ZUNI MOUNTAINS

Trails and Conservation Master Plan

2021

This page intentionally left blank

Zuni Mountains Trail & Conservation Master Plan

USFS Resolution Number 2014-00##

A RESOLUTION OF INTENT TO ADOPT THE ZUNI MOUNTAIN TRAILS AND CONSERVATION MASTER PLAN

WHEREAS, ##-#-### Mt Taylor authorizes the ZMT Partnerships of Cibola and McKinley Counties to adopt and revise the plan; and,

WHEREAS, the ZMT Partnership of Cibola and McKinley Counties adopted the 2014 ZMT&CMP for USFS/Counties through the _____ (?resolution/agreement) that was most recently updated to include revisions in the 2017 ZMT&CMP; and,

WHEREAS, the 2014 ZMT&CMP requires a review at least once every five years to determine whether revisions to the ZMT&CMP are necessary; and,

WHEREAS, an analysis of the review criteria determined revisions were warranted based on changes in the circumstances, changes in community goas, degree to which goals and objectives had been met, and knowledge of specific, and identifiable amendments that would improve the ZMT&CMP's usefulness, so that it better serves the public; and,

WHEREAS, a process to update the ZMT&CMP was initiated in DATE (may 2008) that continued through DATE (may 2014) that included _____ so many rounds of public outreach and engagement and review of draft goals, objectives, actions and other elements of the ZMT&CMP; and,

WHEREAS, based on public and agency input a new draft ZMT&CMP was issued on DATE (June 2014), and subsequently amended on DATE (July 2017) and DATE, and

WHEREAS, a notice of public hearing was advertised in the Gallup Independent, Albuquerque Journal, Grants Beacon and the Navajo Times on DATE (March 2017), date, ; and

WHEREAS, the USFS held a public hearing/submissions for 45 day period to May 2017; and …..,

WHEREAS, the USFS signed the final Decision Notice for the Zuni Mountain Trails Project adopting the ZMT&CMP as amended and created by the Zuni Mountain Trails Partnership; on May 17, 2017; and,

WHEREAS, the USFS has provided recent design specifications and guidelines and updates for this October 2020 ZMT&CMP revision.

NOW, THEREFORE, BE IT RESOLVED that USFS/Counties hereby adopts this Resolution of Intent to repeal the existing ZMT&CMP and adopt the 2020 ZMT&CMP, as amended by the USFS/Counties and Zuni Mountain Partnership and with any necessary editorial and formatting corrections.

PASSED AND ADOPTED THIS _____ DAY OF _____, 2020

ATTEST: USFS/COUNTIES

_____ _____

_____

APPROVED AS TO FORM:

_____ _____

Resolution Signature page simple name document and dates of resolutions
Adopting Revision 2020 Zuni Mountains Trail & Conservation Master Plan

Planning Effort:

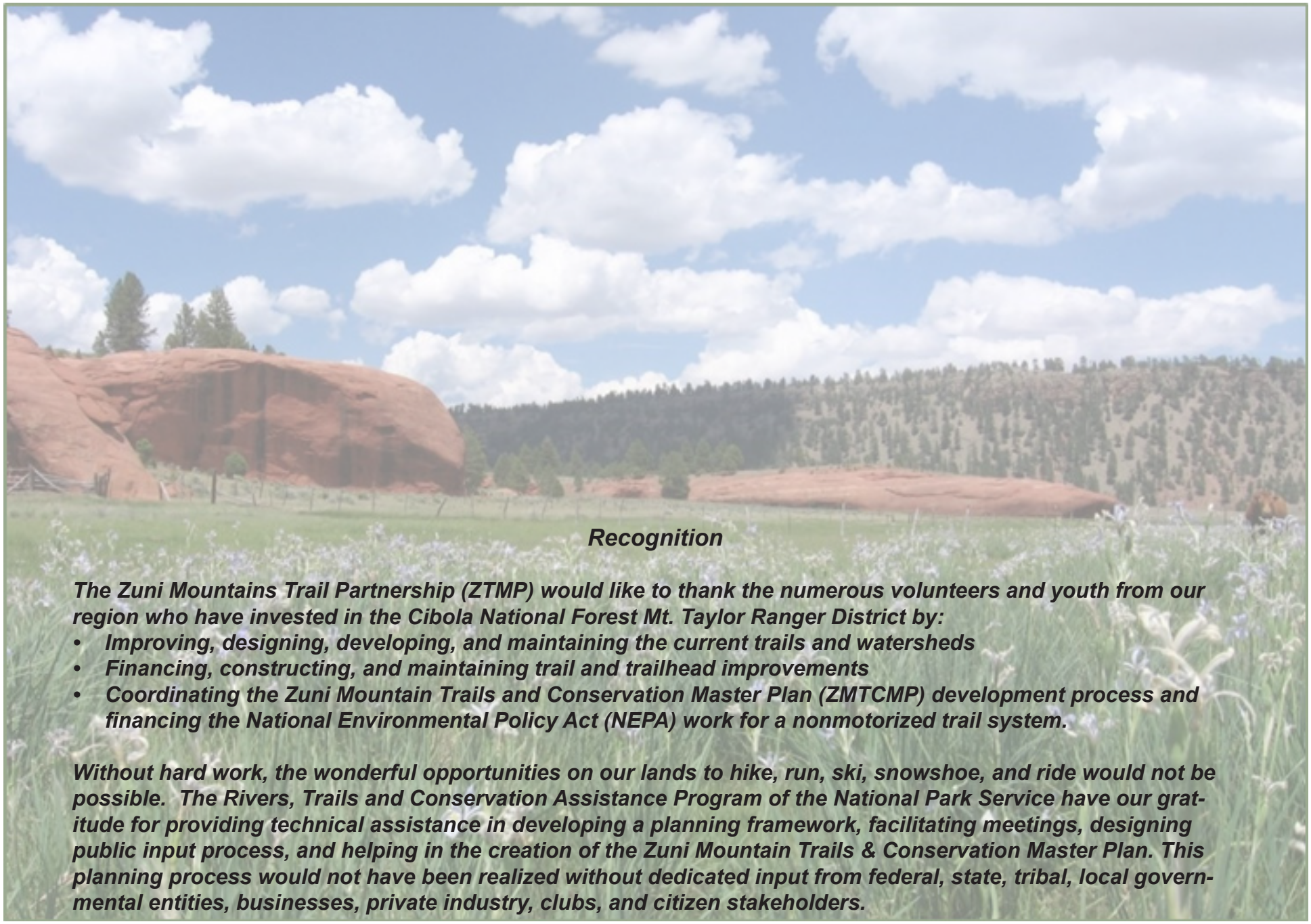
Zuni Mountain Trails Partnership
US Forest Service, Cibola National Forest
National Park Service, Rivers, Trails and Conservation Assistance Program
Northwest New Mexico Council of Governments

Zuni Mountain Trails and Conservation Master Plan

2014	Draft Final
2016	Revision #1
2017	Revision #2
2020	Revision #3

"Part of the shift in paradigm is to make the relationship with our visitors transformational, or to transform the relationship of the recreation program and its constituents to that of one of exchange of fees or taxes for services to that of partner and citizen steward."

-Southwestern Region Sustainable Recreation Strategy, 2014



Recognition

The Zuni Mountains Trail Partnership (ZTMP) would like to thank the numerous volunteers and youth from our region who have invested in the Cibola National Forest Mt. Taylor Ranger District by:

- ***Improving, designing, developing, and maintaining the current trails and watersheds***
- ***Financing, constructing, and maintaining trail and trailhead improvements***
- ***Coordinating the Zuni Mountain Trails and Conservation Master Plan (ZMTCMP) development process and financing the National Environmental Policy Act (NEPA) work for a nonmotorized trail system.***

Without hard work, the wonderful opportunities on our lands to hike, run, ski, snowshoe, and ride would not be possible. The Rivers, Trails and Conservation Assistance Program of the National Park Service have our gratitude for providing technical assistance in developing a planning framework, facilitating meetings, designing public input process, and helping in the creation of the Zuni Mountain Trails & Conservation Master Plan. This planning process would not have been realized without dedicated input from federal, state, tribal, local governmental entities, businesses, private industry, clubs, and citizen stakeholders.

ACKNOWLEDGMENTS

United States Forest Service, USDA
Cibola National Forest and National Grasslands
Steve Hattenbach
Jessica Dunn
Zachary Parsons
Doug Kosik

Mount Taylor Ranger District
Yolynda Begay
Alvin Whitehair
Arnold Wilson
Doug or Jeremy the arch.....
Herbert Ray

Sandia Ranger District
Julie Padilla
Kerry Wood
Russell Berman
Canyon Young

United States Department of Interior
National Park Service
El Morro National Monuments
The Rivers, Trails and Conservation Assistance Program (RTCA)
Attila Bality
Bureau of Land Management
El Malpais National Conservation Area
US Fish and Wildlife Service

State of New Mexico
NM Department of Transportation
  Wade Patterson
  Maggie Moore
NM State Parks
NM State Land Office,
NM Department of Health, Healthy Kids
NM Energy, Minerals, and Natural Resources
Tom Udall, US Senator
Martin Heinrich, US Senator

Tribal Governments
Navajo Nation
Pueblo of Acoma
Pueblo of Hopi
Pueblo of Laguna
Pueblo of Zuni

Cibola County
Kate Fletcher
Judy Horacek
Anna Larson

McKinley County
Anthony Dimas
Doug Decker
Muriel Plummer

Northwest New Mexico Council of Governments
Jeff Kiely
Evan Williams
Martina Whitmore
Brandon Howe
Angelina Grey
Robert Kuipers
Carrie House

City of Grants
Laura Jaramillo
Grants Chamber of Commerce

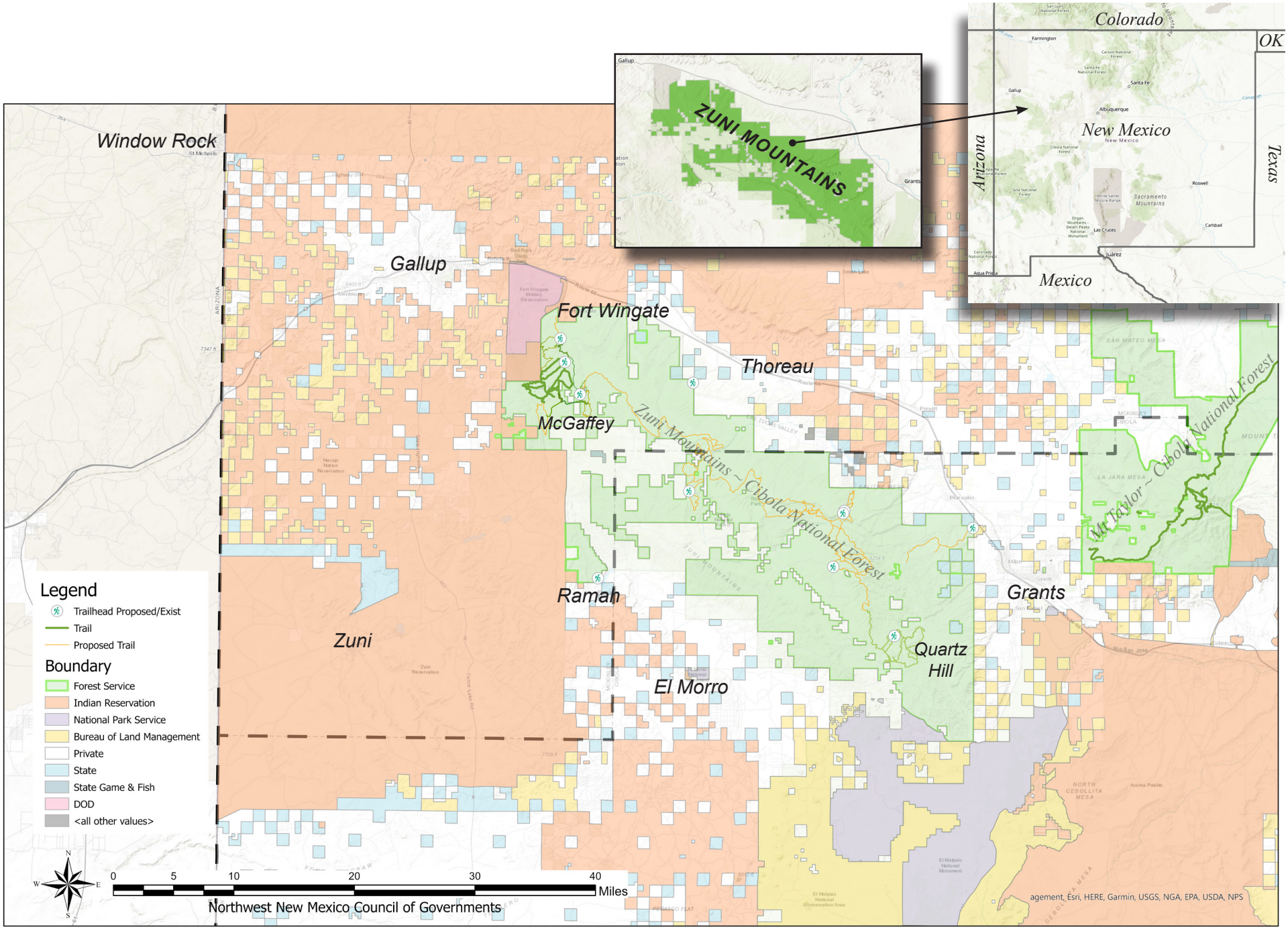
City of Gallup
Gallup Chamber of Commerce

Consulting Planners
SWCA Environmental Consultants
& Okun Consulting Solutions
TEAMS Enterprise

Stakeholders
Adventure Gallup & Beyond (AGB)
Gallup Trails
William Siebersma
Peter Tempest
Bob Rosebrough
Strider Brown
Brian Leddy
Backcountry Horsemen of New Mexico, Zuni Mountains Chapter
International Mountain Bicycling Association
New Mexico Youth Conservation Corp
Grants YCC
Gallup YCC
Cottonwood Gulch YCC
Southwest Conservation Corp, Ancestral Lands
Future Foundations Family Center, Inc.
Gallup Boys & Girls Club
Connections, Inc.
Karl Lohmann
Larry Winn
Plateau Sciences Society
Cibola County Historical Society
Matt Reidy
Ruth Doyle
Steve Owen
Olin Clawson
Aaron Lowden
Tom Mayer
Chuck Van Drunen

Thank You Residents and Businesses of Cibola County and McKinley County

A special thanks to all of the dedicated residents who contributed to this plan on their free time by participating in public meetings, submitted comments and filling out survey forms. Your time, efforts, and ideas are very much appreciated and reflected in this plan.



Boundary Map

TABLE OF CONTENTS

Chapter 1 Introduction
- Zuni Mountains
- Zuni Mountain Trail and Conservation Master Plan
- Vision
- Goals and Objectives

Chapter 2 Existing Conditions
- Existing Trails
- Signage and Infrastructure
- Key Destinations
- Conservation

Chapter 3 Community Engagement
- Background
- Benefits of Trails
- User Groups
- Planning Process
- Methodology and Outreach
- Local and Regional Plans
- Cibola County Comprehensive Plan
- McKinley County Comprehensive Plan
- ZMTP Project Milestones a 20 plus year Legacy

Chapter 4 Recommendations (trail network)
- Trail System
- Trail Improvements
- Trailheads
- Trail System Infrastructure
- Cibola County and McKinley County Key Sources
- Capacity and Resources
- Design Guidelines
- USFS Trail Standards
- USFS Trail Maintenance
- Trail Types [Create Appendix and refer]

Chapter 5 Implementation
- Trail Development
- Final Decision Notice
- Initial Efforts (Trail 4 (redesign), Enterprise (redesign McGaffey area), sow/maps
- Design Specifications (Create APPENDX for Trail Design Specs & Details MR/Quartz..)

Chapter 6 Funding
- Historic Trail Maintenance Budget
- Unit Costs and Contingencies
- Prioritization
- Funding Opportunities

List of Map:

Map 1

List of Figures

FIGURE 1-1: Zuni Mountains Boundary Map
FIGURE 6-1: Zuni Mountain Trail System Breakdown by Construction Types

List of Tables

TABLE 2-1: Outdoor Activity Participation
TABLE 2-2: Out-of-State Visitor Spending on Recreation Activities
TABLE 3-1: Trail Class Matrix
TABLE 3-2: Signage and Information Specifications
TABLE 5-1: The Sustainable Solution
TABLE 5-2: 11 Essentials Elements of Sustainable Trails
TABLE 5-3: Trail Class 3: Developed
TABLE 6-1: Recommended Trail Improvements by Trail Segment
TABLE 6-2: Proposed Upgrade of New, Connector, and Un-authorized Trails
TABLE 6-3: Proposed Trailheads
TABLE 7-1: USFS Trail Maintenance Considerations
TABLE 7-2: ZMTP Trail Maintenance Levels of Effort
TABLE 8-1: Unit Costs
TABLE 8-2: Trail Construction Costs
TABLE 8-3: Trailhead Construction Costs

List of Appendices

Appendix A: Media and Meetings Listing
Appendix B: ZMTP Trail System Powerpoint, 2011, Tom Mayer
Appendix C: ZMTP Site Visit Report, Summer 2011, IMBA
Appendix D: Southwestern Region Sustainable Recreation Strategy, 2014, Team
Appendix E: Memorandum of Understandings
Appendix F: Task Order Example
Appendix G: YCC/RTP Progress Report, 2016 Season
Appendix ? - Trail Design Specifications & Details
Appendix B - Trail Volunteer Handbook
Appendix C - TMP revisions - ZMTP revisions
Appendix ? - ZM map

Acronym List

- **AGB – Adventure Gallup and Beyond**
- **ATV – All Terrain Vehicle**
- **BCHA – Back Country Horsemen of America**
- **CFLRP – Collaborative Forest Landscape Restoration Program**
- **DN – Decision Notice**
- **EMNRD – Energy, Minerals, and Natural Resources Department (State of New Mexico)**
- **EA – Environmental Assessment**
- **FHWA – Federal Highway Administration**
- **FONSI – Finding Of No Significant Impact**
- **GT – Gallup Trails (2010)**
- **IMBA – International Mountain Biking Association. Ride Center**
- **MAP-21 – Moving Ahead for Progress in the 21st Century Act**
- **NEPA – National Environmental Policy Act**
- **NPS – National Park Service**
- **NMDOT – New Mexico Department of Transportation**
- **NWNMCOG – Northwest New Mexico Council of Governments**
- **RAC – (Northern New Mexico) Resource Advisory Committee**
- **RTCA – Rivers, Trails, and Conservation Assistance Program (NPS)**
- **RTP – Recreational Trails Program (NMDOT)**
- **SRS – Secure Rural Schools and Community (Self-Determination Act)**
- **TAP – Transportation Alternative Program (NMDOT)**
- **USFS – United States Forest Service**
- **YCC – Youth Conservation Corps**
- **ZMTP – Zuni Mountains Trail Partnership/Project**
- **ZMTCMP – Zuni Mountain Trails and Conservation Master Plan**

Chapter 1
INTRODUCTION

Zuni Mountains

The Zuni Mountains is characterized by its remarkable landscapes that have had a pronounced influence on the area's history, development, and life style. The beautiful mountain range has ponderosa pine forests, colorful aspen lined canyons green topped mesas, streams and flowering meadows. These places has its own identity and sense of community. The Continental Divide runs through the middle of the Zuni Mountains, a form that is part of the Colorado Plateau. The natural landscapes of breathtaking views creates spaces with tremendous recreational opportunities that provide many of the reasons the residents live here and distant visitors enjoy a high quality of life.

Within northwestern New Mexico, The Zuni Mountains are located located within the Cibola County and McKinley County. The Zuni Mountains is encompassed within the Cibola National Forest approximately sixty miles long and forty miles wide. Mount Mt. Sedgwick, the highest of these mountains, rises 9,256 feet to a range of 6,400 feet.

The Zuni Mountains contains many special place that have provided for fish, wildlife, and people from time immemorial until today. The oldest native Indian artifacts found in the Zuni Mountains date from 5000 BC and 400 AD. Modern day indigenous tribes of the Navajo, Acoma, Laguna, and Zuni continue to utilize the Zuni Mountains. In the 1540s' the Spaniards, conquistadors, intruded upon the indigenous Native landscape. In the 1800s' the Euroamericans, early land grant settlers, miners, loggers, and ranchers have come onto the land. In the early 1900's, much of the Zuni Mountains range was purchased for watershed protection and placed under the care of the US Forest Service. Forest and meadow conditions have gradually improved since then and Zuni Mountains are once again a jewel.

The Cibola National Forest is located in New Mexico and is part of the Southwestern Region of the National Forest System. The Cibola National Forest covers more than 1.6 million acres in New Mexico, with elevations ranging from 2,700 feet to over 11,300 feet.

The Mount Taylor Ranger District is comprised of two mountain ranges, Mt. Taylor and the Zuni Mountains, totaling nearly 520,000 acres of National Forest land. Elevations range from 6,500 to 11,301 feet. Mt. Taylor is a designated Traditional Cultural Property, an area of special religious and cultural significance to several American Indian Tribes and Pueblos.

Mt. Taylor and the Zuni Mountains are rich in cultural resources including many historic sawmills and logging communities. The Gallup and Grants area, like much of New Mexico is rich in history.

The Zuni Mountains are located south of US Interstate 40 between Fort Wingate and Grants, and north of NM State Highway 53. This area is framed by the communities of Baahaali (Breadsprings) Chapter, Pueblo of Zuni, Ramah Village, Ramah Navajo Reservation, El Morro, Bluewater, Continental Divide, and preserved lands of Bluewater Lake State Park, El Malpais National Monument and National Conservation Area, El Morro National Monument.

The Zuni Mountains are often referred to as the Eastern Zuni Mountains and Western Zuni Mountains, known by users due by predominant transportation access into the range. The range is shared by Cibola and McKinley counties, which has made partnership an important component of this project.

The Mt. Taylor Ranger District has played an important part in the area's history. The District evolved from additions to the small forest reserves first set aside in 1906. The consolidation of the Grants Ranger District (headquartered in Grants) and the Gallup Ranger District (Ft. Wingate) resulted in the Mt. Taylor Ranger District in July 1974. Forest work has emphasized restoring areas that were heavily logged and grazed in the early 1900's.

Developed recreation areas are located on both the Mt. Taylor and Zuni Mountains of the District. Lobo Canyon and Ojo Redondo Campgrounds and Bluewater Parking Area can be visited free of charge. Quaking Aspen, McGaffey, and Coal Mine Campgrounds are fee areas.

Zuni Mountain Trail and Conservation Master Plan

The purpose of the Zuni Mountains Trail & Conservation Master Plan is to provide a long-term framework for trails and conservation planning, development, management, maintenance, and funding.

This Plan aligns with the intent and goals of the 2014 Southwestern Regional Sustainable Recreation Strategy. The goal of the Strategy is: “To achieve a sustainable recreation program, essential to advancing the mission of the Forest Service, with a diverse and engaged public that enjoys and actively cares for the National Forests and Grasslands of the Southwest.”Also the 2015 Cibola Sustainable Recreation Strategic Plan, in that, while all improvements are governed and approved by the US Forest Service, success and sustainability are achieved through strong and reliant partnerships.

The Zuni Mountains Trail & Conservation Master Plan is a living document, which will guide the sustainable development of trails, conservation, and non-motorized recreation opportunities in the Zuni Mountains for the social and economic benefit of local communities and visiting public

ZMTP Plan

- Design, development, management, and maintenance of the existing and proposed Zuni Mountains Trail System.
- Recommendations based on Zuni Mountains Trail Partnership members; International Mountain Bike Association (IMBA) guidance and National Parks Service-Rivers, Trails, and Conservation Assistance (RTCA) mapping and reconnaissance.
- Establishes a process for implementation of the Plan, including the specific resources and commitments of Partnership members in advancing and sustaining its goals and objectives.

This Plan is a product of the Zuni Mountains Trail Partnership (ZMTP), a collaboration lead by the US Forest Service and made up of representatives from Cibola and McKinley County governments, non-profit youthfocused organizations, and area community members. The Zuni Mountains Trail System project will provide access to the mountains and forests for local youth who will learn stewardship, character and job skills necessary to adapt to the challenges of a changing world.

The Plan, Partnership, and project are dedicated to serving as a tangible and visible specimen of the Southwestern Region and Cibola National Forest Sustainable Recreation Strategy report; building from a broad-based, strategic partnership into bold and sustainable action that is lead and directed by the US Forest Service.

Double-edged Plan

- Providing clear guidance for action that facilitates trail, conservation, and non-motorized recreation development and management within the Zuni Mountains Division of the Mount Taylor Ranger District, Cibola National Forest.
- Showcasing our local ability as a partnership to the US Forest Service and the capacity to support the work on the ground financially, physically, logistically, socially and career-wise -- while always working through US Forest Service’s process, adhering to their oversight, and working within their constraints.

The Zuni Mountains are the focus and project location of Zuni Mountains Trail & Conservation Master Plan. The development of this plan goes back to efforts started in 1994 by recreation enthusiasts and advanced by economic development and forest planning. An asset-based and community driven process has been the key to success; showcased by a timeline of many key milestones.

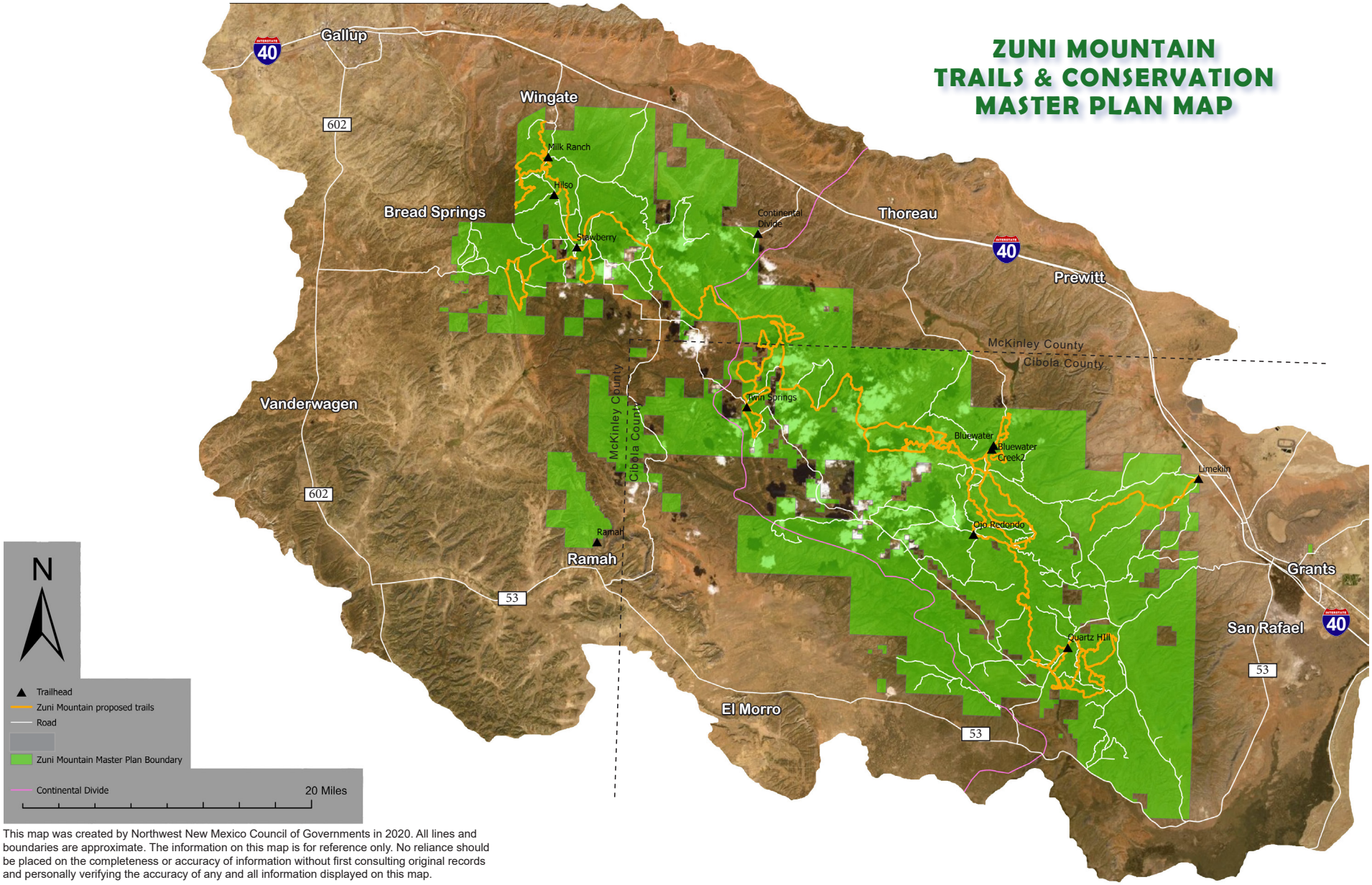
Plan Development

The communities of Cibola County and McKinley County have worked for several decades to develop multi-use, non-motorized trails in the area with special attention and desire for mountain bike trails. During that time, despite the lack of a designated trail system, users have been using National Forest System lands, including historic grazing and logging routes, creating social trail through repeated use. Since 2006, community members have worked to organize a formal partnership with the US Forest Service to make this decades' old dream, a reality.

The trail system consists of 186 miles of non-motorized trails, 28 miles of connector trails, and six (6) new trailheads that are managed for pack and saddle, biking, and hiker/pedestrian. This system incorporates several existing trails within the project area. The trail system would include interconnected, stacked loops affording trail users a variety of trail opportunities and would utilize motorized routes in some segments to connect users back to trailheads.

Zuni Mountain Trails and Conservation Master Plan is guided by these GUIDING PRINCIPLES

- Public Involvement: Communities and individuals should continue to be involved in the planning and decision-making processes that affect them.
- Partnerships: Efforts made by non-governmental groups, private individuals, tribal government, state, and federal agencies to achieve community goals are as vital to community development as local government actions. Partnerships among these groups, individuals and local government are essential.
- Recreation: Zuni Mountain area residents and visitors enjoy recreating in the area's natural landscape. It is important to promote access and to provide facilities that contribute to active and healthy lifestyles, while concurrently protecting natural resources.
- Sustainability: Local government should strive to make decisions that are environmentally sound, fiscally responsible, and supportive of healthy communities over the long term.
- Healthful environment: The right to a healthful environment is fundamentally important. The Zuni Mountains natural and cultural resources make this place unique; they should be conserved, enhanced and enjoyed.
- Conservation: Decision making should consider the impacts and adaptation to conserving the natural resources in policy and regulatory decisions (USFS). Restore and protect soil health, wildlife habitat, and water quality.
- Private propery rights: Respect for private property rights shuld be supported.
- Infrastructure: Investing in infrastructure, as part of implementing planning, is one of the most effective ways to build enduring communities and organizations.



This map was created by Northwest New Mexico Council of Governments in 2020. All lines and boundaries are approximate. The information on this map is for reference only. No reliance should be placed on the completeness or accuracy of information without first consulting original records and personally verifying the accuracy of any and all information displayed on this map.

Zuni Mountains Trail Project Map

Zuni Mountains is comprised of approximately 210,000 acres, with large swaths of Forest lands for multiple land uses including recreation space, and large private land in-holdings used for grazing and agriculture mainly interspersed with family homesteads and several subdivisions (see Figure 1-1). This Plan only covers USFS lands and does not plan across any private or other jurisdiction. Further, trails are not planned that would dead-end at private or other land boundaries, to curb attraction and thus minimize trespass of local users to cross or connect trails across these land jurisdictions. If in the future, easements are acquired or landowners desire trail connections, then and only then will they be included into the Zuni Mountains Trail boundary and subject to the standards and guidelines set forth in this Plan.

Communities

The Zuni Mountains within Cibola National Forest is also part of Cibola County and McKinley County encompasses area communities. City of Gallup, City of Grants, Navajo Nation, Ramah Navajo, Acoma Pueblo, Laguna Pueblo, Zuni Pueblo, unincorporated places such as Fort Wingate, McGaffey, Rehoboth, Church Rock, Jamestown, Iyanbito Chapter, Coolidge, Continental Divide, Thoreau, Las Tusas, Bluewater, Prewitt, Milan, San Rafael, La Jara, Oso Ridge, Ice Caves, El Morro, Pinehill, Candy Kitchen, Mountain View, Ramah, Timberlake, Vanderwagen, Bahalii Chapter, and Red Rock Chapter. Federal and state lands add to this pattern of land ownership requires cooperation among all levels of government to create a compatible system of land management that protects the natural resources and supports the residents' lifestyles.

An effective system for consistent outreach and communication is essential to fostering the Zuni Mountain community that will be necessary to implement this Zuni Mountain Trails and Conservation Master Plan. Numerous agencies and organizations are pursuing individual missions and goals. Adding to the diversity are University of New Mexico – Gallup/Zuni, Navajo Technical University, and New Mexico State University – Grants creates tremendous opportunities to accomplish great things but also creates a challenge to coordinate actions.

The Zuni Mountains Trail System will become an economic driver through adventure tourism, with the end goal of catalyzing jobs and business opportunities. There is agreement that this project needs to be systemically phased in, as capacity and resources grow to meet ongoing maintenance needs, as well as, to manage promotion, growth, and use to avoid being overwhelmed by the visiting public.

Sustainable Recreation

The District brought together history and recreation when they developed the Hilso Trailhead, which was named for the historic Hilso Sawmill. Visitors will catch glimpses of the remains of a once thriving sawmill community as they ride through parts of the 26-mile trail system. Hilso was dedicated in 2011 and quickly became a popular location for hiking and as a top-flight mountain biking destination.

The trailhead was developed following years of collaboration between the Mt. Taylor Ranger District and Gallup Trails 2010, county, state and other federal partners. Some of these same partners have joined forces to develop the Zuni Mountain Trail Partnership.

Long-term goals for the Zuni Mountains Trail System are to develop a sustainable trail network that will earn recognition by the International Mountain Biking Association as a regional "Ride Center" that provides "Gateway Trails" and "Epic Rides" from local communities to the little-known, yet astounding land features and ecosystems of the area. ZMTP members envision the Zuni Mountains as being the backbone for regional and local community development, and that this Trail System matures into the crown jewel of singletrack trail systems in the Southwest.

Recreational Access

In April 2011, the Travel Management Plan for the Mt. Taylor Ranger District was approved and established a network of National Forest System roads and trails designated for motor vehicle use and prohibited motorized use off the designated system except where shown on the Motor Vehicle Use Map. This decision eliminates motorized cross-country travel, reduces the environmental damage associated with unauthorized motorized use, and identifies opportunities to convert unneeded roads to trails.

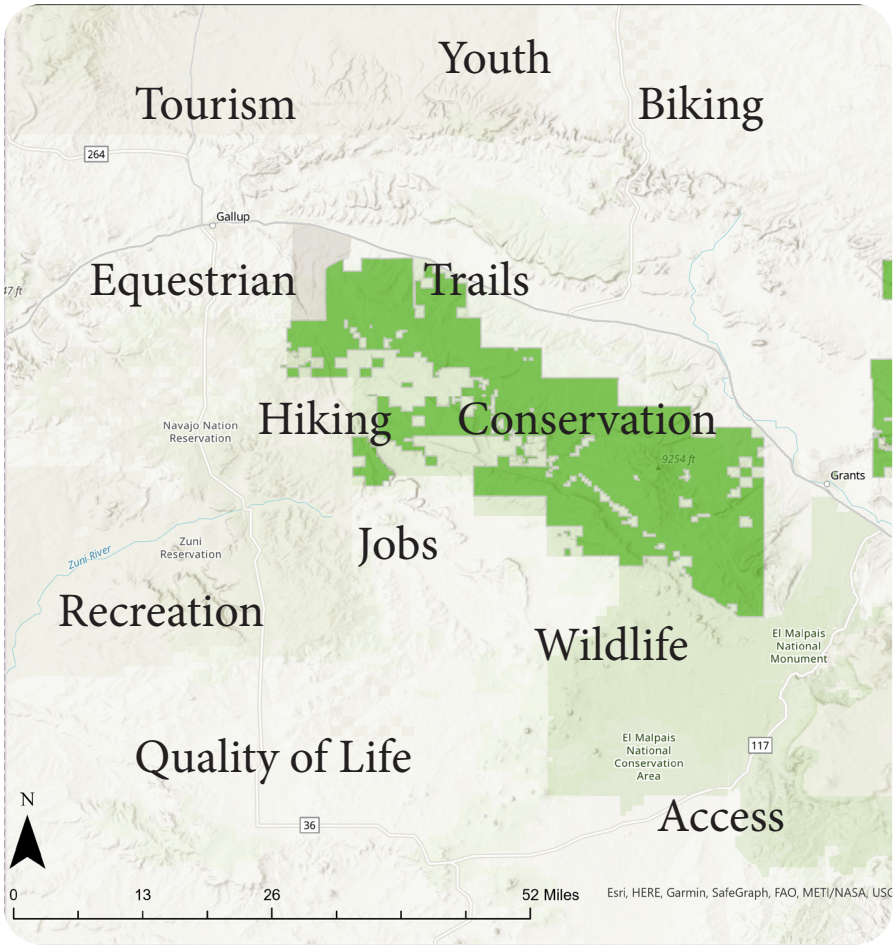
This master plan helps define the vision for the Zuni Mountains Trail System for high quality and challenging hiking, biking and equestrian opportunities and improved watershed conditions. Associated facilities such as appropriately designed and located trailhead with parking and restrooms are proposed to improve visitor services, wildlife habitat, watershed conditions, and forest health. Unauthorized trails and unneeded roads in sensitive or impaired areas would be decommissioned and rehabilitated. Over 160 miles of unauthorized routes that have not been designated for motorized travel could be rehabilitated.

A vision statement is a preamble that sets the stage for the Zuni Mountain Trails and Conservation Master Plan. It is intended to describe what the Zuni Mountain Trails and Conservation Master Plan is designed to help achieve. It reflects the community's self-image and articulates its aspirations. Zuni Mountain area residents enjoy a quality of life that is the envy of many communities. We work to protect this while balancing a transitioning economy and meeting the needs of a growing population on in the face of a changing climate. Zuni Mountain area residents have access a premier year-round recreational destination with a system of interconnected non-motorized trails. Visitors and near-by residents enjoy close-to home forest recreation through community gateway trailheads encompassing the Zuni Mountains. The Zuni Mountains offer trail experiences for mountain bikers, hikers, equestrians, and cross country skiers / snowshoers. Families, novices and expert recreationists have plenty of places to play and enjoy the forest for a half-day or several days at a time.

The Zuni Mountains are the focus and project location of Zuni Mountains Trail & Conservation Master Plan. The development of this plan goes back to efforts started in 1994 by recreation enthusiasts and advanced by economic development and forest planning. An asset-based and community driven process has been the key to success; showcased by a timeline of many key milestones.

Vision

Cibola National Forests' lakes, streams, wildlife, mountains, and clean air will continue to flourish, support an active lifestyle, and create opportunties for economic prosperity. The distinctive local communities throughout the Zuni Mountain region thrive and their uniqueness is encouraged, as the area's overall interests are advanced. The Zuni Mountains continues to be home to an engaged population and a leader in the Zuni Mountains Trail Partnership and Project, a national Impact Award 2020, from the National Association of Development Organizations (NADO).



Vision is Achieved

- Partnership of Communities — Cibola National Forest, Cibola and McKinley counties, state, tribal and other federal governments, and affiliated interests wanting to improve the quality of life and sustainability of the Zuni Mountains dedicate local, state, federal and grant funding to projects & management.
- The Zuni Mountain Trail Partnership coordinates volunteers and youth corps members for trails and forest health projects.
- Outfitters who offer an array of services and guided tours with facilities which range from primitive forest campsites to full service resort facilities in adjacent communities.
- Surrounding gateway communities that have responded with increased recreation related businesses -- guide services, bike sales, repair and service, lodging, camping, and RV supplies.
- Initiatives by local organizations to plan, design, build and maintain specific trail systems.
- Designing trail experiences for specific user groups.

Goals and Objectives

With this Plan, the ZMTP seeks to provide for an outstanding and sustainable recreation experience through careful planning, development and implementation; and employ best management and maintenance practices keeping in mind safety, the environment, and historical and cultural resources.

Goals

- Creation of a multi-stakeholder partnership for sustainable development of the Zuni Mountains region which focuses on conservation, restoration, and recreation opportunities,
- Coordination of public outreach and involvement including community events, public meetings, forums, GIS mapping, etc.,
- Assistance with development of a public mapping process and on-the-ground information gathering and GIS information integration,
- Development of a Zuni Mountains Master Plan with trail connections and linkages to surrounding communities to provide access to area assets
- Identification, inventory, prioritization of sensitive areas and potential restoration projects, such as closing or rehabilitating unneeded routes, throughout the project area.

Objectives

- Establish a non-motorized trail system for mountain biking, equestrian use and hiking throughout the Zuni Mountains. Reduce resource impacts by minimizing the creation and use of unauthorized trails. This system would provide a variety of trailheads and associated facilities such as stacked-loop trails. Opportunities for beginner, intermediate, and advanced users.
- Create new gateway trails that provide close to home recreation opportunities for the public in the Zuni Mountains.
- Create and enhance strong and diverse partnerships that support sustainable recreational visitation, recreational tourism, economic development, and trail stewardship.
- Enhance forest and watershed health by adhering to best management practices for forest road management (road closures and decommissioning) and new trail development. Old logging road corridors may be utilized by mountain bicyclists, equestrians and hikers if converted to sustainable non-motorized trails.
- Heritage resources (prehistoric sites, historic railroad grades, remnants of mining, and logging) are abundant and important in the Zuni Mountains. Trails shall be designed to protect heritage resources through appropriate design, layout, and/or interpretive opportunities. A properly functioning system will minimize future impacts to historic resources. Establishing the proposed trail system will direct current users away from impacted areas and reduce resource damage. In time, heritage personnel may identify backcountry interpretive opportunities as trail use patterns develop.
- The trail system must address visitor risk and safety by appropriate trail location and design. Minimize road crossings where feasible. Address potential user conflicts. Locate and develop trailheads with user safety in mind.
- The trail system shall respect private property rights. Trails will not be designed to terminate at a private property boundary. Trails will not be designed to cross private property without legal access.
- Trail routes identified in alternative development as additional corridors will be considered and analyzed. Field analysis (with data supplied for location) will be required prior to constructing routes.
- The Partnership will continue to outreach to local tribal governments to build and enhance stronger relationships. The partnership will build new bridges through programs such as the National Indian Youth Leadership Program and develop communication strategies through tribal members who are interested in trail-related activities such as health and wellness, forest stewardship, running, bicycling, horseback riding, hunting and gathering forest products.
- The Continental Divide National Scenic Trail does not currently traverse the Zuni Mountains, it may become desirable to CDT proponents and land managers to move the trail from the current route on state highways 53 and 117 to this area.

Chapter 2
EXISTING CONDITIONS

2017 Zuni Mountains Trail & Conservation Master Plan, Amended 2020

Existing Trail Systems

The following section describes the trails and trailheads that are on the part of the National Forest System (NFS) in the Zuni Mountains, Cibola National Forest. Use that occurs throughout the area on livestock, game trails and two-track trails are not addressed in this Master Plan.

Strawberry Canyon Trailhead and Trail

Located just east of the McGaffey Campground entrance where State Highway 400 becomes County Road 50 is the Strawberry Canyon Trailhead. The Strawberry Canyon trail was designed by the US Forest Service as a 2-miles pedestrian trail with mountain biking, snowshoeing, and cross-country skiing as managed uses. A unique mix of plant life dependent on amounts of moisture found on different slopes, includes ponderosa pine, rocky mountain juniper, one-seeded juniper, and pinyon pine are found here, as well as various shrubs and seasonal flowering plants. This non-motorized, multi-use trail is enjoyed by hikers and bicyclists alike.

Hilso Trailhead and McGaffey Area Trail System

Located directly off State Highway 400 South of Fort Wingate is the Hilso trailhead, which provides parking and access to 26 miles of non-motorized single track trails here. An interpretative kiosk at the trailhead provides information on the history of this area and a map of the trails.

Ramah Mormon Pioneer Trailhead and Trail System

The following is a trail system that is just outside of US Forest Service Boundary and is owned by Ramah Land & Irrigation District. The Ramah Land & Irrigation District has provided an easement to McKinley County, which in turn received a Recreation Trails Program grant to construct the trail and trailhead. Located just east of the Ramah Lake entrance (off Bloomfield Road) and north of State Highway 53 in the Village of Ramah is the Ramah Mormon Pioneer Trailhead. The trail was designed as a pedestrian and hiking trail. This 6.1 mile trail offers tremendous overlooks of the Ramah Valley. See Appendix B: A ZMTP Trail System Powerpoint by Tom Mayer showcases the existing trail. This was a planning document completed in 2011, and the Environment Assessment removed any discussion of expanding this trail system to link with the ZMTP.

User Created Trails

Miles of existing trails that are in good condition and meet USFS standards, and are mapped in the Zuni Mountain Trail System proposal were originally “user-created.” User-created trails are defined as social trails that may follow historic or well-defined routes developed by repetitive use. However, these are defined as unauthorized trails per the National Environmental Policy Act (NEPA) process. User-created trails follow old access roads, old logging trails, livestock/game trails, and trail tread created through repeatitive use. The user-created trails are problematic including erosion, flooding of trail segments, destruction of culturally and naturally sensitive areas, trails which cross private land, user conflicts, vegetation overgrowth, and fence crossings. The proposed action and alternatives being analyzed for the Zuni Mountain Trails System would mitigate all of these issues.

ZMTP has sought to construct and maintain trails to USFS Standards and Specifications, while infusing the IMBA standards, best practices, and recommendations. We believe that a common-sense balance can result in sustainable trails that accommodate the managed uses (hiker/pedestrian, bicycle, pack and saddle) and provide enjoyable recreation opportunities.

Signage and Infrastructure

ZMTP has worked closely with US Forest Service staff to develop trails, trailheads, signs, cattleguards, and other improvements per USFS Standards and Specifications. Kiosks are in place at the Hilso Trailhead, Strawberry Trailhead and eventually at Milk Ranch Trailhead, and Quartz Hill Trailhead. Some of these are referenced from other Federal parks and amenities.

Key Destinations

The proposed trail system will provide access to destinations within the Zuni Mountains:

- Quaking Aspen Campground
- McGaffey Campground
- McGaffey Lookout Tower
- Bluewater Creek Picnic Area
- Ojo Redondo Campground
- Oso Ridge Lookout
- Lookout Mountain
- Rice Park and Dam
- Post Office Flat
- Mt. Sedgwick
- Pine Tree Overlook
- Continental Divide

Other key community destinations that could eventually be included into ZMTP;

- Breadsprings (Baahali)
- Gallup
- Grants
- Milan
- Fort Wingate
- Bluewater
- El Morro
- Ramah

In addition are the historic and nationally prominent trail systems, trade routes, monuments, and parks;

- Zuni-Acoma Trail
- Chain of Craters
- Hogbacks
- McGaffey Lake
- El Malpais National Monument
- El Morro National Monument
- Mount Taylor
- Mount Sedgwick
- Continental Divide Trail System

The Environment Assessment did not study or evaluate trail connections to these areas.

map of key destinations / pictures

Conservation

This Plan aims to track and report on progress with conservation efforts in the Forest, and coordinate with these activities to provide for overall forest health.

Forest

Mt. Taylor Ranger District has sought collaborators to help manage other areas of the district. A mutual concern about high fire risks, the need to restore a culturally important landscape and watershed, and the desire to support local forest-based industries led to the development of the Zuni Mountain Collaborative Forest Landscape Restoration Program (CFLRP). This program has received several grants to restore the Zuni Mountain landscape to historic vegetation conditions using thinning and prescribed fire. The materials from the thinning will provide firewood for personal use and commercial contracts. When completed, the landscape will appear more diverse and reflect historic conditions of fewer and larger trees, uneven aged stands with a variety of open areas that encourage a shrubby and grassy understory component. These conditions will enhance scenic quality, increase resilience to climate change and may increase water availability. Overarching goals are to restore forests to increase their resiliency to wildfire, drought, insects and diseases, and climate change while maintaining biodiversity and ecosystem function.

