

DEVELOPING PUBLIC ACCESS RESOURCE ASSESSMENTS AND PLANS AT TEJON RANCH, CALIFORNIA

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A Group Project submitted in partial satisfaction of the requirements for the degree
of Master's in Environmental Science and Management for the
Bren School of Environmental Science & Management

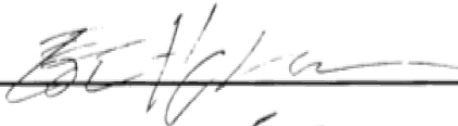


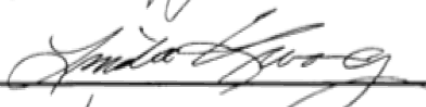
March 2013

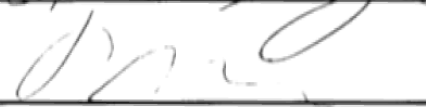


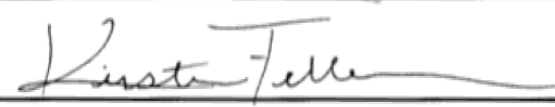
Developing public access resource assessments and plans at Tejon Ranch, California

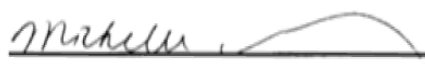
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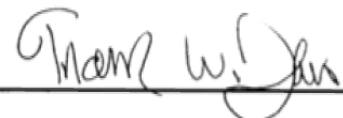

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The mission of the Bren School of Environmental Science & Management is to produce professionals with unrivaled training in environmental science and management who will devote their unique skills to the diagnosis, assessment, mitigation, prevention, and remedy of the environmental problems of today and the future. A guiding principal of the School is that the analysis of environmental problems requires quantitative training in more than one discipline and an awareness of the physical, biological, social, political, and economic consequences that arise from scientific or technological decisions.

The Group Project is required of all students in the Master of Environmental Science and Management (MESM) Program. The project is a three-quarter activity in which small groups of students conduct focused, interdisciplinary research on the scientific, management, and policy dimensions of a specific environmental issue. This Group Project Final Report is authored by MESM students and has been reviewed and approved by:


Frank Davis, Ph.D.
March 2013

March 2013

Acknowledgements

We would like to thank everyone who provided their assistance and support throughout this project.

We are especially appreciative for the Bren School of Environmental Science & Management, particularly: Frank Davis (Faculty Advisor), James Frew (Professor), Tom Dunne (Professor), Sarah Anderson (Assistant Professor), John Jostes (Visiting Faculty), Michael Henderson (Visiting Faculty), Michael O'Connell (Visiting Faculty), Eric Fournier (PhD candidate), Oliver Soong (PhD candidate), Amy Burgard (Group Project Coordinator), Jeff Kubran (MESM 2013), Justin Lichter (MESM 2013).

We would also like to thank our client, the Tejon Ranch Conservancy, especially: Scot Pipkin (Public Access Coordinator), Tom Maloney (Executive Director), Michael White (Conservation Science Director).

Finally, we would like to thank our family and friends for their continued support and encouragement throughout this process.

Abstract

At 270,000 acres, Tejon Ranch is the largest private contiguous landholding in California. The Ranch spans four ecological regions—Mojave Desert, Coastal Range, Central Valley, and Sierra Nevada. It is habitat for the endangered California condor and is home to many other rare, threatened, and interesting flora and fauna. In 2008, the Tejon Ranch Company (TRC) and five environmental organizations signed the Tejon Ranch Conservation and Land Use Agreement, creating the Tejon Ranch Conservancy and conserving in perpetuity 240,000 acres of the Ranch. Enjoyment of the Ranch by the public is a high priority for TRC and the five environmental organizations. The Agreement mandates that a Public Access Plan be included in the Ranch-Wide Management Plan, which is due June 2013. While guided public access is currently implemented, the long-term goal of the Conservancy and TRC is to expand its program and activities, especially regarding community education and opportunities for underserved populations. No previous extensive analysis has examined current public access activities on the Ranch or opportunities for future expansion. Our research helps fill this gap by: 1) understanding the Ranch's public access niche by looking at public access in surrounding areas; 2) gauging visitor experience through an online survey; and 3) evaluating resource opportunities and constraints for management using geospatial analysis and by developing a tool for the Conservancy to assess impacts. Our findings provide the basis for several recommendations for planning, management, and expansion of public access on Tejon Ranch.

