



ZUNI MOUNTAINS

TRAILS & CONSERVATION MASTER PLAN

Produced by the Zuni Mountains Trails Partnership

2017

**A Collaborative Planning Effort of the:
Zuni Mountains Trail Partnership,
US Forest Service,
National Park Service – Rivers, Trails, and Conservation Assistance Program, and
Northwest New Mexico Council of Governments**



“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

**October 2014 – Draft Final
November 2016 – Revision #1
April 2017 – Revision #2**

In accordance with Federal law and US Department of Agriculture policy, this institution is prohibited from discriminating on the basis of race, color, national origin, sex, age, religion, political beliefs, or disability. (Not all prohibited bases apply to all programs)

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Table of Contents

Abbreviations

Acknowledgements

Executive Summary

Chapter 1: A Vision of the Zuni Mountains Trail Partnership.....pg. 3

1.1 Introduction

1.2 Purpose and Scope

1.3 Project Location

1.4 Master Plan Boundary

1.5 Vision

1.6 Goals and Objectives

1.7 Project Milestones, a 20+ Year Legacy

1.8 Planning Process

Chapter 2: Existing Plans, Capacity, and Resources.....pg. 14

2.1 Local and Regional Plans

Chapter 3: Existing Conditions.....pg. 18

3.1 Existing Trails

3.2 Key Destinations

3.3 Trail Types and Conditions

3.4 Signage and Infrastructure Improvements

3.5 Forest Health

Chapter 4: Zuni Mountains Needs Analysis.....pg. 27

4.1 Background and Assessment

4.2 Benefits of Trails

4.3 User Groups

4.4 Member Input

Chapter 5: Design Guidelines.....pg. 29

5.1 USFS-IMBA Trail Standards

5.2 Trail and Trailhead Standards

Chapter 6: Recommendations.....pg. 37

6.1 Overview of Proposed System

6.2 Trail Improvements to the Zuni Mountains Trail System

6.3 Trailhead Improvements to the Zuni Mountains Trail System

6.4 Signage and Wayfinding

Chapter 7: Operation and Maintenance.....pg. 43

- 7.1 Roles and Responsibilities
- 7.2 Local Capacity and Resources
- 7.3 Operation and Maintenance Activities
- 7.4 Operation and Maintenance Budget
- 7.5 Operation and Maintenance Recommendations

Chapter 8: Implementation and Funding.....pg. 57

- 8.1 Preliminary Cost Estimates
- 8.2 Prioritization
- 8.3 Phasing
- 8.4 Trail and Trailhead Construction Costs
- 8.5 Phase Built-Out and Incremental Maintenance Costs
- 8.6 Overview of Annual Construction and Maintenance Costs
- 8.7 Funding Opportunities
- 8.8 Additional Acknowledgements
- 8.9 System Maps

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**

Table of Figures

FIGURE 1-1: Zuni Mountains Boundary Map

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

Table 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 Unauthorized 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

DISCLAIMER ON APPENDIX ITEMS: These are historic documents that we wanted to reference, as part of the overall ZMTP effort and creation of this Master Plan, but a lot of this information and especially the recommendations have been updated and revised to match the Decision Notice and Finding of No Significant Impact.

Appendix B – ZMTP Trail System Powerpoint – was completed in December 2011, prior to the Environment Assessment, so maps and information provided in the powerpoint are not consistent with what was analyzed in the EA for example trails shown on the Hogback have been eliminated. The purpose was to provide an inventory, map, and preliminary analysis of trail routes provided by users.

Appendix C – IMBA Report – this report was completed in Summer 2011, prior to the Environment Assessment, so maps and information provided are not consistent with what was analyzed in the EA. The purpose of including this report is to show the interest and sweat equity by local stakeholders and IMBA. All recommendations in this report would still need to align with a final Decision Notice and be approved by USFS.

Abbreviations

AGB – Adventure Gallup and Beyond.

ATV – All Terrain Vehicle.

BCHA – Back Country Horsemen of America

CFLRP – Collaborative Forest Landscape Restoration Program.

EMNRD – Energy, Minerals, and Natural Resources Department of the State of New Mexico, and administrator of State Parks Division, Youth Conservation Corps Program, and formerly Recreational Trails Program.

FHWA – Federal Highway Administration, provides funding for Transportation Alternative Program and Recreational Trails Program.

IMBA – International Mountain Biking Association.

MAP-21 – Moving Ahead for Progress in the 21st Century Act, long-term highway authorization.

NEPA – National Environmental Policy Act, requires federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions.

RAC – Northern New Mexico Resource Advisory Committee, RAC provides Title II funding for projects.

Ride Center® – IMBA’s designation that represents IMBA’s Model Trails recognition for large-scale mountain bike facilities that offer something for every rider. These are destination-worthy areas that offer riders everything from backcountry adventures to shuttle-served gravity trails, and from advanced to family-friendly.

RTCA – Rivers, Trails, and Conservation Assistance Program through National Parks Service.

RTP – Recreational Trails Program, grant funding for multi-use, non-motorized, and motorized trail systems.

TAP – Transportation Alternative Program, under MAP-21, the new Transportation and Highway Authorization, a consolidated grant program for alternative transportation programs, including scenic byway, trails, etc.

SRS – Secure Rural Schools and Community Self-Determination Act of 2008.

YCC – Youth Conservation Corps, funded under the New Mexico Energy, Minerals & Natural Resources Department.

ZMTP – Zuni Mountains Trail Partnership

Acknowledgements

Overall, 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, and
- Coordinating the overall Master Plan development process and financing NEPA work for a non-motorized trail system.

Without their 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 and especially Regional Outdoor Planner, Attila Bality have our gratitude for providing technical assistance in developing a planning framework, facilitating meetings, designing public input process, and helping in the creation of this Trails & Conservation Master Plan.

This planning process would not have been realized without dedicated input from federal, state, tribal, and local governmental entities; businesses; private industry; clubs; and citizen stakeholders including:

- Cibola County,
- McKinley County,
- Adventure Gallup & Beyond (AGB),
- Backcountry Horsemen of New Mexico, Zuni Mountains Chapter,
- Gallup Trails,
- Gallup and Grants Youth Conservation Corps,
- Future Foundations Family Center, Inc., Gallup Boys & Girls Club, and Connections, Inc.,
- Healthy Kids, New Mexico / Community Transformation Grantees (McKinley, Cibola, and Zuni)
- Plateau Sciences Society and Cibola County Historical Society,
- Navajo Nation and Hopi Tribes,
- Pueblos of Acoma, Laguna, and Zuni,
- SWCA Environmental Consultants and Okun Consulting Solutions
- NM Departments/Divisions of: Fish & Wildlife; Transportation; Health; Energy, Minerals, and Natural Resources; State Parks; and State Land Office,
- International Mountain Bicycling Association,
- Local businesses, Chambers of Commerce, Health Councils, user group representatives, citizens,
- National Park Service (NPS): RTCA Program, El Malpais, and El Morro National Monuments,
- Bureau of Land Management (BLM): El Malpais National Conservation Area,
- US Forest Service (USFS), and
- Northwest New Mexico Council of Governments (NWNMCOG)

The ZMTP Master Planning Team included: Matt Reidy, Arnold Wilson, Ruth Doyle, Alvin Whitehair, Attila Bality, Douglas Decker, Judy Horacek, Karl Lohmann, Larry Winn, Laura Jaramillo, Steve Owen, Mike Jaramillo, William Siebersma, Peter Tempest, Bob Rosebrough, Olin Clawson, Anna Larson, Aaron Lowden, Tom Mayer, Strider Brown, Mike Cernaway, Evan Williams, and Brandon Howe.

We appreciate the support of the Congressional Delegation, its staff, and our State Legislators.

Prepared with technical assistance from:



USDA Forest Service

National Park Service RTCA



Northwest NM Council of Governments



Executive Summary

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.

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 youth-focused 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.

Further, this Plan acts as a double-edged tool:

- 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 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. This new 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.

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 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.

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.

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.

This plan fits into the US Forest Service’s four “P’s” of the recreation management model: *Provide, Protect, Partner, and Perform*. Execution of this plan will only be completed by stakeholders with oversight and approval at planning, design, and implementation stages by the US Forest Service.

This Plan supports the desired outcome by providing a business case for how this 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 strongly believes that these numbers are achievable with minimal USFS in-kind personnel contributions.

This Plan is only the beginning of planning, coordination, and commitments needed for this undertaking; going forward if the 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; and
6. Formalize 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.

“Renewing Body and Spirit, Inspiring Passion for the Land”

Chapter 1: A Vision of the Zuni Mountains Trail Partnership

This chapter helps to present the purpose and scope of the Zuni Mountains Trail & Conservation Master Plan, the vision for the trail system, key goals and objectives of the Plan, and an overview of the planning process.

1.1 Introduction

Tucked away in beautiful Northwest New Mexico is a charming mountain range called the Zuni Mountains. Mt. Sedgwick, the highest of these mountains, rises 9,256 feet over ponderosa pine forests, colorful aspen lined canyons, and green-topped red mesas. The Continental Divide runs through the middle and the Zuni Mountains have several flowing streams draining large, wet flowering meadows.

Native peoples, conquistadors, early land grant settlers, miners, loggers, and ranchers have come in contact with 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.