Benefits of the Landscape Restoration Strategy:

- Reduce high fire risk and improve
- forest health on 56,000 acres;
- Achieve over $30 million in wildfire suppression cost savings;
- grow local forest-based businesses
- and create and sustain over 90 jobs;
- Protect wildlife habitat and threatened and endangered species populations; and,
- Enhance scenic quality by restoring a more natural appearing landscape.

In terms of progress, the Bluewater Watershed CFLRP project area is probably 70% complete with 100% completion by 2018. Initial controlled burns are underway and will continue through 2020. After that there will probably be a decade of maintenance burns to keep the restore forests in a resilient condition.

For the Rio Puerco project area, NEPA formally began in 2015 with an expected decision in 2017. Implementation would then be from 2018-2028 depending on funding.

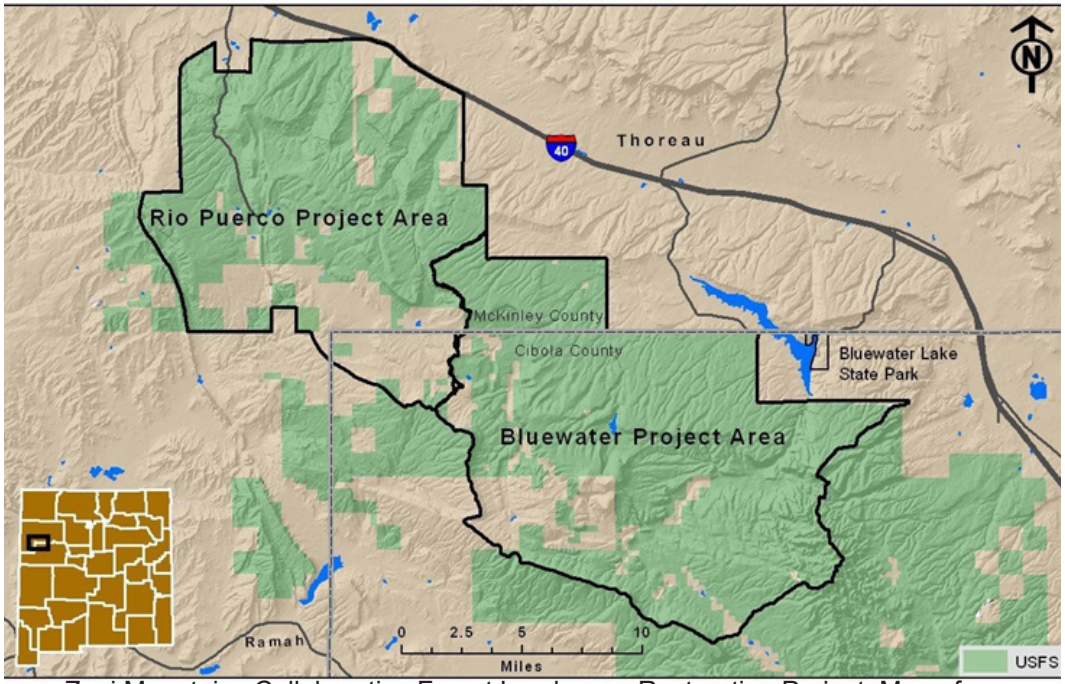
Recreational Access

In April 2011, the Travel Management Plan for the Mt. Taylor Ranger District was approved and established a network of National Forest System roads and trails designated for motor vehicle use and prohibited motorized use off the designated system except where shown on the Motor Vehicle Use Map. This decision eliminates motorized cross-country travel, reduces the environmental damage associated with unauthorized motorized use, and identifies opportunities to convert unneeded roads to trails.

This master plan helps define the vision for the Zuni Mountains Trail System for high quality and challenging hiking, biking and equestrian opportunities and improved watershed conditions. Associated facilities such as appropriately designed and located trailhead with parking and restrooms are proposed to improve visitor services, wildlife habitat, watershed conditions, and forest health. Unauthorized trails and unneeded roads in sensitive or impaired areas would be decommissioned and rehabilitated. Over 160 miles of unauthorized routes that have not been designated for motorized travel could be rehabilitated.

Watershed Restoration and Protection

There have been several projects of note in terms of watershed restoration along the Rio Puerco and Bluewater Creek areas, and protection of the habitat of the National Endangered Species, the Zuni bluehead sucker fish.



Zuni Mountains Collaborative Forest Landscape Restoration Project Map of Project Area (Forest Guild)

Chapter 3 COMMUNITY ENGAGEMENT

This chapter summarizes community engagement benefits of trails, user groups, and ZMTP membership input gained during the planning process. The Zuni Mountains trail system is managed for hiker/pedestrian, mountain bike, pack and saddle equestrian.

Background

The Mount Taylor Ranger District provides recreational opportunities for mountain biking, hiking, backpacking, equestrian, hunting, and picnicking, winter sports, outdoor learning, interpretation, bird watching, and motorized trails. Despite the strong multi-use focus present, area community members indicated that there is a need for a trail system to accommodate increased local use and tourism. On the ground, the demand is reflected by the development of user-created social trails; however, these trails have been constructed without any environmental analysis. While some user-created trails are in appropriate locations and are considered sustainable, many are not. In the decade following a Decision Notice, this project will systematically work to reverse the damage from poorly located user-created trails and design a system of sustainable non-motorized trails that provide opportunities sought by trail users.

In 2011, International Mountain Bike Association (IMBA) Trail Solutions was contracted to review opportunities and needs in the Zuni Mountains. A full copy of their report and recommendations can be found in Appendix C: ZMTP Site Visit Report. This report indicates the potential for attracting mountain bikers from the region and internationally. This report documents the need for trails and a trailhead within a short commute of Grants and Gallup to establish an adventure tourism draw. This report provides the initial prioritization of trail possibilities on the east side, and was one of the catalysts to develop this Plan.

Benefits of Trails

In 2014, the Southwestern Sustainable Recreation Strategy Team created a strategy (see Appendix D: Southwestern Region Sustainable Recreation Strategy) to help the region build a recreation program that is vital to the well-being of our visitors and communities and is essential to the future of the Forest Service and the National Forest and Grasslands. The Cibola National Forest developed its Sustainable Recreation Strategic Plan in 2015. This strategy plan describes the large performance gap between forest use and population growth coupled with growing outdoor recreation demands and recognizes the importance of collaboration and partnerships in accomplishing Forest and community work.

The Back Country Horsemen of America (BCHA) Zuni Mountains Chapter also provided a significant review throughout the proposed project area. The ZMTP believes that our proposed Trail System can be model used throughout the Southwest region to achieve sustainable recreation goals of the US Forest Service and other agencies.
A well-planned, sustainable trail system benefits the surrounding communities in many tangible and intangible ways:

- Conservation of the natural environment, native species and wildlife corridors;
- Alternative to motor vehicle travel linking to other trail systems, open spaces, and remote areas; • Increased opportunities for physical activity and outdoor recreation; and,
- Increased property values and benefits to the local economy.

User Groups

The non-motorized trail user groups include foot travel users, mountain bikers, equestrians, and winter sport enthusiasts. The trails are primarily used in the spring, summer, and fall; however, there is an increasing number of winter time uses including snowshoeing and cross-country skiing depending on seasonal snowfall.

Hikers

Foot Travel Users – hikers, runners, walkers – currently constitute the largest user group on the Zuni Mountains existing trails. Hikers are the most flexible trail users and adapt to the broadest range of trail designs. Traveling by foot allows hikers to adjust to varying trail conditions, travelling over trails that are extremely steep or barely evident. Hiking trails generally traverse all types of environments, grades, and surfaces.

Mountain Bikers

Mountain Bikers. Zuni Mountains mountain bikers generally prefer riding point-to-point or in a loop that includes climbs and descents on a variety of terrain. Recreational mountain bikers prefer to bike on single-track trails. Several popular mountain biking routes exist on the western side of the Forest, including the Hilso Trailhead and McGaffey Trail System, which offered the backdrop for the 2013 and 2014 World Mountain Bike Championships (24-Hours).

Equestrians

Equestrians/Pack and Saddle Users. There is a long history of equestrian use in the Zuni Mountains region and equestrian users have expressed interest in utilizing the Zuni Mountains Trail System. To accommodate equestrian use, trails in the Zuni Mountain system will follow the design standards for pack and saddle.

Winter Users

Cross Country Skiing, Snowshoeing, and Other Non-motorized Winter Users. There are not a large number of users due to inadequate amounts of snowfall and unpredictability of snowfall. There are pockets of users when conditions are favorable. There was some discussion about developing facilities for these at earlier ZMTP meetings, but these were not incorporated into this project at this time. Uses will be allowed to occur in appropriate seasons when conditions permit.

Member Input

Throughout the planning process, members provided a strong case both economically and socially for developing additional non-motorized trail designed and managed for mountain bikers. At interval periods, other non-motorized user groups provided trail and route information, and a desire to be included in this Project. After the draft EA was issued, the cooperating agencies worked to include all users and stakeholders into this Project. Overall members expressed a desire for more trails and trail connections for longer “Epic Rides” that would attract visitors and tourists. There are a number of sections in this plan that help to detail the input of the ZMTP members. Appendix A provides a list of media and meetings that were publicly open to provide input.

Planning Process

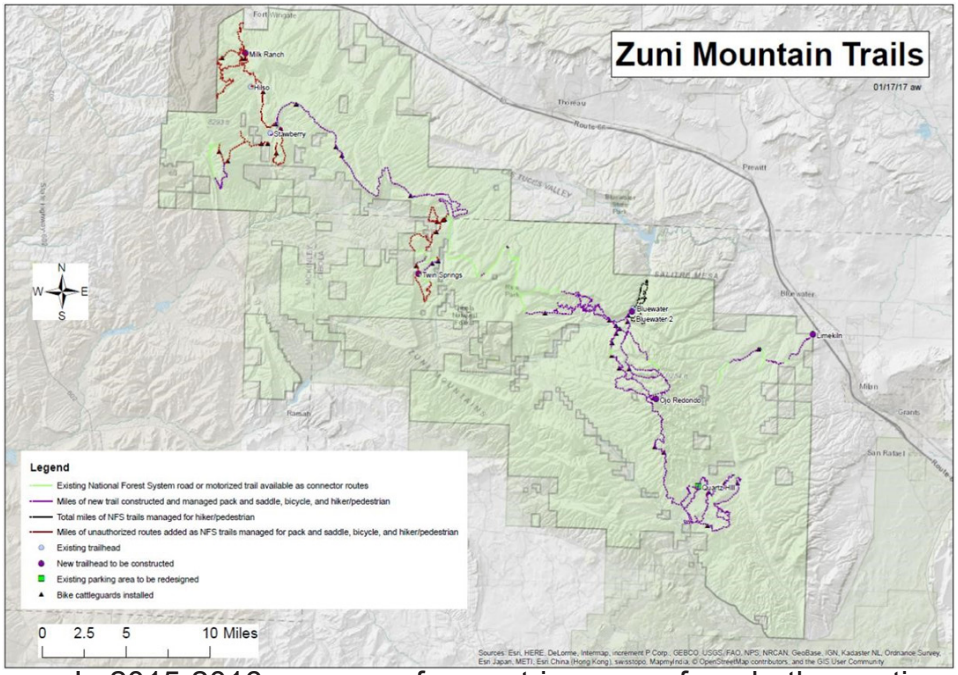
The Zuni Mountains Trail system has been building for decades. People would become the Zuni Mountains Trail Partnership (ZMTP), worked to create a the Zuni Mountain Trail and Conservation Master Plan (ZMTCMP) for the Zuni Mountains area of the Mt. Taylor Ranger District of the Cibola National Forest.

In 2009, the ZMTP worked to create a master planning team made up of stakeholders and agencies from the bi-county area. The National Park Service assisted the team in developing a comprehensive vision, deliverables, and objectives. This planning team and ZMTP stakeholders met monthly to discuss and deliberate on topics detailed in this document. Meeting over 60 times they reviewed grants and methods for funding the project. These meetings shared history, gathered data, maps had patterns to collectively visualize the desired outcome. Meetings were held to reach out to the general public from Grants, Gallup and Ramah. The team focused on crafting an intergovernmental memorandum of understanding between Cibola County, McKinley County, and the USFS. Meetings focused on bringing IMBA to provide an expert review of the project.

The ZMTP built the partnership to conserve natural and cultural resources. To provide recreational opportunities, to contribute to economic, and social well-being of local communities.

Methodology and Outreach

- Development of communication tools; a website (www.zuni-mountaintrailpartnership.com) and Facebook page providing information, meeting noticies, to sign-up, and facilitated forums for public input.
- Utilizing Google Earth, to share existing and additional trail routes and possible trailheads.
- Utilization of mappers to create routes, provide GPS data, and prioritize routes.
- Identified and recruited stakeholder groups. Direct outreach and recruitment of representatives from the equestrian user



- In 2015-2016, a group of equestrian users from both counties, came together to form the Zuni Mountains Chapter of Back Country Horsemen. They investigated all proposed trails and provided a scoping report to the USFS District Ranger for his incorporation into this ZMTCMP and Project evaluation. The equestrian group were interested in adding a trail system at the Continental Divide, south of Thoreau, but discarded this proposal during their field scoping. The group proposed no other route.
- Monthly team meetings at accessible public venues to all citizens, user groups and many area civic organizations.
- Organized field trips and an IMBA trail work session to educate area citizens and project team; on project locations, trail design, construction, and maintenance practices.
- Worked with USFS staff to communicate and meet one-on-one with tribal entities and private landowners to explain project, document concerns, and issues.
- See Appendix A: Media and Meetings Listing for all ZMTP media, public outreach meetings, and events of details on the overall planning and NEPA processes.

Local and Regional Plans

This chapter showcases the alignment of local and regional ZMTP planning efforts. It highlights key goals and recommendations from local City and County Comprehensive Plans, regional plans, and other planning efforts that have provided guidance and a foundation for the overall vision, goals, and objectives, as well as for planning, design, operation, and maintenance of the Zuni Mountains trail system. These studies and plans, support an "all of the above" multi-use approach to trail development to maximize economic opportunities.

Feasibility Study

In 2001 a feasibility study by Southwest Planning & Marketing, demonstrated that adventure tourism, such as mountain biking, hiking, rockclimbing, equestrian, etc., could initially increase tourism spending annually in Gallup by an estimated $5 million. Create 120 new jobs, provide substantial opportunities for youth and community recreational wellness and volunteer activity. This study resulted in significantly increased community support and participation.

Economic Development

The Northwest New Mexico economic development district's Comprehensive Economic Development Strategy Plan (CEDS) **2009-2014** outlines regional strategies to catalyze economic development, create jobs, and to advance sustainable communities throughout Cibola, McKinley and San Juan Counties. **CEDS objective 1.4**, tourism, states that the district will collaborate on regional tourism initiatives by expanding Gallup trails to save 250 jobs and create 50 jobs. The CEDS plan designates Adventure Gallup & Beyond (AGB) as the organization to lead creation of additional adventure sports venues and related small businesses such as bike shops, horse hotels, equestrian and other outfitter expansions with the goal of creating 10 jobs. This private sector development may initially require public sector support and marketing assistance. The CEDS plan calls for the expansion of master planning for adventure tourism with a dialogue between USFS and community stakeholders to create the Zuni Mountains trail system. McKinley and Cibola Counties both have developed Comprehensive Plans to guide land-use development and growth. Both plans focus on developing tourism as key to healthy regional and local economies.

Cibola County Comprehensive Plan

The 2015 county plan focuses on building "a countywide community that appreciates and builds on its unique assets – its natural beauty and the cultural diversity and rich heritage of its citizens;" and "promoting Cibola County as a popular destination for regional, national, international tourists and recreation enthusiasts through enhancing and marketing the County's points of attraction." Specific goals, policies and strategies illustrate how the Zuni Mountain trails system will support the Cibola County Comprehensive Plan.

Land Use

Land Use Policy (LU-7): Support development that will enhance economic development, tourism potential, and Cibola County's attractive positive image.

Economic Development

Recommended Economic Development Actions and Strategies:

- Promote appropriate recreational activities within the Range/Grasslands, Woodlands, Mountains, and Lakes/Rivers/Arroyos that highlight them as destinations along the Scenic Corridors.
- Promote the development of micro-businesses within Traditional Communities and Rural Communities that can provide Local Services that will increase circulation of revenue within the local economy.

The City of Grants trails plan of the Rio San Jose Legacy Trail and connections to other interest points and social hubs. Grants is developing its Comprehensive Plan update to include a strong section of parks, open space, and trails.

McKinley County Comprehensive Plan

McKinley County's Comprehensive Plan Update or the '360/365' Plan, adopted by the County Commission in September 2012, lays out a Vision which in part calls for healthier people and communities. The Plan also suggests county leaders should promote the enjoyment of living in McKinley County. Specific goals, policies and strategies, listed below, clearly illustrate how the Zuni Mountains Trails System will support the McKinley County Comprehensive Plan.

Land Use

It shall be the goal of McKinley County to promote the wise and sustainable use of lands within the County, providing for an effective balance between preservation, open space, growth and development. The county will review the City of Gallup Trails & Open Space Plan and amend and expand, to include all County areas (e.g., the Zuni Mountain Trail System) and expand its role in establishing conservation easements, access agreements, and NEPA review work.

Tourism

It shall be the goal of McKinley County to collaborate with regional partners in the promotion and support of tourism as a major economic driver for the County community.

Economic Development

It shall be the goal of McKinley County to promote and support the expansion of economic opportunity, an increase in the County tax base and the strengthening of the economic security of County citizens and families. Tourism development, especially in connection with Adventure Gallup & Beyond (AGB) initiatives.

City of Gallup Trails and Open Space

The City of Gallup developed a Gallup-McKinley County Trails & Open Space plan in 2005 that has been updated and adopted as part of their 2016 City of Gallup Growth Master Plan. This plan says that singletrack trails for hiking and biking are a priority, especially in the McGaffey Area. It calls for local trails that link to regional trails such as the Zuni Mountain Trails System.

The 2016-2020 "Viva New Mexico" Statewide Comprehensive Outdoor Recreation Plan (SCORP) also supports in Objective 2.5, to "plan, prioritize, and implement new statewide and regional trail connections between cities, towns, and tribal communication", and provides major credence by uplifting Gallup's story as a specific adventure tourism case study (Page 8).

Adventure Gallup and Beyond

Adventure Gallup & Beyond (AGB), became the organization to plan, develop and promote adventure trails and venues in the region surrounding Gallup. Over a decade of coordination and implementation resulted in some of the best trails and venues in the country and adventure tourism events such as:

Squash Blossom Classic
Biking and Running events
Venue started in 2005. High Desert Trail system

Dawn til Dusk
A 12 - hour endurance mountain bicycling event
Venue started in 2005. High Desert Trail system

24 Hours in the Enchanted Forest
A 24 - hour endurance mountain bicycling event
Venue started in 2010. McGaffey Area Trail System

Adventure Gallup & Beyond measured its progress and economic impact with a 10 year economic impact study of Adventure Tourism in McKinley County. The highlights of this 2013 report include the following key findings that encompass the period of 2002 – 2013 for hikers, bikers, and climbers only (due to limited data). (SEE TABLE/AGB 10 yr IMPACT STUDY?? APPENDIX?)

Trail Users: 289,965
Total Spending by Daily Use: $16,672,988
Total Spending by Events: $952,871
McKinley County Combined Spending (Using IMPLAN Multiplier): $25,592,747

Outdoor recreation is big business in New Mexico. According to the Outdoor Industry Association's 2013 Annual Report, outdoor recreation generates $6.1 billion in consumer spending, created 68,000 direct New Mexico jobs, generated $1.7 billion in wages and salaries, and provided $458 million in state and local tax revenues. This revenue is generated from in-state residents and people coming from out-ofstate. The following Table 2-1 describes the recreation activities that people like to participate in.
TABLE 2-1:

Outdoor Activity Participation

New Mexico Population		National Population	
Trail - running, hiking, backpacking, climbing	41%	Running, Jogging, and Trail Running	19%
Camping - RV, tent and rustic lodging	31%	Freshwater, Saltwater, and Fly Fishing	16%
Wildlife Viewing	31%	Road Biking, Mountain Biking and BMX	15%
Bicycling - road and off-road	23%	Car, Backyard and RV Camping	13%
Fishing	13%	Hiking	12%
Hunting	7%		
Snow Sports - ski, snowboard, snowshoeing	7%		
Paddling	7%		

Source: Outdoor Industry Foundation

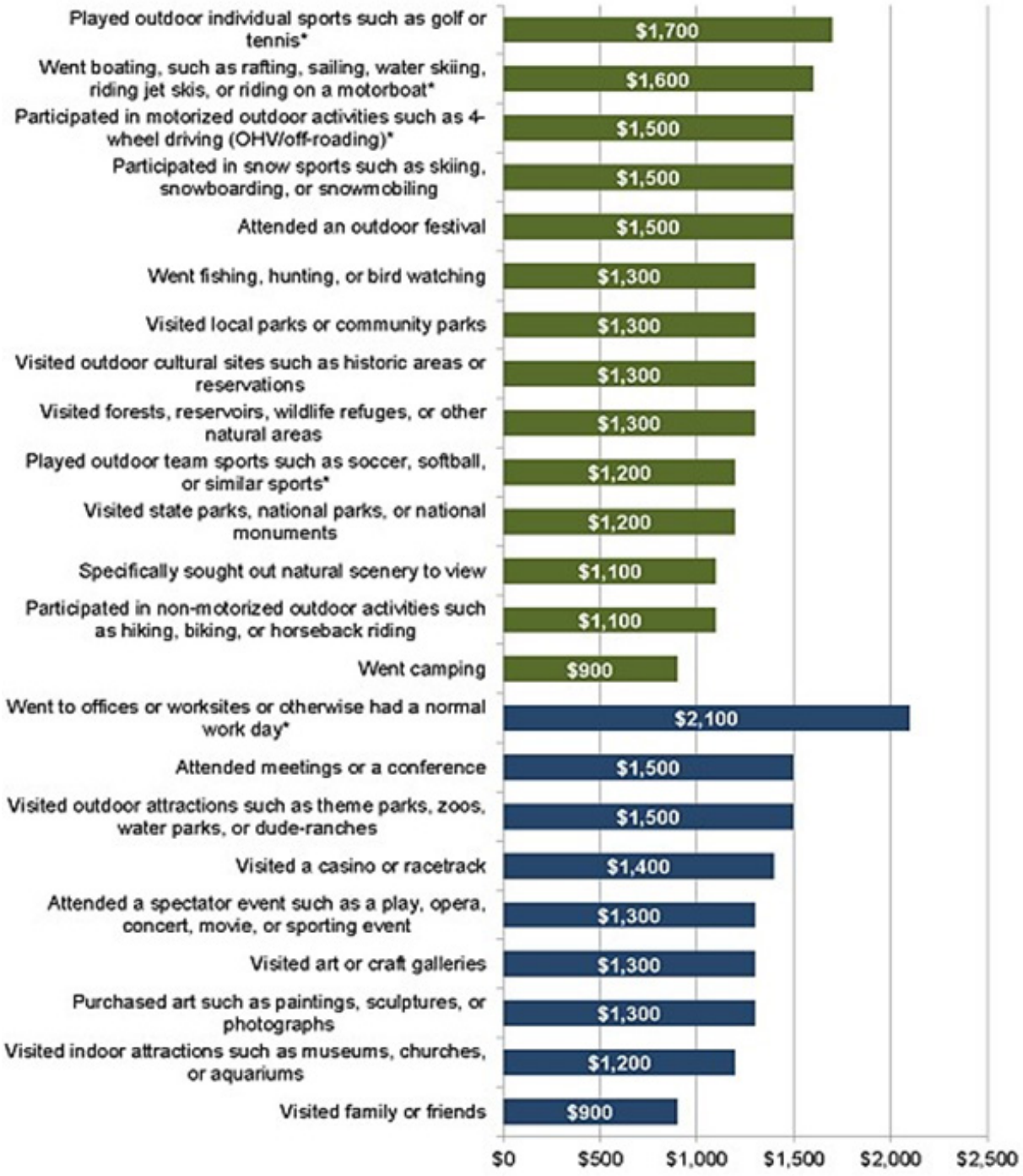
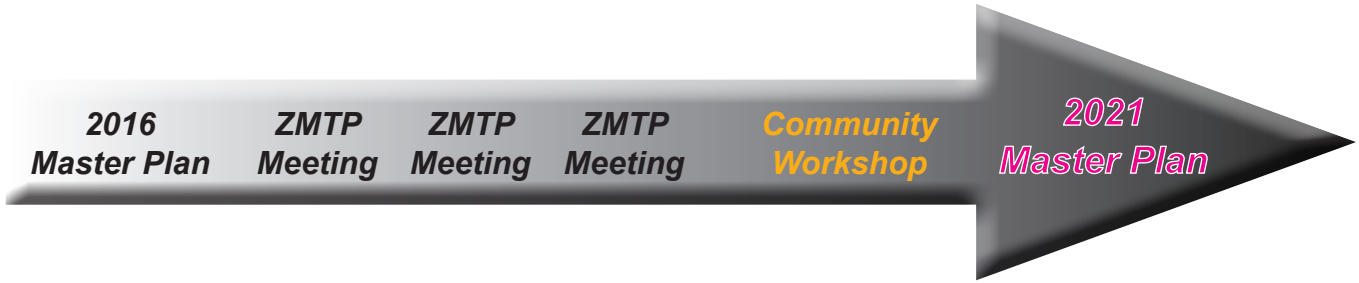


TABLE 2-2: Out-of-State Visitor Spending based on Recreation Activities SOURCE: NM SCORP, 2016-2020,Viva New Mexico



Zuni Mountains Master Trails & Conservation Master Plan (ZMTCMP) review process

ZMTCMP Periodic Updates

It is the responsibility of the ZMTP partnership to accomplish its goals and vision by following through on strategic planning, identifying opportunities, complying with regulations and guidelines set forth by NMDOT, USFS, Cibola and McKinley Counties and other partners. To obtain approval where necessary. To seek and identify additional partners and funding sources; while keeping the public informed regarding the process and developments. To seek and utilize public input throughout the process. The ZMTCMP will be re-visited periodically, to monitor results, evaluate outcomes, and make adjustments as needed.

The Zuni Mountains Master Trails & Conservation Master Plan (ZMTCMP) will be reviewed and renewed every five years to remain current with the needs of the ZMTP membership, adjust to changes in use, and to allow for adaptive management. The review process diagramed above illustrates how the ZMTP and public outreach meetings will interface with the update process.

Adaptive Management is a process of making minor adjustments to a system as needed to meet goals and objectives. ZMTP partnership can utilize an adaptive system by engaging active trail users through a continuous process. Zuni Mountains Trail Partnership will meet several times a year, formally or informally, and work with land managers to discuss and resolve trail issues.

ZMTCMP Document Purposes

1. Support of the NEPA and Environmental Assessment that was drafted by SWCA Environmental Consultants, augmented by Okun Consulting Solutions, and then completed by the USFS staff in support of their final decision;
2. To demonstrate partnership efforts and capabilities in trail development and maintenance, financing improvements, volunteer support and manpower, and our project history including sophistication and abilities;
3. Act as stand-alone master plan that guides implementation of the USFS decision and organizes plans, procedures, and work programs for local ZMTP partners; and,
4. An ever evolving document that incorporates new information and condition changes, including maintenance schedules and contracted work that is consistent with the USFS decision.

ZMTP Project Milestones a 20 plus year Legacy

The ZMTP Partnership has a rich and substantial history in terms of planning a nonmotorized, multi-use trail system. Here is a timeline of events that have built to the reputation and enthusiasm of this project.

- In the **mid-90s**, local mountain bicyclists had a series of meetings with Mt. Taylor Ranger District staff to explore and propose a mountain bike trail system in the McGaffey area; opening communications and movement onto the USFS's Schedule of Proposed Action (SOPA) process.
- **2002–2004**: Americorps*VISTA arrive with a mission to develop sustainable adventure tourism in American Indian communities.
- **2003**: Mayor Bob Rosebrough invited Congressman Tom Udall to tour the McGaffey area trails, a letter to the Mt Taylor District Ranger requesting assistance in achieving the goals of Adventure Gallup & Beyond and Gallup Trails 2010.
- **2003–2005**: Trail development continued to progress with the efforts of Bill Siebersma and Arnold Wilson through the Mount Taylor Ranger District. A major stakeholder meeting was held at UNM-Gallup that provided momentum to elevate the priority of this project.
- **2006**: The initial Zuni Mountain Trail Partnership was formed as a result of an agreement between the USFS, McKinley County, Gallup Trails 2010, Youth Conservation Corps and AGB.
- **September 2007**: the USFS issued a decision notice and a finding of no significant impact (FONSI) on the proposed 26-miles of trails and a trailhead off NM400 to access these trails. The USFS designated the Hilso trailhead at old mile marker 3 and the first 26-miles of Zuni Mountain trails was authorized as non-motorized, multi-use trails.

- **March 2009**: the McKinley County Commission visited with the New Mexico Congressional Delegation requesting an appropriation to fund the construction of trail systems and supporting infrastructure improvements for the Zuni Mountains Trail System.
- **May 2009**: McKinley County submitted its application to RTP.
- **June 2009**: the award was made by the NM Energy, Minerals, & Natural Resources Department, State Parks, and RTP to McKinley County for $227,894.00, 20% represented local labor donated by Gallup Trails 2010's 'Shovelman Crew", Expert Design Services of Strider Brown & Bill Siebersma, and McKinley County's staff and Road Crew.
- **August 2009**: ZMTP awarded a grant from National Park Service "Rivers, Trails, and Conservation Assistance" (RTCA) to reconnect outdoor recreation planner, Attila Bality, with the Zuni Mountains Trail Partnership (ZMTP) team to work on developing a master trails and conservation plan for the Zuni Mountains linking a system of trails and creating a world-class Ride Center and Gateway Trails systems.

- **January 2010**: Hilso Trail System, a contract was finalized with Gallup-McKinley County Youth
- Conservation Corps to complete – (1) improvement of 26-miles of trails, including erosion and drainage controls; (2) fencing the parking lot; (3) developing the trailhead and parking lot; (4) installing signage and way signs; (5) installing a gate and single track cattle guards; and (6) transporting and installing a CXT vault toilet.
- **May 2010**: McKinley County partnered with Ramah Land & Irrigation Company to submit a second RTP grant, which was funded at $154,331 for construction of 6.1 miles of pristine hiking trail and a trailhead facility adjacent to Ramah Lake.
- **November 2010**: McKinley County joined with Cibola County to submit a grant to Northern NM Resource Advisory Committee for $150,000 of Secure Rural Schools-Title II monies to provide for NEPA services needed on the proposed trail system.
- **2010-2011**: ZMTP including Cibola County representatives and the Zuni Mountain Trail riders equestrian group members began working on master trail system plan, including kick-off meetings in July 2010 and the formation of ZMTP Master Planning Team, which met monthly to develop data, trail routes, and information for USFS.
- **May 23–May 25, 2011**: ZMTP and its partners contracted with International Mountain Biking Association (IMBA) to complete an area feasibility study and provide community training.
- **June 4, 2011**: Celebrating National Trails day, USFS, ZMTP and over 150 citizens dedicated the Hilso Trailhead/McGaffey Trail System and forged a new Memorandum of Understanding (MOU) to expand the partnership with Cibola County and several key organizations.

- **June 7, 2014**: McKinley County dedicates the Ramah Mormon Pioneer Trail, a hiking trail that circumnavigates the old Ramah Lake.
- **June 14-15, 2014**: Close to 600 racers again duel it out in McGaffey for bragging rights, as again the US Forest Service and Zia Rides host the 24-Hour National Mountain Biking Championship.
- **December 11, 2014**: New Mexico Department of Transportation awards about $20,000 in special RTP funding to McKinley County to replace intersection signage and trail cattleguards in the McGaffey trail system and upgrade the Strawberry Canyon trailhead.

- **2014-2016**: Annual mountain biking events gained in popularity, e.g. 24-Hours in the Enchanted Forest (June) and the Zuni Mountain 100 (October). Users groups such as Gallup Trails, Cycle Cibola County, and Zuni Mountains Trail Partnership grow memberships through social media.
- **June 30, 2015**: The USFS-Cibola National Forest announces the 30-day comment period for the draft Environmental Assessment (EA) for the Zuni Mountain Trail on the Mt. Taylor Ranger District.
- **September 2015**: The USFS agrees to designate both Cibola and McKinley counties with cooperating agency status.
- **September – November 2015**: consultations with various user groups took place, resulting in a Memorandum of Understanding (MOU) between mountain biking interests and equestrian users.
- **November 2015**: Based on USFS consultations, both counties agreed to add very limited but proportionate funds to complete additional heritage studies and reports for the final EA.
- **February 2016**: Establishment of the Zuni Mountains Chapter of the Back Country Horsemen, who have held several events for fundraising, awareness, and trail scouting reports.
- **August 2016**: Both Cibola and McKinley County submitted prioritized phases of this overall project to the Northwest NM Regional Transportation Planning Organization, as part of their Call for Transportation Projects process and the NM Department of Transportation's Active Transportation and Recreational Trails Program guidance.
- **October 28, 2016**: Both Cibola and McKinley County submitted Recreational Trails Program (RTP) grant applications to build-out this system.
- **March 17, 2017**: USFS--Cibola National Forest issues final Environmental Assessment (EA) for the Zuni Mountain Trail on the Mt. Taylor Ranger District.
- **May 17, 2017**: USFS/Cibola National Forest/Mt. Taylor Ranger District signed the final Decision Notice and Finding No Significant Impact (FONSI) for the Zuni Mountain Trails Project.
- **May 31, 2017**: Signing Ceremony and announcement of $1.7 million New Mexico Department of Transportation grant for trail design and construction of the Zuni Mountain Trails Project.

- **August 2018**: The first trail building in the “Milk Ranch” area near McGaffey commences. The Southwest Conservation Corps/Ancestral Lands Conservancy begins the initial phase.
- **April 12, 2019**: USFS provides Scope of Work for Milk Ranch & McGaffey Trail Systems.
- **May 2019**: NMDOT Recreational Trails Program awarded funds to McKinley County for the McKenzie Ridge Connector Project. $180,400 for design and construction of Twin Springs Trail System Phase I (McKenzie Ridge Trail Connector). Project will connect the Hilso/McGaffey area trails to the Twin Springs Trail System.
- **June 2019**: Re-design/Clearances: Kerry Wood, USFS Trails & Wilderness Program Manager and Carrie House, COG Associate Planner II has completed design and specifications for the Milk Ranch and McGaffey area trail system. USFS provides Scope of Work for Trails A, B, C, D, and 4.
- **June 11, 2019**: USFS provides trail building workshop to SWCC.
- July 20, 2019: USFS and COG provides trail construction workshop to volunteers.
- **September 2019**: Trail A & B trail construction has commenced for the season. The USFS has halted/limited trail construction due to: Biological clearances, Heritage clearances and Court Injunction due to the Mexican Spotted Owl (Wildlife Guardians v. USFS), TBD.
- **November 2019**: QA/QC was approved by the USFS for Trails C and D, constructed by Southwest Conservation Corps. USFS issued “TAMPICO SPRINGS & MIKES RIPPIN’ TRAIL CLOSURE” order. Milk Ranch Trailhead posts installed by McKinley Count Roads Department. USFS and COG begin trail design and specifications for Quartz Hill Trail System.
- **November 20, 2019**: Zuni Mountain Trail Partnership Quartzhill Kick-off meetings with USFS, Cibola, McKinley and COG. Discussions of signs, cattleguards and trails.
- **NADO IMPACT AWARD**: COG received a national award for its role in the Zuni Mountains Trail Partnership and Project. Copies given to the US Forest Service, McKinley County, and Cibola County. COG has received this award for Adventure Gallup & Beyond (2002) and RISTRA Project (2015).
- **March 2020**: USFS/Cibola National Forest/Mt. Taylor Ranger District signed the final Decision Notice and Finding No Significant Impact (FONSI) for the McKenzie Ridge Trail Connector of the Zuni Mountain Trails Project. Novel coronavirus disease (COVID-19): a global pandemic TBD.
- **April 2020**: USFS provides Scope of Work for McGaffey area trail system and Quartz Hill Trail Project. RFP.

Chapter 4
RECOMMENDATIONS

This chapter provides ZMTP recommendations for developing the Zuni Mountains Trails System, including new trails, connector trails, and improvements to existing unauthorized trails. Figure 6-1 was an initial map used to detail these types of trail improvements. All improvements will need to be analyzed in accordance National Environmental Policy Act (NEPA) and be part of the decision notice process by US Forest Service.

Trail System

Based on the environmental analysis and input from the ZMTP, and general public, approximately 186 miles of trail will be added to the National Forest System in the Zuni Mountains and managed for bicycles, pack and saddle and hiker/pedestrian. Almost twenty-eight (28) miles of national forest system routes are available as connectors between trail loops. (See Zuni Mountain Trail System maps at the end of this plan and Figure 6-1.) An additional 28-miles of existing trails will be incorporated and maintained.

IMBA

These trails could be modeled to reflect IMBA's recommended trail distribution by user class (beginner, intermediate, and advanced). Thus, a 20/60/20 spread designates 20 percent of system trails for advanced riders, 60 percent for intermediate riders and 20 percent for beginning riders. Development of the system would occur over several decades as the partnership attracts funding and investments, other partners, and can sustain maintenance responsibilities. Systems would be constructed in order of priority listed in **Section 8.3** or as directed by the USFS.

IMBA's formula provides for the best return on investment and use.

20/60/20 Trail Rating Distribution
20%: Advanced riders
60%: Intermediate riders
20%: Beginner riders

Sustainable Trail Design

Sustainable trail design allows for a high-quality recreational experience for trail users and protects the natural beauty and environmental integrity of the region. These trails are designed and maintained to have minimal undesirable impact on the environment; resist erosion through proper design, construction, and maintenance; and blend with the surrounding area. Sustainable trails appeal to and serve a variety of users. Further, the ZMTP philosophy encourages trail alignment to avoid heading users toward or near any historic or cultural site.

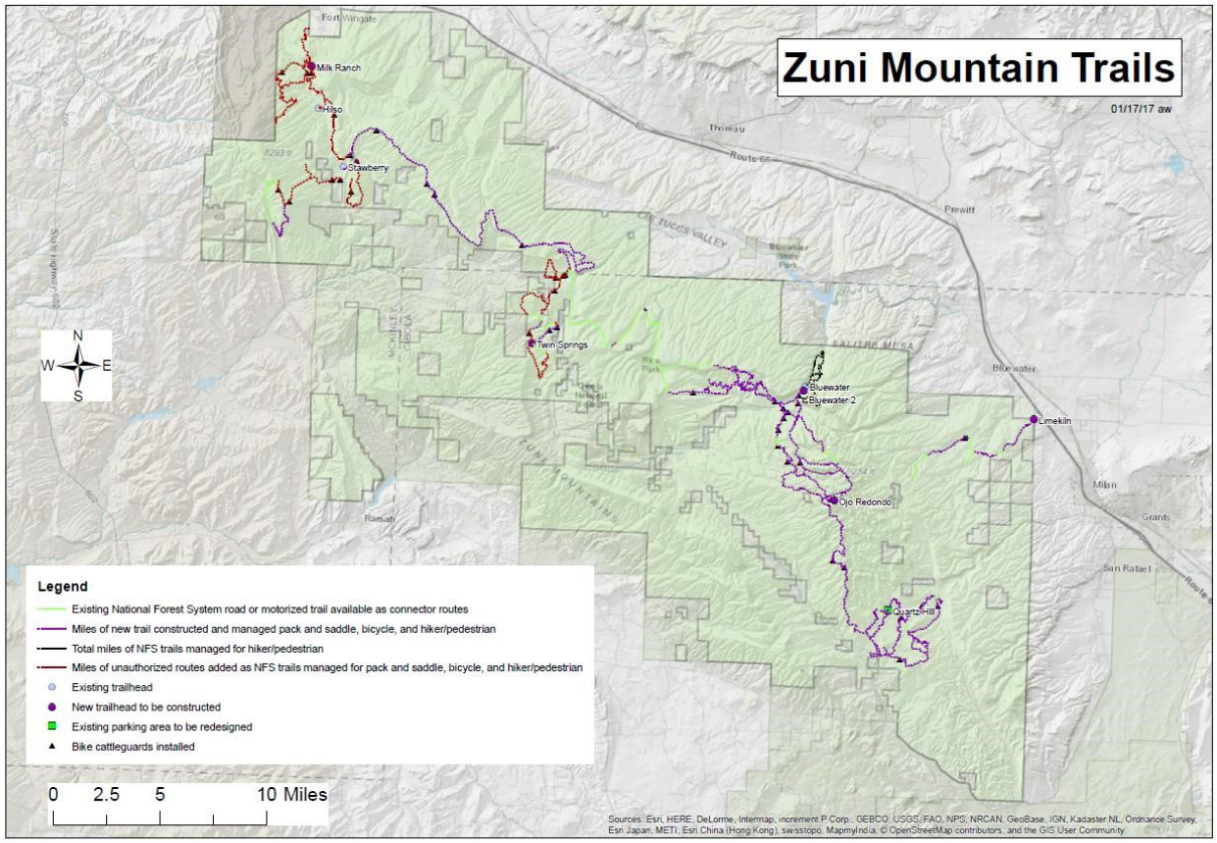


Figure 6-1: ZUNI MOUNTAIN TRAIL SYSTEM BREAKDOWN OF CONSTRUCTION TYPES

Multi-use Trail System, Non-motorized Users

This Plan recommends that the Zuni Mountain Trail System be a non-motorized system, designed and constructed to follow guidelines in USFS Trail Class 3. The designed use is Pack & Saddle because “pack and saddle use generally has the most limiting design requirements” (Trail Fundamentals, 2008). Managed uses include: Bicycling, Hiker/Pedestrian, and Pack & Saddle; non-motorized over snow uses such as crosscountry skiing and snowshoeing are also allowed as conditions permit.The only major exception for this determination would be Bluewater Creek and other sensitive areas that are recommended for hiker/pedestrian only in terms of both designed and managed use. Any other deviations to the ZMTP recommendations will be decided and controlled by the US Forest Service and communicated to all users during design phase as each section and each segment as scheduled for development.

Trail Improvements

This section provides an overview of the trail section improvements compiled by the ZMTP. All improvements will need to be analyzed in accordance National Environmental Policy Act (NEPA) and be part of the Decision Notice/Finding of No Significant Impacts by US Forest Service. Since the Environmental Assessment, specialists' reports, and decision notice were not finalized at the time of this Master Plan, it is recommended that the ZMTP further breakdown and map all trail improvements by segment. This chart shown below will provide a much more detailed segment by segment description, actual designed on-the-ground improvements, and more exact costs for each segment within the overall Trail Sections.

Existing Trails

This Plan will add existing system trails at Strawberry Canyon and Hilso areas to the overall Zuni Mountains Trail System. This will provide 28 miles of system trail managed for multiple non-motorized uses.

Unauthorized, User-created Trails

This Plan recommends adding existing, user-created routes ("unauthorized trails") to the system as USFS Trail Class 3 non-motorized trails. While some of these user-created trails are located in the right place, most are in need of re-routes, grade reversals, and drainage structures to become sustainable trails. The mileages of trails to be converted are shown in Table 6-2. Since the proposed action on the Trail System has not occurred these numbers are our best estimate based on initial planning, mapping, and

TABLE 6-2: Proposed Upgrade of New, Connector, and Unauthorized

Trail Section	Total Miles	New Trails	Connector Trails**	Unauthorized Trails
Quartz Hill	40.0	39.0	0.7	0.0
Bluewater	45.5	*35.0	10.5	0.0
McGaffey	16.0	6.0	3.1	7.0
Milk Ranch	20.0	1.0	0.0	19.0
Ojo Redondo	43.5	42.0	1.4	0.0
Twin Springs	29.5	14.0	8.3	7.0
Limekiln	19.5	16.0	3.4	0.0
Total (Rounded)	214.0	153.0	27.4	33.0

NOTES: * - 8 miles are designated hiking only;
**Connector Trails are existing and will not be improved as part of this Project

New System Trails

This Plan proposes approximately 153 miles of new trails as identified in Table 6-2. Once the proposed action is determined, these trail sections will need to be thoroughly broken down by segment, mapped, and evaluated as to what trail class, uses, and design parameters are appropriate at each segment.

Connector Trails

This plan took advantage of existing National Forest System road and motorized trail as connector routes between trail loops in the system. These routes reduce maintenance and operation costs and provide logical connections where motorized use is infrequent or minimal. This Plan proposes approximately 28 miles of connector trails.

Reclaimed Two-Track Roads

The other concept brought up by the US Forest Service was to convert roads that have been identified as unwarranted through the Travel Management Plan to non-motorized trails. This concept was not analyzed as part of the Environmental Assessment for this project.

Trail and Road Rehabilitation Standards

User created trails and unneeded national forest system roads would be rehabilitated to Forest Service standards, such as those described in Forest Service Manual 7700 and Forest Service Handbook 2309.18. Rehabilitation would include but not be limited to lopping and scattering trees cut on site, ripping, recontouring and reseeding, placing boulders or other physical barriers, fencing.

Terrain Features

The Zuni Mountains Trail System sees and expects a great deal of mountain bike use. Hiking and equestrian use is also expected to increase. Every year banked turns and jump features appear on the trail system. This indicates an interest in freestyle mountain biking. While the character of Zuni Mountains may not support a freestyle bike park, there is a need for some further discussion and this desire could be revisited outside the current NEPA process.

One of the missing features required for an IMBA Ride Center designation is having a downhill course. Similar to a ski resort, downhill trails provide the user a lift service. Based on input, one concept would be to upgrade several trails on the designated Hilso System, namely Berma and Stuck Truck trails, into gravity and flow trails with raised crossings to create downhill opportunities. Forest Road 481 provides a motorized opportunity to return riders to the top of these gravity trails for repeated use or “runs”. This concept was not analyzed as part of the Environmental Assessment (EA) for this project.

There may also be similar projects emerging for pack & saddle and hiker/pedestrian users, as well as other allowable users. If any of these types of projects or future projects are desirable for the Zuni Mountain trail system, they would need to be analyzed through a separate environmental analysis. Any usercreated trails or features not supported by the signed Decision Notice/Finding of No Significant Impact will be strictly prohibited.

Trailheads

This Plan recommends that a total of six (5 new ones and 1 redesigned) trailheads are needed throughout the Zuni Mountain Trail System initially. Each of these trailheads will accommodate approximately 50 people, including 10 passenger vehicles and 3 vehicles towing a trailer with associated maneuvering space to unload trailers. Trailhead design and actual locations will be finalized by USFS as funding becomes available. New trailheads, as defined in Chapter 5: Design Guidelines, may include small- and large- vehicular, pass-through trailer, and bicycle parking, bathrooms, fencing, a kiosk, signage, and interpretative and wayfinding bulletins.

Three trailheads exist in the Project Area including Hilso and Strawberry Canyon that are incorporated into the project in terms of ongoing maintenance. There is a trailhead at Ramah Trailhead that is operated by McKinley County but is seen to serve a stand-alone trail system not incorporated into the project area. This Plan proposes construction of six (6) trailheads, as part of the Zuni Mountains Trail System proposal, as listed in Table 6-3 based on the trailhead design standards shown in Section 5.1.

TABLE 6-3: Proposed Trailheads

#	Trail Section	Trailhead
1	Quartz Hill	Redesigned Trailhead for larger vehicles
2	Milk Ranch	New Trailhead Planned
3	Bluewater	New Trailhead Planned
4	Twin Springs	New Trailhead Planned
5	Ojo Redondo	New Trailhead Planned
6	Limekiln	New Trailhead Planned
	Strawberry Canyon	Existing USFS trailhead
	Hilso Trailhead	Existing USFS trailhead

Additional trailheads have been discussed that would provide community access to the Trail System; they are adjacent to, but not on Federal lands, they include Pinehaven Fire Station, Continental Divide, and Bluewater Lake State Park. These were not part of the EA nor are they being recommended.

