: Final Report by Ecotone Landscape Planning."



B4. RIPARIAN AND WETLAND MANAGEMENT

STANDARD B4.1. Riparian and Wetland Management

Santa Fe County OS maintains the most up-to-date practices for riparian and wetland management as stipulated or required by the NMED Surface Water Quality Bureau, the federal Environmental Protection Agency (EPA), and the US Army Corps of Engineers. SFC OS keeps abreast of and uses BPs that have become the de facto standard for riparian and wetland conditions in northern New Mexico, based on tested and evaluated results. Therefore, Santa Fe County will develop in house capacity and skills and, when necessary, will hire consultants to design and implement BPs related to riparian and wetland management.

PRACTICES

B4.1.1. Understanding Riparian and Wetland Ecosystems

A riparian area is the land adjacent to a waterway, for example streambanks or floodplains, or to bodies of water. Riparian areas serve as the interfaces between wet and dry systems. In a dry southwestern climate, such as Santa Fe County's, the presence of water in riparian zones results in a unique array of soils and vegetation species that are heavily influenced by water. Riparian areas generally occur in low areas, where the groundwater table is closer to the surface, making it possible for riparian vegetation to take up water more easily. Floodplain sediment has the capability to retain large quantities of water, which results in soil that can support productive, diverse plant communities. In the Santa Fe County area, riparian zones with nutrient-rich soils, intact groundwater tables, as well as the presence of surface water, often contain such native species as Rio Grande and narrowleaf cottonwoods (and other poplar species), many different willow species, box elder, Rocky Mountain maple, and alder.

Riparian areas are characterized by alluvial soils, which are deposited in running water, are often very deep, and contain large amounts of water from rainfall and runoff. Riparian vegetation provides "litter-fall"—seasonal organic layering of leaves—and other plant material that may be transported throughout the stream system, providing food and habitat for a diversity of animal species that live in the water. Riparian vegetation also plays a part in reducing flooding and improving water quality. As water flows over a floodplain, vegetation dissipates its velocity, increasing the length of time that water is available to soil for absorption. Additionally, healthy riparian vegetation intercepts sediment and nutrients, making it less likely that pollutants enter the flowing stream.

Riparian zones in Santa Fe County and throughout the Southwest play a crucial ecological role in a number of ways. The flow of water through soil, occurring in water-rich riparian zones, helps recharge groundwater. Healthy riparian vegetation also prevents excessive nutrient and sediment loading, by diverting and removing it from stormwater, keeping surface runoff clean and shallow groundwater free of excessive amounts of nutrients. Riparian vegetation provides



in-stream shade, promoting optimal light and temperature conditions for aquatic species and providing habitat for threatened species of birds, fish, and other wildlife and plants.

B4.1.2. Monitoring Riparian and Wetland Ecosystems

The Bullseye Method for riparian areas utilizes twelve ecological measurements as a guide for reaching optimal management goals. The characteristics of a riparian area that are reaching best conditions and functions as well as a target diagram for documenting findings are included in Appendix A1.2.2. Figure 17 shows the Riparian Bullseye Health Targets and their possible bronze, silver, and gold rankings.

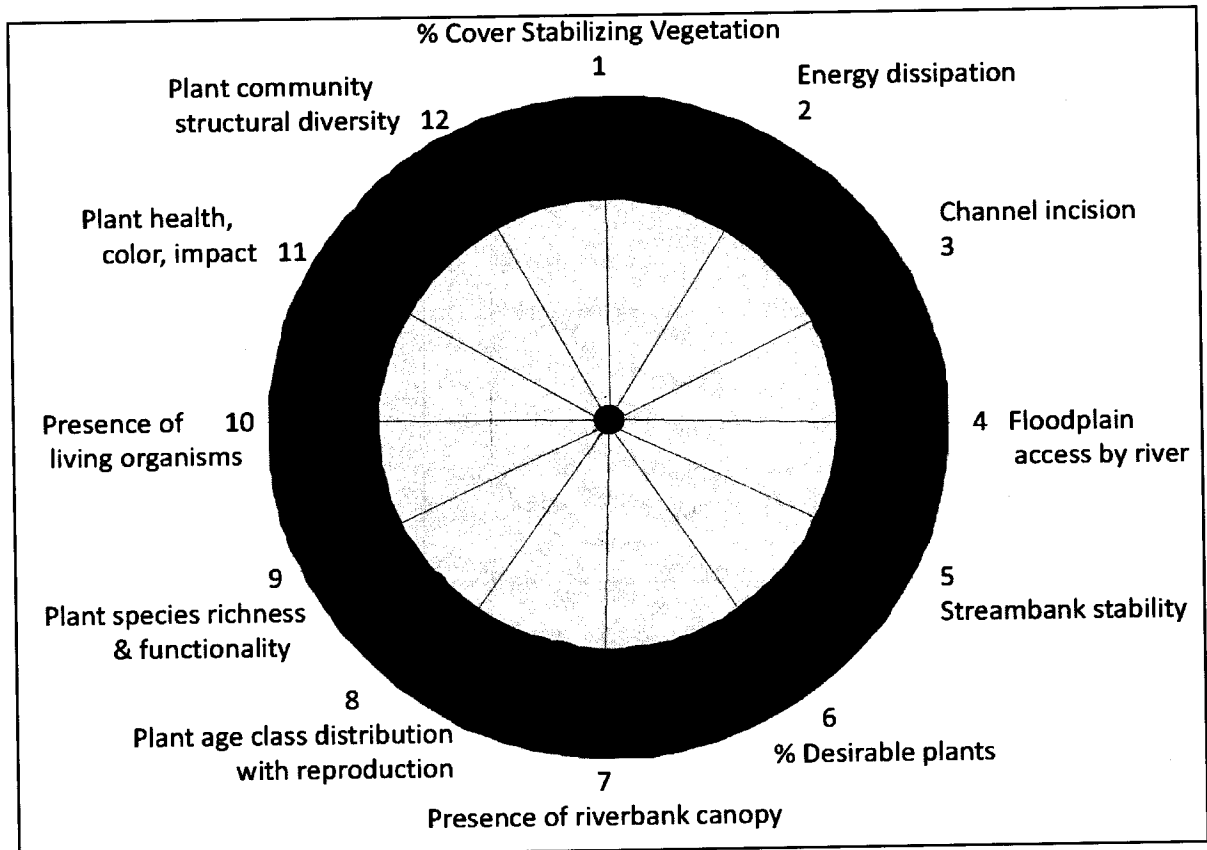


Figure 17: Riparian Bullseye Health Targets diagram. Source: Ecotone Landscape Planning 2018.

B4.1.3. Stormwater Management and Infiltration

The good health of riparian and wetland ecosystems is dependent on good management of upland areas that collect rain water, and thus management of riparian and wetland areas begins with managing stormwater on upland areas. Roads, roofs, parking lots, trails, and other land uses that make soil impervious to water infiltration can create a variety of problems, such as soil erosion, flooding, and even increasing aridity and heating islands. Where these land uses get concentrated and spread through a landscape (particularly but not only in urban areas), the health of the land and streams begins to suffer. For instance, studies have shown that when a



more than 25 percent of a watershed is covered by impervious surfaces, the ability of fish to survive in the river is lost (Center of Watershed Protection).

Best Practices for stormwater management and infiltration are based on the principles of catching rain water and snow where it falls and help “slow, spread, and sink” it. In the last decade, Tucson-based rainwater harvesting expert Brad Lancaster and the Center of Watershed Protection in Tucson, have effectively documented and popularized a comprehensive series of water harvesting Best Practices based on these principles. To effectively implement them in Santa Fe County, it is important to create and follow a stormwater management plan for each site where management is required now or predicted to be required in the future. It is much more difficult and expensive to retrofit an area for best stormwater practices after it has been developed.

Besides covering soil to encourage stormwater interception and infiltration, an important BP for the Santa Fe County area is the construction of bioretention basins and rain gardens. These two BPs focus on passive approaches to stormwater management, as opposed to active systems such as cisterns that collect water. Bioretention basins are shallow water collection areas designed to catch water as it flows off of parking lots or roofs.

While the term “rain garden” may be used somewhat interchangeably with bioretention basins, the latter tend to be larger and more suited to managing larger, more technical and non-residential areas, whereas rain gardens tend to refer to depressions sited in a yard, tended to by an individual. They can be filled with a plant-litter or inert mulch and can be planted with trees, shrubs, and wildflowers that are tolerant of polluted runoff and occasional inundation. Figure 18 shows a standard design for a rain garden or a bioretention basin, with indications for the selections of plants, in which xeric plants (drought-resistant perennials) line the upper edges of the basin, and hydric (water-loving) plants are located where there is prominent water buildup.

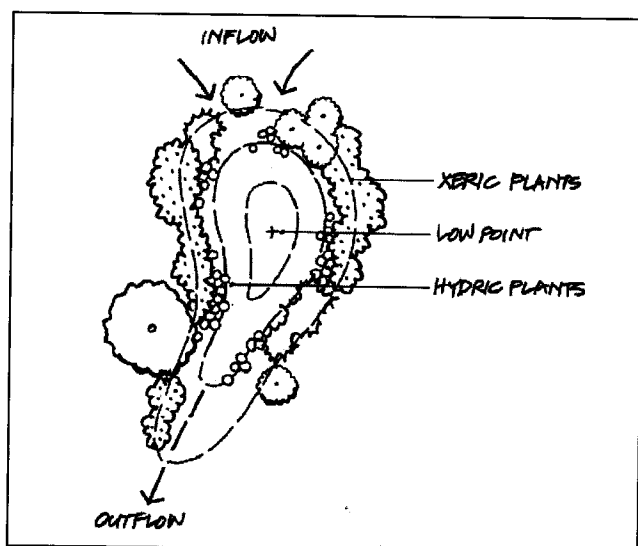


Figure 18: Standard Plan for Rain Garden or Larger



Bioretention Basin. Source: University of Florida.

Bioretention basins have many benefits, such as the capacity to increase groundwater recharge, buffer and reduce cumulative runoff from an area, improve shade, and enhance wildlife habitat (Figures 19 and 20). When implementing bio-retention basins, care should be taken to use dimensions that maximize catchment of runoff and support vegetation through passive irrigation, but do not produce mosquito breeding habitat or a drowning concern (Aaron Kauffman, Southwest Urban Hydrology).

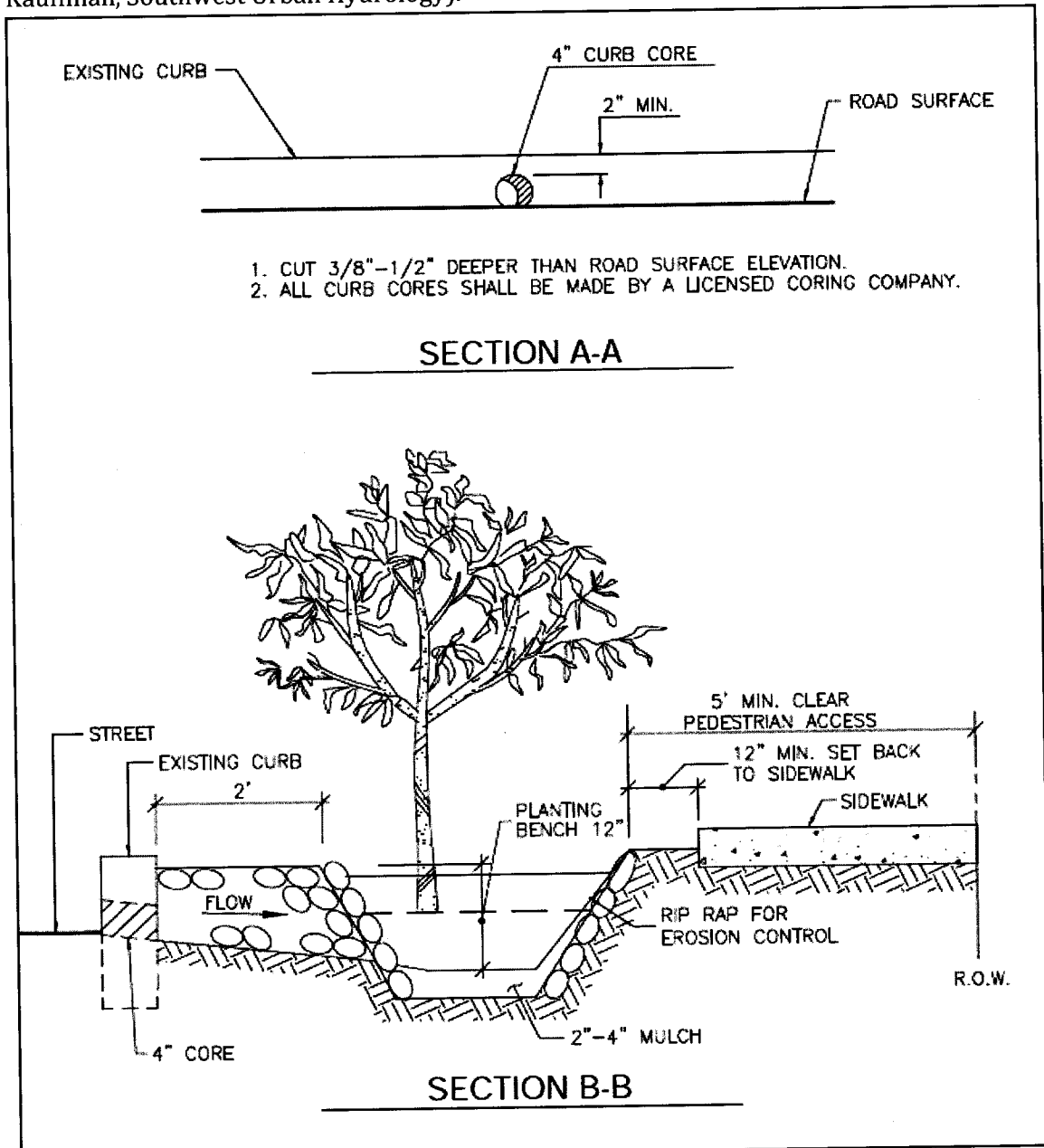


Figure 19: A diagram of a curb cut/bioretention basin combination. Source: Watershed Management Group.



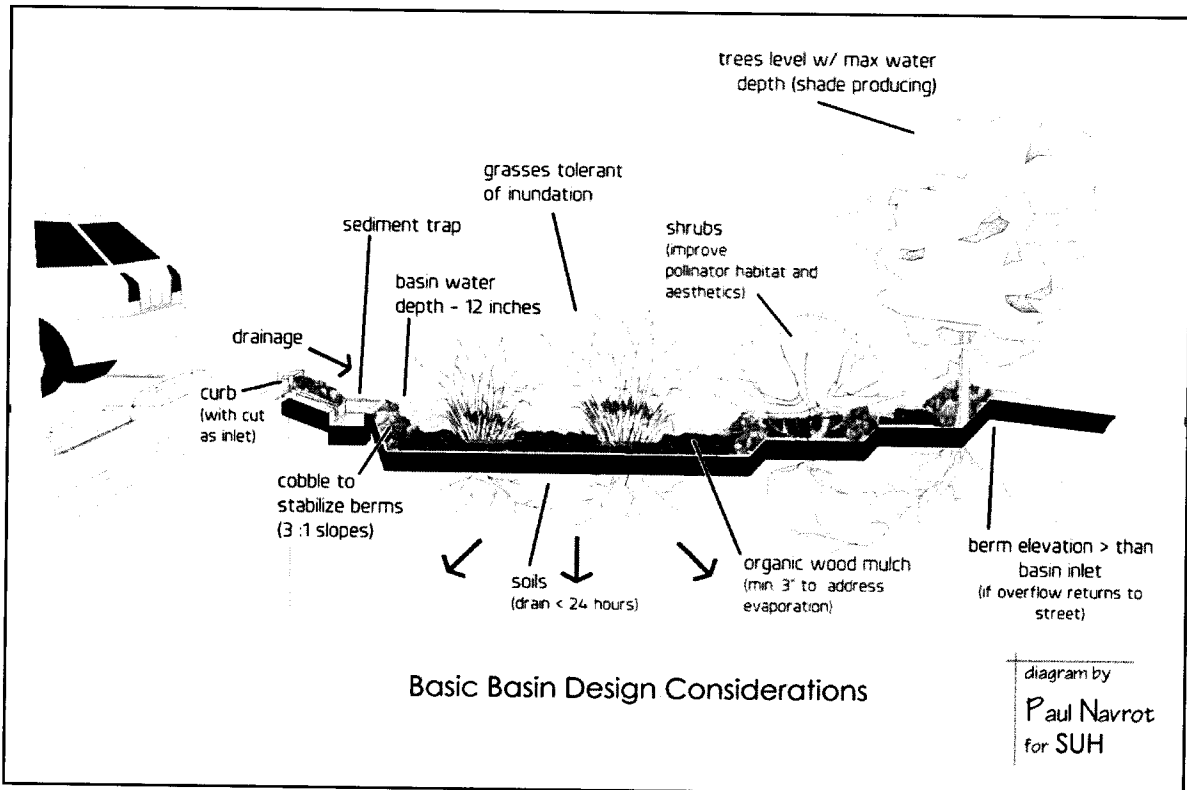


Figure 20: Basic Basin Design Considerations—where roadway curbs concentrate water, carefully designed curb cuts can be combined with bioretention basins to better infiltrate stormwater.
Source: Southwest Urban Hydrology.

GUIDELINES AND REFERENCES

- Center of Watershed Protection: <https://www.cwp.org/>.
- Aaron Kauffman, Southwest Urban Hydrology: <http://www.southwesturbanhydrology.com>.
- Brad Lancaster, Tucson-based rainwater harvesting expert: <https://www.harvestingrainwater.com/>.
- Program for Resource Efficient Communities, University of Florida 2008: Bioretention Basins/Rain Gardens (Florida Field Guide to Low Impact Development, [http://buildgreen.ufl.edu/fact sheet bioretention basins rain gardens.pdf](http://buildgreen.ufl.edu/fact%20sheet%20bioretention%20basins%20rain%20gardens.pdf)).
- Watershed Management Group: <https://watershedmg.org/>.

B4.1.4. Stream Channel Grade Control and Bank Stabilization

Similar to BPs for upland areas, BPs in riparian areas and wetlands also focus on slowing water flow, spreading water across the flood plain or wetland area, and encouraging infiltration for groundwater recharge. Many stream channels and wetland areas have lost their natural capacity to slow, spread, and sink water into the soil. They have eroded in ways that have degraded them to a trench with steep banks and erosional features such as headcuts, arroyos, or gullies. A headcut is a vertical drop in a channel where concentrated flows of water erode backwards into a channel as the water’s energy scours the channel bed at the vertical drop



(Figure 21). Eroding channels speed water flows, cause more erosion, and ultimately become entrenched, which results in the drying of their flood plain areas, riparian vegetation, and wetlands.

One BP to correct stream channel entrenchment and destabilization is the construction of grade control structures. Channel grade control structures are in-stream, man-made structures installed to prevent streambed erosion and improve water quality. The design and installation oversight of such structures requires expert involvement from experienced engineers, stream morphologists, or landscape architects. SFC OS staff is advised to hire such expertise for implementing Best Practices in this field. The following information serves as selected background on some relevant BPs that will enable staff to understand what to require from the experts.

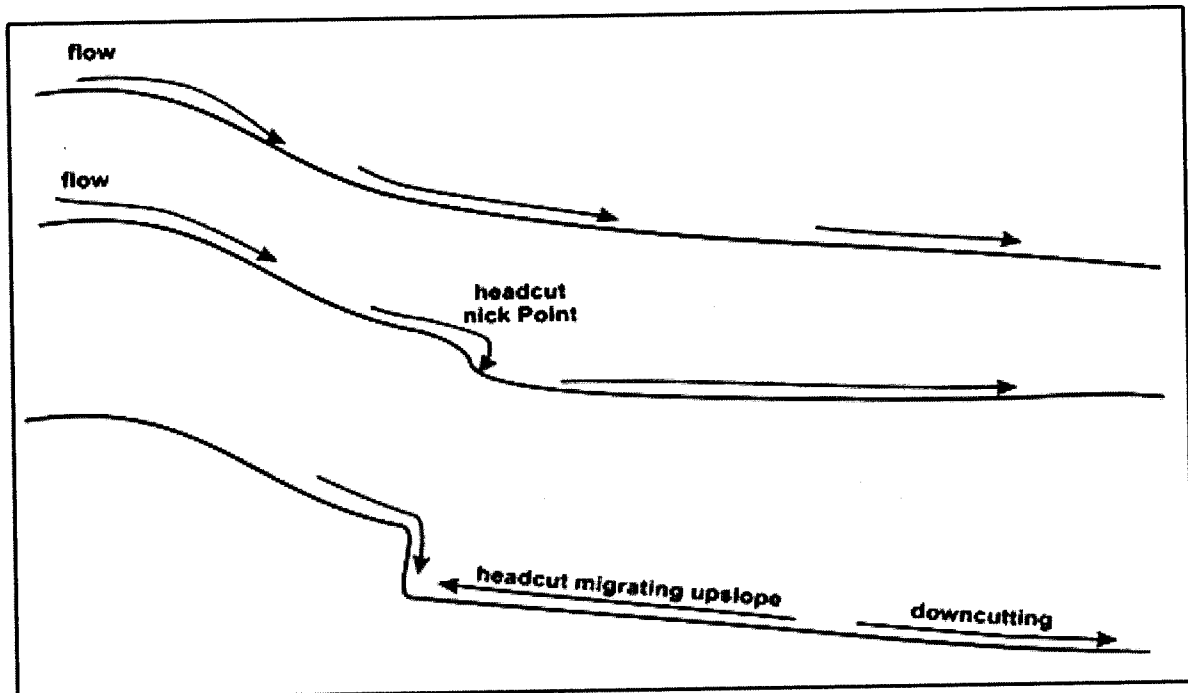


Figure 21. Longitudinal cross-section diagram of a sequence of flows that cause a headcut to form and migrate upward in a stream channel.

Expert advice is critical in assessing whether a channel is unstable and, if so, what discernable limitations to remediation are present, such as land ownership, utility, or land use concerns. Experts will have the necessary knowledge to understand the conditions of a channel in its erosion process and the skill to assist SFC OS staff reverse erosion and evolve renewed channel stability by implementing grade control structures and other BPs (Figure 22).

Grade control structures allow water to pass in a more controlled manner, which decreases the erosion of the streambed. As a result of the decreased channel erosion, the BP helps improve water quality, decrease turbidity (the cloudiness of water), improve wildlife habitat, slow down



flow speed, and increase the water table. Effective grade control in combination with densely-rooted vegetation, either planted or natural, also stabilizes the soil in a stream channel and prevents over-aggradation (accumulation of sediment) and erosion.