1.2 Purpose and Scope

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 Region Sustainable Recreation Strategy and 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 Plan:

- Offers recommendations for design, development, management, and maintenance of the existing and proposed Zuni Mountains Trail System;
- Details recommendations based on Zuni Mountains Trail Partnership members, IMBA site visit and guidance, National Parks Service-Rivers, Trails, and Conservation Assistance input, and user mapping and reconnaissance; and,
- 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.

1.3 Project Location

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.

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.

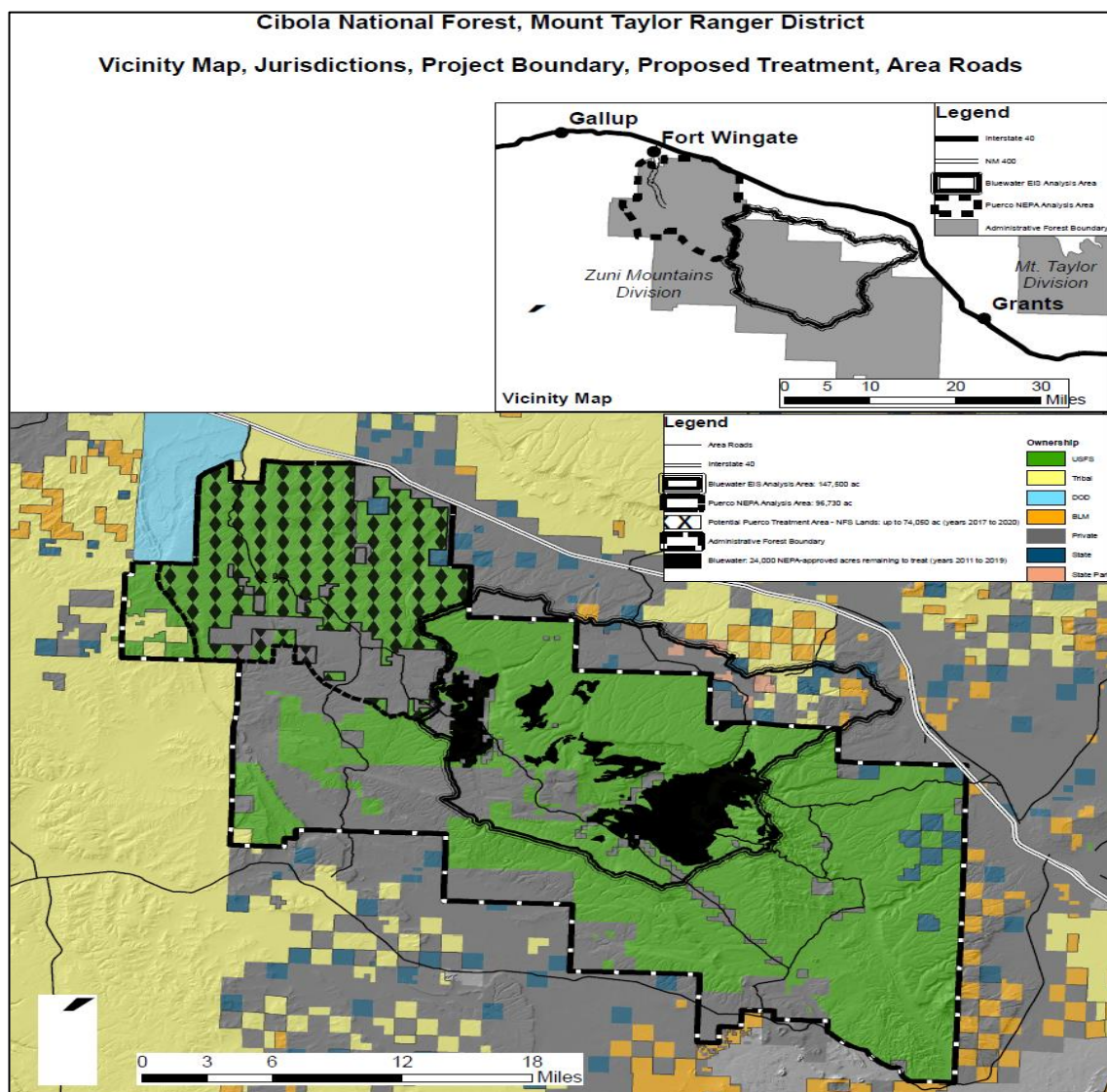
The trailhead was developed following years of collaboration between the Mt. Taylor Ranger District and Gallup Trails 2010, county, state and other federal partners. Some of these same partners have joined forces to develop the Zuni Mountain Trail Partnership.

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.

1.4 Master Boundary 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.

Figure 1-1: Zuni Mountains Boundary Map



1.5 Vision

The Zuni Mountains are a premier year-round recreational destination with a system of interconnected non-motorized trails. 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. Visitors and near-by residents enjoy close-to home forest recreation through community gateway trailheads encompassing the Zuni Mountains.

This Vision is achieved by:

- A 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.

1.6 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.

The Goals of the ZMTP include:

- 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 and forums, GIS mapping events, 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, and
- Identification, inventory, and prioritization of sensitive areas and potential restoration projects, such as closing or rehabilitating unneeded routes, throughout the project area.

The **Objectives** of the ZMTP include:

- Establish a non-motorized trail system for mountain biking, equestrian use and hiking throughout the Zuni Mountains that reduces resource impacts by minimizing the creation and use of unauthorized trails. Further, this system would provide a variety of trailheads and associated facilities such as stacked-loop trails and 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 (such as prehistoric sites, historic railroad grades, and remnants of contemporary mining, 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 reduce current and 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, minimizing road crossings where feasible, addressing potential user conflicts, and locating and developing 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 and 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 tribal member health and wellness, forest stewardship, running, bicycling, horseback riding, hunting or gathering forest products.
- Finally, although 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.

1.7 Project Milestones, a 20+ Year Legacy

The Zuni Mountains Trail Partnership has a rich and substantial history in terms of planning a non-motorized, 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.



Hilso Trailhead

- **March/April 2012:** Executed MOU detailing the roles and responsibilities of the Zuni Mountains Trail Partnership (12-MAR-3723).
- **March 2012:** USA Cycling announced its award to hold the 2013 and 2014 Mountain Bicycling 24-Hour National Championships on the McGaffey Trail System.
- **October 2012:** ZMTP and its partners were selected to present our story at the IMBA World Summit in Santa Fe.
- **October- November 2012:** Zuni Mountains Trail Project Open House meetings held:
 - **Grants, October 29th, Gallup, Nov. 5th, Ramah, Nov. 7th**
- **2012-2013:** McKinley and Cibola Counties selected SWCA Environmental Consultants, working under the direction of USFS staff, to complete an Environmental Assessment for the Zuni Mountains Trail Project.
- **June 15, 2013:** Over 500 riders enjoyed and participated in the 24 Hours in the Enchanted Forest at the 24-Hour National Mountain Biking Championship on the Hilso Trail System.

- **September 21-22, 2013:** Gallup hosts Squash Blossom Classic and Levi Leipheimer, US Cyclist, opens the Gallup Brickyard Bike Park. This bike park was inspired by the IMBA Site Visit report.
- **November 21, 2013:** USFS and SWCA Environmental Consultants held a NEPA Progress Report meeting to announce timeline for finalization Environmental Assessment and potential Decision document, and review draft Trail System alternatives and concerns to date.

- **June 7, 2014:** McKinley County dedicates the Ramah Mormon Pioneer Trail, a hiking trail that circumnavigates the old Ramah Lake.



Ramah Trailhead

- **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.
- **TBD:** USFS-Cibola National Forest issues Decision Notice/Finding of No Significant Impact based on the final Environmental Assessment (EA) for the Zuni Mountain Trail on the Mt. Taylor Ranger District.

1.8 Planning Process

Momentum for the Zuni Mountains Trail system has been building for over a decade. The people who would later become the Zuni Mountains Trail Partnership worked to create a master trail system development and conservation plan for the Zuni Mountains area of the Mt. Taylor District of the Cibola National Forest.

Starting in 2009, the ZMTP worked to create a Master Planning Team made up of stakeholders and agencies from the bi-county area. Attila Bality, NPS Outdoor Recreation Planner, assisted the team in developing a comprehensive vision, deliverables, and objectives. This Master Planning Team and ZMTP stakeholders met monthly to discuss and deliberate on topics detailed in this document. Since then the partnership has met over 60 times. Early meetings reviewed grants and methods for funding the project. Most were straightforward meetings used to share history, gather data, map existing use patterns and collectively visualize the desired outcome. About 19 meetings were held to reach out to the general public from the communities in the project area, such as Grants, Gallup and Ramah. Several meetings focused on crafting an intergovernmental memorandum of understanding between Cibola County and McKinley County and the Forest Service. Three of the meetings focused on bringing the International Mountain Biking Association to provide an expert review of the project.

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



The planning methodology and outreach goals led to the following actions:

- Development of communication tools, a website and a Facebook page to publish information and meeting notices, sign-up interested parties and facilitate forums for public input. www.zunimountaintrailpartnership.com
 - Creation of interactive map through Google Earth, to share and add existing and additional trail routes and possible trailheads.
 - Utilization of professional and knowledgeable GIS and trail cartographers (e.g. mappers) to map routes, provide GPS data, and prioritize routes.

- Identified stakeholder groups, perhaps not well represented in the Master Planning Team, and engaged in active recruitment of these important voices. An example was direct outreach and recruitment of representatives from the equestrian user group within the affected communities.
 - The equestrian group was 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.
- Held monthly team meetings at public venues open and accessible to all citizens and user groups; also held meeting specifically for many area civic organizations.
- Organized several field trips and an interactive IMBA trail work session to educate area citizens and project team on project locations and 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 and document concerns and issues.