Good access to a trail system is a key element for its success. Trailheads serve trail users by car, trailers, transit, bicycle or other modes. Trailheads provide essential access to the trail system and may include amenities such as off-street parking for vehicles, bike parking, a kiosk, signage, and interpretative and wayfinding bulletins. A user information area should be provided for any informational signs or other supporting facilities, backed with native vegetation, rocks and fencing if necessary.

New trailheads provided to service the Zuni Mountain Trail system will accommodate large vehicles and vehicles in tow, such as trailers for horses and bicycles, and are based on a conceptual design from Bernalillo County. Amenities provided at new trailheads may include vault toilets, bulletin boards/information kiosks, designated parking, barriers to control vehicular access, and trash receptacles. The existing Hilso and Ramah (McKinley County operated) trailheads, which do not accommodate larger or towed vehicles, are illustrated on next page. Two other USFS trailheads exist within the proposed project area are the Strawberry Canyon and McGaffey Lake Trailheads, which are noted in this Plan for maintenance cost purposes only.

Kiosks

Kiosks provide visitors with information to orient themselves, learn of site opportunities, rules and regulations, hours of operation, and local events such as volunteer activities for the Reserve trail system. Kiosk design and style should coordinate with the character and branding developed for the overall sign system. The kiosk should be readily identifiable as an information source and provide elements such as bulletin boards, regional maps, rules and regulations and accessibility advisories.

Information kiosks are recommended at all trailheads. These signs can provide the universe of information including a trail map, distances to destinations, trail conditions, connection with area amenities, and regulatory and safety information (trail rules, etc.). Trail kiosks should display the trailhead name to allow users to better identify their location within the trail system. The kiosk will be made to USFS standard.

Restrooms

Double Vault toilets are permanent structures located at Hilso Trailhead and McGaffey Lake area. Portable toilets may also be brought in temporarily for special events. Vault toilets are non-flush toilets that comes with a sealed container buried underground to receive the excreta. These toilets are over decades old and are a perfect choice for parks and other recreational areas that require waterless toilets. The building has a vent system that allows fresh air to flow in and out of the vent and vault pipe. Portable toilets may also be brought in temporarily for special events.

Trail System Infrastructure

The ZMTP has worked closely with US Forest Service staff to develop trails, trailheads, and other improvements per USFS standards or are referenced from other Federal parks and amenities. Refer to Appendixes SOW sections Quartzhill..

Fence and Cattleguards

These barriers will remain in compliance with the June 2006 guidance, entitled “Vehicle Barriers: Their Use and Planning Considerations” as developed by USDA Forest Service San Dimas Technology and Development Center, and be specified as needed by USFS throughout the project.

Signage

Signage recommendations include kiosks with trail maps, directional/intersection signs, trail identification markers, and interpretive signs, as defined in Section 3.5: Signage and Infrastructure Improvements. Wayfinding could include a set of color-coded trails and information related to trail design and conditions. The partnership would create a sign plan which lists sign locations throughout the system. Reassurance markers such small rock cairns could be used only at places where the trail is not obvious. Trailhead Kiosks with informational signs such as share trails information/allowed uses, pack/in pack out, Leave No Trace ethics, Stay on Trails, and a local system map will be built. Interpretive signs enhance the trail or path experience by providing information about the area’s history and culture. Signs may feature local ecology, people, environmental issues and other educational information. Trail Intersection Signs and Trail/Motorized Route Intersection Signs are also needed.

Trail Maps

This Plan recommends that two types of maps be developed for the Zuni Mountains Trail.

- Section Maps: the first map is developed as each section of trail is completed; and
- System Map Guides: the second is a comprehensive guide completed similar to the guide that USFS is developing for the Zuni Mountains Motorized System.

Currently, members are marketing and providing online maps for approved trails in the System. Adventure Gallup & Beyond developed and distributed a nice mapguide. The Hilso/McGaffey Trail System panel is shown below. A similar map could be developed for each trailhead and trail system, as it is developed. USFS and ZMTP could provide this at various shops, hotels, and visitors center. In recent years, local partners have produced these as tear-off maps that are hugely successful.

The following additional information is recommended for inclusion on the map:

- Trail distances and design parameters. This would help users understand the length and if the trail was appropriate for their needs and skill level.
- Trail and trailhead names.
- Trail rules.
-

The USFS and ZMTP should invest in developing and marketing a guide that could be sold in hard copy or online. Users of the online guide could program trails and tracks into GPS system to guide their ride or hike on a mobile device. Profits above breakeven costs should be used for expenses related to maintenance or annual trail events.

Trail Counters

ZMTP is looking at installing both infrared and bike counters near trailheads to get a sense of use and types to assist with maintenance and economic impact reporting. The system shown here is TRAFx G3.

Cibola County and McKinley County
Key Sources

Interested organizations and citizens can join the partnership at any time, especially as the Project moves into implementation. The partnership has a history of seeking out and welcoming new members. Leadership roles have come about as key individuals in both Cibola and McKinley counties have stepped forward and volunteered to take the lead and be the contact in their prospective regions. Each partner brings passion, commitment, knowledge, expertise, coordination, resources, and in-kind donations to the entire process. Meetings occur on a regular basis and as deemed necessary by the members of the partnership. Dialogue and information sharing regularly occurs between the partnership and key entities such as the Health Councils, Chambers of Commerce, Economic Development organizations (EDOs), etc. as coordination among key stakeholders is viewed as critical. ZMTP members are leaders in local communities and continuously participate in the dialogue for community betterment.

In the conducting its business, the partnership will remember the following 10 guidelines for great civic organizations.

1. Write Specific Memoranda of Agreement.
2. Have a clear understanding of the role, rules, and the responsibilities of all the parties to an on-going partnership. Develop specific, concrete action agreements in writing.
3. Start Simple and build on the mutual successes.
4. Have Patience and understand land management decisions and processes take lots of time.
5. Respect Each Other's Viewpoints. Trail users often have diverse goals ranging from wanting smooth trails to technical challenges or solitude. Land managers often are challenged by political, regulatory and resource constraints. Understand and appreciate each partner's positions.
6. Be Civil. It's OK to disagree. Good partnerships stipulate how disagreements are handled and under what conditions an agreement can be terminated.
7. Maintain On-going Communication. Partnerships often require a great deal of meeting and negotiation as the partners formulate and maintain their agreement. Strive to have the agreement transcend the particular individuals who created it!
8. Adapt to Change. Include mechanisms for identifying changing needs and goals and adapting to them.
9. Upgrade Knowledge & Skills. Trail organizations have to meet the expectations set forth by land management professionals including clear communication, accountability, training and time management. Likewise, land management professionals should become familiar with trends in trail-based recreation and design.
10. Keep Your Eyes on the Prize. Always focus on the goal/vision. This will allow partners to move past rough patches or project setbacks.
11. Think Locally. Local knowledge is the key to solving local problems.

Managing Mountain Biking, IMBA's Guide to Providing Great Riding (2007)

Trail Operation and Maintenance

Recommendations in this section are focused on increasing and standardizing volunteer participation in upkeeping the system. These recommendations would assist in decreasing construction and maintenance costs, as well as, increasing outreach, engagement, and education. While the ZMTP recognizes that volunteers are an important element to the sustainability of this project, these efforts are not factored into the overall construction and maintenance cost of the project. The YCC programs are still the workforce for trail management short-term. All work on USFS lands will need to be evaluated and approved by the District Ranger through a task order process. An example of a task order that is issued by McKinley County to YCC with USFS consent and approval can be found in Appendix F: Task Order Example.

Trail Manager

While at this time, there is neither work enough nor budget enough, but one consideration would be to create a Trail Manager position. The Trail Manager would be responsible to manage the Zuni Mountains Trail System and act as liaison to user groups. The ZMTP should consider revisiting this consideration, if and when the project moves towards 50% build-out of the Plan. While funded by the ZMTP and administratively attached to one of the members, this Trail Manager would be in day-to-day contact with the USFS, ZMTP entities, and volunteers. Potential responsibilities could include:

- Coordinate and setup YCC work schedules with the regional YCC programs.
- Coordinate the “Shovelhead” Trail Crew and Trail Ranger program.
- Serve as a liaison between the USFS and ZMTP entities in the planning, acquisition, development, and maintenance of the summer trail system.
- Act as the liaison between the users, race promoters, and tour businesses, keeping them informed about the need for special use authorizations, work activities and trail closures, as reported by USFS and ZMTP.
- As requested by landowners, work on potential easements or alignments to be incorporated into the trail system. The Trail Manager would communicate with the membership and neighbors to ensure there is appropriate dialog with all parties.
- As requested by adjacent communities, coordinate with them and the US Forest Service staff to plan future trail connections.
- Plan training activities which bring together volunteers who wish to help maintain the trail system. These meetings should be held at least annually.
- Coordinate and facilitate volunteer trail work days and keep a record of the number of volunteers and number of volunteer hours.
- Coordinate updates to the USFS and ZMTP websites concerning volunteer days and other trail activity days, including the project website.
- Keep track of ZMTP member recommendations regarding trail construction and maintenance needs and trail-related activities.
- Outreach to local businesses and entrepreneurs on market opportunities, tourism and trail information, and potential sponsorships.
- Manage maintenance trail logs, trail counters and data, economic impact statistics and reporting, and grantwriting functions.
- Create an annual summary of the year’s maintenance, promotional, and other trail-oriented activities to share with the USFS and ZTMP entities.

In the interim, these duties will need to be distributed to ZMTP members and day-to-day management of the trails and facilities will need to be defined in a “gatekeeper” contract between the counties and with one of the appropriate ZMTP entities. Similar agreements exist on High Desert Trail System in Gallup between McKinley County and Adventure Gallup & Beyond, and one is being developed for the Ramah Mormon Pioneer Trail System.

Memorandum of Understanding ~ Non-motorized Trail System
ZMTP SHALL:

A. Plan a non-motorized recreation trail system and coordinate the NEPA compliance for the trail system with the US Forest Service.
B. Work with the US Forest Service to identify appropriate partnership and funding opportunities, and jointly pursue such projects in conjunction with the local communities and the US Forest Service.
C. Provide technical assistance to land managers and communities involved with planning, trail projects, education activities, and non-motorized recreation activities.
D. Identify training opportunities and work with the US Forest Service to conduct trail-building schools, Trail Care Crews, Rules of the Trail, Leave No Trace, Tread Lightly ethics, and the National Mountains Bike Patrol programs.
E. Obtain US Forest Service approval prior to implementation of any construction, maintenance, educational or publication or distribution of any printed materials regarding non-motorized recreation uses on National Forest System lands.
F. Review this agreement with the US Forest Service annually and modify as necessary.
G. US Forest Service shall:
H. Work with ZMTP to identify non-motorized opportunities (trail projects, education, and assistance) and jointly pursue such projects with Cibola and McKinley County communities.
I. Make National Forest System lands available for non-motorized recreation activities, subject to applicable Federal laws, regulations, policy, Forest Plan and other management direction.
J. Include and utilize ZMTP technical expertise in developing US Forest Service programs as they relate to non-motorized recreation trail construction and maintenance.
K. Provide to the public the appropriate rules and regulations pertaining to non-motorized recreation trail construction and maintenance.
L. Coordinate all maintenance and construction activities providing the proper specifications and clearances.
M. Review and concur with all publication or printed materials published by parties covered under this agreement intended for public distribution regarding non-motorized recreation on National Forest System lands.
N. Coordinate and approve any special use or administrative activities within designated nonmotorized trail corridors prior to the date of activity.
O. Review this agreement with ZMTP and modify as necessary.

The ZMTP members have agreed to and are actively meeting the expectations outlined in this MOU. The capacity and resources that are brought to bear to accomplish and sustain this commitment.

Capacity and Resources

The Zuni Mountain Trail Partnership is made of several entities and organizations that can provide turnkey trail management, design, financing, construction, and maintenance services.

Cibola and McKinley Counties have an excellent track record of setting goals, acquiring grant and local funding, implementing actions, achieving results, and maintaining quality. Both have the capacity and capability to pull together workforce and volunteers leveraging multi-streams of funding to advance and maintain projects. If USFS approves a Decision Notice/Finding of No Significant Impact, the partnership will develop an Operation, Maintenance, and Replacement Plan (O&MR Plan) and ZMTP maintenance agreement for the Zuni Mountain Trail System. The OM&R Plan will identify and assign resources, prioritize maintenance needs, and outline an USFS-approval protocol for the trail maintenance. The maintenance agreement would commit entities to maintain the trail system with an understanding of minimal direct assistance from Forest Service.

Youth Conservation Corp

The United States Youth Conservation Corps (YCC) is a summer youth employment program that engages young people in meaningful work experiences on national parks, forests, wildlife refuges, and fish hatcheries while developing an ethic of environmental stewardship and civic responsibility. YCC programs are generally 8 to 10 weeks and members are paid the minimum wage for a 40-hour work week. Corps members may build trails, improve wildfire resiliency, control erosion, create and install public art, improve senior and community centers, beautify natural areas and public parks, preserve cultural resources or map natural resources.

Cibola and McKinley counties continues to benefit from YCC members who work in a healthful outdoor setting on a variety of projects including building trails, maintaining fences, cleaning up campgrounds, improving wildlife habitat, environmental education planning and teaching, stream restoration, historic building preservation, and more. New Mexico will benefit by having its natural and urban environments improved and enhanced and its youth instilled with an appropriation of natural resources, cooperation, hard work and accomplishment. The YCC provides a process to employ young persons in public projects that conserve New Mexico's natural resources and provide community benefits of lasting value while developing job skills, work ethics, and how to get along with others.

Both counties have active YCC programs with experienced crew, supervisors, and managers. In 2013 alone, the City of Gallup, the Boys & Girls Club, Future Foundations Family Center, and YCC were granted about $160,000, which employed 43 youth workers.

Gallup YCC

The Gallup YCC program track record is showcased below including satisfied clients/funding partners, including the USFS, National Parks Service, and Navajo Nation. The High Desert Trail System that was improved and is maintained by this crew received designation as a National Recreational Trail by the Department of the Interior. The partnership plans to employ 70 area seasonal, youth workers to develop and maintain the Zuni Mountains Trail System and conservation related activities in the project area.

Average YCC per year

Gallup YCC Workforce = 60
Grants YCC Workforce = 12
Other Area Programs = 30

It is estimated that 112 area seasonal, youth workers will be available to develop and maintain Zuni Mountains Trail System, conservation, and improvement projects.

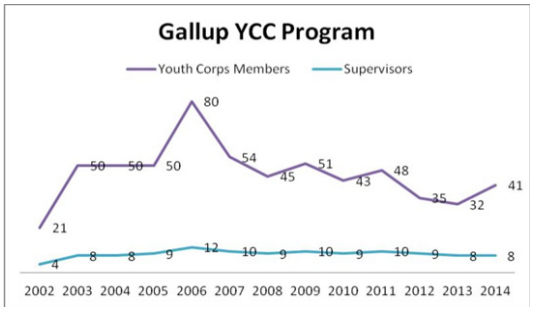
Leadership of other regional Youth Conservation Corps in Tohacthi, Acoma, and Zuni are collaborating to bring additional corps members (and their shared skills, resources, and budgets) to this Project. This collaboration promises to expand the trailbuilding and conservation workforce in the region.

The Gallup YCC program track record is showcased below including satisfied clients/funding partners:

Year	YCC Grant	Matching Funds	Youth Corp Members	Supervisors
2014	$200,000	$200,000	41	8
2013	$104,381	$149,342	32	8
2012	$150,000	$150,000	35	9
2011	$150,000	$150,000	48	10
2010	$150,000	$150,000	43	9
2009	$150,000	$150,000	51	10
2008	$150,000	$150,000	45	9
2007	$200,000	$200,000	54	10
2006	$200,000	$200,000	80	12
2005	$200,000	$200,000	50	9
2004	$200,000	$200,000	50	8
2003	$180,000	$180,000	50	8
2002	$85,000	$85,000	21	4
TOTAL	$2,119,381	$2,164,342	600	114

Partners & Clients

- City of Gallup
- McKinley County
- Apache Sitgreaves National Forest
- Nature Conservancy
- National Park Service
- El Malpais NCA
- Quivira Coalition
- BLM
- USFS: Mt. Taylor Ranger District
- National Resource Conservation Service
- Ramah Land & Irrigation
- Gamerco, LLC.
- McKinley Soil & Water Conservation District
- Gallup-McKinley County Schools
- Navajo Nation EPA



Gallup YCC: over 95% of YCC Grant funding was expended in Youth Wages,

Adventure Gallup & Beyond

Since 2002, Adventure Gallup and Beyond (AGB) has advocated and provided the structure to develop adventure tourism as a regional economic driver. AGB provides "gatekeeper" services for many of the trails and venues in McKinley County, including High Desert Trail System and Ramah Mormon Pioneer Trail System. www.adventuregallup.org

Gatekeeper services are basically the operation, management, and maintenance services that USFS needs from the ZMTP. AGB has a web-based trail concern system to report issues and provide real time results - http://www.ad-

Gallup Trails

Gallup Trails (GT) is a membership-based non-profit organization that believes that accessible trails improve the quality of life for all citizens of Gallup and McKinley County. Launched in 2002, Gallup Trails has grown to over 100 local members and about 725 followers on Facebook. GT has a dedicated board of local trail enthusiasts and users. www.galluptrails.com

In 2009, Gallup Trails received the "Jessica R. Terrell" award from the NM State Parks for their leadership in the development of the High Desert Trail System, which is a National Recreation Trail. GT and its membership provide hundreds of hours per year in trail development, maintenance, planning, awareness, and trail and trailhead cleanups. GT's "Shovelman Crew" work alongside YCC workers in coordinated trail work days. GT also held trail and trailhead cleanup days in 2013, and provided weekly work days to get Gallup's new bike park opened. GT provides a necessary workforce of volunteers that are ready for an expanded Zuni Mountain Trail System and will answer the call to arms to deliver the necessary sweat equity needed to maintain trails.

Cottonwood Gulch Expeditions

Cottonwood Gulch Expeditions sponsors educational wilderness expeditions and outdoor programs in the American Southwest. Cottonwood Gulch has built strong relationships throughout the Four Corners and treats this as our community. Cottonwood Gulch places a high value on contributing work to make it better. Youth participating in their programs often work with the BLM, USFS, or Park Service to improve trails and campsites.

Since 2013 Cottonwood Gulch provides workers for the 24-Hour Mountain Bike National Championship race. Cottonwood Gulch works closely with schools in McKinley and Cibola counties, bringing kids to trails in the Zunis. Cottonwood Gulch's base camp is at the foot of the Zuni Mountains, and workers have experience with riparian restoration projects making them a great partner.

Other Volunteer Organizations

Backcountry Horseman of American and Zuni Chapter
New Mexico Volunteers for the Outdoors
Cycle Cibola
McKinley County Search & Rescue
Boy and Girl Scouts
Tohatchi Youth Build
Americorps*VISTA
National Civilian Community Corp (NCCC)
Zuni Youth Empowerment Project
Boys & Girls Clubs
Plateau Sciences Society
Cibola County Historical Society
McKinley Citizens Recycling Council
Recycle Cibola
Comcast Cares Day
CARE 66 Handymen
American Hiking Society Volunteer Vacations
Student Conservation Association
Civic Groups: Kiwanis, Rotary, Lions Club, etc.
Chambers of Commerce membership

Annual Trails Education Day

ZMTP could establish an annual trails education day providing lessons on open space subjects aimed at school aged children. The annual trails education day could include a short, guided hike, or utilizing Bike Mobile for a short trail rides, USFS talks, and a trail safety and courtesy workshop. The goal would be to instill a sense of stewardship at an early age. This could be a recruitment opportunity for the regional YCC programs.

Annual Trail Builders' Work Day

Similarly, ZMTP could partner with the IMBA Trail Care Crew, BCHA, and other partners to establish an annual trail builders' day providing best practices and techniques in terms of trail building and maintenance. The annual trail builders' day could include a section of trail or an actual project to make the event as experiential and productive as possible. The goal would be to educate locals and hopefully get them to sign up for other work days and volunteer programs.

'Shovelhead' Trail Work Days

Expanding on Gallup Trails program, which provides opportunities for volunteers to perform public service and gain a sense of accomplishment by maintaining the Zuni Mountain trails. These work days would help with to defer maintenance costs. Once a month, these work days could be arranged on smaller projects to differentiate them from the Annual Trailbuilders' Day.

Volunteer Trail Ranger Program

ZMTP could encourage clubs to establish a trail ranger program. The use of trained patrols of volunteer hikers, mountain bikers, and equestrian can provide opportunities for member involvement in trail management; and to enhance the safety and enjoyment of trail system users. A good example is the Equestrian Volunteer Program under the Forest Service Volunteer Association.

The volunteer trail rangers could perform the following activities:

- Inform users of trail rules verbally and/or through distributing written trail rules
- Observe and report trail maintenance needs, physical hazards on trails, or potentially hazardous behavior by trail users
- Assist trail users who require first aid or other forms of help
- Pick-up trash on trails and refresh kiosks with maps

Adopt-a-Trail Program

An adopt-a-trail program could encourage member participation in the on-going maintenance, realignment, and build-out of trails and related improvements through the "adoption" of specific trails, trailhead, or portions thereof, by an individual or group. Volunteer activities along adopted trails could include:

- Routine maintenance such as removing rocks, brush, tall grasses and litter.
- Work projects involving tasks that cannot be completed through routine maintenance. These tasks would be identified by the adopter or the USFS and ultimately approved by the USFS. Activities could include tread and drainage maintenance, non-native plant removal alongside trails, revegetation of non-system trails, and staining kiosks, sign posts or other furnishings.
- Supervised build-out of new system trails requiring no use of power tools.
- Financing a particular project or trail maintenance need would be welcome. Financing could take the form of contribution of materials, fundraising events, matching funds, and/or direct donations to the ZMTP.

Trail Patrol Program

To help ensure that the project can be completed and maintained, programs such as IMBA's National Mountain Bike Patrol Program could be implemented. Patrol volunteers could perform the following activities:

- Assist in medical and mechanical emergencies and educate trail users of proper etiquette.
- Inform land managers, land owners and trail users of trail conditions through monitoring efforts.
- Work with land managers to maintain and/or gain trail access for mountain bikers.
- Offer volunteer services at outdoor races and events.
- Collaborate with local clubs on trail work days, clinics, group rides and Take a Kid Mountain Biking Day events (IMBA).

Establishing a Zuni Mountains area chapter of this organization in partnership with a local trail clubs will be the first step to address some of the identified concerns, such as:

- Engaging the smaller communities of the area in the project,
- Gathering information to establish capacity baselines,
- Documenting what is working and lessons learned on the trail,
- Working to establish good relations with other recreation user groups, forest products gathers, area hunters and private land owners,
- Bring new partner members up to speed,
- Identify clear benchmarks for celebrating successes such as establishing a trail system with proper construction, maintenance and management, opening new trailheads and holding community events,
- Keep partners and the public engaged in the process,
- Identify erosional issues which threaten listed species upon development before becoming problematic.

Patrol volunteers could also assist in the designation of emergency evacuation routes and establishing a sign plan with mileage markers with information that could be relayed to emergency personnel.

Awareness Events & Partnerships

Events such as the Kids Quad held in unison with the Mt. Taylor Winter Quadrathalon are great venues to build interest and leadership in future generations and to build a strong local trails constituency. Similarly, events, such as 24 Hours in the Enchanted Forest, have non-competitive or family oriented trails activities which occur during the main event and promote trail stewardship for future generations. The partnership will continue to seek opportunities to build a strong local trails constituency especially in the larger communities of Ramah, Grants, Milan and Gallup; and continue to interact with community leaders and elected officials to perpetuate momentum and enthusiasm. The partnership will continue its outreach to native communities through organizations such as National Indian Youth Leadership Project.

Design Guidelines

The design guidelines that are utilized by USFS Trail Construction and Maintenance Notebook, the draft National Strategy for a Sustainable Trail System initiative, and best practices offered by the International Mountain Biking Association (IMBA). The ZMTP partnership of Cibola and McKinley counties, set out to develop a multi-use, non-motorized trail system.The focus was on building a system that would be highly attractive to the local and visiting mountain biking users; offering hundreds of miles of connected and looped singletrack.

Equestrian

In 2016, equestrian partners helped return this project back to its original focus of providing nonmotorized trail opportunities to a diversity of user groups. The Backcountry Horsemen (BCH) of New Mexico, Zuni Mountains Chapter did reconnaissance trips to all of the proposed trail sections and provided a scoping report. The scoping report revealed that several segments of trail in their current condition would not be suitable for pack & saddle. The ZMTP revised this Master Plan to assume that all trail segments will have a Pack & Saddle designed use has the most limiting design requirements. (USFS, Trail Fundamentals, 2008). Equestrians partners encourage responsible use of USFS lands by visitors participating in equestrian and recreational stock travel and activities. bchnm.org

IMBA

ZMTP members advocated for IMBA trail design, construction, maintenance, and use guidance be incorporated, where applicable, into the Zuni Mountain Trail System, especially the percentage of trails suited for the needs of the beginning, intermediate and advanced users. To pull in these best practices into USFS requirements for sustainable trail design, construction and maintenance that provide important benefits to visitors and communities, protect natural, cultural and social resources, minimize annual and deferred maintenance needs.

Building principles:

- Trails will be designed with contours so that the tread won't be eroded away by water and use.
- Trails that will not affect water quality or the natural ecosystem.
- Trails that meet the needs and expectations of the intended users.
- Trails that do not harm the natural environment.

USFS, IMBA and BCH objectives are for enjoyable riding experiences, within design standards for pack and saddle. Standards are summarized in 5-2.

ZMTP partners are encouraged to utilize recent publications;

- IMBA's Guide to Building Sweet Singletrack: Trail Solutions
- Managing Mountain Biking; IMBA's Guide to Providing Great Riding
- USFS Trail Construction and Maintenance Notebook

TABLE 5-2: 11 Essential Elements of Sustainable Trails

1. Trail Location: Sidehill trails are best
2. Outslope: ensures good sheet flow
3. Sustainable trail alignment: avoid the fall line
4. Adapt trail design to soil conditions
5. Half Rule: guides trail alignment
6. Minimize user caused soil displacement
7. Sustainable Grade: Follow the ten percent average guideline
8. Prevent user-created trails
9. Maximum sustainable grade
10. Maintenance
11. Grade Reversals: Gets water off the trail

Managing Mountain Biking; IMBA's Guide to Providing Great Riding

ZMTP Determination

The ZMTP partners has provided in addition to the USFS Trail Fundamentals are incorporating local conditions, topography, and user group needs. The only major exception for this determination would be Bluewater Creek and other sensitive areas that are hiker/pedestrian only in terms of both managed and designed use. Any other deviations to the ZMTP partners determinations below will be authorized and controlled by the US Forest Service and communicated to all users during design phase as each section and each segment are scheduled for development.

USFS Trail Concept Forest Service Handbook	USFS Definition	ZMTP Determination
Trail Type (FSH) 2309.18, Section 14.1)	Is a category that reflects the predominant trail surface and general mode of travel accommodated by a trail.	Standard/Terra Trail: A trail that has a surface consisting predominantly of the ground and that is designed and managed to accommodate use on that surface.
Trail Class (FSH 2309.18, Section 14.2)	Is the prescribed scale of development for a trail, representing its intended design and management standards	Trail Class 3: Developed Class 2 & Class 4 may be included
Managed Use (FSH 2309.18, Section 14.3)	Is a mode of travel that is actively managed and appropriate on a trail, based on its design and management. There can be more than one.	Managed Uses: Bicycle, Hiker/Pedestrian, and Pack & Saddle Allowable Uses: All non-motorized uses including Winter Seasonal uses (cross-country skiing, snowshoeing, etc.)
Designed Use (FSH 2309.18, Section 14.4)	Is the single Managed Use of a trail that requires the most demanding design, construction, and maintenance parameters and that, in conjunction with the applicable Trail Class, determines which Design Parameters will apply to a trail. There is only one Designed Use per trail or trail segment.	Designed Use: Pack & Saddle
Design Parameters (FSH 2309.18, Section 14.5)	Are technical guidelines for the survey, design, construction, maintenance, and assessment of a trail, based on its Designed Use and Trail Class.	Detailed further in Table 5-3

USFS Trail Standards

This Zuni Mountain Trails and Conservation Master Plan recommends USFS Class 3 trail class, although there may be trail sections and segments that are built to an appropriate and sustainable design to accommodate safety, trail sustainability, and trail connectivity.

The Standard Trail Plans and Specifications reflect current Forest Service trail management efforts for constructed features and tasks, developed in conjunction with the agency's National Trails Program, with funding and support from the Federal Highway Administration, Recreational Trails Program. The USDA Forest Service Standard Trail Plans and Specifications are for the design, construction, and maintenance of National Forest System trails and trail bridges. These plans and specifications also are available for other Federal, State, and local agencies, communities, trail partners, volunteers, and entities.

The Mount Taylor Ranger District, Cibola National Forest and National Grasslands, US Forest Service, US Department of Agriculture provides different opportunities for visitors; bicycling, hiking, horse riding, camping, hunting, nature viewing, outdoor learning, picnicking, scenic driving, winter sports, off-highway vehicle riding. Each trail is designed specifically for that particular section of trail. See specific trail design standard and guidelines in Appendix #

Class 3 Trail

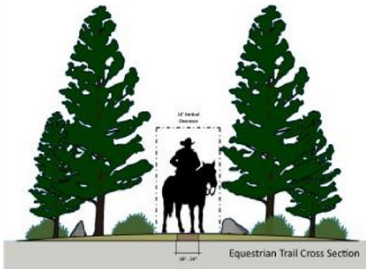
This Zuni Mountain Trails and Conservation Master Plan recommends USFS Class 3 trail class, although there might need to be trail sections and segments that are built to Class 2 and Class 4 design parameters to accommodate safety, sustainable trail development, and trail connectivity.

USFS Class 3 trail class will incorporate the following maintenance best practices, where applicable and USFS approved for sustainable trails:

- **Trail Design Grade:** Grade is the elevation gain between two points divided by the linear distance between them. It is expressed as a percentage.The "Half Rule" is a general guide for trail grading such that a trail should not exceed half the grade of the hillside it traverses. The recommended average grade for recreational trails is between 5 and 10 percent. Trails with greater difficulty can reach grades of up to 15 percent with sufficient armoring and reinforcement. Trails over 15 percent are not recommended.
- **Cross Slope:** Outsloping is a common practice used to increase drainage off trails whereby the downhill or outer edge of the trail tread is tilted slightly downwards away from the high side. Recommended cross slope between 3-5 percent with maximum of 8 percent.
- **Clearance Height:** Clearance Height should be adequate to allow trail users to pass underneath trees. The recommended space from trail tread to vegetation should be 10 feet. If more than half of a tree must be pruned for clearance, then it should be removed.
- **Clearance Width:** Along narrow trails, both the US Forest Service and IMBA trail standards recommend vegetation should be cleared 72-96 inches or approximately 3-4 feet either side of the center. On moderate to steep side slopes users traveling along the outer or lower edge of the trail can cause tread failure; therefore vegetation should be cut on the uphill side of the trail to encourage users to stay to the high side.
- **Shoulder Clearance:** Shoulder Clearance should be between 12-18 inches and pack clearance should be 36 by 36 inches.
- **Sustainability of the natural environment:** The natural aesthetic is an important factor in designing and maintaining trails. The trail should "lie lightly on the land", as if it had always been there.
- **Trail builders** must take advantage of features in the landscape for drainage.

Managed uses are Bicycles, Hiker/Pedestrian, and Pack & Saddle while allowing for all other non-motorized uses. These standards would be implemented along with trail mapping and signage to communicate managed and allowed uses. Wider passing spaces would be provided as determined need. ZMTP has chosen to further illustrate Trail Class 3 with USFS Design Parameters for Pack and Saddle Design.

TABLE 5-3: Trail Class 3: Developed Pack & Saddle Design

Photo	Photo 
Cross Section	Cross Section 
Design Tread Width Non-Wilderness (Single Lane)	Range: 18” – 48”
Design Surface	Type: Native, with some onsite borrow or imported material where needed for stabilization and occasional grading; Intermittently rough Protrusions: ≤ 3”; may be common, not continuous Obstacles: (Maximum Height): 6”
Design Grade	Target Grade: 3 – 12% Short Pitch Maximum: 20% Maximum Pitch Density: 5 – 15%
Design Cross Slope	Target Cross Slope: 3 – 5% Maximum Cross Slope: 8%
Design Clearing	Height: 10’ Width: 72” – 96” Shoulder Clearance: 12” – 18” (Pack Clearance: 36” x 36”)
Design Turn	Radius: 5’ – 8’

Allowable Uses: All non-motorized uses including Winter Seasonal uses (cross country skiing, snowshoeing, etc

Managed Uses: Bicycle, Hiker/Pedestrian, and Pack and Saddle

Designed Uses: Pack and Saddle

Trail Class Matrix (FSH 2353, Section 14.2, Exhibit 01)

Trail Classes are general categories reflecting trail development scale, arranged along a continuum. The Trail Class identified for a National Forest System (NFS) trail prescribes its development scale, representing its intended design and management standards.[1] Local deviations from any Trail Class descriptor may be established based on trail-specific conditions, topography, or other factors, provided that the deviations do not undermine the general intent of the applicable Trail Class.

Identify the appropriate Trail Class for each National Forest System trail or trail segment based on the management intent in the applicable land management plan, travel management direction, trail-specific decisions, and other related direction. Apply the Trail Class that most closely matches the management intent for the trail or trail segment, which may or may not reflect the current condition of the trail.

Trail Attributes	Trail Class 1 Minimally Developed	Trail Class 2 Moderately Developed	Trail Class 3 Developed	Trail Class 4 Highly Developed	Trail Class 5 Fully Developed
Tread & Traffic Flow	• Tread intermittent and often indistinct • May require route finding • Single lane with no allowances constructed for passing • Predominantly native materials	• Tread continuous and discernible, but narrow and rough • Single lane with minor allowances constructed for passing • Typically native materials	• Tread continuous and obvious • Single lane, with allowances constructed for passing where required by traffic volumes in areas with no reasonable passing opportunities available • Native or imported materials	• Tread wide and relatively smooth with few irregularities • Single lane, with allowances constructed for passing where required by traffic volumes in areas with no reasonable passing opportunities available • Double lane where traffic volumes are high and passing is frequent • Native or imported materials • May be hardened	• Tread wide, firm, stable, and generally uniform • Single lane, with frequent turnouts where traffic volumes are low to moderate • Double lane where traffic volumes are moderate to high • Commonly hardened with asphalt or other imported material
Obstacles	• Obstacles common, naturally occurring, often substantial and intended to provide increased challenge • Narrow passages; brush, steep grades, rocks and logs present	• Obstacles may be common, substantial, and intended to provide increased challenge • Blockages cleared to define route and protect resources • Vegetation may encroach into trailway	• Obstacles may be common, but not substantial or intended to provide challenge • Vegetation cleared outside of trailway	• Obstacles infrequent and insubstantial • Vegetation cleared outside of trailway	• Obstacles not present • Grades typically < 8%

ZMTP

10/16/2008

Trail Attributes	Trail Class 1 Minimally Developed	Trail Class 2 Moderately Developed	Trail Class 3 Developed	Trail Class 4 Highly Developed	Trail Class 5 Fully Developed
Constructed Features & Trail Elements	• Structures minimal to non-existent • Drainage typically accomplished without structures • Natural fords • Typically no bridges	• Structures of limited size, scale, and quantity; typically constructed of native materials • Structures adequate to protect trail infrastructure and resources • Natural fords • Bridges as needed for resource protection and appropriate access	• Structures may be common and substantial; constructed of imported or native materials • Natural or constructed fords • Bridges as needed for resource protection and appropriate access	• Structures frequent and substantial; typically constructed of imported materials • Constructed or natural fords • Bridges as needed for resource protection and user convenience • Trailside amenities may be present	• Structures frequent or continuous; typically constructed of imported materials • May include bridges, boardwalks, curbs, handrails, trailside amenities, and similar features
Signs[2]	• Route identification signing limited to junctions • Route markers present when trail location is not evident • Regulatory and resource protection signing infrequent • Destination signing, unless required, generally not present • Information and interpretive signing generally not present	• Route identification signing limited to junctions • Route markers present when trail location is not evident • Regulatory and resource protection signing infrequent • Destination signing typically infrequent outside of wilderness; generally not present in wilderness • Information and interpretive signing not common	• Route identification signing at junctions and as needed for user reassurance • Route markers as needed for user reassurance • Regulatory and resource protection signing may be common • Destination signing likely outside of wilderness; generally not present in wilderness • Information and interpretive signs may be present outside of wilderness	• Route identification signing at junctions and as needed for user reassurance • Route markers as needed for user reassurance • Regulatory and resource protection signing common • Destination signing common outside of wilderness; generally not present in wilderness • Information and interpretive signs may be common outside of wilderness • Accessibility information likely displayed at trailhead	• Route identification signing at junctions and for user reassurance • Route markers as needed for user reassurance • Regulatory and resource protection signing common • Destination signing common • Information and interpretive signs common • Accessibility information likely displayed at trailhead
Typical Recreation Environs & Experience[3]	• Natural, unmodified • ROS: Typically Primitive to Roaded Natural • WROS: Typically Primitive to Semi-Primitive	• Natural, essentially unmodified • ROS: Typically Primitive to Roaded Natural • WROS: Typically Primitive to Semi-Primitive	• Natural, primarily unmodified • ROS: Typically Primitive to Roaded Natural • WROS: Typically Semi-Primitive to Transition	• May be modified • ROS: Typically Semi-Primitive to Rural • WROS: Typically Portal or Transition	• May be highly modified • Commonly associated with visitor centers or high-use recreation sites • ROS: Typically Roaded Natural to Urban • Generally not present in wilderness

ZMTP

[1] For National Quality Standards for Trails, Potential Appropriateness of Trail Classes for Managed Uses, Design Parameters, and other related guidance, refer to FSM 2353, FSH 2309.18, and other applicable agency references.

[2] For standards and guidelines for the use of signs and posters along trails, refer to the Sign and Poster Guidelines for the Forest Service (EM-7100-15).

[3] The Trail Class Matrix shows the combinations of Trail Class and Recreation Opportunity Spectrum (ROS) or Wilderness Recreation Opportunity Spectrum (WROS) settings that commonly occur, although trails in all Trail Classes may and do occur in all settings. For guidance on the application of the ROS and WROS, refer to FSM 2310 and 2353 and FSH 2309.18.

Trail Design Parameters
Pack and Saddle (FSH 2309.18, Section 23.12, Exhibit 01)

Design Parameters are technical guidelines for the survey, design, construction, maintenance, and assessment of National Forest System trails, based on their Designed Use and Trail Class and consistent with their management intent.[1] Local deviations from any Design Parameter may be established based on trail-specific conditions, topography, or other factors, provided that the deviations are consistent with the general intent of the applicable Trail Class.

Designed Use PACK AND SADDLE		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	Wilderness (Single Lane)	Typically not designed or actively managed for equestrians, although use may be allowed	12″ – 18″ May be up to 48″ along steep side slopes 48″ – 60″ or greater along precipices	18″ – 24″ May be up to 48″ along steep side slopes 48″ – 60″ or greater along precipices	24″ May be up to 48″ along steep side slopes 48″ – 60″ or greater along precipices	Typically not designed or actively managed for equestrians, although use may be allowed
	Non-Wilderness (Single Lane)		12″ – 24″ May be up to 48″ along steep side slopes 48″ – 60″ or greater along precipices	18″ – 48″ 48″ – 60″ or greater along precipices	24″ – 96″ 48″ – 60″ or greater along precipices	
	Non-Wilderness (Double Lane)		60″	60″ – 84″	84″ – 120″	
	Structures (Minimum Width)		Other than bridges: 36″ Bridges without handrails: 60″ Bridges with handrails: 84″ clear width	Other than bridges: 36″ Bridges without handrails: 60″ Bridges with handrails: 84″ clear width	Other than bridges: 36″ Bridges without handrails: 60″ Bridges with handrails: 84″ clear width	
Design Surface[2]	Type		Native, with limited grading May be frequently rough	Native, with some onsite borrow or imported material where needed for stabilization and occasional grading Intermittently rough	Native, with improved sections of borrow or imported material and routine grading Minor roughness	
	Protrusions		≤ 6″ May be common and continuous	≤ 3″ May be common, not continuous	≤ 3″ Uncommon, not continuous	
	Obstacles (Maximum Height)		12″	6″	3″	

ZMTP

10/16/2008

ZMTP

Designed Use PACK AND SADDLE		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Grade[2]	Target Grade	Typically not designed or actively managed for equestrians, although use may be allowed	5% – 20%	3% – 12%	2% – 10%	Typically not designed or actively managed for equestrians, although use may be allowed
	Short Pitch Maximum		30%	20%	15%	
	Maximum Pitch Density		15% – 20% of trail	5% – 15% of trail	5% – 10% of trail	
Design Cross Slope	Target Cross Slope		5% – 10%	3% – 5%	0% – 5%	
	Maximum Cross Slope		10%	8%	5%	
Design Clearing	Height		8′ – 10′	10′	10′ – 12′	
	Width		72″ Some light vegetation may encroach into clearing area	72″ – 96″	96″	
	Shoulder Clearance		6″ – 12″ Pack clearance: 36″ x 36″	12″ – 18″ Pack clearance: 36″ x 36″	12″ – 18″ Pack clearance: 36″ x 36″	
Design Turn	Radius		4′ – 5′	5′ – 8′	6′ – 10′	

[1] For definitions of Design Parameter attributes (for example, Design Tread Width and Short Pitch Maximum) see FSH 2309.18, Section 05.

[2] The determination of trail-specific Design Grade, Design Surface, and other Design Parameters should be based upon soils, hydrological conditions, use levels, erosion potential, and other factors contributing to surface stability and overall sustainability of the trail.

USFS Trail Fundamentals & Management

For each trail or trail segment is based on applicable land management plan direction, travel management decisions, trail-specific decisions, and other related direction (FSM 2353.13). The US Forest Service Trails Fundamentals and Trail Management Objectives (2008): provide an integrated means to consistently record and communicate the intended design and management guidelines for trail design, construction, maintenance and use. It is essential to clearly understand their intent.

fs.fed.us/recreation/programs/trail-management/documents/trailfundamentals/1623-3801_TrailFdml+TMO_Sec508_11-14-16_150dpi.pdf

Trail Fundamentals are five concepts that are the cornerstones of USFS, trail management:

• **Trail Type** (Forest Service Handbook [FSH] 2309.18, Section 14.1) The Trail Type is a category that reflects the predominant trail surface and general mode of travel accommodated by a trail.

• **Trail Class** (FSH 2309.18, Section 14.2)
The Trail Class is the prescribed scale of development for a trail, representing its intended design and management standards.Trail Classes are general categories reflecting trail development scale, arranged along a continuum. There are five Trail Classes, ranging from the least developed (Trail Class 1) to the most developed (Trail Class 5):

•• Trail Class 1—Minimally Developed
•• Trail Class 2—Moderately Developed
•• Trail Class 3—Developed
•• Trail Class 4—Highly Developed
•• Trail Class 5—Fully Developed

For guidance on the potential appropriateness of each Trail Class to each Managed Use, see FSH 2309.18, Section 14.3, Exhibit 01.

• **Managed Use** (FSH 2309.18, Section 14.3)
Managed Use is a mode of travel that is actively managed and appropriate on a trail, based on its design and management.

• **Designed Use** (FSH 2309.18, Section 14.4)
Designed Use is the single Managed Use of a trail that requires the most demanding design, construction, and maintenance parameters and that, in conjunction with the applicable Trail Class, determines which Design Parameters will apply to a trail.

• **Design Parameters** (FSH 2309.18, Section 14.5)
Design Parameters are technical guidelines for the survey, design, construction, maintenance, and assessment of a trail, based on its Designed Use and Trail Class. *For the complete set of Design Parameters, refer to FSH 2309.18, Section 23.11, Exhibit 01, through Section 23.33, Exhibit 01 and pages 49 through 66 of this publication.*

ZMTP Trail Prescription

Based on local expertise and actual on-the-ground maintenance on trails in the Zuni Mountains, mainly through our Youth Conversation Corps, the ZMTP has developed a more prescriptive maintenance program.

This prescriptive maintenance program is based on three levels of effort, see Table 7-2 for trail maintenance aimed at meeting and exceeding USFS Trail Maintenance Considerations in Table 7-1. Maintenance levels of effort for trails will be based on criteria such as the Trail Management Objective and Trail Class, amount of use, potential to affect resources, safety considerations, etc.,

Maintenance frequency will be identified through a collaborative process between ZMTP and the US Forest Service, to be reviewed and updated annually or as appropriate. When determining maintenance levels of effort, higher priority may be given to trails where use is significant. ZMTP plans to install trail counters to collect and record user volume data. This data collection should proceed on a continuing basis to provide needed information for planning, developing, monitoring, and confirming maintenance levels. A three-year schedule of maintenance will be developed and a trail maintenance log will be kept. Significant trail maintenance will be done for a period of three years after a trail is constructed to correct drainage and identify and construct needed re-routes. ZMTP is recommending that prior to and after major events that special maintenance or “grooming” is performed.

- **Vegetation control.** This activity includes removing fallen trees that block the trail and trimming back vegetation. In some cases, professional fallers with skill have been needed to remove trees. Brush and branches that encroach on the horizontal clearance and can make a trail less safe. In some areas machinery can be used but trails must be cleared by hand. In the fall, this material is removed and chipped or burned in place if it cannot be removed.
- **Erosion control.** This activity includes repairing washed out water bars and drainage elements and inspecting and clearing drainage structures. The spring snowmelt will blow through water bars, change drainage patterns, and/or move rocks. It is a priority to keep water off the trails. The trail crew inspects drainage structures annually and clears all that are blocked with debris in the spring.
- **Bathroom maintenance.** This activity includes pumping out bathrooms at least two times during the season or more frequently with increased use, routine cleaning, and restocking supplies at these facilities.
- **Trail map distribution.** This activity includes refilling kiosks with trail maps seasonally. Trail maps may be provided for each trailhead at the USFS Offices and Visitors Centers in the area. Hard copy will be phased out with continued technology and adoption with the goal of eliminating all potential sources of litter.
- **Trail signage and kiosk placement and removal.** This activity includes annual inspection of trail signage and kiosks. Worn, damaged, deteriorated, or destroyed signs will be replaced.
- **Situational maintenance.** This activity includes responses to vandalism, accidents, or special weather events. Situational maintenance can be difficult to anticipate and budget for. With a limited budget and season of operation, it can be difficult at times to perform the necessary trail maintenance. Therefore, it is important that the Zuni Mountain Trail System is phased in over several years, to allow the necessary time to foster and grow solid partnerships for taking care of annual and situational maintenance needs before adding more miles of trail and infrastructure to the system.

Accessibility
ZMTP strives to meet the needs of a broad range of users with and without disabilities. Where visitor amenities such as parking areas and restrooms are provided, the Americans with Disabilities Act/Architectural Barriers Act Accessibility Guidelines (ADAABAAG) and Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG) will be followed as appropriate. The design of trails that meet the following conditions,
1) newly constructed or reconstructed trails,
2) designed use of hiker/pedestrian, and
3) are connected to an accessible trail or trailhead, will comply with the Forest Service Trail Accessibility Guidelines (FSTAG). The accessibility guidelines can be found at: http://www.fs.fed.us/recreation/programs/accessibility/

Drainage and Erosion Control
Erosion control is necessary to maintain a stable trail surface. The goal is to outslope the trail so that water sheets across it, instead of down its tread. Grade reversals are the preferred way to mitigate trail erosion because they do not present barriers to users. A grade reversal is an undulation within the trail tread: a short dip followed by a rise. This grade change in the tread catches water at the low point and diverts it off the trail. Grade reversals can be traversed by all users and require little maintenance once installed. When not incorporated into the original construction of the trail, there are two techniques available to retrofit them into the tread:

- Knick: In soils with a high displacement factor, a grade reversal should be accomplished by removing a wedge of soil to create a dip in the tread.
- Rolling Grade Dip: This technique uses the soil excavated from the low section of a trail to build up the entrance and exit to the dip. Ideally dips use natural features, such as trees or rocks, as landscape anchors.
- Rolling grade and grade reversals are preferred to other mechanical methods of routing water off of trails such as water bars, check dams, and culverts because they do not present a barrier to users. The ZMTP advocates that original construction provide for proper drainage and erosion control features. Building proper trails at the offset will help reduce maintenance costs over the short and longer term.