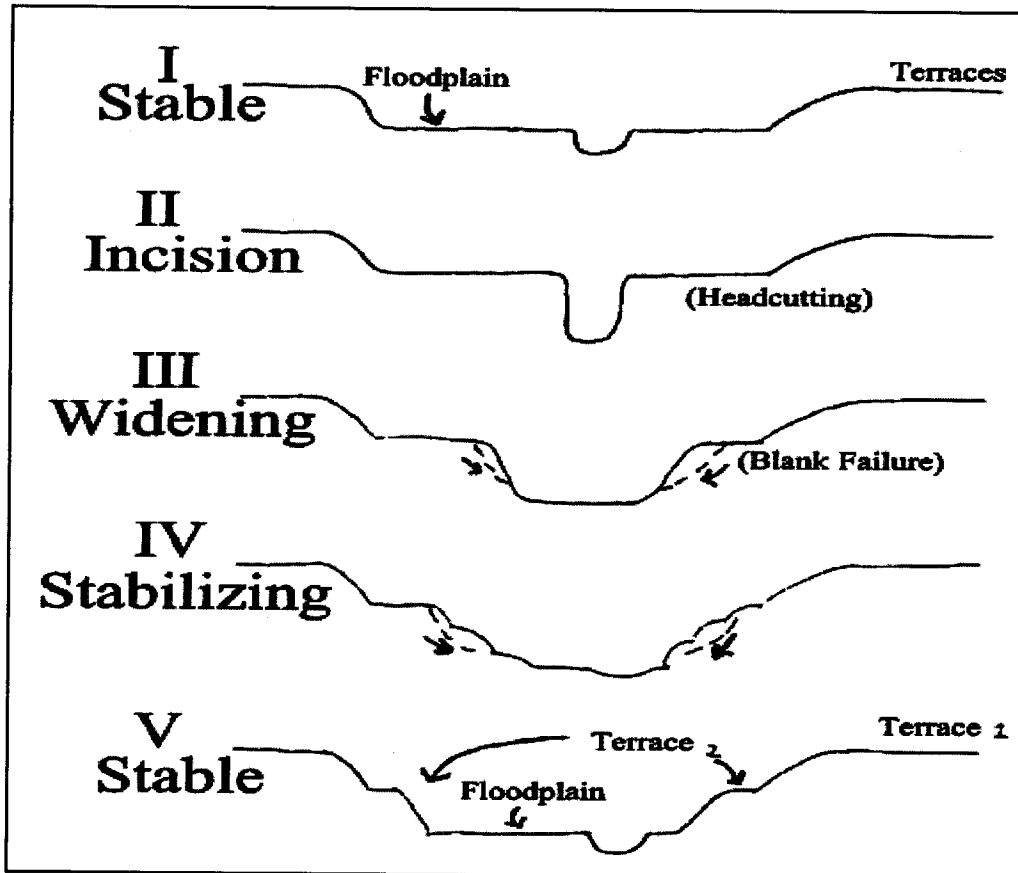


Figure 22. Progression of channel evolution. Source: Harvey 1978.

There are several approaches to proper grade control, each requiring a thorough understanding of channel morphology, elevation changes, cross-sectional area, and other basic ecosystem traits of the stream. David Rosgen of Wildland Hydrology pioneered the field of Natural Channel Design for the Western United States and formulated region-appropriate structures, such as crossvanes, shown in Figures 23 and 24. Cross vanes are effective structures for directing stream flow to the channel center and for fish habitat enhancement. This kind of structure can work well in areas that are not heavily urbanized. In urban areas with rapid runoff relative to the amount of rainfall, more robust structures may be needed, such as the grouted rock rundowns used in the 2018 Santa Fe River Greenway project.

On a landscape scale, managers can promote riparian and floodplain buffers, and restore and protect floodplain ecology with compatible land use practices (see also B4.1.7). Large-scale restoration techniques might necessitate intensive operations, such as the design of induced meandering on straightened reaches, removing improperly placed culverts, reshaping channels



and/or new floodplains, reestablishing and protecting functional floodplains, and promoting wetland restoration.

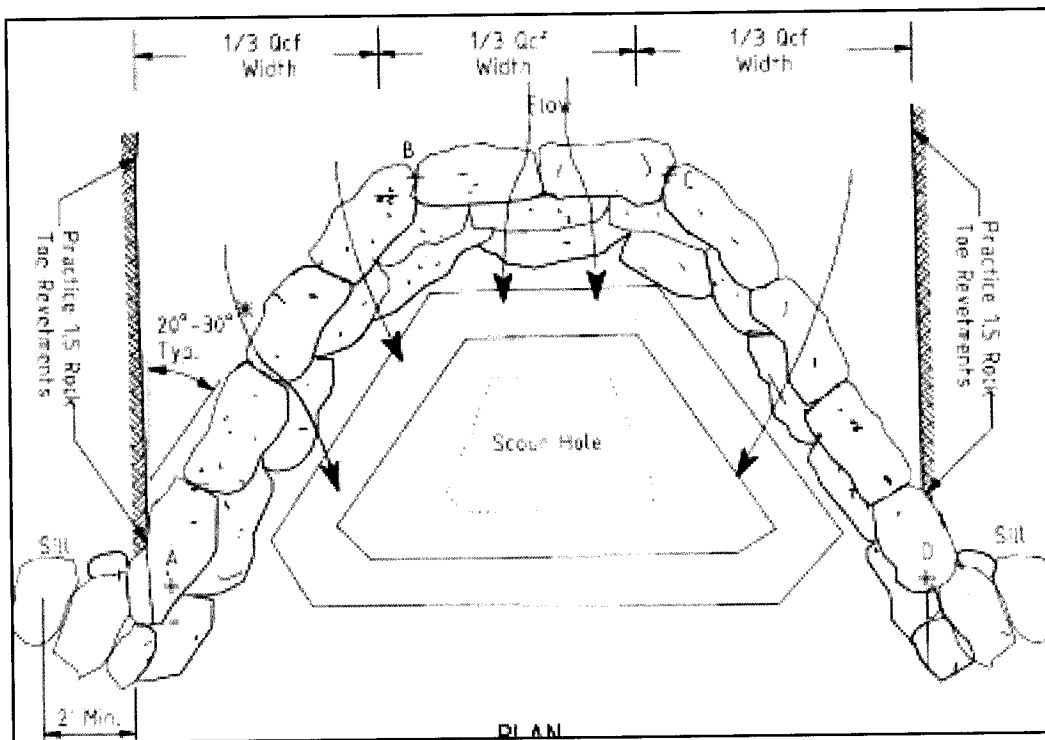


Figure 23: Plan view of a rock cross vane. Source: Texas A&M University.



Figure 24. Image of a rock vane centering the flow.
Source: Conejos Canyon Ranch.



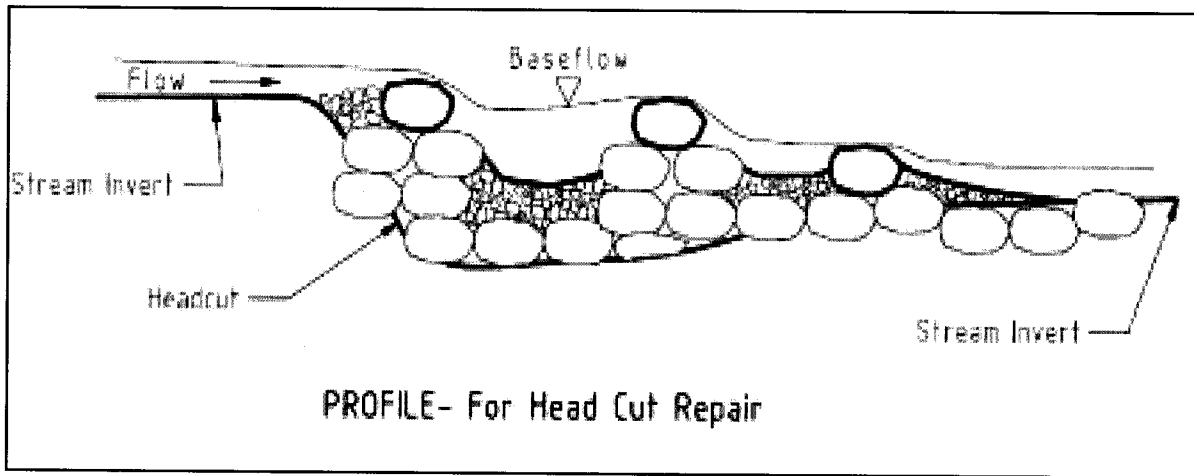


Figure 25. Longitudinal cross-section diagram of a rock cascade with step pools, which is appropriate in confined channels with slopes over 3% to connect two reaches with different elevation. Source: Virginia Department of Conservation and Recreation 2004.

Other Best Practices for grade control include rock cascades, log drops, and rock “W” weirs. The choice of the kind of structure depends on terrain conditions, desired future conditions and ecological functions, spatial limitations, the natural materials on site (such as the presence of woody debris), costs and budget, and visual quality considerations.

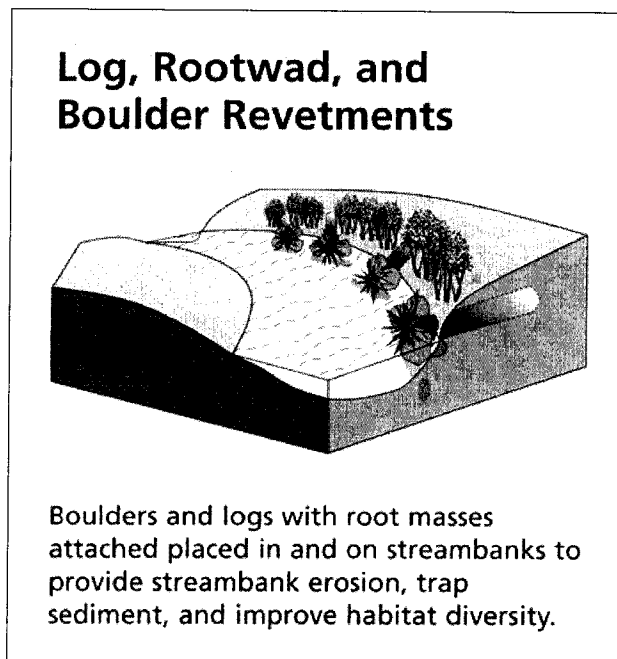
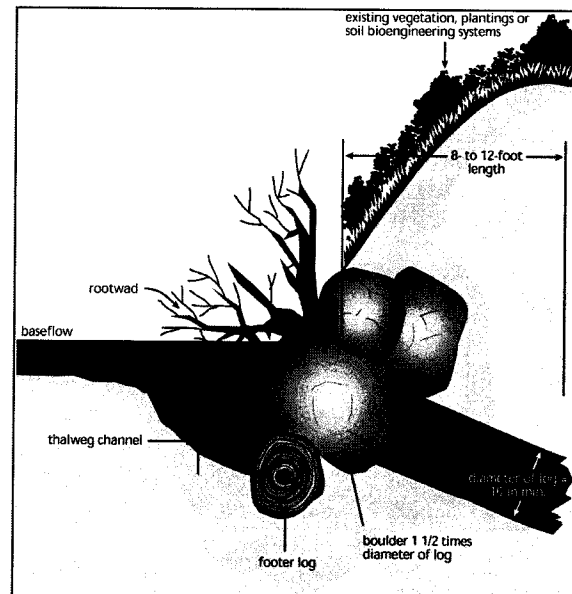


Figure 26 (left). Three-dimensional cut-out diagram of a stream protected with log, rootwad, and boulder revetments to protect the toe of the streambank against the erosive force of stream flow. Source: Alameda County Resource Conservation District. **Figure 27 (right).** Cross-section diagram of a rootwad toe revetment structure.



Natural channel design principles also offer a range of structures to reduce stream bank erosion. Common ones used in northern New Mexico include post vanes, rock vanes, post-and-rock vanes, picket baffles, rock baffles, toe wood, root wad revetments, floodplain benches, planting of native, deep-rooting vegetation on banks, biodegradable erosion-control blankets, brush mattresses, bio-logs, and wattles or fiber rolls (Figures 26, 27, 28, 29, and 30).

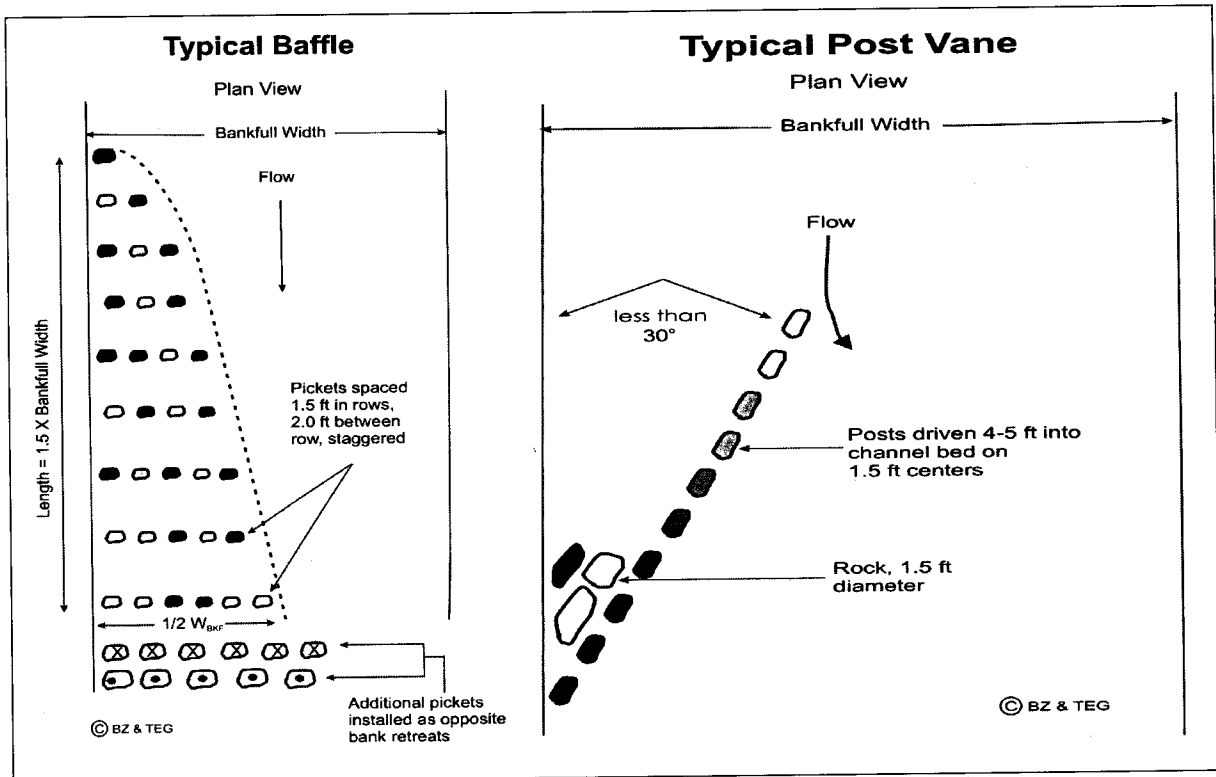


Figure 28 (left). Plan view diagram of a typical post vane. Source: Zeedyk and Clothier, 2009. **Figure 29 (right).** Plan view diagram of a typical picket baffle. Source: Zeedyk and Clothier, 2009.

Some restoration structures provide benefits for aquatic life while others do not. For instance, the rock cross vane that enables a scour pool to become established just below the structure lip can create ephemeral pools of water that are used by wildlife. In contrast, the grouted rock rundowns often do not create scour and so do not produce pools. Log rootwads for streambank protection and boulders are also effective for improving fish habitat by creating deep scour pools that contain cool, slowly flowing water for fish.

In designing streambank protection structures, BPs require the consideration of the cost of earthwork and materials, scheduling and timing, moisture requirements and effects, and potential of vegetative improvements. Wire-encased riprap structures (sometimes called “gabions”), which were often implemented in the past, are now falling out of favor due to a legacy of failure.



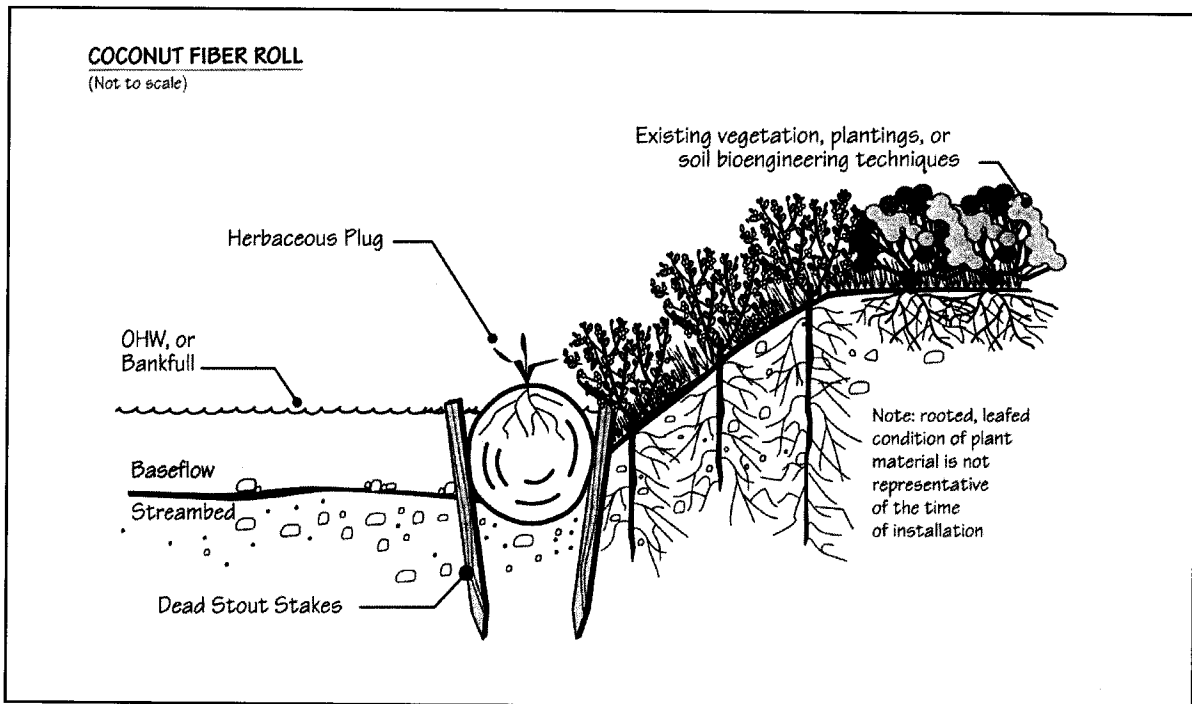


Figure 30. Cross-section diagram of a coconut fiber roll or wattle that is used as a toe revetment along a stream to protect the toe of the bank against the erosive force of stream flow. Source: Michigan Natural Shoreline Partnership.

GUIDELINES AND REFERENCES

- Michigan Natural Shoreline Partnership, "Erosion Control: Soil Bioengineering," <http://www.mishorelinepartnership.org/shoreline-erosion-control.html>.
- Rock cross vane diagram source: Jaber, Fouad and Al-Qudah, Omar (2012). City of McKinney Stream Restoration Project: Old Settlers Creek Restoration Design Report. Texas A&M University, AgriLife Research and Extension Center. https://www.researchgate.net/publication/261474232_City_of_McKinney_Stream_Restoration_Project_Old_Settlers_Creek_Restoration_Design_Report.
- Division of Soil and Water Conservation (2004). The Virginia Stream Restoration and Stabilization Best Management Practices Guide. <http://www.deq.virginia.gov/Portals/0/DEQ/Water/Publications/BMPGuide.pdf>

B4.1.5. Stream Bank and Headcut Stabilization in Intermittent and Ephemeral Drainages

As with the Best Practices and techniques presented above, streambank and headcut stabilization requires expert involvement from experienced engineers, stream morphologists, or landscape architects. SFC OS staff is advised to hire such expertise for implementing Best Practices in this field.



Streams below a certain grade tend to meander. Stream meandering is a natural process that leads to a certain amount of bank erosion and lateral movement of channels. This otherwise desirable process can occur excessively in response to poor land management practices. Also, overgrazing near riparian areas, removal of vegetation, and excessive trampling by livestock, wildlife, or humans can accelerate streambank erosion and lead to sediment and pollutants entering area lakes, streams, and ponds.

Many intermittent and ephemeral streams in New Mexico have become incised, which keeps water flows concentrated in narrow channels rather than spreading water over a wider floodplain. As a result, many streams have become arroyos with stream banks that are steep and prone to drying out and eroding much faster than low stream banks that allow flood waters to flow across the floodplain. Channels that become incised—cut off from their floodplain—are at risk of both headcut and streambank erosion, and long-term instability.

BPs that address streambank erosion have the general aim of dissipating the energy of streamflow, trapping and holding soil on the bank, controlling short-term surface and rill erosion, and reestablishing vegetation. Structural measures to lower stream banks in order to increase the frequency of floods spreading over the floodplain, combined with plantings, will reduce the erosive power of flood water and counter streambank erosion.

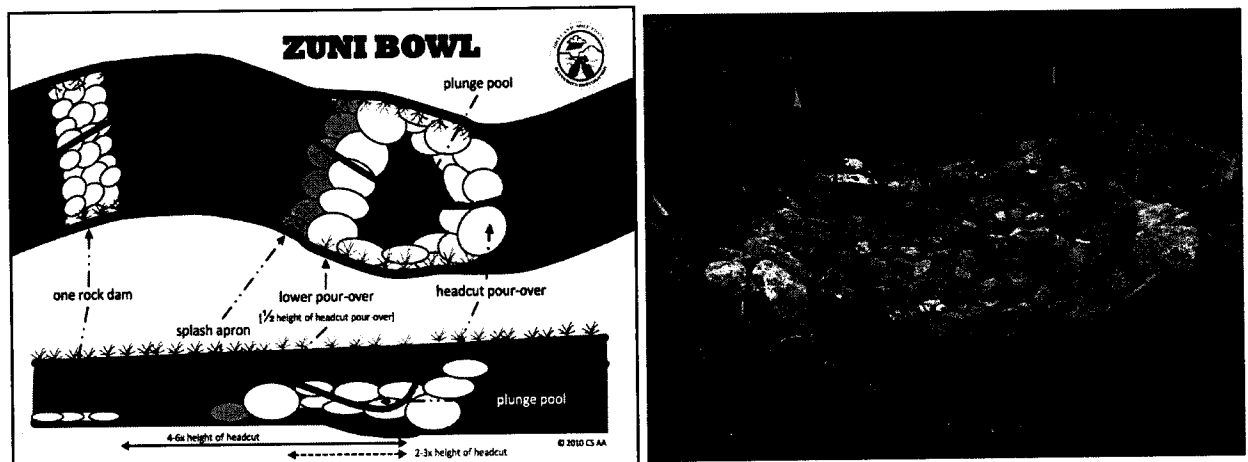


Figure 31 (left). Plan view diagram of a Zuni bowl and one-rock dam to accommodate a low headcut in a stream channel and stabilize the grade at that location. Source: Sponholtz and Anderson Sponholtz 2010. **Figure 32 (right).** Image of a Zuni bowl, viewing upstream. Photo: Ecotone Landscape Planning.

In smaller streams and gullies, techniques such as one-rock dams, Zuni bowls, and media lunas can be used to slow and spread water and stop stream incision and headcutting (Figures 31 and 32, and Figure 33 (next page)). On steep banks, the use of brush layers or fiber wattles, staked in place on contour lines, has proven to be an effective Best Practice (Figure 34).





Figure 33. One-rock dam in upland areas. Photo: Ecotone Landscape Planning.