See **Appendix A: Media and Meetings Listing** for all media and ZMTP and public outreach meeting and events for more details on the overall planning and NEPA process.

Document Uses

The Zuni Mountains Trails & Conservation Master Plan is designed for several purposes, including:

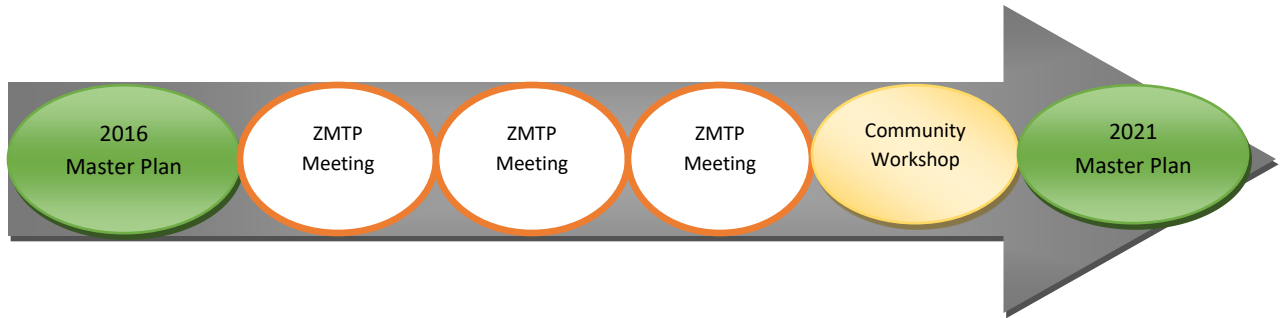
1. Support of the NEPA and Environmental Assessment that was drafted by SWCA Environmental Consultants, augmented by Okun Consulting Solutions, and then completed by the USFS staff in support of their final decision;
2. To demonstrate partnership efforts and capabilities in trail development and maintenance, 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.

Periodic Updates

It is the responsibility of the partnership to accomplish its goals and vision by following through on strategic planning, identifying opportunities, complying with regulations and guidelines set forth by the US Forest Services and other partners, obtaining approval where necessary, seeking and identifying additional partners and funding sources, while keeping the public informed regarding the process and developments as well as seeking and utilizing public input throughout the process. The strategic plan will be re-visited periodically, to monitor results, evaluate outcomes, and make adjustments as needed.

The Zuni Mountains Master Trails & Conservation Master Plan will be reviewed and renewed every five years to remain current with the needs of the membership, adjust to changes in use, and to allow for adaptive management. The review process diagramed below 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. Zuni Mountains Trail 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.



Chapter 2: Existing Plans, Capacity, and Resources

This chapter showcases the alignment between the ZMTP planning effort and other local and regional plans and 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/or maintenance of the Zuni Mountains Trail System. All of these studies and plans, support an “all of the above” multi-use approach to trail development for a wide range of users to maximize economic opportunities.

2.1 Local and Regional Plans

In a 2001 feasibility study, conducted 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 \$5 million (conservatively estimated), create 120 new jobs and provide substantial opportunities for youth and community recreational, wellness, and volunteer activity. This study resulted in significantly increased community support and participation.

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 trails on Gallup’s to save 250 jobs and create 50 jobs. The CEDS plan designates Adventure Gallup & Beyond 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 the US Forest Service and community stakeholders to create the Zuni Mountains Trail System which connects and builds community trails in the Cibola National Forest.

McKinley and Cibola Counties both have developed Comprehensive Plans to guide land-use development and growth. Both plans focus on developing tourism as one key to healthy regional and local economies.

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.

McKinley County Land Use Goals and Policies

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’s 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 Goals, Policies & Strategies

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 Goals and Policies

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 initiatives.

The Cibola County Comprehensive Plan (2015). This 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 one of the specific goals is “promoting Cibola County as a popular destination for regional, national, and international tourists and recreation enthusiasts through enhancing and marketing the County’s points of attraction.” Specific goals, policies and strategies, listed below, clearly illustrate how the Zuni Mountain Trails System will support the Cibola County Comprehensive Plan.

Land Use Policy – LU-7, Support development that will enhance economic development, tourism potential, and Cibola County’s attractive, positive image.

Recommended Economic Development Actions and Strategies:

h) Promote appropriate recreational activities within the Range/Grasslands, Woodlands, Mountains, and Lakes/Rivers/Arroyos that highlight them as destinations along the Scenic Corridors.

i) 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 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 City of Grants has also done trails planning including the Rio San Jose Legacy Trail and connections from that main trail to other interest points and social hubs, and is currently developing its Comprehensive Plan update to include a strong section of parks, open space, and trails.

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).

In 2015-2016, a group of equestrian users from both counties, came together to form the Zuni Mountains Chapter of Back Country Horsemen. Together they investigated all proposed trails and provided a scoping report to the District Ranger for his incorporation into this Master Plan and Project evaluation.

Adventure Gallup & Beyond, 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), Started in 2005, Venue: High Desert Trail System mainly. |
|  | Dawn Til Dusk (12-hour endurance mountain bicycling event), Started in 2005, Venue: High Desert Trail System. |
|  | 24 Hours in the Enchanted Forest (24-hour endurance mountain bicycling event), Started in 2010, Venue: McGaffey Area Trail System, of the Cibola National Forest. |

In 2013, Adventure Gallup & Beyond measured its progress and economic impact. They produced a 10-year economic impact [study](#) of Adventure Tourism in McKinley County. The highlights of this report include the following key findings that encompass the period of 2002 – 2013 for hikers, bikers, and climbers only (due to limited data).

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-of-state. The following **Table 2-1** describes the recreation activities that people like to participate in.

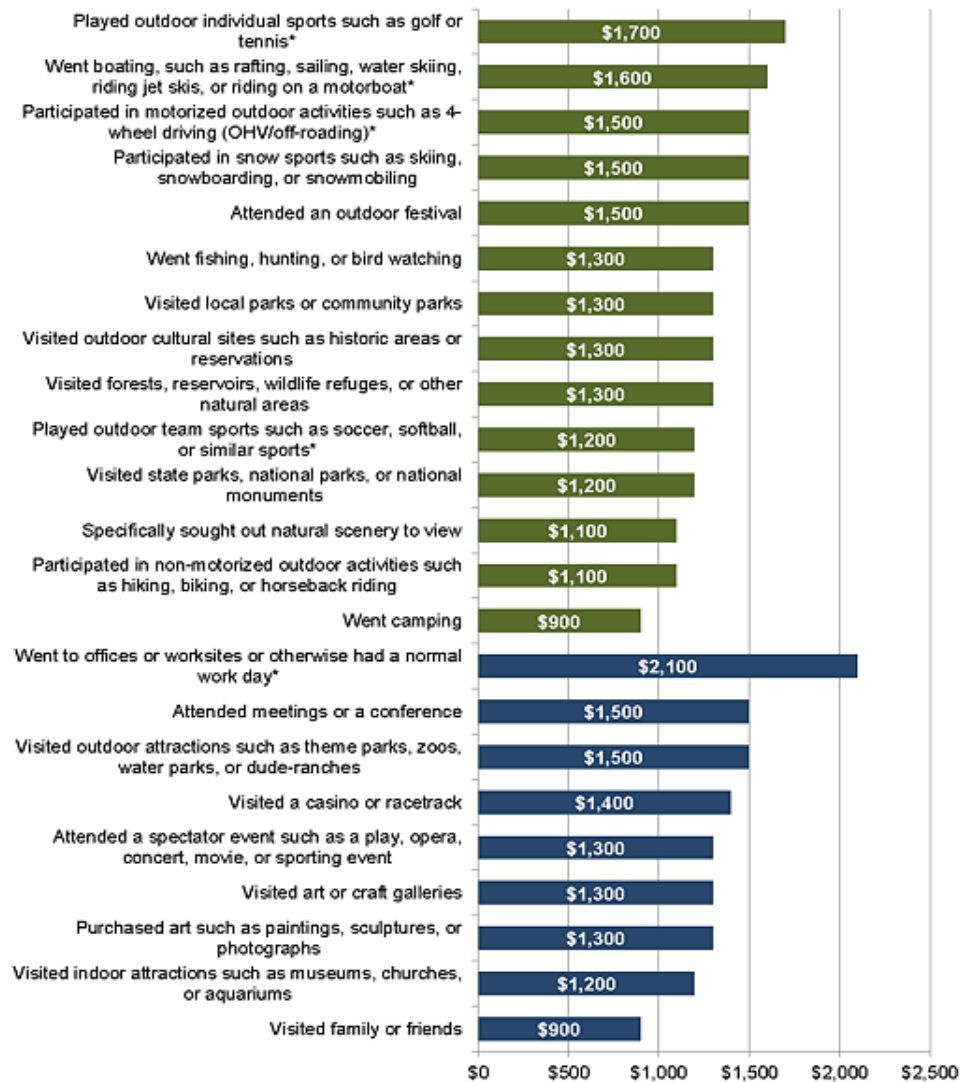
TABLE 2-1: Outdoor Activity Participation

| 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



Chapter 3: Existing Conditions

This chapter describes the existing Zuni Mountains Trail System, including key destinations, trail types and conditions, signage and infrastructure improvements, and forest health.