Techniques for Gaining Elevation/ Switchbacks and climbing turns (http://www.fhwa.dot.gov)
Switchbacks and climbing turns are used to reverse the direction of travel on hillsides and to gain elevation in a limited distance. Trail designers should make every effort to minimize the use of these turns. Planning carefully to avoid impassable or very difficult terrain reduces the need for switchbacks and climbing turns. A climbing turn is a reversal in direction that maintains the existing grade going through the turn without a constructed landing. A switchback is also a reversal in direction, but has a relatively level constructed landing. Switchbacks usually involve special treatment of the approaches, barriers, and drainages. They are used on steeper terrain, usually steeper than 15 to 20 percent. Both of these turns take skill to locate and are relatively expensive to construct and maintain.

USFS Trail Maintenance

Mount Taylor Ranger District does not operate a seasonal trail crew, it is expected that the ZMTP and mainly the regional YCC workforce will complete trail maintenance on the system. All work will need to be approved via task order by the US Forest Service and the local funding source prior to starting work.

(See: Appendix F: Task Order Example) Annual maintenance activities include:

Maintenance

This activity includes trail maintenance as directed by the Trails Management Handbook and detailed by the Trail Construction and Maintenance Notebook. The Handbook (Handbook, 18 – Exhibit 01, pg. 23, 2008) provides the breakdown by Trail Class for trail operation and maintenance considerations. According to this section:

The United States Forest Service Trail Construction and Maintenance Notebook contains a wealth of guidance on trail construction and maintenance techniques. The US Department of Agriculture and the Federal Highway Administration's Recreation Trail Program collaborated in its production.

The notebook is designed for USFS trail crew workers as a practical guide for trail work. It outlines basic information and techniques that comply with USFS policy. The notebook does not cover the in-depth components of planning, compliance, or inventory and monitoring. While those are necessary, the authors wanted trail workers in the field to have an accessible and concise document.

"Trail Operation and Maintenance Considerations are general guidance for developing trail prescriptions and managing, operating, and maintaining National Forest System trails. The considerations are a starting point and likely will need to be adapted to reflect local financial capability and other circumstances. Exceptions to the Trail Operation and Maintenance Considerations may occur at the trail-specific, district, forest or grassland, or regional level."

https://www.fs.fed.us/t-d/pubs/htmlpubs/htm07232806/page15.htm#top
TOOLS HANDBOOK

18 – Exhibit 01

TRAIL OPERATION AND MAINTENANCE CONSIDERATIONS

Trail Operation and Maintenance Considerations are general guidelines for developing trail prescriptions and managing, operating, and maintaining National Forest System trails. The considerations are a starting point and likely will need to be adapted to reflect local financial capability and other circumstances. Exceptions to the Trail Operation and Maintenance Considerations may occur at the trail-specific, district, forest or grassland, or regional level.

Trail Attributes	Trail Class 1 Minimally Developed	Trail Class 2 Moderately Developed	Trail Class 3 Developed	Trail Class 4 Highly Developed	Trail Class 5 Fully Developed
Trail Management	Typically managed to accommodate: ◆ Low use levels ◆ Highly skilled users who are comfortable off-trail ◆ Users with high degree of orienteering skill ◆ Some travel modes and ability levels may be impractical or impossible and may not be encouraged ◆ Water Trails: users with high level of navigation/orientation and paddling skills	Typically managed to accommodate: ◆ Low-to-moderate use levels ◆ Moderately to highly skilled users, capable negotiating obstacles ◆ Users with moderate orienteering skill ◆ Many types of uses, but challenging and requires advanced skills ◆ Water Trails: users with moderate to high level of navigation/orientation and paddling skills	Typically managed to accommodate: ◆ Moderate to heavy use ◆ Users with intermediate skill level and experience ◆ Users with minimal orienteering skills ◆ Moderately easy travel by Managed Uses ◆ Water Trails: basic to moderate navigating and paddling skills required Random potential for accessible use	Typically managed to accommodate: ◆ Very heavy use ◆ Users with minimal skills and experience ◆ Users with minimal or no orienteering skills ◆ Easy travel by Managed Uses ◆ Water Trails: basic navigating and paddling skills required May be or has potential to be made accessible	Typically managed to accommodate: ◆ Intensive use ◆ Users with limited skills and experience Typically meets agency requirements for accessibility
Maintenance Indicators	◆ Resource protection ◆ Safety commensurate with targeted recreation experience	◆ Resource protection ◆ Safety commensurate with targeted recreational experience	◆ Resource protection ◆ User convenience ◆ Safety commensurate with targeted recreation experience	◆ User comfort and ease ◆ Resource protection ◆ Safety commensurate with targeted recreation experience	◆ User comfort and ease ◆ High level of accessibility for Managed Uses ◆ Safety commensurate with targeted recreation experience
Routine Maintenance Frequency and Intensity [1]	◆ Infrequent or no scheduled maintenance ◆ Typically, maintenance conducted every 5 or more years or in response to reports of unusual resource problems requiring repair	◆ Maintenance scheduled to preserve the trail and its location ◆ Typically, maintenance conducted every 3-5 years or in response to reports of unusual resource problems requiring repair	◆ Trail cleared for availability early in its season of use and for preservation of its integrity ◆ Typically, maintenance conducted every 1-3 years or in response to reports of trail or resource damage or significant obstacles to Managed Use and experience level	◆ Trail cleared at earliest opportunity to make it available for season of use ◆ Typically, maintenance conducted at least annually	◆ Typically, maintenance conducted at least annually, or as needed to meet posted conditions ◆ Typically, major damage or safety concerns corrected or posted within 24 hours of discovery

[1] Maintenance in this category does not include routine trail condition assessment surveys.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5403600.pdf

Chapter 5
IMPLEMENTATION

2017 Zuni Mountains Trail & Conservation Master Plan, Amended 2020

This new Zuni Mountains Trail System is proposed based on the International Mountain Biking Association's recommended trail rating distribution of a 20/60/20. About 20% of the system is planned for advanced users, 60% for intermediate, and 20% for beginners. New stacked loop systems called "sections" would be designated by a trailhead and are prioritized for phased construction over the next several decades, based on usage, local capacity to maintain system, and availability of funding to expand. The highest priority system is the Quartz Hill section followed by the Milk Ranch sections and expansion of McGaffey sections. Ultimately, the entire Zuni Mountains Trail system would interconnect and be accessible to non-motorized users from various communities surrounding the Zuni Mountains.

It is also an outdoor classroom to introduce youth to nature, provide experiential learning, and teach work and life skills through programs such as the Youth Conservation Corps, Boys & Girls Club, Future Foundations Family Center, Cottonwood Gulch Foundation, and the National Indian Youth Leadership Project. These organizations and communities are eager to leverage funding sources above the limited resources of the US Forest Service to establish and maintain the Zuni Mountains Trail System.

Trail Development

This Zuni Mountain Trails and Conservation Master Plan fits into the US Forest Service's four "P's" of the recreation management model: Provide, Protect, Partner, and Perform. Execution of this master plan will only be completed by stakeholders with oversight and approval at planning, design, and implementation stages by the US Forest Service. This master plan supports the desired outcome by providing a business case for how this ZMTP Trail System can be developed and maintained using a combination of youth crews, volunteers, grant sources, and local funding commitments. Initial cost estimates reveal that the project will need to raise over $6M in outside funding for trail and trailhead construction (over 12+ years), while increasing an annual maintenance budget from its current level of about $40,000 to $150,000, as expansion occurs. ZMTP partners strongly believes that these numbers are achievable with minimal USFS in-kind personnel contributions.

This Zuni Mountain Trails and Conservation Master Plan is only the beginning of planning, coordination, and commitments needed for this undertaking; going forward if the ZMTP Trail System is designated, the ZMTP recommends:

1. Development of a map and table of all Trail Improvements by Segment (Table 6-1) with actual cost estimates (see Section 6.2), including grouthtruthing, flagging, and design
2. Development of an Operations, Maintenance, & Replacement Plan and maintenance agreement with USFS (either stand-alone or as part of an MOU update)
3. As part of the OM&R Plan, establishment of a maintenance line-item and annual commitment from both counties that is indexed to system expansion (above in-kind Road Crew support of Trailheads)
4. Securing commitments from regional Youth Conservation Corps programs and incorporate projects outlined in "Trail Improvements by Segment" and Maintenance projects into annual Work Plans
5. Establishment of a Project & Resource Strikeforce Team to time projects with application and funding cycles, as well as, deploy youth crews and volunteer assistance activities as approved by USFS
6. Formalize how events and tour businesses will support trail maintenance needs, and although this master plan assumes that USFS financial commitment is limited to in-house personnel costs, there may be roles and expertise that USFS can bring to table that the ZMTP does not currently have.

Final Decision Notice

The final Decision Notice was signed May 17, 2017 for the Zuni Mountain Trails Project. Alvin Whitehair, District Ranger from the Mt. Taylor Ranger District of Cibola National Forest and National Grasslands, signed the final Decision Notice (DN) and Finding of No Significant Impact (FONSI) for the Zuni Mountain Trails project.

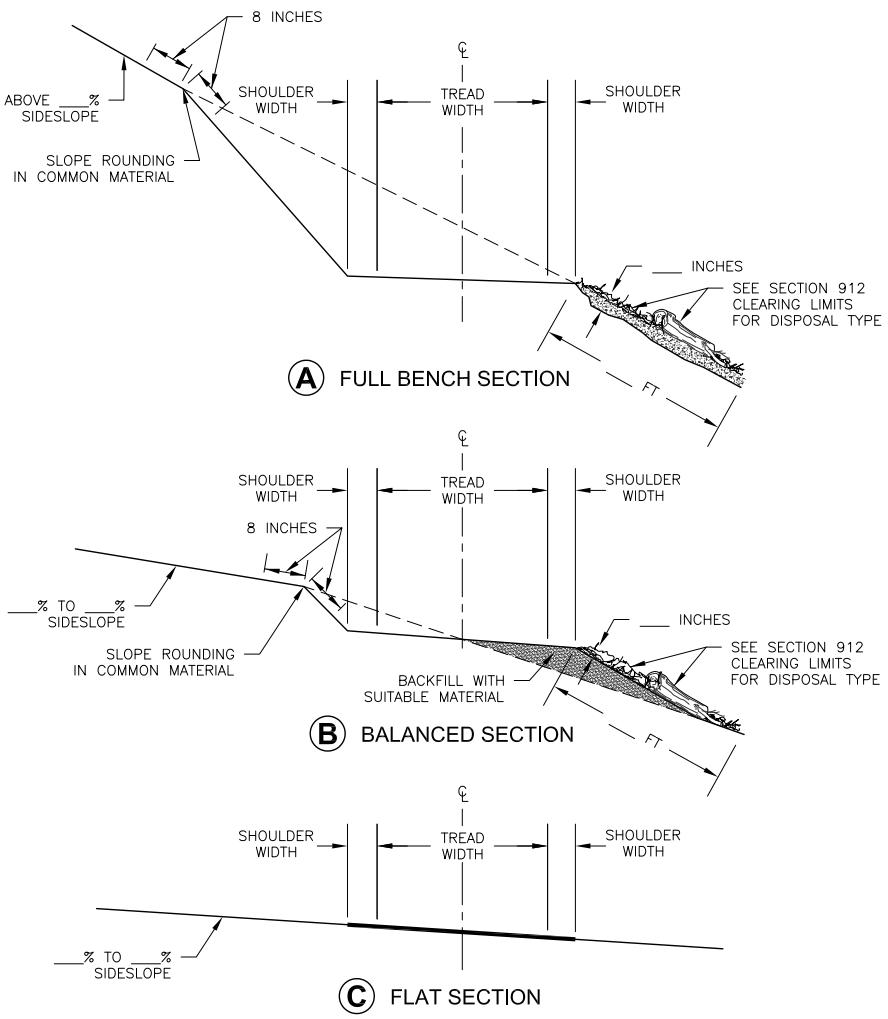
The Environmental Analysis (EA), draft DN, and FONSI were released in March 2017, which began a 45-day objection period. Those who had previously submitted comments about the project had the opportunity to raise concerns about the EA, DN, or FONSI. No objections were received. The project moves from the planning phase to implementation. This decision adds approximately 186 miles of new trails to the existing system. Trails will be managed for multiple uses including horseback riding, mountain biking, and hiking. The trails are designed to protect soil and watershed resources and provide additional dispersed recreation opportunities. Other improvements will include the construction of five new trailheads, the redesign of the Quartz Hill parking area, mountain bike cattle guards, and cowboy gates. Unauthorized routes will be rehabilitated.

The Zuni Mountain Trails Partnership which includes; the Northwest New Mexico Council of Governments, McKinley and Cibola Counties, Adventure Gallup and Beyond, and the U.S. Forest Service has collaboratively worked with the local community as exhibited in this Zuni Mountain Trails and Conservation Master Plan. Prior the final Decision Notice, U.S. Senator Martin Heinrich (D-N.M.), Energy and Natural Resources Committee, urged the U.S. Forest Service to complete the environmental review of the Zuni Mountain Trail Project. With delays in the process, Heinrich pressed the U.S. Forest Service Chief, Tom Tidwell to complete the review so trail design and construction could commence.

A signing ceremony of the final Decision Notice for the Zuni Mountain Trails Project was held at El Malpais National Monument Visitor Center in Grants, New Mexico on May 31, 2017. In attendance was U.S. Senator Martin Heinrich. "Through this collaborative effort, we will ensure that outdoor enthusiasts from near and far can experience all that this special area has to offer," said U.S. Senator Martin Heinrich. "I am proud to support the communities in Cibola and McKinley Counties who have worked for years to make the Zuni Mountain Trails project a reality. This new trail system will boost outdoor recreation and economic development in western New Mexico. I welcome this announcement and thank all who helped make it possible." The Zuni Mountain trail system is a major economic development opportunity. Heinrich stated that outdoor recreation economy creates $887 billion in annual consumer spending and directly supports 7.6 million jobs throughout the United States. In New Mexico, outdoor recreation generates 68,000 jobs and $6.1 billion of annual economic activity.

In 2018, as part of the Milk Ranch trail system "Purple Haze Trail" construction commenced. In 2019, as part of the McGaffey area trail system was designed and constructed, "Torreon, Upper Plush and Lower Plush, two trails were completed and the remainder "Sawmill, Mike's Rippin and Tampico Springs trails suspended construction due to the Mexican Spotted Owl (MSO) Court Injunction. Milk Ranch Trailhead parking lot, fence, and gates are installed but kiosks, signs and other equipment are pending. In 2020, Quartz Hill Trailhead and trail system designs are complete and construction of trail system is suspended until further notice of MSO Court Injunction. McKenzie Ridge trail has been approved for design and construction.

TYPICAL TRAIL CROSS SECTIONS



TYPICAL TRAIL TREAD AND SHOULDER WIDTH

TYPICAL ID	SECTION TYPE	TREAD FINISH	TREAD WIDTH	SHOULDER WIDTH		COMMENTS
				UPHILL	DOWNHILL	
TSF–1		T				

TREAD CROSS SLOPE

TYPICAL ID	OUTSLOPE	INSLOPE	CROWNED SECTION	COMMENTS
	%	%	%	

SLOPE AND TRAILBED FINISH

TREAD FINISH	ROOTS	LOOSE ROCK	EMBEDDED ROCK	COMMENTS
T1				
T2				
T3				
T4				
T5				
T6				

TRAILBED AND SLOPE FINISH

SLOPE FINISH

REMOVE ROOTS THAT PROTRUDE FROM THE BACKSLOPE WITH DIAMETERS GREATER THAN SHOWN IN THE SLOPE AND TRAILBED FINISH TABLE.

TRAILBED FINISH

REMOVE LOOSE ROCK ON THE TRAILBED WITH A DIMENSION GREATER THAN SHOWN IN THE SLOPE AND TRAILBED FINISH TABLE.

REMOVE OR REDUCE EMBEDDED ROCK THAT PROTRUDES MORE THAN THE DIMENSIONS SHOWN IN THE SLOPE AND TRAILBED FINISH TABLE.

NOTES:

1. SLASH CONSISTS OF LOGS, LIMBS, BRUSH, AND ROCKS PLACED RANDOMLY IN A WAY TO CATCH SEDIMENT MOVEMENT.
2. LIMB ALL TREES AND SHRUBS AND TAMP SLASH INTO GROUND SO THAT 80% OF SLASH IS IN CONTACT WITH THE GROUND.

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

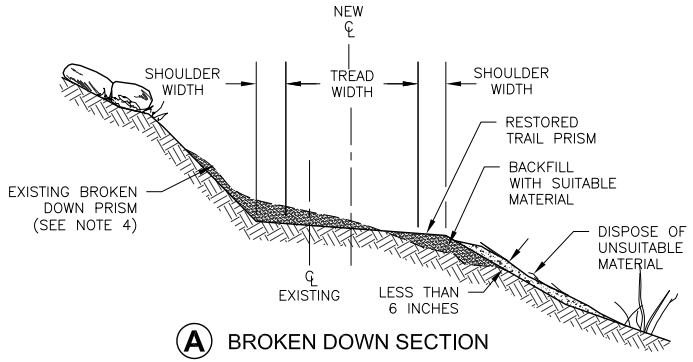
PROJECT NAME & LOCATION

DRAWING NAME
TYPICAL CROSS SECTION & SLOPE FINISH
SECTION: **911 - TREAD AND PRISM**
TYPICAL ID: **TSF/TCS**

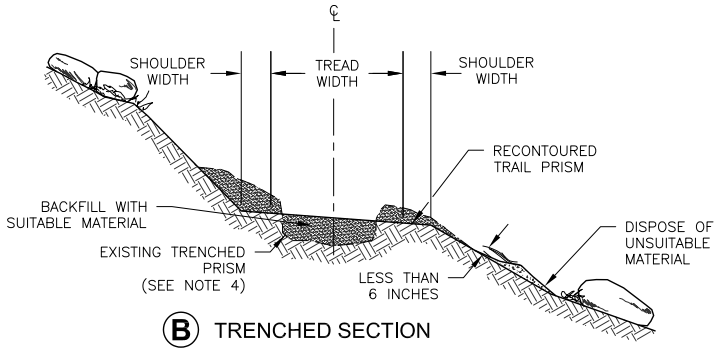
REVISION DATE: **XX/XX/XX**

NO SCALE

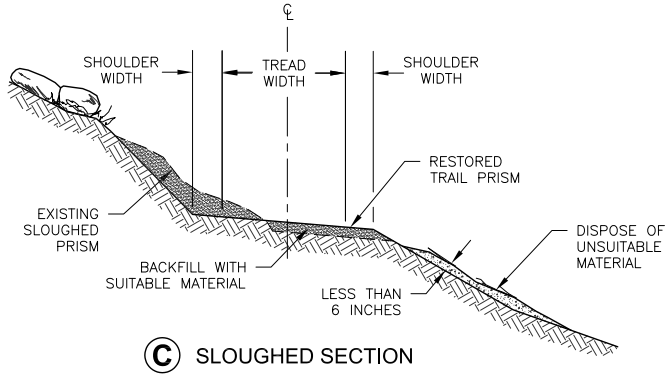
DRAWING NO.: **STD_911-01**
SHEET ___ OF ___



A BROKEN DOWN SECTION



B TRENCHED SECTION



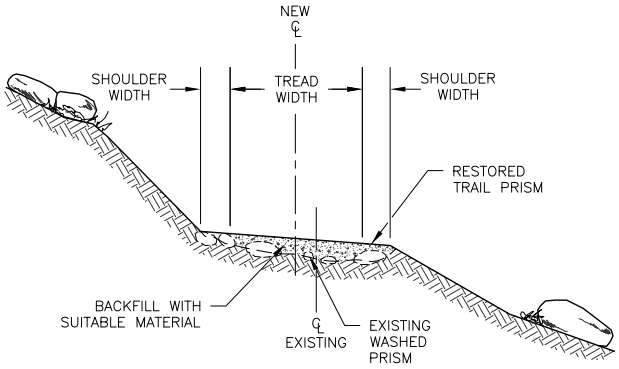
C SLOUGHED SECTION

EXISTING TRAIL RESTORATION

TYPICAL ID	SECTION TYPE	TREAD WIDTH	SHOULDER WIDTH		COMMENTS
			UPHILL	DOWNHILL	
ETR–1					

NOTES:

1. RE–ESTABLISH ORIGINAL DRAINAGE STRUCTURES TO MATCH NEW TREAD SURFACE.
2. INSTALL CHECK DAMS, DRAINAGE DIPS OR OTHER DRAINAGE STRUCTURES WHEN SPECIFIED.
3. DRAINAGE DIPS WILL BE STAKED IN THE FIELD WHEN REQUIRED AND WILL BE PAID SEPARATELY UNDER SECTION 927.
4. USE ONLY SUITABLE MATERIAL TO CONSTRUCT RESTORED TRAIL PRISMS. DISPOSE OF UNSUITABLE MATERIAL AS SHOWN ON PLANS.
5. SEEDING, FERTILIZING & MULCHING WHEN REQUIRED WILL BE PAID UNDER SECTION 981.



D WASHED SECTION

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

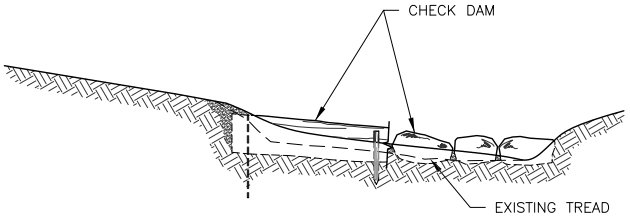
PROJECT NAME & LOCATION

DRAWING NAME
EXISTING TRAIL RESTORATION
SECTION **911 - TREAD AND PRISM**
TYPICAL ID **ETR**

REVISION DATE **XX/XX/XX**

NO SCALE

DRAWING NO. **STD_911-30-01**
SHEET
OF



Ⓐ CHECK DAM SECTION

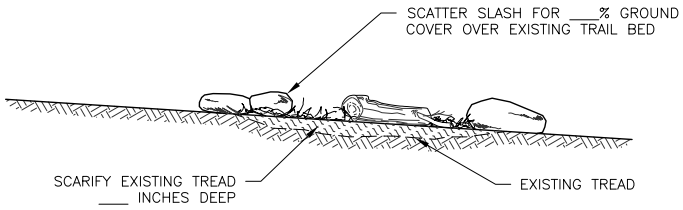
CHECK DAM SPACING

DRAINAGE GRADE %	DRAINAGE SPACING (FEET)
<3	OCCASIONAL
3–7	50
8–12	25
>12	15

TRAIL OBLITERATION

TYPICAL ID	SECTION TYPE	LENGTH	COMMENTS
OBT–1			

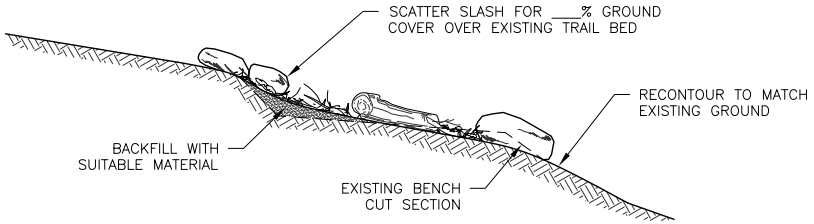
N/A WHEN NOT APPLICABLE
****FOR CHECK DAM SEE SHEET STD_928–01



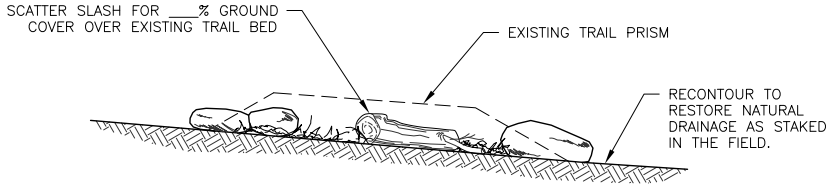
Ⓑ SCARIFICATION AND SLASH PLACEMENT SECTION

NOTES:

1. SLASH CONSISTS OF LOGS, LIMBS, BRUSH, AND ROCKS PLACED IN A WAY TO CATCH SEDIMENT MOVEMENT.
2. SLASH TO BE SPREAD RANDOMLY ACROSS TRAIL BED. DO NOT SPREAD PARALLEL TO TRAIL SURFACE.
3. LIMB ALL TREES AND SHRUBS AND TAMP SLASH INTO GROUND SO THAT 80% OF SLASH IS IN CONTACT WITH THE GROUND.
4. DRAINAGE DIPS WILL BE STAKED IN THE FIELD WHEN REQUIRED AND WILL BE PAID SEPARATELY UNDER SECTION 927.
5. SEEDING, FERTILIZING & MULCHING WHEN REQUIRED WILL BE PAID UNDER SECTION 981.



Ⓒ RECONTOUR & SLASH PLACEMENT SECTION



Ⓓ RESTORE NATURAL DRAINAGE SECTION

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

DRAWING NAME
OBLITERATION OF TRAILS
SECTION **911 - TREAD AND PRISM**
TYPICAL ID **OBT**

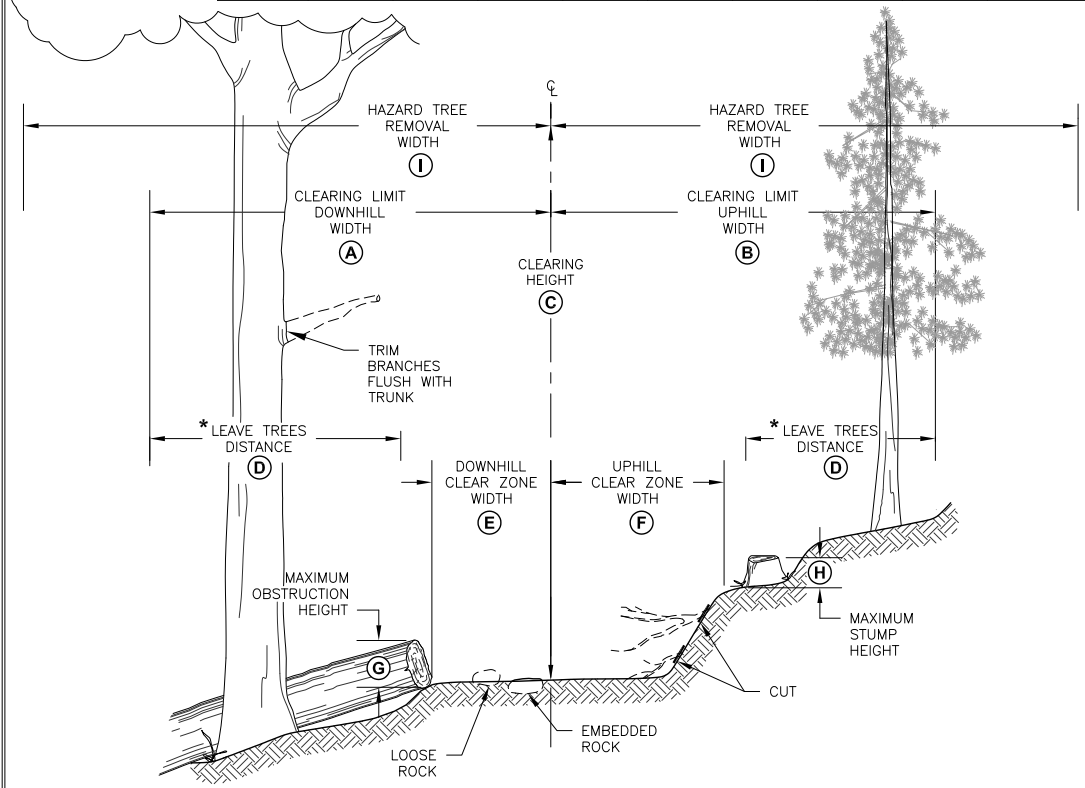
REVISION DATE **XX/XX/XX**

NO SCALE

DRAWING NO. **STD_911-60-01**
SHEET
OF

CLEARING LIMITS - TREES AND LOGS

		CLEARING LIMITS			* LEAVE TREES		CLEAR ZONE			STUMPS	HAZARD TREE		
TYPICAL ID	CLEARING METHOD	DOWNHILL WIDTH (A)	UPHILL WIDTH (B)	CLEARING HEIGHT (C)	DISTANCE (FEET) (D)	DIAMETER (INCHES)	DOWNHILL WIDTH (E)	UPHILL WIDTH (F)	MAXIMUM OBSTRUCTION HEIGHT (G)	MAXIMUM HEIGHT (H)	REMOVAL WIDTH (I)	DISPOSAL METHOD	COMMENTS
CLT–1	C											D	



CLEARING METHOD

CLEARING TYPE	CLEARING METHOD	COMMENTS
C1	NEW CONSTRUCTION	TREES, PRUNING, & BRUSH
C2	CLEARING LIMIT RESTORATION	TREES, PRUNING, LOGS, BRUSH & MAINTENANCE
C3	TRAIL OPENING	LOGGING OUT, LOOSE ROCK & DRAINAGE CLEARING
C4	HAZARD TREE REMOVAL	ALONG TRAIL CORRIDOR
C5	HAZARD TREE REMOVAL	INDIVIDUAL (AS MARKED)
C6	LOOSE ROCK & ROOT REMOVAL	
C7		

LEAVE TREES: LEAVE TREES SHOULD BE LIVE, SOUND & UNDAMAGED WITH UNCOMPROMISED ROOT SYSTEMS.

HAZARD TREES: HAZARD TREES ARE TREES THAT ARE STANDING OR LEANING DEAD TREES LARGER THAN 8 INCHES IN DIAMETER AND GREATER THAN 90 FEET IN HEIGHT.

DISPOSAL METHOD

DISPOSAL TYPE	DISPOSAL METHOD	COMMENTS
D1	LOP AND SCATTER OUTSIDE TRAILWAY	
D2	LOP AND SCATTER ON FILL SLOPE	
D3	PILE AND BURN	
D4	CHIP	
D5	HAUL TO DISPOSAL SITE	
D6		

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
STANDARD TRAIL PLAN

PROJECT NAME & LOCATION

DRAWING NAME
CLEARING LIMITS-TREES AND LOGS
SECTION: **912 - CLEARING LIMITS**
TYPICAL ID: **CLT**

REVISION DATE: **XX/XX/XX**
NO SCALE

DRAWING NO.: **STD_912-01**
SHEET: OF

2020 Scope of Work

Milk Ranch & McGaffey Trail Systems

This Scope of Work (SOW) outlines 2020 tasks that the County of McKinley is scheduled to conduct under Forest Service Agreement #18-CS-11030300-002 and Cooperator Agreement #17-OCT-3888A. The County of McKinley in coordination with the Mt Taylor Ranger District is implementing the ZMTP and Conservation Master Plan. The County of McKinley is managing the operation of existing trails and new improvements for the Milk Ranch & McGaffey Trail Systems. The County of McKinley is coordinating with Zuni Mountain Trail partners to complete 2020 tasks utilizing the Recreation Trails Program funds. McKinley County will issue an RFP for work to be completed once the MSO Injunction is lifted. Implementation will occur in the summer through fall field season once the MSO Injunction is lifted.

Court Order No. CV-13-00151-TUC-RCC which halted all timber management activities on six national forests in New Mexico and Arizona also affected the ZMTP project due to pending formal consultation regarding potential effects on the Mexican spotted owl. Last season, we instructed McKinley County to cease all trail work to comply with the order, therefore interrupting the trail work scheduled under the 2019 SOW. To date, we have not received clearance from the United States District Court to resume any activities affected by the injunction and we do not have a definitive timeline when the order will be lifted. Because of the MSO injunction, we anticipate that adjustments to the SOW will be necessary. The tasks that are affected by the MSO injunction will be implemented as soon as the injunction is lifted.

A total of 20 miles of trail are reflected in this SOW for completion.

TASKS

The following tasks have been identified, in priority order, to meet the intent of the agreement, and construct a sustainable recreation trail system.

The following tasks are not affected by the MSO injunction and *can be implemented immediately*:

Trail Head Construction

1. Order signs
   - Order signs for the TH using the Milk Ranch TH Plan as guidance.

Trail System Construction

2. Order signs and materials
   - Order signs for Trails 2, 3, 4, A, B, C, & D using the Trail Sign Plan as guidance.
   - Order 15 mountain bike and equestrian gates as identified in the Final Environment Assessment and Decision Notice & Finding of No Significant Impact documents.

The following tasks that will be affected by the MSO injunction and *cannot be implemented until the MSO injunction is lifted.*

USDA Forest Service | FS AGR: 18-CS-11030300-002 COOP AGR: 17-OCT-3888A

Trail Head Construction

3. Conduct minor adjustments within the Milk Ranch TH area using the Milk Ranch TH Plan as guidance
   - Install Trail Head signs (D4, D5, D6). Coordinate with New Mexico Department of Transportation for sign installation (D5) on State Highway 400.
   - Reset the road gate to fix the sag (D7, D8, D9). Work with the project manager on the details.
   - Paint the road gate (D9) and install the appropriate signs (D9).
   - Install loose rock riprap as slope protection (R5).

Trail System Construction

4. Reconstruct Trail 4
   - Reconstruct Trail 4 following the approved trail design and specification. This trail is broken in to two areas and maps; Sawmill North, and Sawmill South. Both areas are conducive to machine construction.
   - Install one bike cattle guard and equestrian gate on Trail 4 at the pasture fence crossing.
5. Complete reconstruction activities on Trail A (follow wildlife restriction stipulation)
   - Reconstruct Trail A following the approved trail design and specification specifically for the removal and/or trimming of trees identified in the QA/QC work.
   - Install one bike cattle guards and one equestrian gates at the pasture fence crossing.
6. Complete reconstruction activities on Trail B (follow wildlife restriction stipulation)
   - Reconstruct Trail B following the approved trail design and specification specifically for the removal and/or trimming of trees identified in the QA/QC work and, the needed construction and closure work at segment B012 as shown on the project Map.
   - Install one bike cattle guards and one equestrian gates at the pasture fence crossing.
7. Reconstruct Trail 2 (follow wildlife restriction stipulation)
   - Reconstruct Trail 2 following the approved trail design and specification. Install two bike cattle guards and two equestrian gates at pasture fence crossings. Portions of this trail can be accomplished by machine while a lessor portion must be done by hand.
8. Reconstruct Trail 3 (follow wildlife restriction stipulation)
   - Reconstruct Trail 3 following the approved trail design and specification. This trail must be done by hand.
9. Install Trail signs
   - Install signs on Trails 2, 3, 4, A, B, C, & D using the Trail Sign Plan as guidance.
10. Reporting
    - Submit a quarterly report summary (March, June, September) highlighting progress accomplishments to the Forest Service Project Manager.

Changes to the Scope of Work resulting from unforeseen circumstances will need to be submitted for review and approval by the Forest Service Program Manager.

The attachments provides details in the aforementioned tasks:

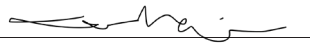
- Project Map
- ZMTP Sign Plan
- Milk Ranch Trailhead design and specs (large file-obtain a hardcopy prior to implementing project)
- Milk Ranch Trail design and specs
- Equestrian Gate specs
- Mountain Bike cattle guard specs

Signatures of Authorized Representative

By signature below, the signing parties certify that they are the official representatives of their respective parties and authorized to act in their respective areas for matters related to the above-referenced grant/agreement.

Submitted: Cooperator Program Mgr	**Signature:** _____	**Date:** _____
	Name/Title: _____	**Phone:** _____

*Note to Cooperator Project Lead: This document helps respond to the performance reporting required by the agreement.

Reviewed: FS Program Mgr	**Signature:** 	**Date:** 04/22/20
	Name/Title: Arnold Wilson/Forester	**Phone:** 505-287-8833

*Note to F. S. Program Manager: Document this and any other monitoring activity in NRM.

PROJECT 4 DESIGN SPECS

Milk Ranch Canyon Trail Network

TRAIL CONSTRUCTION 18”

911.10.01 This work consists of the excavation and placement of excavated material, regardless of its nature, from within the trailway or from other sources, except for material included under other pay items SHOWN IN THE SCHEDULE OF ITEMS.

Includes excavation, embankment, and backfill construction required to shape and finish the trailbed, ditches, backslopes, fill slopes, drainage dips, trail passing sections, and turnouts. Also includes excavation and embankment work required to construct culverts, trail bridges, shallow stream fords and gully crossings, talus and rubble rock sections, and climbing turns.

911.10.04 Trailway Excavation and Embankment. Minor deviations of ± 12 inches in vertical alignment and 36 inches in horizontal alignment with smooth transitions of at least 30 feet on each side of the deviation are acceptable unless otherwise SHOWN ON THE PLANS.

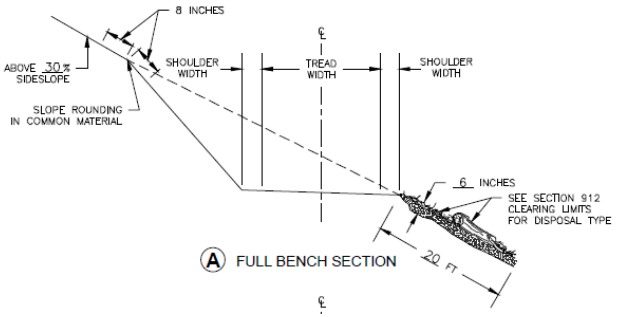
Construct embankments with suitable compacted material. Compact all disturbed soil within the trailbed area. Remove any rock within or above the backslopes that is unstable. Leave the finished slope in a uniform and roughened condition.

Make necessary adjustments of horizontal or vertical alignment, within the tolerances specified in this subsection, to produce the designed trailway section and balance earthwork. Such adjustments shall not be considered as changes.

911.10.05 Trailbed Finish. Fill holes with suitable material, compact, and cut high points to provide a uniform trailbed finish.

Finished trail tread width will be 18”

TYPICAL TRAIL CROSS SECTIONS



BERM REMOVAL & REBENCH

911.30-Existing Trail Restoration

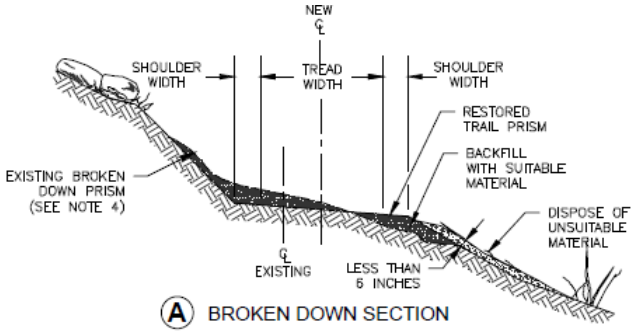
Description

911.30.01 This work consists of restoring the original trail template, including clearing, removing slough and berm, borrow, filling ruts and troughs, reshaping backslopes, excavation, reshaping trail tread, restoring drainage and other trail structures, constructing check dams, and removing protruding rocks, roots, stumps, slough, and berms.

Construction

911.30.03 Clearing and Grubbing. Clear and grub in accordance with the requirements of section 912 and as SHOWN ON THE PLANS.

911.30.04 Excavation and Embankment. Excavate and place all excavated material in accordance with the requirements of section 911.10.04 and as SHOWN ON THE PLANS.

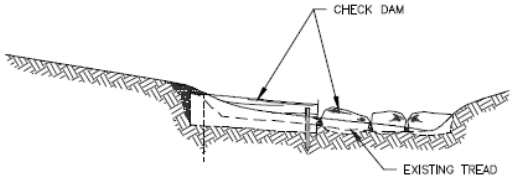


CLOSE/REHAB

911.60 - Obliteration of Abandoned Trails

Description

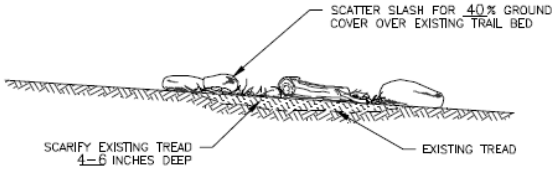
911.60.01 This work consists of removal and disposal of existing structures, including turnpikes, walkways, bridges, culverts, signs and posts, and other material within the trailway, above or below ground. Work also includes salvaging DESIGNATED materials and backfilling the resulting trenches, holes, and pits.



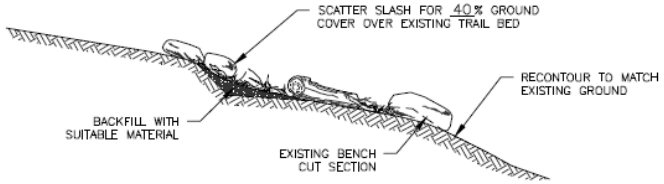
Ⓐ CHECK DAM SECTION

CHECK DAM SPACING

DRAINAGE GRADE %	DRAINAGE SPACING (FEET)
<3	OCCASIONAL
3–7	50
8–12	25
>12	15



Ⓑ SCARIFICATION AND SLASH PLACEMENT SECTION



Ⓒ RECONTOUR & SLASH PLACEMENT SECTION

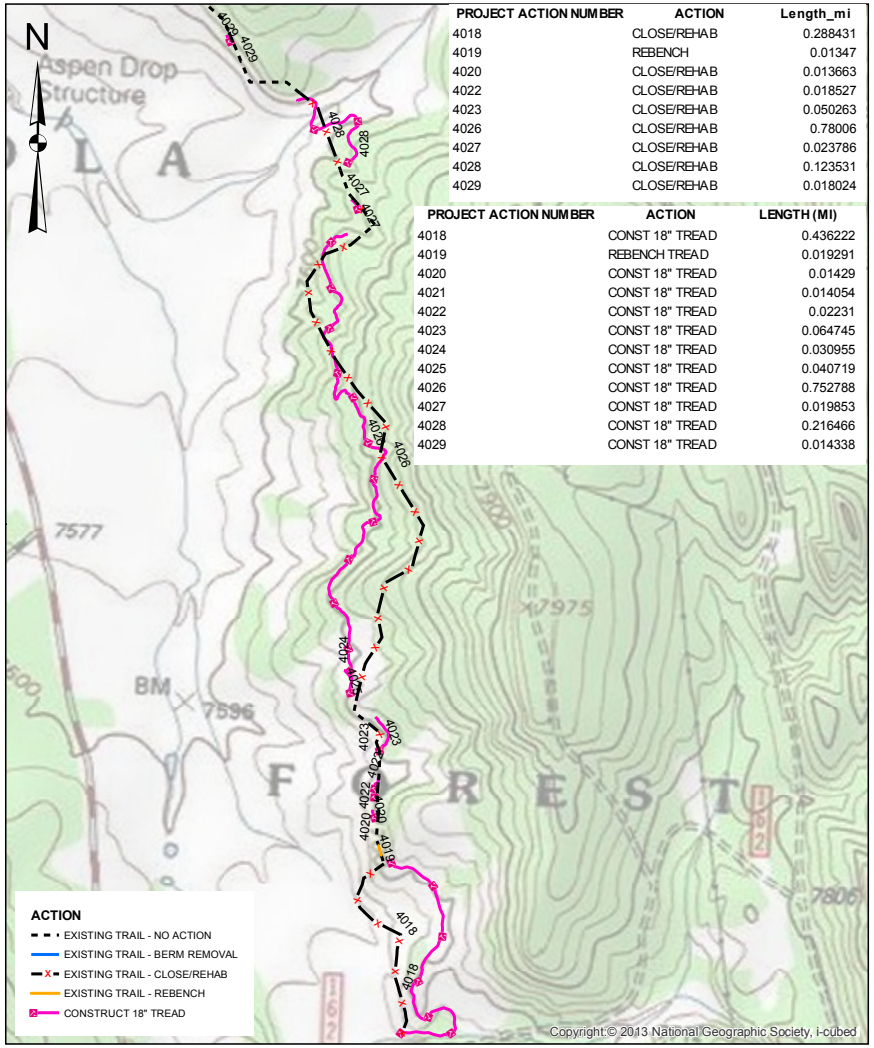
SCATTER SLASH
COVER OVER

ZMTP Projec 4 Actions

PROJECT ACTION NUMBER	LENGTH (MI)	LENGTH (FT)	ACTION	USFS STANDARD TRAIL DRAWING	USFS STANDARD SPEC FOR CONST OF TRAILS	UNIT OF MEASURE	PAY ITEM NO.
4002	0.0	219	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4002	0.0	99	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4003	0.1	274	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4005	0.1	616	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4005	0.0	212	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4006	0.1	297	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4007	0.2	849	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4007	0.2	912	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4008	0.1	701	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4008	0.1	724	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4009	0.1	366	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4009	0.1	531	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4010	0.0	226	BERM REMOVAL	STD_911-30-01 - TREAD WIDTH 18"	911.5	LF	91101
4011	0.1	357	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4011	0.1	358	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4012	0.0	203	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4012	0.0	189	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4013	0.0	124	BERM REMOVAL	STD_911-30-01 - TREAD WIDTH 18"	911.5	LF	91101
4014	0.0	102	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4014	0.0	95	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4015	0.2	963	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4015	0.2	973	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4016	0.1	317	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4016	0.1	370	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4017	0.1	389	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4017	0.1	339	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4018	0.3	1523	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4018	0.4	2303	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4019	0.0	71	REBENCH	STD_911-30-01 - TREAD WIDTH 18"	911.30.01	LF	91101
4020	0.0	72	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4020	0.0	75	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4021	0.0	74	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101

ZMTP Projec 4 Actions

4022	0.0	98	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4022	0.0	118	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4023	0.1	265	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4023	0.1	342	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4024	0.0	163	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4025	0.0	215	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4026	0.8	4119	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4026	0.8	3975	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4027	0.0	126	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4027	0.0	105	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4028	0.1	652	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4028	0.2	1143	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
4029	0.0	95	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
4029	0.0	76	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
Total	5.0	26414					



PROJECT ACTION NUMBER	ACTION	Length_mi
4018	CLOSE/REHAB	0.288431
4019	REBENCH	0.01347
4020	CLOSE/REHAB	0.013663
4022	CLOSE/REHAB	0.018527
4023	CLOSE/REHAB	0.050263
4026	CLOSE/REHAB	0.78006
4027	CLOSE/REHAB	0.023786
4028	CLOSE/REHAB	0.123531
4029	CLOSE/REHAB	0.018024

PROJECT ACTION NUMBER	ACTION	LENGTH (MI)
4018	CONST 18" TREAD	0.436222
4019	REBENCH TREAD	0.019291
4020	CONST 18" TREAD	0.01429
4021	CONST 18" TREAD	0.014054
4022	CONST 18" TREAD	0.02231
4023	CONST 18" TREAD	0.064745
4024	CONST 18" TREAD	0.030955
4025	CONST 18" TREAD	0.040719
4026	CONST 18" TREAD	0.752788
4027	CONST 18" TREAD	0.019853
4028	CONST 18" TREAD	0.216466
4029	CONST 18" TREAD	0.014338

Zuni Mountain Trails Project

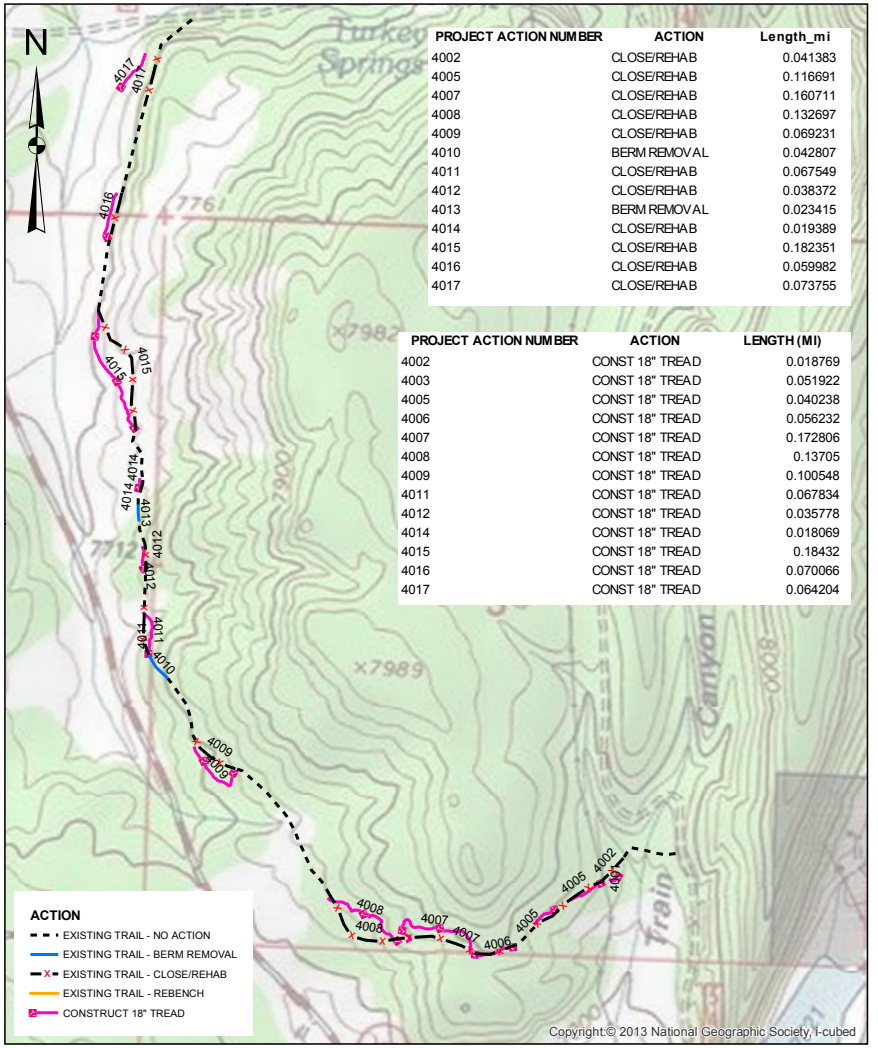
SAWMILL NORTH (TRAIL PROJECT 4)

MAP 1 OF 2

0 0.05 0.1 0.2 0.3 0.4 Miles

NAD 83 1:10,000

The Cibola National Forest uses the most current data available. Updates are performed as new information becomes available. No warranties are made regarding the accuracy of these data.