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List of Abbreviations

Agreement = Ranch-Wide Agreement

AM = Adaptive Management

BBM = Benefits-Based Management

BMP = Best Management Practice

BMPs = Best Management Practices

CNPS = California Native Plant Society

Conservation Easement Areas = areas on the Ranch with conservation easements on the land

Conserved Lands = all Conservation Easement Areas (including those areas that the Conservancy does not currently have an easement on)

CWHR = California Wildlife Habitat Relationship

GIC = Grapevine Industrial Complex

GIS = Geographic Information System

inholdings = properties within Ranch boundaries owned by third parties

IRC = Irvine Ranch Conservancy

LAC = Limits of Acceptable Change

NAFHA = North American Field Herping Association

NPS = National Park Service

NVUMP = National Visitor Use Monitoring Program

Parties = the parties to the RWA: TRC, the Resource Organizations, the Conservancy

PCT = Pacific Crest Trail

PCTA = Pacific Crest Trail Association

Resource Organizations = Audubon Society, Sierra Club, Endangered Habitats League, Planning and Conservation League, Natural Resources Defense Council

ROS = Recreation Opportunity Spectrum

RWA = Ranch-Wide Agreement

RWMP = Ranch-wide Management Plan

SRF = Sustainable Recreation Framework

Tejon = Tejon Ranch

the Board = Tejon Ranch Conservancy's Board of Directors

the Conservancy = Tejon Ranch Conservancy

the Ranch = Tejon Ranch

TMV = Tejon Mountain Village

TOMM = Tourism Optimisation Management Model

TRC = Tejon Ranch Company

TUMSHCP = Tehachapi Uplands Multiple Species Habitat Conservation Plan

USDA = United States Department of Agriculture

USFS = United States Forest Service

USFWS = United States Fish & Wildlife Service

USLE = Universal Soil Loss Equation

VAMP = Visitor Activity Management Process

VERP = Visitor Impact and Resource Protection

VIM = Visitor Impact Management

Executive Summary

At 270,000 acres, Tejon Ranch is the largest contiguous private landholding in California. The Ranch spans four ecoregions—Mojave Desert, Coastal Range, Central Valley, and Sierra Nevada—and is home to many interesting flora and fauna, some of which are rare, threatened, or endangered. Recognizing the conservation value of the Ranch, five environmental organizations (Sierra Club, National Audubon Society, Natural Resources Defense Council, Endangered Habitats League, and Planning and Conservation League) entered into the landmark Tejon Ranch Conservation and Land Use Agreement (RWA) with the Tejon Ranch Company (TRC) in 2008. The RWA conserved 240,000 acres of the Ranch in perpetuity in exchange for developing 30,000 acres and it created the Tejon Ranch Conservancy (the Conservancy).

For public enjoyment of the Ranch, the RWA mandates that TRC and the Conservancy develop a Public Access Plan as part of the Ranch-Wide Management Plan, which is to be updated every five years. The first iteration of this plan is due in June 2013. Since 2008, the Conservancy and TRC have made considerable progress towards providing significant public access on the Ranch. Activities offered include guided hikes, vehicle tours, and citizen science events as well as special events with youth groups and other organizations. The Conservancy's long-term goal is to expand its program and activities, especially regarding community education and opportunities for underserved populations.

TRC retains several historical uses and reserved rights on the Ranch, including farming, cattle grazing, hunting, filming, and limited resource extraction. Additionally, there are several private properties within the Ranch that are owned by other parties. To avoid conflicts with these uses and property owners, TRC primarily allows guided access on the Ranch, and this restriction is unlikely to change in the near future. The Tehachapi Uplands Multiple Species Habitat Conservation Plan (TUMSHCP), which was developed to mitigate habitat loss from the development of Tejon Mountain Village, places additional restrictions on recreation.