3.1 Existing System Trails

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 and game trails and two-track trails are not addressed in this Master Plan.

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.

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.

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 Ramah Mormon Pioneer Trail designed by Strider Brown and the Gallup-McKinley County Youth Conservation Corps as a pedestrian and hiking trail, offers 6.1 miles of trail and tremendous overlooks of the Ramah Valley. **Appendix B: ZMTP Trail System Powerpoint** produced by Tom Mayer showcases the existing trail. Please note that 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.



3.2 Key Destinations

In total, the proposed trail system will provide access to several destinations within the Zuni Mountains, such as:

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

There are also a number of key destinations, communities, and trail systems that eventually the ZMTP is hoping can be tied in including: Breadsprings (Baahali), Gallup, Grants, Milan, Fort Wingate, Bluewater, El Morro, and Ramah areas, as well as, nationally prominent trail systems, trade routes, monuments, and parks, such as the historic Zuni-Acoma Trail, the Chain of Craters, the Hogbacks, McGaffey Lake, El Malpais National Monument, El Morro National Monument, Mount Taylor, Mount Sedgwick, and the Continental Divide Trail System. To be clear, the Environment Assessment did not study or evaluate trail connections to these areas.

3.3 Trail Type, Class and Conditions




Besides existing trails that are in good condition and meet USFS standards, we have several miles of trails that exist and are mapped in the Zuni Mountain Trail System proposal that were originally “user-created”. User-created trails are defined as social trails that may follow historic or well-defined routes developed by repetitive use. Under this plan, these are defined as unauthorized trails in the NEPA process.

The user-created trails largely follow old access roads, old logging trails, livestock/game trails, and trail tread created through repeated use. On the user-created trails, some problematic trail conditions exist 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.

In recent years, ZMTP has sought to construct and maintain trails to United States Department of Agriculture Forest Service’s (US Forest Service’s) standards, 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.

Table 3-1 provides a short description of the US Forest Service trail class matrix for USFS Trail Classes 2, 3, and 4, which are the applicable trail classes for the Zuni Mountain trail system. USFS Trail Class 1 and Class 5 were ruled out based on Potential Appropriateness of Trail Classes for Managed Use (Trails Management Handbook, 14.3 Exhibit 01, 2008). USFS Trail Fundamentals (2008) allows “local deviations from any Trail Class descriptor may be established based on trail-specific conditions, topography, erosion, or other factors, provided that the deviations do not undermine the general intent of the applicable Trail Class” (p. 2).

TABLE 3-1: Trail Class Matrix


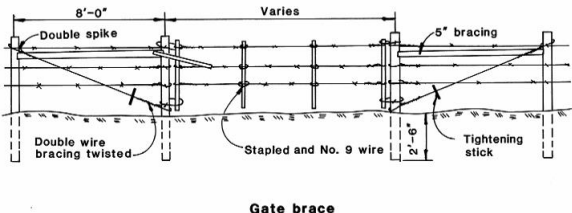


| Class | Trail Class 2 Moderately Developed | Trail Class 3 Developed | Trail Class 4 Highly Developed |
|------------------|--|--|--|
| Trail Attributes | <ul style="list-style-type: none"> Tread continuous and discernible, but narrow and rough Single lane with minor allowances constructed for passing Typically native materials Vegetation may encroach on trail Obstacles common and substantial Trail signs at junctions Structures limited and adequate to protect trail infrastructure and resources | <ul style="list-style-type: none"> 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 Vegetation cleared outside trailway Obstacles common Trail signs for assurance Structures may be common | <ul style="list-style-type: none"> Tread wider and smoother Single lane, with allowances constructed for passing where required by traffic volumes in areas with no reasonable passing opportunities available Native or imported materials Vegetation cleared outside trailway Obstacles infrequent Trail signs & structures common |
| Picture Examples |  |  |  |
| Surface | <ul style="list-style-type: none"> Native, limited grading May be continuously rough Sections of soft or unstable tread on grades < 5% may be common | <ul style="list-style-type: none"> Native with some onsite borrow or imported material where needed for stabilization, occasional grading Intermittently rough Sections of soft or unstable tread on grades < 5% may be present, but not common | <ul style="list-style-type: none"> Native, routine grading with improved sections of borrow or imported materials Stable with minor roughness |




3.4 Signage and Infrastructure Improvements

The ZMTP has worked closely with US Forest Service staff to develop trails, trailheads, and other improvements per USFS standards.

The following items are in place at the Hilso Trailhead and on the McGaffey Trail System, or are referenced from other Federal parks and amenities.

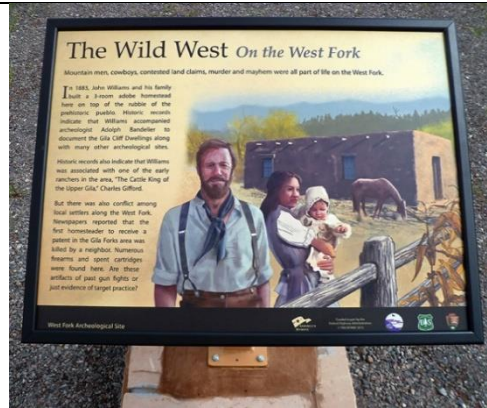
TABLE 3-2: Signage and Information Specifications

| | |
|--|---|
| <p>Boundary Fencing, Gates and Other Vehicle Barriers</p> <p>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.</p> |   <p>Gate brace</p> <p><small>Figure 14—Standard brace for gate in a wire fence. Sawed material is preferred over round. Notch braces to fit firmly against posts.</small></p>   |
|--|---|

| | |
|---|--|
| <p>Toilet Double Vault (14'4"X11'11")</p> |  |
| <p>Bike Cattle Guards (53"-58" width) – USFS approved elevated design only</p> |  |
| <p>Cattleguard</p> |  |
| <p>Trail Information Kiosks:</p> <p>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.</p> |  |

Interpretative Signs:

Interpretive signs communicate specific messages to visitors, such as information on cultural, environmental, or historical resources. They are most commonly used for self-guiding trails or for wayside exhibits at points of interest, such as viewing areas and resource management areas. The ultimate goal is to convey stewardship in the minds of the users. Potential interpretive signage locations include along the Nature Loop and at scenic vistas. The information provided at each interpretive installation should be based on the experiences, knowledge, and interests of its expected audience.



Bulletin Board:

USFS standard, two-sided Bulletin Board with trail and area information.



USFS Standard Recreation Information Signs:

USFS standard providing information on Trailhead location and prohibited use advisements.



Trail Re-Assurance Markers:

Carsonite signs, 5', brown with various decals

Information to be displayed could include the name and/or color designation for the trail, a jurisdictional branding element (such as ZMTP), and managed and prohibited uses.



ZMTP Trail Directional and Intersection Current Signs:

These are typically placed at trail junctions (also called decision points) to guide trail users toward a destination or experience. Directional signs are recommended where named trails intersect.



ZMTP Trail Directional and Intersection Future Signs:

We will transition all signage to USFS standard. These are typically placed at trail junctions (also called decision points) to guide trail users toward a destination or experience. Directional signs are recommended where named trails intersect.



User Trail Yield-to-Signs

USFS standard providing information on trail etiquette signage that should be signed as required.



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.



3.5 Forest Health

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

Zuni Mountains Collaborative Forest Landscape Restoration Program

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

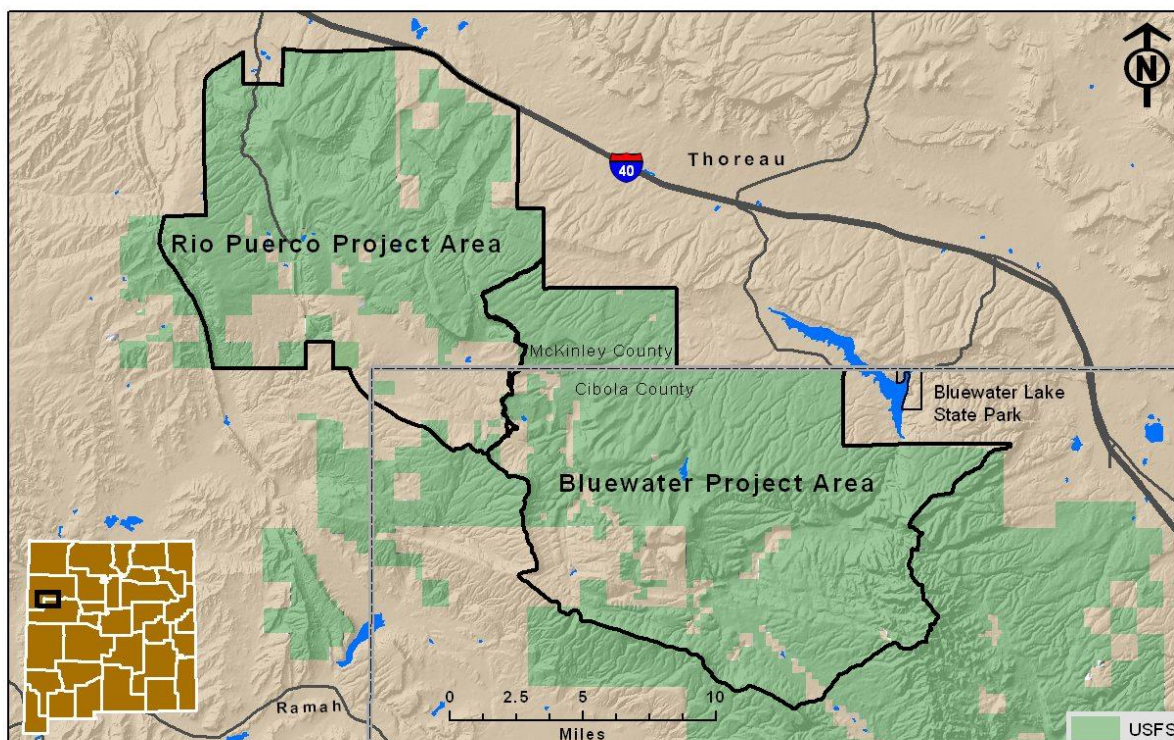
In April 2011, the Travel Management Plan for the Mt. Taylor Ranger District was approved and established a network of National Forest System roads and trails designated for motor vehicle use and prohibited motorized use off the designated system except where shown on the Motor Vehicle Use Map. This 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 4: Zuni Mountains Needs Analysis

This chapter summarizes 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 and pack and saddle equestrian.

