Interpretive Services Planning

Opportunities for Interpretation along the Mammoth Lakes Trail System
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1 **Introduction**

Background

In February 2009, the Town of Mammoth Lakes Trail System Master Plan (TSMP) was released in Final Draft form. In essence, the TSMP is an update to the Town's previous Trails Master Plan, completed in 1991. Recommendations were made for expanding trail infrastructure, improving signage, and performing regular maintenance to improve conditions during all seasons along the Mammoth Lakes Trail System (MLTS). Additionally, specific recommendations were made to add interpretive activities and programming to the trail system to enhance the experience of trail users and promote good trails and public-land stewardship ethics.

The present document, *Interpretive Services Planning: Opportunities for Interpretation Along the Mammoth Lakes Trail System*, addresses the need and potential for interpretive services along the MLTS. As with all MLTS planning efforts, this document was created with the needs of the landowners, agency managers, and trail users in mind. Special attention has been given to areas that satisfy existing interpretive goals set out by the Inyo National Forest (INF), since many of the resources being interpreted and most of the land through which the MLTS passes is managed by the INF.

Authority

The present document was created in response to recommendations G4 and E4 of the TSMP. All content herein—its goals, products, and recommendations—are rooted in these recommendations:

Recommendation G4 (p. 114)

> In addition to the uniform trail signage…more customized interpretive signage should also be developed for the trail system. The first step in this process should be the identification of locations along trails within the UGB which provide the best opportunities for interpretive signage… The design process should involve the community at large and professionals with expertise in the selected subject matter. The information provided at each interpretive installation should be based on the experiences, knowledge and interests of its expected audience. (MLTPA 2009)

Recommendation E4 (p. 154)

> The Town of Mammoth Lakes should work with the Forest Service, the Wilderness Society, the Valentine Reserve, local non-profit organizations, schools, other organizations and individuals to develop trail related educational programs for children and adults. The programs should include organized tours and activities led by docents. Programs should also make full use of popular technological advances in order to attract the attention of children. Tours could be made available over the internet through the posting of tour descriptions and printable maps as well as audio narrations available for download to personal audio devices… (MLTPA 2009)

These recommendations were made with the understanding that interpretation is a powerful tool for

teaching and encouraging stewardship. Interpretation achieves this by fostering emotional and intellectual connections between the visitor and the place that is being visited. A sense of responsibility is created through understanding and appreciation of, and pride in, a place. In essence, strong bonds between person and place increase the desire to return to and care for that place throughout life. The MLTS and the community of Mammoth Lakes will benefit greatly from these bonds and for years to come.

A short primer on the art and importance of interpretation is provided in Chapter 2 of this report.

Setting

The Town of Mammoth Lakes is located in east-central California at approximately 8,000 feet on the eastern slope of the Sierra Nevada. It is bounded by sub-ranges of the Sierra Nevada mountains on three sides and by Great Basin desert and mountain ranges to the east. Owing to its remarkable scenery, pleasant climate, and year-round recreational opportunities, the town is a four-season destination-resort community. Close proximity to National Park Service units such as Devils Postpile National Monument, Manzanar National Historic Site, and the Death Valley, Yosemite, and Sequoia and Kings Canyon national parks bring thousands of additional visitors to the area each year, primarily during the summer months.

The community has evolved a tourism-based economy with recreation and access to surrounding public lands being the primary draw for most visitors and residents alike. Outdoor trail-based activities such as biking, hiking, and running are growing in popularity and areas with well-developed and well-advertised trail systems are reaping the rewards of good planning and implementation. The TSMP and the Trails Master Plan (1991) were both born from an understanding that trails and supporting amenities are central to providing high-quality recreation experiences for the growing segment of visitors and residents that wants low-cost trail-based activities. Interpretive services play an important role in any trail system, animating civic pride among residents and encouraging visitors to return and learn more.

Purpose

The Town and its planning partners recognize the importance of interpretation in enhancing tourism and recreation opportunities. This document is not a formal plan intended to be adopted by the Town; rather, its purpose is to provide guidance for the development of interpretive programming along the trails in lieu of a formalized plan, or to inform a comprehensive interpretation-planning process in the future. This document and accompanying data seek to answer three questions:

1) *What* features and stories could be interpreted along the MLTS?

2) *Where* could interpretation occur along the MLTS?

3) *How* could interpretation occur along the MLTS (i.e., what media and formats)?

Vision, Goals, and Objectives

Community Vision: Surrounded by uniquely spectacular scenery and diverse four-season recreational opportunities, the community of Mammoth Lakes is committed to provide the very highest quality of life for our residents and the highest quality experience for our visitors {MLTPA, 2009 #7}.

Goal: Presents information and recommendations highlighting a broad spectrum of interpretive opportunities along the MLTS multi-use path system and provide guidance relating to first steps and implementation.

Objective 1: Determine *what* features and stories could be interpreted along the MLTS.

Objective 2: Determine *where* interpretation could occur along the MLTS.

Objective 3: Determine *how* interpretation could occur at various locations along the MLTS.

Objective 4: Provide recommendations for programming along the MLTS.

Scope

The lists of features and stories (Ch. 5) were created with a scope extending to the edges of the Town's Planning Area, including peripheral locations such as Hot Creek and Convict Lake. The Reds Meadow Valley, though part of this area, was not included since that area is included in the General Management Plan and Long Range Interpretive Plan for Devils Postpile National Monument currently under development. These plans, once complete, will provide useful guidance regarding interpretive themes for that area, which should be folded into MLTS planning in the future.

The location assessment (Ch. 7) and media assessment (Ch.8) were conducted with a more limited scope. Only paved multi-use paths and some sidewalks (Map 1, below) were assessed for interpretive opportunities and media options. Most of these multi-use paths lie within the Urban Growth Boundary (UGB), but the paved trails leading to Shady Rest Park and the Lakes Basin were also included. Trails in the Lakes Basin above Twin Lakes could not surveyed for interpretive opportunities due to the persistent late-season snowpack covering all trails in that area during the field season for this project. When pertinent and applicable, unpaved trails and notable features outside the UGB will be mentioned when relevant to particular recommendations and opportunities for expanding into remote areas.

Map 1: Map showing trails surveyed (purple lines) during research for this report.

2 **Interpretation** – A necessary art

Interpretation is an educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information.
Freeman Tilden (1957)

Interpretation is a communication process designed to reveal meanings and relationships of our cultural and natural heritage to the public (visitors) through first-hand experiences with objects, artifacts, landscapes, or sites.
Interpretation Canada (1976)

Interpretation is a mission-based communication process that forges emotional and intellectual connections between the interests of the audience, and the inherent meanings in the resource.
National Association for Interpretation (2011)

In its physical form, interpretation includes docent-led tours, dramatic re-enactments, informational signage, museum exhibits, self-guided tours, publications, etc. Interpretation is *personal* when a person is used to present information, or *non-personal* when something other than a person is used to present the information—for example, a sign. While remote areas may use only non-personal interpretation, most areas with high use utilize a combination of personal and non-personal interpretation to reach visitors.

Interpretation as an art

As an art, interpretation is the use of language and senses to communicate the significance of a place, event, object, or idea. Done poorly, interpretation offers the visitor facts and little more. Done well, interpretation leads the visitor toward his or her own personal connection with those facts and the feature those facts describe. Emotions are used to initiate and codify this nexus. Such a connection can never effectively be forced; rather, it must be fostered using effective techniques, each with pros and cons and situation-dependent efficacy. Just as a master painter uses exacting brush stokes and colors to convey the depth of a scene and feelings of warmth and cold, master interpreters know how to use particular media and techniques to paint a picture of a place using universally recognized concepts such as struggle, home, survival, etc. Interpretation is an art because it requires mastery of techniques and media and knowledge of when and when not to use them.

Historically, interpretation's lineage has been rich with famous authors who wrote volumes about their own personal connections with nature. Ralph Waldo Emerson, Henry David Thoreau, and John Muir are often cited as being early American interpreters. Some trace interpretation back to the origin of storytelling, since stories often use allegory and performance to teach particular lessons. Our modern use and view of interpretation is often specific to the explanation of certain cultural or natural resources, termed *heritage interpretation*, commencement of which is often credited to Freeman Tilden, whose book *Interpreting Our Heritage*, written in 1957, is looked to as the cornerstone of modern interpretation even today. In particular, Tilden's six guiding principles (Tilden 1957) are the standard

road map to good interpretation:

1.) Any interpretation that does not somehow relate what is being displayed or described to something within the personality or experience of the visitor will be sterile.

2.) Information, as such, is not interpretation. Interpretation is revelation based upon information. But they are entirely different things. However, all interpretation includes information.

3.) Interpretation is an art, which combines many arts, whether the materials presented are scientific, historical or architectural. Any art is in some degree teachable.

4.) The chief aim of interpretation is not instruction, but provocation.

5.) Interpretation should aim to present a whole rather than a part, and must address itself to the whole person rather than any phase.

6.) Interpretation addressed to children (say, up to the age of twelve) should not be a dilution of the presentation to adults, but should follow a fundamentally different approach. To be at its best it will require a separate program.

Defining Interpretation

As mentioned above, there is an important distinction between information and interpretation. Where information provides facts, interpretation tells a story that gives context and meaning to facts. For example:

Informational statement: Mammoth Rock is made of marble, metamorphic limestone, which began as sea floor approximately 450 million years ago, was uplifted over a period of millions of years, and was eroded by glaciers into its present form during the last 1 million years.

Interpretive statement: Mammoth Rock is a proud survivor. Born as ancient sea floor some 450 million years ago, it has endured millions of years of tectonic pressure and upheaval and even stood its ground during ice ages when glaciers scraped at and scoured it from all angles.

Both convey the idea that Mammoth Rock is made of old rock that has been eroded over time, but that idea is explained in different terms. Without going into great detail, the difference between the two is that the second contains less of the raw information that a geologist might desire, but more of the emotion and basic ideas that a non-geologist can relate to and appreciate. Whereas most people have trouble comprehending timescales measured in millions of years, everyone understands what it means to be born, to be a survivor of something, and to "stand one's ground." While the second is less precise than the first, it is no less accurate. Admittedly, some precision has been sacrificed for comprehension. While such a sacrifice would be inappropriate in a scientific article, it is expected in interpretation.

Knowing the audience

Knowledge of the audience is also key in executing good interpretation. In the Mammoth Lakes area most visitors come from Southern California, where earthquakes are common and most people have a basic understanding of faults. As a result, signage relating to geology might prioritize the interpretation of volcanism in the region ahead of faulting, since volcanism may be less familiar to this large group of visitors.

The benefits of interpretation go far beyond education. Interpretation is a powerful tool for modifying undesirable behavior (e.g., littering), circulating important messages about a particular issue (e.g., global warming), raising awareness and support for conservation (e.g., presence of an endangered species), and encouraging cooperation within a community (e.g., respecting private property). For decades now, federal agencies have used interpretation to encourage people to put their campfires out, keep their food away from bears, and keep their community cleaner and litter-free with positive results.

Interpretive media

Each of Tilden's guiding principles (above) apply to all interpretive *media*—used here in its traditional sense to include both personal and non-personal forms (signs, publications, computer-based applications, etc.) of medium.[*] It is often the manner in which information is presented that is most important to successful interpretation. Certain media can, however, make interpretation more accessible to a greater number of people. For example, docent-led tours are often available only a few times each day, whereas trail-side displays (i.e., *waysides)* are usually available every day and at all hours. The information offered on a sign is generally less comprehensive than that from a docent and doesn't offer the opportunity to ask questions. There are always benefits and sacrifices associated with choosing one media over another. Often the type of message one wants to deliver can determine the type of media selected, though funding, seasonality, and visitation often play an important role in this decision as well.

Interpretive organizations

There are many organizations and projects specific to the improvement of interpretation. The National Park Service has always played a leading role in the development of interpretive standards and the proximity of NPS units (Devils Postpile National Monument, Manzanar National Historic Site, Yosemite National Park) to Mammoth Lakes has huge potential benefits for the development of high-quality interpretation along the MLTS.

The National Association for Interpretation (NAI) is a non-profit professional organization committed to the enhancement of interpretation and serves as an international clearinghouse for interpretation resources, standards, and best practices. For example, the NAI has collaborated with dozens of organizations and agencies including the NPS, National Audubon Society, and U.S. Forest Service to produce a common and standard vocabulary for use in education and interpretation activities. This ongoing effort, called "The Definitions Project," is an example of a resource that could be used in future interpretive development along the MLTS.

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[*]   For example, as performing artists, interpreters often use their bodies, faces, and mere presence as a medium of expression.

Funding matters

In a perfect world, interpretive funding for new projects would come as part of a well-funded budget in predictable amounts over time. This is rarely the case, and most interpretive projects are the result of grants, private donations, or special-project money. While grants should be included in the funding strategy, seasonal residents in resort communities such as Mammoth Lakes often take great pride in their association with the community and enjoy making philanthropic contributions, especially when they result in highly visible improvements. For a variety of reasons, philanthropy should be considered as part of the funding strategy for interpretive development along the MLTS. Recommendations found at the end of this document could be used to solicit donations for specific projects.

3 Area Agencies and Missions

The following chapter is devoted to listing those agencies that either manage parts of the MLTS or whose land(s) abut or otherwise are affected by the MLTS. Additionally, the regional role of each agency is described and mission statement presented.

Town of Mammoth Lakes

The Town of Mammoth Lakes (TOML) is the jurisdictional partner with the highest level of control over the development and implementation of the Trail System Master Plan (MLTPA 2009). The TOML's mission is specific to both the permanent and visiting community:

> Surrounded by uniquely spectacular scenery and diverse four-season recreational opportunities, the Town of Mammoth Lakes is committed to providing quality services that ensure the highest quality of life for our residents and our businesses, and an exceptional experience for our visitors.

Interpretation directly supports the TOML mission in several ways. It enhances the experience of residents and visitors alike by invoking connections between individuals and the scenery and history around them. Such connections, when properly made, are often strong and long-lasting. The TOML will benefit greatly from such connections and the resulting increase in civic pride and excitement that comes with learning about a place and feeling more strongly connected to it. Furthermore, interpretation offers the Town the opportunity to get stewardship messages to the public.

National Forest Service

Established in 1905, the National Forest Service was created to manage publicly held lands in the nation's forests and grasslands. The modern mission of the USDA Forest Service is to:

> "…sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations."

In expanded form, the USDA Forest Service explains that their mission includes:

> "Advocating a conservation ethic in promoting the health, productivity, diversity, and beauty of forests and associated lands." (U.S. Forest Service)

The Mammoth Ranger District of the Inyo National Forest (INF) is the management unit responsible for all of the National Forest land surrounding private lands in Mammoth Lakes. Most of the MLTS is under special-use permit from the Inyo National Forest, and the INF's role in the trail system is an important one.

The Mammoth Ranger District contains or serves as a gateway to several popular tourist destinations. To meet the needs of the visiting public, the district has operated a visitor center along the road entering Mammoth Lakes since 1969. The original visitor center was designed primarily to provide outdoor-recreation information for visitors to the surrounding high country. Over time, the center's role broadened to that of a regional gateway serving visitors en route to destinations such as Yosemite and

Death Valley national parks and Bodie State Historic Park.

In 2008, a new Mammoth Lakes Welcome Center opened to the public in a lot adjacent to the old visitor center. The new center—designated a California Welcome Center—is better able to meet the needs of the district and the community's increasing visitation and changing visitor demography and to provide additional information covering many of the area's neighboring attractions, such as Yosemite and Death Valley national parks, Devils Postpile National Monument, and Bodie State Historic Park, as well as its own destinations (e.g., Mammoth Mountain, Hot Creek, Lakes Basin, etc.).

Concurrent with the opening of the new Welcome Center, INF staff released an interpretive-planning document which addresses the expanded regional role of the center and the evolving partnerships between agencies and organizations that serve area visitors, as well as visitation trends, area resources, and themes that the planning workgroup deemed important. The group established the following mission statements for the new center:

> The Mammoth Lakes Welcome Center will provide visitors of all ages, abilities, cultures and educational levels with easily obtainable and comprehensive information on the region's public land outdoor recreation opportunities.

> The Mammoth Lakes Welcome Center will assist visitors in developing an appreciation of the area's natural and cultural resources and an understanding of the agencies that manage these resources.

> The Mammoth Lakes Welcome Center will provide an information and education program aimed at enhancing the visitor's experience to the region while protecting the natural, cultural, and recreational resources of Mammoth Lakes and the surrounding Eastern Sierra. (Custer 2008)

The intended scope of this document is unclear. While the title, mission statements, and much of the text and recommendations seem specific to the Welcome Center, a signatory approval page and some of the thematic development suggest that it may be intended for use district-wide. Regardless of its intent, many of the conclusions and recommendations within are relevant to the broader Mammoth Lakes area of which the MLTS is a part. Where appropriate, elements from the Mammoth Lakes Welcome Center Interpretive Plan will be used as guidance (Custer 2008).

Just west of Mammoth Lakes is the Reds Meadow Valley. The road into this part of the Mammoth Ranger District is generally open fewer than six months each year, yet it offers access to seven campgrounds on INF land, a pack station and general store, several popular trailheads leading into the Ansel Adams Wilderness, a hot-spring shower system, and two road-accessible lakes popular with anglers and families.

Embedded in this matrix of INF land near the end of the road is Devils Postpile National Monument, managed by the National Park Service. Unlike the Lakes Basin, which also has a seasonal road closure, no winter amenities are offered in the Reds Meadow Valley. Furthermore, most of the 100,000-plus people who visit this area each summer are required to do so using a mandatory shuttle-bus system that departs from Mammoth Mountain Ski Area. Though technically a part of the MLTS planning area, this administratively complex and highly seasonal area will not be included in the assessment to follow.