Our overall objective for this project is to support the Conservancy in preparing a Public Access Plan that aligns with their mission of conservation and functions within the constraints of the RWA. We developed the following objectives to support this overall objective:

- I. Assess public access opportunities and their implications for Tejon Ranch.
- II. Survey past visitors to determine demand for future activities.
- III. Develop analytical tools to help the Conservancy plan public access programs and possible complementary infrastructure. Create maps to examine public access opportunities and resource constraints.
- IV. Provide an adaptive management framework for managing public access and resource impacts.

Because public access serves a broad array of stakeholders, it is imperative to understand who those stakeholders are and how to best align their interests. We surveyed the Conservancy's Board of Directors to understand the motivations behind the provision of public access in the RWA. We found they want the public to enjoy the Ranch and experience meaningful activities. The Board members also generally identified underserved communities as those who lack access to nature. We further refined this definition to mean Hispanic communities, adolescent youth, and low-income households by comparing regional National Forest visitors to census data. We also surveyed past visitors to understand what their experience was like on the Ranch and what they want to see in the future. Many respondents expressed interest in an interpretive trail and noted they enjoyed their visit to the Ranch, in part due to the excellent Conservancy staff and guides. Many also commented that more detailed information should be provided on specific public access activities.

National Forests, state parks, preserves, and reserves surround the Ranch, which makes it important to identify the unique public access opportunities Tejon Ranch can provide. We analyzed activities and landscape characteristics of 25 surrounding open space areas to better understand public access opportunities in the region and found hiking is the most commonly offered activity. We also found National Forest visitors tend to visit areas more for the activity than for the location. Therefore, the Conservancy should highlight the unique attributes and activities of the Ranch to attract visitors. With abundant open space in the region, visitors seeking activities potentially incompatible with the Ranch have ample opportunities elsewhere.

Private working ranches are not common in the region, so we broadened our search to see what other private working ranches in California and the nation offer for public access and what issues they encounter. Within California, only 5 out of 74 land trusts were discovered to offer public access on lands comparable to the Ranch. Our examination of other private lands thus highlighted the uniqueness of public

access on Tejon Ranch's working landscape. Major issues encountered on both private and regional lands include vandalism, graffiti, litter, trespassing, and unauthorized trail use.

Several geospatial elements are relevant to public access and useful when planning activities in different locations of the Ranch. These considerations can be analyzed in a geospatial site analysis tool we created for the Conservancy. The Conservancy inputs a route or an area. The tool analyzes the input against seven attributes in a model and produces an output summarizing them. The *Information* outputs (travel time and elevation profile) help communicate the duration and difficulty of an activity. The *Opportunities* outputs (viewsheds and vegetation diversity) help identify features that can enhance visitor experience. Finally, the *Constraints* outputs (erosion potential, potential suitable habitats, and fire risk) help identify possible negative environmental impacts resulting from the activity. With the enormous size of the Ranch, the Conservancy can use this tool to help narrow down appropriate locations for activities. This tool serves as a starting point for evaluating potential areas and routes, but ground-truthing specific sites will be needed as the planning process proceeds and before decisions and actions are made.

We applied our analysis to three case studies to show how our research, model, and recommendations can be used to plan for specific access sites and activities on the Ranch. The case studies include:

- 1) A 17-mile segment of the proposed realignment of the Pacific Crest Trail (PCT)
- 2) A loop-trail near 290th St. in Antelope Valley
- 3) A loop-trail at White Wolf

As the 30,000 acres of development that catalyzed the RWA are built, we expect drastic changes to occur for public access, particularly with Centennial. While it is difficult to anticipate specific changes, we identified a few potential issues based on the insights we gained from our research. These issues are likely to reflect those that are encountered by regional open-space areas with increased urbanization, such as littering, dumping, vandalism, trespassing, and resource degradation.