PROJECT ACTION NUMBER	ACTION	Length_mi
4002	CLOSE/REHAB	0.041383
4005	CLOSE/REHAB	0.116691
4007	CLOSE/REHAB	0.160711
4008	CLOSE/REHAB	0.132697
4009	CLOSE/REHAB	0.069231
4010	BERM REMOVAL	0.042807
4011	CLOSE/REHAB	0.067549
4012	CLOSE/REHAB	0.038372
4013	BERM REMOVAL	0.023415
4014	CLOSE/REHAB	0.019389
4015	CLOSE/REHAB	0.182351
4016	CLOSE/REHAB	0.059982
4017	CLOSE/REHAB	0.073755

PROJECT ACTION NUMBER	ACTION	LENGTH (MI)
4002	CONST 18" TREAD	0.018769
4003	CONST 18" TREAD	0.051922
4005	CONST 18" TREAD	0.040238
4006	CONST 18" TREAD	0.056232
4007	CONST 18" TREAD	0.172806
4008	CONST 18" TREAD	0.13705
4009	CONST 18" TREAD	0.100548
4011	CONST 18" TREAD	0.067834
4012	CONST 18" TREAD	0.035778
4014	CONST 18" TREAD	0.018069
4015	CONST 18" TREAD	0.18432
4016	CONST 18" TREAD	0.070066
4017	CONST 18" TREAD	0.064204

Zuni Mountain Trails Project

SAWMILL SOUTH (TRAIL PROJECT 4)

MAP 2 OF 2

0 0.05 0.1 0.2 0.3 0.4 Miles

NAD 83 1:10,000

The Cibola National Forest uses the most current data available. Updates are performed as new information becomes available. No warranties are made regarding the accuracy of these data.

PROJECT A & B DESIGN SPECS

Milk Ranch Canyon Trail Network

TRAIL CONSTRUCTION 18”

911.10.01 This work consists of the excavation and placement of excavated material, regardless of its nature, from within the trailway or from other sources, except for material included under other pay items SHOWN IN THE SCHEDULE OF ITEMS.

Includes excavation, embankment, and backfill construction required to shape and finish the trailbed, ditches, backslopes, fill slopes, drainage dips, trail passing sections, and turnouts. Also includes excavation and embankment work required to construct culverts, trail bridges, shallow stream fords and gully crossings, talus and rubble rock sections, and climbing turns.

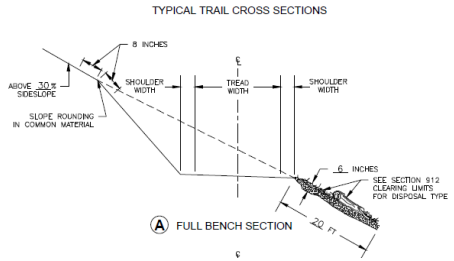
911.10.04 Trailway Excavation and Embankment. Minor deviations of ± 12 inches in vertical alignment and 36 inches in horizontal alignment with smooth transitions of at least 30 feet on each side of the deviation are acceptable unless otherwise SHOWN ON THE PLANS.

Construct embankments with suitable compacted material. Compact all disturbed soil within the trailbed area. Remove any rock within or above the backslopes that is unstable. Leave the finished slope in a uniform and roughened condition.

Make necessary adjustments of horizontal or vertical alignment, within the tolerances specified in this subsection, to produce the designed trailway section and balance earthwork. Such adjustments shall not be considered as changes.

911.10.05 Trailbed Finish. Fill holes with suitable material, compact, and cut high points to provide a uniform trailbed finish.

Finished trail tread width will be 18”



BERM REMOVAL & REBENCH

911.30-Existing Trail Restoration

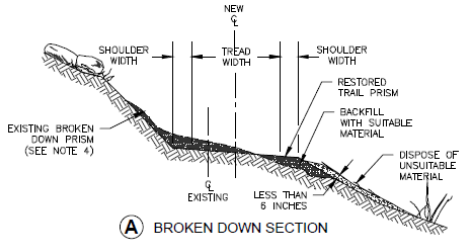
Description

911.30.01 This work consists of restoring the original trail template, including clearing, removing slough and berm, borrow, filling ruts and troughs, reshaping backslopes, excavation, reshaping trail tread, restoring drainage and other trail structures, constructing check dams, and removing protruding rocks, roots, stumps, slough, and berms.

Construction

911.30.03 Clearing and Grubbing. Clear and grub in accordance with the requirements of section 912 and as SHOWN ON THE PLANS.

911.30.04 Excavation and Embankment. Excavate and place all excavated material in accordance with the requirements of section 911.10.04 and as SHOWN ON THE PLANS.

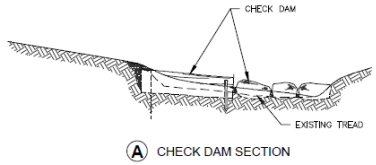


CLOSE/REHAB

911.60 - Obliteration of Abandoned Trails

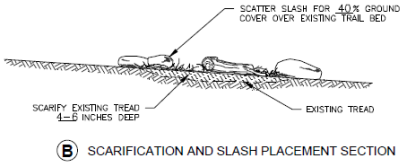
Description

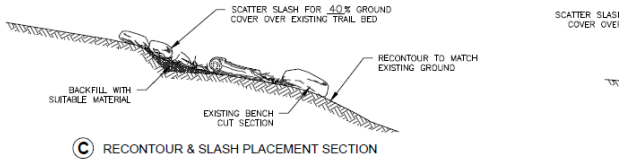
911.60.01 This work consists of removal and disposal of existing structures, including turnpikes, walkways, bridges, culverts, signs and posts, and other material within the trailway, above or below ground. Work also includes salvaging DESIGNATED materials and backfilling the resulting trenches, holes, and pits.



CHECK DAM SPACING

DRAINAGE GRADE %	DRAINAGE SPACING (FEET)
<3	OCCASIONAL
3–7	50
8–12	25
>12	15





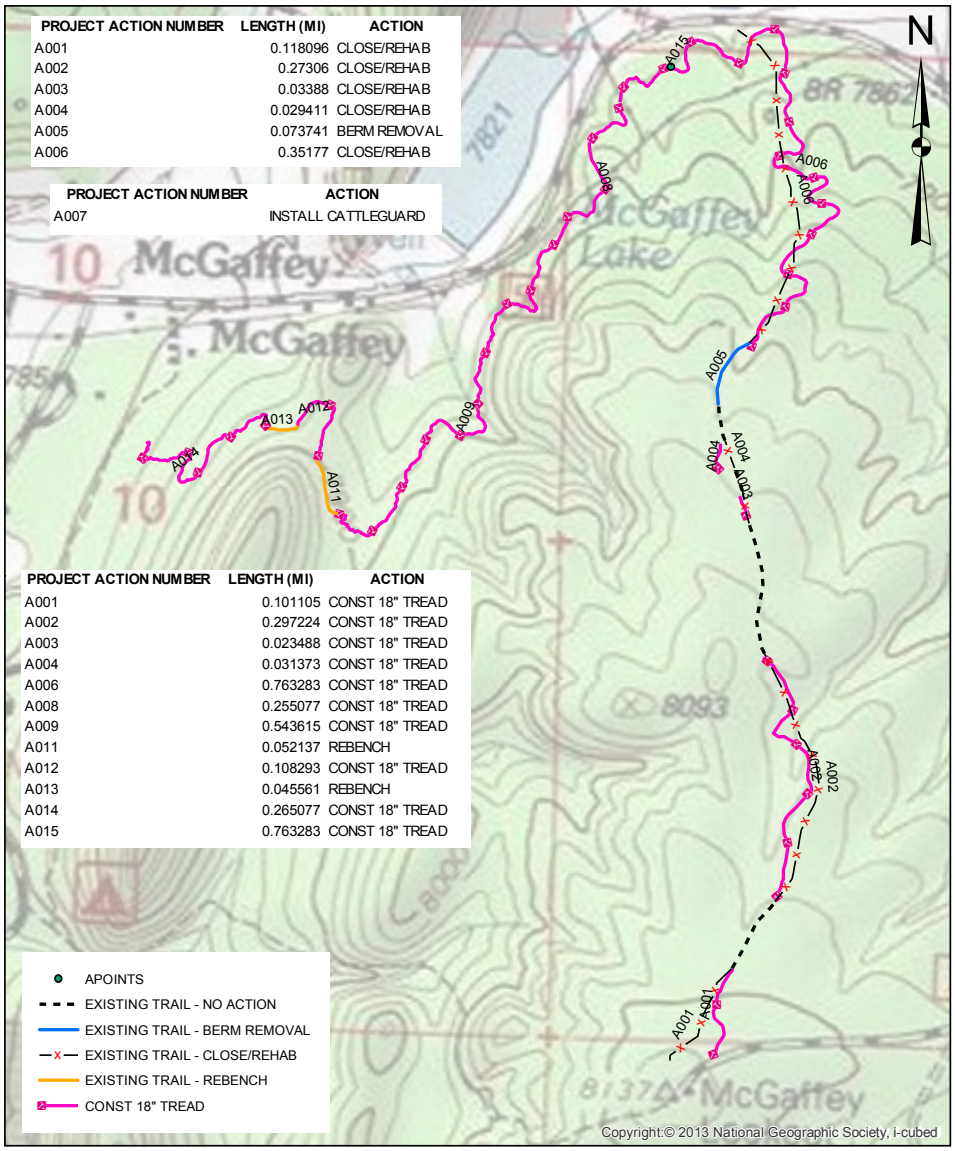
ZMTP PROJECT A & B ACTIONS

PROJECT ACTION NUMBER	LENGTH (MI)	LENGTH (FT)	ACTION	USFS STANDARD TRAIL DRAWING	USFS STANDARD SPEC FOR CONST OF TRAILS	UNIT OF MEASURE	PAY ITEM NO.
A001	0.101105489	533.836983	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
A001	0.118095782	623.5457304	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
A002	0.297224307	1569.344343	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
A002	0.273060408	1441.758956	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
A003	0.023487882	124.0160176	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
A003	0.033880179	178.8873467	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
A004	0.031372553	165.647079	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
A004	0.02941115	155.290872	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
A005	0.073741258	389.3538405	BERM REMOVAL	STD_911-30-01 - TREAD WIDTH 18"	911.5	LF	91101
A006	0.763283282	4030.13573	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
A006	0.351770217	1857.346748	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
A008	0.255077397	1346.808655	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
A009	0.543615208	2870.2883	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
A011	0.052137322	275.285061	REBENCH	STD_911-30-01 - TREAD WIDTH 18"	911.30.01	LF	91101
A012	0.108293392	571.7891095	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
A013	0.045560585	240.5598868	REBENCH	STD_911-30-01 - TREAD WIDTH 18"	911.30.01	LF	91101
A014	0.265076837	1399.605701	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
A015	0.763283282	4030.13573	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
B001	0.055300414	291.9861857	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
B001	0.076832866	405.6775341	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
B002	0.022629115	119.4817279	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
B003	0.035682406	188.403104	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
B003	0.075985343	401.2026136	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
B004	0.026773241	141.3627139	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
B004	0.023914429	126.2681869	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
B007	0.037976314	200.5149376	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
B007	0.038961817	205.7183942	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
B009	0.572840087	3024.595659	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
B009	0.603874404	3188.456853	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
B010	0.027467793	145.0299484	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
B010	0.070396038	371.6910832	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
B011	0.041685948	220.1018076	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
B011	0.030572073	161.4205445	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
B012	0.187513963	990.0737239	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
B012	0.267941318	1414.73016	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
B013	0.037501082	198.005714	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
B013	0.045452527	239.9893418	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
B014	0.022528845	118.9523022	BERM REMOVAL	STD_911-30-01 - TREAD WIDTH 18"	911.5	LF	91101
B015	0.037281348	196.8455166	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
B015	0.035568345	187.8008627	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
B016	0.348642956	1840.834806	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
B016	0.565397192	2985.297172	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101

PROJECT ACTION NUMBER	LENGTH (MI)	ACTION
A001	0.118096	CLOSE/REHAB
A002	0.27306	CLOSE/REHAB
A003	0.03388	CLOSE/REHAB
A004	0.029411	CLOSE/REHAB
A005	0.073741	BERM REMOVAL
A006	0.35177	CLOSE/REHAB

PROJECT ACTION NUMBER	ACTION
A007	INSTALL CATTLEGUARD

PROJECT ACTION NUMBER	LENGTH (MI)	ACTION
A001	0.101105	CONST 18" TREAD
A002	0.297224	CONST 18" TREAD
A003	0.023488	CONST 18" TREAD
A004	0.031373	CONST 18" TREAD
A006	0.763283	CONST 18" TREAD
A008	0.255077	CONST 18" TREAD
A009	0.543615	CONST 18" TREAD
A011	0.052137	REBENCH
A012	0.108293	CONST 18" TREAD
A013	0.045561	REBENCH
A014	0.265077	CONST 18" TREAD
A015	0.763283	CONST 18" TREAD



Zuni Mountain Trails Project

MIKES RIPPIN (TRAIL PROJECT A)

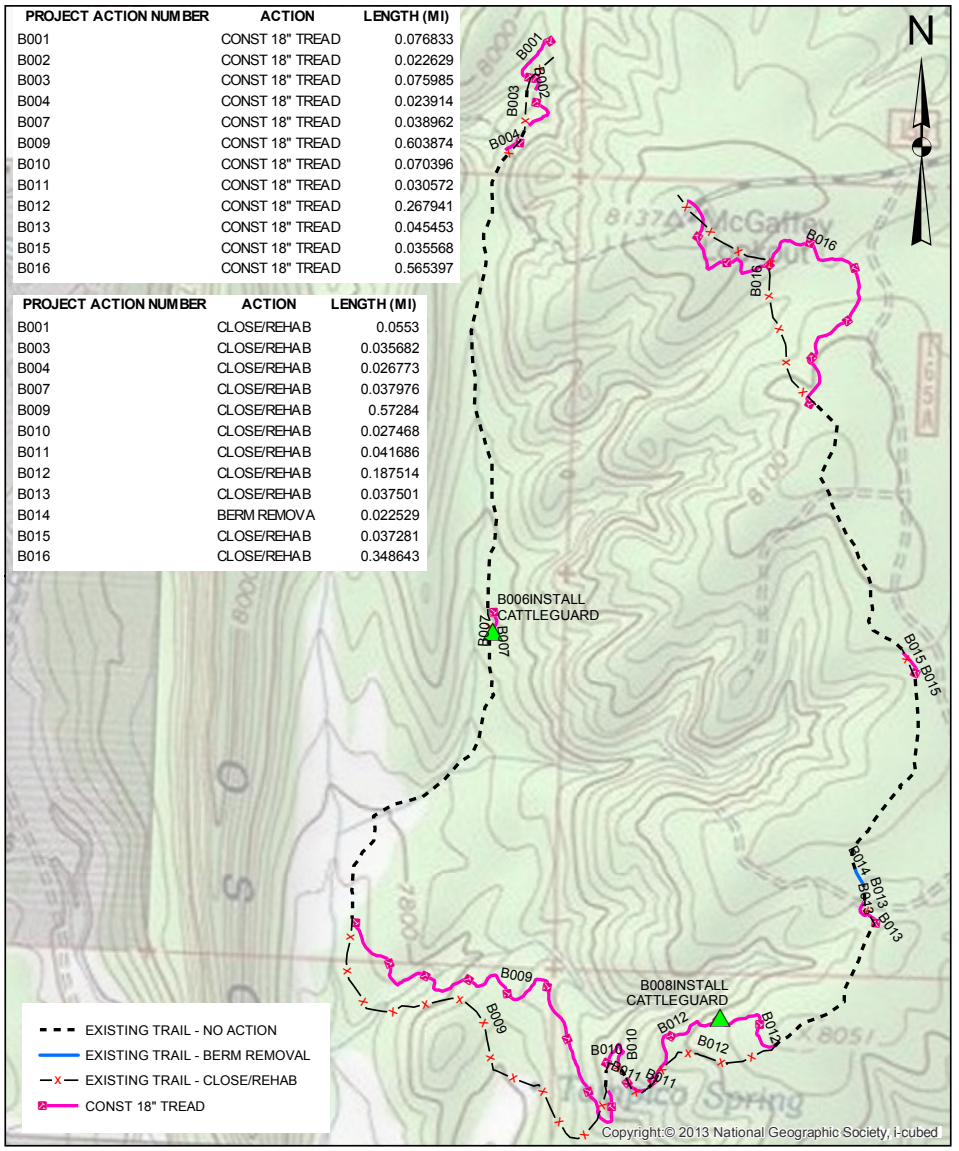
0 0.05 0.1 0.2 0.3 0.4 Miles

NAD 83 1:8,000

The Cibola National Forest uses the most current data available. Updates are performed as new information becomes available. No warranties are made regarding the accuracy of these data.

PROJECT ACTION NUMBER	ACTION	LENGTH (MI)
B001	CONST 18" TREAD	0.076833
B002	CONST 18" TREAD	0.022629
B003	CONST 18" TREAD	0.075985
B004	CONST 18" TREAD	0.023914
B007	CONST 18" TREAD	0.038962
B009	CONST 18" TREAD	0.603874
B010	CONST 18" TREAD	0.070396
B011	CONST 18" TREAD	0.030572
B012	CONST 18" TREAD	0.267941
B013	CONST 18" TREAD	0.045453
B015	CONST 18" TREAD	0.035568
B016	CONST 18" TREAD	0.565397

PROJECT ACTION NUMBER	ACTION	LENGTH (MI)
B001	CLOSE/REHAB	0.0553
B003	CLOSE/REHAB	0.035682
B004	CLOSE/REHAB	0.026773
B007	CLOSE/REHAB	0.037976
B009	CLOSE/REHAB	0.57284
B010	CLOSE/REHAB	0.027468
B011	CLOSE/REHAB	0.041686
B012	CLOSE/REHAB	0.187514
B013	CLOSE/REHAB	0.037501
B014	BERM REMOVA	0.022529
B015	CLOSE/REHAB	0.037281
B016	CLOSE/REHAB	0.348643



Zuni Mountain Trails Project

TAMPICO SPRINGS (TRAIL PROJECT B)

0 0.05 0.1 0.2 0.3 0.4 Miles

NAD 83 1:10,000

The Cibola National Forest uses the most current data available. Updates are performed as new information becomes available. No warranties are made regarding the accuracy of these data.

PROJECT 2 & 3 DESIGN SPECS

Milk Ranch Canyon Trail Network

TRAIL CONSTRUCTION 18”

911.10.01 This work consists of the excavation and placement of excavated material, regardless of its nature, from within the trailway or from other sources, except for material included under other pay items SHOWN IN THE SCHEDULE OF ITEMS.

Includes excavation, embankment, and backfill construction required to shape and finish the trailbed, ditches, backslopes, fill slopes, drainage dips, trail passing sections, and turnouts. Also includes excavation and embankment work required to construct culverts, trail bridges, shallow stream fords and gully crossings, talus and rubble rock sections, and climbing turns.

911.10.04 Trailway Excavation and Embankment. Minor deviations of ± 12 inches in vertical alignment and 36 inches in horizontal alignment with smooth transitions of at least 30 feet on each side of the deviation are acceptable unless otherwise SHOWN ON THE PLANS.

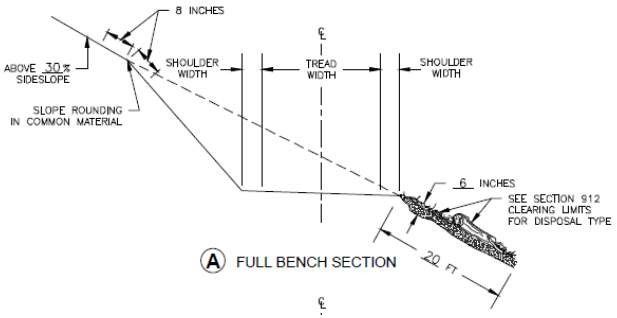
Construct embankments with suitable compacted material. Compact all disturbed soil within the trailbed area. Remove any rock within or above the backslopes that is unstable. Leave the finished slope in a uniform and roughened condition.

Make necessary adjustments of horizontal or vertical alignment, within the tolerances specified in this subsection, to produce the designed trailway section and balance earthwork. Such adjustments shall not be considered as changes.

911.10.05 Trailbed Finish. Fill holes with suitable material, compact, and cut high points to provide a uniform trailbed finish.

Finished trail tread width will be 18”

TYPICAL TRAIL CROSS SECTIONS



BERM REMOVAL & REBENCH

911.30-Existing Trail Restoration

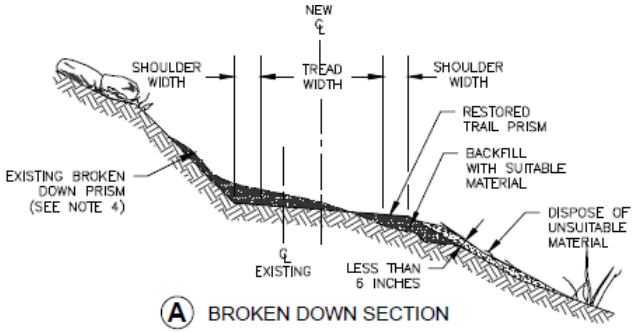
Description

911.30.01 This work consists of restoring the original trail template, including clearing, removing slough and berm, borrow, filling ruts and troughs, reshaping backslopes, excavation, reshaping trail tread, restoring drainage and other trail structures, constructing check dams, and removing protruding rocks, roots, stumps, slough, and berms.

Construction

911.30.03 Clearing and Grubbing. Clear and grub in accordance with the requirements of section 912 and as SHOWN ON THE PLANS.

911.30.04 Excavation and Embankment. Excavate and place all excavated material in accordance with the requirements of section 911.10.04 and as SHOWN ON THE PLANS.

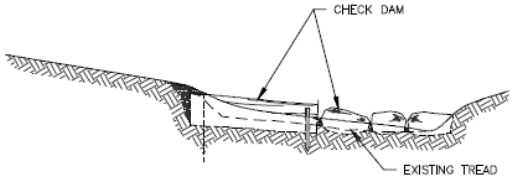


CLOSE/REHAB

911.60 - Obliteration of Abandoned Trails

Description

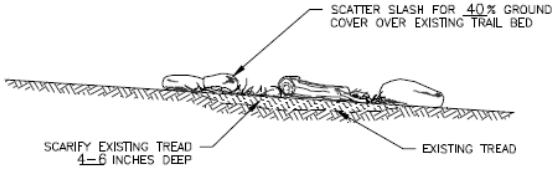
911.60.01 This work consists of removal and disposal of existing structures, including turnpikes, walkways, bridges, culverts, signs and posts, and other material within the trailway, above or below ground. Work also includes salvaging DESIGNATED materials and backfilling the resulting trenches, holes, and pits.



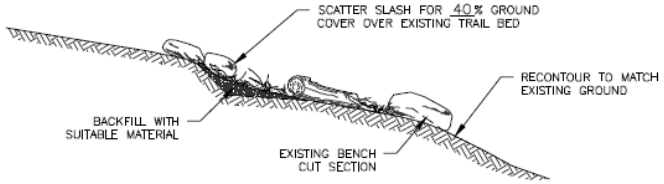
Ⓐ CHECK DAM SECTION

CHECK DAM SPACING

DRAINAGE GRADE %	DRAINAGE SPACING (FEET)
<3	OCCASIONAL
3–7	50
8–12	25
>12	15



Ⓑ SCARIFICATION AND SLASH PLACEMENT SECTION



Ⓒ RECONTOUR & SLASH PLACEMENT SECTION

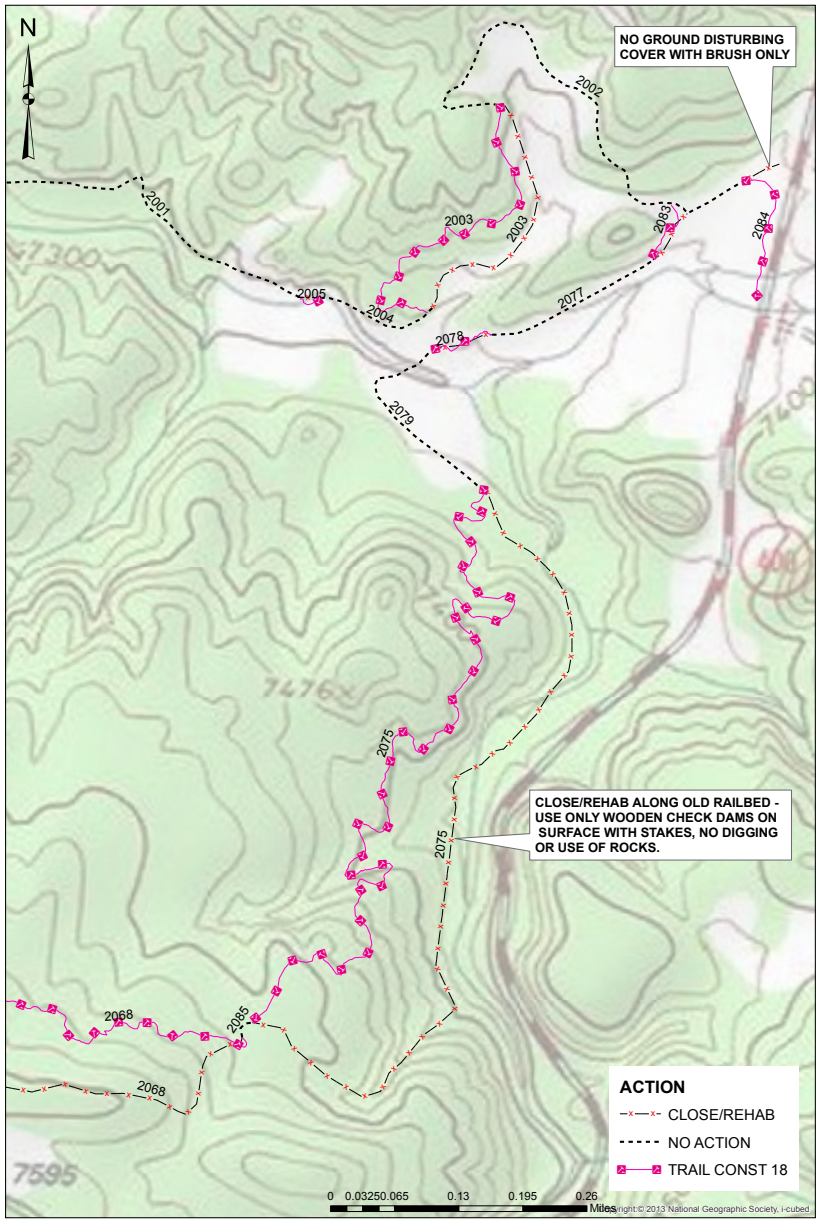
SCATTER SLASH
COVER OVER

PROJECT ACTION NUMBER	LENGTH (MI)	LENGTH (FT)	ACTION	USFS STANDARD TRAIL DRAWING	USFS STANDARD SPEC FOR CONST OF TRAILS	UNIT OF MEASURE	PAY ITEM NO.
2003	0.4	2075	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2005	0.0	129	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2008	0.0	162	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2010	0.0	79	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2012	0.0	71	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2014	0.0	106	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2016	0.0	22	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2018	0.0	69	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2020	0.0	76	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2022	0.1	275	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2024	0.1	426	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2026	0.0	41	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2028	0.0	90	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2030	0.0	110	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2032	0.0	153	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2034	0.0	73	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2037	0.0	156	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2006	0.1	396	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2047	0.0	80	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2049	0.2	1149	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2051	0.2	1063	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2053	0.0	119	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2055	0.2	820	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2057	0.1	659	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2059	0.0	140	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2061	0.0	97	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2063	0.0	254	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2065	0.0	81	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2067	0.0	129	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2070	0.0	146	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2072	0.2	1239	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101

2074	0.1	491	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2078	0.1	377	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2083	0.1	363	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2084	0.1	783	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2075	1.1	5952	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
2068	0.5	2783	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
Total 2 Relocations	4.0	21236					
2002	0.0	201	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2003	0.3	1462	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2005	0.0	108	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2006	0.1	387	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2008	0.0	158	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2010	0.0	64	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2012	0.0	53	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2014	0.0	116	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2016	0.0	39	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2018	0.0	37	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2020	0.0	105	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2022	0.0	235	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2024	0.1	376	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2026	0.0	37	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2028	0.0	79	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2030	0.0	129	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2032	0.0	114	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2034	0.0	76	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2037	0.0	136	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2047	0.0	72	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2049	0.3	1625	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2051	0.1	646	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2053	0.0	109	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2055	0.1	750	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2057	0.1	742	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2059	0.0	184	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2061	0.0	92	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115

2063	0.0	217	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2065	0.0	62	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2067	0.0	78	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2068	0.5	2463	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2070	0.0	152	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2072	0.1	645	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2074	0.1	399	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2075	0.9	4698	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2078	0.1	325	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
2083	0.1	319	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
Total 2 Rehab	3.3	17491					

PROJECT ACTION NUMBER	LENGTH (MI)	LENGTH (FT)	ACTION	USFS STANDARD TRAIL DRAWING	USFS STANDARD SPEC FOR CONST OF TRAILS	UNIT OF MEASURE	PAY ITEM NO.
3002	0.3	1657	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
3004	0.3	1394	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
3005	0.3	1526	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
3008	0.1	466	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
3012	0.0	182	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
3013	0.1	317	TRAIL CONST 18"	STD_911-01 (A) FULL BENCH SECTION - TREAD WIDTH 18"	911.10.04	LF	91101
otal 3 Relocatior	1.0	5541					
3002	0.5	2620	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
3004	1.2	6160	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
3005	0.5	2417	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
3008	0.1	364	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
3012	0.0	97	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
3013	0.0	221	CLOSE/REHAB	STD_911-60-01	911.60.01	LF	9115
Total 3 Rehab	2.2	11880					

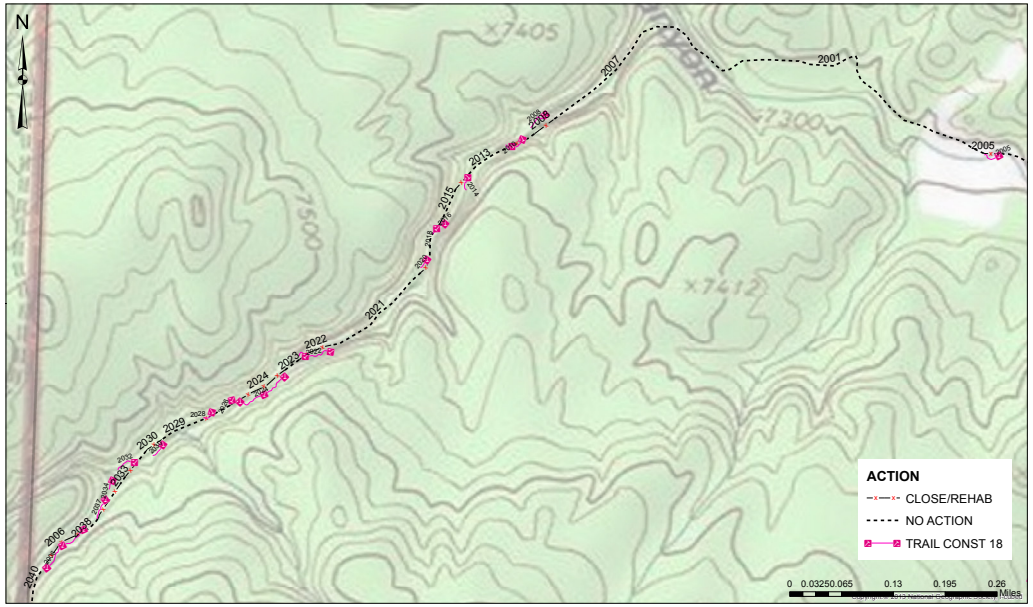


Zuni Mountain Trails Project
Project 2 (Milk Ranch Loop) Map 1 of 3
Updated 04/21/2020

NAD 83 1:5,000

USDA

The Cibola National Forest uses the most c urrent data available. Updates are performed as new information be comes available. No warranties are made regarding the accuracy of these data.

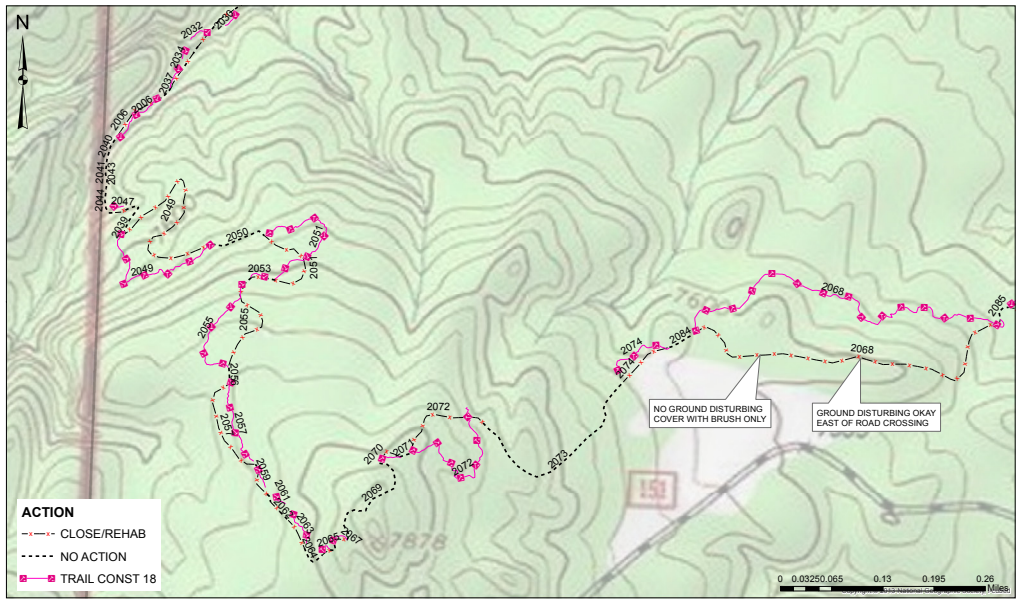


Zuni Mountain Trails Project
Project 2 (Milk Ranch Loop) Map 2 of 3
Updated 04/21/2020

NAD 83 1:5,000

USDA

The Cibola National Forest uses the most c urrent data available. Updates are performed as new information be comes available. No warranties are made regarding the accuracy of these data.

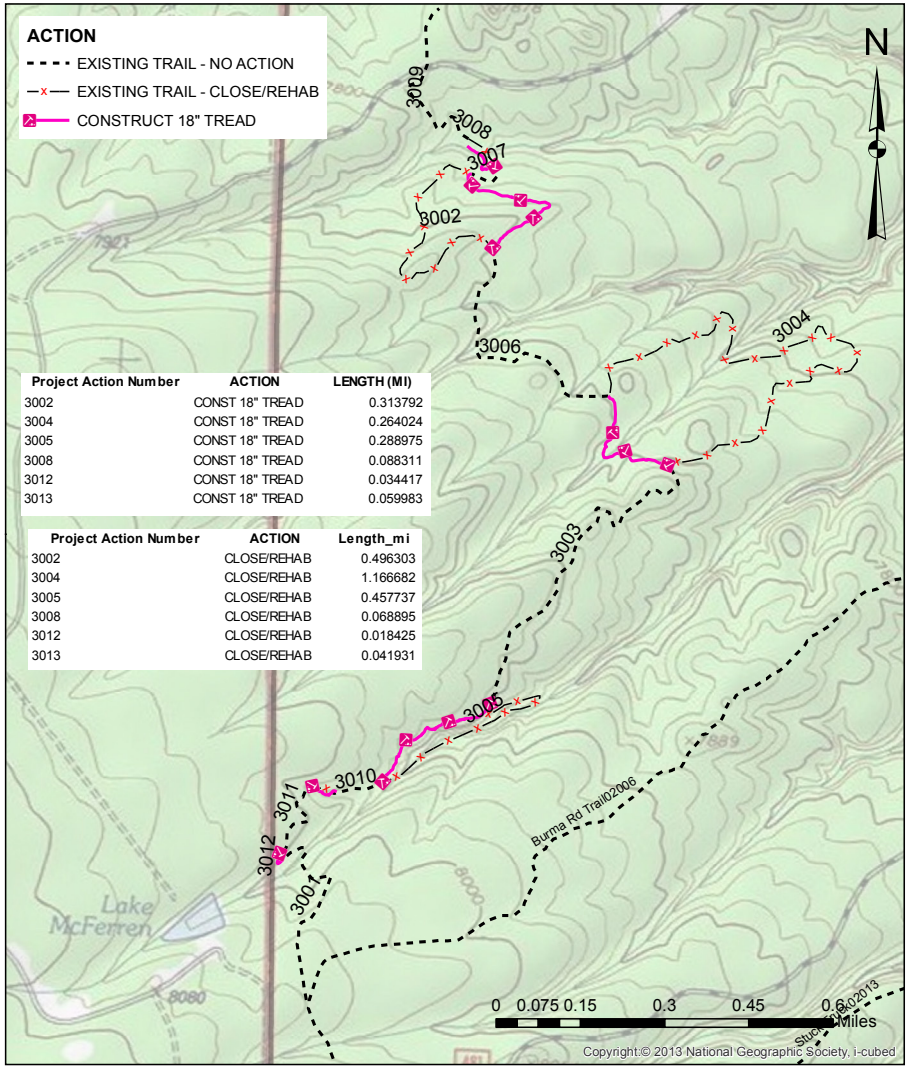


Zuni Mountain Trails Project
Project 2 (Milk Ranch Loop) Map 3 of 3
Updated 04/21/2020

NAD 83 1:5,000

USDA

The Cibola National Forest uses the most c urrent data available. Updates are performed as new information be comes available. No warranties are made regarding the accuracy of these data.



Project Action Number	ACTION	LENGTH (MI)
3002	CONST 18" TREAD	0.313792
3004	CONST 18" TREAD	0.264024
3005	CONST 18" TREAD	0.288975
3008	CONST 18" TREAD	0.088311
3012	CONST 18" TREAD	0.034417
3013	CONST 18" TREAD	0.059983

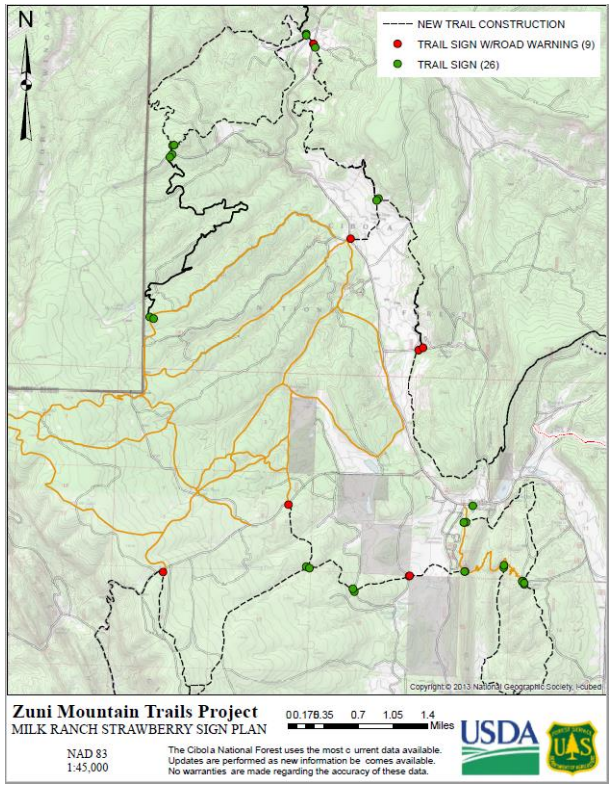
Project Action Number	ACTION	Length_mi
3002	CLOSE/REHAB	0.496303
3004	CLOSE/REHAB	1.166682
3005	CLOSE/REHAB	0.457737
3008	CLOSE/REHAB	0.068895
3012	CLOSE/REHAB	0.018425
3013	CLOSE/REHAB	0.041931

Zuni Mountain Trails Project
Project 3 (Quasimodo)
Updated 4/21/2020

NAD 83 1:13,000

The Cibola National Forest uses the most c urrent data available. Updates are performed as new information be comes available. No warranties are made regarding the accuracy of these data.

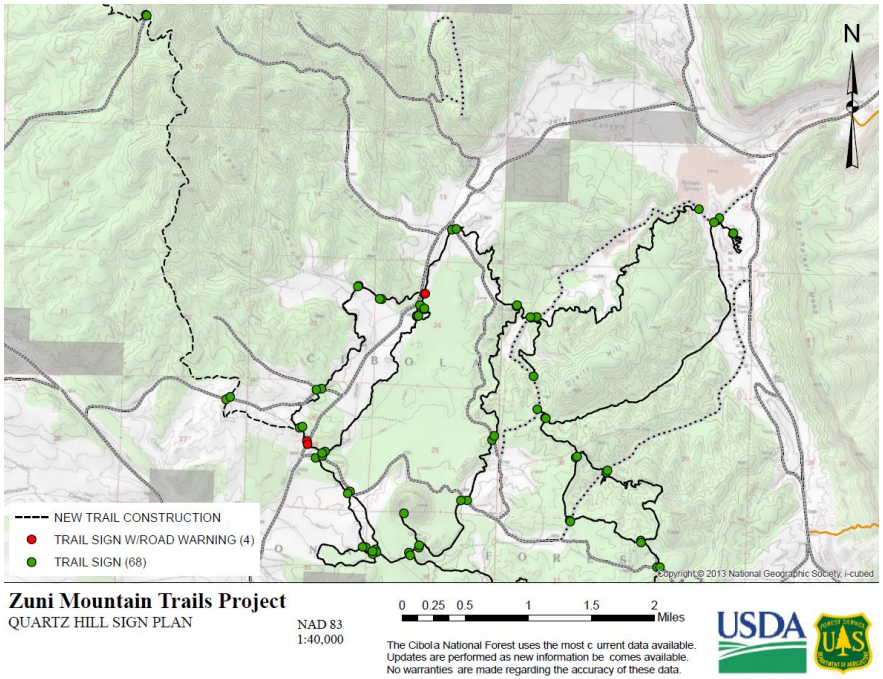
Milk Ranch/Strawberry



MILK RANCH/STRAWBERRY SIGNS			
Component	**Quantity per sign**	**Signs**	**Total**
Route Identifier/Directional Sign	1	35	35
Number Decal	3	35	105
Arrow Decal (if needed)	2	35	70
Regulatory Strip Decal	1	35	35
Carsonite Backing Piece	1	35	35
Sign Post	1	35	35
Lag Bolt 3/8”X 2 ½”	3	35	105
3/8” Washer	2	35	70
Course Thread Deck Screw 1”	2	35	70
Road Crossing Warning Sign	1	9	9

Preliminary Quantities Per Area

Quartz Hill



QUARTZ HILL SIGNS			
Component	**Quantity per sign**	**Signs**	**Total**
Route Identifier/Directional Sign	1	72	72
Number Decal	3	72	216
Arrow Decal (if needed)	2	72	144
Regulatory Strip Decal	1	72	72
Carsonite Backing Piece	1	72	72
Sign Post	1	72	72
Lag Bolt 3/8”X 2 ½”	3	72	216
3/8” Washer	2	72	144
Course Thread Deck Screw 1”	2	72	144
Road Crossing Warning Sign	1	4	4

Trail Sign Plan

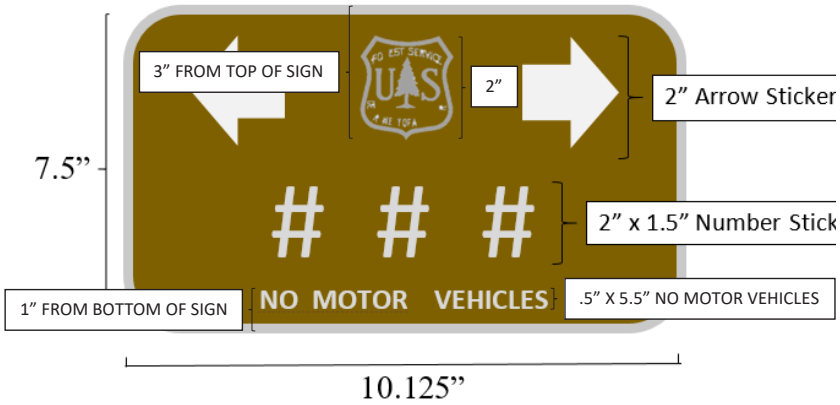
ZUNI MOUNTAIN TRAIL PROJECT-01/2020

Sign Specifications

The primary sign design shall include the following components per installation:

Component	Quantity
Route Identifier/Directional Sign	1
Number Decal	3
Arrow Decal (if needed)	2
Regulatory Strip Decal	1
Carsonite Backing Piece	1
Steel u-channel post (#2, 6' in length)	1
Bolt 5/16-18 X 2 ½" (full thread)	4
5/16" Washer	8
5/16" Tamper-resistant Nut	4

Route Identifier/Directional Sign



Panel Dimensions: 10.125" x 7.5" x 1/8" thick
Panel Substrate: Aluminum Surface: Retroreflective
Legend Size: 2" x 1.5" numbers and 2" arrows (reflective stickers)

Recommend: Rocky Mountain Aluminum to purchase "blank" signs (Retroflective brown signs with Forest Service Shield and "NO MOTOR VEHICLES" printed on it.)

Number Stickers: https://www.rockartsigns.com/d72/product/10-305-
10-305-(number 0-9)
Individual numeric decals measure 1.5"W x 2"H.
White numbers on brown backgrounds with full bleeds. Reflective.

Arrow Stickers: https://www.rockartsigns.com/d72/product/10-612-2-
10-612-2-00 (white)
2" Tall arrows are computer cut from reflective Engineering Grade vinyl.
Sold by the strip, with 10 arrows per strip.

Regulatory Strip Decal

1in.

1in.

Custom Strip Decal from RockArt Signs on carsonite piece mounted to sign post 1"below Trail Sign.

https://www.rockartsigns.com

3" x 21" Strip Decal. Trail. Trail courtesy triangle. Hikers, horses, bicycles. No motor vehicles. With US Forest Service logo at the bottom. White/brown. Reflective.