This omission is made primarily for practical reasons, since the trails and features there are far from existing MUPs, which are the focus of this report, and also because so much interpretive information created by the NPS and INF already exists there. However, some features in the Reds Meadow Valley can be seen from or are directly tied to locations closer to main MLTS arteries (e.g., the Minarets, the French Trail), in which case those resources will be identified and considered for inclusion in interpretive media along the MLTS.

Eastern Sierra Interpretive Association

The Eastern Sierra Interpretive Association (ESIA) is a non-profit benefit corporation established in 1970 as a partner to the USFS to help with educational, historical, scientific, and interpretive activities. In the Mammoth Lakes area, the organization partners with the Inyo National Forest, Devils Postpile National Monument, and Bureau of Land Management's Bishop Field Office. The organization's mission (below) is currently achieved through the operation of bookstores and the development, publishing, and sales of interpretive and educational books, maps, and brochures:

> The Eastern Sierra Interpretive Association is a nonprofit corporation whose specific and primary purpose is to assist in the educational, historical, scientific and interpretive activities of the USDA National Forest, the InterAgency of the Owens Valley and the Bureau of Land Management's Bishop Field Office. (ESIA 2011)

Recently, ESIA has funded the printing of seasonal newspapers for the Inyo National Forest and Devils Postpile National Monument and has assisted in the development of interpretive signage for the Mammoth Lakes area.

Since interpretation is central to the organization's history and mission, partnership with ESIA will be important for the development of future interpretive programming along the MLTS.

Valentine Eastern Sierra Reserve & Sierra Nevada Aquatic Research Laboratory

The Valentine Eastern Sierra Reserve (VESR) is a part of the University of California's (UC) Natural Reserve System. This system consists of 36 reserves that broadly represent, in a relatively undisturbed condition, the rich biodiversity found in California. Each reserve is managed primarily for ecological function, species diversity, and research. Public access to the reserves is carefully controlled and monitored. Use of the reserves is allowed only when consistent with the Natural Reserve System mission:

> The mission of the Natural Reserve System is to contribute to the understanding and wise stewardship of the Earth and its natural systems by supporting university-level teaching, research, and public service at protected natural areas throughout California. (University of California Regents 2010)

Use of each reserve is also subject to approval by the reserve manager. While special interpretive tours may be offered by Valentine Reserve staff, unregulated public access is currently not allowed at Valentine Reserve, nor is such access anticipated in the future. Because of these formalized restrictions,

lands administered by the UC's Natural Reserve System, namely VESR and SNARL, will not be considered for inclusion in programmatic-level interpretation such as regularly scheduled tours, panel installation, or computer-based media. However, the reserves attract high-level researchers and academics to the area whose knowledge and expertise could be used to develop media and add depth and currency to the interpretive experience at key locations along the MLTS.

National Park Service

Devils Postpile National Monument (DEPO) is a major summertime attraction to the Mammoth Lakes area. It is located in the Reds Meadow Valley on the edge of the TOML Planning Area. As a National Park Service (NPS) unit, DEPO is managed for both public access and resource protection. The NPS mission:

> The National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world. (NPS)

Good trail access, signage, and safety is central to the NPS mission, and the agency spends millions each year maintaining and improving trails. Interpretation is also a fundamental part of the agency's mission, in its ability to educate and inspire the public and to convince the public to behave in a way that does no damage to the resources they enjoy. Historically the NPS has been at the forefront of interpretation theory and implementation, and even today the agency's interpretation is often considered to be the standard against which all others are compared. Recently, however, heavy regulation of Internet usage by federal agencies has put the NPS at a disadvantage in a world filled with new and emerging technologies.

The agency takes great pride in its history and identity, and while it is unlikely that any MLTS improvements would occur within DEPO, improved access to DEPO is a part of the TSMP. At the time of this writing, DEPO was in the process of writing its Long Range Interpretive Plan, a 7- to 10-year guiding document used to hone the focus of the monument's interpretation around specific themes agreed upon by a planning workgroup and developed through a combination of public workshops and internal discussions. This interpretive plan is not necessarily limited to the boundaries of the monument, but includes NPS interpretation that does or might occur throughout the Reds Meadow Valley and at the Minaret Vista, Mammoth Mountain Adventure Center, and Mammoth Lakes Welcome Center. The monument's General Management Plan, also in progress at the time of this writing, contains a section on interpretation and its scope includes the entire Reds Meadow Valley as part of the planning area.

Since significant interpretive planning and implementation is already underway for DEPO and the Reds Meadow Valley, these areas will be mentioned only occasionally in this report. However, since those areas are so regionally important both in terms of the natural and cultural resources that exist there and the number of visitors shared between Mammoth Lakes and the Reds Meadow Valley, interpretation along the MLTS should consider the planned and existing infrastructure and programming available at DEPO and INF locations in the Reds Meadow Valley.

4 Inventory of Features and Stories Along the MLTS

In this chapter, we attempt to inventory, describe, categorize, and rank all of the things that could be interpreted along sections of the MLTS.

Terminology

Topics

Interpretation revolves around topics. A **topic** is the subject that will be discussed during a particular program or interpretive service. Topics include both *features*, which can usually be visited and experienced firsthand, and *stories* or accounts, which cannot be visited per se, but must be reenacted or retold.

Feature topics

A **feature** is a tangible, visible, or otherwise sensible thing. Some features—a completely degraded cabin, for example—may no longer exist in physical form, but the cabin site may, and interpretive media such as old photos, drawings, or scaled models can be used to recreate the feature for the visitor on site. Some things that seem to be features cannot be interpreted as such. For example, the American black bear—or any other wild animal—is a tangible, sensible thing; however, unless there is a captive bear available for display, it must be interpreted as a story. Occasionally a feature may be located in a remote or sensitive place and not accessible by all visitors, in which case it may be desirable to interpret the feature off site. New and increasingly available technologies have made it possible to "visit" and learn about features virtually via the Internet. Current trends in technology indicate that it will become increasingly easier for people to visit features virtually.

Story topics

The significance of many features may be subtle. It is the role of interpretation to explain and clarify the significance of these features using stories. A **story** can be factual, fictional, or a mix of the two. All features have a story, and, like features, stories may be cultural, geological, ecological, or grounded in any field of study imaginable and any combination thereof. Stories are often rich in certain details and poor in others in order to emphasize a particular part of an event or point of view.

The art of storytelling is a significant component of interpretation. It is how we link feeling with features and vice versa. Though features and stories are different by definition, they are inextricably linked in that every feature has a story and every story is made of features.

Categorization of Topics

Feature and story topics in the Mammoth Lakes area fall under several fields of study (e.g., geology, ecology, anthropology). Rather than attempt to categorize topics based on these narrowly defined fields, a broader set of categories has been created based on thematic potential. These categories are referred to as *theme genres*.

Topic area	Theme genre
Natural Topics	Living Earth
	Physical Earth
Cultural Topics	Native Culture
	Settlement History
	The Modern Community
Recreational Topics	Outdoor Recreation

Table 1: Categorization structure for features and stories. Each topic is classified into one theme genre.

Inventory of Natural Features and Stories

The following lists were created solely by the authors. No public process was used in the creation of these lists. An open forum with local experts and residents would undoubtedly result in longer and more comprehensive lists.

Natural-feature topics were placed into two theme genres: *Living Earth* and *Physical Earth*.

Living Earth Topics

These topics belong to the life sciences and include all living organisms, processes, and linkages.

Alpine community*	Hibernation and torpor*	Plant communities*
Aspen*	Insects*	Riparian communities*
Avian migrations*	Jeffrey pine forest*	Sage community*
Bark beetles*	Lower montane forest*	Sherwin Meadow
Bears*	Mammalian migrations*	Subalpine forest*
Clark's Nutcracker*	Manzanita/Ceanothus*	Treeline*
Eastern Sierra biogeographic* region	Mountain yellow-legged frog*	Upper montane forest*
Elevational zonation*	Pandora moth cycle*	Wetland communities*
Fish (native and non)*	Parasitic & saprophytic plants	Whitebark pine forest*
	Pika*	Wildlife (general)*

List 1: Topic inventory for the Living Earth theme genre. Asterisks (*) denote topics relevant to the geographic scope of this report (i.e., those that could be interpreted from paved MUPs below Twin Lakes).

Physical Earth Topics

These topics are part of the physical sciences, including geology, hydrology, weather and climate, and related processes.

Alkali sinks	Hot Creek	Obsidian*
Avalanche paths*	Hot springs	Owens River*
Casa Diablo Geothermal Field*	Inyo Craters	Panorama Dome*
Convict Lake	Laurel Lakes Moraine*	Plate tectonics*
Convict Moraine	Lenticular clouds (Sierra Wave)*	Pumice*
Crystal Crag*	Long Valley Caldera*	Rain shadowing*
Earthquake Fault	Mammoth Creek*	Resurgent Dome*
Earthquakes*	Mammoth Crest*	Ritter Range roof pendant*
Erosion*	Mammoth Falls*	Roof pendant formation*
Fire*	Mammoth Knolls*	San Joaquin River Valley*
Fumaroles	Mammoth Lakes Basin*	Sherwin Crest*
Glacial erratics*	Mammoth Mountain*	Sierra Nevada Mountains*
Glaciation*	Mammoth Pass*	Sierran fossils*
Glass Mountains*	Mammoth Rock*	Springs (freshwater)
Granite*	Minaret Pass & Vista*	The Minarets
Great Basin*	Mineral Hill/Gold Mountain*	Twin Falls*
Hole in the Wall (the Bottomless Pit)	Morrison roof pendant*	Volcanism*
	Mountain weather*	White Mountains*
Horseshoe Lake tree kill	Night sky*	

List 2: Topic inventory for the Physical Earth theme genre. Asterisks (*) denote topics relevant to the geographic scope of this report (i.e., those that could be interpreted from paved MUPs below Twin Lakes).

Inventory of Cultural Features and Stories

The following lists were created solely by the authors. No public process was used in the creation of these lists. An open forum with local experts and residents would undoubtedly result in longer and more comprehensive lists.

Cultural-feature topics were placed into three theme genres: *Native Cultures*, *Settlement History*, and *The Modern Community*

Native Culture Topics

These topics relate to past and present traditions and uses by Native Americans in the Mammoth Lakes area.

Important: Topics in this area were not covered by the authors. This is not because we find native culture to be unimportant, but rather out of respect for the tribes' autonomy. It is our opinion that local

tribes should determine what content is delivered to the public about their culture. Future interpretive-planning efforts should reach out to local tribes and work with them to develop a plan for programming and content. Archaeological evidence for culture is another matter. While science relating to the local tribes may seem factual and thus indisputable, scientists themselves must interpret scant evidence to recreate the story of past cultures. We recommend that a balanced panel of archaeologists and tribal representatives be formed and consulted when creating interpretive content for the public.

List not populated for reasons stated above.

List 3: Topic inventory for the Native Culture theme genre.

Settlement History Topics

These topics relate to the period of European settlement of the area and focus on the early communities in the Old Mammoth area before the incorporation of the Town of Mammoth Lakes. Major elements of this period include the area's mining, logging, grazing, and water-diversion history.

Cattle and sheep drives*	Logging History*	Old Mammoth Village*
Doug Robinson*	Lost Cement Mine*	Tamarack Lodge*
The Fly Wheel	Mammoth Camp*	The Sartori/Cable Vision Cabin*
The Hayden Cabin*	Mammoth City*	The Wildasinn Hotel and Store*
The Knight Wheel*	Mammoth Mining Company*	
Lakes Mining District*	Mammoth Pass*	

List 4: Topic inventory for the Settlement History theme genre. Asterisks (*) denote topics relevant to the geographic scope of this report (i.e., those that could be interpreted from paved MUPs below Twin Lakes).

The Modern Community

These topics relate to the community of Mammoth Lakes as it exists today, but also includes the recent history (past 50 years) leading to the modern resort community. This genre includes locally important issues relating to changing demography, land ownership, public safety, and rights of way.

Army weasels*	Earthquake preparedness*	Open spaces*
Bear management*	Fish hatcheries*	Public lands and land management*
Crowley Lake*	Geothermal energy*	Second/summer home ownership*
Dave McCoy*	Hispanic culture*	Snow removal and storage*
Defensible space (fire)*	Local agriculture*	Trail networks*
Development*	Main Street*	Volcanic hazards awareness*
Dog ownership*	Mammoth lodging history*	Winter of 1969*

List 5: Topic inventory for The Modern Community theme genre. Asterisks (*) denote topics relevant to the geographic scope of this report (i.e., those that could be interpreted from paved MUPs below Twin Lakes).

Inventory of Recreational Features and Stories

The following lists were created solely by the authors. Recreation-feature topics were placed into a single theme genre: Outdoor Recreation.

Outdoor Recreation

These topics relate to the wide spectrum of recreation that occurs on the MLTS or in its immediate surroundings. This list is obviously incomplete and many other types of recreation activities occur on and along the MLTS. This list includes many of the activities for which Mammoth Lakes is a destination and some of the key places and concepts associated with those activities.

Alpinism*	Fish stocking*	Off-road vehicle use*
Camping*	High-altitude training*	Skiing*
Disabled sports	Leave no trace*	Snowboarding*
Equestrian activities*	Mammoth Lakes Trail System*	Trail etiquette*
Famous female skiers*	Mammoth Mountain Ski Area*	Wilderness*
Fishing*	Mountain biking*	

List 6: Topic inventory for the Outdoor Recreation theme genre. Asterisks (*) denote topics relevant to the geographic scope of this report (i.e., those that could be interpreted from paved MUPs below Twin Lakes).

Descriptions of Area Features and Stories

A brief description of each topic inventoried above has been included in the Appendix to this document.

Prioritization of Features and Stories

The inventory of topics summarized above includes more than 200 topics that could be covered. A way

to prioritize topics would be not only useful, but essential given limited available funding and limited attention on the part of MLTS trail users. Even if funding was not a limiting factor, creating signage and programming for 200 topics would probably overwhelm individual trail users and overshoot the demand for interpretive information.

Methods

A scoring method was created to compare and contrast the relative importance of each topic. The following criteria was used to score and rank topics:

Criteria	Points awarded
Nationally unique or significant	5
Regionally unique or significant	3
Related to another topic area	1 each (2 points max)

Table 2: Criteria used to score and rank topics. Features and stories are ranked only against those of the same topic area (e.g., Mammoth Rock is ranked against other natural topics). The term "unique" is often used as a synonym for interesting. Here it is used to mean that it is the only one of its kind in the nation or region.

Management priorities were not included in the scoring/ranking process. This omission was intentional and due to the fact that such priorities tend to vary over time and between agencies. Gaining a full understanding of each stakeholder's priorities was beyond the scope of this report. The lists and rankings in this document can serve as a starting point for the sorting and filtering of topics based on agency priorities to meet management goals.

Results

Complete data tables showing scores for every topic is available in the datasets produced during the research for this report. The highest-scoring topics in each topic area are presented below.

Rank	Feature/Story	Nationally unique/sig.	Regionally unique/sig.	Cultural significance	Recreation significance	Score	Notes
1	Jeffrey pine forest*	5	3	1		**9**	Largest pure stands of Jeffrey pine in the world.
2	Horseshoe Lake tree kill	5	3			**8**	The circumstances are nationally unique.
	Long Valley Caldera*	5	3			**8**	One of the nation's most intensely monitored geologic features.
3	Mammoth Mountain*		3	1	1	**5**	Unrest makes this feature regionally significant.
	Owens River*		3	1	1	**5**	Main river in the Mammoth Lakes area.
	Volcanism*		3	1	1	**5**	Primary geologic force in the area. Has created much of the landscape we see today.
4	Casa Diablo Geothermal Field*		3	1		**4**	Largest concentration of geothermal activity in the region.
	Earthquake Fault		3	1		**4**	Only known deep, open fissure in the region.
	Pandora moth cycle*		3	1		**4**	Major regular disturbance mechanism.
5	Clark's Nutcracker*		3			**3**	Ecologically important as primary seed disperser.
	Glaciation*		3			**3**	Primary force that shaped the modern landscape.
	Mammoth Rock*		3			**3**	Significant outcropping of ancient rock.
	Resurgent Dome*		3			**3**	Unrest and geothermal resources make this feature regionally unique and significant.
	Sierran fossils		3			**3**	Morrison pendant contains some of the oldest fossils in the region. Fossils are rare along the Eastern Sierra.
	The Minarets		3			**3**	Distinctive feature and exemplary of glacial landscapes.

Table 3: Fifteen highest-scoring natural features and stories. Topics with the same score are presented in alphabetical order. Asterisks (*) denote topics relevant to the geographic scope of this report (i.e., those that could be interpreted from the paved MUPs below Twin Lakes).

Rank	Feature/Story	Nationally unique/sig.	Regionally unique/sig.	Natural significance	Recreation significance	Score	Notes
1	Public lands and management		3	1	1	5	Regionally significant due to sheer amount of federally owned and managed land in the area. Related to Living & Physical Earth.
2	Dave McCoy		3		1	4	Regionally significant due to the effect on local economy and development. Related to Outdoor Recreation.
	Lakes Mining District		3	1		4	Regionally significant due to its impact on local settlement patterns.
	Mammoth Pass		3	1		4	Regionally significant due to its importance in relation to connectivity with other cultures and regional economies. Related to Physical Earth.
	The Hayden Cabin		3		1	4	Regionally unique due to the level of preservation this feature has received. Related to Outdoor Recreation (historical).
	Volcanic hazards awareness		3	1		4	Regionally significant due to the degree of volcanic unrest and monitoring in the area. Related to Physical Earth.
3	The Lost Cement Mine		3			3	Regionally significant due to its effect on early settlement in the area during the short mining boom.
	The Knight Wheel		3			3	Regionally unique due to the level of preservation this feature has received. Few other examples like it.
4	Bear management			1	1	2	Related to Living Earth.
	Crowley Lake			1	1	2	Related to Living & Physical Earth and Outdoor Recreation.
	Fish hatcheries			1	1	2	Related to Living Earth and Outdoor Recreation.
	Winter of 1969			1	1	2	Related to Physical Earth and Outdoor Recreation.