4.1 Background and Assessment

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 indicate 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, 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 of the Zuni Mountains for attracting mountain bikers from the region and eventually 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.

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 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.

4.2 Benefits of Trails

Benefits of Trails. A well-planned, sustainable trail system benefits the surrounding communities in many tangible and intangible ways, including:

- 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.

4.3 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.

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. 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 singletrack 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/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.

Cross Country Skiing, Snowshoeing, and Other Non-motorized Winter Users. Currently, 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.

4.4 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.

Chapter 5: Design Guidelines

This Chapter summarizes the design guidelines that are utilized by the US Forest Service through its 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. Very briefly, the Zuni Mountains Trails Project has evolved over the years. The Partnership, especially the cooperating agencies of Cibola and McKinley counties, set out to develop a multi-use, non-motorized trail system. During the process, the project became more and more focused on building a system that be highly attractive to the local and visiting mountain biking users; offering hundreds of miles of connected and looped singletrack.

In 2016, our equestrian partners helped return this project back to its original focus of providing non-motorized trail opportunities to a diversity of user groups. The Zuni Mountains Chapter of the Backcountry Horsemen did reconnaissance trips to all of the proposed trail sections within the project and provided a scoping report. The scoping report reveals that there only a few small segments of proposed trails that 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 because “pack and saddle use generally has the most limiting design requirements” (Trail Fundamentals, 2008).

5.1 IMBA Trail Standards

During the planning process, several ZMTP members researched best practices and guidance from the International Mountain Biking Association. In 2011, local stakeholders worked with IMBA to put a trail planning work day on the east side of the Zuni Mountains.

ZMTP members have advocated that 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. The approach would be to pull in these best practices into Forest Service requirements for sustainable trail design, construction and maintenance that provide important benefits to visitors and communities, protect natural, cultural and social resources, and minimize annual and deferred maintenance needs. For example, building our system with principles that:

- 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; and,
- Trails that do not harm the natural environment.

TABLE 5-1: The Sustainable Solution

- ❖ Outsloped Tread
- ❖ Sustainable Grades
- ❖ Frequent Grade Reversals
- ❖ Erosion Resistance
- ❖ Path that traverses along the sideslope
- ❖ Provision for sheet flow of runoff
- ❖ Positive User Experiences
- ❖ Low maintenance

This equals = the Rolling Contour Trail

USFS Trail Construction & Maintenance Notebook 2007

Along with tools and techniques from the USFS Trail Management Objectives and Trail Fundamentals and expertise from Forest Service staff, ZMTP members, and contractors, it should be encouraged to pull from

the International Mountain Biking Association standards for enjoyable riding experiences, but only within the USFS designed use for pack & saddle. Publications such as recent editions of the Forest Service *Trail Construction and Maintenance Notebook (2007)* and *IMBA's Guide to Building Sweet Singletrack: Trail Solutions (2004)*. Those standards are summarized in the tables 5-1 and 5-2.

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

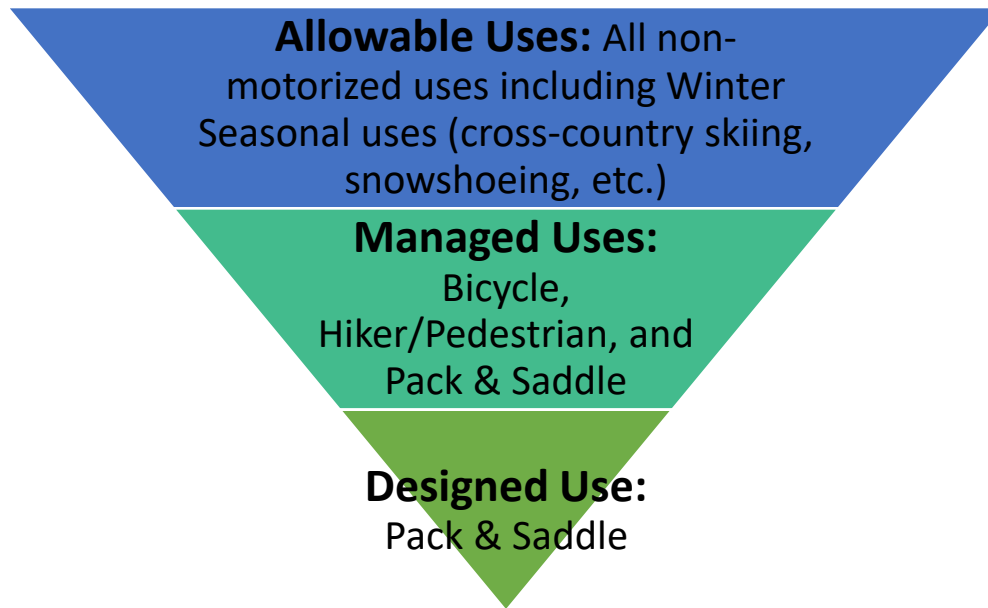
Managing Mountain Biking; IMBA's Guide to Providing Great Riding

5.2 Trail and Trailhead Standards

Based on the Trail Fundamentals (2008) guidance, the Zuni Mountains Trail Partnership has provided guidance in terms of the five concepts that are the cornerstones of any Forest Service trail, while 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 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.

| Trail Concept | Definition | ZMTP Determination |
|--|--|---|
| Trail Type (FSH 2309.18, sec 14.1) | 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, sec 14.2) | The prescribed scale of development for a trail, representing its intended design and management standards | Trail Class 3: Developed |
| Managed Use (FSH 2309.18, sec 14.3) | A mode of travel that is <u>actively</u> managed and appropriate on a trail, based on its design and management. <u>There can be more than one.</u> | 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, sec 14.4) | The 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. <u>There is only one Designed Use per trail or trail segment.</u> | Designed Use: Pack & Saddle |
| Design Parameters (FSH 2309.18, sec 14.5) | Technical guidelines for the survey, design, construction, maintenance, and assessment of a trail, based on its Designed Use and Trail Class. | Detailed further below in Table 5-3. |

This Plan recommends USFS Class 3 trail type, but understands that 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.


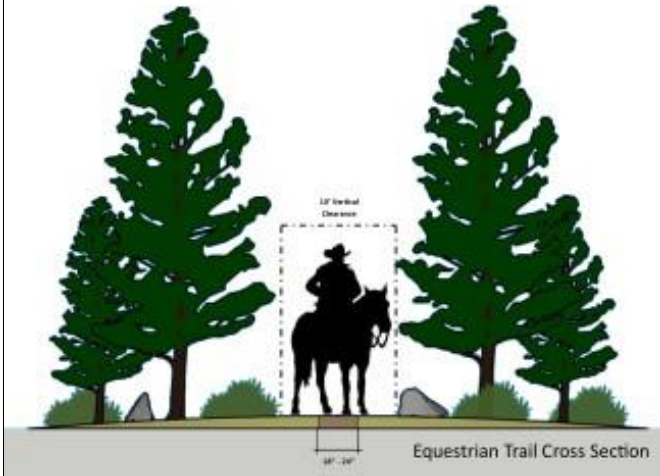


USFS Class 3 trail class will incorporate the following maintenance best practices, where applicable and USFS approved for sustainable trails:

- **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.

For purposes of this Plan, the ZMTP has chosen to further illustrate the Trail Class 3 with Design Parameters for Pack and Saddle Design including the ranges from USFS Trails Management Handbook in **Table 5-3**.

TABLE 5-3: Trail Class 3: Developed

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

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.

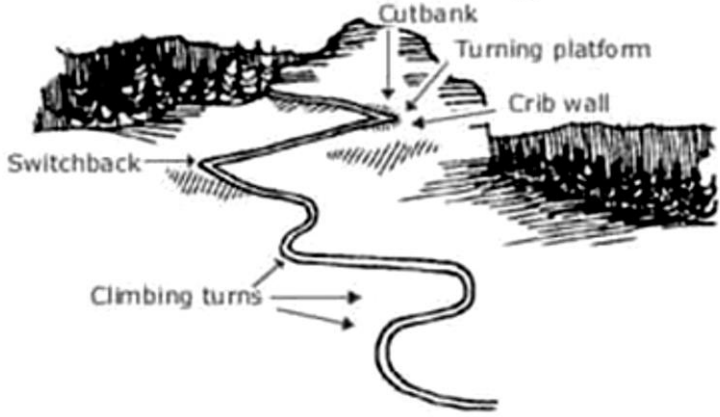

A grade reversal is an undulation within the trail tread: a short dip followed by a rise. This grade change in the tread catches water at the low point and diverts it off the trail. Grade reversals can be traversed by all users and require little maintenance once installed. When not incorporated into 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 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.