We developed an Adaptive Management (AM) framework for managing public access on the Ranch to help balance the Conservancy's mission of conserving biodiversity and ecosystem values, while providing the public with opportunities to experience and learn about the Ranch. Several key steps are needed to establish this

AM framework. Goals and objectives for the public access program must first be developed and put in context of baseline conditions on the Ranch. The Conservancy must also be aware of uncertainties and indicators associated with public access, such as recreational impacts, visitor satisfaction, and impacts of potentially increased visitation. Consistent and thorough monitoring informs the manager of the effectiveness of implemented actions, their associated impacts, and any changes that may be necessary. Our AM framework is comparable to those used for ecological systems. However, AM for public access differs by considering the management of users in addition to the landscape. To illustrate this, we included a case study in AM for public access that focuses on using docents to adaptively manage the 290th loop-trail from our site analysis case study. Recommendations include using docents to monitor trail, sign, and vegetation conditions, as well as to distribute a survey to future Ranch visitors.

The key recommendations from our research are:

- 1) Offer activities that speak to the unique resources of Tejon Ranch to attract visitors and leave them with a meaningful impact (e.g. a guided tour). Visitors should want to experience Tejon Ranch rather than participating in activities they think they can do anywhere.
- 2) Assessment of environmental and resource impacts are important in the planning process for balancing public access with forwarding the Conservancy's mission of conservation. Our site analysis tool can be used as a starting point for this assessment, but ground-truthing is necessary.
- 3) Provide more detailed information on public access on the Ranch, particularly with regards to specific activities, to clearly set visitor expectations and educate them about the activities.
- 4) While the majority of public access activities are guided, there is a demand and an opportunity for offering self-guided interpretive activities. With sufficient monitoring, self-guided interpretive activities can be implemented in low impact areas to satisfy visitors who want to see the Ranch at their own pace. Docents provide an opportunity for adaptively monitoring and managing the self-guided interpretive activities.
- 5) Implement adaptive management for both environmental impacts and visitor satisfaction. Utilize visitors and docents to help monitor and respond to issues, such as vandalism, littering, and off-trail use.

Recommendations

Our recommendations are broad and target many areas of public access planning, management, and programming that the Conservancy may consider now or in the future. Above all, we recommend the Conservancy maintain its high quality staffing and continue to understand and learn about the vast landscape of Tejon Ranch. For the latter, we have provided the Conservancy with a tool to help them gain information about specific sites on the Ranch.

The following is a list of our recommendations that we conclude the Conservancy should follow in planning public access:

- **Limit soil erosion that may be exacerbated by public access activities through the implementation of best management practices (BMPs).** This may include: reducing road traffic and road grading, retaining vegetation on applicable roads, using erosion control features such as water bars, and considering the mode of travel.
- **Reduce impact to wildlife, especially sensitive, threatened, and endangered species.** This may include: rotating activity areas so that one area is not excessively visited and heavily impacted, educating visitors on the importance of picking up garbage and microtrash, and following the TUMSHCP requirements for raptor nests.
- **Reduce human caused fires and possible fire risks.** This may include: carefully defined fire policies and monitoring for visitor compliance, implementing fire breaks near structures, and following Kern County and Forest Service fire notices.
- **Improve communication of activities to clearly set visitor expectations.** This may include: clearly communicating length and difficulty of an activity and providing detailed descriptions of what visitors will see and experience.
- **Implement an adaptive management approach for public access.** This may include: using an active adaptive management approach to manage both ecological impacts and visitor satisfaction, using indicators to monitor potential impacts, focusing on uncertainties of impacts or conditions, and continually

adjusting management approaches in response to indicators and greater certainty.