Table 4: Thirteen highest-scoring cultural features and stories. Topics with the same score are presented in alphabetical order. Asterisks (*) denote topics relevant to the geographic scope of this report (i.e., those that could be interpreted from the paved MUPs below Twin Lakes).

Rank	Feature/Story	Nationally unique/sig.	Regionally unique/sig.	Natural significance	Cultural significance	Score	Notes
1	High-altitude training*		3		1	**4**	Regionally significant because of the famous athletes who live in the area. Related to Living & Physical Earth.
2	Alpinism		3			**3**	Regionally significant because Laurel Mountain was the site of the first "modern" (ropes and protection were used) alpine ascent in the Sierra Nevada.
3	Camping*			1	1	**2**	Related to Living & Physical Earth.
	Fishing*			1	1	**2**	Related to Living Earth and The Modern Community.
	Fish stocking*			1	1	**2**	Related to Living Earth, Settlement History, and The Modern Community.
	Mammoth Mountain Resort*			1	1	**2**	Related to Physical Earth and The Modern Community.
	Off-highway vehicles*			1	1	**2**	Related to Living & Physical Earth and The Modern Community.
	Wilderness*			1	1	**2**	Related to Settlement History and The Modern Community.

Table 5: Eight highest-scoring recreation features and stories. Topics with the same score are presented in alphabetical order. Asterisks (*) denote topics relevant to the geographic scope of this report (i.e., those that could be interpreted from the paved MUPs below Twin Lakes).

5 Interpretive Themes Along the MLTS

Interpretive themes are central to any interpretive program. Themes guide the overall direction of a program, but they are not simply a storyline. A theme is the message that one wants to communicate to the visitor through the interpretive content. Two scales of interpretive themes exist: broad-scale planning themes such as those found in interpretive planning documents, and themes for individual exhibits, guided walks, etc. Planning themes tend to be "big picture" and guide the types of programs offered to the degree that an area's most important resources are not forgotten or omitted from interpretive offerings. At the level of individual interpretive offerings, the theme is crafted with a degree of creative license by the naturalist, panel designer, script writer, etc., while keeping one or more of the planning themes in mind.

INF Themes

As stated before, the purpose of this report is to identify locations along the MLTS where interpretive opportunities exist and which media are appropriate for use there. The creation of planning themes for an area requires a process of intense collaboration between area stakeholders and experts and is beyond the scope of this report. That being said, many of the locations along the MLTS are on land managed by the INF Mammoth Ranger District, which has already identified important primary and sub-themes in the *Mammoth Lakes Welcome Center and Mammoth Ranger District Interpretive Plan* (Custer 2008). They are:

> **Primary Theme:** "The local landscape of the Eastern Sierra Nevada is very diverse and has created many recreation opportunities."

> **Sub-Theme #1**: "Highly visible geologic features provide the clues to a dramatic story of the geologic processes that have forged, molded and carved this dynamic landscape."

> **Sub-Theme #2**: "Visitors should be educated in ways to perform thoughtful recreation."

> **Sub-Theme #3**: "The diverse landscape includes many types of habitats that support a wide variety of plants and animals."

TOML Themes

To our knowledge, the Town of Mammoth Lakes has not identified formal interpretive themes. In lieu of its own, the Town could look to the INF themes for guidance. Exhibits and programs outside the urban limit (i.e., on INF land) should address one or more of the established themes identified above. A thematic area noticeably missing from the above list is that of the region's human history.

Interpretation will help the TOML achieve the goals stated in its General Plan {TOML, 2007 #16} in a variety of ways. To explore connections between interpretation and these goals, the matrix below was created based on the interpretive *theme genres* explained above.

TOML goal	Goal Text	page	Relevant Topic Areas & Theme Genres	Comments
E2	Achieve sustainable tourism by building on the area's natural beauty, recreational, cultural, and historic assets	13	**Natural topics** **Cultural topics** **Recreational topics**	A system-wide interpretive program provides a low-cost activity that encourages tourism. The area's natural beauty, recreation, and cultural and historic assets can be targeted with specific system-wide themes.
A1	Be stewards of Mammoth's unique natural environment	14	**Natural topics**	Interpretation encourages stewardship.
A2	Be a vibrant cultural center by weaving arts and local heritage and the area's unique natural history into everyday life	14	**Cultural topics**	Weaving arts and other elements of local heritage could be interpreted using a variety of media.
A3	Encourage public art and cultural expression throughout the community	15	**Cultural topics**	Allowing local writers and artists to develop artwork and content for interpretive displays creates an outlet for expression and encourages public art.
C2	Design the man-made environment to complement, not dominate, the natural environment	16	**Media – Waysides**	Attractive waysides soften the urban environment by adding natural and historic context to the space.
C3	Ensure safe and attractive public spaces, including sidewalks, trails, parks and streets	17	**Media – Waysides**	Waysides typically contain attractive artwork that can beautify the space and streetscape (see C.3.Daround it
C4	Be stewards of natural and scenic resources essential to community image and character	20	**Media – Waysides**	Interpretation encourages stewardship.
C5	Eliminate glare to improve public safety. Minimize light pollution to preserve views of starts and night sky	21	**Natural topics – Physical Earth** **Cultural topics – The Modern Community**	Interpretation of the night sky will emphasize the importance of smart lighting in order to preserve this often overlooked resource.
L1	Be stewards of the community's small town character and charm, compact form, spectacular natural surroundings and access to public lands by planning for and managing growth	30	**Cultural topics – The Modern Community** **Recreational topics – Outdoor Recreation**	Interpretation can be used to explain, foster understanding, and identify the benefits of limits to urban growth
L4	Be the symbolic and physical heart of the Eastern Sierra: the regional economic, administrative, commercial, recreational, educational and cultural center.	32	**Cultural topics** **Recreational topics – Outdoor Recreation**	Interpretation will play an important and necessary role in making Mammoth Lakes an educational and cultural center.
L6	Maintain the Urban Growth Boundary to ensure a compact urban form; protect natural and outdoor recreational resources; prevent sprawl	33	**Cultural topics – The Modern Community**	The Urban Growth Boundary along with it's history and benefits can be interpreted to the public and visitor to promote understanding of current and future urban planning.
M3	Emphasize feet first, public transportation second, and car last in planning the community transportation system while still meeting Level of Service standards	38	**Cultural topics – The Modern Community**	Interpretation can help the TOML promote this paradigm by interpreting its benefits.
P2	Provide additional parks within town	42	**Entire program**	Including interpretive signage in parks is mentioned explicitly in Policy: P.2.E.1
P4	Provide and encourage a wide variety of outdoor and indoor recreation readily accessible to residents and visitors of all ages	43	**Recreational topic – Outdoor Recreation**	Interpretation of recreational opportunities in the Mammoth area would encourage participation in these activities.

Table 6: Matrix relating interpretive topic areas and theme genres to TOML goals as stated in the Town of Mammoth Lakes General Plan 2007 (continued on following page).

TOML goal	Goal Text	page	Relevant Topic Areas & Theme Genres	Comments
R1	Be stewards of habitat, wildlife, fisheries, forests and vegetation resources of significant biological, ecological, aesthetic and recreational value.	44	**Natural topics**	Interpretation encourages environmental stewardship.
R2	Maintain a healthy regional natural ecosystem and provide stewardship for wetlands, wet meadows and riparian areas from development-related impacts	45	**Natural topics – Living Earth**	Interpretation encourages environmental stewardship and can publicize actions taken by the TOML to preserve sensitive areas.
R3	Preserve and enhance the exceptional natural, scenic and recreational value of Mammoth Creek	45	**Natural topics**	Interpretation can encourage public behaviors helping TOML to achieve this goal.
R4	Conserve and enhance the quality and quantity of Mammoth Lakes' water resources	45	**Natural topics – Physical Earth** **Cultural topic – The Modern Community**	Interpretation can encourage a water conservation ethic at the tap (see R.4.B.), at the source, and around the yard (see R.4.C.1.)
R5	Minimize erosion and sedimentation	46	**Natural topics – Physical Earth**	Interpretation encourages environmental stewardship and themes relating to natural and human-caused erosion would help achieve this goal.
R6-11	Goals relating to energy, waste, pollution	46	**Cultural topics – The Modern Community**	System-wide themes could include these issues and interpret their importance and solutions.
S4	Maintain adequate emergency response capabilities	51	**Natural topics – Physical Earth** **Cultural topics – The Modern Community**	Forest fires, earthquakes, and volcanic hazards have been identified as interpretive topics based on their natural history, but also on their effect, or potential effects to the modern community. Interpretation is an effective way to teach people about these natural phenomena and what to do should one of them occur.
S5	Support high quality educational services and life-long learning resources within the community	52	**Entire program**	The development of system-wide interpretation gives teachers and their students opportunities for field-based learning as well as opportunities to become involved in local interpretive activities such as video and audio clips.

Table 7: Matrix relating interpretive topic areas and theme genres to TOML goals as stated in the Town of Mammoth Lakes General Plan 2007 (continued from previous page).

Recommendations

Though mining history could be included under sub-theme 1, a theme specific to cultural history seems warranted. Such a theme would include both pre- and post-European settlement periods. Two possibilities: For thousands of years, humans have struggled to balance and satiate the need for food, shelter, water, riches, and, recently, recreation in the Sierra Nevada. The people of the Eastern Sierra are a reflection of landscape and the plants, animals, weather, and activities that occur there.

Both of these examples are specific to cultural history, but broad enough to include Native American, logging, mining, and more recent recreational sites.

As stated before, themes really are essential to good interpretation. Any interpretive-program development along the MLTS should be done with both broad-scale planning themes and more specific, program-oriented themes in mind.

6 Opportunities for Interpretive Media Along the MLTS

Introduction

Interpretive media can be divided into *personal interpretation*, which requires a living, breathing human being to present information, and *non-personal interpretation*, which consists of both traditional graphic and printed media and high-tech electronic media. For the purpose of analysis, media will be categorized as follows:

1. Personal Interpretation Media

2. Graphic and Printed Media

3. Electronic Interpretation Media

Each media category has advantages and disadvantages. The following analysis was adapted from the Brecon Beacons National Park Authority Interpretation Plan (Meekins 2007).

Interpretive Media Analysis

Personal Interpretation Media

Examples	*Advantages*	*Disadvantages*
Guided walks Evening programs Roving interpretation Events and activities Storytelling Costumed interpreters Street theater	• Very effective. Research shows that personal interpretation is the most effective kind of interpretation. • Very flexible. It's designed specifically for your site and content can be modified easily. • Inclusive. Can attract a wide audience with people from different ages and social groups. • Complex stories can be told well. • Can be creative. • Responsive to different audiences and their needs on the day. • Can generate income. • Can attract good publicity. • Social experience. • Can be fun and exciting. • Can involve multiple skills from different people. • Can have an extended life through websites, photographs, video, reports, and press coverage.	• Outdoor events are weather dependent. • Some events reach only a small audience. • Heavy in administration. • Needs good marketing. • Needs good forward planning. • Requires initial financial outlay. • Needs a range of skills in program development, delivery, coaching, and marketing. • Audience size can be limited. • Can be dominated by a single individual. • Can be a one-off experience. • If repeated, needs assessment and development (coaching).

Printed and Graphic Interpretation Media

Examples	Advantages	Disadvantages
Leaflets Publications Trail guides Waysides Exhibitions	**All printed and graphic materials:** • Can be unobtrusive in an area. • Have good initial impact. • Encourage the use of a variety of senses. • Can be creative. • Can be used at one's chosen time and pace. • Some can be used in bad weather. **Leaflets, publications, and trail guides:** • Can be used on and off site. • Can earn revenue. • Can be cheap to produce per unit. • Have souvenir value: can be taken home. • Can alter language to suit audience. • Are portable and pocket sized. • Do not intrude on landscape. • Can involve partner organizations and local businesses as distribution outlets. • Can include more information than a wayside. • Can help orientation and navigation. **Outdoor panels:** • Available 24/7. • Focus attention on specific features. • Can reach a large audience. • Easy for people to use. • Do not need supervision. • Can help orientate visitors. • Low maintenance. **Indoor panels:** • Indoor panels/exhibitions can be secured. • Easier to be interactive than outdoor panels.	**All printed and graphic materials:** • Need good design and writing. • Can require high initial financial investment. • May be ignored and left unread. • Are inflexible and dated once produced. **Leaflets, publications, and trail guides:** • Require effective distribution. • Revenue collection can be difficult with numerous small outlets. • Can be potential litter. • Have to compete for attention with numerous other publications. • May need regular reprinting. **Outdoor panels:** • May require planning permission. • Expensive to produce and install. • Need regular maintenance and upkeep. • Vulnerable to damage by weather, vandalism, animals. • Can intrude on landscape. • Can cause erosion around sign. • Inflexible content. • Static (boring to some). • Are widely used and may therefore become ignored. **Indoor panels:** • Need space/building. • Only available when building is open. • Immobile. • If high tech, prone to breaking.

Electronic Interpretation Media

Examples	Advantages	Disadvantages
Websites Audio guides Podcasts Interactive screens CDs Cell-phone tours Smartphone tours	• Appeals to a wide audience, including younger people. • Not intrusive in the landscape. • Opportunities for creative and exciting use of design, sound, images, and/or video. • Can be multilayered. • Opportunities for creative characterization. • Can be multilingual. • Can be used as storytelling. • Material that can be downloaded from the Internet is accessible from some people's home or mobile devices. • Information is easily updated. • Can be innovative and interactive.	• Relatively expensive start-up costs. • Some people will feel alienated by the use of high-tech media. • Users need access to specialized equipment: computer, smartphone, MP3 player, etc. • Can isolate users from each other and from the site features • Important operational issues such as equipment purchasing, storage, and charging. • Technology is developing rapidly, so systems may become dated quickly. • Equipment susceptible to serious faults or malfunctions. • High-tech devices are vulnerable to damage and theft. • Can be expensive to operate. • Some equipment requires regular maintenance (e.g., charging batteries for mobile devices).

Interpretive Media Along the MLTS

Special concerns for the Mammoth area

For the Mammoth Lakes area, certain additional factors must be taken into account when deciding on the kinds of media to use at a particular location. Many of these concerns are related to Mammoth's remote location and extreme elevation and weather.

Personal interpretation

Altitude: Guided walks should be planned with the area's elevation in mind. Many visitors come from low elevations, and walks should be of relatively short duration and planned around easy to moderate trails.

Printed and graphic interpretation

Snow load: All waysides along the MLTS should be taken down seasonally due to potential snow loads.

Wind: Waysides in exposed areas should be of the "low-profile" design as opposed to vertical uprights to avoid damage during periods of high wind.

UV exposure: Exhibit panels fade faster over time at high elevations.

Electronic interpretation

Cell service: Certain areas in and around Mammoth Lakes have limited cell service. Prior to project initiation, site visits should be made to confirm adequate cell service exists for the site.

Bandwidth: During periods of peak visitation, the area's limited bandwidth could make cell-based services slow or inoperable.

Personal Interpretation

Though many types of personal interpretation exist, only a few are feasible on a trail system. For the Mammoth Lakes Trail System we focus our analysis on:

- Guided tours
- Roving interpretation

While interpretation in more theatrical settings, such as an auditorium or street performance, is feasible for the Mammoth Lakes area, these types of elaborate performances seem less applicable to a trail system. The same is true for interpretation at special events. Local organizations such as ESIA and the Southern Sierra Historical Society would be better able to organize and promote such events and collaboration with organizations such as the Mammoth Lakes Repertory Theatre. By concentrating on these two most common forms of personal interpretation we do not intend to limit the possibilities of interpretation in Mammoth Lakes; rather, we want to focus on basic opportunities for the young MLTS.

Guided Tours

Guided walks are a formal, scheduled, and advertised form of personal interpretation. Guided walks are probably the most familiar form of personal interpretation to the visiting public. During a guided walk, a uniformed interpreter or docent leads a group of visitors to predetermined locations where stories are told, topics are discussed, and questions are answered. Each predetermined stop along the tour should fit within the interpreter's conceptual theme guiding that specific program. While the interpreter tries to focus his or her presentation around a specific theme, questions and interest in stories or features outside the theme are expected and addressed as needed. During theme development, the interpreter tries to anticipate areas of interest along the route and to work them into the theme. Tour length is very flexible, but is generally 45 to 90 minutes.

Strengths and Weaknesses

(+)	(-)
• Scheduled and advertised; public can plan guided tours into their itinerary.	• Only available at certain times on certain days, limiting the number of visitors.
• They are a "mini event" that people get excited about.	• Weather dependent.
• Great publicity.	• Can only move as fast as the slowest person.
• The theme-based and structured format creates a setting for profound emotional and intellectual connections.	• Effectiveness is highly dependent on the skills of the interpreter.
• People feel more comfortable going to new and remote places with a guide.	

Certain facilities and amenities should exist at the tour meeting location to meet the visitors' basic needs (*see* list 7). In lieu of a drinking fountain or sink, drinking water can be provided on site by the interpreter, using either bottled water or a large drink cooler (preferred). Meeting locations should be easy to locate using short, simple directions, such as those printed in a local newspaper "events calendar" or given during a radio announcement.

Whenever possible, it is preferred to have guided tours offered during the same day(s) and time(s) each week. It is also advisable to keep tour-program schedules consistent from year to year, since many visitors will gather information from old travel guides and guidebooks and many repeat visitors will attend a particular program year after year.

Guided Tour Interpretation
Requisite facilities/amenities

| Meeting area | Bathrooms |
| Parking | Drinking water (optional) |

List 7: Required facilities and amenities in order to provide guided-tour interpretation.

MLTS Results

The following locations meet the needs and criteria stated above and are places where a guided tour could begin based on proximity to interesting features and stories. Each of these locations has nearby parking, good meeting areas, bathrooms, and (usually) drinking water. Some of these locations may not be accessible during all seasons, but most are.