Install on 23" piece of carsonite* with 1" on top and bottom.

*Cut from posts (suggest purchase of 54" posts)

Road Crossing Warning Sign

Custom "Road Crossing Ahead" sign from P&M Signs Inc.
Panel Dimensions: 8" x 16" x 0.08" thick
Panel Substrate: Aluminum Surface: Retroreflective
For ordering, reference Invoice #7980

Tamper-Resistant Nut
Either form works as long as it's compatible with the 5/16-18 bolt.
The Tri-Groove nut requires a special wrench that we (USFS) owns.

Equestrian Gates Specs

Figure 4—A horse walking through a “V” gate.

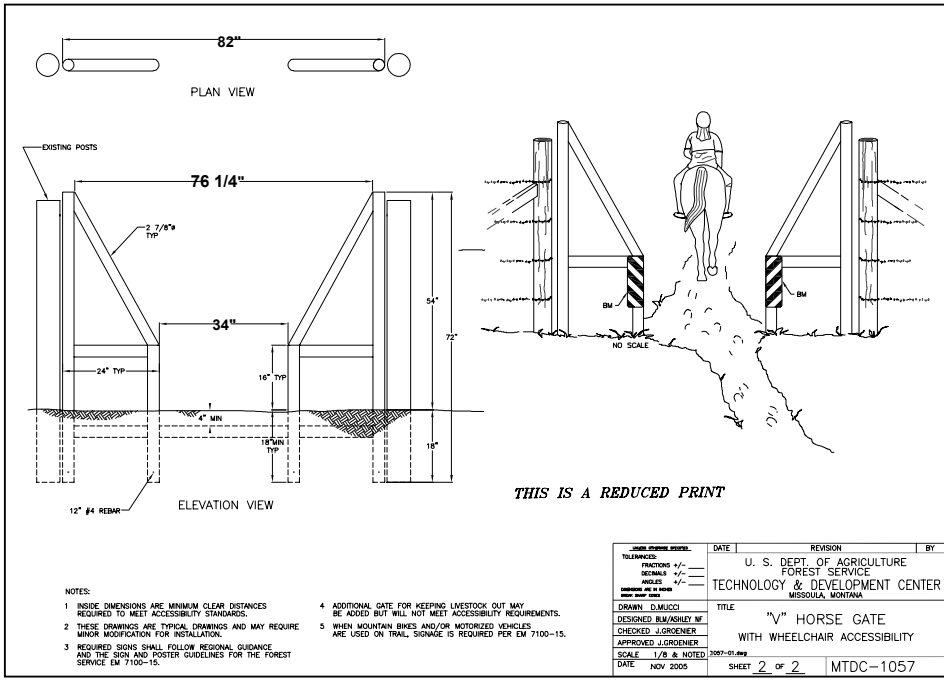
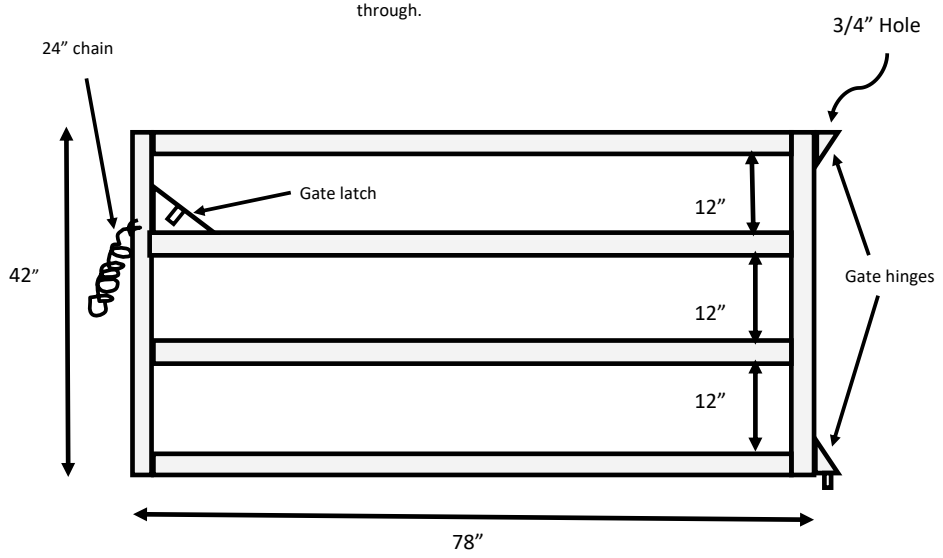


Figure 5—Accessible “V” gate drawing (MTDC–1057–02).

Modification to “V” horse gate

A swing gate needs to be added to the Main "V" structure is to prevent cattle from walking through.



Hinges need to be added to the main “V” structure to match this gate. Use measurements from this design to match the hinges on the main “V” structure.

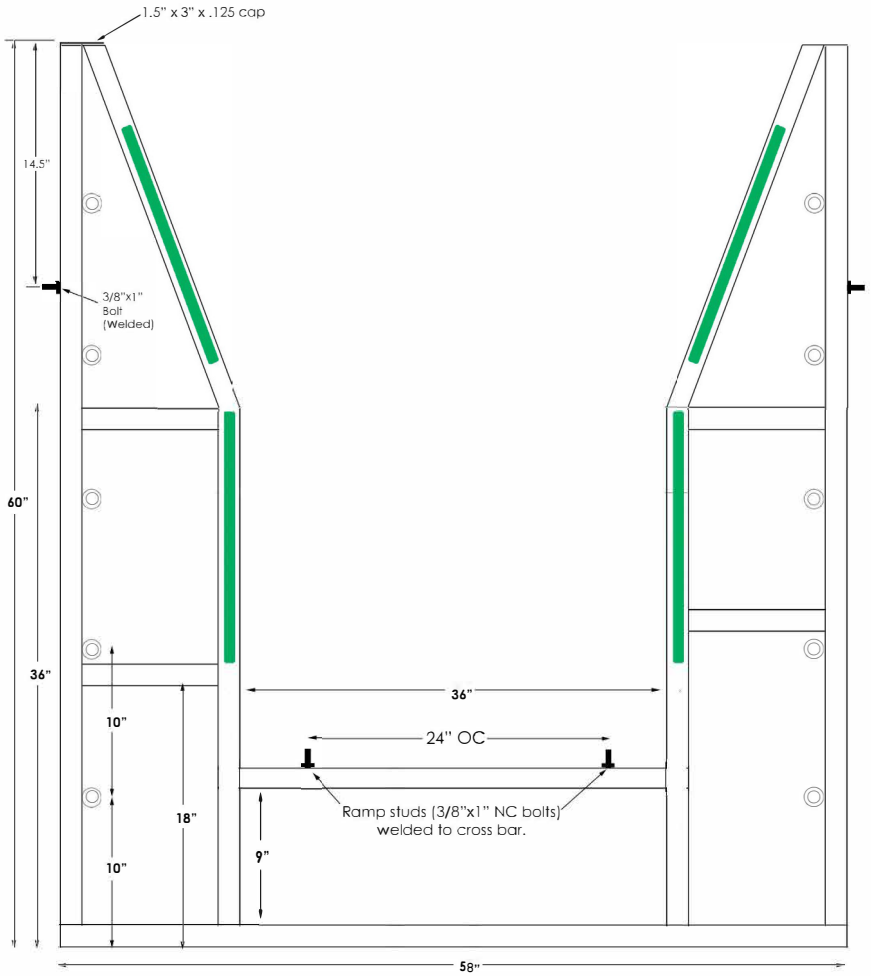
On the ”V” structure, add a hold at the top for a bolt-on hinge and weld a triangle hinge with a 3/4 “ pin for the bottom hinge.

Mountain Bike Cattle Guard Specs

Mountain Bike Trail
Cattle Guard for
Wire Fence Installation

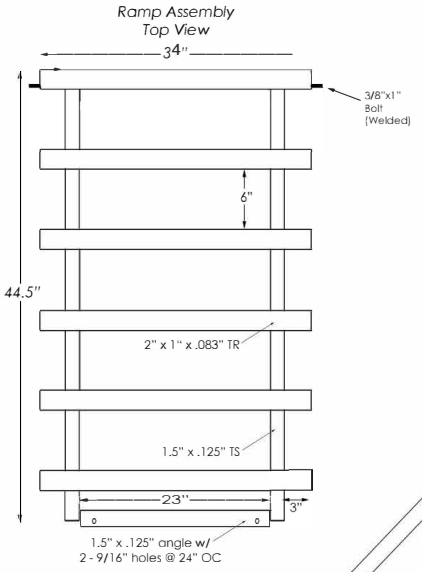
Structural U Frame

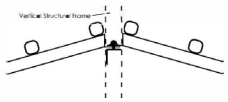
Notes:
1. *Frame is all !.5" x .125" Square Tubing*
2. *Wire guide thimbles are ~1/2" x 1" Sch 40 pipe*
3. *MIG welded joints typical.*
4. *Acid wash after fabrication to remove mill scale.*



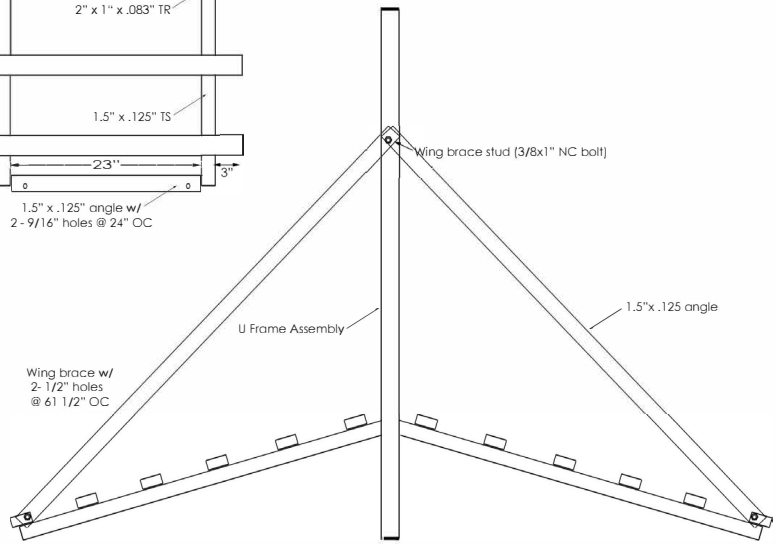
Mountain Bike Trail
Cattle Guard for
Wire Fence Installation
© 2004

Side View & Ramp Details





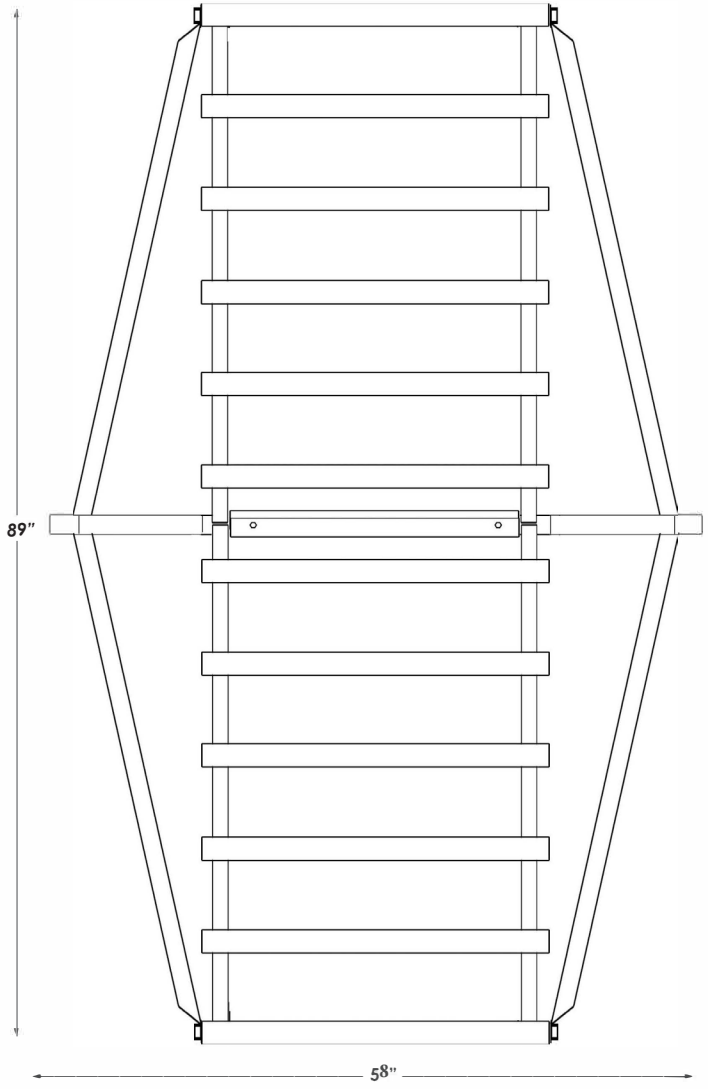
Ramp Conection Detail



Side View

Mountain Bike Trail
Cattle Guard for
Wire Fence Installation

Top View



This materials list is for 10 cattleguards:

Materials List:
13 joints TS 1.5 x .120
8 joints TR 2 x 1 x .120
7 joints A 1.5 x 1.5 x .125
1 joint ST 1.5 x .125

100 ea- 3/8" x 1" bolts, 3/8" nuts, 3/8" flat washers, 3/8" lock washers.
12 ea- 3/8" x 2" bolts with nuts, flats, and locks.
(Not stainless, in fact I would prefer unplated bare steel if available.)

2020 Scope of Work

Quartz Hill Trail System

This Scope of Work (SOW) outlines 2020 tasks that the County of Cibola is scheduled to conduct under Forest Service Agreement #20-CS-11030300-001. The County of Cibola in coordination with the Mt Taylor Ranger District is implementing the ZMTP and Conservation Master Plan. The County of Cibola is managing the operation of existing trails and new improvements for the Quartz Hill Trail Systems. The County of Cibola is coordinating closely with (McKinley County as lead on the project grant funds); and also working with Zuni Mountain Trail partners to complete 2020 tasks utilizing the Recreation Trails Program funds. McKinley County, as lead on the project grant funds for Cibola County, will issue an RFP for work to be completed once the MSO Injunction is lifted. Implementation will occur in the summer through fall field season once the MSO Injunction is lifted.

Court Order No. CV-13-00151-TUC-RCC which halted all timber management activities on six national forests in New Mexico and Arizona also affected the ZMTP project due to pending formal consultation regarding potential effects on the Mexican spotted owl. Last season, we instructed McKinley County to cease all trail work to comply with the order, therefore interrupting the trail work scheduled under their 2019 SOW. To date, we have not received clearance from the United States District Court to resume any activities affected by the injunction and we do not have a definitive timeline when the order will be lifted. Because of the MSO injunction, we anticipate that adjustments to the SOW will be necessary. The tasks that are affected by the MSO injunction will be implemented as soon as the injunction is lifted.

A total of 30 miles of trail are reflected in this SOW for completion.

TASKS

The following tasks have been identified, in priority order, to meet the intent of the agreement, and construct a sustainable recreation trail system.

The following tasks are not affected by the MSO injunction and *can be implemented immediately*:

Trail Head Construction

1. Order the Quartz Hill TH signs and materials using the Quartz Hill TH Plan as guidance
   - Order TH signs (D4, D5, D6).
   - Order the road gate including requires signs for gates (D7, D8, D9). Work with the project manager on the details.
   - Order the concrete wheel stops (D3).
   - Purchase angular rock as needed (R2).

Trail System Construction

2. Order signs and materials
   - Order signs for the trails system using the Trail Sign Plan as guidance.

- Order 7 mountain bike and equestrian gates as identified in the Final Environment Assessment and Decision Notice & Finding of No Significant Impact documents.

The following tasks that will be affected by the MSO injunction and *cannot be implemented until the MSO injunction is lifted.*

Trail Construction

3. Construct the Quartz Hill trail system
   - Construct 30 miles of trail following the approved trail design and specification.
   - Install a bike cattle guard and equestrian gate at the pasture fence crossings (total 7) on QH trail system. Work with the Forest Service Project Manager on the details.
4. Install Trail signs
   - Install signs on Trails system using the Trail Sign Plan as guidance.
5. Reporting
   - Submit a quarterly report summary (March, June, September) highlighting progress accomplishments to the Forest Service Project Manager.

Changes to the Scope of Work resulting from unforeseen circumstances will need to be submitted for review and approval by the Forest Service Program Manager.

The attachments provides details in the aforementioned tasks:

- Project Map
- Quartz Hill Trailhead design and specs (Specs is a large document-obtain a hardcopy prior to construction)
- ZMTP Sign Plan
- Equestrian Gate specs
- Mountain Bike cattle guard specs

Signatures of Authorized Representative

By signature below, the signing parties certify that they are the official representatives of their respective parties and authorized to act in their respective areas for matters related to the above-referenced grant/agreement.

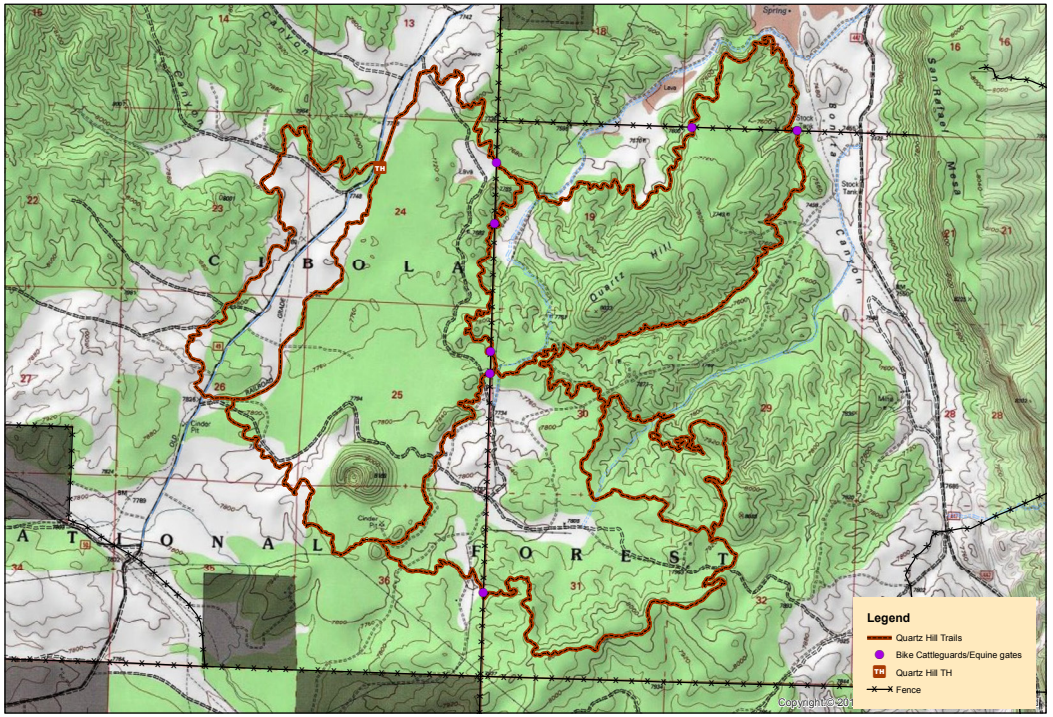
Submitted: Cooperator Program Mgr	**Signature:** _____	**Date:** _____
	Name/Title: _____	**Phone:** _____

*Note to Cooperator Project Lead: This document helps respond to the performance reporting required by the agreement.

USDA Forest Service	FS AGR: 20-CS-11030300-001 COOP AGR:

Reviewed: FS Program Mer	Signature:	Date: 04/21/20
	Name/Title: Arnold Wilson/Forester	Phone: 505-287-8833

*Note to F. S. Program Manager: Document this and any other monitoring activity in NRM.



Project Map
2020 Scope of Work
Quartz Hill Trail Network

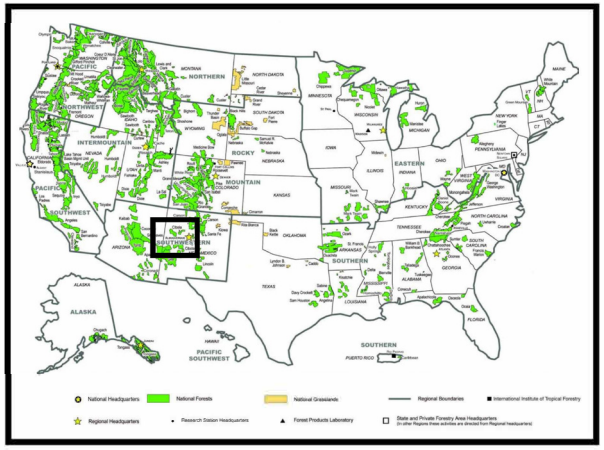
Cibola National Forest
Mt Taylor Ranger District
FS Agr: 20-CS-11030300-001

United States Department of Agriculture
Forest Service

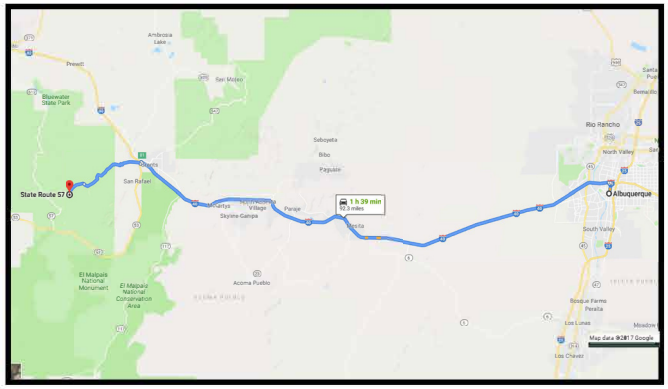
R3 SOUTHWESTERN REGION
CIBOLA NATIONAL FOREST

Cibola County
NEW MEXICO

QUARTZ HILL TRAILHEAD



PROJECT LOCATION



VICINITY MAP

TRAVEL DIRECTIONS:

FROM ALBUQUERQUE, NEW MEXICO, TRAVEL WEST ON I-40 FOR 76 MILES. TAKE ZUNI CANYON ROAD TO STATE ROUTE 57 FOR 14.2 MILES TO QUARTZ HILL TRAILHEAD SITE. 35°05'07.76"N 108°03'29.46"W.

INDEX OF SHEETS

SHEET	SHEET TITLE	DATE
G1	COVER SHEET	9/26/19
G2	SCHEDULE OF ITEMS AND PROJECT DESCRIPTION	9/26/19
S1	SITE PLAN	9/26/19
D1	2-UNIT VAULT COMFORT STATION LAYOUT	9/26/19
D2	COMFORT STATION INSTALLATION, CONCRETE, AND VAN HORN ROLE CONCRETE TO AGGREGATE DETAILS	9/26/19
D3	BARRIER ROCK AND CONCRETE WHEEL STOP DETAILS	9/26/19
D4	2-PANEL BULLETIN BOARD INSTALLATION DETAILS	9/26/19
D5	SIGN LIST AND INSTALLATION DETAILS	9/26/19
D6	MINOR SITE IDENTIFICATION SIGN DETAILS	9/26/19
D7	GATE FABRICATION DETAIL	9/26/19
D8	GATE FABRICATION DETAILS (CONT.)	9/26/19
D9	GATE INSTALLATION DETAILS	9/26/19
R1	ACCESS ROAD PLAN AND PROFILE	9/26/19
R2	TYPICAL ROAD CROSS SECTIONS	9/26/19
CS1	CONSTRUCTION STAKEOUT POINTS	9/26/19
CS2	CONSTRUCTION STAKEOUT POINTS (CONT.)	9/26/19

RECOMMENDED BY:

FOREST ENGINEER _____ DATE _____

DISTRICT RANGER _____ DATE _____

APPROVED:

FOREST SUPERVISOR _____ DATE _____

SCHEDULE OF ITEMS

ITEM NUMBER	DESCRIPTION	METHOD OF MEAS	UNIT	QUANTITY
010250	Construction Staking	LSQ	LS	Lump Sun
011900	Mobilization	LSQ	LS	Lump Sum
022060	Loose Rock Riprap, Rock Mulch	DQ	CY	110
101110	Two-Panel Bulletin Board (Kiosk)	AQ	EA	1
101400	Signs - Regulatory & Directional (Aluminum)	AQ	EA	8
101415	Signs - Minor Site I.D. Sign (HDPE)	AQ	EA	1
132700	Pre-cast Concrete Vault Restroom (Double unit)	AQ	EA	1
133460	Pre-cast Concrete Vault Restroom Installation (Includes 4' concrete apron)	LSQ	LS	Lump Sum
311000	Clearing and Grubbing - Acre	AQ	Acre	1
312010	Select Borrow (Under roads, parking, toilet area)	DQ	CY	185
312100	Project Site Preparation and Grading (Road, Parking Areas, Pathway, Toilet and Bulletin Board Area)	LSQ	LS	Lump Sum
321204-1	Crushed Aggregate Surface Course - Grading G (Road, Parking)	DQ	CY	140
321204-2	Crushed Aggregate Base Course - Grading C (Under concrete apron)	DQ	CY	10
321400	Crusher Fines Surface Course (Accessible Areas around Restroom and Bulletin Board)	DQ	CY	33
322205	Barrier Rock (Can be salvaged from site)	AQ	EA	57
322622	Precast Concrete Curb - 6'	AQ	EA	10
322716	Road Closure Gate (22-foot width, Double-Gate)	AQ	EA	2

PROJECT DESCRIPTION

1. THIS PROJECT INCLUDES CONSTRUCTION OF A NEW TRAILHEAD PARKING AREA INCLUDING ENTRANCE AND EXIT ROAD ROAD OFF THE STATE ROAD.
2. THE WORK INCLUDES CLEARING AND GRUBBING OF THE AREAS TO RECEIVE THE NEW ROADS AND PARKING AREAS, CONSTRUCTION OF A NEW AGGREGATE SURFACE ENTRANCE ROAD AND PARKING AREAS, INSTALLATION OF A NEW DOUBLE VAULT RESTROOM WITH CONCRETE APRON, CONSTRUCTION OF AN ACCESSIBLE AGGREGATE SURFACE RESTROOM AREA AND FUTURE PICNIC AREA, INSTALLATION OF RIPRAP ROCK, INSTALLATION OF A NEW 2–PANEL BULLETIN BOARD, CONSTRUCTION OF AN ACCESSIBLE AGGREGATE SURFACED BULLETIN BOARD AREA, AND INSTALLATION OF SIGNS, BARRIER ROCKS, CURB STOPS, ENTRANCE AND EXIT GATES AND OTHER WORK AS DESCRIBED IN THE PLANS.

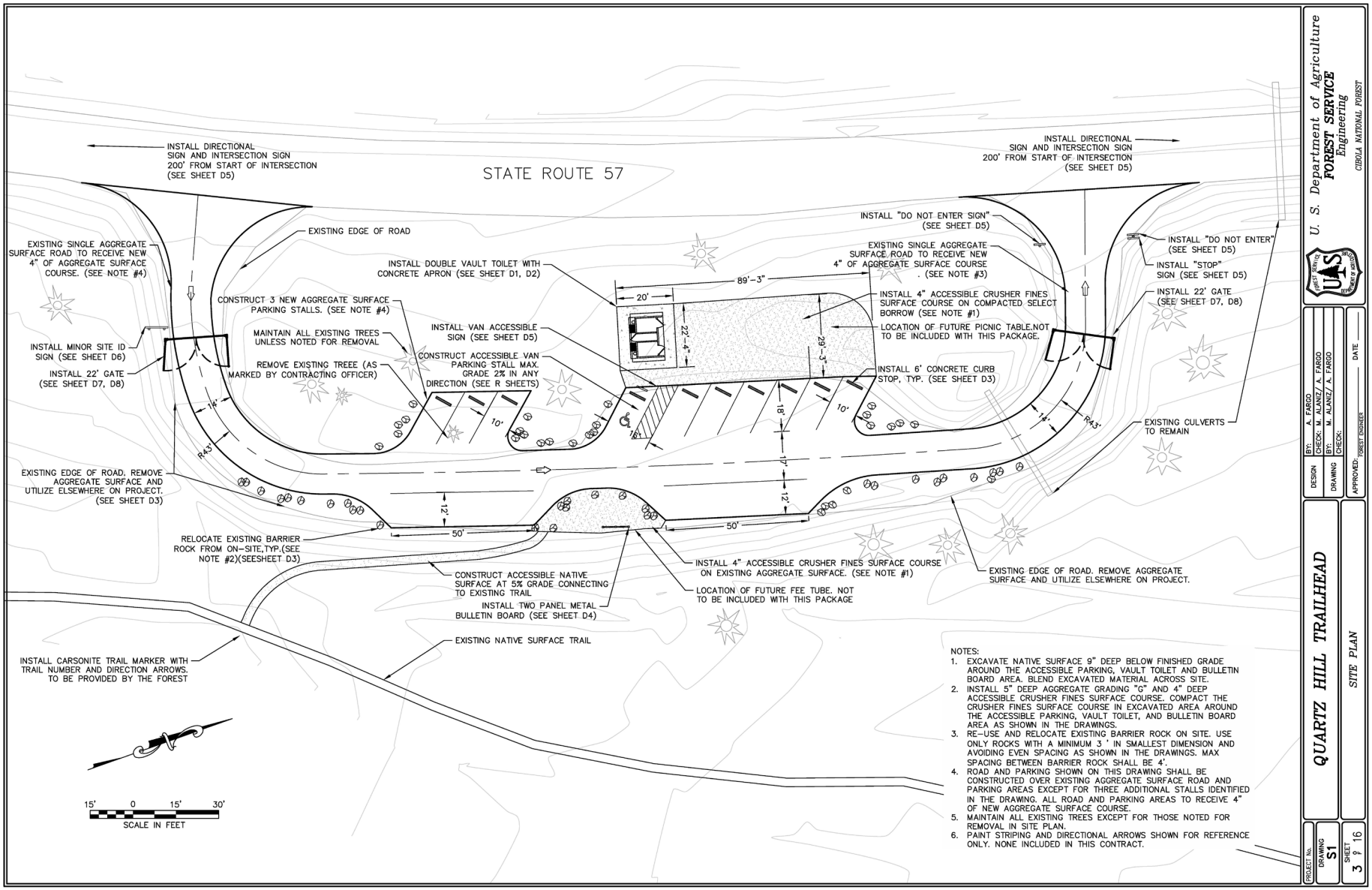
U. S. Department of Agriculture
FOREST SERVICE
Engineering
CIBOLA NATIONAL FOREST

DESIGN BY: M.ALANIZ/ A.FARGO
DRAWING BY: M. ALANIZ/A.FARGO
APPROVED: FOREST ENGINEER DATE

QUARTZ HILL TRAILHEAD

SCHEDULE OF ITEMS AND PROJECT DESCRIPTION

PROJECT No.
DRAWING G2
SHEET 2 of 16



NOTES:

1. EXCAVATE NATIVE SURFACE 9" DEEP BELOW FINISHED GRADE AROUND THE ACCESSIBLE PARKING, VAULT TOILET AND BULLETIN BOARD AREA. BLEND EXCAVATED MATERIAL ACROSS SITE.
2. INSTALL 5" DEEP AGGREGATE GRADING "G" AND 4" DEEP ACCESSIBLE CRUSHER FINES SURFACE COURSE. COMPACT THE CRUSHER FINES SURFACE COURSE IN EXCAVATED AREA AROUND THE ACCESSIBLE PARKING, VAULT TOILET, AND BULLETIN BOARD AREA AS SHOWN IN THE DRAWINGS.
3. RE-USE AND RELOCATE EXISTING BARRIER ROCK ON SITE. USE ONLY ROCKS WITH A MINIMUM 3 ' IN SMALLEST DIMENSION AND AVOIDING EVEN SPACING AS SHOWN IN THE DRAWINGS. MAX SPACING BETWEEN BARRIER ROCK SHALL BE 4'.
4. ROAD AND PARKING SHOWN ON THIS DRAWING SHALL BE CONSTRUCTED OVER EXISTING AGGREGATE SURFACE ROAD AND PARKING AREAS EXCEPT FOR THREE ADDITIONAL STALLS IDENTIFIED IN THE DRAWING. ALL ROAD AND PARKING AREAS TO RECEIVE 4" OF NEW AGGREGATE SURFACE COURSE.
5. MAINTAIN ALL EXISTING TREES EXCEPT FOR THOSE NOTED FOR REMOVAL IN SITE PLAN.
6. PAINT STRIPING AND DIRECTIONAL ARROWS SHOWN FOR REFERENCE ONLY. NONE INCLUDED IN THIS CONTRACT.

U. S. Department of Agriculture
FOREST SERVICE
Engineering
CIBOLA NATIONAL FOREST

DESIGN BY: A. FARGO
DRAWING CHECK: M. ALANIZ/ A. FARGO
BY: M. ALANIZ/ A. FARGO
CHECK:
APPROVED: FOREST ENGINEER DATE

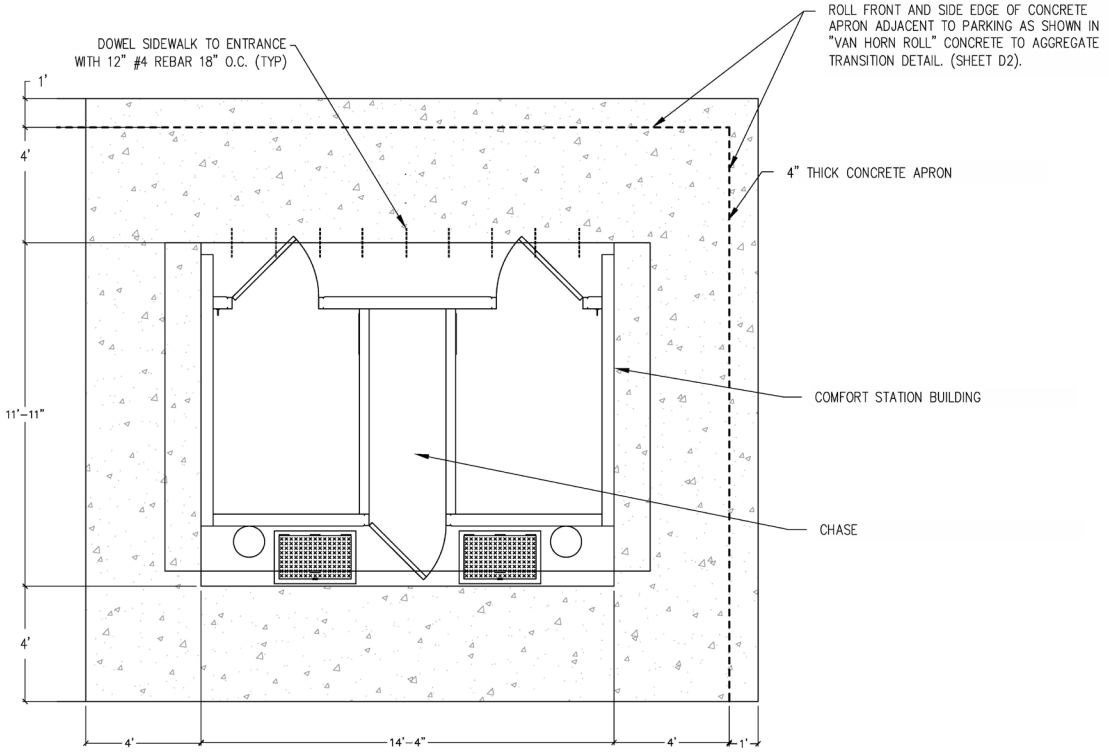
QUARTZ HILL TRAILHEAD

SITE PLAN

PROJECT No.
DRAWING S1
SHEET 3 OF 16

NOTES:

1. COMFORT STATION SHALL BE MODEL: DOUBLE CASCADIAN MANUFACTURED BY CXT INCOPRORATED OR AN APPROVED EQUAL.SEE SPECIFICATIONS SECTION 133450.
2. PREPARE THE SITE AS SHOWN ON THIS SHEET AND D2.
3. FRONT AND SIDE CONCRETE APRON EDGES WILL ROLL UNDER CRUSHER FINE AGGREGATE MATERIAL WITH 4' OF CONCRETE SIDEWALK EXPOSED AROUND TOILET. SEE "VAN HORN ROLL" CONCRETE TO AGGREGATE TRANSITION DETAIL (SHEET D2)
4. FINAL GRADING SHALL ENSURE POSITIVE DRAINAGE AWAY FROM BUILDING AT 2% FOR 10'.



2-UNIT VAULT COMFORT STATION LAYOUT (NO SCALE)
(PLAN VIEW)

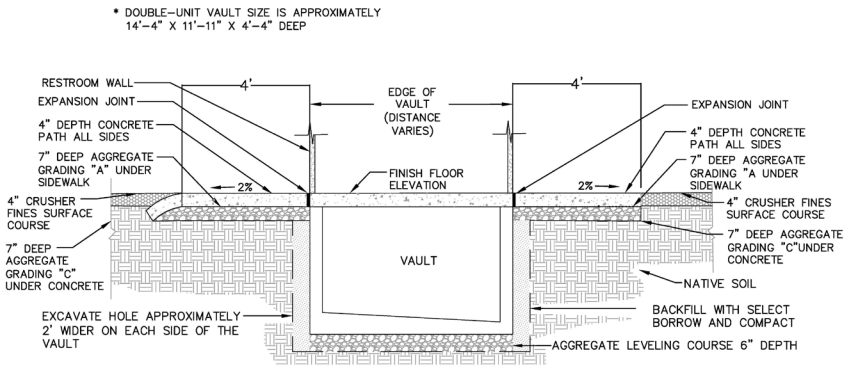
U. S. Department of Agriculture
FOREST SERVICE
Engineering
CIBOLA NATIONAL FOREST

DESIGN BY: A. FARGO
DESIGN CHECK: S. BINGHAM
DRAWING BY: A. FARGO
DRAWING CHECK: S. BINGHAM
APPROVED: FOREST ENGINEER DATE

QUARTZ HILL TRAILHEAD

2-UNIT VAULT COMFORT STATION LAYOUT

PROJECT No.
DRAWING D1
SHEET 4 OF 16

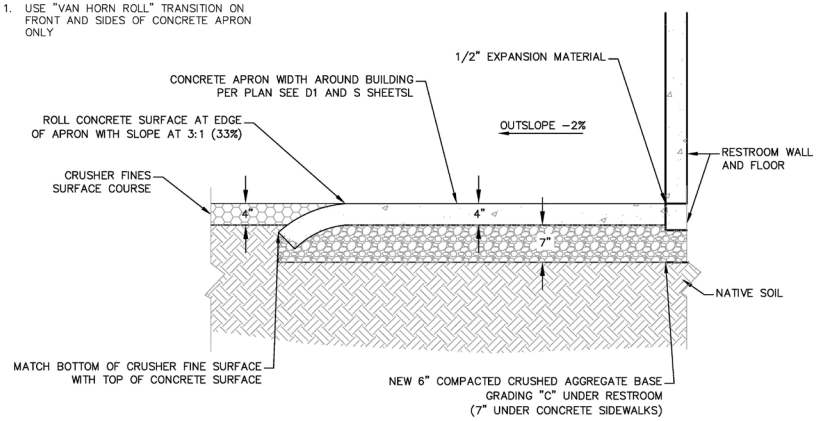


VAULT COMFORT STATION INSTALLATION DETAIL (NO SCALE)

(SECTION ELEVATION)

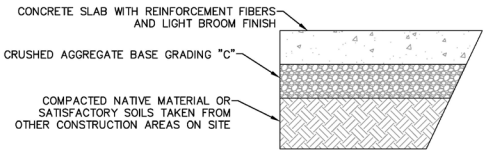
NOTES:

1. USE "VAN HORN ROLL" TRANSITION ON FRONT AND SIDES OF CONCRETE APRON ONLY

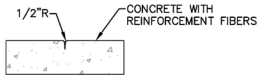


"VAN HORN ROLL" CONCRETE TO AGGREGATE TRANSITION DETAIL (NO SCALE)

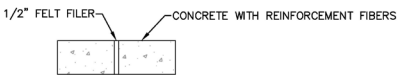
(SECTION ELEVATION)



TYPICAL CONCRETE SECTION



HAND TOOLED CONTRACTION JOINT



EXPANSION DETAIL

NOTES:

1. INSTALL CONTRACTION JOINTS 10 FEET ON CENTER AND EXPANSION JOINTS AT INTERSECTIONS IN CONCRETE SIDEWALKS AND BETWEEN SIDEWALK AND BUILDING.
2. MAXIMUM SPACE BETWEEN CONTRACTION JOINTS SHALL BE 10 FEET ON CENTER IN CONCRETE PADS. A CONTRACTION AND EXPANSION LAYOUT PLAN SHALL BE PROPOSED BY THE CONTRACTOR AND APPROVED BY THE COR PRIOR TO CONSTRUCTION.

COMFORT STATION CONCRETE DETAILS (NO SCALE)

(SECTION ELEVATION)

U. S. Department of Agriculture
FOREST SERVICE
Engineering
CIBOLA NATIONAL FOREST

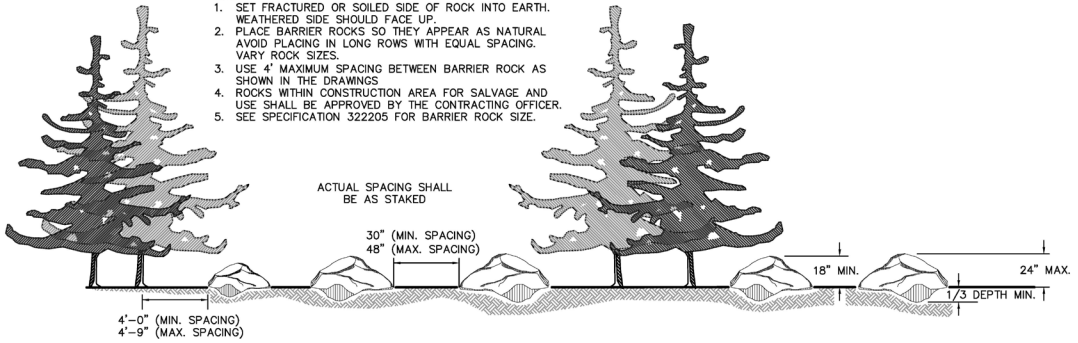
DESIGN BY: A. FARGO
CHECK: S. BINGHAM
DRAWING BY: A. FARGO
CHECK: S. BINGHAM
APPROVED: FOREST ENGINEER DATE

QUARTZ HILL TRAILHEAD

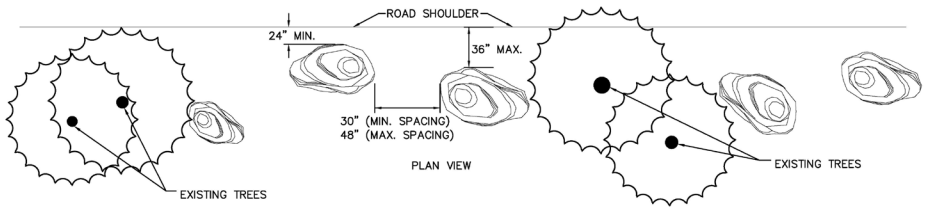
COMFORT STATION INSTALLATION, CONCRETE, AND "VAN HORN ROLL" CONCRETE TO AGGREGATE DETAILS

PROJECT No.
DRAWING D2
SHEET 5 of 16

NOTES:
1. SET FRACTURED OR SOILED SIDE OF ROCK INTO EARTH. WEATHERED SIDE SHOULD FACE UP.
2. PLACE BARRIER ROCKS SO THEY APPEAR AS NATURAL AVOID PLACING IN LONG ROWS WITH EQUAL SPACING. VARY ROCK SIZES.
3. USE 4' MAXIMUM SPACING BETWEEN BARRIER ROCK AS SHOWN IN THE DRAWINGS
4. ROCKS WITHIN CONSTRUCTION AREA FOR SALVAGE AND USE SHALL BE APPROVED BY THE CONTRACTING OFFICER.
5. SEE SPECIFICATION 322205 FOR BARRIER ROCK SIZE.



ELEVATION VIEW

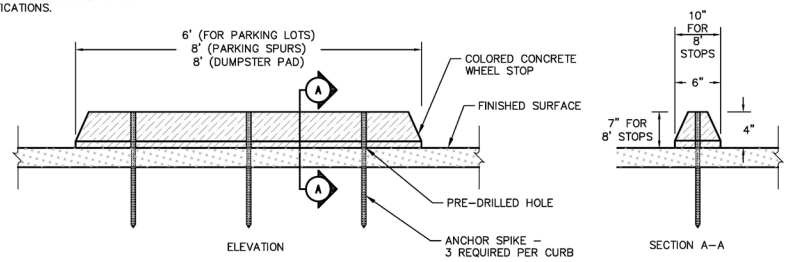


PLAN VIEW

BARRIER ROCK – DETAIL

(NOT TO SCALE)

NOTES:
1. SEE SPECIFICATION 322622 FOR WHEEL STOP STYLE AND SIZE.
2. INSTALL PER MANUFACTURERS SPECIFICATIONS.