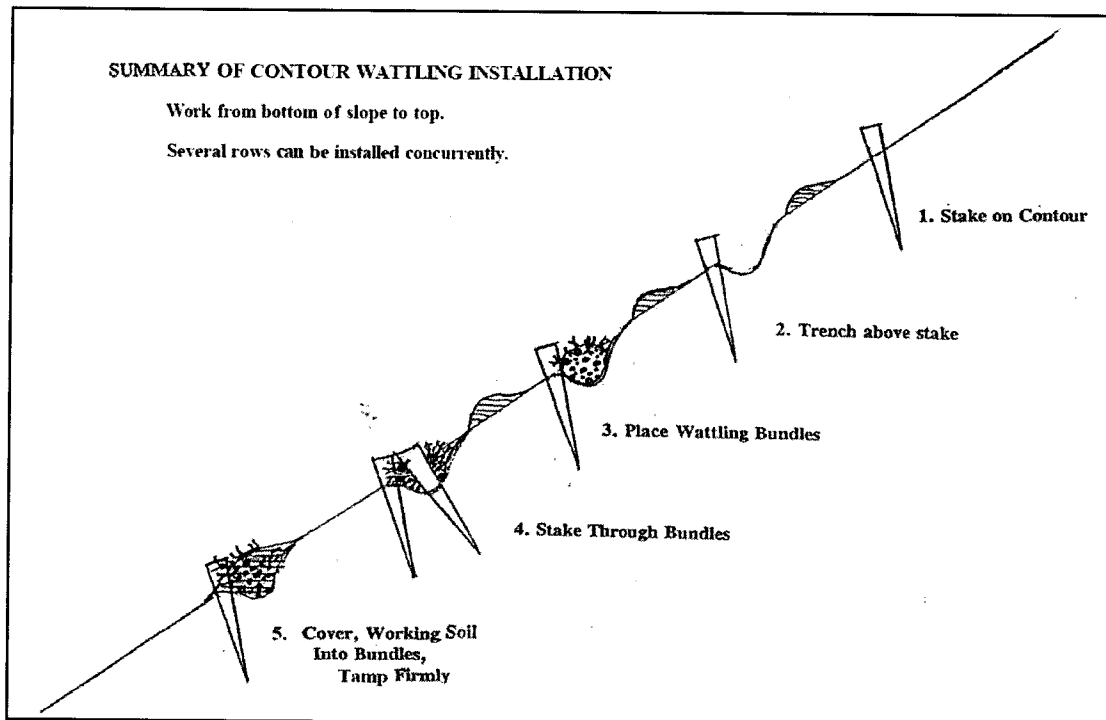


Figure 34. Cross-section diagram of a slope stabilized with wattles of brush or other fiber, staked in place on contour lines. Source: South Dakota Department of Environment and Natural Resources (2002).



GUIDELINES AND REFERENCES

- Craig Sponholtz and Avery C. Anderson Sponholtz (2010). "Erosion Control Field Guide," Quivira Coalition, www.quiviracoalition.org.
- Bill Zeedyk and Van Clothier (2009). *Let the Water Do the Work: Induced Meandering, An Evolving Method for Restoring Incised Stream Channels*, Quivira Coalition, www.quiviracoalition.org.

B4.1.6. Maintaining Biotic Life in Intermittent Drainages and Perennial Streams

Best Practices for addressing the health and sustainability of flora and fauna in perennial streams ensure that riparian vegetation, channel flow, water quality, pool-to-riffle ratio, and temperature, among other conditions, provide a diversity of habitats for different riparian species. Maintaining structural diversity of vegetation and following practices that minimize turbidity and sedimentation are crucial, as well as ensuring that shading and vegetation diversity foster habitat infrastructure.

General education and signage are important factors to consider when bringing humans in contact with riparian areas, recreationally, educationally, or otherwise. Beaver and bird habitat should be protected to minimize human contact, with an emphasis on educating the public on the ecosystem services occurring around them.

When functioning properly, ephemeral streams provide the same ecosystem services as their perennial counterparts: they "provide landscape hydrologic connections; stream energy dissipation during high-water flows to reduce erosion and improve water quality; surface and subsurface water storage and exchange; ground-water recharge and discharge; sediment transport, storage, and deposition to aid in floodplain maintenance and development; nutrient storage and cycling; wildlife habitat and migration corridors; support for vegetation communities to help stabilize stream banks and provide wildlife services; and water supply and water-quality filtering." (Levick, 2015).

The ephemeral nature of a stream may also lead to its functionality as a breeding ground for amphibians and reptiles. Maintaining the ability of ephemeral riparian zones to retain moisture by implementing grade control, revegetating, and promoting compatible land use practices is important to ensuring the integrity of ephemeral stream habitat function. Similar care should be given to ephemeral stream restoration and preservation as is given to perennial stream improvements.

GUIDELINES AND REFERENCES

- Dr. Dennis C. Clarke (2002). "Designing and Installing Streambank Stabilization Practices." South Dakota Department of Environment and Natural Resources. <https://denr.sd.gov/dfta/wp/wqprojects/sederosionconf.pdf>
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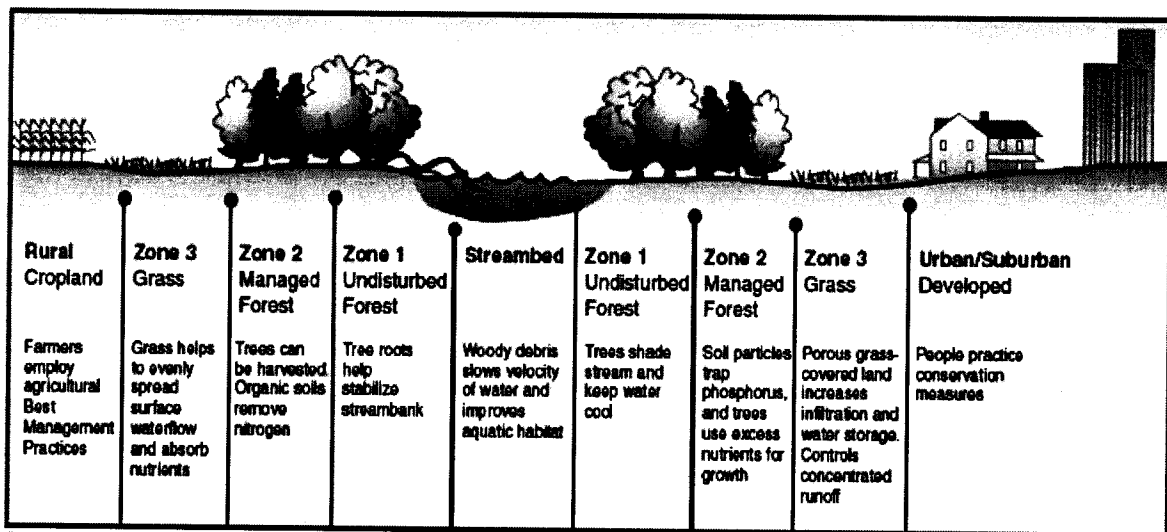
Protection Agency (EPA), https://www.epa.gov/sites/production/files/2015-03/documents/ephemeral_streams_report_final_508-kepner.pdf).

B4.1.7. (Re)establishing and Managing Riparian Buffer Strips

Vegetated riparian buffers are crucial in maintaining the integrity of wildlife habitat and often mitigate the migration of nonpoint source pollution into stream channels. They are also an important source of food, habitat, and structural diversity in a riparian ecosystem. Riparian buffers contain vegetation which serves as a soil stabilizer, deflecting flood wave energy and maintaining an intact floodplain. Along with capturing and slowing down sediment-laden runoff, riparian buffers ensure increased surface runoff infiltration, allowing for greater groundwater recharge. The vegetation in buffers can also serve as crucial stream shading, lowering temperatures in the water and ambient air and improving the quality of habitat in the riparian area, both terrestrial and aquatic.

Recommended buffer widths generally depend on the particular goals land managers are trying to achieve (Figures 35 and 36). For erosion prevention purposes, buffer widths of 30 to 100 feet have proven to be effective. With regard to retaining nitrogen and phosphorous-laden sediments, buffers designed near agriculturally intensive land practices are recommended to be about 50 feet on either side of the stream channel. To mitigate the travel of other contaminants into waterways, recommended buffer width can range from 30 feet to over 300 feet. To maintain adequate quality of aquatic habitat, litter and debris input, and stream temperature, buffer widths of 50 feet are generally recommended, and for maintenance of viable terrestrial habitat, much larger widths, from 150 to about 300 feet, are preferred. (Yale School of Forestry, 2008).

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From: www.agnr.umd.edu/MCE/Publications/PDFs/FS724.pdf

Figure 35. Riparian buffer zones. Source: Maryland Cooperative Extension 1998.



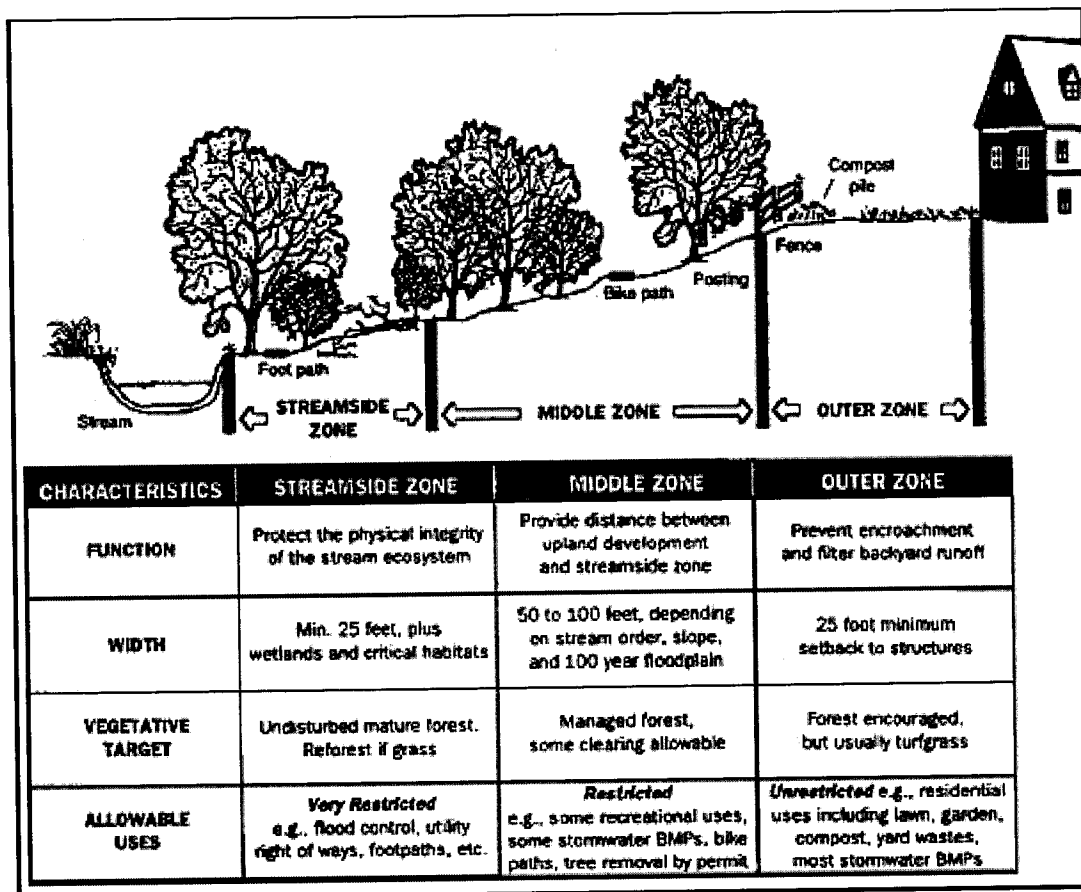


Figure 36. Three-zone urban buffer system. Source: Schueler 1995; Metropolitan COG 1995.

As with the BPs and techniques presented above, designing and overseeing the installation of vegetative buffers requires expert involvement from experienced ecological engineers, biologists, or landscape architects. SFC OS staff is advised to hire such expertise for implementing Best Practices in this field.

To revegetate areas with native riparian shrubs and trees, planting cut cottonwood or willow poles at the proper depths for the site has proven to be a successful practice in the SFC area (Figure 37). Specific types of vegetation will vary according to the site elevation and hydrological regime. Common plants include Rio Grande and narrowleaf cottonwood, coyote willow, Goodings Black willow, and box elder. The technique involves:

- Harvesting or buying dormant live poles in late winter or early spring and keeping them wet for no more than 10-14 days before planting; longer soaking may lead to stem rot.
- Planting the cut poles to a depth where the bottom cut tips are in saturated wet soils at the beginning of the growing season, typically in March-May. It is best to plant the poles before the plants bud out or begin to produce leaves.



- Use tools such as digging bars, pole planting bars or augers (20 inch drills on hand-held drills for sandy soils and high water tables, large two-person augers, or drills mounted on bobcats for sites with a deep water table and soils with lots of cobble-sized rock).
- Cut willows will generate root growth hormones. A common practice is to plant several willow stems in the same hole as a cottonwood to induce root growth (Figure 37).

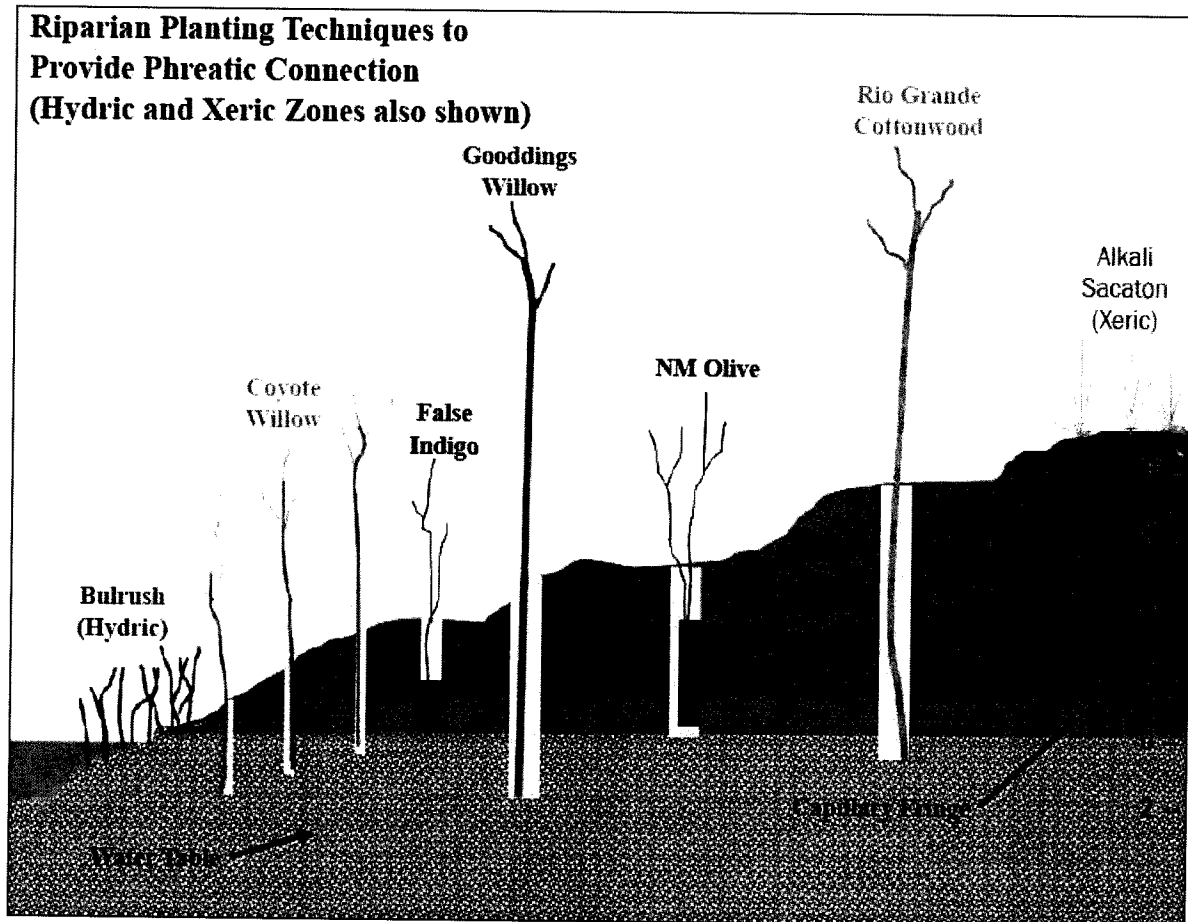


Figure 37. Cross section diagram of pole planting at the appropriate depth. Source: Hoag 2007.

GUIDELINES AND REFERENCES

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- USDA. 2007. *A Guide for Planning Riparian Treatments in New Mexico*.

B4.1.8. Aquatic Habitat and Riparian Wildlife Management and Protecting Infrastructure

Beavers are a natural part of the foothill stream ecology of the Sangre de Cristo Mountains. They are adaptable to periodic ecosystem changes and will migrate both upstream and downstream. Therefore, it is important to be prepared to adapt OS properties and adjacent infrastructure to their habitat needs and impacts.

In riparian zones, the presence of beavers can lead to the creation of rare and valuable riparian habitat. Beaver colonies help increase the natural sinuous flow regime of a waterway, which encourages the infiltration of water into the landscape, provides habitat for fish, birds, and other wildlife, improves the quality of water, and creates the conditions necessary for healthy wet meadow ecosystems.

Beaver may present challenges as well. Beaver impacts to the riparian environment may require mitigation. Beaver dams raise the water level of the pond on which they are residing, sometimes high enough to cause saturation and slumping of surrounding roads. Rising water levels behind beaver dams can cause flooding, and dam material can occasionally clog culverts that need to be kept clear.

BPs for managing the presence and impacts of beaver on infrastructure are:

- Developing a good understanding of what infrastructure amenities are present and might be impacted, for example by inventorying culverts, roads, and medium-to-large native cottonwood trees. If important infrastructure is not present, beavers that stay to build dams will have a net benefit rather than a negative impact on the property.



- Monitoring for recently cut and debarked willows and cottonwood branches, which typically show a very white bark in contrast to a grey, oxidized one; checking regularly to see if fresh mud is being placed by beavers on the crests of their dams.
- Conducting a geomorphology survey of the river channel (with a laser-level or total station) and groundwater elevations (with groundwater piezometers) if the presence of beavers occurs where valuable infrastructure is present; baseline information is important for comparison with current pond levels relative to built structures and for detecting damage such as road slumping.

If beavers build dams and create ponds near infrastructure, there are several techniques to adapt to their impacts:

- Pond leveling devices (Figure 38) can be installed to prevent water levels from rising to harmful heights. The devices route water through the beaver dam with a pipe, which allows for the regulation of water levels on the upstream side of the dam.
- Placing wire cages over the ends of culverts to keep beaver from clogging them with sticks and debris and making sure they are monitored and cleared periodically.
- Installing cages around large cottonwoods and other riparian trees to prevent beavers from taking too many of them down.
- Trapping beaver and relocating them or, as a last resort, using lethal means to remove them.

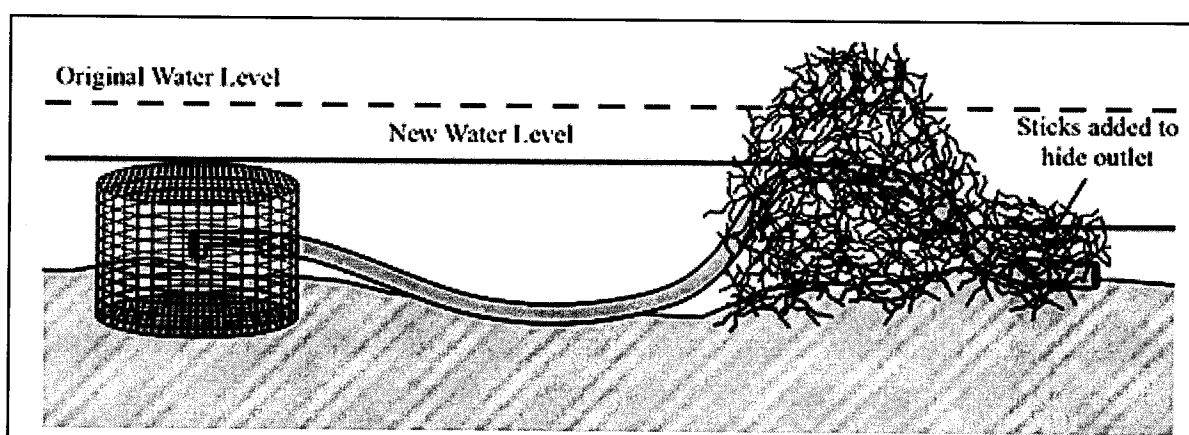


Figure 38. Cross-section diagram of a pond leveling device or beaver deceiver. Source: Dee Ebbeka for Nebraska Extension.

GUIDELINES AND REFERENCES

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- Beavers: Wetlands and Wildlife: <http://www.beaversww.org/solving-problems/manage-flooding/>.
- Beaver Deceivers, Nebraska Extension: <http://extensionpublications.unl.edu/assets/html/g1434/build/g1434.htm>.



B4.1.9. Restoring and Reconnecting Floodplain Access

Headcut erosion and streambank instability in a river channel often result from the construction of levees and buildings in floodplains or the rapid accumulation of floodwater from roads and other sources—both of which may concentrate stream flow energy in a narrow channel. In contrast, small, regular floods that inundate riverside floodplains are essential to a river’s health and provide a wide variety of benefits to wildlife, fish, and people, including increased groundwater storage that may reduce downstream flooding. A reduction in high velocity stream flows also prevents downstream streambank erosion and channel incision.

Several practices are effective in restoring floodplain access for typical floods so they have less erosive power. Moving levees back from the river, notching them, or removing them entirely will help floods spread into a wider area. In New Mexico, this practice has been adopted in several places, including the lower Santa Fe River in La Cieneguilla. Another approach to reconnecting floodplains to river floods is to lower the streambank that has become perched above the typical flood height.

The practice of levee removal and bank lowering involves:

- Detailed geomorphology assessment of the floodplain with cross-sections to identify the abandoned/disconnected floodplain
- Hydrologic analysis of the river to determine typical flood size for two- to five-year return periods
- Determining the amount of material that needs to be removed to reconnect the floodplain and the location to which that material will be moved; identifying any mitigation work to prevent erosion on the reconnected floodplain
- Securing a Clean Water Act Section 404 (Army Corps) and Section 401 certification (NMED) permit to do this work

As with the Best Practices and techniques presented above, restoring the stream’s floodplain access requires involvement from experienced, expert engineers, stream morphologists, or landscape architects. SFC OS staff is advised to hire such expertise for implementing Best Practices in this field.

B4.1.10. Protecting and Restoring Jurisdictional and Non-jurisdictional Wetlands

Wetlands are the link between the land and the water. They are transition zones where the flow of water, cycling of nutrients, and energy of the sun meet to produce a unique ecosystem characterized by hydrology, soils, and vegetation—making these areas very important features of a watershed. Riverine or riparian wetlands are composed of the native plant communities that are fostered by the saturated soil on the banks of a creek, stream, or river (Figure 39).