Guided-Tour Opportunities
Suitable meeting areas

Tamarack Lodge (A)

Eagle Lodge (B)

The Village (C)

Mammoth Creek Park (D)

Mammoth Lakes Public Library (E)

Mammoth Lakes Welcome Center (F)

Shady Rest Park (G)

Volcom Brothers Skate Park (H)

List 8: Suitable starting locations for guided tours along the MLTS. Letters correspond to labels on Map 2, right.
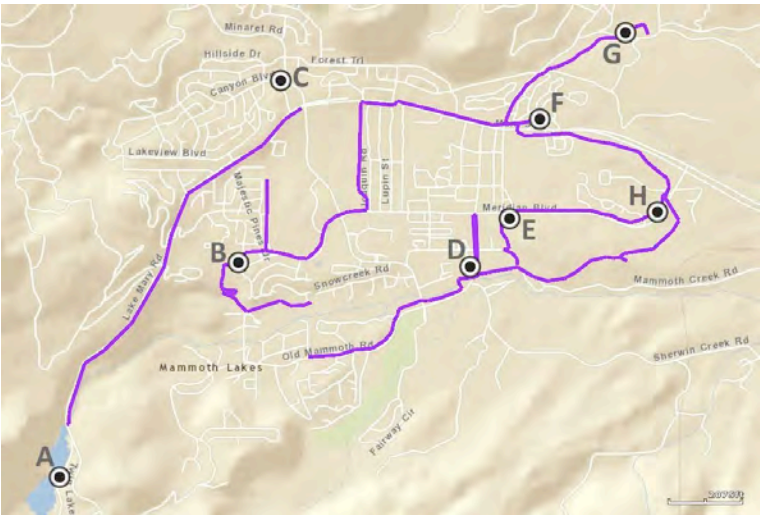
Map 2: Suitable starting locations (shown as black dots). Letter labels correspond to place names in List 8. Purple lines indicate trails surveyed for this study.

Roving Interpretation

Roving interpretation is an informal, unadvertised type of personal interpretation. During a rove, a uniformed interpreter or docent goes to one or more high-use areas and makes him or herself available for questions or actively tries to initiate dialogue with visitors in an informal way. Oftentimes the roving interpreter will carry props (animals skins, rock samples, etc.) or information (fact sheets, species lists, etc.) that can be used to elaborate on a variety of topics. While roving interpretation is usually focused around a particular destination site, the walk to and from that destination is included as part of the loosely defined interpretive "program" as well.

Stretches of trail where people rarely stop (i.e., no vista or special feature present) are as effective for roving interpretation as are trails leading to and from a destination. Roves are not intended to make people stop and appreciate something; this can be bothersome. Rather, it is a way to serve those who have already stopped to appreciate something or are willing to stop in order to ask a question. It is most appropriate and effective at well-defined destinations where people tend to pause, congregate, rest, and observe something in particular. Busy urban settings with no prominent features or resources are often poor locations for roving interpretation, but can be excellent locations for other types of roving services, such as those focused on disseminating information, orienting visitors, and providing safety information.

Strengths and Weaknesses

| (+)	(-)
• Spontaneous and unexpected: adds excitement to the visitors' day.	• Interactions are usually brief, limiting the amount of information that can be interpreted.
• It's fairly social: people like meeting other people, especially locals who know the area.	• The quantity and quality of the interaction is usually limited by how outgoing or motivated the interpreter is.
• Props create great memories and involve the senses.	• Conducted in the wrong place, it can be unfruitful or even bothersome to passersby.
• People who might not otherwise attend a formal program get to experience personal interpretation firsthand.	
• A roving interpreter can help disseminate safety and appropriate use information (leash laws, litter laws, etc.).	
• Roving interpreters can take advantage of special moments (a bald eagle fishing a lake, a bear wandering through) that occur unexpectedly.	

MLTS Results

Site visits and assessments revealed one trail segment currently ideal for roving interpretation (Map 3, below). Overall, most portions of the trail system lack a prominent and formalized destination around which an interpretive rove could be focused. However, other roving could be done between the Interagency Visitor Center and various high-use areas near the town center such as Main Street, Old Mammoth Road, and Shady Rest.

The Mammoth Creek Park to Sherwins Vista section was identified as a good place for roving interpretation. It has relatively high use, offers opportunities for interpretation of many different topics and features (List 9), and ends at a beautiful vista complete with a picnic table and benches nearby. People frequently stop there, and a roving interpreter would have ample opportunity to connect visitors to a variety of resources. Season(s): summer only, due to low use during winter months.

The Lakes Basin Path has potential for roving interpretation if a more finished vista is constructed somewhere along the path. Additionally, the Lakes Basin contains several locations where roving interpretation could be conducted during both summer and winter.

Roving Interpretation Opportunities
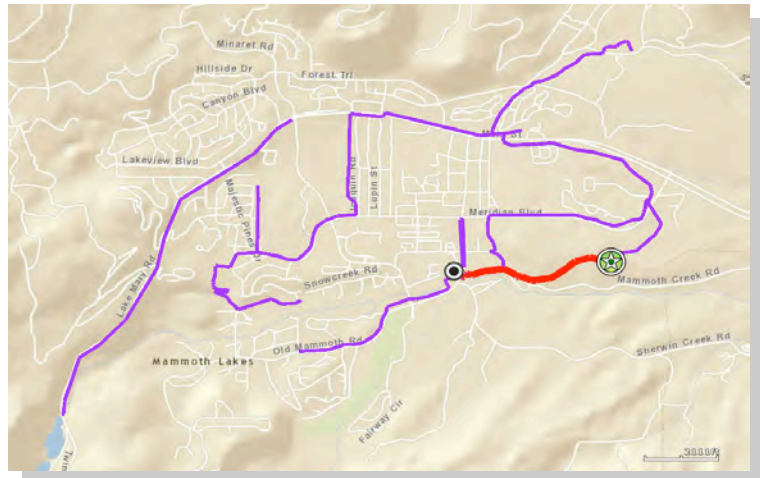
Map 3: Opportunities for roving interpretation along the MLTS (red line). A black dot marks the rove starting location; a star marks the rove destination. Purple lines indicate trails surveyed for this study.

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Recommendations

Staffing resources will almost certainly remain limited for the MLTS into the foreseeable future, and hiring a full-time or part-time interpreter to conduct roves seems to be a poor investment. However, both the Inyo National Forest and Devils Postpile National Monument hire interns for their own interpretation programs during the summer months. These agencies provide interpretive training and coaching to their interns.

1. The MLTS should create an exchange program where interns from these agencies are borrowed on rotation to conduct roves along the MLTS during peak periods.

2. The MLTS should create a volunteer program that offers local high-school students the opportunity to attend INF and NPS interpretation trainings and gain work experience roving MLTS trails during weekends.

Roving Interpretation Opportunities
Mammoth Creek Park to Sherwins Vista

Natural Topics

- Living Earth -
Eastern Sierra biogeographic region
Elevational gradients
Insects
Jeffrey pine forest
Lower montane forest
Manzanita/ceanothus
Mammalian migrations
Owens River
Plant communities
Rainshadowing
Riparian communities
Sage community
Treeline

- Physical Earth -
Avalanche paths
Casa Diablo Geothermal Field
Convict Moraine
Glaciation
Glacial erratics
Glass Mountains
Great Basin
Laurel Lakes moraine

Long Valley Caldera
Mammoth Creek
Mammoth Crest
Mammoth Mountain
Mammoth Pass
Mammoth Rock
Mineral Hill/Gold Mountain
Morrison roof pendant
Panorama Dome
Resurgent Dome
Ritter Range roof pendant
San Joaquin River Valley
Scenic Loop domes
Sherwin Crest
White Mountains

Cultural Topics

- Native Culture -
Not inventoried in this report

- Settlement History -
Cattle and sheep drives
The Hayden Cabin
Lakes Mining District
Lost Cement Mine

Mammoth Pass
Old Mammoth Village

- The Modern Community -
Crowley Lake
Development
Dog ownership
Federal lands and management
Fish hatcheries
Geothermal energy
Open spaces
Second/summer home ownership
Trail networks
Volcanic hazards

Recreational Topics

- Outdoor Recreation -
Equestrian activities
Fishing
Fish stocking
Mammoth Lakes Trail System
Trail etiquette

List 9: Interpretive opportunities along the paved MUP between Mammoth Creek Park and the Sherwins Vista.

Printed and Graphic Interpretation

Printed and graphic interpretation has long been a mainstay of non-personal interpretation. Typical forms of printed media include leaflets, publications, and trail guides. Graphic media typically exist as waysides or exhibitions. Some of these media are more relevant and feasible for the MLTS in its current state than others.

Exhibitions will not be considered because they require a relatively large indoor space. This kind of media is more appropriate for the Mammoth Lakes Welcome Center, which has some excellent exhibitions about volcanic unrest in the area, and Mammoth Mountain Ski Area, which has a large interactive exhibition at the Top of the World Interpretive Center.

Leaflets will also not be considered because of the great potential for them to become litter. This is particularly true in Mammoth Lakes, where strong winds frequently occur along many portions of the trail system. Strong winds would make distribution of leaflets using standard brochure racks challenging at almost all locations.

For the Mammoth Lakes Trail System we focus our analysis on:

- Publications & Trail Guides
- Waysides

Publications & Trail Guides

Brochures, newspapers, and trail guides have long been the cornerstone of printed materials in natural areas. The National Park Service gives out millions of *Official Map & Guide* park brochures to its visitors each year. Locally, the small and highly seasonal NPS unit of Devils Postpile National Monument often distributes in excess of 50,000 brochures during its short four- to six-month season.

Publications have the added benefit of being souvenirs that visitors can take home and share with friends. It will be shown, however, that many of the benefits of printed materials are also found in modern mobile Web-based platforms, which will be discussed in the following section.

Strengths and Weaknesses

(+)	(-)
• Information is portable	• Publications often become trash, or worse: litter
• Low tech, low maintenance	• Not interactive
• Easy to distribute	• Competition with existing publications
• Contain more info than a wayside	• Contain less info than personal interpretation
• Souvenir value	• Initial cost of development
• Can be passed from one person to another	• Recurring cost of reprinting

MLTS Results

Currently, an MLTS-specific publication does not exist. Given that funding for such an endeavor could be found, printed materials such as a booklet, brochure, or magazine could provide trail users with both orientation and interpretive information in great detail. Distribution at area visitor centers, shopping malls, and gas stations would be relatively easy and an effective way to advertise the MLTS and its lesser-used portions. An MLTS Interpretive Trail Guide could be sold to offset printing costs, though charging even a nominal amount usually decreases distribution dramatically. Alternatively, advertising space could be sold to offset costs, keeping the publication free and increasing distribution. Unfortunately, the Mammoth Lakes area is fairly saturated with publications of all kinds, and competition at the bookshelf and brochure rack would undoubtedly be steep.

Alternatively, several existing area magazines and travel guides could publish interpretive information relevant to features and stories along the MLTS. This kind of published information would be much more limited in the breadth of content than a devoted publication, but "special features" highlighting a certain section of trail and the interpretive opportunities along it could rotate weekly, monthly, or seasonally depending on the print schedule of the tabloid. Over the long term, these articles could cover a wide portion of the MLTS.

Opportunities to disseminate printed materials are almost endless in the Mammoth Lakes area. Besides the obvious locations, such as the Mammoth Lakes Welcome Center, Vons shopping center, and Mammoth Lakes Public Library, countless restaurants, hotels, guesthouses, and outfitters display free publications. Several bookstores in the area would probably be willing to sell an MLTS-specific trail guide. As stated before, competition with existing publications makes these numerous opportunities less effective. These locations, being so numerous and commonly known, were not mapped for this report.

Recommendations

Given both the initial and repeat investments needed to make and reprint an attractive publication, a dedicated publication seems an unwise investment for the MLTS interpretive services program. As noted before, there are other opportunities to provide interpretive information for the MLTS using existing publications such as *Sierra Magazine* and the Inyo National Forest's annual Visitor Guide. As will be mentioned shortly, many of the benefits of printed materials have now been achieved or surpassed by mobile Web-based platforms.

Waysides

Waysides are durable, typically two-dimensional printed signs installed alongside trails that present either orientation or interpretive information or a combination. Waysides come in a variety of sizes, from small, postcard-size panels that provide identification of a single plant species to large, wall-size displays that provide information about an entire region.

The most common style of wayside is the cantilevered low-profile design. Panel sizes vary, with 48 by 24 inches being common. This particular size and design is popular because it is readable from a wheelchair (Figure 1) and by children.

Waysides can also be configured into larger arrays (Figure 2), sometimes meant to be read in a particular order. Small, postcard-size panels with plant names and descriptions are commonly arranged along a trail to provide plant identification for self-guided nature walks. Wayside panels are typically rectangular in shape; however, they can be cut and shaped to suit a desired effect (Figure 3). Elaborate panel shaping is more common among indoor exhibits. Likewise, panels can be mounted in a variety of ways, though metal frames are the most common and inexpensive.

While there are several options when it comes to panel materials (porcelain enamels, composites, metal etching), digital printing on high-pressure laminates has become the standard in the Sierra Nevada parks due to its mid-range cost, rich color quality, and durability under high-UV conditions. High-pressure laminate panels are expected to last five to seven years when exposed to high-elevation UV levels, at which point panel content is usually due for an update anyhow. The use of fiberglass embedment is strongly discouraged for high-elevation areas such as Mammoth Lakes because of its tendency to become cloudy with age under strong UV.

Strengths and Weaknesses

(+)
- Attractive and creative
- Available 24/7
- Low maintenance
- Can reach a wide audience
- Familiar format to those on the NPS circuit
- Can phase well with high-tech media

(-)
- Information is not easy to update
- Fade over time
- Not interactive
- Easily passed by unless attractive
- Limited space, easily cluttered

Figure 1: A cantilevered low-profile wayside. The panel area measures 48" wide by 24" tall. NPS photo.

Figure 2: A series of panels at the Minaret Vista near Mammoth Lakes. The six panels are configured to interpret different parts of the panoramic scene. NPS photo.

Figure 3: Panels can be cut and mounted in a variety of ways to blend with the local culture and landscape. Interpretive Graphics photos

MLTS Results

Most of the paved MUP and sidewalk inventories for interpretive opportunities were found to be suitable for wayside panels. Notable exceptions exist along the Lakes Basin Path where the paved trail fits tightly between the road on one side and guardrails or fencing on the other. Many locations along this section of trail are not currently suitable for wayside installation since visitors would have to stand in the path while reading the panel. There is also the risk of a cyclist riding into a panel located close to the trail at high speed. However, locations could be made suitable for waysides by adding fill to create viewpoints.

Since almost all sections of trail surveyed were found to be eligible for wayside installation in one form or another, no map was included. Note that while most sections of trail could accommodate a wayside, that is not to say that all sections of trail *warrant* installation of a wayside. Specific recommendations for waysides along the MLTS will be made later in the report in reference to specific stories and features.

Recommendations

The public is familiar with and has come to expect waysides along popular trails with notable features.

1. Waysides, small and large, should be included as part of the overall MLTS interpretation strategy.

2. Waysides should be incorporated with high-tech interactive media and programs (see next section).

Electronic Interpretation

Recent advances in the sophistication, affordability, and ease of use among high-tech mobile devices like smart phones and global positioning system (GPS) units have created a new high-tech niche in interpretation. These technologies and platforms continue to evolve quickly. The use of these emerging technologies in interpretation is desirable—if not inevitable—for its appeal to younger generations and the ease with which it can put vast amounts of information literally in the palm of one's hand.

To foster an ongoing relationship with visitors and encourage long-term support, many agencies are harnessing new technologies. Digital media interpretation includes mobile applications, interactive website features, and integration with social-media platforms. Digital interpretive programs generally achieve increased visitor engagement with features, resources, and the surrounding environment.

The following high-tech interpretive media were selected for review for the MLTS:

- Website
- Cell-phone tours
- Smartphone tours
- QR codes

Website

Visitors to interpretive sites now expect to take an active role in experiencing their surroundings and engaging with their environments. This could be as simple as using their cell-phone camera to take and upload a picture to their Facebook page with a brief description of what they are doing, or as involved as the FireFly Project (https://www.mos.org/fireflywatch/), which ties visitors to place and invests them in solving local problems by charging them with "citizen-scientist" duties of data collection. Another example is the MoMA Teens Project, which encourages local students to write, produce, and submit digital media projects, giving MoMA the opportunity to engage local students in hands-on learning activities that create content for the website, thus relieving the need for the interpretive agency to supply all of the content for the website.

Strengths and Weaknesses

(+)

- Keeps visitors connected and continues to foster visitor relationships when they are out of the area
- Opportunity to capture data through user-generated content
- Interactive websites can increase visitor stewardship for the land and environment
- Far-reaching and inexpensive fundraising opportunities (e.g., PayPal banner)

(-)

- Can be expensive to update and maintain interactive websites and online presence through social media

- Changes in technology may demand updating the design and overall functionality of a website every few years
- Demands somewhat tech-savvy staff or contract with outside company
- Interactive sites require project coordination and staff vetting

MLTS Results

The MLTS has in place the human and technological resources to build a comprehensive website that allows users to explore the MLTS and receive up-to-date trail information. The MLTS is also working on a wireframe to deliver Web content on mobile devices.

Recommendations

The public increasingly expects to take an active role by engaging with their environment and sharing their experiences. This allows visitors to foster a sense of connection to and shared responsibility for the area even though they are not full-time residents.

1. Create an online interpreter-led discussion forum where visitors can grapple with interpretive themes and with issues they may have interpreting resources.

2. Participate in citizen-scientist data-gathering projects. This could be as simple as analyzing visitor pictures of an area over time to gauge changes or as complex as the FireFly Project (https://www.mos.org/fireflywatch/).

3. Share website content and, by extension, raise awareness about the area and stewardship issues through their own social-media accounts.