ELEVATION

SECTION A–A

CONCRETE WHEEL STOP – DETAIL

(NOT TO SCALE)

U. S. Department of Agriculture
FOREST SERVICE
Engineering
CIBOLA NATIONAL FOREST

DESIGN BY: A. FARGO CHECK: S. BINGHAM
DRAWING BY: A. FARGO CHECK: S. BINGHAM
APPROVED: _____ FOREST ENGINEER DATE: _____

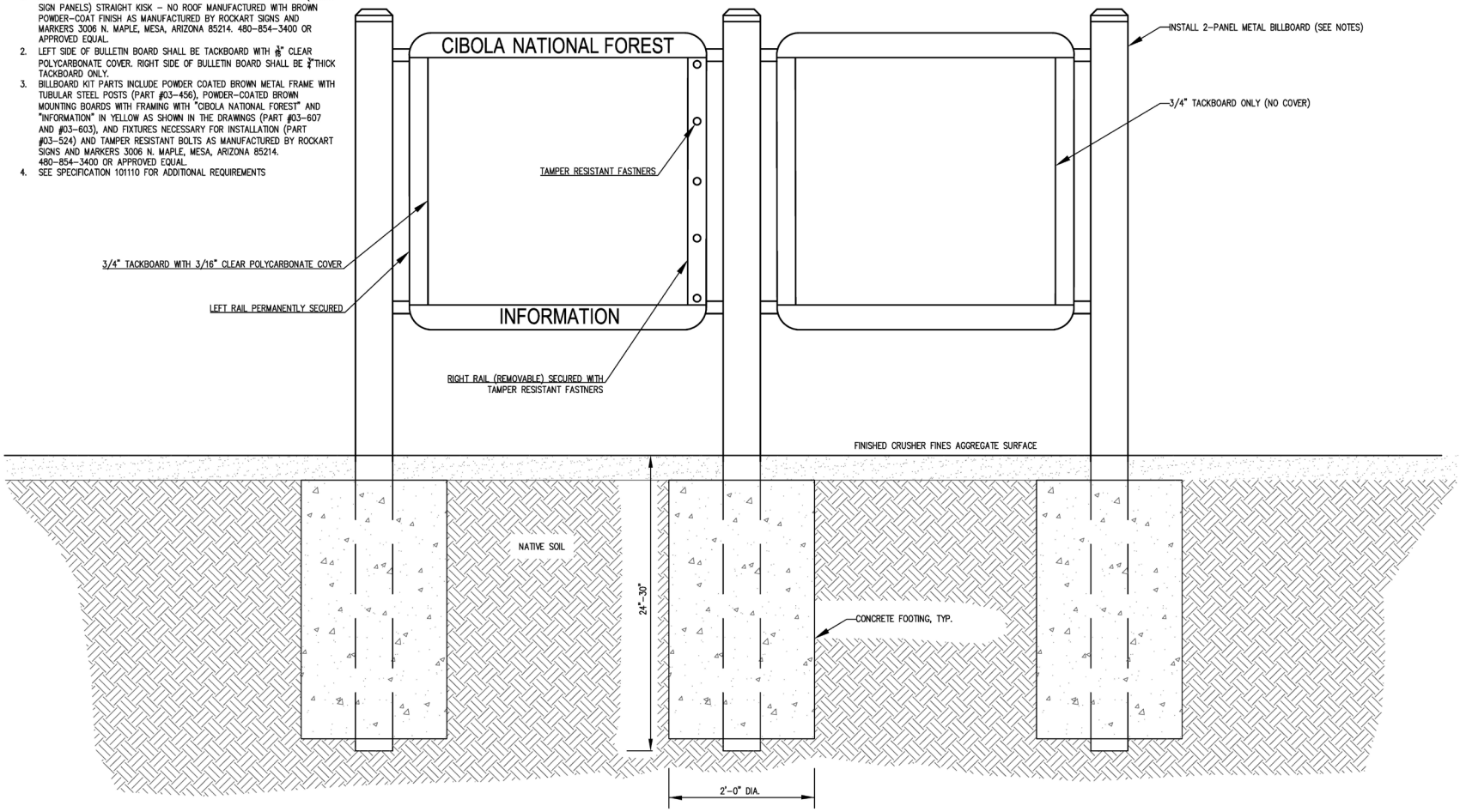
QUARTZ HILL TRAILHEAD

BARRIER ROCK AND CONCRETE WHEEL STOP DETAILS

PROJECT No.
DRAWING D3
SHEET 6 OF 16

NOTES:

1. BILLBOARD SHALL BE MODEL: PREFABRICATED METAL 6X6 2-PANEL (48X48 SIGN PANELS) STRAIGHT KISK - NO ROOF MANUFACTURED WITH BROWN POWDER-COAT FINISH AS MANUFACTURED BY ROCKART SIGNS AND MARKERS 3006 N. MAPLE, MESA, ARIZONA 85214. 480-854-3400 OR APPROVED EQUAL.
2. LEFT SIDE OF BULLETIN BOARD SHALL BE TACKBOARD WITH 3/16" CLEAR POLYCARBONATE COVER. RIGHT SIDE OF BULLETIN BOARD SHALL BE 3/4"THICK TACKBOARD ONLY.
3. BILLBOARD KIT PARTS INCLUDE POWDER COATED BROWN METAL FRAME WITH TUBULAR STEEL POSTS (PART #03-456), POWDER-COATED BROWN MOUNTING BOARDS WITH FRAMING WITH "CIBOLA NATIONAL FOREST" AND "INFORMATION" IN YELLOW AS SHOWN IN THE DRAWINGS (PART #03-607 AND #03-603), AND FIXTURES NECESSARY FOR INSTALLATION (PART #03-524) AND TAMPER RESISTANT BOLTS AS MANUFACTURED BY ROCKART SIGNS AND MARKERS 3006 N. MAPLE, MESA, ARIZONA 85214. 480-854-3400 OR APPROVED EQUAL.
4. SEE SPECIFICATION 101110 FOR ADDITIONAL REQUIREMENTS



FRONT ELEVATION
(NO SCALE)

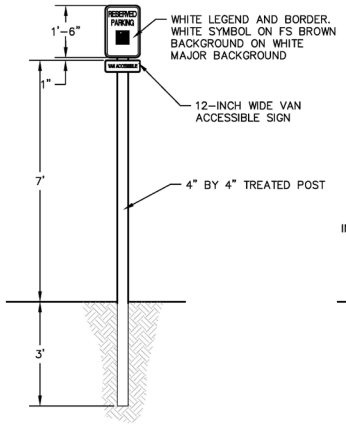
U. S. Department of Agriculture
FOREST SERVICE
Engineering
CIBOLA NATIONAL FOREST

DESIGN BY: A. FARGO CHECK: S. BINGHAM
DRAWING BY: A. FARGO CHECK: S. BINGHAM
APPROVED: _____ FOREST ENGINEER DATE: _____

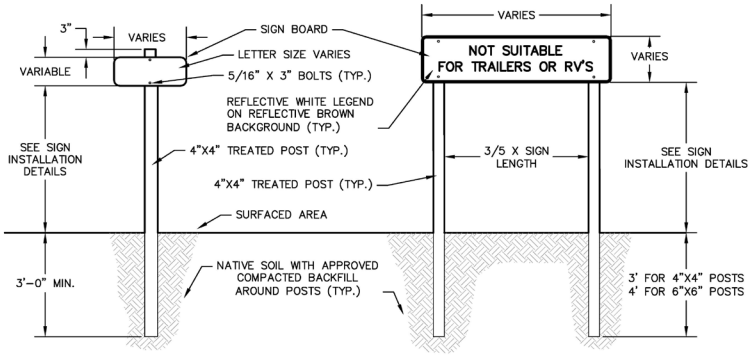
QUARTZ HILL TRAILHEAD

2-PANEL BULLETIN BOARD INSTALLATION DETAIL

PROJECT No.
DRAWING D4
SHEET 7 of 16

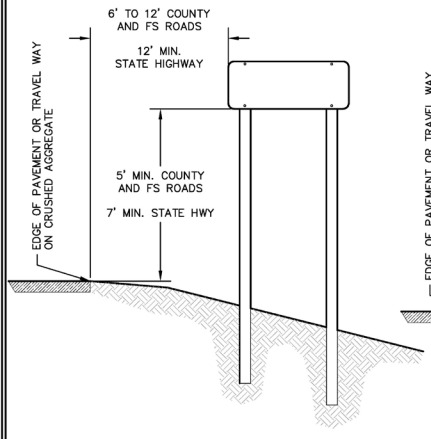


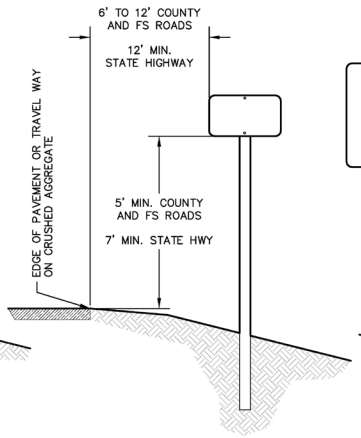
ACCESSIBLE PARKING SIGNS



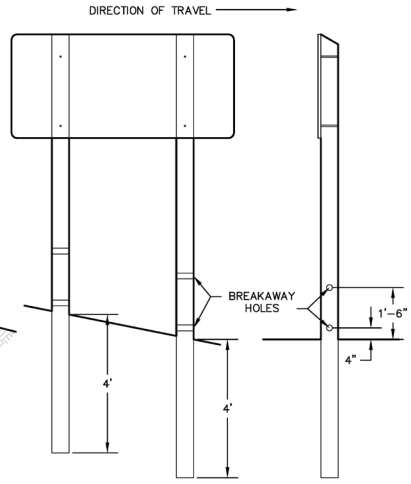
SINGLE POST SIGNS

DOUBLE POST SIGNS





SIGN INSTALLATION DETAILS



*FIELD DRILL HOLES AND TREAT WITH PRESERVATIVES.
**WOOD POSTS LARGER THAN 4"X4" OR A CROSS SECTIONAL AREA OF 24 SQUARE INCHES OR GREATER REQUIRE BREAKAWAY POSTS.

WOOD BREAKAWAY POST DETAILS

SIGN LIST

SINGLE POST SIGNS (4"X4" POSTS)

	DESCRIPTION	SIGN #	QUANTITY	SIZE NOTES	COLOR
SIGN #1	STOP SIGN	R1-1-24	1		WHITE ON RED
SIGN #2	ACCESSIBLE PARKING W/ VAN ACCESSIBLE PLAQUE	R7-8-12 R7-8a	1		WHITE ON BROWN
SIGN #3	QUARTZ HILL TRAILHEAD ⇦	FRD-2-6	1		WHITE ON BROWN
SIGN #4	QUARTZ HILL TRAILHEAD ⇨	FRD-2-6	1		WHITE ON BROWN
SIGN #5	INTERSECTION WARNING	W2-1	2		BLACK ON YELLOW
SIGN #6	DO NOT ENTER	R5-1-24	2		WHITE ON RED

NOTES:

1. SEE EM 7100-15 MANUAL FOR FRD SIGN LAYOUT REQUIREMENTS.
2. ALL SIGN BOARDS INSTALLED ON SINGLE POSTS SHALL BE CENTERED.
3. DIMENSIONS FOR SIGN INSTALLATION ARE SCHEMATIC.
4. SEE SPECIFICATION 101400 FOR SIGN POST AND MATERIALS.
5. ALL SIGNS SHALL BE INSTALLED USING VANDAL RESISTANT BOLTS AND NUTS.
6. INSTALLATION DATE AND VANDAL WARNING LABELS SHALL BE INSTALLED ON ALL SIGNS IN ACCORDANCE WITH FS MANUAL EM 7100-15.
7. ALL SIGNS SHALL MEET MUTCD AND FOREST SERVICE STANDARDS.
8. CLEAR VEGETATION AS NEEDED TO MAINTAIN VISIBILITY OF SIGNS. CLEARING SHALL BE HANDLED IN ACCORDANCE WITH SPECIFICATION 311000.
9. ALL SIGNS SHALL BE INSTALLED ON A WOOD POST UNLESS OTHERWISE NOTED.
10. THE BACK OF ALL SIGNS SHALL BE PAINTED OR POWDER COAT BROWN.
11. ALL SIGNS SHALL BE ALUMINUM.
12. ALL SIGNS SHALL BE 100% RETRO-REFLECTIVE HIGH INTENSITY TYPE III OR IV SHEETING.
13. SIGNS INSTALLED ALONG SATE ROUTE 57 WILL REQUIRE APPROVAL FROM THE COUNTY. SIGNS INCLUDE "INTERSECTION WARNING"(2) AND "QUARTZ HILL TRAILHEAD" (2)

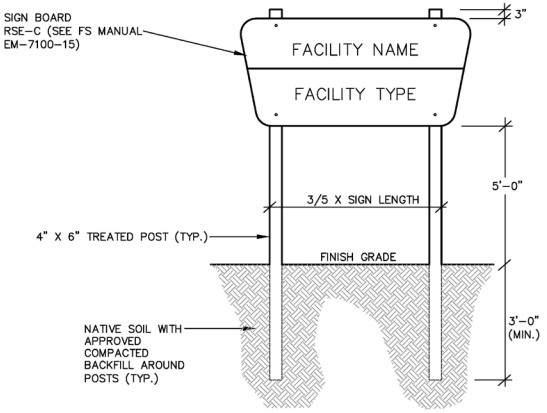
U. S. Department of Agriculture
FOREST SERVICE
Engineering
CIBOLA NATIONAL FOREST

DESIGN BY: S.BINGHAM
DRAWING CHECK: S.BINGHAM
APPROVED: FOREST ENGINEER DATE

QUARTZ HILL TRAILHEAD

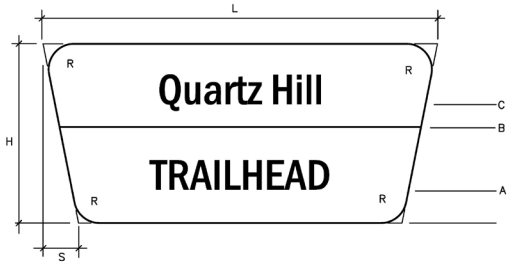
SIGN LIST AND INSTALLATION DETAILS

PROJECT No.
DRAWING D5
SHEET 8 of 16



MINOR SITE ID SIGN

(REQUIRES DOUBLE 4" X 6" POST BASE)



SIGN FACE

HDPE SIGN

TOP LEGEND

BROWN LETTERS (FEDERAL STANDARD 595 NO. 20059) ON YELLOW-CREAM (FEDERAL STANDARD 595 NO. 23695) BACKGROUND

BOTTOM LEGEND

YELLOW-CREAM LETTERS (FEDERAL STANDARD 595 NO. 23695) ON BROWN (FEDERAL STANDARD 595 NO. 20059) BACKGROUND

NOTES:

1. DIMENSIONS FOR SIGN INSTALLATION ARE SCHEMATIC.
2. SIGNS WILL BE LOCATED BY THE CONTRACTING OFFICER.
3. SEE SPECIFICATION 101415 FOR SIGN POST MATERIALS AND SPECIFICATION 101415 FOR WOOD SIGN FABRICATION.
4. ALL SIGNS SHALL BE INSTALLED USING VANDAL RESISTANT BOLTS AND NUTS.
5. ALL SIGNS SHALL BE IN ACCORDANCE WITH FS MANUAL EM 7100-15 CHAPTER 7B.

MINOR SITE ID SIGN RSE-C TABLE

SIGN #	SIGN PANEL TEXT		PANEL DIMENSIONS (INCHES)				LAYOUT DIMENSIONS MEASURED FROM BOTTOM OF PANEL (INCHES)					LETTER SIZE (INCHES)			MATERIAL
	FACILITY NAME (UPPER PANEL)	FACILITY TYPE (LOWER PANEL)	H	L	R	S	A	B	C	D	E	FACILITY NAME ASA SERIES D (INITIAL CAPS LOWER CASE)	FACILITY TYPE ASA SERIES D (UPPER CASE)	FACILITY STATUS (UPPER CASE)	
MS1	Quartz Hill	TRAILHEAD	24	60	4	4¾	5	13	16¼	N/A	N/A	5	5	N/A	HDPE

SITE IDENTIFICATION SIGN LAYOUT

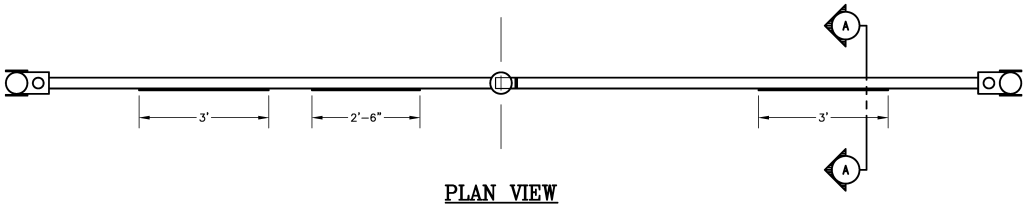
U. S. Department of Agriculture
FOREST SERVICE
Engineering
CIBOLA NATIONAL FOREST

DESIGN BY: A. FARGO CHECK: S. BINGHAM
DRAWING BY: A. FARGO CHECK: S. BINGHAM
APPROVED: FOREST ENGINEER DATE

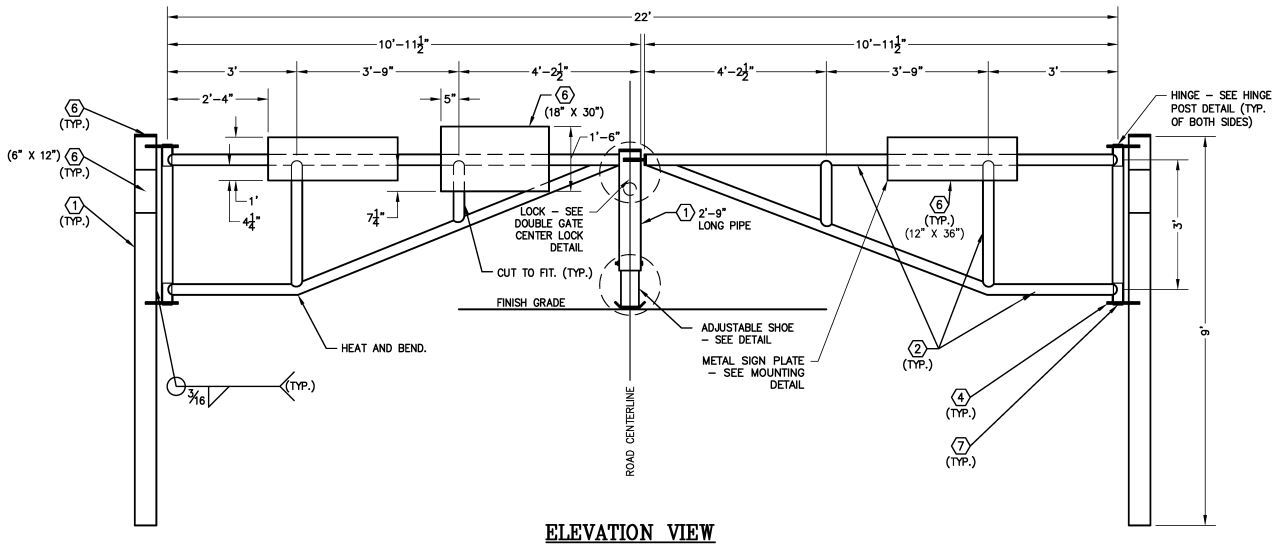
QUARTZ HILL TRAILHEAD

MINOR SITE IDENTIFICATION SIGN DETAILS

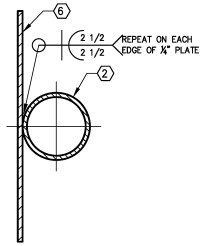
PROJECT No.
DRAWING D6
SHEET 9 OF 16



PLAN VIEW



ELEVATION VIEW



SECTION A–A
METAL SIGN PLATE
MOUNTING DETAIL

MATERIALS:

1	6" DIAMETER PIPE	6	¼" THICK PLATE
2	3" DIAMETER PIPE	7	2½" DIAMETER PIPE
3	4" DIAMETER PIPE	8	3" PIPE CAP WITH GREASE FITTING
4	¾" THICK PLATE	9	5" DIAMETER PIPE
5	½" THICK PLATE		

NOTES:

1. PRIOR TO FABRICATING GATE, THE CONTRACTOR SHALL CHECK SLOPE OF ROADWAY WHERE GATE IS TO BE INSTALLED. THE GATE MUST OPEN TOWARD MINUS GRADE ON THE FINISHED ROAD SURFACE.
2. PAINT ALL EXPOSED METAL SURFACES WITH ONE COAT OF BENJAMIN MOORE RETARDO METAL PRIMER AND TWO COATS OF BENJAMIN MOORE BROWN IMPERVO NO. 20059 OR APPROVED EQUALS.

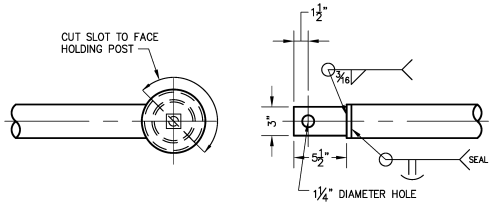
U. S. Department of Agriculture
FOREST SERVICE
Engineering
CIBOLA NATIONAL FOREST

DESIGN BY: S. BINGHAM
DRAWING CHECK: D. JEPPSEN
CHECK: S. BINGHAM
APPROVED: FOREST ENGINEER DATE

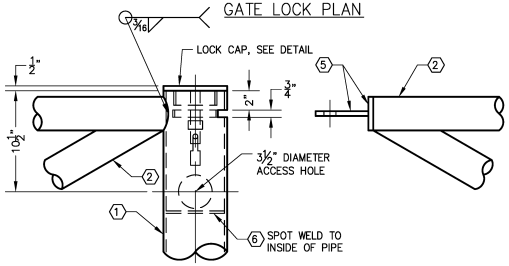
QUARTZ HILL TRAILHEAD

GATE FABRICATION DETAILS

PROJECT No.
DRAWING D7
SHEET 10 OF 16

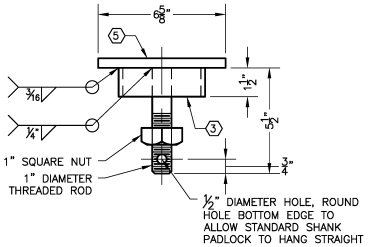


GATE LOCK PLAN

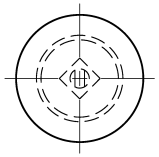


GATE LOCK ELEVATION

DOUBLE GATE CENTER LOCK DETAIL

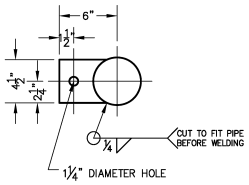


LOCK CAP ELEVATION

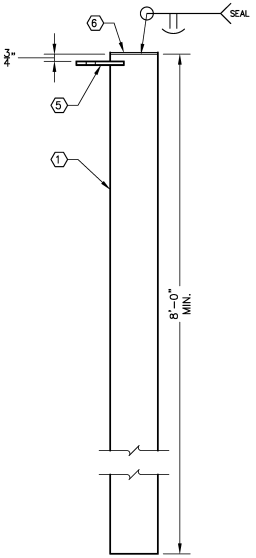


LOCK CAP PLAN

LOCK CAP DETAIL

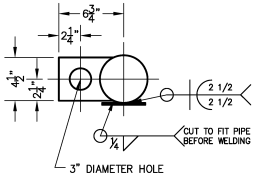


HOLDING POST PLAN

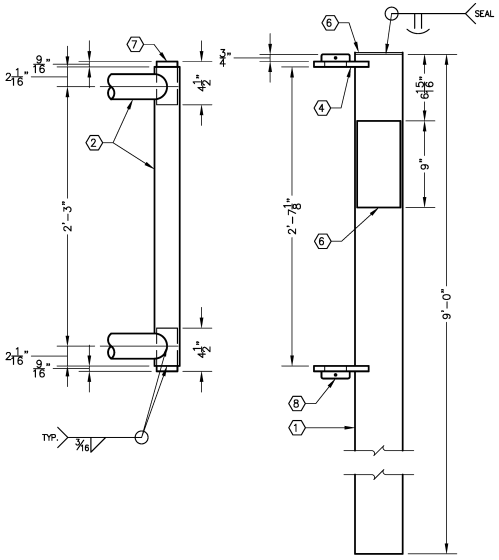


HOLDING POST ELEVATION

HOLDING POST "A" DETAIL

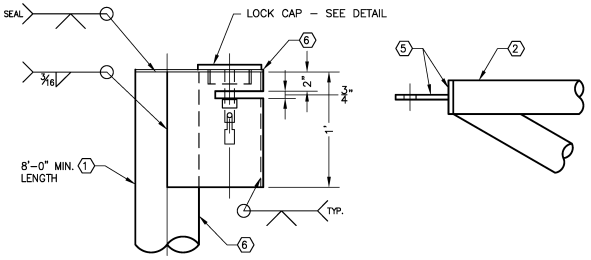


HINGE POST PLAN

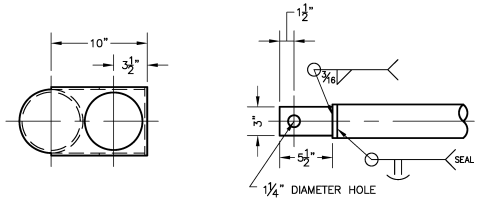


HINGE POST ELEVATIONS

HINGE POST DETAIL

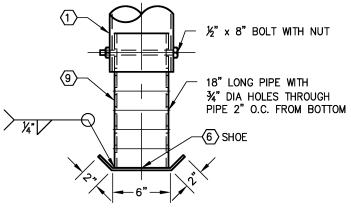


"B" GATE LOCK ELEVATION



"B" GATE LOCK PLAN

HOLDING POST "B" GATE LOCK DETAIL



ADJUSTABLE SHOE DETAIL

NOTE:

MATERIALS LIST FOUND ON "GATE FABRICATION" SHEET.

U. S. Department of Agriculture
FOREST SERVICE
Engineering
CIBOLA NATIONAL FOREST

DESIGN BY: S. BINGHAM
DRAWING CHECK: D. JEPPSEN
BY: S. BINGHAM
CHECK: S. BINGHAM
APPROVED FOREST ENGINEER DATE

QUARTZ HILL TRAILHEAD

GATE FABRICATION DETAILS (CONT.)

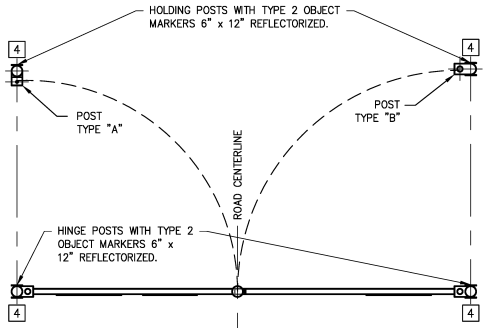
PROJECT No.
DRAWING DB
SHEET 11 of 16

NOTES:

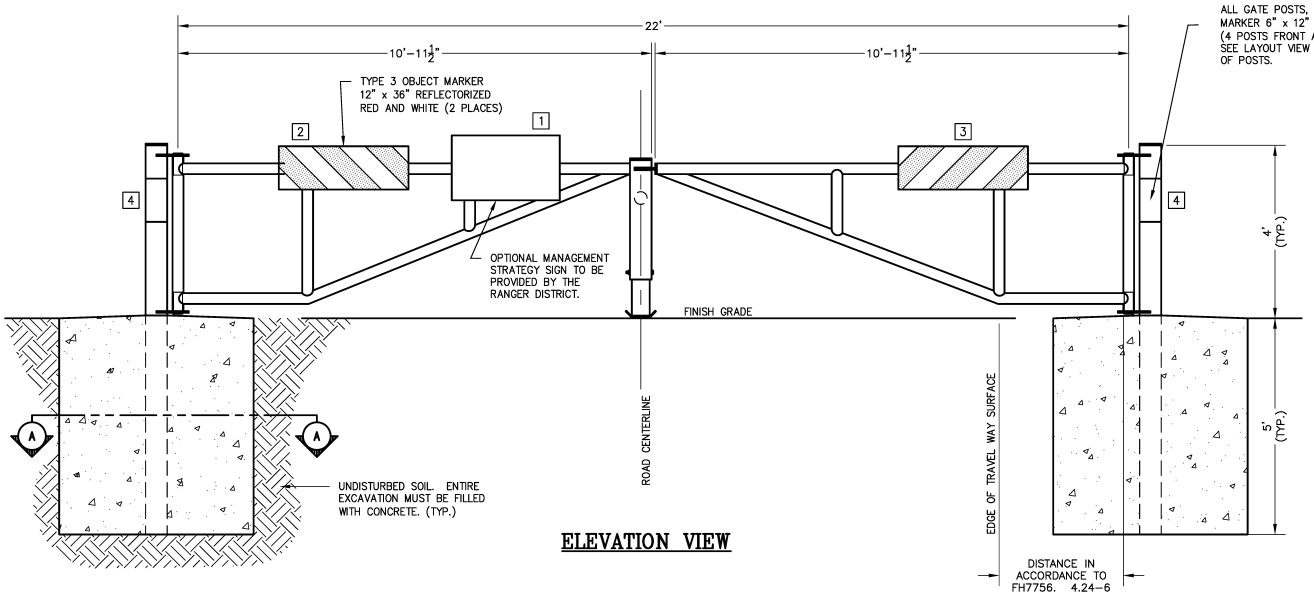
1. FIELD LOCATE HOLDING POSTS TO SUPPORT GATE IN OPEN POSITION.
2. ALL SIGNS AND OBJECT MARKERS SHALL BE BOLTED TO STEEL BACKING PLATES.
3. IF HOLES FOR POSTS ARE OVER EXCAVATED, THE CONTRACTOR MUST FILL THE OVER EXCAVATED HOLES WITH CONCRETE AT NO EXTRA COST TO THE GOVERNMENT.
4. THE CONTRACTOR SHALL FURNISH AND INSTALL OBJECT MARKERS AND SIGNS. THESE SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

SIGN SCHEDULE

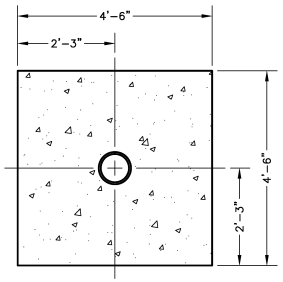
SIGN	QTY.	DESCRIPTION	SIZE	MATERIAL	REMARKS
1	1	FRD-1-4 BLACK ON WHITE	AS REQ.	ALUMINUM	ROAD CLOSED
2	1	BM-L	36 x 12	ALUMINUM	
3	1	BM-R	36 x 12	ALUMINUM	
4	8	OM2-2	6 x 12	REFLECTORIZED DECAL	



LAYOUT VIEW



ELEVATION VIEW



SECTION A-A

NOTES:

1. TYPICAL FOR HINGE POSTS ONLY.
2. CONCRETE BASES FOR HOLDING POSTS "A" AND "B" SHALL BE 24" SQUARE AND 48" DEEP.
3. EXPOSED TOP PORTION OF EACH CONCRETE BASE SHALL BE SLOPED A MINIMUM OF 2% TO DRAIN AWAY FROM POST.

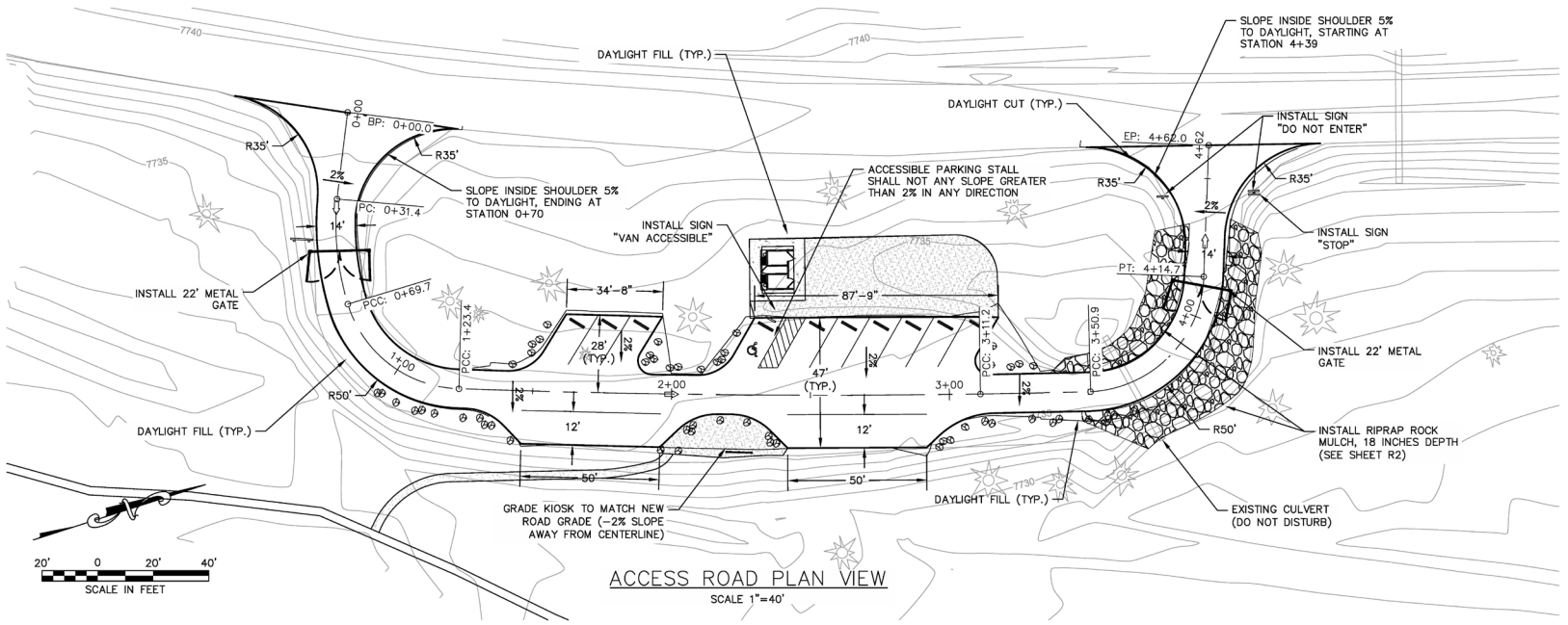
U. S. Department of Agriculture
FOREST SERVICE
Engineering
CIBOLA NATIONAL FOREST

DESIGN BY: S. BINGHAM
DRAWING CHECK: D. JEPPSEN
CHECK: S. BINGHAM
APPROVED: FOREST ENGINEER
DATE

QUARTZ HILL TRAILHEAD

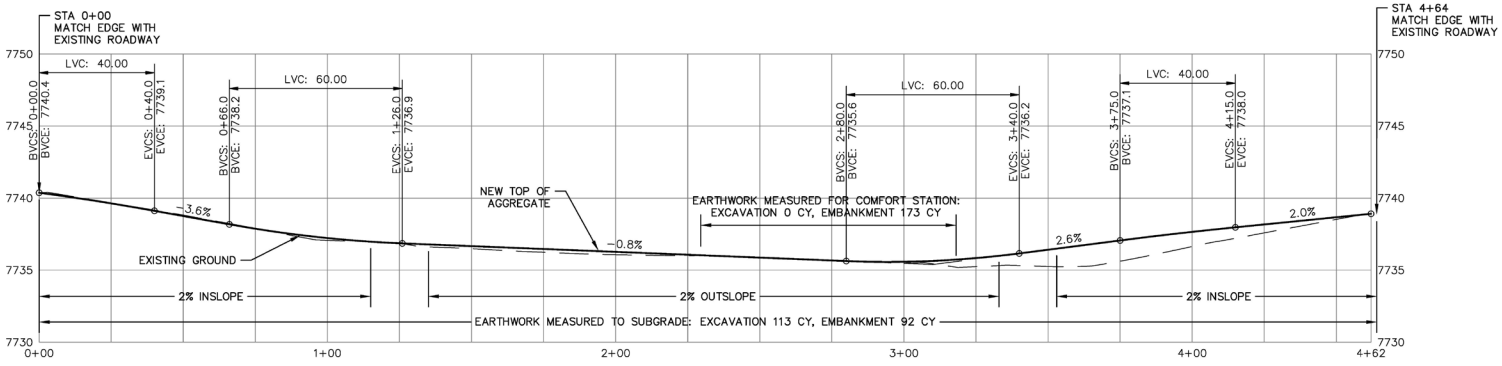
GATE INSTALLATION DETAILS

PROJECT No.
DRAWING D9
SHEET 12 OF 16



ACCESS ROAD PLAN VIEW

SCALE 1"=40'



ACCESS ROAD PROFILE

HORIZONTAL 1"=40', VERTICAL 1"=8'

NOTE: ALL VOLUMES SHOWN AS "IN-PLACE"

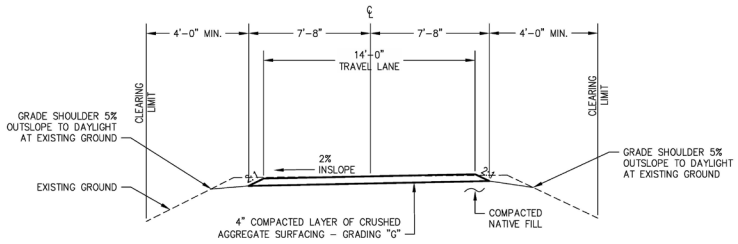
U. S. Department of Agriculture
FOREST SERVICE
Engineering
CIBOLA NATIONAL FOREST

DESIGN BY: M. ALANIZ
DRAWING CHECK: M. ALANIZ
APPROVED: FOREST ENGINEER DATE

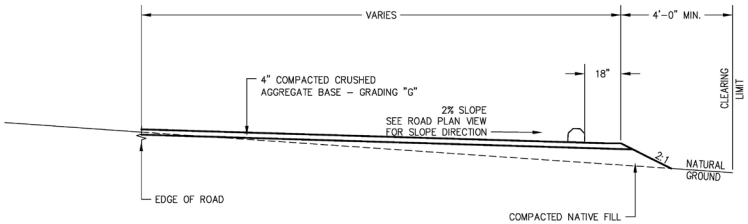
QUARTZ HILL TRAILHEAD

ACCESS ROAD PLAN AND PROFILE

PROJECT No.
DRAWING R1
SHEET 13 OF 16



TYPICAL ONE-LANE INSLOPED AGGREGATE SURFACE ROAD SECTION

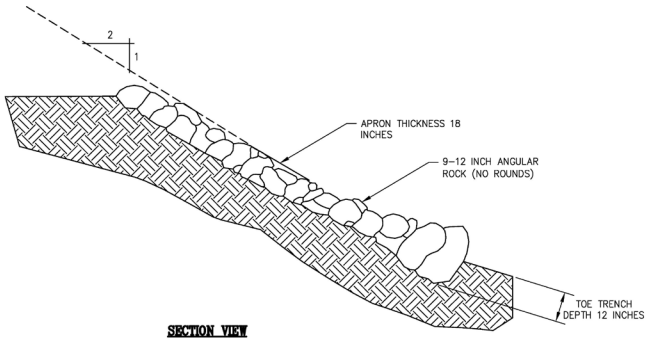


TYPICAL AGGREGATE SURFACE PARKING LOT SECTION

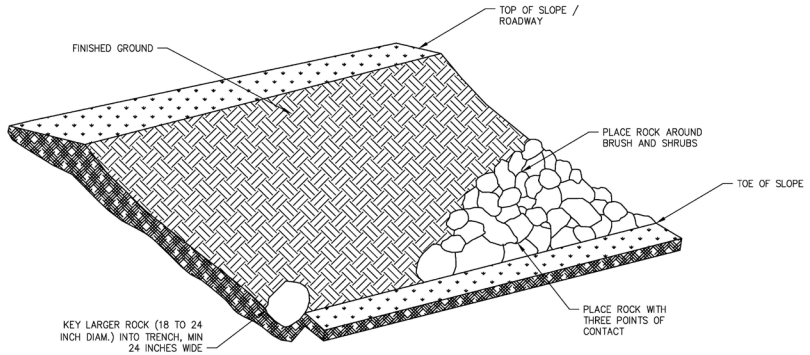
NOTES:

1. TRANSITIONS BETWEEN CROSS SECTIONS SHALL BE GRADUAL. TRANSITIONS SHALL BE 40' IN LENGTH, 20' ON EACH SIDE OF TRANSITIONING ROADWAYS. EXACT STATIONING FOR CROSS SECTIONS IS SHOWN FOR REFERENCE ONLY.
2. ALL EXCAVATED BOULDERS SHALL BE PLACED AS DESIGNATED BY THE CONTRACTING OFFICER.
3. ALL AGGREGATE DEPTHS SHOWN ARE COMPACTED DEPTHS.
4. NEATLY PLACE ANY EXCAVATED ROCK TO ARMOR FILL SLOPES FROM EROSION AND FOOT TRAFFIC AS DIRECTED.
5. WHERE NO DITCH IS INDICATED ON THE PLAN AND PROFILE DRAWINGS, ENSURE THAT WATER WILL NOT POND ALONG THE EDGE OF THE ROAD. GRADE EDGE OF ROAD SO WATER WILL SHEET FLOW ACROSS THE ROAD.
6. ROADWAY WIDTHS AND SLOPE VARY. SEE PLAN VIEW SHEETS FOR ROADWAY WIDENING AND SLOPE DIRECTIONS (INSLOPE OR OUTSLOPE).
7. RIPRAP MULCH COLOR SHALL BE COLOR OF NATIVE SURFACE AND BE APPROVED BY CONTRACTING OFFICER.

ROAD CROSS SECTIONS TABLE		
ROAD	STATIONING	TYPICAL SECTION
PARKING LOOP	0+00 TO 1+10	14' SINGLE LANE AGGREGATE SURFACE, 2% SLOPE LEFT
PARKING LOOP	1+10 TO 1+50	14' SINGLE LANE AGGREGATE SURFACE, TRANSITION TO OUTSLOPE (AS STAKED)
PARKING LOOP	1+50 TO 3+14	14' SINGLE LANE AGGREGATE SURFACE, 2% SLOPE RIGHT
PARKING LOOP	3+14 TO 3+54	14' SINGLE LANE AGGREGATE SURFACE, TRANSITION TO INSLOPE (AS STAKED)
PARKING LOOP	3+54 TO 4+64.1	14' SINGLE LANE AGGREGATE SURFACE, 2% SLOPE LEFT



SECTION VIEW



PERSPECTIVE VIEW

ROCK MULCH APRON – SLOPE PROTECTION

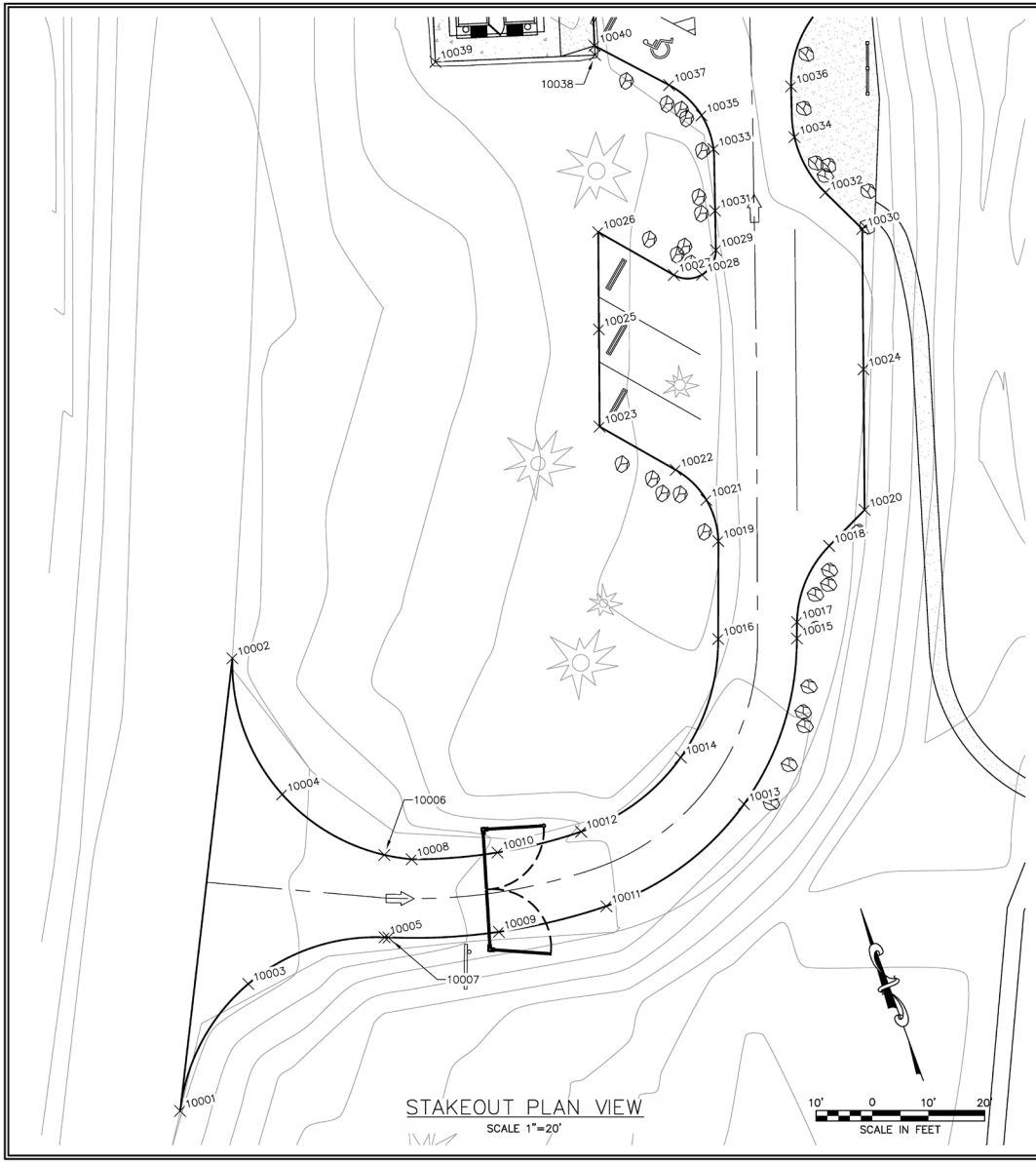
U. S. Department of Agriculture
FOREST SERVICE
Engineering
CIBOLA NATIONAL FOREST

DESIGN BY: M. ALANIZ
DRAWING CHECK: M. ALANIZ
APPROVED: FOREST ENGINEER DATE

QUIARTZ HILL TRAILHEAD

TYPICAL ROAD CROSS SECTIONS

PROJECT No.
DRAWING R2
SHEET 14 of 16



STAKEOUT PLAN VIEW
SCALE 1"=20'

10' 0 10' 20'
SCALE IN FEET

PT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
10001	1486192.747	2655752.915	7740.14	FG
10002	1486269.321	2655779.619	7740.33	FG
10003	1486212.158	2655769.685	7740.47	FG
10004	1486243.755	2655782.968	7739.70	FG
10005	1486214.937	2655795.180	7739.53	FG
10006	1486229.248	2655798.337	7739.27	FG
10007	1486214.758	2655795.837	7739.51	FG
10008	1486227.421	2655802.919	7739.10	FG
10009	1486211.417	2655815.238	7738.85	FG
10010	1486225.252	2655818.100	7738.50	FG
10011	1486211.692	2655834.922	7738.19	FG
10012	1486225.613	2655833.430	7737.91	FG
10013	1486224.028	2655862.780	7737.44	FG
10014	1486234.621	2655853.625	7737.16	FG
10015	1486250.752	2655878.422	7737.02	FG
10016	1486253.735	2655864.743	7736.74	FG
10017	1486253.612	2655879.080	7737.00	FG
10018	1486265.577	2655887.641	7736.50	FG
10019	1486270.734	2655868.580	7736.88	FG
10020	1486270.461	2655895.210	7736.32	FG
10021	1486278.361	2655868.113	7736.87	FG
10022	1486284.768	2655863.951	7736.94	FG
10023	1486295.235	2655852.423	7737.15	FG
10024	1486294.900	2655900.477	7736.13	FG
10025	1486312.162	2655856.093	7737.00	FG
10026	1486329.089	2655859.764	7736.86	FG
10027	1486318.678	2655871.231	7736.65	FG
10028	1486317.625	2655876.138	7736.55	FG
10029	1486321.363	2655879.488	7736.47	FG
10030	1486319.339	2655905.745	7735.92	FG
10031	1486328.241	2655880.909	7736.41	FG
10032	1486327.086	2655900.746	7736.00	FG
10033	1486339.001	2655883.021	7736.32	FG
10034	1486337.931	2655897.551	7736.02	FG
10035	1486345.332	2655882.266	7736.32	FG
10036	1486346.868	2655898.937	7735.96	FG
10037	1486351.857	2655877.807	7736.38	FG
10038	1486359.953	2655866.125	7736.60	PAD
10039	1486364.985	2655838.123	7737.20	PAD
10040	1486361.580	2655866.373	7736.59	FG

KEY
FG FINISHED GRADE FOR COMPLETED ROADWAY
PAD FINISHED GRADE FOR COMFORT STATION PAD

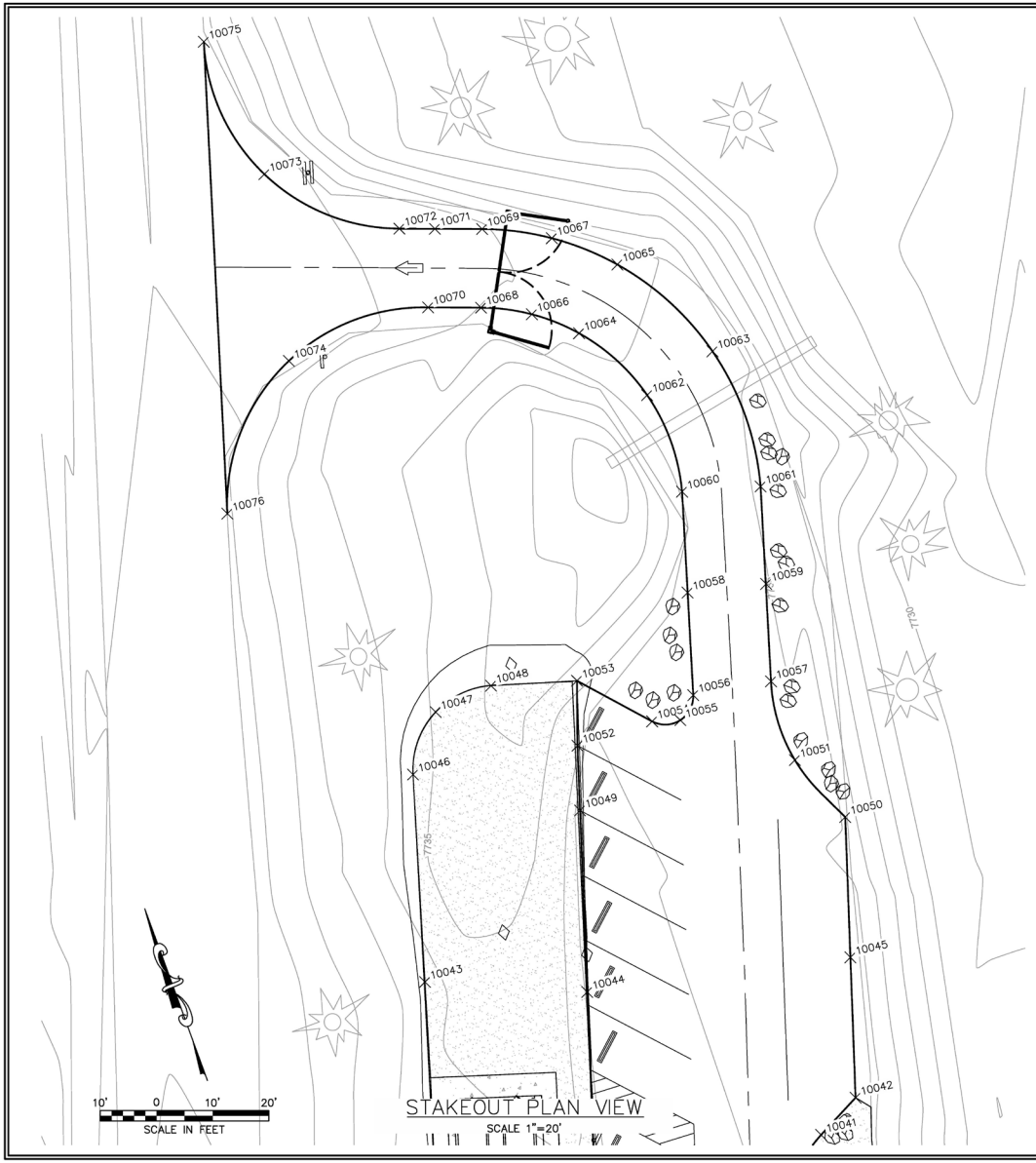
U. S. Department of Agriculture
FOREST SERVICE
Engineering
CIBOLA NATIONAL FOREST

DESIGN BY: M. ALANIZ
DRAWING CHECK: M. ALANIZ
APPROVED FOREST ENGINEER DATE

QUARTZ HILL TRAILHEAD

CONSTRUCTION STAKEOUT POINTS

PROJECT No.
DRAWING CS1
SHEET 15 OF 16



STAKEOUT PLAN VIEW
SCALE 1"=20'

PT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
10041	1486359.452	2655907.235	7735.73	FG
10042	1486364.556	2655914.670	7735.55	FG
10043	1486401.456	2655844.412	7736.97	PAD
10044	1486393.383	2655872.195	7736.33	FG
10045	1486389.134	2655919.242	7735.36	FG
10046	1486437.932	2655850.412	7736.75	FG
10047	1486447.895	2655856.781	7737.67	PAD
10048	1486450.317	2655867.417	7737.59	PAD
10049	1486425.186	2655878.018	7736.14	PAD
10050	1486413.712	2655923.814	7735.20	FG
10051	1486425.562	2655917.299	7735.38	FG
10052	1486436.544	2655880.097	7736.18	FG
10053	1486447.829	2655882.544	7736.29	FG
10054	1486437.841	2655894.009	7735.94	FG
10055	1486436.949	2655898.951	7735.84	FG
10056	1486440.800	2655902.175	7735.83	FG
10057	1486440.163	2655916.211	7735.57	FG
10058	1486458.837	2655905.188	7735.85	FG
10059	1486457.277	2655919.166	7736.15	FG
10060	1486476.566	2655908.162	7736.30	FG
10061	1486474.411	2655921.998	7736.58	FG
10062	1486494.703	2655905.862	7736.87	FG
10063	1486499.758	2655918.913	7737.15	FG
10064	1486508.107	2655896.447	7737.33	FG
10065	1486518.551	2655905.769	7737.61	FG
10066	1486513.236	2655888.997	7737.58	FG
10067	1486525.670	2655895.424	7737.86	FG
10068	1486516.367	2655880.414	7737.82	FG
10069	1486529.976	2655883.669	7738.10	FG
10070	1486518.467	2655871.243	7738.00	FG
10071	1486531.860	2655875.470	7738.28	FG
10072	1486533.268	2655869.318	7738.40	FG
10073	1486547.987	2655847.993	7739.07	FG
10074	1486514.587	2655844.989	7738.34	FG
10075	1486573.338	2655842.635	7738.43	FG
10076	1486490.478	2655828.330	7739.22	FG

KEY
FG FINISHED GRADE FOR COMPLETED ROADWAY
PAD FINISHED GRADE FOR COMFORT STATION PAD

U. S. Department of Agriculture
FOREST SERVICE
Engineering
CIBOLA NATIONAL FOREST

DESIGN BY: M. ALANIZ
DRAWING BY: M. ALANIZ
APPROVED FOREST ENGINEER DATE

QUARTZ HILL TRAILHEAD
CONSTRUCTION STAKEOUT POINTS

PROJECT No.
DRAWING CS2
SHEET 16 OF 16

Chapter 6
Funding

Historic Trail Maintenance Budget

Hilso Trail System received trail maintenance (April – September 2014) provided by the Gallup YCC, which accounted for approximately $12,200 of ZMTP's Levels 1 and 2 maintenance work. $15,000 in purchase and installation of bike cattleguards. $13,000 of specialized pre- and post-event maintenance for the 24-Hour National Mountain Bike Championships.