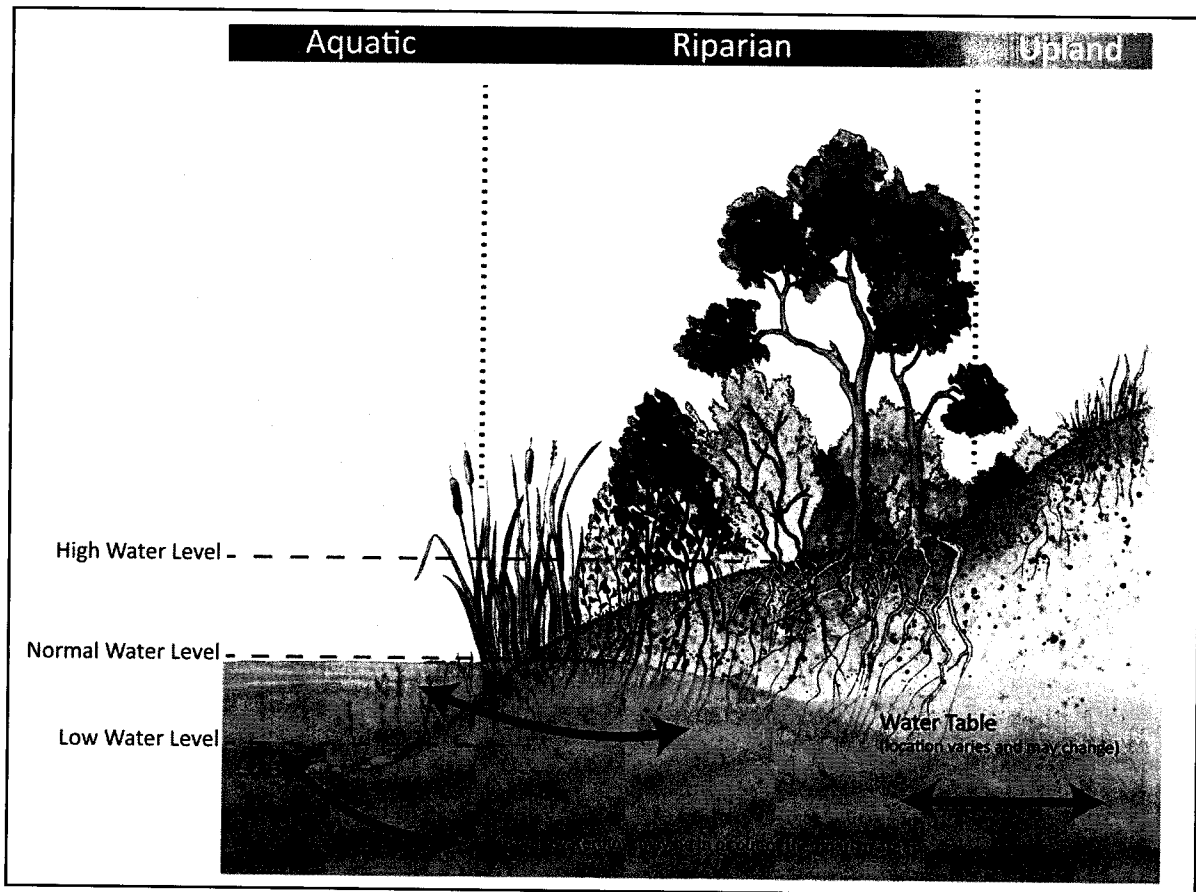


Figure 39. Cross-section diagram of riparian vegetation communities. Source: Lesser Slave Watershed Council.

The difference between depressional wetlands and slope wetlands is shown in Figure 40 (NMED and Quivira Coalition, 2014). Playas are a type of depressional wetland that is only filled with water seasonally and for short periods of time before drying.

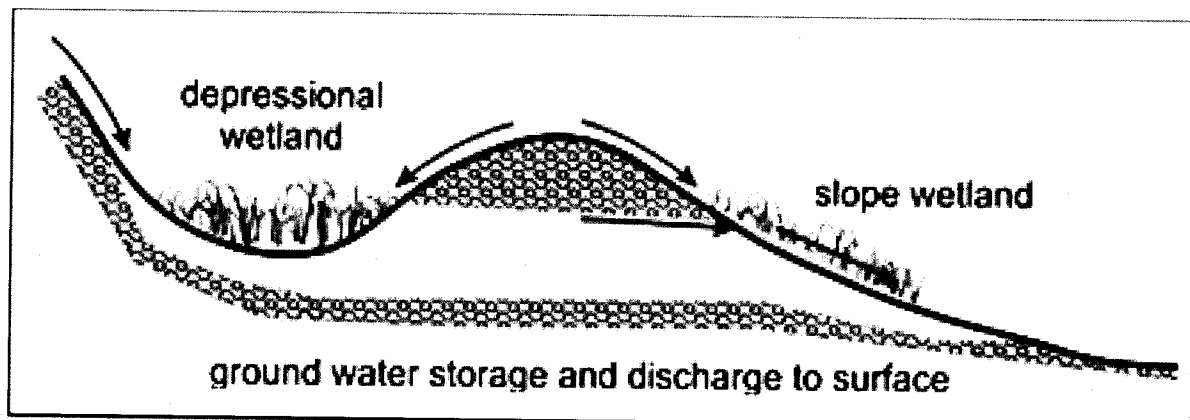


Figure 40. Cross-section diagram of a depressional wetland and a slope wetland.



Lacustrine fringe wetlands occur around lakes and are dominated by water with a shallow “fringe” of wetland vegetation around the water’s edge (Figure 41).

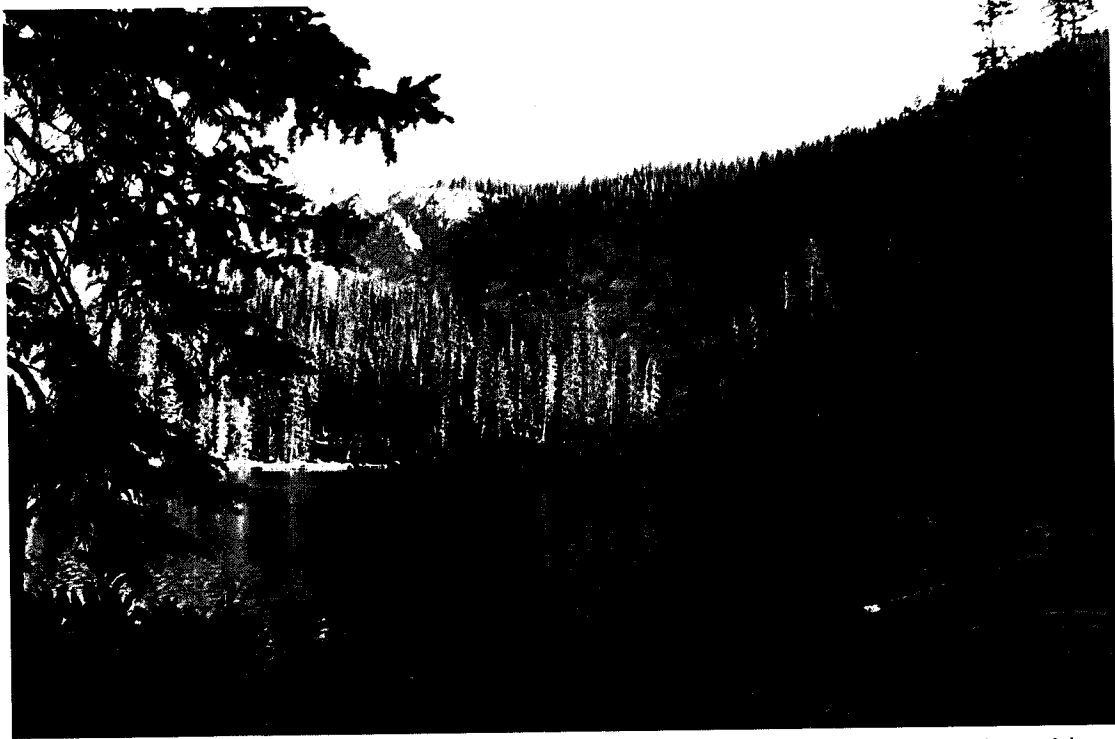


Figure 41. Image of Nambe Lake, below Lake Peak in the Sangre de Cristo Mountains, with a lacustrine fringe wetland at its edges. Photo: Ecotone Landscape Planning.

All of these wetland types are subject to many disturbances, including degradation of the stream channel either by bank erosion, drying of the stream banks and larger floodplain due to channel downcutting, and streambed scouring from flood events. Many creeks, streams, and rivers have become straighter over time, either due to human interference or from past land use practices that have led to increased erosion and degraded ecosystems. These wetlands are subject to overuse by livestock, wildlife, and human recreation, and impacts from roads.

Climate change is also negatively affecting the wetland health and resilience caused by periods of prolonged drought, more frequent flooding, high intensity storm events, and earlier snowmelt runoff . A list of possible stressors (mechanisms that negatively impact wetland health and resilience) include:

Legacy Stressors

- Mining scars
- Old roads
- Railroads
- Trailing



Current Stressors

- Modern roads
- Trailing
- Stock tanks
- Road drainage and culverts

Climate-related Stressors

- Drought severity and duration
- Increased storm intensity
- Earlier snowmelt
- Warmer temperatures

All wetland types in New Mexico should be protected from overuse and subsequent degradation. Many of these wetland types are already in a degraded state. For these wetlands, restoration and stabilization activities should be considered.

Wetlands are protected by the US Army Corps of Engineers (ACE). For this purpose, wetlands are considered either jurisdictional or non-jurisdictional. Jurisdictional wetlands are determined by a formal wetland delineation process required by the ACE to determine if activities in the wetland will be subject to Federal Clean Water Act Section 404 rules. During a wetland delineation, a project area is surveyed to determine whether wetlands meet three criteria. Wetland delineations are conducted in accordance with the 1987 ACE Wetland Delineation Manual (<https://www.fedcenter.gov/Bookmarks/index.cfm?id=6403>). There are ten regional supplements issued by the ACE which are specific to different regions of the United States. Wetlands must have three specific criteria in order to be classified as a wetland: hydric soils (soils that are formed under conditions of high water saturations which lead to anaerobic, or oxygenless, conditions in the upper horizons), hydrophytic (water-loving) vegetation, and hydrology (Figure 42).



Figure 42. The three criteria for the classification and delineation of jurisdictional wetlands. Source: The Watershed Company.



If a wetland is not characterized by all three criteria, it is a non-jurisdictional wetland. It is essential to consult with the ACE before planning to conduct any activities in a wetland, even if it does not currently exhibit all three criteria. In a dry year, the hydrophytic vegetation may be missing, but the wetland would be considered a jurisdictional wetland in a year of adequate precipitation.

In 2012, the New Mexico Environment Department (NMED) Surface Water Quality Bureau Wetland Program, in collaboration with Santa Fe County and Ecotone Landscape Planning, produced a Wetlands Action Plan (WAP) for Santa Fe County (Jansens 2012). The SFC WAP addresses both jurisdictional and non-jurisdictional wetlands and riparian areas. It describes wetland conditions, threats to wetland functions (in particular those related to urban development, water use, and climate change), and a variety of strategies for wetland protection and wetland restoration. The document also includes many examples of BPs regarding regulatory improvements, standards for measuring wetland health, monitoring practices, and wetland restoration and maintenance techniques.

For wetland stabilization and restoration projects, a professional consultant should be hired to determine wetland jurisdiction status, prepare all required permitting and design, and implement any activities that would result in either dredge (material removal) or fill (material addition) in jurisdictional wetlands. References for BPs and techniques for wetland restoration in New Mexico include several detailed technical documents; a selection appropriate for SFC OS properties is referenced in Appendix B4.1.10.

Some of the most useful BPs for management of riparian and wetland areas on SFCO OS properties include:

- Water-spreading and erosion control structures
- Grazing management
- Fencing or enclosures (to manage animal grazing and/or human access)
- Frequent movement of livestock
- Removing non-native vegetation
- Planting native vegetation
- Improving road placement and road drainage (porous fill, water bars, low water crossings)
- Managing stormwater flows (from developments and buildings) and infiltration

While activities to directly improve the health of riparian, depression, slope, and lacustrine fringe wetlands are well documented, the importance of maintaining the health and resilience of upland vegetation communities in the watershed cannot be underestimated. Good vegetative cover and minimal bare ground in the watersheds above wetlands does much to improve the quality and quantity of the water reaching all wetland types.



GUIDELINES AND REFERENCES

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B5. GRASSLAND MANAGEMENT

STANDARD B5.1. Grassland Management

Santa Fe County OS maintains the most up-to-date practices for grasslands management, including wet meadows and upland dry rangeland, and keeps abreast of and uses Best Practices (BPs) that have become the de facto standard for grassland ecosystems in northern New Mexico, based on tested and evaluated results.

PRACTICES

B5.1.1. Ecological Health, Diversity, and Resilience in Meadows

Grasslands, wet meadows, and wetlands require site-specific management plans and BPs. Each grassland or wetland differs in the amount of water in the soil and in species composition. Differences in soil type, topography, and elevation also lead to differences in plant community types.

Grasslands, including wet meadows, are highly biodiverse environments which are formed by interacting forces of nature that favor some species in any particular natural cycle of grazing, fire, freezing, flooding, and drought. The forces that can be manipulated by humans include fire, grazing, and drought (in the form of water management when irrigation or water harvesting/spreading is a possibility). If erosion control is necessary for land health, it should be considered as a water management BP in grasslands.

Grasslands, wet meadows, and wetlands have in common that when left uncontrolled, they have the tendency to be over-utilized by livestock and wild ungulates such as elk and deer. Overuse by any species yields a reduction in biomass (plant production), reduction in plant species diversity, and increase in bare ground. An increase in bare ground leads to problems of soil erosion, which starts a cycle of degradation. An increase in bare ground may also increase the chances of land being invaded by noxious weed species.

B5.1.2. Management of Wet Meadows and Wetlands

Wet meadows and wetlands are grasslands with periodically or permanently saturated soils, typical water dependent plants, and soils that exhibit characteristics of periodic saturation. These areas may have patches of standing water seasonally or year round.

Wet meadows and wetlands are landscape types and habitat types, which in many cases fall under the protection of State code and the Federal Clean Water Act. The New Mexico Environment Department's Water Quality Bureau Wetlands Program can offer support and advice about state regulations and practices regarding wetland management. Any work in jurisdictional wetlands (wetlands that meet the federal definition of a wetland) where soil is disturbed or materials are added to the wetland will require permission from the US Army Corps of Engineers. When in doubt, OS staff should consult the SFC floodplain manager, New



Mexico Environment Department, or an expert consultant to determine whether work is planned in an area that is possibly a jurisdictional wetland. Each wetland will be unique, and a specific management plan should be prepared by a wetland professional. For more information on wetland management, see section B4.1.10 and Appendix B.4.1.10.

B5.1.3. Soil and Water Conservation in Dry Meadows and Grass-Shrubland

Other than overgrazing or over rest, the greatest threat to grasslands, wet meadows, and wetlands in New Mexico is active erosion. Erosion control has been discussed elsewhere in this manual (B1.1.3 and B1.1.4). Many erosion control structures may be built by the SFC OS maintenance crew or volunteers, but a professional should be consulted to make a plan for stabilization and restoration structures that will halt erosion in grasslands and wetlands. Inherent in addressing erosion issues is spreading flood waters and stormwater over the landscape in the form of sheetflow rather than have them leave the site in channelized flows through rills and gullies (see Appendix B4.1.10 for the Slope Wetland Technical Guide).

B5.1.4. Grazing Management and Managed Grazing

Grazing management for livestock is essential. Each site is different and will require a rangeland professional to create a grazing management plan based on site conditions. Grazing in wetlands should only be allowed during the winter months, if it is allowed at all.

Minimal requirements for implementing managed grazing include fencing, water sources, personnel to implement planned grazing and monitor site conditions, and grazing animals. Absence of grazing for several years in a grassland ecosystem leads to a condition in which the plant community begins to suffer from over rest. Periodic grazing is good for grassland species diversity, improving contact of plant litter with the soil surface, and improving the mineral cycle, incorporating nutrients back into the soil.

B5.1.5. Controlling Invasive Plant Species and Woody Plant Encroachment

Controlling invasive plant species in meadows requires the Best Practices described in the BP section on invasive plant management (B1.1.5). Additionally, it is important to keep grassland soils covered with grass, forbs, plant litter (mulch), or natural gravel and stone material in order to prevent the invasion of noxious and invasive plants in exposed or disturbed soil.

In the absence of fire, tree and shrub species can invade grasslands. If prescribed fire cannot be used, mechanical removal of woody species is necessary. If woody species are small, goats may be used to remove invading tree and shrub seedlings.

Mechanical removal of woody species is best accomplished with loppers, hand saws, chainsaws, or weed wrenches (see B1.1.5 and B3.1.1).



B5.1.6. Fire Management

Grasslands burned more frequently in the past before people began to actively suppress any wildland fire. In the absence of grazers, fire is an important tool to reset (disturb) over-rested grasslands toward natural regeneration. In grasslands that have been overgrazed, fire is often not able to spread due to the lack of fine fuels (dry grass). One important role of fire in grasslands is to keep invading shrub species from becoming too abundant.

Fire may be a management tool where managed grazing is not a viable option. However, fire is never recommended for wetlands or wet meadows. Fire as a tool does not require fencing or water sources. It does require the help of a prescribed burn professional to write a plan and implement a prescribed burn. Additional insurance and public notifications are necessary when conducting prescribed burns.

Prescribed fire or spontaneous grassland wildfire is often not desirable for conditions close to residential areas or infrastructure. It is also not desirable in conditions where the fire may spread to other habitat (e.g., woodlands or forest lands) that have not been treated to be “fire adapted” (i.e. resilient to low-intensity wildfire). In such cases, periodic managed grazing and mechanical removal of woody species are the most important tools to reduce fuel loads and associated wildfire risk in grasslands (see above). Additionally, creating fire breaks and buffers, such as seasonal mowing of roadside berms, as well as public education and other public safety precautions are important to reduce wildfire risk in grasslands.



C. INFRASTRUCTURE MANAGEMENT

C1. SUSTAINABLE TRAIL BUILDING AND STEWARDSHIP

STANDARD C1.1. Trail Stewardship

Santa Fe County OS maintains and improves county trails using the most up-to-date practices for trail stewardship. OS staff determines the most appropriate users for each trail based on terrain conditions, natural processes along the trail, and available maintenance capacity in the face of the diversity of user preferences, in order to keep trails in proper condition, ensure public safety, and protect the surrounding landscape.

PRACTICES

C1.1.1. Designing Trails

Trails in Santa Fe County fall into two categories, "Regional Trails" and "Local Trails." Regional Trails are wide, multi-use trails that are improved with some form of surface treatment. Local Trails are narrow, multi-use, natural surface trails.

When designing trail alignments and tread details, SFC OS staff will need to hire consultants and direct them to use the already developed Trail Design guidelines for the OS and Trails Program. Where the existing county guidelines fall short, OS staff will direct consultants to use the most appropriate trail design and development guidelines for the specific terrain conditions and trail objectives specified for the project. Despite the proliferation of trail development reference books, local appropriateness of trail design standards is essential to minimize future maintenance and trail repair.

C1.1.2. Maintaining Trails

When maintaining and restoring existing local, natural surface trails, Santa Fe County uses locally appropriate trail stewardship Best Practices (BPs). Such BPs vary for each type of trail and each location. For example, appropriate BPs for medium and low elevation, natural surface foot trails are described in the 2012 publication *Caring for Good Trails* (Jansens 2012), while appropriate BPs for various kinds of bicycle trails are described in the latest International Mountain Biking Association (IMBA) trail guide. IMBA BPs are generic and must be adapted to SFC local conditions, following principles and techniques explained in the 2012 *Caring for Good Trails* document. In cases of complex trail conditions, Santa Fe County is advised to hire an experienced local trail consultant or work with experienced local trail stewards.

Under conditions of snow melt and after heavy rains, the trail tread usually becomes saturated, which leads to puddles and muddy tread conditions. An appropriate BP for such conditions includes the temporary closure of trails and signage indicating the closure.



Similarly, it is an appropriate Best Practice in Santa Fe County to use signage, placement of branches, and interactive public education to indicate the closure of “social” trails (informal, user-made trails) steep and eroded trail cutoff sections, and rills that may look like informal trails. Various trail closure and rerouting options are presented in the 2012 Caring for Good Trails document (Appendix C1.1.2.).

C1.1.3. Creating and Maintaining Side Trails or Access Bubbles to High Value Viewpoints

Santa Fe County creates side trails, short loops, or access bubbles, off of main trails that provide ease of access to quality viewpoints and unique experiences. For example, at the La Cieneguilla Open Space (LCOS) short side trails from the footpath by the river to the edge of the stream will be created for trail users to allow easy access to the river for outdoor classroom opportunities. Local users of the access bubbles can be engaged in maintaining the side trail where appropriate. For instance, at the LCOS in locations where willows may encroach on the access pathway, clearance of vegetation may be performed by users of the access bubbles.

GUIDELINES AND REFERENCES

- International Mountain Bicycling Association (2004). *Trail Solutions. IMBA’s Guide to Building Sweet Singletrack*, <https://www.imba.com/resource/trail-solutions> and [https://www.imba.com/explore-imba/trail-creation-and-enhancement/trail-solutions?param=trail-solutions-\(ts\)-project#](https://www.imba.com/explore-imba/trail-creation-and-enhancement/trail-solutions?param=trail-solutions-(ts)-project#).
- Jan-Willem Jansens (2012). *Caring for Good Trails. A Field Guide for Trail Maintenance Volunteers in the Southwestern U.S.* Santa Fe Conservation Trust, <http://www.sfct.org/trails>.



C2. OPEN SPACE INFRASTRUCTURE

STANDARD C2.1. Maintaining Open Space Infrastructure

Santa Fe County OS maintains and improves specific infrastructure elements associated with SF OS in addition to trails. These include signs, bulletin boards, parking areas, sites for community events, trail head areas, irrigation systems, stormwater management features, wildlife and livestock water drinkers, planted trees and their support structures, fences, gates, stiles, and other boundary infrastructure. OS staff determines the most appropriate design, dimensions, materials, and other features for these elements based on terrain conditions, natural processes, and available maintenance capacity in the face of the diversity of user preferences, in order to keep OS properties in proper condition, ensure public safety, and protect the surrounding landscape.

PRACTICES

C2.1.1. Creating and Maintaining Sites for Community Events

Santa Fe County OS may provide staging at open space properties with appropriate access for the purpose of hosting the county's own events or allowing other groups to conduct activities that encourage stewardship and care of OS properties. Best Practices include:

- Defining the location of the event on the property to ensure that enough space for event activities exists to occur safely and without damage to property resources
- Determining that footpath or road access is available to match the needs of the event, such as for bringing in tables, shade canopy, or chairs and removing recycling and garbage generated during the event
- Ensuring that events have little to no impact on the water, wildlife, plants, and soil resources on the property
- When demand for events on open spaces becomes high, considering the creation of a permit system that defines the event organizers' responsibilities for set-up, clean-up, and fees

C2.1.2. Signage and Bulletin Boards

SFC OS Staff will follow the design guidelines of the September 2017 Santa Fe County Open Space Signage Plan for the development and maintenance of signs, kiosks, and bulletin boards used at county OS and trails.