4. Create an interactive portion of the website dedicated to allowing local students and teachers to:

   a. Access hands-on learning activities and lesson plans that connect them to the land, help them learn more about the area, and foster a sense of stewardship toward the environment.

   b. Research and publish student-generated content (this would be vetted by interpretive staff).

5. Integrate Web-based interpretation with social-media platforms where visitors can share their experiences with nature, culture, and recreation on the MLTS and stay connected to the MLTS and interpretive opportunities.

6. Create avenues for visitors and users to make donations or larger contributions online.

Cell-phone tours

Cell-phone tours have become an effective tool for making audio interpretive content available to the public. Basically, an audio program is recorded onto what is essentially a voicemail recording. At each stop, the visitor calls a phone number specific to that stop and can listen to the program on his or her phone. An alternative format operates from a single phone number and the content for each stop is accessed by typing in an extension. This extension-based system is particularly useful when stops are close together, since it eliminates the need to hang up and dial a new number at each stop.

The type and manner of content delivered by cell-phone tours is almost identical to that of "push-button" audio tours in the past, where a display or wayside is rigged with audio equipment that plays a single recording when the visitor pushes the button to start the recording. Cell-phone tours have become increasingly popular as cell-phone ownership and usage has become exceedingly common and less expensive.

Strengths and Weaknesses

(+)
- Nearly everyone has a cell phone
- Eliminates the need for the interpretive institution to purchase and maintain its own tour equipment
- Ability to deliver different content in different languages
- Content is accessible anywhere (in the world) that there is cell coverage

(-)
- Reliant on cell-service coverage
- Audio quality is generally low and generally precludes the use of music or sound effects
- Start-up costs for planning and producing a comprehensive tour can be significant
- May not be an attractive media for certain segments of the public
- International visitors may not be able to access the tours

MLTS Results

Cell Service (Verizon) Along the MLTS
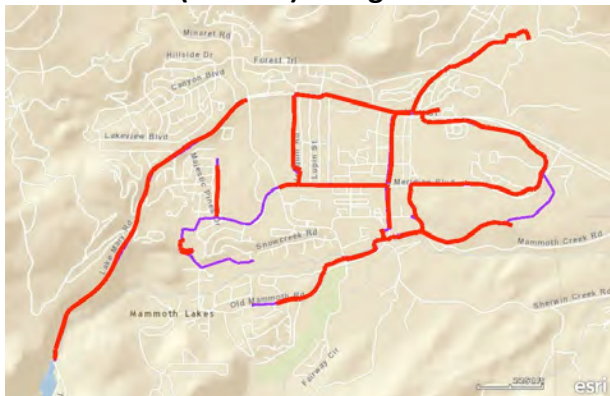
Map 4: Sections of paved MUPs with sufficient Verizon cell-phone service for cell-phone tours, June 2011 (red lines). Purple lines indicate trails surveyed for this study.

Locations Suitable for Cell-Phone Tours

Map 5: Sections of paved MUPs suitable for cell-phone tours based on cell-service coverage, proximity to noisy urban areas, and frequent high wind noise (red lines). Purple lines indicate trails surveyed for this study.

Recommendations

1. Avoid offering cell-phone tours in noisy areas where visitors would have trouble hearing the tour. For Mammoth, this includes frequently windy and busy urban areas.

2. If audio is developed for other interpretive media (e.g., smartphone tours), this content could be made available via cell-phone tours at a small additional cost.

3. Cell-phone tours may be particularly effective along sections of trail that are less than ideal for wayside panels due to space or snow-load concerns. Signposts displaying the phone number can be designed to have a small footprint, sustain heavy snow load, and be visible during periods of deep snowpack.

4. Cell-phone tours seem to be a great four-season media for the MLTS.

Smartphone tours

Smartphone tours can be conducted in a couple of ways: either an application is downloaded onto the user's phone, or a Web-based application is accessed via wi-fi or cellular Internet connection at each stop. Both could be used along the MLTS, though certain specific locations may not have consistent and reliable service. Extreme caution should be used in areas with suspect service or bandwidth capacity. However, the outlook for increased bandwidth brought by the ongoing Digital 395 project makes the future of smartphone tours look increasingly bright. This project will increase both coverage and Internet data speeds in the area.

Developing the content and framework for smartphone tours is the biggest challenge. Once complete, the product is usually very impressive and stimulating. The use of this more sophisticated style of tour is a bit of a gamble with a large initial investment that, if done successfully, can reach a wide segment of the population that finds traditional interpretive media to be boring.

Another point of caution involves the type of content that is hosted on a smartphone tour. Content should be as impressive as the media hosting it. In other words, don't offer "dumb" (i.e., traditional) content on a "smart" media. Smartphone content should consist of video, interactive features, real-time content (e.g., USGS earthquake info), and connections to social media. Other kinds of content can be offered at lower start-up and maintenance costs using waysides, cell-phone tours, or simple QR-accessed methods.

Strengths and Weaknesses

(+)
- Eliminates the need for the interpretive institution to purchase and maintain its own tour equipment
- Ability to deliver multimedia content: audio and visual content, interactive Web content, and interaction with other, third-party mobile applications
- Outreach to new visitors and younger visitors, who are regularly exposed to multimedia information
- Ability to deliver different content in different languages

- Ability to deliver content to hearing and visually impaired visitors through audio and captioned video

(-)
- Reliant on coverage
- Not everyone has a smartphone
- High start-up costs for planning and producing a comprehensive tour
- Older, more-traditional public may not be the right audience
- International visitors may not be able to access tours

MLTS Results

Suitability is constrained primarily by cell-phone coverage. See Map 4, above.

Recommendations

1. Smartphone tours should be used to offer content not possible on a wayside, such as video, audio, interactive lessons, and augmented reality.

2. If audio is used, noisy areas should be avoided.

3. If video or images are used, locations without shade should be avoided. Screen glare due to Mammoth's intense high-altitude light is a serious concern for the use of this media in certain locations.

4. Explore the feasibility of creating treasure-hunt/geocache programs along the MLTS that use GPS-enabled devices (which includes most smartphones). This kind of program would be particularly useful for reaching kids.

Content linked by QR code

A QR code, short for *quick response code*, is a two dimensional "barcode" containing Web-address information that can link a smartphone to content on the Internet. Smartphone users can "scan" the code using the phone's camera and a scanning application and be directed to a specific website or application hosted online. QR codes eliminate having to type in long URLs or search on a small screen.

This media is similar to a smartphone tour and is often used as a component of a smartphone tour. QR-linked content has certain advantages over a full smartphone tour since it can be used to simply link a user to content hosted online without the need for a comprehensive "tour." The use of QR-code technology is incredibly versatile. Codes can be imbedded in a wayside, on a signpost, in a publication, etc., and they can link to a video hosted on free services such as YouTube, a private or third-party server, or to social-media platforms.

From an interpretive standpoint, QR codes should be used to link visitors to *expanded* content and should not be central to the desired interpretive experience. Building an interpretive program around QR codes has the potential to isolate visitors who don't own a smartphone.

Strengths and Weaknesses

(+)
- Allows visitors to select experiences
- Interpretive media not limited to text and images; can include audio and video
- Can deliver up-to-date trail, weather, and avalanche conditions as needed
- Can deliver calendar events that would automatically populate a visitor's calender

(-)
- Reliant on coverage
- Not everyone has a smartphone
- Requires a mobile-device-specific wireframe
- Older, more-traditional public may not be the right audience
- Application issues: not everyone has the same QR code reader application

MLTS Results

QR codes could be used anywhere there is cell-phone coverage. See Map 4 for coverage information.

Recommendations

1. QR codes should be used in printed materials (publications, waysides) to link visitors to video, interactive content, and social-media platforms.

2. QR codes should complement waysides and traditional content, not replace them.

3. Provide enough interpretive content on waysides for people without smartphones.

For more information about using high-tech media in interpretation, see the following:

- Falk, J., & Dierking, L. (1992). *The Museum Experience*. Washington, D.C.: Whalesback Books.
- Johnson, L., Witchey, H., Smith, R., Levine, A., and Haywood, K., (2010). *The 2010 Horizon Report: Museum Edition*. Austin, TX: The New Media Consortium.
- Tallon, Loïc, and Walker, Kevin. (2008). *Digital Technologies and the Museum Experience: Handheld Guides and Other Experiences*. Lanham, MD: AltaMira Press.

7 Opportunities for Interpretation of Topics, Theme Genres, and Topic Areas Along the MLTS

Introduction

There are numerous locations along the Mammoth Lakes Trail System where nature, culture, and recreation could be interpreted. For someone trying to decide where interpretive media should be located, the number of inspiring and suitable vistas in the area is impressive, if not overwhelming. To complicate things, the area is surrounded by a great number of interesting and important features and stories, making it potentially difficult to maintain focus around a specific theme.

For future interpretive planning it will be useful to know which areas of the trail system could be targeted for interpretation. Likewise, because good interpretation is built around predetermined themes, it would be useful to know how groups of features and stories relevant to themes are distributed across the area. By surveying and mapping the area's features and stories, certain patterns of overlap emerge, providing useful guidance about where interpretation of specific topics and themes might be particularly effective and comprehensive—where outstanding opportunities for interpretation exist.

The following is an assessment of locations with outstanding interpretive opportunities along the paved MUPs below the Mammoth Lakes Basin in June 2011. Persistent, record-breaking snowpack prevented this assessment from being conducted in the Mammoth Lakes Basin.

Methodology

Trails were surveyed for interpretive opportunities. This involved walking the trails to look for places where a trail user could interact with features or stories, or at least see them. With few exceptions, each section of trail was walked in both directions to get a better feel for scenic vistas and the overall trail experience. Working off of the master inventory of area topics (Chapter 4), objective assessments were made of what features and applicable stories were clearly within view along all paved MUPs below the Twin Lakes Vista. Locations and notes were recorded on field sheets using a combination of paper maps, GPS, and interpolation. This more or less objective assessment was tempered by judgment in two ways: (1) locations with significant visual distractions were omitted (e.g., a location overlooking the industrial park was omitted because it was too distracting); and (2) locations with particularly high scenic value were recorded as points along a section to bring attention to locations with outstanding value for that topic(s); for example, a point for the feature *Mammoth Rock* was created along a trail section that had already been recorded as suitable for the *Mammoth Rock* feature to highlight the scenic value of that particular location.

Points and trail segments with opportunities for interpretation were digitized using GIS. Points and segments were determined to have "outstanding" opportunities for interpretation at a variety of scales based on a combination of objective and subjective criteria (*see* Table 8).

Since most visitors to Mammoth Lakes come for its natural beauty, an additional scoring and analysis was conducted to reveal sections of trail with particularly high interpretive value. Scoring (and thus ranking) for points and segments was accomplished by simply adding up all of the features and stories

that were applicable to each location. This scoring produced the maps found on pages 68, 72, and 81 and is one example of how spatial analysis was useful in determining interpretive opportunities along the MLTS.

Scale	Topic	Theme genre	Topic area	Interdisciplinary
Criteria	1) High feature/story priority score (Ch. 4) 2) Scenic views of the feature or features relevant to the topic 3) High-use area	1) Multiple features/ stories present 2) Several with high priority score	1) Multiple features/stories present 2) Several with high priority score 3) All theme genres represented	1) Scenic views of features 2) Several features belong to multiple theme genres or topic areas 3) Several with high priority score

Table 8: Criteria for "outstanding" interpretive opportunities for the entire range of thematic scales.

Results

The following information is a summary of the highest-ranking opportunities found along the MLTS. Opportunities are listing in order of increasing scale, beginning with individual topics sorted by topic area and theme genre, followed by opportunities for interpreting at the *theme genre* level, followed by opportunities for interpreting at the *topic area* level, and concluding with opportunities for interdisciplinary interpretation, which links a variety of topics, theme genres, and topic areas by a common programmatic theme. Interdisciplinary interpretive programs are often the most interesting and effective at connecting visitors to local resources.

Only important (i.e., high scoring) topics relevant to the paved MUPs below Twin Lakes are included in this summary. Topics that scored high in the inventory above (Ch. 5), but not found along these trail sections, were omitted from the summary below.

Outstanding Opportunities for Topic-Specific Interpretation

### *Natural Features & Stories*

Jeffrey pine forest
Long Valley Caldera
Mammoth Mountain
Owens River
Volcanism
Casa Diablo Geothermal Field
Pandora moth cycle
Clark's Nutcracker
Glaciation
Mammoth Rock
Resurgent Dome

Jeffrey pine forest

Topic-area rank: #1
Uniqueness/significance: Nationally unique and regionally significant
Topic-area overlap: Cultural (Native Cultures & Settlement History)

Notes: The Mammoth Lakes area is home to the world's largest pure stands of Jeffrey pine forest. Nowhere else do Jeffrey pines dominate the landscape as they do along the Eastern Sierra near Mammoth Lakes. Jeffrey pine is the host species for the parasitic Pandora moth, which was harvested and eaten by native peoples. During the settlement period, it was a primary source of timber.
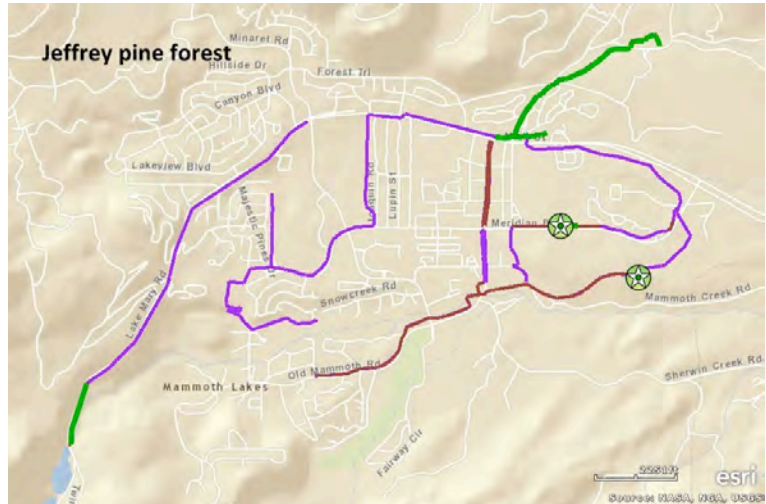
Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program. **Stars:** ideal points for interpretive discussion.

Long Valley Caldera

Topic-area rank: Group #2
Uniqueness/significance: Nationally significant and regionally unique
Topic-area overlap: None

Notes: The Long Valley Caldera is one of the most active and instrumented geologic features in the U.S. The feature has gained national attention and its activity has warranted intense monitoring by the USGS.

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program. **Stars:** ideal points for interpretive discussion.

Mammoth Mountain

Topic-area rank: Group #3
Uniqueness/significance: Regionally significant
Topic-area overlap: Cultural and recreational (The Modern Community & Outdoor Recreation)

Notes: Mammoth Mountain is regionally significant due its volcanic unrest and its geologic history, which is tied to other notable geologic features in the area such as Devils Postpile and Rainbow Falls. Mammoth Mountain is central to the local resort economy and much of the area's summer and winter recreation.

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program. **Stars:** ideal points for interpretive discussion.

Owens River

Topic-area rank: Group #3
Uniqueness/significance: Regionally significant
Topic-area overlap: Cultural and recreational (Settlement History & Outdoor Recreation)

Notes: The Owens River is significant as the region's primary waterway. Its wetlands are important for migrating birds and mammals. It played a major role late in the settlement period. Currently it attracts thousands of anglers.

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program. **Stars:** ideal points for interpretive discussion.

Volcanism

Topic-area rank: Group #3
Uniqueness/significance: Regionally significant
Topic-area overlap: Cultural and recreational (The Modern Community & Outdoor Recreation)

Notes: Volcanism has been the dominant geologic force shaping the Mammoth landscape east of the Sierra Crest. Volcanic unrest continues into modern times and affects public safety and urban planning. Much of the area's recreational opportunities are a result of the area's volcanic landscape.

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Stars:** ideal points for interpretive discussion.

Casa Diablo Geothermal Field

Topic-area rank: Group #4
Uniqueness/significance: Regionally unique and significant
Topic-area overlap: Cultural (The Modern Community)

Notes: The Casa Diablo Geothermal Field is regionally unique in the extent and degree of thermal energy that reaches the surface there. This energy is currently being utilized to create electricity, and the geothermal infrastructure continues to expand in scope.
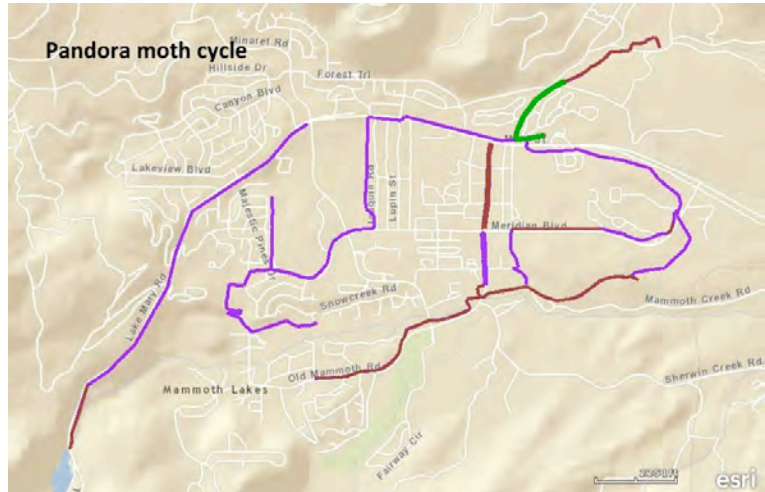

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Stars:** ideal points for interpretive discussion.

Pandora moth cycle

Topic-area rank: Group #4
Uniqueness/significance: Regionally significant
Topic-area overlap: Cultural (Native Cultures)

Notes: Every two years, Pandora moths reach maturity en masse and defoliate the area's Jeffrey pine trees. While the moths rarely kill trees, occasional severe outbreaks have occurred, resulting in concentrated areas of high tree mortality. The Paiute people harvest the larvae as a food source.