- **Emphasize the unique aspects of the Ranch and diversify and enhance outreach.** This may include: emphasizing the size, location, history, and biodiversity along with the free guided tours, emphasizing different opportunities such as citizen science, restoration, and education, providing information about nearby lodging, and providing multilingual information through handouts, brochures, and online material.
- **Expand and diversify the hiking activities offered.** This may include: implementing interpretive tours or trails that focus on history, science, or the Ranch as a working cattle ranch, and utilizing docents to offer hikes of varying length from one hour to a full day.
- **Consider building and improving public access infrastructure.** This may include: continuing to plan the future visitor center, placing bathrooms near access points or staging areas, implementing interpretive signs around the future visitor center or a designated trail, constructing picnic tables at choice areas, and allowing overnight camping at access points.

For detailed explanations of and support for these recommendations, refer to the specific chapters of interest in the report.

Chapter 1: Introduction

Tejon Ranch Overview

Tejon Ranch (the Ranch) occupies the western Tehachapi Mountains about one and a half hours north of Los Angeles (Figure 1-1). The Ranch is California's largest contiguous private landholding, spanning 270,000 acres and encompassing four major ecological regions—the Sierra Nevada, Mojave Desert, Coastal Range, and San Joaquin Valley (Appendix A: Location and Ecoregions of Tejon Ranch). In 2008, the owner of the Ranch, Tejon Ranch Company (TRC), and five environmental non-profit organizations—Sierra Club, Audubon California, Natural Resources Defense Council, Endangered Habitats League, and Planning and Conservation League (Resource Organizations)—signed the Tejon Ranch Conservation and Land Use Agreement, otherwise known as the Ranch-Wide Agreement (RWA). The RWA set aside 240,000 acres of the Ranch for conservation (Conserved Lands) in exchange for developing 30,000 acres and established the Tejon Ranch Conservancy (the Conservancy).



Figure 1-1 Location Map for Tejon Ranch.

The Conservancy was created to work with TRC to manage and hold the easements on the Conserved Lands. TRC and the Resource Organizations appointed the Board of Directors (the Board) for the Conservancy, which manages the business and affairs of the Conservancy and may exercise powers set forth in the RWA. The Conservancy's mission, as written in the RWA, is "to preserve, enhance, and restore the native biodiversity and ecosystem values of Tejon Ranch and the Tehachapi Range for the benefit of California's future generations" (RWA, 2008).

A high priority of the Resource Organizations, TRC and the Conservancy is to allow the public to enjoy the "natural communities and habitats [that] are pristine and include diverse flora and fauna, scenic resources, and important cultural and historical resources" on the Conserved Lands (RWA, 2008). The RWA also mandates the Conservancy and TRC to prepare a Ranch-Wide Management Plan (RWMP) that includes a Public Access Plan by June 2013. The Conservancy and TRC together drafted the Interim Ranch-Wide Management Plan and Interim Public Access Plan in 2009.

Since the RWA was signed, the Conservancy and TRC have made significant progress developing well-managed public access on the Ranch. The Conservancy is currently implementing a public access program that includes community hikes, resource group hikes, citizen science activities, school field trips, and other special events (Chapter 3: Current Public Access at Tejon Ranch). The long-term goal of the Conservancy and TRC is to expand these opportunities through a public access plan and to provide more community education programs and opportunities for underserved populations.

Restrictions of Public Access on Tejon Ranch

Guided Access and the TUMSHCP

The Conservancy's Public Access Plan will focus on public access on the Ranch within the next five years (2013-2018). Our report mainly explores activities and programs that the Conservancy can likely implement within this timeframe. However, we also examine medium and long-term activities and programs that are currently planned, such as the Pacific Crest Trail (PCT), and other considerations that may affect public access into the future. We must also consider all restrictions and constraints that can impact a public access plan in order to make realistic recommendations. For example, the majority of current public access activities are guided. The Conservancy and TRC are planning to incrementally develop the public access program in order to

understand and evaluate impacts of recreation on the Ranch through a controlled setting. Therefore, access will remain primarily guided until changed by the Board.

Another public access restriction on the Ranch is the Tehachapi Uplands Multiple Species Habitat Conservation Plan (TUMSHCP). The TUMSHCP provides the conservation and management of 27 species and their habitats, including the federally endangered California condor (*Gymnogyps californianus*). The U.S. Fish and Wildlife Service (USFWS) must approve recreation activities, trail development, and other infrastructure expansion on land designated in the TUMSHCP (Appendix A: TUMSHCP Covered Lands). The TUMSHCP and the challenges surrounding unguided access over most or all of the Ranch are important considerations regarding public access. These terms guide our logic for many of our recommendations.