C2.1.3. Parking Areas and Trailheads

SFC OS Staff will follow guidelines of Santa Fe Public Works and the 2012 Sustainable Land Development Code (SLDC) for the development and maintenance of parking areas and trailheads. For maintenance activities associated with weed control, erosion control, drainage

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management, and other aspects of terrain management, the same BPs apply as for the maintenance of trail and OS terrain presented elsewhere in this manual.

C2.1.4. Irrigation

Irrigation is an important BP in the semi-desert ecosystems of Santa Fe County, and plays an important role in supporting vegetation at select locations of OS properties. Water sources are scarce in the county, making irrigation systems exceptional forms of infrastructure on county OS properties. The technical, specialized, and site specific nature of irrigation systems will require in most cases that SFC OS staff hire an expert to address the installation and upkeep of irrigation systems. On county OS properties, such systems include:

- River-related flood irrigation (or riparian ecosystems)
- Acequia irrigation of meadows and areas with a historical agricultural purpose (e.g., at Los Potreros OS)
- Piped systems for furrows, flood irrigation, or drip irrigation on fields (e.g., at Los Potreros OS)
- French drain irrigation

It is essential to verify in each case whether the county owns water rights for irrigation and what the conditions for the water right are. If no water rights exist, it will be necessary to import water to the site.

Acequias need annual cleanup. Participation of SFC OS staff in the acequia association associated with the acequia to be maintained will be of value in coordinating cleanup work and ensuring community involvement and quality control. Best Practices for acequia cleanup and restoration are best determined in collaboration with other parciantes (i.e., neighbors) in the acequia association.

C2.1.5. Fencing, Gates, Stiles, and Boundary Management

Boundary management is important to control access and prevent trespassing by people and livestock. Boundary management also is of importance in the communication with neighbors about where county maintenance begins and maintenance by neighbors ends.

As a general rule, it is advisable that county OS properties are fenced with the simplest fencing techniques necessary to meet the purpose of managing boundaries at each property. Boundary management goals vary between properties and between locations at each property. Goals may include:

- Identification (demarcation) of property boundaries for maintenance purposes and communication with neighbors
- Prevention of unwanted access and activities, e.g., from livestock, (off-road) vehicles, hikers, riders, or equestrians



- Prevention of encroachment from neighboring activities and associated waste products or nuisance (noise, fire, littering, etc.)
- Prevention of dumping of waste

Simple fencing would include smooth wire (one, two, or three strands), wooden split rail fences, and other designs of rustic wooden fencing. For keeping livestock out, barbed-wire fencing would be necessary. However, precautions must be taken to allow any wildlife present in the area to pass (see BPs for wildlife-friendly fencing, B2.2.1.4).

SFC OS Staff will follow the guidelines of Santa Fe Public Works and the 2012 Sustainable Land Development Code for the development and maintenance of fences. It may be necessary in some cases to hire consultants or contractors to improve or install fencing to achieve the desired quality and meet fencing goals.

SFC OS may want to develop internal guidelines and techniques for providing desired access through the standardization of gates and stiles for different forms of access and users. It would be advisable that this topic be addressed in a contract for a planning and design contractor, similar to the County Signage Plan.

C2.1.6. Planted Trees and Their Support Structures

A tree that is planted correctly will grow twice as fast and live at least twice as long as one that is incorrectly planted. Following planting Best Practices will ensure the success of planted stock.

If the soil in the planting area is loose or it is possible to loosen the soil by digging or roto-tilling in an area with a radius of 5 times the diameter of the rootball, dig a hole as deep as the rootball is tall. In many cases that will be 12-18 inches. Create a planting hole with a width approximately 3-4 times the diameter of the root ball. The prepared, loose soil will encourage root growth beyond the root ball and result in a healthier tree (Figure 43).

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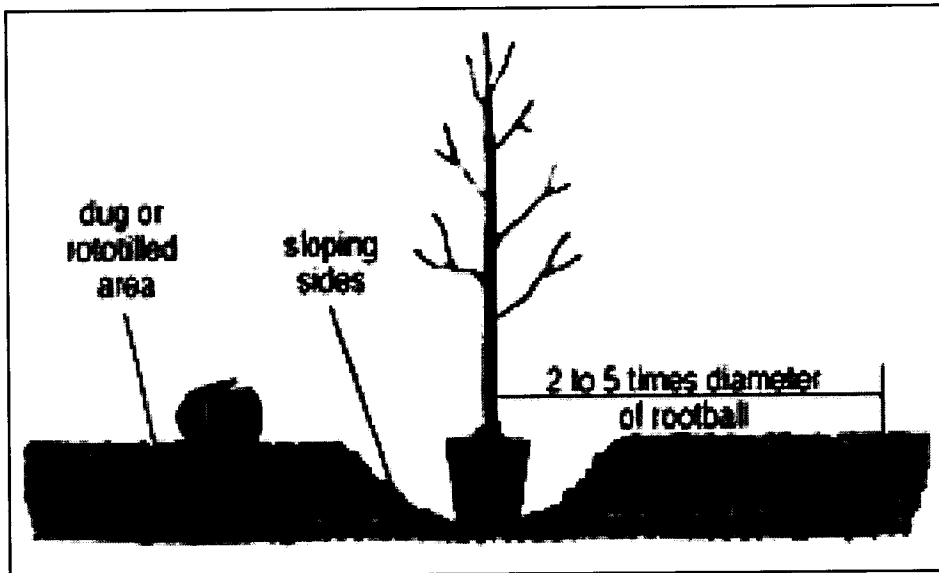


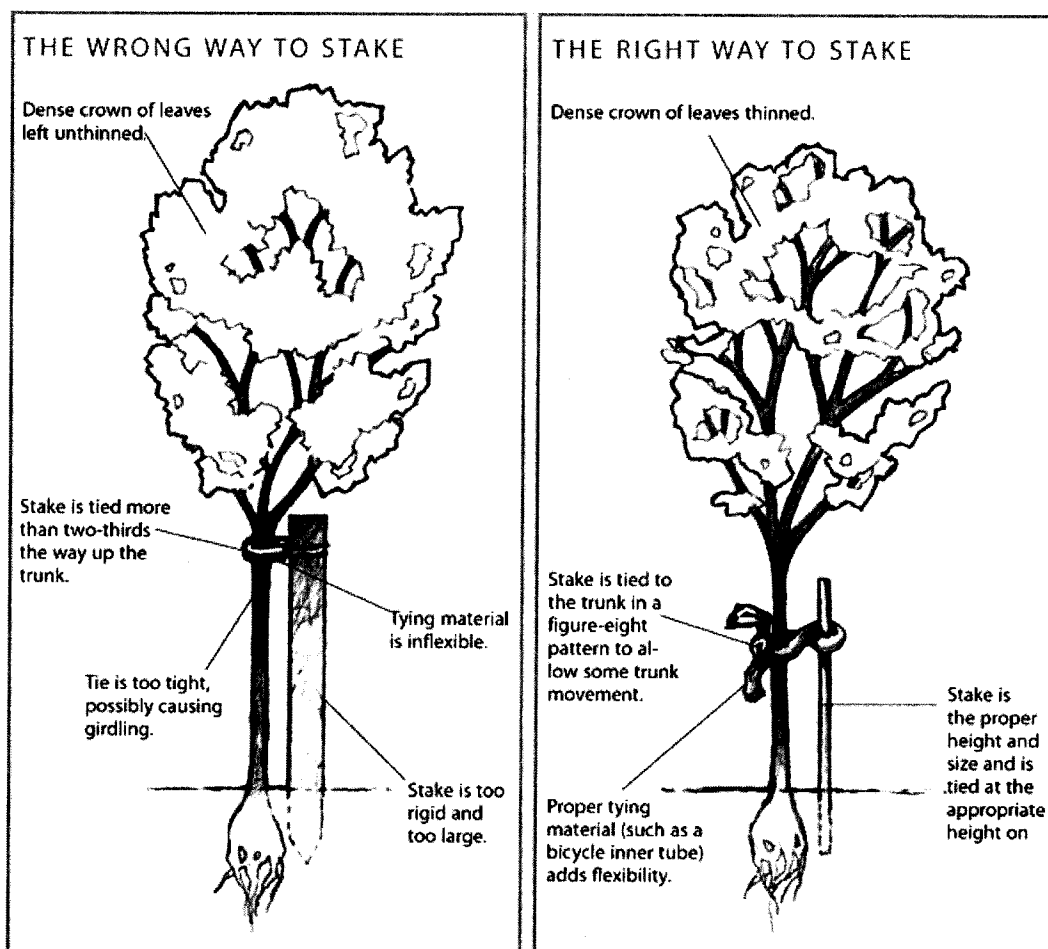
Figure 43. Cross-section diagram of tree planting Best Practices. Source: Tree New Mexico.

If the soil in the planting area is very dense because of a high clay content or compaction and it is not possible to loosen the soil by digging or roto-tilling, dig a hole as deep as the rootball is tall (in many cases 12-18 inches) and approximately 2-3 times the diameter of the root ball. A tighter hole and unprepared, dense soil will require the tree from the start to invest most of its energy in root development and cause stunting below and above ground.

In transplanting the tree from the container to the ground, be sure to keep soil around the roots, for example by watering the pot a day in advance or moistening the ball in the pot before planting. Always handle the tree by the root ball or container, not by the trunk or branches. Don't let the root ball dry out. Watch for circling roots. Help prevent root girdling by vertically cutting any roots that show tendencies to circle the root ball.

In windy areas and shallow and soft soils, specimen trees of 8 feet tall and taller may need to be stabilized with one or more tree stakes or braces. An easy way to stake a tree is to use one or





• **Figure 44.** Cross-section diagrams of tree staking BPs. Source: Fine Gardening.

more 8-foot, treated, square or round post (2-4 inches in diameter), sunk 3-4 feet into the ground, 12-18 inches from the tree and connected to the tree with a broad canvass and/or rubber brace band. Ensure that the tree can still move in the wind, that the area of the band touching the tree is covered by soft fabric to prevent it from girdling the bark, and that the tree stem has ample room to grow within the band.

If the crown of the banded tree has a dense canopy of leaves or needles, it will be necessary to thin the canopy to about 50 percent permeability in order to reduce wind pressure on the tree (Figure 44). Check the bands regularly to make sure that they have not started to girdle the bark and continue to allow room for growth. After 2-5 years, when the tree is stable enough to support itself, remove the stake(s) and brace band(s).

After placing the tree, pack soil firmly but not tightly around the root ball. Use any left-over dirt from the planting hole to create a low (1-2 inches) mound around the planting hole at about 3 feet from the stem to create a well that will hold water in place. Water the soil and place a protective cover of mulch in the tree well and on its circular berm.



In areas where watering frequencies must be limited, the planting hole can be augered or dug to a depth of 4 or 5 feet and filled with gravel and 2-3 inches of cobble material to create a French drain 2-3 feet deep. Dirt is backfilled on top of the gravel and cobble layers, along with a 3-4 inch flexible, corrugated PVC pipe (Ag pipe) that is dug into the French drain cobble and gravel fill. This pipe is meant to serve as an inlet for watering, while the French drain is meant as a storage device for water (Figure 45). The tree will gradually grow in and around the French drain to access the water, and will in this way have a greater chance of survival under dry weather conditions. Depending on the size of the French drain, the size and water needs of the tree, and weather conditions, watering can be limited to once a week or once a month in the first year of tree establishment.

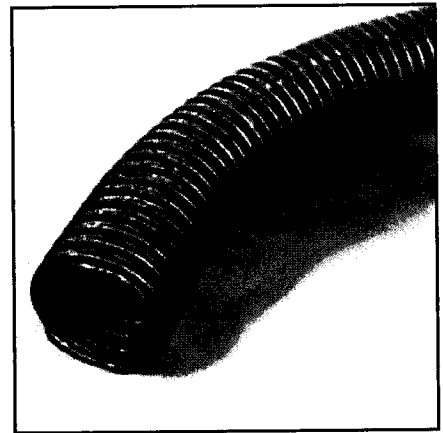


Figure 45. Image of an Ag pipe (flexible, corrugated PVC pipe) for tree watering.

Trees planted on slopes of 4 percent or greater may need to be supported by additional structures. The tree well will need to have a rock-reinforced overflow on its downhill side to prevent overflowing water from creating a headcut into the planting hole. The overflow (mini-spillway) needs to cover about a quarter of the tree well mound and must not be higher than any other part of the tree well mound. When installed at the time of planting, it is useful to make the rock overflow 0.5-1 inch lower than the tree well mound because the mound will tend to erode down over time. In some cases, a stacked rock cover or retaining wall is necessary to shore up the planting hole on the downhill side and to prevent erosion. In this way, a mini-terrace will be created to support the tree on the slope (Figure 46).





Figure 46. Image of an individual tree terrace with a rock retention wall. Source: Ecotone Landscape Planning 2018.

Where the planted trees need to be protected from wildlife, cattle, or other forms of potential damage, each tree or the entire planted area may need to be fenced off. There are specific cages and plastic tubing devices for sale for trees, called “tree shelters” (Figure 46). As one land steward states.

... tree shelters do more than just protect the seedling from deer, mice, voles and rabbits. They act as a greenhouse, collecting light and warming the temperature inside the shelter for earlier growth in the spring and later growth in the fall. Shelters act as markers, making the trees easier to see. This allows quicker inspection and maintenance. Being visible also prevents the tree from being mowed by a careless operator (Whitescarver Land Management LLC 2013).





Figure 47. Example of tree shelters in a field of planted trees. Source: Tubex.

For large groups of planted trees, such as riparian buffers or planted clumps, temporarily fencing out the area with wildlife fencing or barbed-wire fencing to keep cattle out is essential to establish the vegetation. In planning the activity, it will necessary to determine whether individual tree shelters or a boundary fence is most cost effective from the point of view of material costs, installation costs (labor time) of the tree shelters or fencing, access and tree maintenance, and future removal of these protective measures.

GUIDELINES AND REFERENCES

- NM Energy Minerals and Natural Resources Department, State Forestry Division, Conservation Seedling Program – Planting, <http://www.emnrd.state.nm.us/SFD/treepublic/Planting.html>.
- Leigh Reich (2018). “To Stake or Not to Stake”: <http://www.finegardening.com/article/to-stake-or-not-to-stake>.



- Tubex on tree shelters: <http://www.tubexusa.com/forestry-products-tree-shelters.html>.
- Santa Fe County (2017). Santa Fe County Open Space Properties Signage Plan. Prepared by Design Office for Santa Fe County. September 2017.
- Tree New Mexico, How to Plant a Tree? <http://www.treenm.com/how-to-plant-a-tree/>.
- Tubex USA (tree shelters): <http://www.tubexusa.com/forestry-products-tree-shelters.html>.
- Whitescarver Land Management LLC (2013). "Tree Shelters, Are They Worth It and If So When Should They Be Removed?" <https://www.gettingmoreontheground.com/2013/02/21/tree-shelters-are-they-worth-it-and-if-so-when-should-they-be-removed/>.

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OSTP Signage Plan

The OSTP Signage Plan provides consistency in the design of OSTP trailheads and signage. This begins to “brand” OSTP in order to provide recognizable and standard wayfinding and identification.

The following document is the OSTP Signage Plan.



El Camino Real, a National Historic Trail



Ortiz Mountains Open Space

Action

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SANTA FE COUNTY

OPEN SPACE PROPERTIES SIGNAGE PLAN

PREPARED BY DESIGN OFFICE
FOR SANTA FE COUNTY, SEPTEMBER 2017

SFC CLERK RECORDED 01/09/2019

SEPTEMBER 2017



SANTA FE COUNTY

OPEN SPACE PROPERTIES SIGNAGE PLAN

PREPARED FOR SANTA FE COUNTY BY:
design office
landscape planning urbanism

WITH:
NOBLE ERICKSON . signage / graphic design
J9 DESIGNS . logo design

SFC CLERK RECORDED 01/09/2019

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INTRODUCTION

PURPOSE

Santa Fe County manages over 46 miles of trails and 36 park and open spaces areas totaling more than 7,345 acres. Although these facilities and landholdings are widespread and some are well used, Santa Fe County is often not recognized as the land steward and manager of these sites.

The signage plan project focuses on the planning, design and documentation of a comprehensive wayfinding and signage program for Santa Fe County open space properties and facilities. The Signage Plan is intended to address aspects of navigation, marketing, and advertising.

Santa Fe County proposes the following sign program for Santa Fe County open space properties, facilities, and trails in order to achieve the following goals:

- communicate a consistent Santa Fe County brand that the public can recognize
- convey information to the public about Santa Fe County open space properties and trails
- identify those facilities administered in partnership with other groups or agencies
- offer a positive image and identity for facilities owned and maintained by Santa Fe County
- enhance the experience of the site by providing information about safe use, access, and wayfinding within the facility
- provide learning opportunities through interpretive signage

The sign program is intended to provide an overall recognizable brand that also incorporates elements of the unique character and landscapes of each property or region. Within the long and narrow land area of 1,911 square miles that extends from Edgewood to Espanola and Chimayo, Santa Fe County encompasses a multitude of diverse ecoregions, settlements, and cultures.

The Signage Plan sets the stage for the effective management of Santa Fe County open space properties by establishing standards for planning, designing, fabricating, ordering, installing, and maintaining signs to ensure a consistent and effective county-wide sign program that sets a professional and positive image of Santa Fe County. This Signage Plan:

- describes the sign planning process
- describes the types and locations of signs
- outlines Santa Fe County open space sign standards
- provides specific design standards for certain types of signs

SIGN PRINCIPLES

Santa Fe County must place signs appropriately; use established emblems, international symbols and established standards of the sign industry; adhere to Uniform Federal Accessibility Standards (UFAS) guidelines; meet specifications established by the Manual of Uniform Traffic Control Devices (MUTCD) for vehicle and pedestrian traffic control signs; adhere to other federal, state, and local laws as applicable; and complement other media.

SIGN PROGRAM STRATEGY

The sign program strategy for Santa Fe County open space properties is as follows:

- Identify lands and facilities administered by Santa Fe County
- Support master plan and management plan directions for the protection, management, and use of Santa Fe County administered lands.
- Provide information on the use and management of resources.
- Provide information to enhance the users' safety, enjoyment, and access.
- Interpret natural, historic, and cultural features as appropriate.
- Provide consistency in sign shape, materials, message, and appearance.

MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES

The Manual of Uniform Traffic Control Devices, or MUTCD defines the standards used by road managers to maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public travel. These include all traffic control devices, road markings, highway signs, and traffic signals. The MUTCD is published and administered by the Federal Highway Administration (FHWA).

Where applicable, all signs and sign bases within this Signage Plan should be constructed, located, installed and maintained per MUTCD standards. MUTCD standards are not outlined in this Signage Plan.

SANTA FE COUNTY - LAND DEVELOPMENT CODE

Chapter 7 - Sustainable Design Standards, Section 7.9 Signs of Santa Fe County's Sustainable Land Development Code (SLDC) outlines Santa Fe County requirements for signs. All signs and sign bases within the Signage Plan should be constructed, located, installed and maintained according to Santa Fe County SLDC.

ROLES AND RESPONSIBILITIES

The following entities play a role in the Santa Fe County open space Signage Plan:

- Land Use Planning
- Open Space Maintenance

The vision for the property outlines the level of development for the property which includes density and type of signage. New capital projects should include assessment and siting of signs which will be reviewed through the development review process by the open space planner. This open space signage plan will be incorporated into the Public Works Design Standards for projects to facilitate implementation of these guidelines. New signs will be assessed through review of applicable plans and approved through a review by the Santa Fe County interdepartmental open space working group.

Monitoring and maintenance of signage will be included in monitoring schedule and protocol for all properties. Monitoring can be done by volunteers or staff as necessary, in accordance with the monitoring plan for each property.

EXISTING CONDITIONS ASSESSMENT AND SIGN RECOMMENDATIONS

EXISTING CONDITIONS ASSESSMENT

The initial task of the Signage Plan was to catalog the types of facilities and properties managed by Santa Fe County and document existing locations and types of signs.

SANTA FE COUNTY OPEN SPACE PROPERTIES

Open space properties managed by Santa Fe County are diverse in size, location, and types / frequency of use. They include parks, trails, conservation areas, and preserves.

PARK

A total of 14 parks are managed by Santa Fe County that range in size from 1/2 acre to over 70 acres. Over half (8 of 14) of the County's parks are located adjacent to community centers and provide small-scale recreational options such as children's playgrounds, trails, or basketball courts. The remaining parks provide larger specialized active and passive recreational opportunities for the surrounding community.

TRAIL

Major trails operated and maintained by Santa Fe County include sections of the Santa Fe River Trail (4 mi.), Santa Fe Rail Trail (12 mi.), and the Arroyo Hondo Trail (in progress). These trails are primary corridors that connect neighborhoods to area destinations and extend beyond County maintenance into the City of Santa Fe urban trail system.

CONSERVATION AREA

Conservation areas are designated open space tracts that focus on resource protection while allowing selective public access for passive recreation. In some cases, portions of conservation areas may be seasonally restricted for special considerations (e.g. nesting seasons, migratory periods, unique cultural / historical features). Only four of the 14 conservation areas have improvements (trails, trailheads, etc.) and are being used by the public: Arroyo Hondo Open Space, Cerrillos Hills Historic Park, Talaya Hills Open Space, and Tesuque Creek Open Space.

PRESERVE

Land holdings designated as 'Preserve' protect underlying natural or cultural resources that require protection and preservation. Preserves have limited public access. Currently, some preserve properties are open to the public for guided tours or to researchers with prior approval. In the future, select preserve properties may be open to low-impact, controlled public access.

SIGN RECOMMENDATIONS

The Signage Plan offers recommendations for a new signage system to serve as a standard for all new and replacement Santa Fe County open space signs. The Signage Plan was developed following interviews with County staff, a review of the existing conditions assessment, and an analysis of Santa Fe County open space property needs.

Sign recommendations include the following:

- establish a consistent Santa Fe County message / brand
- develop a materials palette for signs, sign mounting, and adjacent site improvements
- create a sign family that can accommodate the range of content needed for a site at the appropriate scale
- utilize off-the-shelf materials and components where possible to facilitate repairs and sign replacement
- outline a protocol for sign assessment and maintenance.

EXISTING SIGN SYSTEM

An inventory of existing signs present on Santa Fe County parks, trails, conservation areas, and preserves was conducted (see Appendix B: Existing Conditions Assessment) to catalog the types, locations, materials, and overall design of existing signs.

The signage existing conditions assessment revealed the following:

- lack of consistent Santa Fe County message / brand
- inconsistency in sign materials, shape, message, and placement,
- sign graphics vary throughout the facilities and properties
- no protocol for sign design, identification, fabrication, and installation
- no protocol for sign assessment and maintenance.

SIGN STANDARDS

SIGN TYPES

SIGN TYPES

A signage needs analysis was conducted for each Santa Fe County open space property and facility to determine recommended signs (see Appendix A: *Site Signage Recommendations*). The following sign types are recommended to communicate needed information in the proper location:

VEHICULAR DESTINATION SIGNS

Vehicular destination signs are signs placed along the roadway that announce to motorists and travelers arrival at a destination. The type and size of the vehicular destination sign is dependent on the type and size of the facility and the road classification / speed of the adjacent roadway. The sign materials and placement should complement the facility while reinforcing the Santa Fe County brand.