YCC youth wages were provided under a grant from the State and from McKinley County through the Secure Rural Schools RAC-Title II program. For large special events, it is estimated that special race trail preparations and post-race maintenance is about $500 a mile. Responsibilities by the event planner for pre- and post-event maintenance should be specified in the operating plan that is part of the special use authorization. Races seem to have a substantial impact to the trail system in a short period of time due to numbers of participants and their concentrated use. A similar concept might be suitable for large tour operators, as well.

The current annual trail maintenance costs $40,000 to $50,000 dollars per season or approximately $1,050 to $1,350 per mile of trail per year. This amount will increase as new trail sections are built, and ZMTP members will need to develop a financing strategy to identify increased maintenance funding, prior to approval of new trail sections and segments.

While the State YCC program, can provide for the youth crews and their wages, other costs such as supervisors, trail foreman, trail engineering/design, vehicles, equipment and other operating supplies are not covered. YCC does require a 1:1 local match, which will need to be used to cover the following examples of costs (which incorporate both maintenance and construction work) include:

- $25,000 for management of the program
- $115,000 for seasonal supervisors and trail foreman
- $2,500 for yearly vehicle cost (per vehicle)
- $2,500 for vehicle fuel (per vehicle)
- $1,000 for vehicle maintenance (per vehicle)
- $4,000 for equipment and supplies

Maintenance generally runs from mid-March through October; however, it can be shortened (or lengthened) due to seasonal conditions. Annual maintenance is expected including identifying hazard trees at trailhead, clearing debris from bike cattleguards, routine maintenance of trailhead facilities (parking, fencing, wheel-stops, restrooms) and identifying trail signs and markers that needs replacement. Every five years, the trail intersection sign faces and trail markers will need to be replaced for user safety and to maintain a pristine system. These will need to be a special request to the counties or done through a grant as a maintenance component. For instance, ZMTP has used Secure Rural Schools – Title II program monies for this type of replacement project.

The Strawberry Canyon Trail needs to be added to the ZMTP trail maintenance program. Annual trail maintenance costs are estimate as follows:

Existing Trails -- Maintenance

	Cost Breakdown / Costs	Source of Funds
Strawberry Canyon Trail	2.0 miles of trail maintenance (Level 1) = $1,000	YCC and USFS
Hilso Trail System	26.0 miles of trail maintenance (Level 2) = $26,000	YCC and McKinley County (Secure Rural Schools-Title II)
24 Hours in the Enchanted Forest Race*	26.0 mile course (Special Race Maintenance Rate) = $13,000	Race Promoter*, YCC, and McKinley County
Total	**$40,000.00**	

*ZMTP are recommending that Race Promoter pay for specialized race maintenance on the trail system.

Trailheads and Infrastructure

The Strawberry Canyon Trailhead and McGaffey Lake Recreation Area Trailhead were built by and are the responsibility of the USFS. Hilso Trailhead was built by and is the responsibility of McKinley County. The annual expenses for trailhead include bathroom pumping services, bathroom cleaning, trash pickup, painting, bathroom supplies, trailhead cleanup, and situational maintenance that arises throughout the year. Trail counters will be an important litmus test of when trailhead maintenance should be done and when level of maintenance needs to increase to offset use.

The CXT vault buildings comply with the Architectural Barriers Act Accessibility Guidelines, Sweet Smelling Technology vault toilet buildings. These vault buildings are designed to meet or exceed the effects of a seismic design category E earthquake, a 150-mph wind load and a 350-pound per square foot snow load, so maintenance cost is very minimal for this type of structure. Vandalism cost on developed facilities is estimated to approximately $150 per year by the Mt. Taylor Ranger District. Replacement cost is generally related to toilet riser, door vent, or window damage. This cost varies depending on the type of damage and could easily escalate to $600 for a steel door replacement. Vandalism is situational and hard to predict. For this Plan, it is assumed $600 per year in additional costs to cover vandalism and other situational maintenance requirements.

New trailheads being recommended in this Plan, maintenance cost per trailhead is approximately $2,000 each per year. This cost is showcased by the existing costs that we have annually at the Hilso Trailhead. Annual maintenance includes; toilet pumping, cleaning, stocking supplies, clearing debris from cattleguards, identifying wheel stops, vehicle barriers, trailhead signage for replacement, and hazard trees removal. Every 10-15 years, re-surfacing of the parking area will likely be needed, depending on levels of use. Maintenance of the driving surface will be provided by the counties through their Road Crews, as in-kind.

Approximately every ten years, a full overhaul will be needed to change out trail kiosk, bulletin boards, signage, wheel stops, and vehicle barriers. Cattleguards can be evaluated every ten years. These will need to be a special request to the counties or done through a grant as a maintenance need.

Existing Trailheads -- Maintenance Schedule

Trailheads	Cost Breakdown / Costs	Source of Funds
Hilso Trailhead	Bathroom Pumping Services* ($400-600) @ 2 times a year = $1,000.00	McKinley County
	Bathroom Cleaning & Restocking Supplies = $100 @ 4 times a year = $400.00	
	Other Needs = $600.00	
Total	**$2,000.00**	

*Price quoted by GS Septic Services

TABLE 7-2: ZMTP Trail Maintenance Levels of Effort (based from YCC Experience for Trail Class 3 trails in Hilso System)

	Level 1	Level 2	Level 3
Description	**Basic Custodial Care**	**Intermediate**	**Overhaul & Re-build**
Maintenance Objectives	• Treads maintained for public safety. • Logs or similar rustic structures may be provided at stream crossings. • Drainage functional and not likely to fail. • Trail sides not brushed, but tread is kept passable. • Structures maintained as needed.	• Tread maintenance for public safety and user convenience. • Drainage same as Level 1. • Trail sides brushed out to pack stock standards. • Structures maintained to original design standards.	• Tread maintenance is reconstructed where needed to ensure public safety and user convenience. • Drainage structures rebuilt. • Structures re-built to original design standards.
Maintenance Frequency	Annually	Maintenance frequency of every 3-5 years.	Maintenance frequency of 10-15 years.
Maintenance Activities Performed	(1) Emergency Drainage (major water flow/runoff) (2) Minor structure repair (3) Cleaning waterbars and repairing drainage structures (4) Limited brushing (5) Logging out (6) Minor Tread maintenance (7) Reporting major trail issues (large blowdowns, broken bridges, illegal camping activity, etc.) (8) Trash clean-up	All maintenance activities performed in Levels 1, plus, (1) Tread grading and grubbing of protruding rocks and stumps (2) Rock removal (loose surface rock). (3) Spot surfacing. (4) Surface replacement. (5) Full brushing to Class 3 USFS standards	All maintenance activities performed in Levels 1 and 2, plus, (1) Re-build drainage structures (2) Major structure reconstruction (3) Adding waterbars and reconstructing drainage structures (4) Major Tread reconstruction, where needed
Inspection Frequency	Condition surveys made annually to check for resource and trail damage and unsafe conditions. If no major resource damage is occurring, no further action is taken.		
Estimated Costs *	**$500.00 per mile**	**$1,000.00 per mile**	**$1,500.00 per mile**

*ZMTP based on costs to date and for trails that were properly constructed

Unit Costs and Contingencies

Table 8-1 presents planning level unit costs used for the purpose of programming for Zuni Mountain trail construction and capital improvements. These unit costs (and the cost estimates based on them) are intended for planning purposes only and actual construction costs can be determined after each project has undergone more detailed engineering design work and task order cost evaluation, as provided in the Trail Improvements by Trail Segment, see **Table 6-1**.

Trailhead facility and associate improvement costs are based on actual expenses that resulted from the recent Hilso and Ramah trailhead construction in 2011 and 2014, respectively.
Trail construction are also based on previous work completed by Gallup Youth Conservation Corps (YCC) on Hilso trail system, and discussions with other YCC crews that have done work in the Southwestern region, including Rocky Mountain Youth Corps and Southwest Conservation Corps. As stated, construction costs of trailbuilding relates directly to the type of work being completed, whether it is:

- New trail construction.
- Connector trails.
- Tread or corridor trail enhancement – based on improving existing unauthorized trails into sustainable trail, including re-routes, drainage structures, rolling grade dips, grade reversals, and switchbacks.
-

These trails will be built to USFS Trail Class 3 standard and the majority will be designed for pack & saddle use.
Building properly designed, sustainable trails at the onset will help reduce maintenance costs over the short-, mid- and long- terms. Proper design and pin flagging of trails will be key to building trails that last. In line with USFS and IMBA trail standards shown in table below, trail construction will include building proper drainage structures and trails that follow natural contours.

Once the ZMTP develops a detailed Trail Improvements by Trail Segment (Table 6-1) chart, map, and cost estimate as outlined in Section 6.2, all costs should include contingencies for construction projects to account for each stage of project implementation, based on factors of the construction cost, including:

- Design, flagging, and construction overhead (mobilization and general conditions) – 10 percent
- Project administration during planning design, and construction – 5 percent
- Change orders – 5 percent

The total contingency is estimated at 20 percent of construction costs.
For the purposes of this Plan, the range of trail construction starts at $7,000 a mile for building new, natural surface trail construction and drainage structures only (with contingencies $8,400 per mile). On the higher side, would be $12,500 to repurpose an unauthorized route into a USFS Class 3 trail with drainage and a half a mile of switchback construction (with contingencies $15,000 per mile).

Table 8-1: Unit Costs

No.	Item	Unit*	Cost
Trails			
1	New trail construction	MI	$3,000.00
2	Drainage (e.g. Grade Reversals, Rolling Grade Dips, & Knicks)	MI	$4,000.00
3	Climbing turns / switchbacks	MI	$7,000.00
4	Rebuild / Reroute	MI	$4,000.00
5	Close and Restore Trail (Rip, recontour, seed trail; two regulatory signs/mi. of trail)	MI	$5,000.00
6	Bike Cattleguard/Cowboy Gates	EA	$1,500.00
Trailheads			
7	Trailhead Construction – dirt and rock work	LF	$10.41
8	Gravel	LF	$12.41
9	Dual Vault Toilet/Restroom (Dual)	EA	$60,000.00
10	Cattleguard	EA	$7,000.00
11	Culvert (24"x24')	EA	$600.00
12	Fencing	LF	$15.00
13	Parking Bumpers	EA	$100.00
Signage			
14	Kiosk	EA	$1,000.00
15	Trailhead Construction – Wayfinding and interpretative bulletin board	EA	$3,000.00
16	Signage (ZTMP Intersection Signs)	EA	$200.00
17	On-Trail Carsonite Markers	EA	$815.00
Misc.			
18	Construct Natural Drainage Swale w/ Rock check dams	LF	$12.00
19	Erosion Control	MI	$250.00
20	Trim Vegetation / Tree Limbs	MI	$250.00

* LS = lump sum, EA = each, LF = linear foot, MI = mile

Base Cost of Trail Construction

Table 8-2 Trail Construction Costs below shows estimated base trail construction costs, which only includes building trail and drainage features. Costs do not reflect re-routes, switchbacks, signage, or bike cattleguards that will be needed throughout the system.

Based on this analysis, the range for trail construction costs is estimated at $1,884,800. Although volunteer hours and sweat equity are not reflected in these costs, volunteers and programs could have a significant impact in the overall costs of building the trails. Overall a 12-year period, the ZMTP could expect that it would need to generate, raise, and leverage $150,000 per year.

While this number seems daunting at first, one must remember that the ZMTP conservatively expects the State's Youth Conservation Corps program to invest at least $300,000 annually for youth wages among the regional YCC programs (Gallup, Grants, Acoma, Zuni, and/or Tohatchi), based on the history showcased in Section 7.2: Local Capacity and Resources. The requirement for the State funding is that the local entity or program provide an equivalent dollar-to-dollar match, so ZMTP expects a total $600,000 regionally going into YCC programs. YCC programs work on various community projects throughout their season, so conservatively we estimate that 25% of this funding will be invested into ZMTP trail construction projects or $150,000.

Further, the ZMTP feels confident that the Zuni Mountain Trail System would be well positioned to acquire grant funding from programs such as Recreational Trails Program, Transportation Alternative Program, and Federal Lands Access Program for trail construction.

TABLE 8-2: Trail Construction Costs

Trail Section	New Trails	Connector Trails	Unauthorized Trails	Total Miles
Quartz Hill	39	0.7	0	40
McGaffey	6	10.5	7	16
Milk Ranch	1	3.1	19	20
Bluewater	35.0	0.0	0	45.5
Ojo Redondo	42	1.4	0	43.5
Twin Springs	14	8.3	7	29.5
Limekiln	16	3.4	0	19.5
Total Miles	153.0	27.4	33.0	**186.0**
Base Cost per Mile	**$8,400.00**	**$0.00**	**$15,000.00**	
Basic Total Cost	**$1,285,200.00**	**$0.00**	**$495,000.00**	**$1,884,800.00**

Trail Construction At-A-Glance

Estimated Total Cost for 186 miles of Trail:
$1.8M

Cost per Year:
$150,000

YCC Investment Needed: ***$150,000 per year***

Potential Grant Sources:
RTP, TAP, and FLAP

Base Cost of Trailhead Construction

This cost includes building trailheads and infrastructure features only. For planning purposes, all new trailheads which will be designed and built as full service trailheads, which will be 20,000 linear feet with two culverts. Every trailhead requires a vault toilet, cattleguard, parking bumpers, a kiosk, pull-through parking spots for horse trailers, and bulletin board. It is expected that USFS will pay for the street signs.

Based on this analysis, trailhead construction costs are estimated at around $3,105,600. We used this number for, Overview of Annual Costs, but are depending on County in-kind to lower this cost.

The ZMTP expects that the County Road crews will provide all of the labor, equipment, and dirt work from their County force accounts, as in-kind. The McKinley County Road Crew provided this service at both the Hilso Trailhead and Ramah Trailhead. This measure alone reduces the estimated total cost by $75,000 - $150,000 each. For planning purposes, we will use the low end of $75,000 in-kind contribution on each new trailhead.

The remaining $2,655,600 for trailhead construction will need to be fully grant funded. Again, the ZMTP feels confident that the Zuni Mountain Trail System would be well positioned to acquire grant funding from programs such as Recreational Trails Program, Transportation Alternative Program, and Federal Lands Access Program for trailhead improvements, upgrades, and construction. Both the Hilso and Ramah Trailheads were built with County in-kind support and Recreational Trails Program funding.

TABLE 8-3: Trailhead Construction Costs

Trail Section	Trailhead	Dirt/Rock Work and Gravel	Other Features	Total Costs
Quartz Hill	Existing parking area to be redesigned and expanded to accommodate larger and towed vehicles	Dirt/Rock Work: $10.41 per LF @ 20,000 LF = **$208,200.00** Gravel: $12.21 per LF @ 13,000 LF = **$244,200.00** Fencing: $15.00 per LF @ 3,000 LF = **$45,000.00** **Total: $497,400.00**	2 culverts @ $600: **$1,200.00** 2 cattleguards @$7,000: **$14,000.00** Kiosk: **$1,000.00** Bulletin Board: **$3,000.00** Parking Bumpers: 10 bumpers @ $100.00 = **$1,000.00** **Total: $20,200.00**	**$517,600.00**
Milk Ranch	New Trailhead Planned to be constructed	Dirt/Rock Work: $10.41 per LF @ 20,000 LF = **$208,200.00** Gravel: $12.21 per LF @ 13,000 LF = **$244,200.00** Fencing: $15.00 per LF @ 3,000 LF = **$45,000.00** **Total: $497,400.00**	2 culverts @ $600: **$1,200.00** 2 cattleguards @$7,000: **$14,000.00** Kiosk: **$1,000.00** Bulletin Board: **$3,000.00** Parking Bumpers: 10 bumpers @ $100.00 = **$1,000.00** **Total: $20,200.00**	**$517,600.00**
Bluewater	New Trailhead to be constructed	Same as above	Same as above	**$517,600.00**
Ojo Redondo	New Trailhead Planned to be constructed	Same as above	Same as above	**$517,600.00**
Twin Springs	New Trailhead Planned to be constructed	Same as above	Same as above	**$517,600.00**
Limekiln	New Trailhead Planned to be constructed	Same as above	Same as above	**$517,600.00**
5 new Trailheads and 1 redesigned/expanded trailhead		**$2,984,400.00**	**$121,200.00**	**$3,105,600.00**

Trailhead Construction At-A-Glance

Estimated Total Cost for 6 trailheads
$3.1M

County In-kind Dirt/Rock Work:
$450,000

Cost per Year:
$221,300

Potential Grant Sources:
RTP, TAP, and FLAP

Prioritization

The ZMTP convened a series of meetings to discuss and establish trail corridors, systems, and trailheads, and prioritize their construction. Appendix B: ZMTP Trail System Powerpoint was a good tool for this process. These priorities have not been finalized and USFS reserves the right to re-evaluate as needed with adjustments made based on user demand, environmental damage, and other factors. Based on the signed Decision Notice/Finding of No Significant Impact, these may need to be re-prioritized.

The intent of project prioritization was to identify achievable, priority projects for near-term implementation as well as projects for mid- and longer-term implementation. The evaluation criteria presented in the matrix below was used to give weight to those projects that best support the project goals and will therefore receive higher priority. These scores are then added together, with 30 being the highest possible score, thus the greatest priority for the Quartz Hill trail system.

In 2012, the partnership utilized the above matrix which focused on ten aspects to rate each trail system for building priority on a thirty-point scale, Quartz Hill (27 points), Bluewater (26), McGaffey expansion (26), Milk Ranch (23), Ramah** (23), Ojo Redondo (21), Twin Springs (21), and Limekiln (18). Up to six trail access points (full service trailheads)

Section Attribute	Points
Provides an important aesthetic recreational experience	3
Project completes a significant gap in the overall network	3
Provides a strong recreational experience at a low cost	3
Provides recreational opportunities for a variety of users	3
Is not likely to have significant resource concerns	3
Provides easy access from communities to trails networks	3
Can generate community interest in development and long term stewardship	3
Generates broad business and tourism support	3
Provides year round access	3
Offers unique features	3
Affords the ability to phase or modify loops	3
Total	**30**

would be built. In addition to a parking area, each trailhead should provide similar amenities as at the Hilso Trailhead, trailhead boundary fencing, vault toilets, large cattleguards, pull-through parking spots for horse trailers, and bike-wide cattleguards or cowboy gates to provide access across trailhead boundaries. In 2016-17, USFS agreed that there was growing demand to develop the McKenzie Ridge trail segment as part of the Twin Springs section. Through subsequent ZMTP meetings and concurrence, the Twin Springs trail section was elevated as shown below.

Trail System Sections	New/Unauthorized Miles	Original Priority*	Revised Priority*
Quartz Hill	39	1	1
Bluewater	35	2	3
McGaffey	13	2	2
Milk Ranch	20	3	2
Ramah/Pasture Hollow**	0	3	ELIMINATED
Ojo Redondo	42	4	4
Twin Springs	21	4	Phase I /Phase II (1/3)
Limekiln	16	5	5
Total	**186**		

*Priorities will ultimately be approved to coincide with USFS management needs and funding cycles
**Ramah/Pasture Hollow was completely eliminated from this project

Phasing

This Plan distinguishes projects by near- term, mid-term, and long- term. If the trail system is approved, ZMTP will develop a detailed Trail Improvements by Trail Segment (Table 6-1) chart, map, and cost estimate as outlined in Section 6.2. Trail construction phases can be further broken down into approximately 15-20 mile sections. For purposes of this Plan, only Twin Springs trail system was broken down into two phases.
Phasing of trail system improvements is based on usage trends, project priority, successful maintenance of previous phases, and funding and crew availability. Near-term projects could be carried out within the next four years. Mid-term projects would be carried out in a period 4 to 8 years. Long-term project would be carried out in a period 8 to 12 years.

See Maps directly at the end of this Plan, to see these improvements on maps.

Near-Term (0 to 4 Years)
Recommended near-term trail improvement projects include:

- Design and construct Quartz Hill trailhead facility and stacked loop trail system.
- Design and construct the McGaffey Trails, expansion and connection with the existing Hilso system and trailhead.
- Design and construct Milk Ranch trailhead facility and stacked loop trail system.
- Design and construct Twin Springs (McKenzie Ridge) trail connector. (Phase I)

Mid-Term (4 to 8 years)
Recommended mid-term trail improvement projects include:

- Design and construct Bluewater trailhead facility and stacked loop trail system.
- Design and construct Twin Springs trailhead facility and trail system. (Phase II) • Design and construct Ojo Redondo trailhead facility and stacked loop trail system.

Long-Term (8 to 12 years)
Recommended long-term trail improvement projects include:

- Design and construct Limekiln trailhead facilities.
- Design and construct Limekiln trail system.
- Work with Bluewater Lake State Park to develop a joint plan building off their current facilities.

Projects will be implemented per USFS approval and as funding is available, so projects will be pushed out as needed.

Phased Built-Out

As detailed in Section 8.3, this Plan recommends that trails and trailheads be phased in and developed over time. This provides for more sustainable development, adaptive management, and community managed tourism to the extent possible. Simply, it makes sure we “do not get over of our handle bars” by outpacing construction of trails and assets with maintenance budget, trail use, and capacities. This section provides a baseline analysis of built-out and incremental maintenance costs. The section will be further refined as part of the Operations, Maintenance, and Replacement Plan. Projects may shift due to grant funding and processes related to them. Rather than using actual years, year 1 will represent one year after the record of decision, which is anticipated in 2018.

Construction Cost Analysis | Near-Term (0 to 4 Years)
Recommended near-term trail and trailhead construction projects, include:

Trail Section	New Trails	Unauthorized Trails	Total Costs
Quartz Hill	39	0	$327,600.00
McGaffey	6	7	$155,400.00
Milk Ranch	1	19	$293,400.00
Twin Springs (Phase I)	14	0	$117,600.00
Base Cost per Mile	$8,400.00	$15,000.00	
Total Construction Costs	$504,000.00	$390,000.00	$894,000.00

Trail Section	Trailhead	Dirt/Rock Work & Gravel	Other Features	Total Costs
Quartz Hill	Expand existing parking area to handle larger/towed vehicles	Total: $497,400.00	Total: $20,200.00	$517,600.00
Milk Ranch	Construct New Trailhead	Total: $497,400.00	Total: $20,200.00	$517,600.00
			Total Construction Costs	$1,035,200.00

Total Construction Costs | Near-Term (0 to 4 Years)
For the purposes of this plan, trail section and trailhead construction will total **$1,929,200.00**.

Maintenance Cost Analysis | Near-Term (0 to 4 Years)
Maintenance Costs below do not reflect additional costs due to events, heavy use, vandalism, or natural disasters. In Year 4, there will be additional items such as trail intersection sign face and trail markers replacement, as outlined in *Section 7.4*. Using **Table 8-1**, we estimate an additional maintenance cost of $15,000.00 for signage, markers, and bike cattleguard replacements. These numbers will be refined in the Operations, Maintenance, and Replacement Plan.

Trail System

Section	Year 1	2	3	4
Strawberry Canyon Trail	2.0 miles of trail maintenance (Level 1) = **$1,000**	2.0 miles of trail maintenance (Level 1) = **$1,000**	2.0 miles of trail maintenance (Level 1) = **$1,000**	2.0 miles of trail maintenance (Level 1) = **$1,000**
Hilso Trail System	26.0 miles of trail maintenance (Level 2) = **$26,000**	26.0 miles of trail maintenance (Level 1) = **$13,000**	26.0 miles of trail maintenance (Level 1) = **$13,000**	26.0 miles of trail maintenance (Level 1) = **$13,000**
Quartz Hill	In Design	Under Construction	39 miles of trail maintenance (Level 2) = **$39,000**	39 miles of trail maintenance (Level 1) = **$19,500**
McGaffey	In Design	Under Construction	13 miles of trail maintenance (Level 2) = **$13,000**	13 miles of trail maintenance (Level 1) = **$6,500**
Milk Ranch	Planning	Planning	Planning	In Design
Twin Springs (Phase I)	Planning	Planning	Planning	In Design
Annual Total	**$27,000.00**	**$14,000.00**	**$66,000.00**	**$40,000.00**

Trailhead Maintenance

Trailhead	1	2	3	4
Hilso	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**
Strawberry Canyon	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**
Quartz Hill	Design	Construction	Basic: **$2,000**	Basic: **$2,000**
Annual Total	**$4,000.00**	**$4,000.00**	**$6,000.00**	**$6,000.00**

Total Maintenance Costs | Near-Term (0 to 4 Years)
For the purposes of this plan, trail section and trailhead maintenance will total **$167,000.00**. In Year 5, according *Section 7.4*, we will need the County Road crews to provide additional trailhead maintenance, since this will be in-kind; it is not reflected in cost above. This number will be added as part of the Operations, Maintenance, and Replacement Plan.

Construction Cost Analysis | Mid-Term (4 to 8 years)
Recommended near-term trail and trailhead construction projects include those projects slated for implementation on or after Year 5, including:

Trail Section	New Trails	Unauthorized Trails	Total Costs
Bluewater	35	0	$294,000.00
Twin Springs (Phase II)	0	7	$210,000.00
Ojo Redondo	42	0	$352,800.00
Base Cost per Mile	**$8,400.00**	**$15,000.00**	
Total Construction Costs	**$646,800.00**	**$105,000.00**	**$751,800.00**

Trail Section	Trailhead	Dirt/Rock Work & Gravel	Other Features	Total Costs
Bluewater	Construct New Trailhead	**Total: $497,400.00**	**Total: $20,200.00**	**$517,600.00**
Twin Springs	Construct New Trailhead	**Total: $497,400.00**	**Total: $20,200.00**	**$517,600.00**
Ojo Redondo	Construct New Trailhead	**Total: $497,400.00**	**Total: $20,200.00**	**$517,600.00**
			Total Construction Costs	**$1,552,800.00**

Total Construction Costs | Mid-Term (4 to 8 years)
For the purposes of this plan, trail section and trailhead construction will total **$2,304,600.00.**

Maintenance Cost Analysis | Mid-Term (4 to 8 years)
Maintenance Costs below do not reflect additional costs due to events, heavy use, vandalism, natural disasters. In Year 8, there will be additional items such as trail intersection sign face and trail markers replacement, as outlined in *Section 7.4*. Using **Table 8-1**, we estimate an additional maintenance cost of $30,000.00 for signage, marker, and bike cattleguard replacements. This number will be refined in the Operations, Maintenance, and Replacement Plan.

Trail System

Section	5	6	7	8
Strawberry Canyon Trail	2 miles of trail maintenance (Level 1) = **$1,000**	2 miles of trail maintenance (Level 1) = **$1,000**	2 miles of trail maintenance (Level 1) = **$1,000**	2 miles of trail maintenance (Level 1) = **$1,000**
Hilso Trail System	26.0 miles of trail maintenance (Level 1) = **$13,000**	26.0 miles of trail maintenance (Level 1) = **$13,000**	26.0 miles of trail maintenance (Level 1) = **$13,000**	26.0 miles of trail maintenance (Level 1) = **$13,000**
Quartz Hill	39 miles of trail maintenance (Level 1) = **$19,500**	39 miles of trail maintenance (Level 1) = **$19,500**	39 miles of trail maintenance (Level 1) = **$19,500**	39 miles of trail maintenance (Level 1) = **$19,500**
McGaffey	13 miles of trail maintenance (Level 1) = **$6,500**	13 miles of trail maintenance (Level 1) = **$6,500**	13 miles of trail maintenance (Level 1) = **$6,500**	13 miles of trail maintenance (Level 1) = **$6,500**

Milk Ranch	Under Construction	20 miles of trail maintenance (Level 2) = **$20,000**	20 miles of trail maintenance (Level 1) = **$10,000**	20 miles of trail maintenance (Level 1) = **$10,000**
Twin Springs (Phase I)	Under Construction	14 miles of trail maintenance (Level 2) = **$14,000**	14 miles of trail maintenance (Level 1) = **$7,000**	14 miles of trail maintenance (Level 1) = **$7,000**
Bluewater	In Design	Under Construction	35 miles of trail maintenance (Level 2) = **$35,000**	35 miles of trail maintenance (Level 1) = **$17,500**
Twin Springs (Phase II)	In Design	Under Construction	7 miles of trail maintenance (Level 2) = **$7,000**	7 miles of trail maintenance (Level 1) = **$3,500**
Ojo Redondo	Planning	In Design	Under Construction	42 miles of trail maintenance (Level 2) = **$42,000**
Annual Total	**$ 40,000**	**$109,000**	**$81,500**	**$120,000**

Trailhead Maintenance

Trailhead	5	6	7	8
Hilso	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**
Strawberry Canyon	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**
Quartz Hill	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**
Milk Ranch	Under Construction	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**
Twin Springs	Under Construction	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**
Bluewater	In Design	Under Construction	Basic: **$2,000**	Basic: **$2,000**
Ojo Redondo	Planning	In Design	Under Construction	Basic: **$2,000**
Annual Total	**$6,000.00**	**$10,000.00**	**$12,000.00**	**$14,000.00**

Total Maintenance Costs | Mid-Term (4 to 8 years)

For the purposes of this plan, trail section and trailhead maintenance will total **$392,500.00**. In Year 8, according *Section 7.4*, we will need the County Road crews to provide additional trailhead maintenance, since this will be in-kind; it is not reflected in cost above. This number will be added as part of the Operations, Maintenance, and Replacement Plan.

Construction Cost Analysis | Long-Term (9 to 12 years)

Recommended near-term trail and trailhead construction projects include those projects slated for implementation in Year 9, including:

Trail Section	New Trails	Unauthorized Trails	Total Costs
Limekiln	16	0	**$134,400.00**
Base Cost per Mile	**$8,400.00**	**$15,000.00**	
Total Construction Costs	**$134,400.00**	**$0.00**	**$134,400.00**

Trail Section	Trailhead	Dirt/Rock Work & Gravel	Other Features	Total Costs
Limekiln	Construct New Trailhead	**Total: $497,400.00**	**Total: $20,200.00**	**$517,600.00**
			Total Construction Costs	**$517,600.00**

Total Construction Costs | Long-Term (9 to 12 years)

For the purposes of this plan, trail section and trailhead construction will total **$652,000.00**.

Maintenance Cost Analysis | Long-Term (9 to 12 years)

Maintenance Costs below do not reflect additional costs due to events, heavy use, vandalism, natural disasters. In Year 12, there will be additional items such as trail intersection sign face and trail markers replacement, as outlined in *Section 7.4*. Using **Table 8-1**, we estimate an additional maintenance cost of $45,000.00 for signage, marker, and bike cattleguard replacements. This number will be refined in the Operations, Maintenance, and Replacement Plan.

Trail System

Section	9	10	11	12
Strawberry Canyon Trail	2 miles of trail maintenance (Level 1) = **$1,000**	2 miles of trail maintenance (Level 1) = **$1,000**	2 miles of trail maintenance (Level 1) = **$1,000**	2 miles of trail maintenance (Level 1) = **$1,000**
Hilso Trail System	26.0 miles of trail maintenance (Level 1) = **$13,000**	26.0 miles of trail maintenance (Level 1) = **$13,000**	26.0 miles of trail maintenance (Level 1) = **$13,000**	26.0 miles of trail maintenance (Level 1) = **$13,000**
Quartz Hill	39 miles of trail maintenance (Level 1) = **$19,500**	39 miles of trail maintenance (Level 1) = **$19,500**	39 miles of trail maintenance (Level 1) = **$19,500**	39 miles of trail maintenance (Level 1) = **$19,500**
McGaffey	13 miles of trail maintenance (Level 1) = **$6,500**	13 miles of trail maintenance (Level 1) = **$6,500**	13 miles of trail maintenance (Level 1) = **$6,500**	13 miles of trail maintenance (Level 1) = **$6,500**
Milk Ranch	20 miles of trail maintenance (Level 1) = **$10,000**	20 miles of trail maintenance (Level 1) = **$10,000**	20 miles of trail maintenance (Level 1) = **$10,000**	20 miles of trail maintenance (Level 1) = **$10,000**
Twin Springs (Combined Phases I/II)	21 miles of trail maintenance (Level 1) = **$10,500**	21 miles of trail maintenance (Level 1) = **$10,500**	21 miles of trail maintenance (Level 1) = **$10,500**	21 miles of trail maintenance (Level 1) = **$10,500**

Bluewater	35 miles of trail maintenance (Level 1) = **$17,500**	35 miles of trail maintenance (Level 1) = **$17,500**	35 miles of trail maintenance (Level 1) = **$17,500**	35 miles of trail maintenance (Level 1) = **$17,500**
Ojo Redondo	42 miles of trail maintenance (Level 1) = **$21,000**	42 miles of trail maintenance (Level 1) = **$21,000**	42 miles of trail maintenance (Level 1) = **$21,000**	42 miles of trail maintenance (Level 1) = **$21,000**
Limekiln	Planning	In Design	Under Construction	16 miles of trail maintenance (Level 2) = **$16,000**
Annual Total	**$ 99,000**	**$ 99,000**	**$ 99,000**	**$ 115,000.00**

Trailhead Maintenance

Trailhead	**9**	**10**	**11**	**12**
Hilso	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**
Strawberry Canyon	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**
Quartz Hill	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**
Milk Ranch	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**
Twin Springs	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**
Bluewater	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**
Ojo Redondo	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**	Basic: **$2,000**
Limekiln	Planning	Design	Under Construction	Basic: **$2,000**
Annual Total	**$14,000.00**	**$14,000.00**	**$14,000.00**	**$16,000.00**

Long-Term (8 to 12 years) Maintenance Costs

For the purposes of this plan, trail section and trailhead maintenance will total **$470,000.00**. In Year 12, according *Section 7.4*, we will need the County Road crews to provide additional trailhead maintenance, since this will be in-kind; it is not reflected in cost above. This number will be added as part of the Operations, Maintenance, and Replacement Plan. For the purposes of this Plan, the ZMTP estimated maintenance costs out until Year 12, future updates and the Operations, Maintenance, & Replacement Plan will need to outline future costs. Estimating these costs now would give a false sense of the true maintenance cost, as costs change over time due to inflation, materials costs, etc. Additionally, during this period, cattleguards may need to be replaced, as well as trail kiosk, bulletin boards, and signage. These will need to be a special request to the counties or done through a grant as a maintenance need.

8.6 Overview of Annual Costs

Based on basic cost calculations from the previous Section, below are the annual costs to provide a quick snapshot over a 12-Year period.

- The reality is that this build-out is more likely over a 15-20 year period.
- For this analysis, we left in the trailhead gravel and dirt work cost even though we are confident County Road crews will provide this work, but it is a substantial that should be analyzed and understood.
- The trail and trailhead construction costs are divided evenly over a 4-year period to compare with the near-, mid-, and long-term phasing approach.
- These costs are very similar to those derived in *Section 8.4* above.

Items	1	2	3	4	5	6	7	8	9	10	11	12	12-Year Total
Trail Construction	$223,500.00	$223,500.00	$223,500.00	$223,500.00	$187,950.00	$187,950.00	$187,950.00	$187,950.00	$33,600.00	$33,600.00	$33,600.00	$33,600.00	$1,782,00.00
Trailhead Construction	$258,800.00	$258,800.00	$258,800.00	$258,800.00	$388,200.00	$388,200.00	$388,200.00	$388,200.00	$129,400.00	$129,400.00	$129,400.00	$129,400.00	$3,105,600.00
Bike Cattle Guards & Cowboy Gates (42)	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$0.00	$0.00	$0.00	$7,000.00	$63,000.00
Trail Maintenance	$27,000.00	$14,000.00	$66,000.00	$40,000.00	$40,000.00	$109,000.00	$81,500.00	$120,000.00	$99,000.00	$99,000.00	$99,000.00	$115,000.00	$909,500.00
Trailhead Maintenance	$4,000.00	$4,000.00	$6,000.00	$6,000.00	$6,000.00	$10,000.00	$12,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$16,000.00	$120,000.00
Periodic Costs				$15,000.00				$30,000.00		$100,000.00		$45,000.00	$190,000.00
Total Cost per Year	$520,300.00	$507,300.00	$561,300.00	$535,300.00	$629,150.00	$702,150.00	$676,650.00	$717,150.00	$276,000.00	$276,000.00	$276,000.00	$346,000.00	$6,023,300.00

*Periodic Costs include system upgrades for signage, marker, and bike cattleguard replacements and trailhead overhauls.

Going forward with implementation of the Zuni Mountain Trail System, ZMTP recommends:

1. Development of a map and table of all **Trail Improvements by Segment** (**Table 6-1**) with actual cost estimates (see *Section 6.2)*;
2. Development of an **Operations, Maintenance, & Replacement Plan** and **maintenance agreement** with USFS (either stand-alone or as part of an MOU update);
3. As part of the OM&R Plan, establishment of a maintenance **line-item and annual commitment** from both counties that is indexed to system expansion (above in-kind Road Crew support of Trailheads);
4. Securing commitments from regional **Youth Conservation Corps program** and incorporate projects in "Trail Improvements by Segment" and Maintenance projects into annual Work Plans;
5. Establishing a **Project & Resource Strikeforce Team** to time projects with application and funding cycles, as well as, deploy youth crews and volunteer assistance activities as approved by USFS; and
6. Formalizing how events and tour businesses will support trail maintenance needs, and although this Plan assumes that **USFS financial commitment** is limited to in-house personnel costs, there may be roles and expertise that USFS can bring to table that the ZMTP does not currently have.

Funding Opportunities

The Zuni Mountains Trail Partnership and its members have a strong history of locating and winning funding to support planning, design, construction, maintenance, and improvements for the trails and associated infrastructure. Not including YCC grant funding awards totaling over $4M, the Northwest New Mexico Council of Governments (NWNMCOG), USFS, and Cibola and McKinley counties have led several successful grant applications. Adventure Gallup & Beyond, one of the region's leading organizations for trails development, has a proven track record of financing and coordinating volunteers to develop adventure trails and venues outside of the Forest Service lands including High Desert Trail System, Red Rock Trail System, Ramah Pioneer Trail System, Mentmore Rock Climbing Area, Gallup Shooting Range, and Gallup ATV/Motorcross Park.

Secure Rural Schools Title II RAC Funding

Year	County	Project	Amount
2009	Cibola & McKinley	Zuni Mountains Trail System, planning and NEPA services	$150,000
2010	Cibola & McKinley	Zuni Mountains Trail System Phase 2	$75,000
2010	Cibola	Mt. Taylor Trail Maintenance Project	$38,546
2011	Cibola	Zuni Mountains Trail System Phase 2B	$75,000
2011	Cibola	Mt. Taylor ATV/UTV Trail Implementation	$71,510
2011	Cibola	Mt. Taylor-Bluewater Creek Parking Area Pole Fence Project	$27,900
2011	McKinley	McGaffey Area Trail Maintenance and Conservation Project	$28,594
2012	McKinley	Zuni Mountains Trail System Project – Cattleguard & Signage	$29,386
2012	Cibola	Mt. Taylor ATV/UTV Trail Implementation	$40,000
2012	Cibola	Mt. Taylor Noxious Weed Project	$9,795
2012	Cibola	Forest Road 180 Improvement	$25,050
TOTAL			**$570,781**

SRS Title II funding is administered by the Northern NM Resource Advisory Committee, and both counties have shown a high level of support in using Title II monies for trail system development, maintenance, and enhancements.

Recreational Trails Program

Year	County	Project	Amount
2009	McKinley	Hilso Trailhead & McGaffey Area Trail System	$227,894
2010	McKinley	Ramah Trail System & Trailhead (non-USFS)	$154,331
2014	McKinley	Strawberry Canyon Trailhead & McGaffey Trail Improvements	$20,000
TOTAL			**$402,225**

RTP is now being administrated by the NM Department of Transportation and is on a two-year Call for Projects cycle.

Other Grant Funding Opportunities being targeted

Type	Name	Description
Local	Local Trail Maintenance line-items or In-kind Contribution equivalents	Both counties realize that as trails are developed, a proportionate amount of maintenance funding will be needed on an annual and ongoing basis. McKinley County is considering a proposal to create a line-item of $20,000 to start contracting with Youth Conservation Corps.
	Local Lodger's Tax	The City of Grants and the City of Gallup may be willing to add some lodgers' tax to help market and publicize the trail system in partnership with USFS. These funds could be leverage to apply to the NM Cooperative Tourism Marketing Program, which is how Adventure Gallup & Beyond (AGB) funded its mapguide, shown on Page #38.
	Local Quality of Life GRT	The State of New Mexico allows local counties and cities to pass a tax for quality of life initiatives. None have passed this special tax to date.
State	Transportation Alternative Program www.fhwa.dot.gov	MAP-21 establishes a new program to provide for a variety of alternative transportation projects, including many that were previously eligible activities under separately funded programs. The TAP replaces the funding from pre-MAP-21 programs including Transportation Enhancements, Recreational Trails, Safe Routes to School, and several other discretionary programs, wrapping them into a single funding source. Funding is prioritized by NWNM Regional Transportation Planning Organization.
	State Tourism Department & State Parks Division	The COG and local Chambers have applied for strategic tourism investments and infrastructure improvements, including improvements to Bluewater State Park that could augment the Zuni Mountains Trail System.
	Tribal Infrastructure Fund www.iad.state.nm.us	The State of NM offers capital outlay for Native American communities and critical infrastructure. Projects would have to be owned by tribes or pueblos, and would need to be applied for by a tribal community.
Federal	Federal Lands Access Program www.cflhd.gov	FLAP Provides funds for work on public highways, roads, bridges, trails, and transit systems that are located on, are adjacent to, or provide access to Federal Lands. These facilities must be owned or maintained by a state, county, town, township, tribe, municipal, or local government. This program is a new program, being created under Moving Ahead for Progress in the 21st Century (MAP-21). This program places emphasis on projects that provide access to high-use recreation sites or economic generators.
	TIGER Grant (FHWA) www.dot.gov/tiger	The Transportation Investment Generating Economic Recovery, or TIGER Discretionary Grant program, provides a unique opportunity for the US Department of Transportation to invest in road, rail, transit, trails, and port projects that promise to achieve critical national objectives.
	Tribal Transportation Program www.fhwa.dot.gov	BIA provides funding for tribal entities including all MAP-21 programs.
Private	McCune Foundation www.nmmccune.org	A NM foundation that funded AGB through its developmental phases, and invested in creating adventure tourism as an economic driver.
	Healthy People –Healthy Places www.conalma.org	Con Alma Health Foundation, several health providers in NM support improvements to the built environment.
	Specialized Dealer Grant www.specialized.com	Gallup currently has a local retailer selling Specialized bikes.
	IMBA Bikes Belong Grant www.imba.com	International Mountain Bike Association
	People for Bikes www.peopleforbikes.org	
	American Trails Library www.americantrails.org	A database of funding sources.
	Backcountry Horsemen of America https://www.bcha.org/	Several programs and resources.

ZMTP AWARDS

NMDOT

NADO

COUNTIES

NMDOT
FUNDING DEADLINES