Historic Uses and Reserved Rights

Tejon Ranch has a long history of cattle ranching and farming. Native Americans are thought to have cultivated the land before the arrival of Europeans. European settlement brought cattle and sheep ranching. By the 1890s, orange and fig orchards, as well as vineyards, were planted. Today, leased cattle grazing occurs on 250,000 acres and agriculture uses another 6,000 acres (Tejon Ranch Company, n.d.a, n.d.b). Farming and ranching, as well as other activities—hunting and limited cement and oil production, mining, filming, and private recreational use—are “Designated Uses” and “Reserved Rights” for TRC as stated in the RWA (2008). TRC’s Reserved Rights will play a significant role in the development of a public access plan. For example, hunting takes place on much of the Ranch, and conflicts between hunters and passive recreationists is undesirable for both TRC and the Conservancy. Thus, the Ranch’s economic pursuits must be considered and balanced with the land’s recreational and scenic value for the public.

Development Areas and Proposed Developments

TRC has planned three developments for the Ranch (Appendix A: Proposed Developments on Tejon Ranch). The Grapevine Industrial Complex (GIC) lies near Interstate 5 in the San Joaquin Valley. Tejon Mountain Village (TMV) is a planned low-density community in the Tehachapi Mountains in Kern County, and Centennial is a planned city of 60,000-70,000 people in the Antelope Valley portion of the Ranch in Los Angeles County. Development is underway at GIC, and Kern County recently approved the Environmental Impact Statement for TMV. L.A. County has not yet permitted development of Centennial.

We do not consider public access within the development areas. The RWA does, however, allow for access within Bear Trap Canyon in the TMV development area (RWA, 2008). Access to Bear Trap Canyon by the general public will remain guided and the Conservancy, TRC, and the Project Sponsor for TMV will develop “specific policies and procedures governing such access” (RWA, 2008, Section 3.11(c)). Therefore, we do not consider or make recommendations for public access at Bear Trap Canyon. We do, however, consider future impacts of the three developments on the surrounding Conserved Lands and have described these considerations in Chapter 8: Future Considerations.

Project Significance

Extensive natural areas provide people with a sense of “solitude,” “remoteness,” and a “connection to nature”—values sought by those who enjoy outdoor recreation and interacting with nature (USFS, 2005a; USFS, 2005b; BLM, 2010; BLM, 2008). As California’s population continues to grow, demand for outdoor recreation in natural areas is increasing (BLM, 2008). More people tend to opt for local vacations due to high fuel costs in the US, while international visitors are increasing due to stronger marketing and a “weakened [US] dollar” (BLM, 2008). These factors contribute to the growing trend of sustainable tourism—a sector of the tourism industry where tourists interact with nature through experiential learning (BLM, 2008). With increasing demand on open space land, public access should strive to balance providing access opportunities with protecting natural and cultural resources (USFS, 2005a; USFS, 2005b; BLM, 2010). Additionally, both public and private open-space organizations are looking to build stronger connections and support through partnerships with local communities (BLM, 2008; USFS 2010; USFS, 2005a; USFS, 2005b).

Preserving Tejon Ranch for “the benefit of California’s future generations” (RWA, 2008) means protecting natural and cultural resources while allowing for enjoyment of those resources through public access. To do this, the Conservancy needs a platform and framework on which they can develop a well-managed public access program. No previous extensive analysis has examined the Ranch’s current public access activities or its opportunities for future expansion. In our research, we aim to fill this gap by understanding current public access on the Ranch and the regional and private lands context, gauging visitor experience, considering resource constraints, and making recommendations for continued expansion and management of public access.