PEDESTRIAN ARRIVAL SIGNS

Upon arrival at a Santa Fe County property or facility, Pedestrian Arrival Signs provide information to orient and direct users, establish rules and regulations, and communicate information from the community. Pedestrian arrival signs are scaled to pedestrians and are typically located at thresholds between parking areas and pedestrian access to the facility.

PEDESTRIAN DIRECTIONAL SIGNS

Within an open space property or trail system, pedestrian directional signs provide internal wayfinding information and help orient the user. Depending on the information needed at particular junctions, signs may include orientation maps, directional information, reassurance, or distances. The consistent use of the sign family within the facility help reassure the user that they are in the right location within a Santa Fe County managed facility.


INTERPRETIVE SIGNS


Interpretive signs are intended to raise awareness and understanding of natural, cultural, and archaeological resources in an effort to instill respect and help preserve these resources for future generations. Interpretation engages visitors by telling stories in a unified and compelling way. Content for interpretive signs will be governed by existing interpretive plans (e.g. Galisteo Basin Interpretive Plan), or by individual site master plans or management plans. The essential qualities of meaningful interpretation are to make the information purposeful, enjoyable, relevant, organized, and thematic.


REGULATORY SIGNS

Regulatory signs inform road (and trail) users of selected traffic laws as set by federal, state, and local laws. Regulatory signs are required to adhere to MUTCD standards, be of retroreflective material, and have designated sizes, shapes, and placement.


Vehicular - Destination

 **VD1**
Gateway / Monument


 **VD2**
Primary Identifier


 **VD3**
Facility Identifier

 **VD4**
Facility Identifier - Alternative


 **VD5**
Facility Identifier - Wall / Fence Mounted

Pedestrian - Arrival


 **PA1**
Primary Kiosk

 **PA2**
Secondary Kiosk


 **PA3**
Rules

 **PA4**
Marker - Rules


Pedestrian - Directional


 **PD1**
Orientation

 **PD2**
Directional

 **PD3**
Marker - Distance / Reassurance

Pedestrian - Interpretive


 **PI1**
Panel - LG

 **PI2**
Panel - MD

 **PI3**
Panel - SM

 **PI4**
Panel - XS

Regulatory

 **R1**
Vehicular

 **R2**
Trail

VEHICULAR - DESTINATION

Monument sign sizes and configurations (single, double, double-sided) are determined as appropriate to the setting and shall be designed specifically for each site. Certain sign components (steel panel, fonts, logos) are standardized so each sign communicates the Santa Fe County brand, while other components (items indicated in gray, below) are variable so that elements may be appropriately designed for each site to complement the setting.

Sign backing and sign bases shall incorporate site specific, regionally appropriate materials and be scaled appropriate for each site. Stucco colors or stone veneer, for example, shall relate to the surrounding landscape or match that of nearby structures.

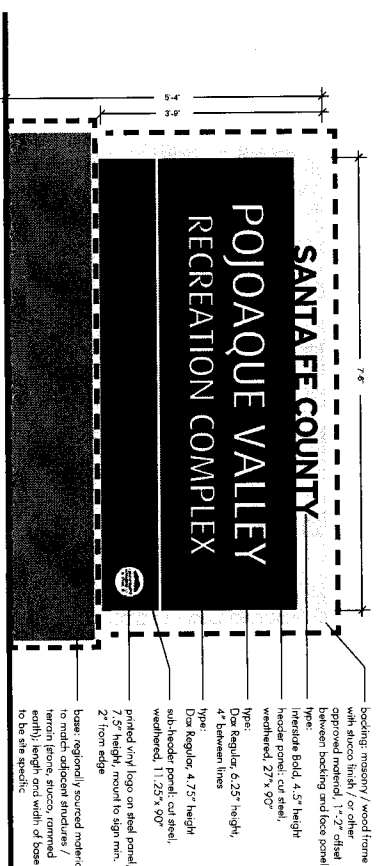
See Appendix A: *Site Sign Recommendations Matrix for Monument Sign suggestions for Romero Park, Thornton Ranch Open Space, Pojoaque Valley Recreation Center, and Edgewood Open Space*

Design considerations for Monument / Primary Identity Signs:

- Scale: Sign size and base configuration / size to correspond with size of facility / anticipated visitors and speed of vehicular approach; signs should not dominate or detract from the facility or surrounding landscape.
- Configuration: Double sign (gateway) or single sign configuration (orientation, location) to be determined by desired visibility from roadway and corresponding size of facility.
- 2-sided / 1-sided: Double or single-sided sign content to be determined by sign configuration and desired messaging (e.g. facility information could align with approach and separate, alternate content could occur upon exiting facility).

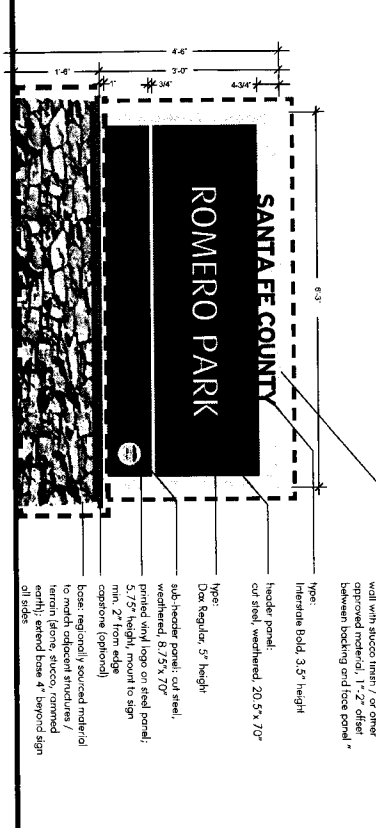
- Material: Sign backing and base material to harmonize with site landscape, regionally found materials, and conform to designated approved site material palette.
- Content: Panels shall identify Santa Fe County, the standard facility name, and any partner emblems. Additional information such as operating hours, directional information, or unique (discreet) graphics may be included as long as it does not detract from the overall legibility of the sign.

- Mock-up: A full size wood block-out of the monument sign placed on site, scaled model, or a scaled perspective rendering is recommended prior to finalizing the monument sign location, configuration, and scale.

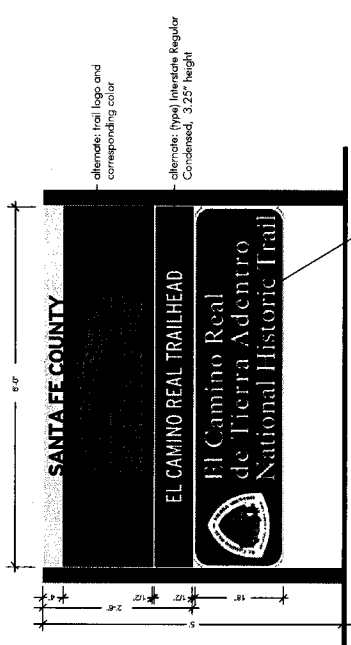


Y01 Gateway / Monument Sign

Note: Gateway / Monument sign illustrated above is an example only. Gateway / Monument sign designs to be generated for specific open space properties. Proposed Gateway / Monument signs to follow design considerations listed above, utilize standard Signage Plan header panel w/ logo and graphics, and sub-header panel with text and/or graphics.



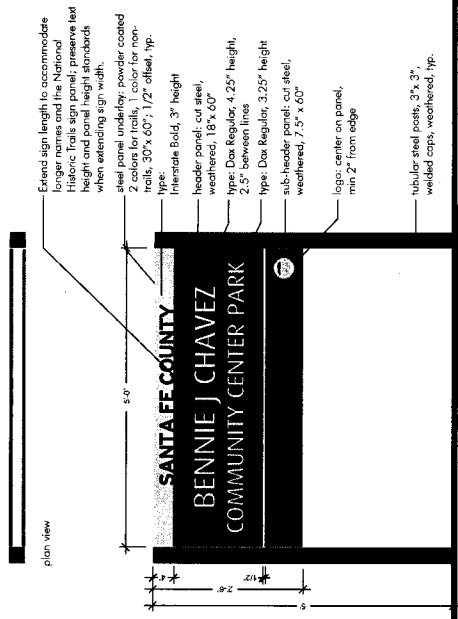
Y02 Primary Identifier



alternate: trail logo and corresponding color

alternate: (type) Interstate Regular Condensed, 3.25' height

alternate:
sign frame widened to accommodate NHT Site Identifiatory Entrance sign standard panel (72" width x 18" height), logo and trail name vary



Extend sign length to accommodate longer names and the National Historic Trails sign panel; preserve total height and panel height standards when extending sign width.

steel panel underlay: powder coated 2 colors for trails, 1 color for non-trails, 30" x 60", 1/2" offset, typ.

type: Interstate Bold, 3" height

header panel: cut steel, weathered, 18" x 60"

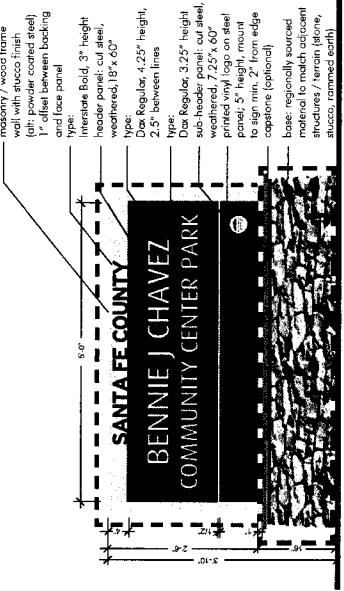
type: Dae Regular, 4.25" height, 2.5" between lines

type: Dae Regular, 3.25" height weathered, 7.5" x 60"

logo: center on panel, min. 2" from edge

sub-header panel: cut steel, weathered, 7.5" x 60"

tubular steel posts, 3" x 3", welded caps, weathered, typ.



masonry / wood frame wall with stucco finish (air powder coated steel) 1" offset between backing and face panel

Interstate Bold, 3" height header panel: cut steel, weathered, 18" x 60"

type: Dae Regular, 4.25" height, 2.5" between lines

Dae Regular, 3.25" height weathered, 7.25" x 60"

sub-header panel: cut steel, weathered, 7.25" x 60"

printed vinyl logo on steel panel, 5" height, mount to sign min. 2" from edge capstone (optional)

base: regionally sourced material to match adjacent structures / terrain (stone, stucco, tanned earth)

VP3 Facility Identifier

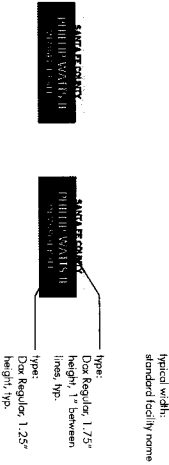
VP4 Facility Identifier - Alternative

VP5 Facility Identifier - Wall / Fence Mounted

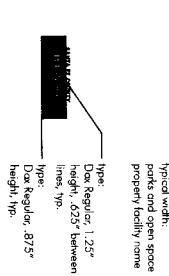
PEDESTRIAN - ARRIVAL



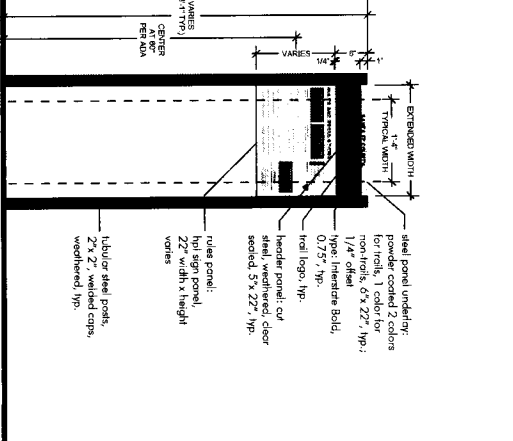
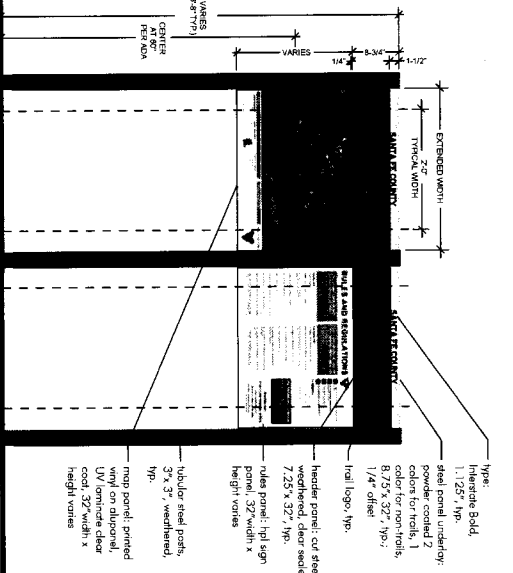
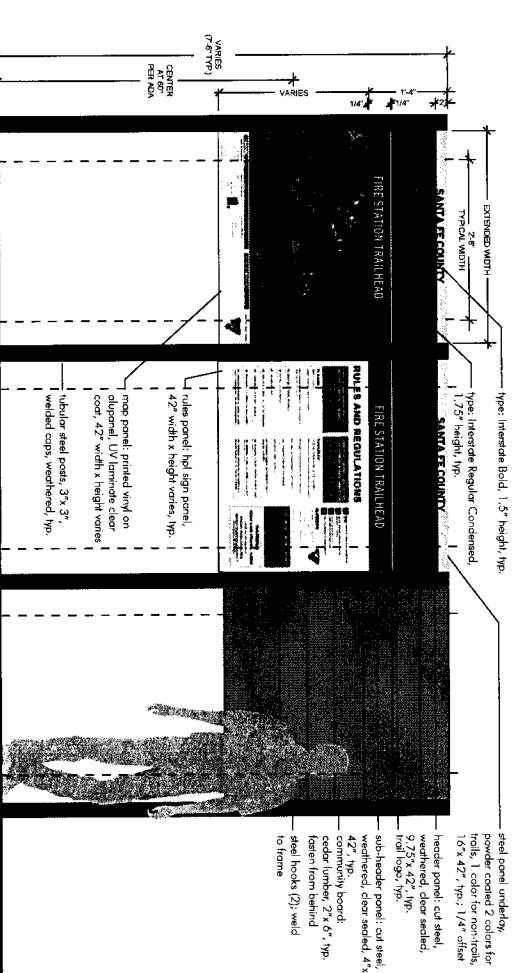
plan view



plan view

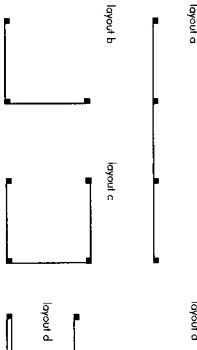


plan view



PA1 Primary Kiosk

Note: Extended width kiosk sign illustrations how sign panels may be extended to accommodate longer piece names or map panels. Big size/2x height and height and height standards. The use of standard sizes is encouraged but the size can vary according to sign use and message. Final panel width is driven by the content of the map and/or rules panel.



PA2 Secondary Kiosk

PA3 Rules

PEDESTRIAN - DIRECTIONAL

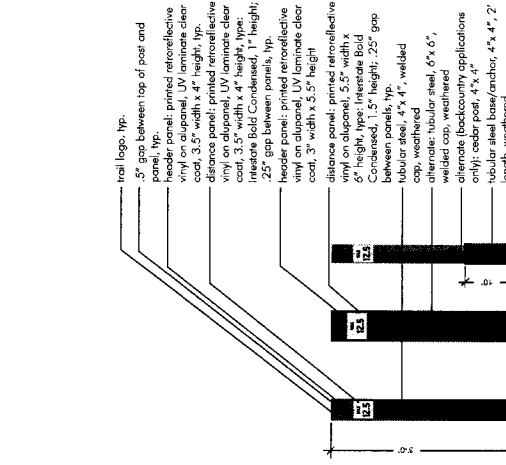
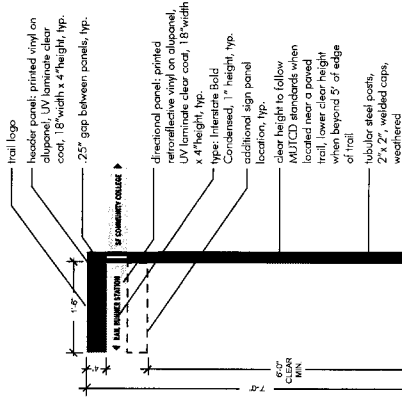
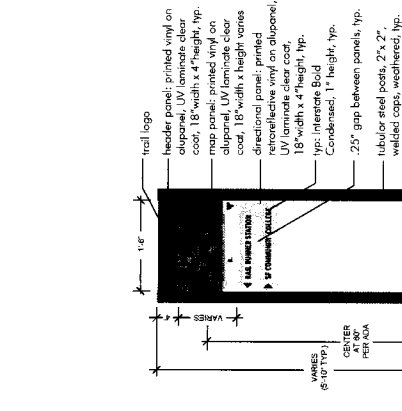


plan view

plan view

plan view

plan view



5" gap between top of post and panel, tp.
 header panel: printed retroreflective vinyl on alupanel, UV laminate clear coat, 3.5" width x 4" height, tp.
 use panel: printed retroreflective vinyl on alupanel, UV laminate clear coat, 3.5" width x 4" height, tp.
 25" gap between panels, tp.
 rule icon panel: printed retroreflective vinyl on alupanel, UV laminate clear coat, 3.5" width x 4" height, tp.
 tubular steel post, 4" x 4", welded cap, weathered

trail logo
 header panel: printed vinyl on alupanel, UV laminate clear coat, 18" width x 4" height, tp.
 map panel: printed vinyl on alupanel, UV laminate clear coat, 18" width x height varies
 directional panel: printed retroreflective vinyl on alupanel, UV laminate clear coat, 18" width x 4" height, tp.
 type: Interstate Bold Condensed, 1" height, tp.
 25" gap between panels, tp.
 tubular steel posts, 2" x 2", welded caps, weathered, tp.

trail logo
 header panel: printed vinyl on alupanel, UV laminate clear coat, 18" width x 4" height, tp.
 directional panel: printed retroreflective vinyl on alupanel, UV laminate clear coat, 18" width x height varies
 type: Interstate Bold Condensed, 1" height, tp.
 additional sign panel location, tp.
 clear height to follow MUTCD standards when located near a paved trail, lower clear height when beyond 5' of edge of trail
 tubular steel posts, 2" x 2", welded caps, weathered

5" gap between top of post and panel, tp.
 header panel: printed retroreflective vinyl on alupanel, UV laminate clear coat, 3.5" width x 4" height, tp.
 distance panel: printed retroreflective vinyl on alupanel, UV laminate clear coat, 3.5" width x 4" height, tp.
 Interstate Bold Condensed, 1" height, tp.
 25" gap between panels, tp.
 header panel: printed retroreflective vinyl on alupanel, UV laminate clear coat, 3" width x 3.5" height
 distance panel: printed retroreflective vinyl on alupanel, 3.5" width x 4" height, tp.
 Condensed, 1" height, tp.
 25" gap between panels, tp.
 tubular steel, 4" x 4", welded cap, weathered
 alternate: tubular steel, 6" x 6", welded cap, weathered
 alternate (backcountry applications only): cedar post, 4" x 4" tubular steel base/anchor, 4" x 4", 2" length, weathered

PA4 Marker - Rules

PDI 1 Orientation Map

PDI 2 Directional Sign

PDI 3 Marker - Distance / Reassurance

Note: While a four-directional sign is illustrated above in plan view, sign prices may differ in any combination of directions. If directional signs to be easily added or removed are needed for better user interface.

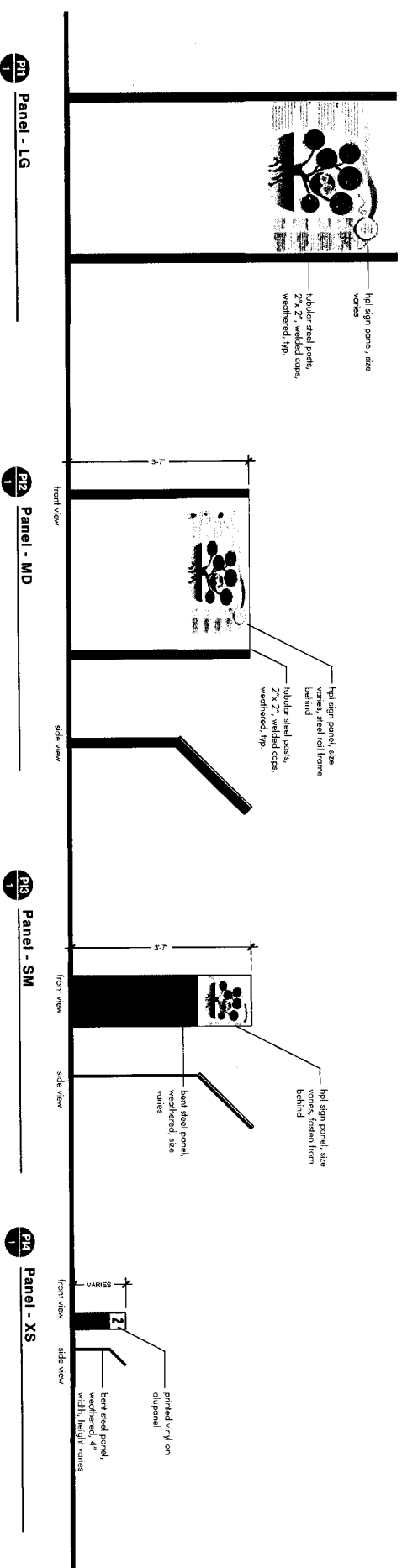
PEDESTRIAN - INTERPRETIVE

Interpretive signs communicate additional information about unique aspects of a site's natural, cultural, or archaeological resources. The interpretive content, panel size, frame type, and placement will be determined to best communicate the information in a way that engages the reader.

The following interpretive sign series is intended to be a starting point for interpretive information and is not exhaustive. Primary requirements of interpretive signs include: utilizing materials and fabrication methods of other pedestrian signs within the signage plan, and sizing / placing content in locations to engage the reader but not distract from the resource.