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

Clark's Nutcracker

Topic-area rank: Group #5
Uniqueness/significance: Regionally significant
Topic-area overlap: None

Notes: Clark's Nutcrackers play an important ecological role, especially in high-elevation forests. They help trees colonize higher elevations by caching large amounts of seed above treeline. These caches are an important food source for other animals that often raid them; an example is the black bear.

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Stars:** ideal points for interpretive discussion.

Glaciation

Topic-area rank:	Group #5
Uniqueness/significance:	Regionally significant
Topic-area overlap:	None

Notes: Second only to volcanism, glaciation is one of the most dominant forces that has shaped the scenic landscapes around Mammoth Lakes and the surrounding Sierra Nevada.

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program. **Stars:** ideal points for interpretive discussion.

Mammoth Rock

Topic-area rank:	Group #5
Uniqueness/significance:	Regionally unique and significant
Topic-area overlap:	None

Notes: Mammoth Rock is significant as one of the most recognized geologic features in the Mammoth Lakes area. It is also significant for its age, which dates to the Devonian Period. It is the oldest rock in the immediate surroundings of Mammoth Lakes.
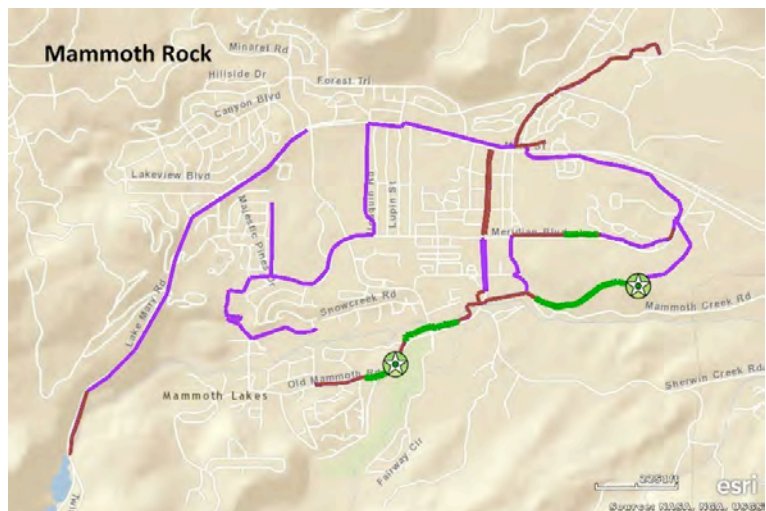

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program. **Stars:** ideal points for interpretive discussion.

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Resurgent Dome

Topic-area rank: Group #5
Uniqueness/significance: Regionally unique and significant
Topic-area overlap: None

Notes: The Resurgent Dome is the part of the Long Valley Caldera that continues to rise as the caldera's magma chamber slowly fills. It is regionally significant for its activity and ties to the Long Valley Caldera and for the potential for another massive eruption in the distant future.

Purple: trails surveyed for this study. Red: trails suitable for this specific interpretive topic/program. Green: areas with outstanding potential for this specific interpretive topic/program. Stars: ideal points for interpretive discussion.

Outstanding Opportunities for Topic-Specific Interpretation

Cultural Features & Stories

Public lands and management
Dave McCoy
Lakes Mining District
Mammoth Pass
The Hayden Cabin
Volcanic hazards awareness
The Lost Cement Mine
The Knight Wheel

Public lands and management

Topic-area rank: #1
Uniqueness/significance: Regionally significant
Topic-area overlap: Natural (Living & Physical Earth)

Notes: The U.S. government dominates land ownership in the Mammoth Lakes area. Agencies such as the National Forest Service, National Park Service, and Bureau of Land Management manage natural resources and public access to much of the surrounding area. Furthermore, much of the water rights to the Owens River is held by the City of Los Angeles. This has created a situation where most of the land surrounding the community of Mammoth Lakes is not actually managed by the people living and working there; rather, the lands are more directly held by the public, as a whole, who comes to visit. Because so much of the land is publicly held, an exceptionally strong case for increased stewardship and cooperation can be made.

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program. **Stars:** ideal points for interpretive discussion.

While some may find this topic to be unexciting in regards to interpretation, the importance of it is indisputable and worthy of good interpretation to foster understanding of both management challenges and benefits regarding access that public ownership has created.
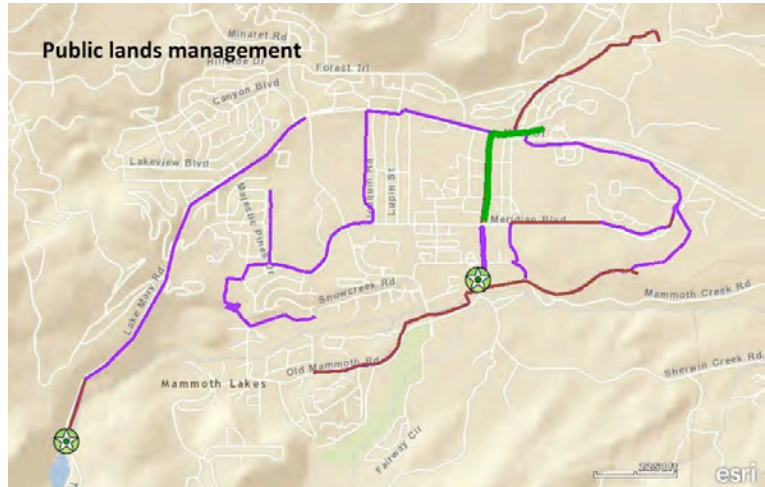
Dave McCoy

Topic-area rank: Group #2
Uniqueness/significance: Regionally unique and significant
Topic-area overlap: Recreation (Outdoor Recreation)

Notes: The story of Dave McCoy is an incredibly inspiring one—a story of dreaming, achieving, and building a community. This dream has fundamentally changed the way Mammoth Lakes looks today. While recreation was already increasing in the area prior to the building of Mammoth Mountain Ski Area, the ski resort drastically changed the seasonality, visitation, and impact of recreation on the local economy and landscape.

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Lakes Mining District

Topic-area rank: Group #2
Uniqueness/significance: Regionally significant
Topic-area overlap: Natural (Physical Earth)

Notes: The Lakes Mining District formed the nexus around which the early settlement boom occurred. Though mining efforts ultimately flailed in comparison to those at Bodie or farther north in Nevada, the mining developments set the stage and brought the initial infrastructure and investments needed to bring people in from outlying and distant areas to enjoy the area's recreational potential.
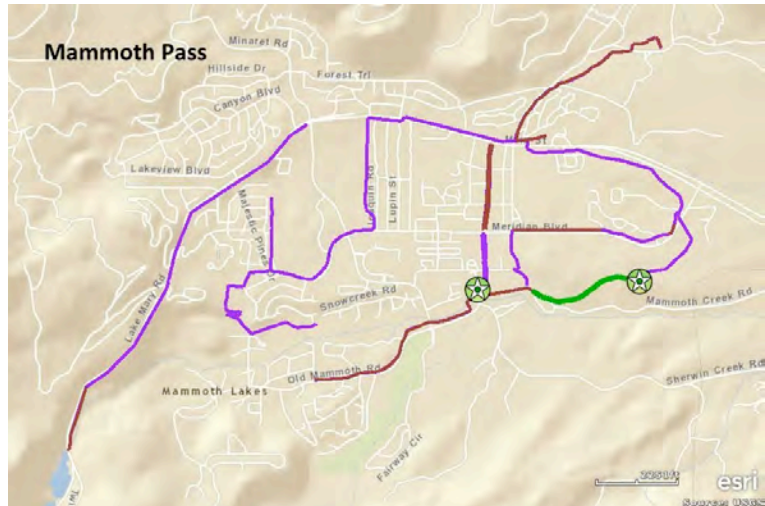

Purple: trails surveyed for this study. **Green:** areas with outstanding potential for this specific interpretive topic/program. **Stars:** ideal points for interpretive discussion.

Mammoth Pass

Topic-area rank: Group #2
Uniqueness/significance: Regionally significant
Topic-area overlap: Natural (Physical Earth)

Notes: Mammoth Pass is one of the lowest passes in the Central/Southern Sierra Nevada. Humans and animals alike have been taking advantage of this break in the jagged crest of the Sierra Nevada for millennia. Settlers also used this route over the crest to bring supplies and trade. Mammoth Pass is important for its connectivity in terms of culture and economy and in the physical and biological realms as well.

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The Hayden Cabin

Topic-area rank: Group #2
Uniqueness/significance: Regionally unique
Topic-area overlap: Recreation (Outdoor Recreation)

Notes: While the Hayden Cabin was probably not the most important structure during its day, it has become exceedingly important because it is one of the few old cabins to have survived the rough winters and exploding booms of development that characterize Mammoth Lakes. It has been well preserved and lies just across Mammoth Creek from a popular section of MUP.

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Volcanic hazards awareness

Topic-area rank: Group #2
Uniqueness/significance: Regionally significant
Topic-area overlap: Natural (Physical Earth)

Notes: The Mammoth Lakes landscape is not the only thing that has been affected by volcanic activity in the area. Volcanic unrest caused a real-estate crisis in the 1980s and poses serious threats to public safety. Like many parts of California, the people of this area have learned to plan for and live alongside the risk of renewed volcanic unrest.

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The Lost Cement Mine

Topic-area rank: Group #3
Uniqueness/significance: Regionally significant
Topic-area overlap: None

Notes: While no one ever found the legendary Lost Cement Mine, the legend alone was enough to spawn a sustained influx of people to the Mammoth Lakes area. Many of the exorbitant mineral claims in the area were never fully—or even partially, in some cases—realized, but the allure of this claim continued to draw people to the area. This feature personifies the quest for a dream and the fact that tales of utter failure and great disappointment are often not enough to keep the human spirit from enduring great pains and poverty in search of something big. Many fanciful stories surround the search for the Lost Cement Mine. These stories are particularly interesting when contrasted with the story of Dave

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McCoy's founding of Mammoth Mountain Ski Area, which was a different kind of dream—a more successful and lasting one.

The Knight Wheel

Topic-area rank: Group #3
Uniqueness/significance: Regionally significant
Topic-area overlap: None

Notes: The Knight Wheel is one of the better-preserved, elaborate, and easily accessible relics of the mining boom in Mammoth Lakes. Water power was key in those days and the design of the Knight Wheel is such that little water power would be wasted even during lower flows. While such a wheel was probably not unique during its time, it is unique today and lies alongside a paved MUP and at a site relevant to many other features and stories.

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Stars:** ideal points for interpretive discussion.

Outstanding Opportunities for Topic-Specific Interpretation

Recreation Features & Stories

High-altitude training
Camping
Fishing
Fish stocking
Mammoth Mountain Resort
Wilderness

High-altitude training

Topic-area rank: #1
Uniqueness/significance: Regionally unique
Topic-area overlap: Cultural (The Modern Community)

Notes: World-class athletes have made Mammoth Lakes their home and training grounds because the area's altitude enhances their performance. These athletes are among the world's top elite and have drawn significant attention during the last decade. As a result of this publicity, athletes of various calibers are now traveling to Mammoth Lakes to take advantage of the high altitude, pleasant climate, and inspiring scenery.
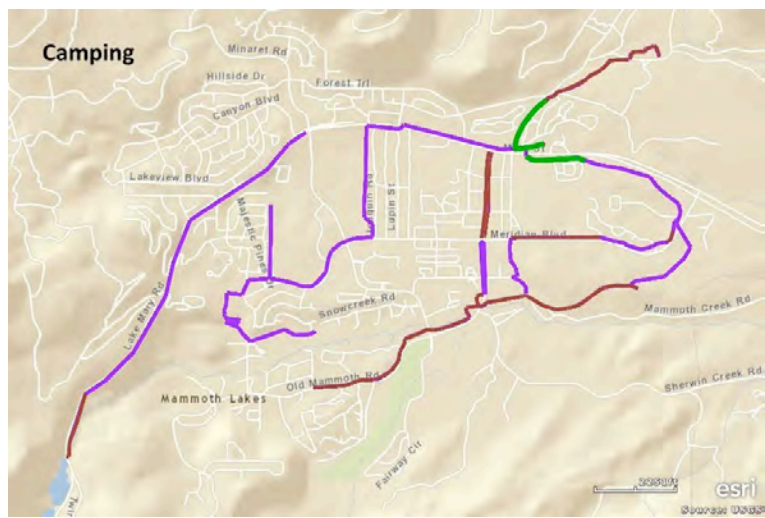

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

Camping

Topic-area rank: Group #3
Uniqueness/significance: None
Topic-area overlap: Natural (Living & Physical Earth) and Cultural (The Modern Community)

Notes: Camping is an important and famous part of the Mammoth Lakes experience for both visitors and residents.
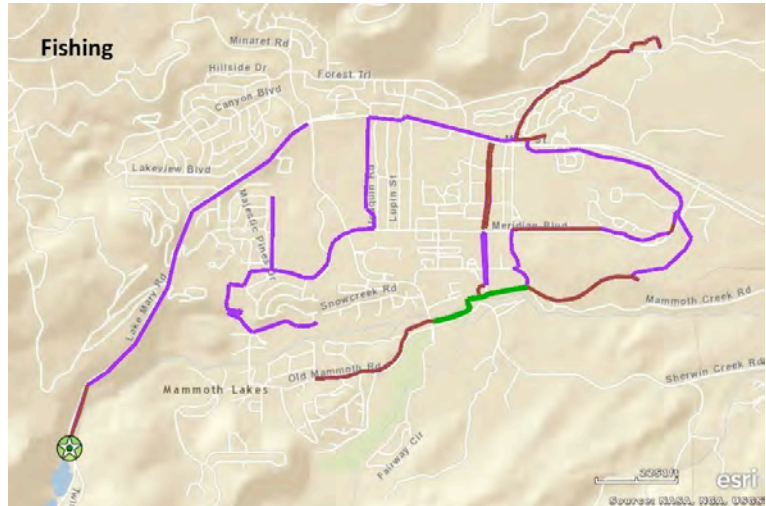

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

Fishing

Topic-area rank: Group #3
Uniqueness/significance: None
Topic-area overlap: Natural (Living Earth) and Cultural (The Modern Community)

Notes: Clear streams backdropped by the towering range of the Sierra Nevada has made Mammoth Lakes somewhat famous among anglers. Fishing is a major component of the local economy and has been a primary recreational activity for centuries.

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Fish stocking

Topic-area rank: Group #3
Uniqueness/significance: None
Topic-area overlap: Natural (Living Earth) and Cultural (Settlement History and The Modern Community

Notes: Fish stocking has been a boon for some and a bust for others. Notably, the large and numerous stocker fish satisfy the thousands of visitors who come to the area each week during the summer, while decimating native amphibian populations. The practice has deep historic roots and fish were undoubtedly brought into previously fish-free lakes almost as soon as Europeans arrived in the area. The pros and cons of fish stocking make for difficult management decisions.
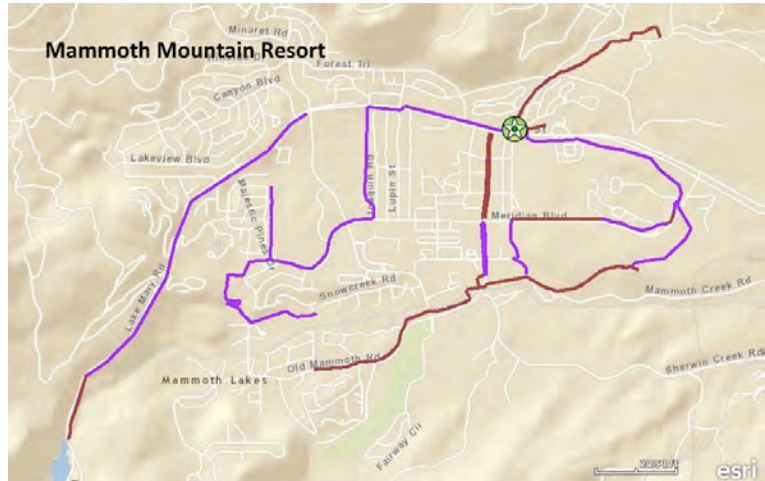

Purple: trails surveyed for this study. Red: trails suitable for this specific interpretive topic/program. Green: areas with outstanding potential for this specific interpretive topic/program. Stars: ideal points for interpretive discussion.

Mammoth Mountain Resort

Topic-area rank:	Group #3
Uniqueness/significance:	None
Topic-area overlap:	Natural (Physical Earth) and Cultural (The Modern Community)

Notes: Mammoth Mountain Resort is so deeply intertwined with the local economy and the nature of the modern recreation-based community that it can be difficult to understand the town of Mammoth Lakes without knowing about the resort. MMSA should be interpreted carefully so that such information is not misconstrued as free advertising. The history of the resort and its influence on the town makes for a compelling and worthy story.