Different forms of public access resonate differently with various recreationists and each has a unique combination of associated environmental, social, and economic impacts. For example, trails can negatively affect the surrounding natural ecosystems through increased human foot traffic and effects on wildlife behavior, risk of introducing new exotic pest species, habitat fragmentation, erosion acceleration, and edge effects (Olive & Marion, 2009; Ripple & Larson, 2000; Ripple & Beschta, 2006; Treves & Karanth, 2003; Whittaker & Knight, 1998). An activity can also vary in impact level depending on how the activity is managed. This might include using best management practices (BMPs), adaptive management (AM), or other approaches. Tejon Ranch is a biodiversity hotspot and home to rare, threatened, and endangered species. Understanding the implications of current and expanded public access on the Ranch's natural resources is thus an important component of preparing the RWMP and developing a well-managed public access program.

Development of TMV and Centennial (Appendix A: Proposed Developments on Tejon Ranch) will greatly increase the level of human activity on the Ranch and alter the landscape context for the Conserved Lands. When applied to public access, an adaptive management framework will be useful for adjusting to the rapid changes the developments will bring. Not only will public access management need to accommodate the growing population, it will also need to protect Tejon Ranch's natural resources for generations to come.

The RWA also includes three projects specific to public access: the realignment of the Pacific Crest Trail (PCT), a California State Park, and a University of California Natural Reserve. Of these three projects, the PCT has been sited and planning for its development is underway, so its associated environmental impacts are considered in this project. Realignment of the PCT will undoubtedly increase visitation to the Ranch. Thus, it is important to determine the impacts of realignment, particularly with regards to the endangered California condor and other sensitive species (Appendix N: California Condor (*Gymnogyps californianus*) and Microtrash).

Furthermore, the Ranch's value to the public, especially the local and underserved communities, is important for a well-managed public access program and the Conservancy's future goals. Expanding public access will facilitate wider-spread enjoyment of the Ranch's unique ecosystems and biodiversity, build awareness for the importance of the Ranch's Conserved Lands, and convey an understanding of the Ranch's unique ecological setting and strong commitment to stewardship. The value

gained from recreation on the Ranch, along with an educational component, can help ensure future appreciation and value for the conserved land and biodiversity in this region.

Project Objectives

Our overall objective for this project is to support the Conservancy in preparing their Public Access Plan. The Public Access Plan intends to accomplish numerous goals (Appendix B: Tejon Ranch Conservancy's Public Access Goals). We focus on the following for our report:

- Establish significant, diverse public access programs/activities on Tejon Ranch that are compatible with the Conservancy's conservation goals.
- Identify sensitive resource areas and design appropriate public access activities that avoid negative impacts.
- Provide underserved populations with an opportunity to experience Tejon Ranch's natural processes, habitats and working landscapes.
- Identify and develop Tejon Ranch Conservancy's unique regional niche in public access programming.
- Identify adaptive management measures specific to public access to protect biodiversity.

We created several objectives for our own project to help the Conservancy fulfill these goals.

I. Assess public access opportunities and their implications for Tejon Ranch.

We assessed current access opportunities afforded by public and private lands in the region to identify special opportunities on Tejon Ranch that would be of most interest to regional residents, underserved communities, and the general public.

II. Survey past visitors to determine demand for future activities.

By collecting the opinions of past visitors, the group determined what activities are desirable and undesirable for the future of public access on the Ranch. The survey results also serve as a baseline for visitor satisfaction and experience.

III. Develop analytical tools to help the Conservancy plan public access programs and possible complementary infrastructure. Create maps to examine public access opportunities and resource constraints.

These tools incorporate elements of environmental impact, such as erosion and habitat suitability, and opportunities, such as viewshed, to help facilitate TRC and Conservancy discussion and planning. These tools can be used by the Conservancy to create recreational planning maps to identify areas on the Ranch that are well-suited for public access programs.

IV. Provide an adaptive management framework for managing public access and resource impacts.

The group defined an adaptive management framework for mitigating impacts on resources and ecosystems that the Conservancy can use iteratively to manage public access areas.