Where feasible, interpretive panels can be incorporated within other pedestrian signs (e.g. primary kiosk, secondary kiosk, trail map) as separate panels or portions of panels.

plan view

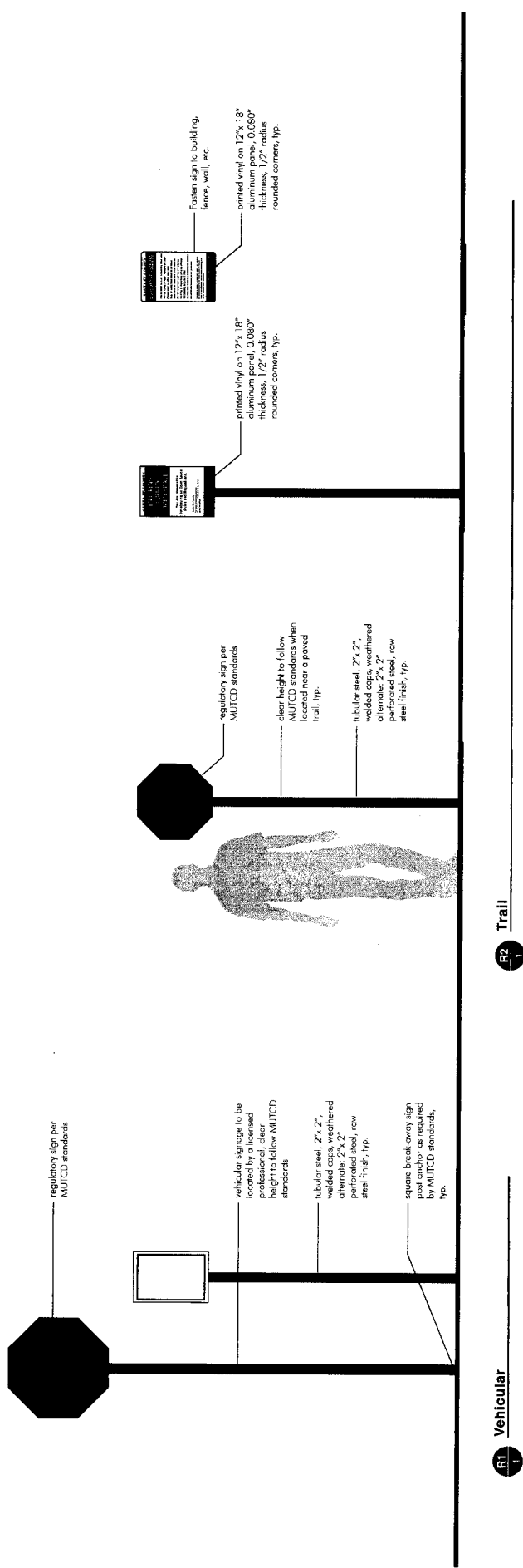


REGULATORY

Regulatory signs include those used to communicate laws and requirements. Regulatory signs (e.g. stop signs, one-way signs, ADA parking signs, etc.) are required to conform to applicable national and/or local codes.

In conformance with universal standards set for regulatory signs, designated material / color standards for posts as indicated in the Santa Fe County Open Space sign family can help unify signage across a site. Weathered, raw-steel posts (weathered steel) should be used where possible to establish a cohesive signage aesthetic.

plan view



FONT FAMILY

Two compatible font types are used throughout the sign family to create a hierarchical text system that visibly brands signs as Santa Fe County and clearly communicates sign content. Selected fonts are sans serif condensed typefaces to maximize space for longer names while preserving legibility. On most signs, text is center justified allowing sign panel width to be extended without scaling the text.

Fonts

Interstate Bold

text height:
see sign detail
letting:
see sign detail
kerning:
see sign detail
rule / measure sign (-57)
primary identifier (-57)
facility identifier (-57)
wall / fence mounted identifier (-47)
primary block (-38)
secondary block (-38)
rules sm (-45)

Interstate Regular Condensed

text height:
see sign detail
letting:
see sign detail
kerning:
all signs (0)

Interstate Bold Condensed

text height:
see sign detail
letting:
see sign detail
kerning:
orientation map sign (0)
directional sign (0)
marker - distance / reassurance (-25)

Dax

text height:
see sign detail
letting:
see sign detail
kerning:
all signs (0)
Interstate Bold, all caps
(Headline)
Dax Regular, all caps
(headline text; standard geographic name/common usage)
Dax Regular, all caps
(headline text - second line; standard geographic name; common usage)
Interstate Regular Condensed, all caps
(Sub-line text; Tollhead Name / Sub-area within sign area)

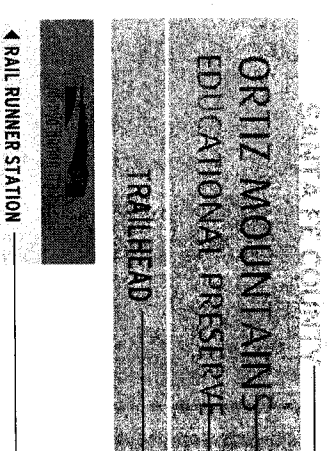
ABCDEFGHIJKLMNO
PQRSTUVWXYZ

ABCDEFGHIJKLMNO
PQRSTUVWXYZ

ABCDEFGHIJKLMNO
PQRSTUVWXYZ

ABCDEFGHIJKLMNO
PQRSTUVWXYZ

Typical Font Use Key



Interstate Bold, all caps
(Headline)
Dax Regular, all caps
(headline text; standard geographic name/common usage)
Dax Regular, all caps
(headline text - second line; standard geographic name; common usage)
Interstate Regular Condensed, all caps
(Sub-line text; Tollhead Name / Sub-area within sign area)

Interstate Bold Condensed, all caps
(Destination / Directional)

MATERIALS PALETTE

A consistent materials palette for signs that complements existing or proposed site furnishings / site elements helps establish a cohesive look for Santa Fe County open space properties. Suggested materials are specified to harmonize with site-specific materials, correspond with the character of the region, and have a track record of being durable and easy to maintain.

For Santa Fe County, the weathered steel panel system serves as the hallmark of Santa Fe County signs and is consistent throughout the sign family. Weathered steel was selected for its appropriateness in rural and urban locations as well as its distinct texture, color, and longevity.

On larger vehicular directional signs, other materials (e.g. rammed earth, stone, stucco, colored concrete) are permitted that utilize local building materials and relate to site specific elements. When planning a sign at a community center, for example, site elements such as walls, fences, site furniture, soil color, colored gravel, or building materiality should inform the sign material selection in order to orchestrate a cohesive built environment.

On sites where public amenities will be implemented in phases, aluminum sign panels with printed vinyl graphics are specified so they can be easily removed, updated with current graphics / information, and reinstalled on existing posts. Where possible, materials are clear-sealed or coated to extend their longevity and withstand graffiti and UV rays.

Site elements that may inform material selection and placement:

Materials



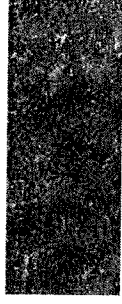
Weathered Steel Sign Panels, clear sealed Sign Supports



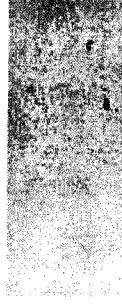
Weathered Steel, clear sealed Sign Panels



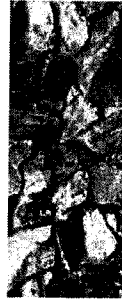
Rammed Earth



Stucco



Concrete (colored)

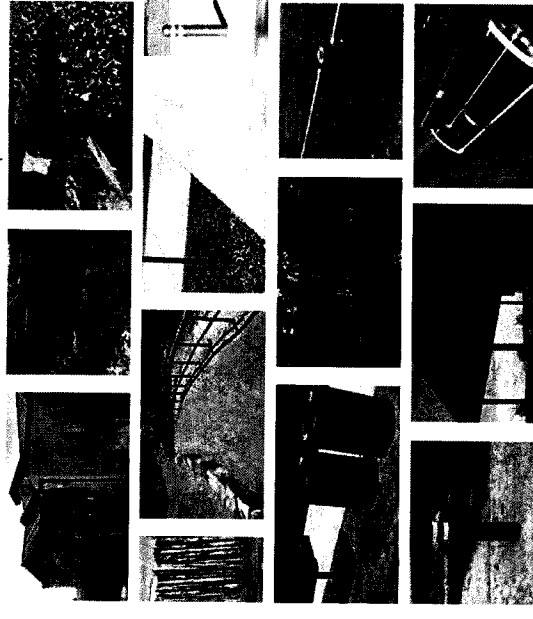
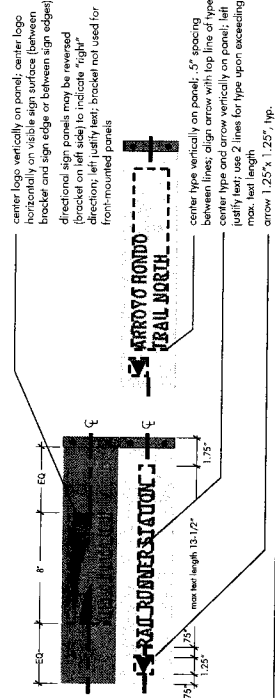
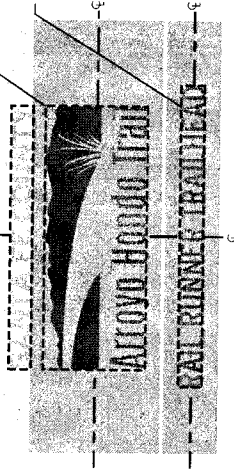
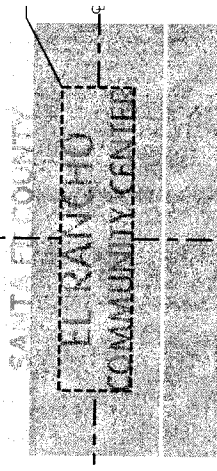
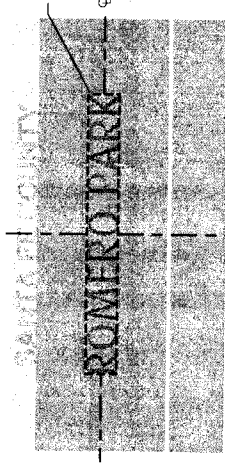


Stone (mosaic pattern)



Stone (random ashlar pattern)

Type Layout - Typical



Santa Fe County / City of Santa Fe Urban Trails Map

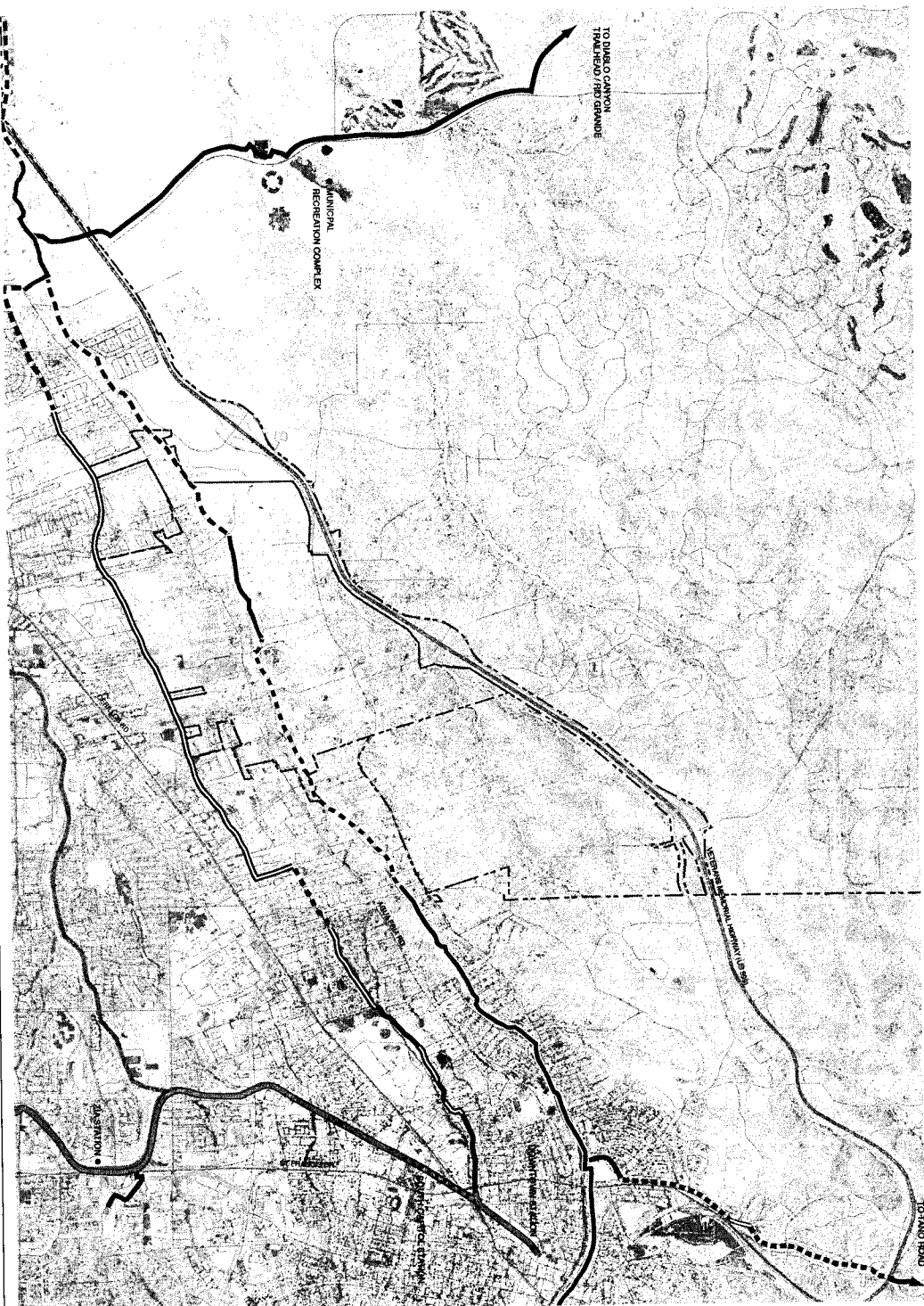
A network of existing and planned regional urban trails connect neighborhoods and destinations within the City and County. The following color selections are suggested for use along area trails / trail systems to reinforce designated trail identity and help with orientation and wayfinding.

This color identification system needs further coordination between the City and the County and formal adoption as more trails are developed and signed. The goal is to create a cohesive regional / urban trail network that is graphically recognizable on a trail system map and as a waypoint along the trail.

With this signage plan, Santa Fe County establishes a color and trail logo combination for regional trails within Santa Fe County that can be easily recognized.

Regional Trails - proposed color selections

- Santa Fe River Trail
- Acequia Trail
- Santa Fe Rail Trail
- Arroyo Chamisso Trail
- St. Francis Trail
- Canada Rincon Trail
- El Camino Real Trail
- Gail Ryba Trail
- Arroyo Hondo Trail (off map)
- NIM Central Trail (off map)



SANTA FE COUNTY OPEN SPACE SIGNAGE PLAN

COLOR FAMILY AND TRAIL LOGOS

Color - Baseline

The following colors are common to all signs within the sign system. The baseline color for larger sign panels and sign posts is weathered steel. Smaller signs and printed vinyl signs will use a dark brown color to match the weathered steel.

Back sides of sign panels that have no graphics are to be black or match the brown baseline colors.



Weathered Steel



RAL 6012 (powder coat)
CMYK: C=59, M=77, Y=75, K=47
RGB: R=102, G=51, B=43
PANTONE: 478 C

Note: match with weathered steel color to finishing color.

The backdrop layer behind cut weathered steel signs and the background printed vinyl color for directional signs is as follows:



RAL 1015 (powder coat)
CMYK: C=59, M=15, Y=79, K=0
RGB: R=230, G=210, B=181
PANTONE: 7500 C

STUCCO: to approximate the above colors
The backdrop color designation is intended to be a guide. Color samples should be made and tested at sites for site-specific sign families to ensure the tan color matches or blends with adjacent building or wall stucco colors, dirt colors, or other similarly colored site materials. Deviations from the above color to be approved by the County's project manager or other designated owner's representative.

Color - Accent

The following accent colors are to be used along designated trail systems for wayfinding. Accent colors are to be combined with the trail logo. Accent colors should be utilized in trail graphic panels (maps, rules signs) to reinforce trail system branding.



ARROYO HONDO TRAIL
RAL 6021 (powder coat)
CMYK: C=49, Y=29, M=60, K=4
RGB: R=138, G=153, B=119
PANTONE: 7494 C



SANTA FE RIVER TRAIL
RAL 6034 (powder coat)
CMYK: C=54, Y=19, M=32, K=0
RGB: R=122, G=172, B=172
PANTONE: 5503 C



SANTA FE RAIL TRAIL
RAL 7044 (powder coat)
CMYK: C=30, M=52, Y=32, K=0
RGB: R=180, G=179, B=168
PANTONE: 403 C

Trail Logos

The following logos will serve as official brands for designated Santa Fe County trail systems. Additional logos may be developed for other trail systems within Santa Fe County provided they conform to the proportions, concepts, and fonts of the trail logo family.

Logo graphic files are available for use upon request.



Arroyo Hondo Trail Logo - rectangular



Arroyo Hondo Trail Logo - square



Santa Fe River Trail Logo - rectangular



Santa Fe River Trail Logo - square



Santa Fe Rail Trail Logo - rectangular



Santa Fe Rail Trail Logo - square

SIGN ELEMENTS

SIGN MOUNTING / SUPPORT SYSTEMS

Several components make up the sign system: sign bases, sign posts / frames, attachment hardware, and sign panels with graphics. At the outset of each sign project, construction documents or shop drawings should be generated for each sign type specific to the location and proposed sign family for a project site.

Sign Bases

Solid bases with foundations and backdrop walls / panels on Vehicular Destination signs provide robust surfaces for mounting large sign panels. Sign base materials should be selected on a site by site basis in coordination with other site elements and buildings. The bases shall be engineered to withstand wind loads as well as the weight of the sign panels. Additional framing or reinforcing may be necessary in locations where sign panels are affixed to the base. Bottom of footings for sign bases should be placed below frost depth in that location (typically 24" below finish grade for City of Santa Fe area).

Sign Posts and Frames

Sign posts or frames shall be weathered steel with caps welded to the tops and ground smooth. Sign post frames should include horizontal flat crossbars welded to posts to provide rigidity to the frame and serve as a mounting surface for sign panels.

When installing sign frames with 2 or more posts, additional temporary bracing at the base of the signs may be necessary so frames are installed level, plumb, and true.

Sign posts that are subject to MUTCD regulations are required to be installed with breakaway devices at the base.

Foundations

Concrete footings for sign posts shall be installed with minimum 3,000 psi concrete with the top of footing 4" below grade to allow adjacent finish material to extend.

Hardware

All exposed fasteners to be tamper proof. Where possible, sign hardware should be hidden from view by fastening panels from the back or utilizing a mounting system with no visible hardware on the sign face. Where signs are specified as printed vinyl on aluminum, these panels are typically mounted from the front.

PANEL LAYERING / PROTECTIVE COATINGS

On larger signs (vehicular destination, pedestrian arrival), sign panels are layered with an outer weathered steel panel and a background surface or colored steel panel. The face panel should be minimally offset from the background surface / panel with spacers in order to allow rain to seep through and for ease of cleaning.

Weathered steel sign panels located directly above printed vinyl/aluminum or hpl panels shall be sealed to prevent rust stains on lower panels and provide a graffiti-proof layer. Posts or other panels that stand off from signs shall not be sealed.

Graffiti / UV Protection

For ease of graffiti removal and sign longevity, the following surfaces shall receive surface protection:

- Printed Vinyl Sign Panels: outdoor rated vinyl 10 years with UV clear over-laminate film
- Weathered Steel Panel (above printed vinyl panel): matte clear powder coat, or DuPont Imron 5000 Clear Anti-Grffiti Protection, or equal
- Powder coated Steel Panel: no additional coating necessary
- Painted Steel Panel: DuPont Imron 5000 Clear Anti-Grffiti Protection, or equal

PARTNER EMBLEMS / STEWARDSHIP

In certain situations, Santa Fe County may include partner emblems or logos on sign panels. For example, in locations where Santa Fe County has partnered with other organizations to manage sites or facilities, such as BLM or NM State Parks, their logos will be added to the signs. Sites that have received funding through the Land and Water Conservation Fund will also display the logo on the primary identity or monument sign. See *Sign Family graphics for partner emblem location, size, and materials*.

Kiosk signs provide additional opportunities to highlight partnerships, partner agencies, and stewardship involvement. Where this is desirable, portions of the rules panel, an interpretive panel, or the community board can be utilized to communicate this information. The graphic design for this panel should correspond with that of the other adjacent panels.

LIGHTING

In some cases primary vehicular signs may need lighting for nighttime visibility. For example, Santa Fe County facilities that operate after dusk or within urban areas may benefit from lighting facility identity signs for ease of wayfinding. The addition of lighting should be evaluated on a case by case basis.

If it is determined that lighting is needed for a sign, it should follow these guidelines:

- comply with applicable night skies ordinances
- provide light sufficient for legibility while respecting the adjacent ambient light levels (particularly in rural areas)
- lighting can be either wall wash or back lighting (behind the face panel or weathered steel)
- consider the sign location and perimeter site design in the placement of the fixtures, screen fixtures with planting or site elements where possible
- specify light fixtures that comply with Santa Fe County standards
- put lights on a dimmer or timer for shut-off

SIGN MANAGEMENT

Effective sign management helps ensure the safe use of Santa Fe County open space facilities and contributes to a positive image for Santa Fe County. In order to keep track of signs and maintain their intended purposes, a sign management program outlines procedures for inventorying, inspecting, maintaining, repairing, and record keeping.

SIGN INVENTORY / CODING

As the signage plan is implemented, Santa Fe County should codify newly installed signs by sign type, content, and location (GPS coordinates) and keep the information in a centrally accessible GIS database. The addition of an identification sticker on the back of each sign (see samples below) can provide information on the sign asset, installation date, and penalty for removal.

If possible, signs installed in Santa Fe County administered open spaces, trails, and facilities should utilize the existing tracking and sign management software used by Santa Fe County for regulatory signs along roadways.

This inventory can be set up and managed so it is usable as a database for recording maintenance and other sign management information.



Sign asset sticker sample with bar code



Sign installation date / penalty sticker sample

INSPECTION

Signs should be inspected on a regular basis for damage, visibility, legibility, and retroreflectivity (if applicable).

- Damage: Review the level of damage to the sign to evaluate whether to repair or replace.
- Visibility: Clear obstructions or vegetation impeding visibility of the sign, or relocate sign if obstructions cannot be eliminated.
- Legibility: Maintain signs for legibility to their original condition.

- Retroreflectivity: On signs with retroreflective materials that permit greater nighttime visibility, conduct a retroreflectivity assessment to gauge levels. See http://safety.fhwa.dot.gov/roadway_dept/night_visib/sign_retro_4page.pdf.

The sign inspection should complement the periodic sign review (see p. 19), which helps determine which signs to keep or remove, identifies needed new signs to resolve use problems, or addresses other issues (e.g. information, safety, public health). See *Appendix 4- Sample Sign Survey Form 9130-4, BLM National Sign Guidebook*.

MAINTENANCE

General sign cleaning is recommended as follows:

- Flush the surface with water to remove loose dirt
- Scrub surface gently with a soft cloth and mild detergent
- Rinse with clean water

If signs are marked with graffiti or marred with staining agents, the cleaning procedure is as follows:

- Mild Procedure (Soaps, Household Detergents): apply full strength cleaning agent such as Goo Gone, Goo Off, Graffiti Solutions or bleach to disinfect with a soft cloth and wipe off. Do not leave the cleaning agent on for more than one minute and perform general cleaning as recommended above. (good to clean off stickers, etc.)
- Moderate Procedure (Solvents): Stains with grease based paint or ink will require the use of a solvent such as mineral spirits, turpentine, WD-40 or MEK (methyl ethyl ketone) to clean off the material. Pre-clean the panel and the apply the solvent with a soft cloth following manufacturer's recommendations, then perform general cleaning as recommended above. Do not leave the cleaning agent on for more than one minute. (good to clean off lipstick, crayon, sharpie, tar, oil, bituminous material; use commercial paint remover for paint)

For community bulletin boards, follow these procedures to keep the board tidy:

- Ensure wood panels are in good condition (no splinters, etc.)
- Avoid clutter and overlapping; do not post duplicate or conflicting messages.
- Laminate maps before posting
- Regularly remove excess staples, nails, tacks, paper remnants and tape residue.
- Remove and/ or replace faded, torn, streaked or outdated materials.