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Wilderness

Topic-area rank:	Group #3
Uniqueness/significance:	None
Topic-area overlap:	Natural (Living & Physical Earth) and Cultural (Settlement History and The Modern Community)

Notes: The proximity and extent of wilderness in relation to Mammoth Lakes is truly remarkable. Hundreds of through-hikers pass through the area each summer, and thousands more go on day hikes or short overnight trips. However, wilderness is not just a designation; it is a concept that many consider to be the pinnacle of the American conservation movement. It is also an important part of the history of the United States, though during the early years of exploration it generally evoked more fear and consternation than the pleasure and relaxation common today.
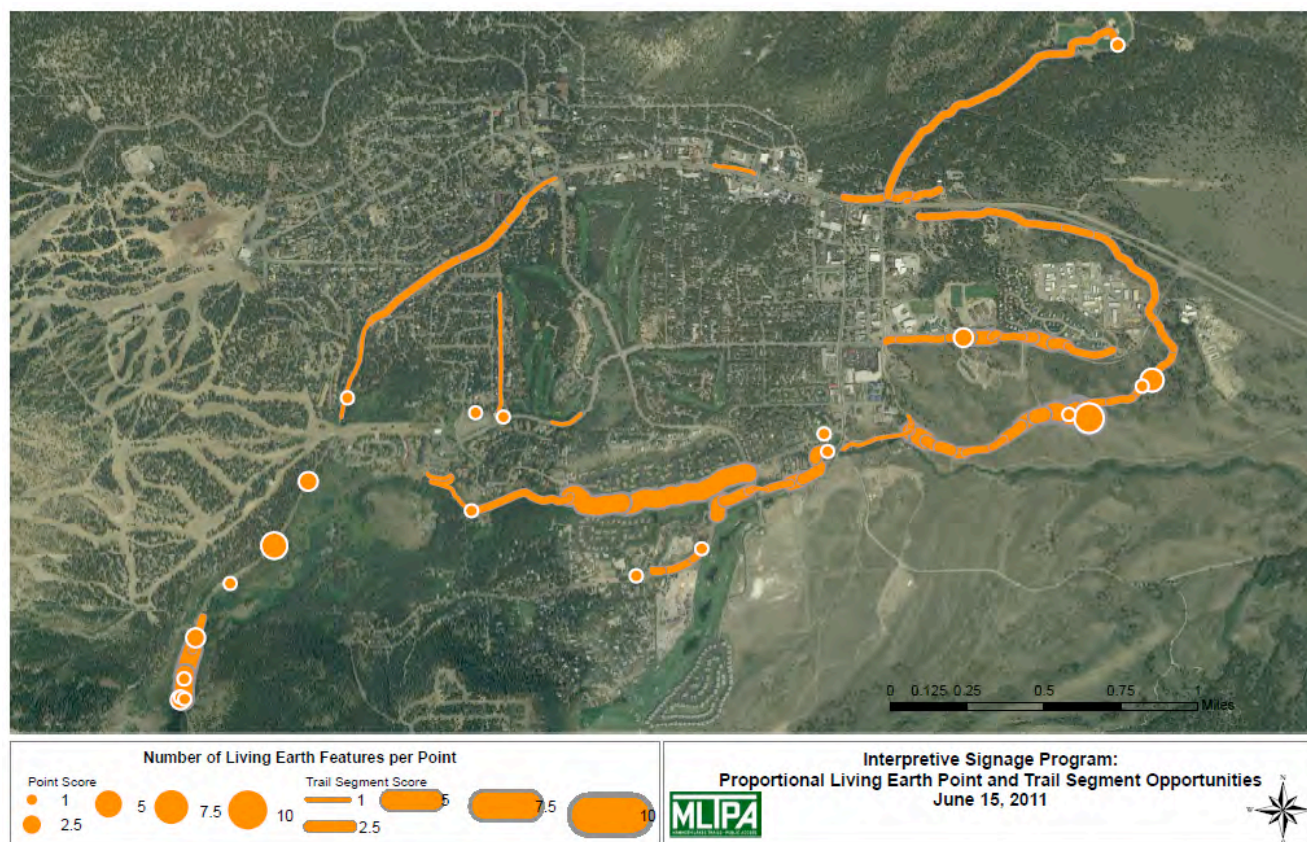

Purple: trails surveyed for this study. Red: trails suitable for this specific interpretive topic/program. Stars: ideal points for interpretive discussion.

Outstanding Opportunities for Theme Genre Interpretation

### Living Earth (Natural Features & Stories)

Map 6: Opportunities for interpretation of Living Earth features and stories. Symbology is such that the size of points and thickness of lines represents the number of topics relevant to that point or segment. Notice that Snowcreek Meadow is included in this map. While not a part of the MLTS, that area has extremely high interpretive value deserving mention.

Program #1: **Mammoth-Area Xeric Plant Walk**

This program tours the plant communities and affinities on drier slopes between town and Highway 395.

Topics: *Avian migrations, bears, Eastern Sierra biogeographic region, elevational zonation, insects, Jeffrey pine forest, lower montane forests, montane scrub, plant communities, riparian communities, sage community*
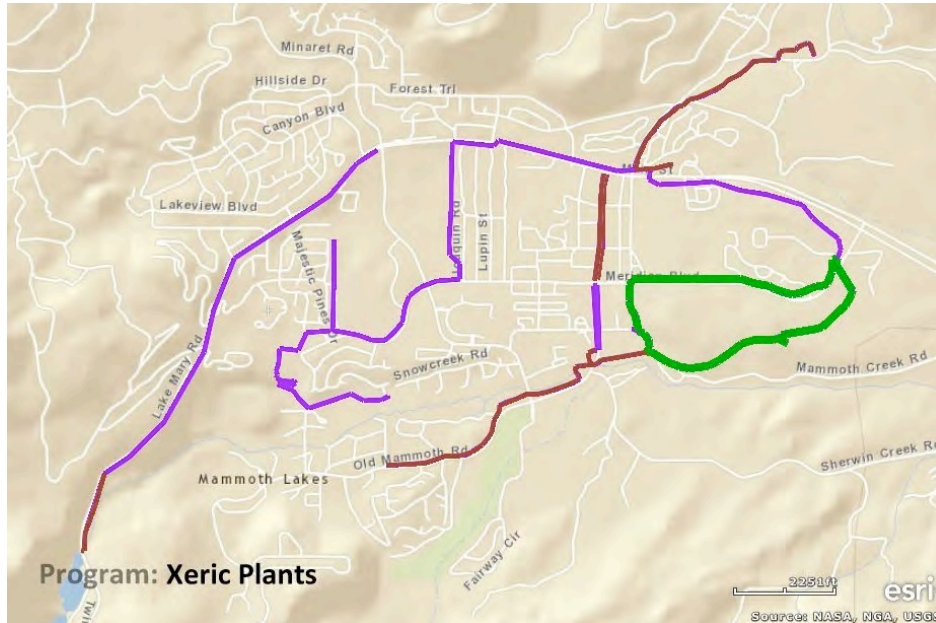
Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

Program #2: **Mammoth Forests Tour**

This program takes visitors through or within sight of the dominant forests of the area and explains how forests support other forms of life such as birds, mammals, insects, parasites, and decomposers.

Topics: *Aspen, bark beetles, bears, Clark's Nutcracker, Eastern Sierra biogeographic region, elevational zonation, Jeffrey pine forest, lower montane forest, Pandora moth cycle, parasitic and saprophytic plants, plant communities, riparian communities, subalpine forest, treeline, upper montane forest, whitebark pine forest*
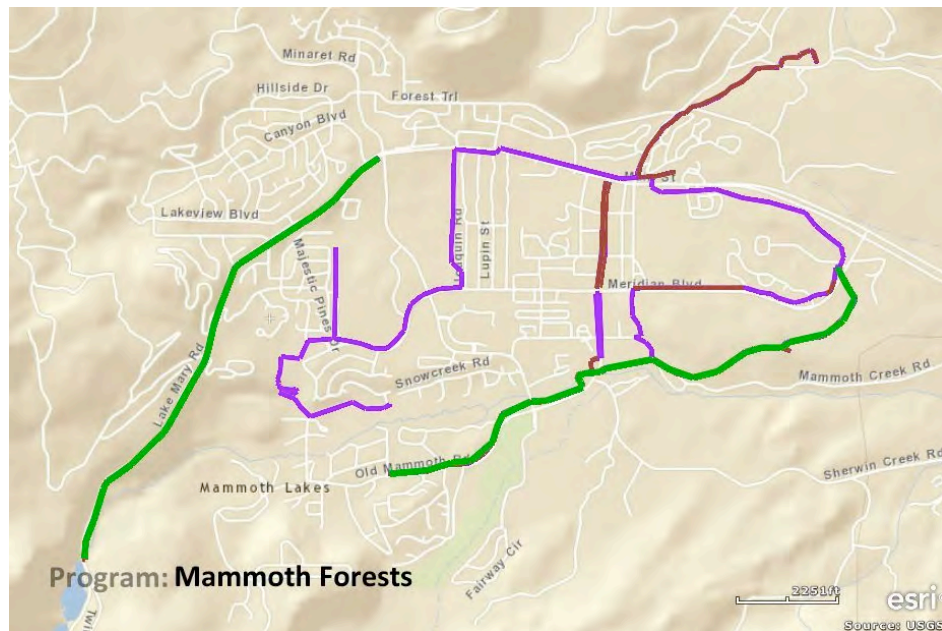

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

Program #3: **Mammoth Wildlife**

This program gives visitors a brief overview of both the commonly seen wildlife species and those that are more elusive.

Topics: *Avian migrations, bears, Clark's Nutcracker, Eastern Sierra biogeographic region, elevational zonation, fish (native and non), hibernation and torpor, mammalian migrations, pika, plant communities, riparian communities, whitebark pine forest, wildlife (general)*
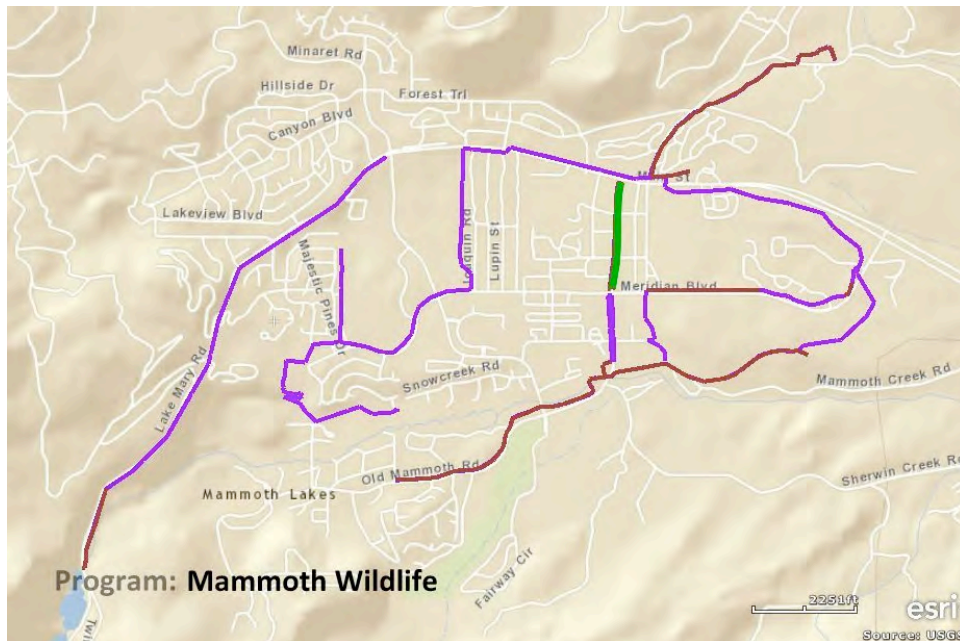

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

Outstanding Opportunities for Theme Genre Interpretation

Physical Earth (Natural Features & Stories)
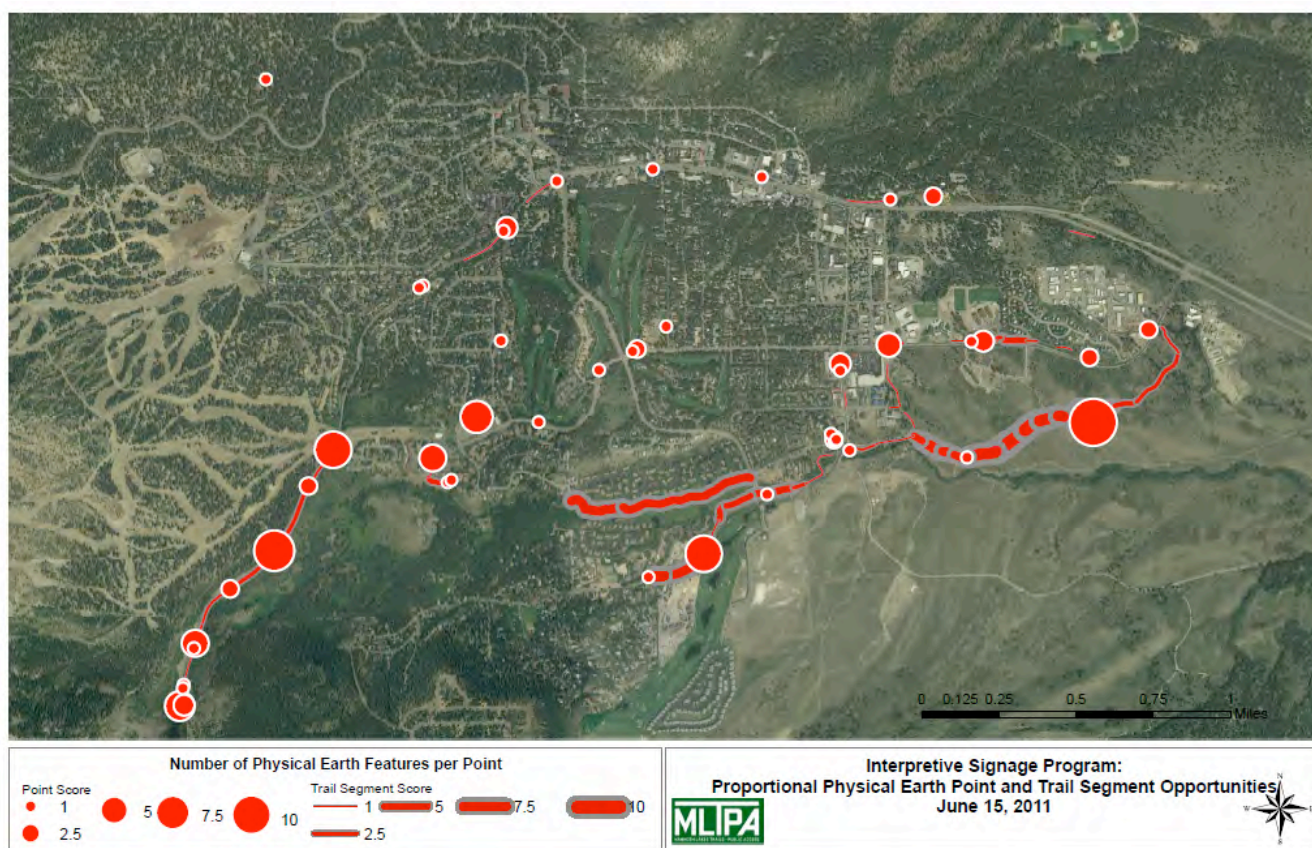
Map 7: Opportunities for interpretation of Physical Earth features and stories. Symbology is such that the size of points and thickness of lines represents the number of topics relevant to that point or segment. Notice that Snowcreek Meadow is included in this map. While not a part of the MLTS, that area has extremely high interpretive value deserving mention.

Program #4: **Blasts in the Past**

This program is a volcano-specific tour of past eruptions in the Mammoth Lakes area.

Topics: *Inyo Craters, Long Valley Caldera, Mammoth Falls, Mammoth Knolls, Mammoth Mountain, obsidian, Panorama Dome, plate tectonics, pumice, Resurgent Dome, Ritter Range roof pendant, San Joaquin River Valley, Sherwin Crest, volcanism*
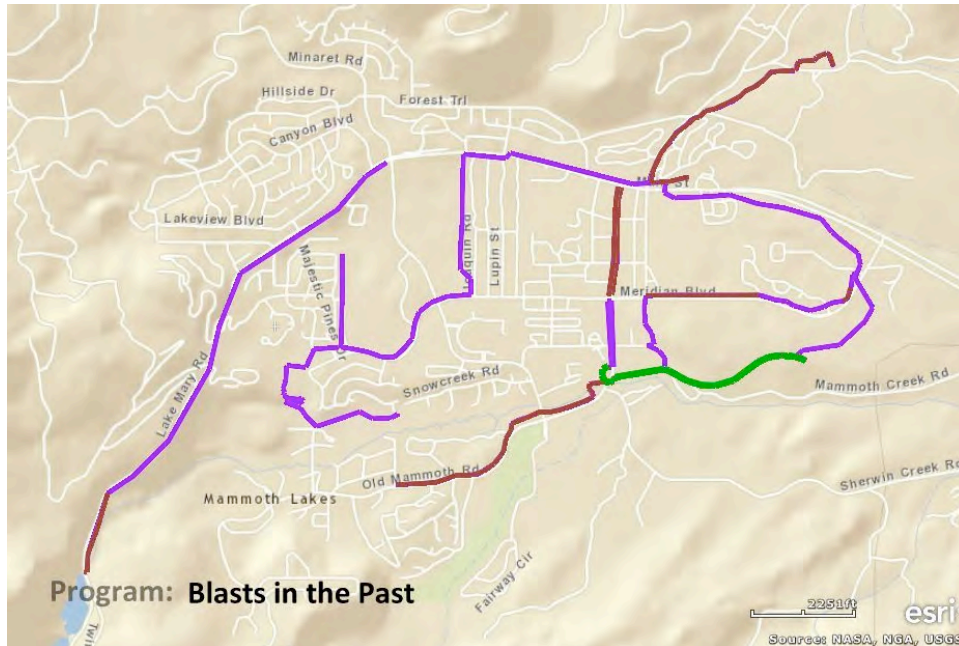
Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

Program #5: **A Land of Fire and Ice**

This program explains how the Mammoth landscape has been shaped primarily by volcanoes and glaciers during the past one million years.

Topics: *Avalanche paths, Convict Moraine, Crystal Crag, earthquakes, erosion, glacial erratics, glaciation, Glass Mountains, granite, Laurel Lakes Moraine, Long Valley Caldera, Mammoth Crest, Mammoth Falls, Mammoth Knolls, Mammoth Lakes Basin, Mammoth Mountain, Mammoth Rock, obsidian, Panorama Dome, plate tectonics, pumice, Resurgent Dome, San Joaquin River Valley, Sherwin Crest, Sierra Nevada mountains, volcanism*

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

Outstanding Opportunities for Theme Genre Interpretation

Native Culture (Cultural Features & Stories)

Not covered by this report. Consult with tribe.