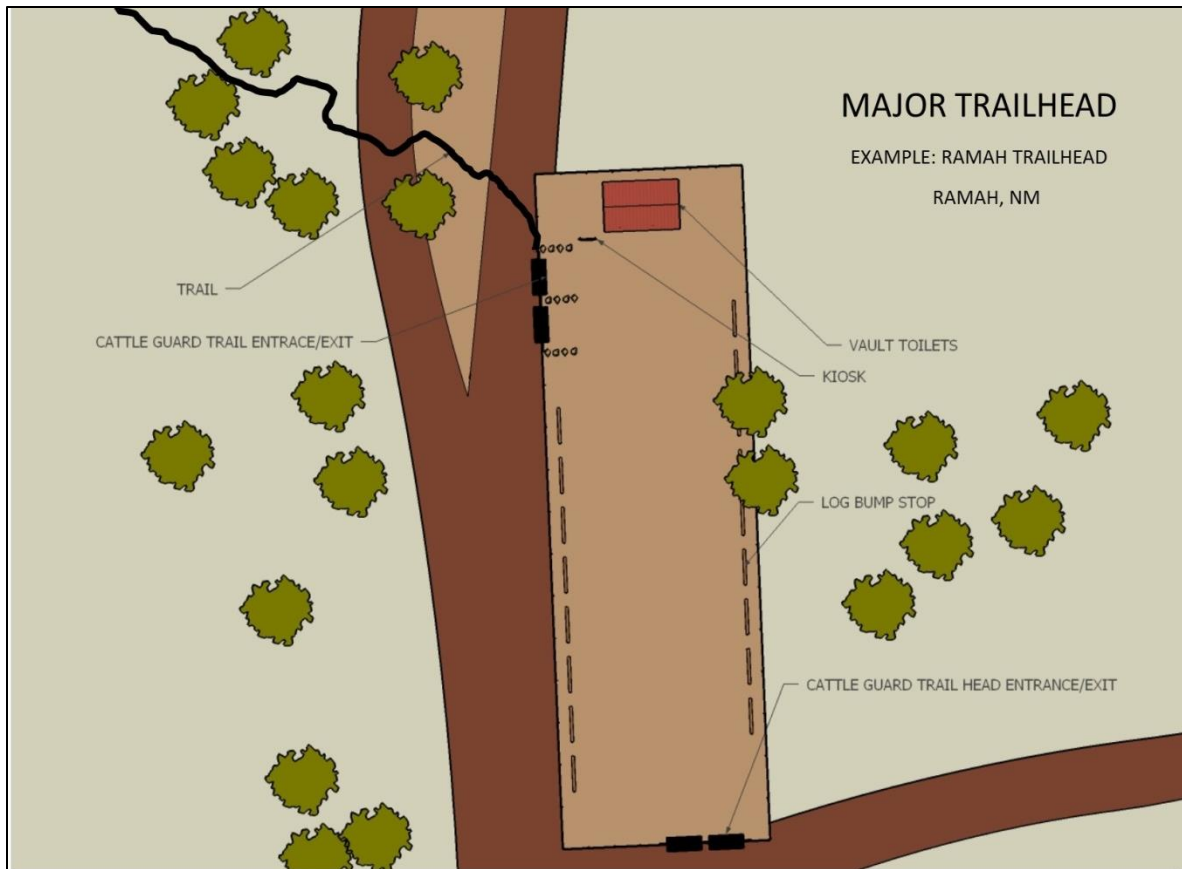
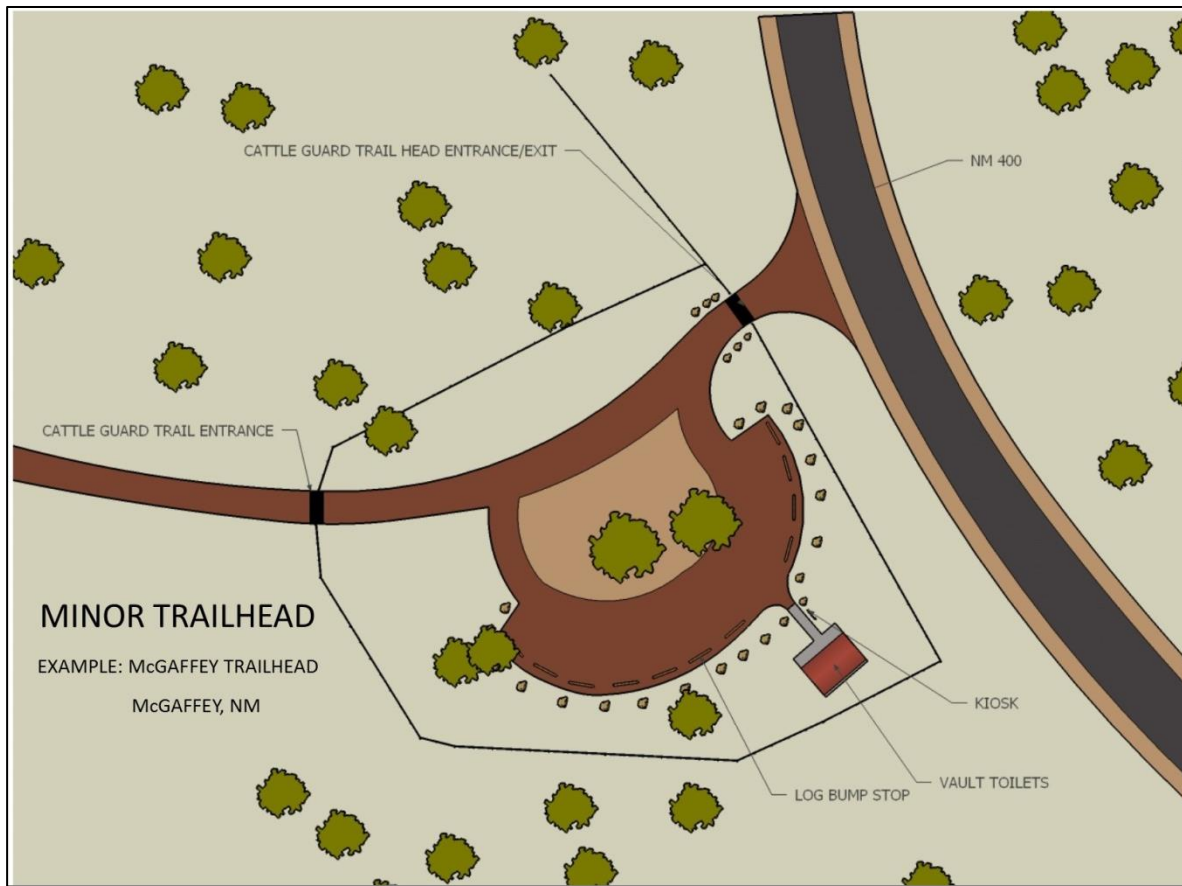
| | |
|--|---|
| <p>Switchbacks and Climbing Turns</p>  | <p>Climbing turns can be built on gentler slopes whereas switchbacks are needed on steeper slopes.</p> <p>(Source: http://www.fhwa.dot.gov)</p> |
|  | <p>Fewer, long switchbacks are preferable to frequent short switchbacks.</p> <p>(Source: http://www.fhwa.dot.gov)</p> |

Trailheads

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



Signage and other infrastructure improvements are described in **Table 3-2** above.

Chapter 6: 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.

6.1 Overview of the Proposed 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.

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.