REPAIR / REPLACEMENT

For sign repairs, use only those materials that comply with this Signage Plan installed as part of the original installation. Evaluate the maintained materials against the original standard.

If repairs are needed, follow general good practices for repairs to sign materials to keep the structural integrity of the sign and maintain the visibility and legibility of the sign content. If the sign is badly damaged, consider partial or full replacement.

If funding is not available for replacement from annual maintenance funds, costs for sign replacement should be included in long-term budgets and prioritized according to need.

Removed obsolete sign panels should be reused if they are in good shape, recycled, or repurposed (e.g. site furniture, shelving, etc.). Damaged sign panels should be recycled. Prior to sign panel recycling, the sign should be defaced to prevent misuse. In order to protect Santa Fe County property, an agreement should be in place with local recyclers requiring confirmation of sign recycling by official Santa Fe County personnel prior to recycling.

REPORTING / RECORD KEEPING

A mechanism for public reporting of sign issues should be instigated by Santa Fe County. This will allow the facility users to report damaged (or needed) signs at Santa Fe County open space facilities and could be particularly useful for reporting problems in remote locations. The existing 'Public Comment Form' on Santa Fe County's website could be used as a starting point for this effort. A protocol should be established for recording, evaluating, answering, and documenting actions taken to public sign comments.

New signs requested by the public to address use issues should follow sign planning and review guidelines (p. 19).

Updating sign records digitally as part of a GIS database will help Santa Fe County with record keeping and provide reminders of sign evaluation and maintenance activities.

SIGN PLANNING

SIGN PLANNING

A sign plan helps establish the framework for managing an effective and consistent sign program, determining future sign budget requirements, and identifying what signs are needed.

Detailed sign plans should be generated for each Santa Fe County property for budgeting purposes and to establish priority projects. These can be accomplished as part of master planning efforts or construction design phases for properties. Sign plans should be developed as part of an interdisciplinary approach, involving recreation planners, landscape architects, engineers, interpretive specialists, and other program specialists as needed. Proposed sign plans and sign designs should be evaluated by the site administrator and other Santa Fe County personnel to ensure the design adheres to the Signage Plan and meets regulatory and safety requirements as well as fulfilling the goals of the plan.

The detailed sign plan for each site should outline existing signs to remain (if any), signs to be replaced / eliminated, and new signs to be installed as part of the site communication strategy. At recreation sites, sign plans should consider vehicular and pedestrian traffic patterns, road / parking lot designs, access / traffic control devices, and speeds of travel. The intention is to develop sign layouts that are clear, concise, and result in an enjoyable experience for the visitor.

SIGN STRATEGY

Each sign should be carefully selected and located to satisfy an identified need and correctly inform the intended audience. The sign plan should consider the following hierarchy of sign interface zones upon approach and interaction with various sites:

Exterior

This zone encompasses the approach to the site, which includes roadway directional wayfinding that help visitors arrive at the site but also information for how to get there and what to do as delivered in formats such as websites, brochures, public outreach programs, etc. This sign plan recognizes the importance of this zone of communication, but does not cover recommendations at this level.

Entrance (Vehicular Destination)

Signs at the entrance to the site inform visitors that they have arrived at their destination.

Transition (Pedestrian Arrival)

Signs within the transition zone are more detailed. They reinforce information regarding the destination and provide details on orientation, wayfinding, warnings, services, regulatory instructions, interpretive themes, and allow opportunities for community interface.

Interior

Signs within the interior zone are typically at a smallest scale and focus primarily on orientation, wayfinding, internal regulatory distinctions, and interpretive information.

SIGN PLACEMENT STRATEGY

Sign need and placement should be governed by the following priorities:

1. Public health and safety.
2. Entrances to and boundaries of Santa Fe County properties.
3. Special use areas (trails, playgrounds, parks, etc.)
4. Visitor enhancement and convenience.

Prior to including a sign in the sign plan for a site, it must be determined whether a sign is the best method to deliver the information. Signs should:

- Fulfill a user need and contain pertinent information to ensure that the user has a safe and enjoyable visit
- Convey clear, simple, brief, and positive messages
- Command attention and respect
- Be presented in a manner that allows for ease of viewing and that gives the viewer time to respond appropriately
- Be designed, installed, and maintained to reflect a positive image of Santa Fe County

COMPREHENSIVE DESIGN

While this document focuses on the design, materials, and placement of signs, it is important to note that the user experience of a site extends to the entire setting. The sign design and placement should consider the design and placement of all natural and constructed elements.

While generating sign plans, the designer should orchestrate the placement of the signs in relation to existing natural features, buildings, views, topography, circulation (vehicular, pedestrian, etc.), and other site elements to create an enjoyable and safe user experience. Where possible, signs should work seamlessly with other site elements (fences, barriers, planting, surface materials) to help with navigation and reinforce the site design.

SIGN REVIEW

Once implemented, the sign inventory should be reviewed on a periodic basis to determine which signs to retain or eliminate, which need clarification, and if there are specific locations where additional signs are needed to solve problems. Public input on problem areas can also precipitate the need for a sign review.

Sign reviews shall follow the same procedures as sign planning.

SIGN PLAN REQUIREMENTS

Santa Fe County open space properties are wide ranging in their program offerings, scale, and planned use. Each site requires thoughtful consideration to generate an effective site-specific sign plan that identifies the property, introduces the user to the site and clearly communicates relevant information to the user without cluttering the property.

Sign plans for Santa Fe County administered sites should include the following information:

- Overall site description, management objectives, scope (plan purpose), planning criteria
- Existing sign inventory (*update of Sign Existing Conditions Assessment, Appendix B*)
- Proposed Sign Plan / Needs Matrix, including:
 - Type of Sign (code)
 - Specialized sign content for each sign
 - Sign size
 - Sign location
 - Sign Material
 - Special Instructions
- Sign Layout Plan that outlines sign types and placement should accompany a sign plan matrix.
- Estimate of Probable Costs

The following sample sign layouts illustrate how different properties may use the sign family to effectively configure a site and represents sign modifications specific to each property. Sign type selections for additional properties are identified on the *Site Sign Inventory / Needs Matrix (Appendix A)*.

SAMPLE SIGN PLAN

SAMPLE SIGN PLAN - TRAIL SYSTEM DRAFT

Santa Fe County Property: Arroyo Hondo Trail

Site Description: The Arroyo Hondo Trail is a multi-phase regional trail system proposed by Santa Fe County; the Phase 1 segment is currently in design phase. The AHT system connects major destinations and will extend from the NM 599 Rail Runner Station east to Richards Avenue / Santa Fe Community College and provide multiple access points for Santa Fe County residents along the way. Plans include incorporating the existing Spur Trail into the AHT system thereby connecting the network to the Santa Fe Rail Trail. The Arroyo Hondo Trail will also extend north to a newly constructed underpass under I-25 to connect to the Arroyo Chamiso Trail.

Management Objective: Identify the trail system, establish rules of use, provide a safe and enjoyable experience for trail users.

Scope: Identify Santa Fe County managed facility, access, wayfinding / orientation, rules / regulations, and interpretive information
Planning Criteria: Access, Parking, Wayfinding, Orientation, Interpretation, Common Activities, Easy updates to content (maps, wayfinding) as system expands

Existing Sign Inventory: n/a

Proposed Sign Plan / Needs: A hierarchy of signs at access points is combined with internal assurance markers / orientation maps to help orient users and provide additional wayfinding. The sign plan identifies primary trailheads, secondary access points, neighborhood connections, and internal junctions with maps and/or directional signage. Orientation map panels illustrating the trail system and wayfinding signs are designed to be easily removed, updated, and replaced.

Site specific modifications to signs include:

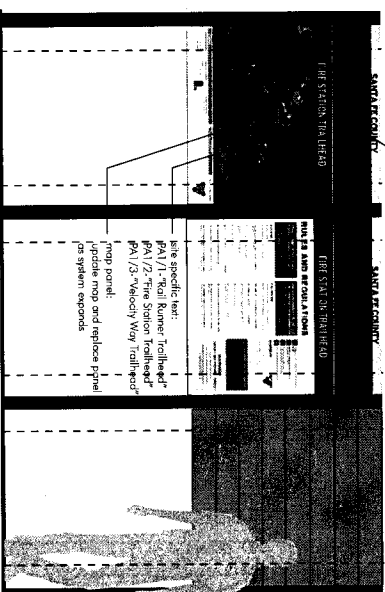
- geographic place name / common usage names (or facility name)
- trail specific logo / color branding
- directional destinations



trail specific logo and color

site specific text:
 YDA/1 - "Rail Runner Trailhead"
 YDA/2 - "Fire Station Trailhead"
 YDA/3 - "Velocity Way Trailhead"

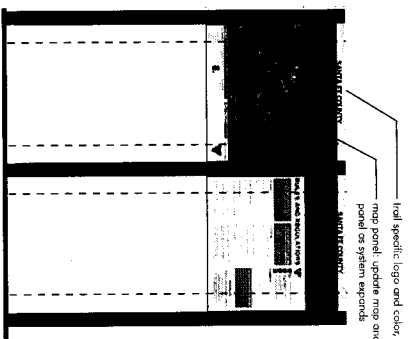
YDA 1
 YDA 2
 YDA 3



trail specific logo and color, YP.

site specific text:
 PA1/1 - "Rail Runner Trailhead"
 PA1/2 - "Fire Station Trailhead"
 PA1/3 - "Velocity Way Trailhead"
 map panel:
 include map and replace trail as system expands

PA1 1
 PA1 2
 PA1 3



trail specific logo and color, YP.
 map panel: update map and replace panel as system expands

PA2 1
 PA2 2
 PA2 3
 PA2 4
 PA2 5



trail specific logo and color, YP.

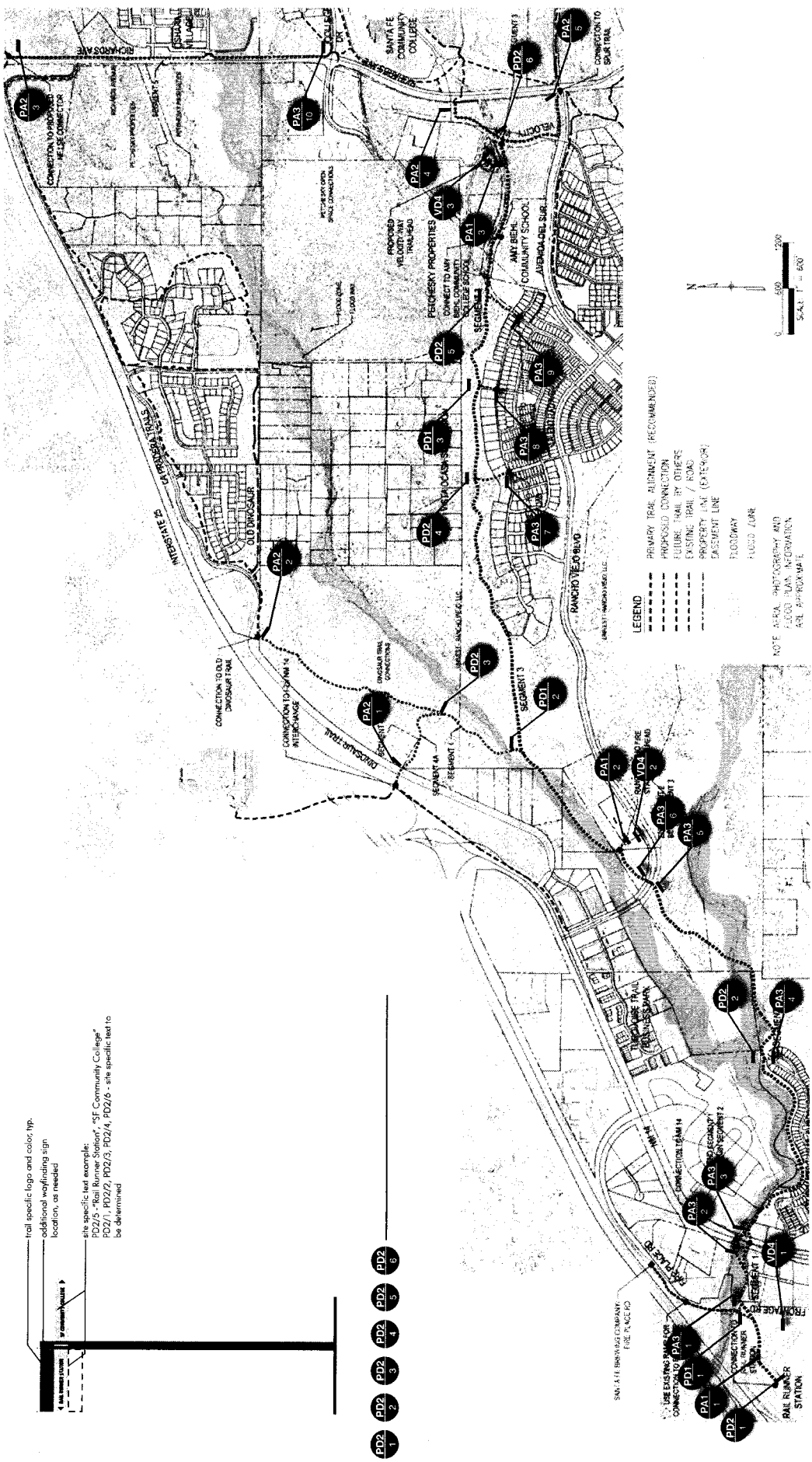
PA3 1
 PA3 2
 PA3 3
 PA3 4
 PA3 5
 PA3 6
 PA3 7
 PA3 8
 PA3 9
 PA3 10



trail specific logo and color, YP.

map panel:
 update graphics and replace panel as system expands
 site specific text example:
 PD1/1 - "Santa Fe Community College"
 PD1/2 - "Santa Fe Community College"
 PD1/3 - "Santa Fe Community College"
 PD1/4 - "Santa Fe Community College"
 PD1/5 - "Santa Fe Community College"
 PD1/6 - "Santa Fe Community College"
 PD1/7 - "Santa Fe Community College"
 PD1/8 - "Santa Fe Community College"
 PD1/9 - "Santa Fe Community College"
 PD1/10 - "Santa Fe Community College"
 additional wayfinding sign location, as needed

PD1 1
 PD1 2
 PD1 3



— rail specific logo and color, typ.
 — additional wayfinding sign location, as needed
 — site specific text example:
 PD2/5 - "Rail Runner Station", "SF Community College"
 PD2/1, PD2/2, PD2/3, PD2/4, PD2/6 - site specific text to be determined

- PD2 1
- PD2 2
- PD2 3
- PD2 4
- PD2 5
- PD2 6

SFC CLERK RECORDED 01/09/2019

SANTA FE COUNTY OPEN SPACE SIGNAGE PLAN

SAMPLE SIGN PLAN - COMMUNITY CENTER DRAFT

Santa Fe County Property: El Rancho Community Center

Site Description: El Rancho Community Center is located in the northern portion of Santa Fe County off of CR 84. It is comprised of a basketball court, shade structures, small playground, and community center with parking lot.

Management Objective: Communicate the facility and recreation area as a Santa Fe County operated facility subject to its rules and regulations.

Scope: Identify Santa Fe County facility, provide internal County-specific regulatory signage (recreation area, playground), and internal vehicular regulatory signage upgrades.

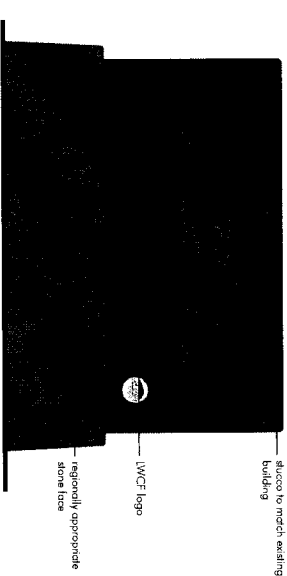
Planning Criteria: Access, Parking, Safety, Common Activities

Existing Sign Inventory: Includes parking regulatory signs and playground rules sign. (see Appendix C: Sign Existing Conditions Assessment)

Proposed Sign Plan / Needs: The sign layout for this property clearly identifies the property prior to entering by vehicle and designates County rules and regulations near the primary outdoor recreation area. Regulatory signs are placed according to code and consist of materials similar to the rest of the sign family.

Site specific modifications to signs include:

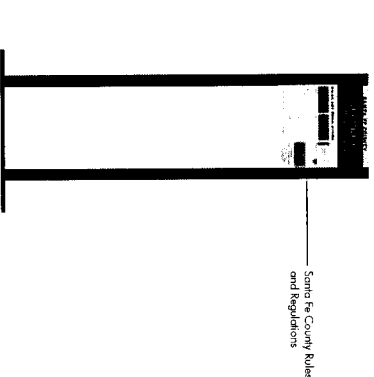
- facility name / common usage
- partner agency identification: Land Water Conservation Fund (LWCF)
- regional materials: stone foundations
- stucco color
- VD3-1 may be substituted with an all steel version facility identifier (VD4-1).



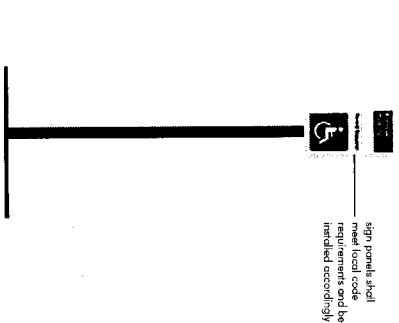
VJ3



El Rancho Community Center - Sign Plan Layout



PA3



RI

SIGN PLAN - CONSERVATION AREAS

Conservation areas are generally categorized as landscapes open to limited passive recreation or agricultural use and require limited signs for public health and safety. Some areas may benefit from interpretive signage in appropriate locations.

Existing improvements on conservation areas consist of trail networks with signs and rural trailheads with parking areas. Typically, existing signs are part of a larger defined system (i.e. Cerrillos Hills State Park or the Dale Ball Trail system) with multiple land owners and already have a distinct family of signs. Areas with existing signs that are co-managed with another agency are not required to utilize Santa Fe County signage standards as long as signs establish Santa Fe County ownership or participation. Future sign needs assessments for these areas should be conducted in coordination with the partner agency.

Conservation area properties without improvements or public access will require additional planning in order to identify use areas and programs relevant to each site. Conservation area master plans and/or management plans should guide the development of signage plans that conform with Santa Fe County sign plan standards.

SIGN PLAN - OPEN SPACE PRESERVES

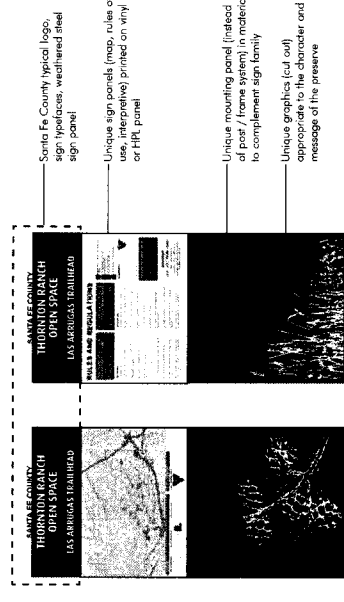
Santa Fe County open space preserves represent a category of properties that require special planning and careful implementation. Typically, preserves are large areas of land intended to protect sensitive environments, special habitat, endangered species, and cultural resources. Public access to these sites is generally limited or highly managed.

Given the distinctive character and unique qualities of each Santa Fe County preserve, master plans and/or management plans generated for these properties should guide site-specific signage plans. These planning documents may outline opportunities for educational programming, guided trails, and interpretive signage and may also present the need for specialized conditions that require signage to preserve area resources.

Preserve property signage plans may deviate from Santa Fe County sign standards and develop site-specific identity branding in order to distinguish them from other recreational areas and to create a distinct, property-specific experience relevant to the exceptionalism in each Preserve. While the sign types, materials, and colors outlined in the Signage Plan should still be referenced and utilized, they may be modified or adjusted to represent the uniqueness of each place and still communicate the Santa Fe County identity.

Signage for preserve properties must communicate needed information but not detract from the primary purpose of retaining the integrity of the landscape and any resources that are present.

Sample customized signs for preserve properties (draft example Thornton Ranch Open Space):



PHASED IMPLEMENTATION OF THE SIGNAGE PLAN

The signage plan for Santa Fe County administered lands is intended to be implemented in phases as funding allows. For budgeting purposes, the *Sign Recommendations Matrix (Appendix A)* and the accompanying *Draft Estimate of Probable Signage Costs (Appendix C)* serve as a resource to outline projected needs and capital outlay costs to implement signs at various sites.

The following criteria should be considered in evaluating the order of priority for signage plan implementation:

- Public health, safety and security
- Known locations of confusion and / or conflict where the addition of signs might help alleviate some of the issues
- Implementation as part of projects that have funding or are in line to receive capital improvement funds (e.g. Arroyo Hondo Trail - phase 1, Pojoaque Valley Recreation Center, Romero Park - phase 2)
- Projects that have the capacity to receive grants for implementation

A phased implementation strategy allows for signs to be fabricated, installed at specific sites, and evaluated for any improvements that should be made to the signage program or the installation process.

ACTION PLAN

The following items have been identified for further action as part of the Santa Fe County Signage Plan:

- Generate full-scale samples of representative sign panels to evaluate materials, scale, colors, etc. and make adjustments to the signage plan as necessary
- Prepare detailed Sign Plans for each Santa Fe County site
- Include Sign Plans and Sign Plan Construction Drawings in the scope of work and construction budgets for future improvements to Santa Fe County open space properties
- Work with Santa Fe County GIS staff to devise an appropriate method for coding, cataloging and updating sign information in a central database.
- Generate full-scale standard graphic templates of sign panels for use by Santa Fe County and Santa Fe County consultants to detail sign packages for construction
- Prepare standard construction details / shop drawings for typical signs / sign mounting
- Outline a maintenance schedule / program to inspect existing signs on a yearly basis
- Outline a program to evaluate needs for additional signs at sites every two years.
- Research and apply for grants and revenue sources that could help reduce the capital costs of installed signage.

Adopted Management Plans

OSTP recognized the need for property specific management plans to guide management of the unique resources and environmental conditions of each property. The individual OSTP properties are so diverse and community needs are varied that tailored management actions are required. The following list includes the adopted property Management Plans:

- Cerrillos Hills Historic Park Management Plan, Resolution 2003-63*
- Arroyo Hondo Open Space Management Plan, Resolution 2008-23
- Los Potreros Open Space Management Plan, Resolution 2016-110
- La Cieneguilla Open Space Management Plan, Resolution 2016-110
- San Pedro Open Space Management Plan, Resolution 2016-110
- Madrid Open Space Management Plan, Resolution 2017-40
- Lamy Open Space Management Plan, Resolution 2017-40
- Thornton Ranch Open Space Management Plan, Resolution 2017-112

* This plan has been updated as part of management through NM State Parks. The updated plan has not yet been adopted by Santa Fe County.