Outstanding Opportunities for Theme Genre Interpretation

 Settlement History (Cultural Features & Stories)

Program #6: **The Old "Old Mammoth"**

This program provides visitors with a general overview of how the earliest communities in Mammoth came to be, who lived there, and how they all fell apart.

Topics: *Lakes Mining District, The Hayden Cabin (mining equipment is older than the cabin itself), The Knight Wheel, The Lost Cement Mine, Mammoth Camp, Mammoth City, Mammoth Mining Company, Mammoth Pass, Old Mammoth Village*
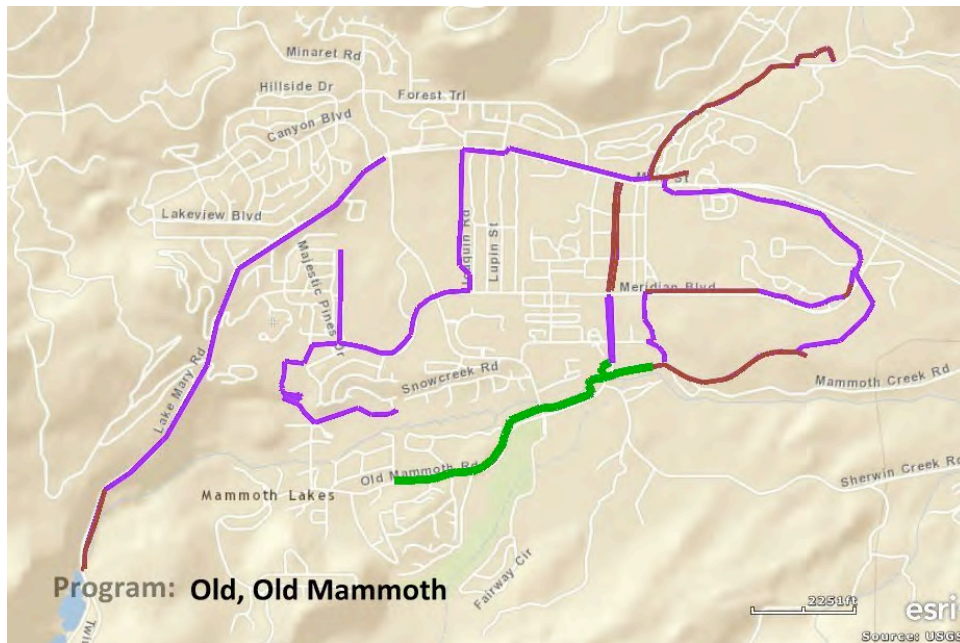
Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

Program #7: **Mining History**

This program is specific to mining history in Mammoth Lakes.

Topics: *The Knight Wheel, Lakes Mining District, Lost Cement Mine, Mammoth Camp, Mammoth City, Mammoth Mining Company, Mammoth Pass, Old Mammoth Village, The Wildasinn Hotel and Store*

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

Program #8: **Logging History**

This program is specific to logging history in Mammoth Lakes. NOTE: Admittedly, research for this report did not uncover a great deal of site-specific locations for interpreting the area's logging history. Undoubtedly, some very good locations and stories exist, but unfortunately we are able to report only on a few generic locations here.

Topics: *Lakes Mining District, logging history, Old Mammoth Village*

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

Outstanding Opportunities for Theme Genre Interpretation

The Modern Community (Cultural Features & Stories)

See "Outstanding Interdisciplinary Opportunities" *below.*

Outdoor Recreation (Recreation Features & Stories)

See "Outstanding Interdisciplinary Opportunities" *below.*

Outstanding Opportunities for Topic Area Interpretation

Natural Features & Stories

Number of Living Earth and Physical Earth Features per Point

DRAFT

Interpretive Signage Program:
Proportional Living Earth and Physical Earth Point and Trail Segment Opportunities
June 15, 2011
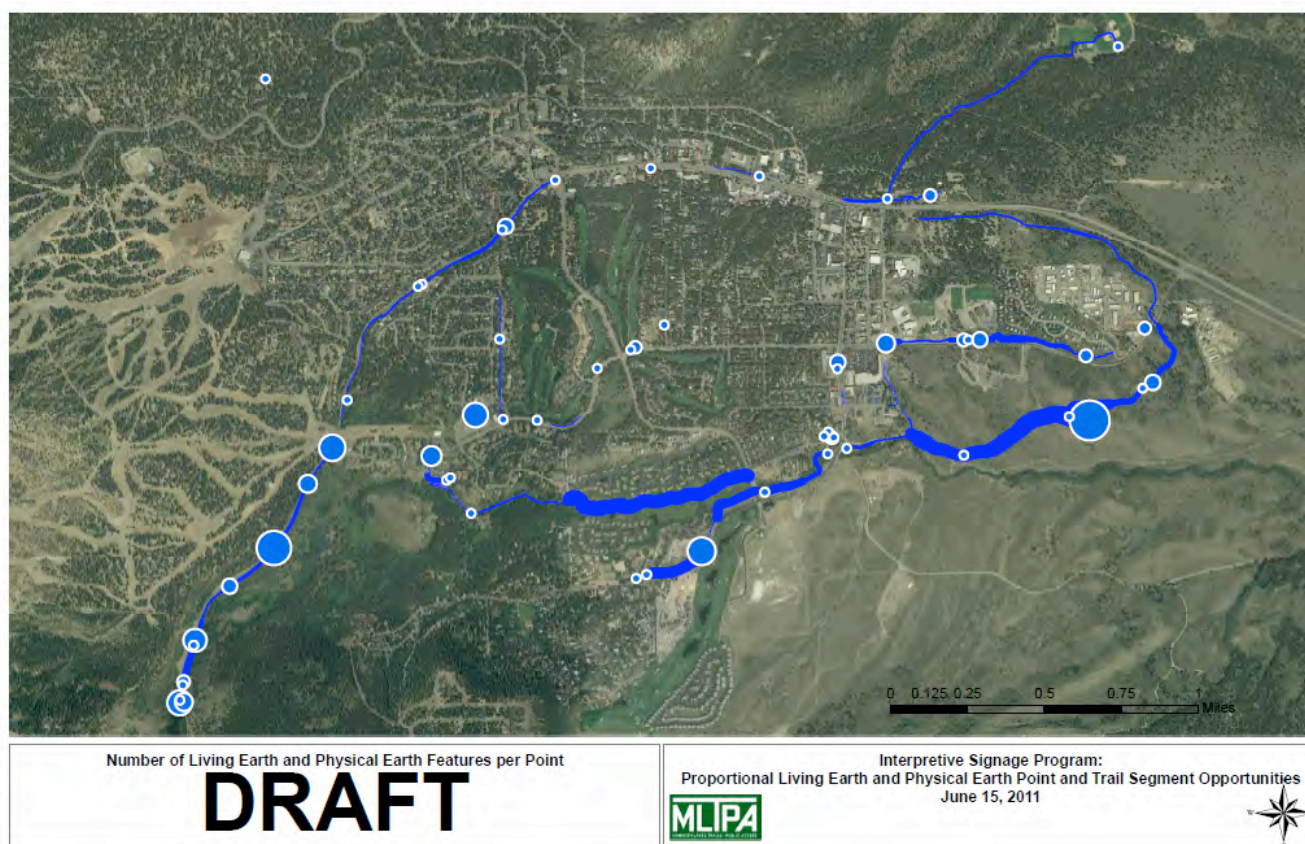
Map 8: Opportunities for interpretation of Living & Physical Earth features and stories. Symbology is such that the size of points and thickness of lines represents the number of topics relevant to that point or segment. Notice that Snowcreek Meadow is included in this map. While not a part of the MLTS, that area has extremely high interpretive value deserving mention.

Program #9: **The Fine Line Between Rain or Shine**

This is a program about the influence that mountains have in creating weather that both favors and hinders the growth of plants and animals.

Living Earth topics: *Eastern Sierra biogeographic region, elevational zonation, Jeffrey pine forest, manzanita/ceanothus, plant communities, sage community, subalpine forest, whitebark pine forest*

Physical Earth topics: *Glass Mountains, Great Basin, lenticular clouds, mountain weather, rain shadowing, Sierra Nevada mountains, springs, White Mountains*

Purple: trails surveyed for this study. Red: trails suitable for this specific interpretive topic/program. Green: areas with outstanding potential for this specific interpretive topic/program.

Outstanding Opportunities for Topic Area Interpretation

Cultural Features and Stories

Program #10: **The Ways and Means of Living in Mammoth**

This program describes what challenges people have encountered in Mammoth over time and how they managed to thrive in its extreme environment.

Settlement History topics: *Army weasels, cattle and sheep drives, Tamarack Lodge*

The Modern Community topics: *Bear management, Dave McCoy, local agriculture, Mammoth lodging history, snow removal and storage, volcanic hazards awareness, winter of 1969*

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

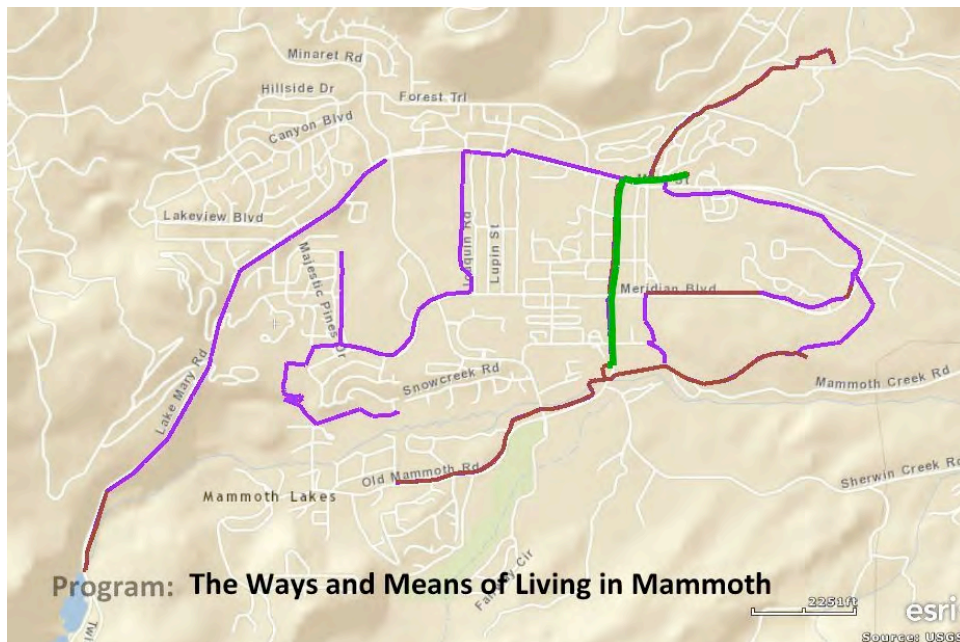*Outstanding Opportunities for Topic Area Interpretation*

 Recreational Features and Stories

Program #11: **The Greatest Outdoors**

This program highlights some of the more popular activities in the Mammoth Lakes area and how these activities bring us closer to the land, closer to each other, and closer to ourselves.

Outdoor Recreation topics: *Alpinism, camping, disabled sports, equestrian activities, fishing, mountain biking, off-road vehicle use, skiing, snowboarding, trail etiquette, wilderness*

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program. **Stars:** ideal points for interpretive discussion.

Outstanding Interdisciplinary Opportunities

These are interpretive opportunities that link and relate topic areas and theme genres. Interdisciplinary programs help reveal and teach about connections and feedback cycles in the world.

Program #12: **High-Altitude Life**

This program highlights some of the extreme beings and behaviors that have evolved at high elevations of the Sierra Nevada.

Living Earth topics: *Alpine community, avian migrations, bark beetles, Clark's Nutcracker, elevation zonation, mammalian migrations, yellow-legged frog, pika, treeline, whitebark pine forest*

Physical Earth topics: *Sierran fossils (for contrast)*

Native Culture topics: *Consult with tribe.*

Settlement History topics: *Cattle and sheep drives, Lakes Mining District*

The Modern Community topics: *Local agriculture, snow removal and storage*

Outdoor Recreation topics: H*igh-altitude training, skiing, snowboarding*

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

Program #13: **Survival Strategies**

This is a program that compares and relates how animals and humans must employ careful strategy in order to survive in the Mammoth Lakes area.

Living Earth topics: *Avian migrations, bears, fish, hibernation and torpor, insects, mammalian migrations, pandora moths, pika*

Native Culture topics: *Consult with tribe.*

Settlement History topics: *The Hayden Cabin*

The Modern Community topics: *Defensible space, earthquake preparedness, Mammoth Mountain Ski Area, snow removal and storage, volcanic hazards*

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

Program #14: **Extreme Activity**

This is a program that highlights the extreme human and geologic activity in the Mammoth Lakes area.

Living Earth topics: *Avian migrations, Clark's Nutcracker*

Physical Earth topics: *Avalanche paths, Casa Diablo Geothermal Field, earthquakes, fire, fumaroles, Hot Creek, Long Valley Caldera, Mammoth Mountain, plate tectonics, Resurgent Dome, volcanism*

Native Culture topics: *Consult with tribe.*

Settlement History topics: *Lakes Mining District, Lost Cement Mine (the search for)*

The Modern Community topics: *Bear management, earthquake preparedness, volcanic hazards and awareness, winter of 1969*

Outdoor Recreation topics: *Alpinism, disabled sports, high-altitude training, mountain biking, off-road vehicle use, skiing, snowboarding, wilderness*

Program: Extreme Activity

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

Program #15: **Epic Tales from an Epic Place**

This program highlights a few outstanding stories of people who have lived particularly noteworthy lives while in Mammoth Lakes.

Native Cultures topics: *Consult with tribe.*

Settlement History topics: *Doug Robinson, others*

The Modern Community topics: *Dave McCoy, others*

Outdoor Recreation topics: *Famous female skiers, others*

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

Program #16: **From Mining Bust to Recreation Boom-Town**

This program highlights how Mammoth Lakes went from being a failed mining boom to a successful and booming epicenter of recreation.

Settlement History topics: *Old Mammoth Village*

The Modern Community topics: *Crowley Lake, Dave McCoy, development, fish hatcheries, Main Street, Mammoth lodging history, public lands and management, second/summer home ownership, trail networks*

Outdoor Recreation topics: *Alpinism, camping, equestrian activities, fishing, fish stocking, Mammoth Lakes Trail System, Mammoth Mountain Ski Area, mountain biking, off-road vehicle use, skiing, snowboarding, wilderness*

Purple: trails surveyed for this study. **Red:** trails suitable for this specific interpretive topic/program. **Green:** areas with outstanding potential for this specific interpretive topic/program.

8 Recommendations

Several of the chapters above contain specific recommendations. Here we make recommendations for the development of a small but comprehensive interpretive program that can grow over time. The seed for this program is the installation of a few (three to five) waysides at various locations around the trail system. The waysides are meant to interpret, but also to present visitors and trail users with QR codes and/or phone numbers for accessing high-tech content.

While the goal is to create exciting high-tech interpretive content, we believe that this content must be introduced using more traditional trailside forms.

1. Form a cooperative multi-agency panel to ***create or agree upon existing themes*** that will be targeted along the MLTS. This panel should contain members knowledgeable about the area and experienced in field-based interpretation.

2. ***Hire a project manager*** to coordinate the development of the program.

3. To start, ***plan several small interpretation projects*** devoted to *one* of the themes identified. Do not leave out any of the agreed-upon themes. Each theme should be represented by one project (e.g., a wayside).

4. ***Create one interdisciplinary program*** that incorporates and utilizes all of the theme-specific projects (above). This is a program, not a project. It will use and link all of the panel content.

5. ***Identify high-use locations*** where these projects could be implemented. Try to identify locations where the high-ranking features and stories overlap with high visitor use.

6. ***Select suitable low-tech media,*** probably a type of wayside, that can be built. This should be a physical, tangible object that trail users will see along the trail or at the start of the trail.

7. ***Decide what kind(s) of high-tech media can be used*** to enhance the content of that low-tech media. Can QR codes and/or a cell-phone tour be implemented there? If not, what are the other options for signage location in order to utilize enhanced high-tech media?

8. After themes, locations, and media (in that order) have been agreed upon, ***select the most compelling or important features and stories*** that should be interpreted there. High-ranking features should probably be prioritized and interpreted on low-tech signage. High-tech media can be used to interpret all the other features and stories.

9. ***Identify local experts for the subject matter.*** Identify all of the compelling and interesting stories for individual features and stories.

10. ***Identify local experts in interpretation.*** Allow them to use the art of interpretation to tie local expert knowledge to interpretive concepts that help visitors make *emotional,* as well as intellectual, connections using tangible, intangible, and universal concepts.

11. ***Identify local artists*** who can create graphics that are attractive and effective in communicating the facts and feel supporting the theme.

12. ***Fabricate physical signage*** in a way that complements (not dominates) the landscape and scene.

13. ***Tie signage to high-tech media*** that enhances content and interacts with the user.

14. ***Build off of the physical signage infrastructure*** by adding additional high-tech, low-cost opportunities interpreting related topics and features nearby. Let the signage be the physical nexus to ever-expanding opportunities (cell-phone tours, smartphone tours, guided walks, roves).

15. ***Advertise, advertise, advertise.*** The public won't use it if they don't know it is there.

Many great interpretive opportunities exist along the MLTS. For the benefit of the local community, the visiting public, and the managers who seek to meet the needs of everyone, the MLTS should seek to provide a healthy balance of high-tech, low-tech, cultural, natural, and recreational interpretation.

When talking about interpretation, we often refer to *the* visitor or *the* user. The benefits of interpretation, however, go beyond that of the individual. Well-rounded interpretation teaches us to understand each other and the world that surrounds us. Through better understanding we often avoid conflict and find better ways to live—be it with bears, forest fires, or neighbors.

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