20/60/20 Trail Rating Distribution

20%: Advanced riders

60%: Intermediate riders

20%: Beginner riders

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

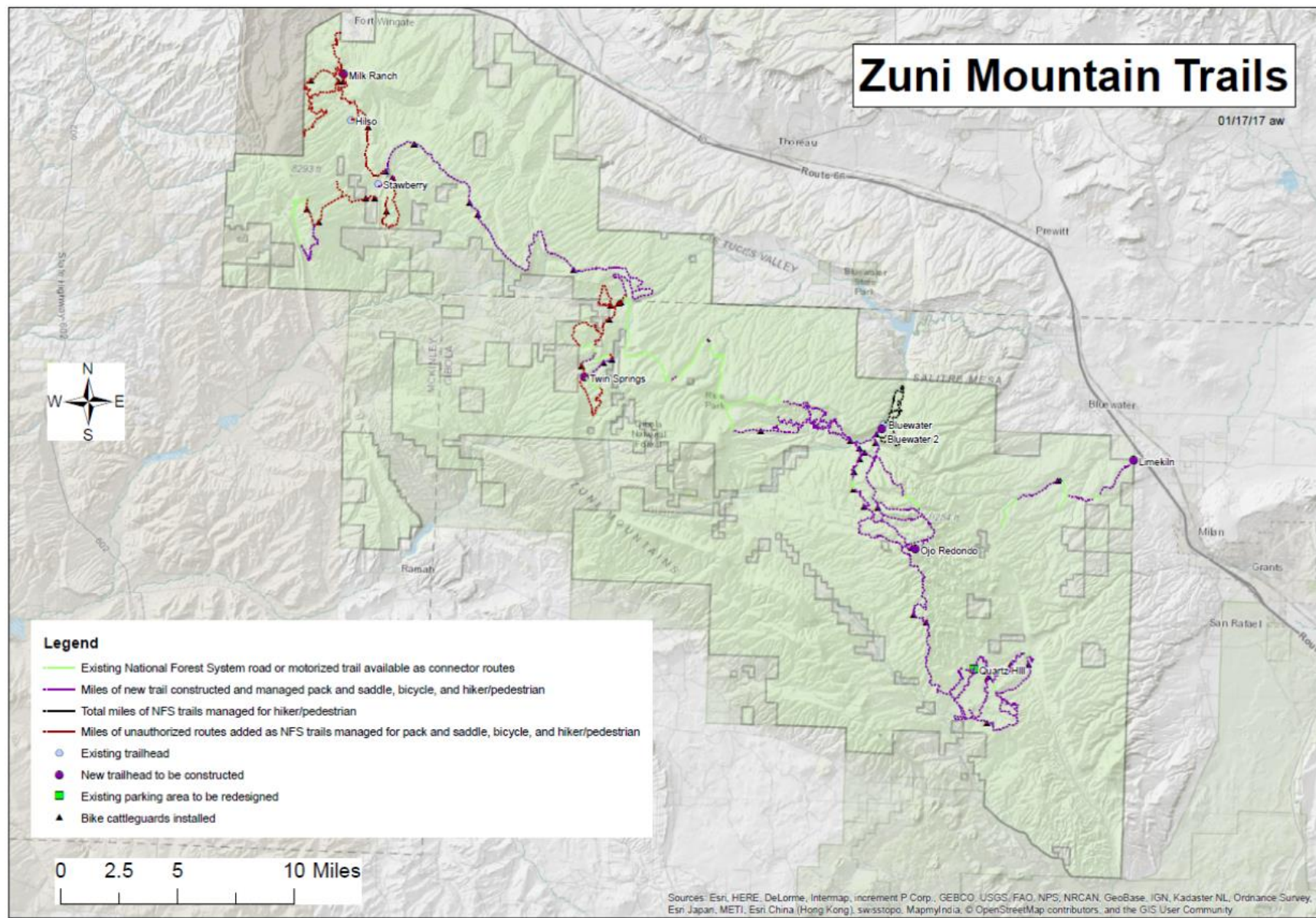
Sustainable Trail Design

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.

Multi-Use Trail System for All 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 cross-country 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.

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



6.2 Trail Improvements to the Zuni Mountains Trail System

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.

TABLE 6-1: Recommended Trail Improvements by Trail Segment

| Trail Section | Trail Marker/GPS Coordinates | Length (LF) | Proposed Trail Type | Recommended Improvements | Additional Study Needed? | Design Needed? | USFS Approval? | Total Cost Estimate |
|---------------|------------------------------|-------------|---------------------|--------------------------|--------------------------|----------------|----------------|---------------------|
| | | | | | Y/N | Y/N | Y/N | |

Existing System 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 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 NEPA work.

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

| 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, re-contouring 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 user-created trails or features not supported by the signed Decision Notice/Finding of No Significant Impact will be strictly prohibited.

6.3 Trailhead Improvements to the Zuni Mountain Trail System

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.

Currently, 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** and based on the trailhead design standards shown in *Section 5.1*.

TABLE 6-3: Proposed Trailheads

| # | Trail Section | Trailhead |
|---|-------------------|--|
| 1 | Quartz Hill | Resigned Trailhead (Existing parking area to be redesigned 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 at this time.

6.4 Signage and Wayfinding

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. 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.

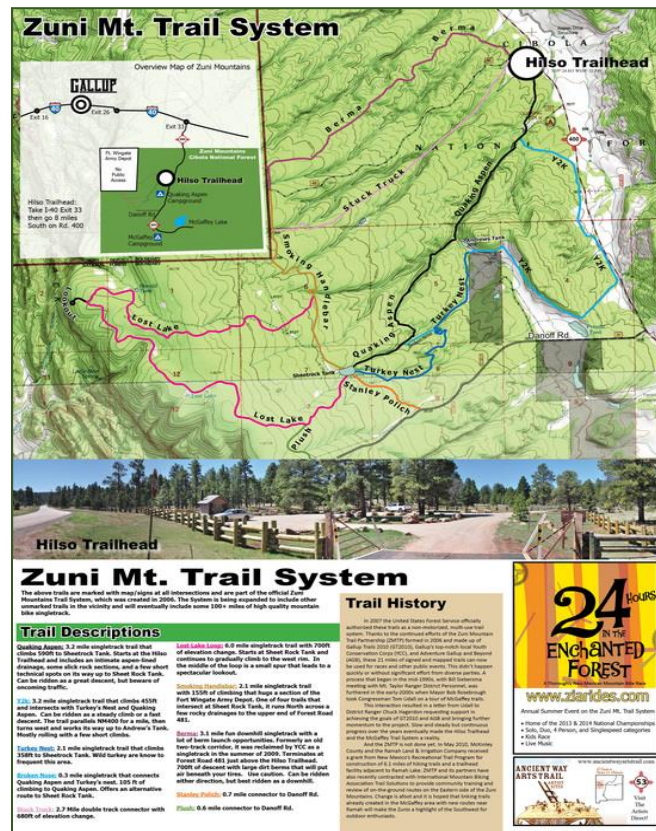
- **Section Maps**: the first map is developed as each section of trail is completed; and
- **System Map Guides**: the second is a comprehensive guide completed similar to the guide that USFS is developing for the Zuni Mountains Motorized System.

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.



Chapter 7: Operation and Maintenance Considerations

This chapter provides guidance on the roles and responsibilities of the US Forest Service and ZMTP members, and details how operation and maintenance of the Zuni Mountains Trail System will be accomplished.

7.1 Roles and Responsibilities

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. 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.
2. Start Simple and build on the mutual successes.
3. Have Patience and understand land management decisions and processes take lots of time.
4. 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.
5. Be Civil. It's OK to disagree. Good partnerships stipulate how disagreements are handled and under what conditions an agreement can be terminated.
6. 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!
7. Adapt to Change. Include mechanisms for identifying changing needs and goals and adapting to them.
8. 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.
9. Keep Your Eyes on the Prize. Always focus on the goal/vision. This will allow partners to move past rough patches or project setbacks.
10. Think Locally. Local knowledge is the key to solving local problems.

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

In 2011, the US Forest and the Zuni Mountains Trail Partnership members updated its commitment to the Zuni Mountains Non-motorized Trail System Project through a Memorandum of Understanding (MOU). (See **Appendix E: MOU: Zuni Mountains Non-motorized Trail System Project, 2011**)

This document spells the roles and responsibilities of the US Forest Service and the ZTMP, as follows:

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.

US Forest Service shall:

- A. Work with ZMTP to identify non-motorized opportunities (trail projects, education, and assistance) and jointly pursue such projects with Cibola and McKinley County communities.
- B. Make National Forest System lands available for non-motorized recreation activities, subject to applicable Federal laws, regulations, policy, Forest Plan and other management direction.
- C. Include and utilize ZMTP technical expertise in developing US Forest Service programs as they relate to non-motorized recreation trail construction and maintenance.
- D. Provide to the public the appropriate rules and regulations pertaining to non-motorized recreation trail construction and maintenance.
- E. Coordinate all maintenance and construction activities providing the proper specifications and clearances.
- F. 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.
- G. Coordinate and approve any special use or administrative activities within designated non-motorized trail corridors prior to the date of activity.
- H. 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 next section showcases the capacity and resources that are brought to bear to accomplish and sustain this commitment.

7.2 Local 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.

Workforce

Youth Conservation Corps: Over the last 14 years, a crucial element for the design, construction, and maintenance of trails in Cibola and McKinley counties has been the New Mexico Youth Conservation Corps (YCC) program. The purpose of YCC is to provide a process to employ young persons in public projects that conserve New Mexico's natural resources and provide community benefits of lasting value while learn job skills, develop work ethics and learn how to get along with others. 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.

Both counties have active YCC programs with experienced crew, supervisors, and managers. In 2013 alone, the City of Gallup/Boys & Girls Club and Future Foundations Family Center/YCC were granted about \$160,000, which employed 43 youth workers. Karl Lohmann and Laura Malaj Jaramillo have operated these programs for nearly a decade with notably success, respectfully. A main component of the Gallup YCC is trail construction, maintenance, and improvements; overseen and quality assured by local trail designer Strider Brown.



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

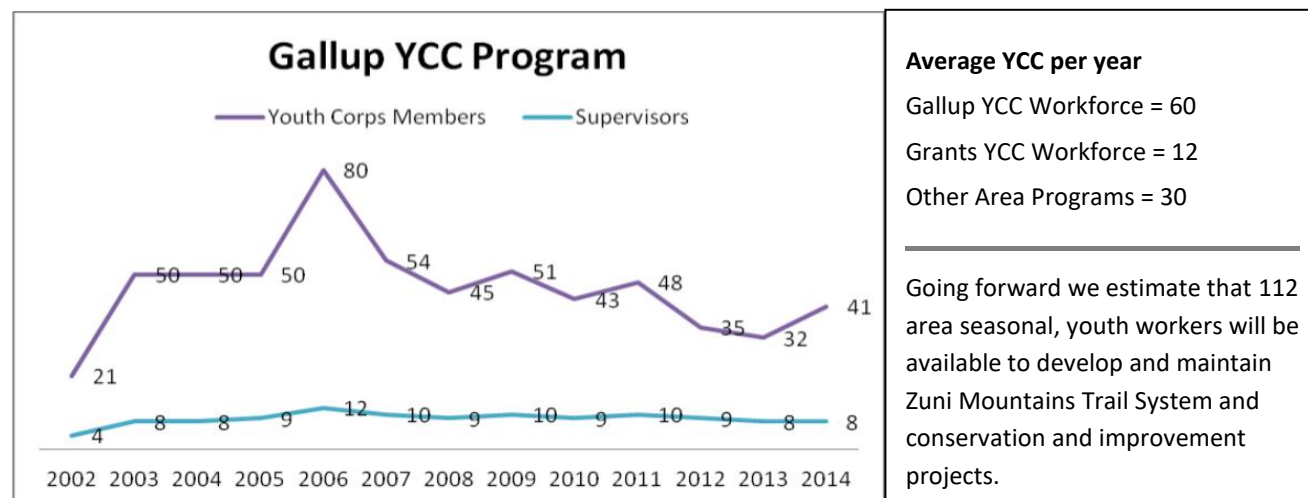
Department of the Interior. The partnership plans to employ 70 area seasonal, youth workers to develop and maintain the Zuni Mountains Trail System and conservation related activities in the project area.

Leadership of other regional Youth Conservation Corps in Tohatchi, 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 Corps Members | Supervisors | Partners/Clients |
|--------------|--------------------|--------------------|---------------------|-------------|--------------------------------------|
| 2014 | \$200,000 | \$200,000* | 41 | 8 | City of Gallup |
| 2013 | \$104,381 | \$149,342 | 32 | 8 | McKinley County |
| 2012 | \$150,000 | \$150,000 | 35 | 9 | Apache Sitgreaves National Forest |
| 2011 | \$150,000 | \$150,000 | 48 | 10 | Nature Conservancy |
| 2010 | \$150,000 | \$150,000 | 43 | 9 | National Park Service |
| 2009 | \$150,000 | \$150,000 | 51 | 10 | El Malpais NCA |
| 2008 | \$150,000 | \$150,000 | 45 | 9 | Quivira Coalition |
| 2007 | \$200,000 | \$200,000 | 54 | 10 | BLM |
| 2006 | \$200,000 | \$200,000 | 80 | 12 | USFS: Mt. Taylor Ranger District |
| 2005 | \$200,000 | \$200,000 | 50 | 9 | National Resource Cons. Service |
| 2004 | \$200,000 | \$200,000 | 50 | 8 | Ramah Land & Irrigation |
| 2003 | \$180,000 | \$180,000 | 50 | 8 | Gamerco, LLC. |
| 2002 | \$85,000 | \$85,000 | 21 | 4 | McKinley Soil & Water Cons. District |
| | | | | | Gallup-McKinley County Schools |
| | | | | | Navajo Nation EPA |
| TOTAL | \$2,119,381 | \$2,164,342 | 600 | 114 | |

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



Volunteer Organizations & Groups

Adventure Gallup & Beyond | www.adventuregallup.org

Since 2002, AGB has advocated and provided the structure to develop adventure tourism as a regional economic driver. They currently provide “gatekeeper” services for many of the trails and venues in McKinley County including High Desert Trail System and Ramah Mormon Pioneer Trail System.

Gatekeeper services are basically the operation, management, and maintenance services that US Forest Service is needed from the ZMTP. They have developed a web-based trail concern system to report issues and provide real time results - <http://www.adventuregallup.org/about-us/trail-gatekeeper/>

Gallup Trails | www.galluptrails.com



Gallup Trails 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. Gallup Trails has a dedicated board of local trail enthusiasts and users.

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 became a National Recreation Trail in 2012. Gallup Trails and its membership provide hundreds of hours per year in trail development, maintenance, planning, awareness, and trail and trailhead cleanups. Through its “Shovelman Crew”, Gallup Trails work in concert with or alongside YCC workers in coordinated trail work days. Gallup Trails also held trail and trailhead cleanup days in April 2013, and also provided weekly work days to get Gallup’s new bike park opened. Gallup Trails provides a necessary workforce and 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 Foundation | www.cottonwoodgulch.org



The Cottonwood Gulch Foundation sponsors educational wilderness expeditions and outdoor programs in the American Southwest. The Foundation has built strong relationships throughout the Four Corners and treats this as our community. The Foundation 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. In 2013, the Cottonwood Gulch provided workers for the 24-Hour Mountain Bike National Championship race. The Foundation’s base camp is at the foot of the Zuni Mountains, and workers have experience with riparian restoration work making them a great partner.



Other volunteer groups interested in the project include:

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, NCCC, Zuni Youth Empowerment Project, Boys & Girls Clubs, Plateau Sciences Society and Cibola County Historical Society, McKinley Citizens Recycling Council and Recycle Cibola!, Comcast Cares Day, CARE 66 Handymen, American Hiking Society Volunteer Vacations, Student Conservation Association, Civic Groups, such as Kiwanis, Rotary, Lions Club, etc., and Chambers of Commerce membership.

7.3 Operation and Maintenance Activities

Since the 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:

- **Trail 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:

“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.”

The targets for Trail Class 3 (Developed) are showcased in the **Table 7-1** below:

TABLE 7-1: USFS Trail Maintenance Considerations

| Trail Attributes | Trail Class 3 (Developed) |
|---|--|
| <i>Trail Management</i> | Typically managed to accommodate: <ul style="list-style-type: none">• 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 |
| <i>Maintenance Indicators</i> | <ul style="list-style-type: none">• Resource protection• User convenience• Safety commensurate with targeted recreation experience |
| <i>Routine Maintenance Frequency and Intensity</i> | <ul style="list-style-type: none">• 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 |

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. Also, 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, and 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.

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 | <ul style="list-style-type: none"> • 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. | <ul style="list-style-type: none"> • 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. | <ul style="list-style-type: none"> • Tread maintenance is reconstructed where needed to ensure public safety and user convenience. • Drainage structures re-built. • 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

7.4 Operation and Maintenance Budget

Historic Perspective on Maintaining the Trail System

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

Funding for these costs came from YCC youth wages 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 Strawberry Canyon Trail needs to be added to the ZMTP trail maintenance program. Annual trail maintenance costs are estimate as follows:

Existing Trails -- Maintenance Schedule

| | 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.

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, wheelstops, 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.

Trailheads and Infrastructure

The Strawberry Canyon Trailhead and McGaffey Lake Recreation Area Trailhead were built by and are the responsibility of the USFS, while the 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. Again, the 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, we have assumed \$600 per year in additional costs to cover vandalism and other situational maintenance requirements.

For the 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, shown below. Annual maintenance includes toilet pumping and cleaning, stocking supplies, clearing debris from cattleguards, and identifying wheel stops, vehicle barriers, and trailhead signage for replacement, as well as hazard trees for removal. Every 10-15 years, resurfacing 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, and signage, and 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

7.5 Operation & Maintenance Recommendations

This section presents recommendations related to operation and maintenance of the trail system. 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 Youth Conservation Corps programs are still the workforce for trail management short-term. All work on US Forest Service 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 Youth Conservation Corps 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 ZTMP 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 ZTMP 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.

Annual Trails Education Day

ZTMP 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, ZTMP 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

ZTMP 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

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.

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.

Awareness Events & Partnerships

Events such as the Kids Quad held in unison with the Mt. Taylor Winter Quadrathlon 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.



8 Implementation and Funding

This section provides recommendations on implementation, project prioritization and phasing, and funding opportunities.

8.1 Preliminary Cost Estimates

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.

| 40/40/20 Drainage Distribution |
|---|
| 40%: Grade Reversals |
| 40%: Rolling Grade Dips |
| 20%: Knick points |
| This formula provides for best drainage and trail sustainability. |

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

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).

8.2 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.

| 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 |

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) 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

8.3 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.

8.4 Trail and Trailhead Construction Costs

This section takes the priorities, phasing, and unit costs to provide an initial and phased project cost estimate of the Zuni Mountain Trail System.

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.

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 |

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.

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.

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 |

Based on this analysis, trailhead construction costs are estimated at around **\$3,105,600**. We used this number for *Section 8.6, 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.

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

8.5 Phased Built-Out and Incremental Maintenance Costs

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.

8.7 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. |

8.8 Additional Acknowledgements

Local Professional & Technical Consultants who have spent time on this project: **Strider Brown**, Trail Engineer and Land Restoration Specialist; **William Siebersma**, Artist and Trail Designer; **Lee Perlow**, Principal, Perlow Mapping & Design, LLC.; **Tom Mayer**, Trail Specialist; **Brian Leddy**, Photographer; **Karl Lohmann**, Youth Advocate & YCC Director; and **Chuck Van Drunen**, Trail Mapper/Media Arts & Publishing.

This document has been prepared with assistance from the Rivers, Trails and Conservation Assistance Program (RTCA) which helps carry out the National Park Service's conservation and outdoor recreation mission. As one of the agency's leading community assistance programs, RTCA is uniquely positioned to increase the value and benefits of the NPS by helping communities across the country conserve and restore waterways, preserve open spaces and parks, develop trails and greenways, and provide opportunities for outdoor recreation.

8.9 System Maps

System Maps will be added to this document, based on final Decision Notice/Finding of No Significant Impact, for now please **see Figure 6-1**.