Chapter 2: Public Access Planning Frameworks

Defining Public Access on Tejon Ranch

The parties to the RWA agreed it is important to provide “opportunities for the public to enjoy Tejon Ranch through well-managed public access” (RWA, 2008). The RWA also states the Conservancy has the “right to permit Public access” on Conservation Easement Areas of the Ranch and, along with TRC, to prepare a Public Access Plan (RWA, 2008). To create a Public Access Plan, the terms “public access” and “public” must be defined as they apply to the Ranch. The RWA defines “public” as:

[A]ny person who is not (a) an agent or employee of [TRC] or the Conservancy, (b) an employee of any local, state, federal, or other governmental agency or body while engaged in the conduct of their official duties for such governmental agency or body, (c) a tenant, licensee, occupant or easement holder that claims an interest in the Conservation Easement Area by or through [TRC], or (d) an invitee of [TRC] (RWA, 2008).

Our project defines “public access” as allowing people from the general public, including underserved communities and populations, to access the Ranch through recreational, educational, and volunteer activities. Thus, the Conservancy’s Public Access Plan must define underserved and include a section outlining how the Conservancy will meet this goal (see Underserved sections of Chapter 4: Stakeholders).

As already mentioned, the Conservancy staff implements public access through guided activities. Changes to this protocol require the Board’s approval. We assume the majority of public access on the Ranch will remain guided until the Board decides to allow unguided activities.

Public Access Planning Frameworks

Several frameworks have been developed for planning recreation on open space lands (Appendix C: Relevant Public Access Planning Frameworks). Frameworks help

make decisions for achieving desired outcomes and provide a “process for making those decisions” (McCool et al., 2007). McCool et al. (2007) describe several recreation frameworks that have been used on public lands. Three of these frameworks are most applicable to Tejon: the Recreation Opportunity Spectrum, Limits of Acceptable Change, and Benefits-Based Management.

The Recreation Opportunity Spectrum (ROS) framework recommends basing recreation planning on three types of attributes of the recreational setting, which vary along a continuum (McCool et al., 2007):

- 1) **The physical setting:** defined by the evidence of humans as well as the interactions or encounters with other people.
- 2) **The social setting:** defined by the amount and type of human interactions that occur.
- 3) **The managerial setting:** defined as the restrictions or actions of the administering agency or landowner that affect recreation opportunities (USDA, 1982).

ROS is the most widely used framework around the globe and is the main recreation planning framework used by the USFS (McCool et al., 2007).

ROS was developed for federal lands with open public access. It has, however, been used on nonfederal lands as described in More et al. (2009). While this paper modifies ROS to better fit nonfederal lands—such as state, county, and non-governmental owned lands—the authors assume the land owners permit open, unguided access and that the land is smaller in size than federal or National Forest land (More et al., 2009). These assumptions reflect major differences in the managerial protocol of the lands described by McCool et al. (2007) or More et al. (2009) and Tejon Ranch.

Another key difference between ROS-managed lands and the Ranch is how ROS characterizes land based on roads. ROS uses roads as evidence of people. Because the Ranch remains a working landscape with over 2000 miles of roads, encountering a road during an activity may be unavoidable. Thus, only certain elements of ROS and the other frameworks discussed by McCool et al. (2007) are relevant to Tejon Ranch.

One useful aspect of ROS for the Ranch is that it requires planners/managers to consider user experience within the biophysical environment. This leads to zoning

the land for different activities (hiking, biking, picnicking, etc.) or level of use (front country, backcountry, primitive backcountry, etc.). This aspect of ROS can be used to zone areas of the Ranch for different public access uses.

The second framework listed by McCool et al. (2007) is the Limits of Acceptable Change (LAC), which deals with recreation carrying capacities for designated wilderness areas. LAC focuses on managing visitor-induced impacts rather than providing recreational opportunities. It is particularly useful when two or more land management goals conflict with one another (McCool et al., 2007). For example, as McCool et al. (2007) state, “One goal may be sustaining the natural conditions and processes that give rise to the area’s value, and a secondary goal may be providing recreation access.”

This is exactly the case for the Conservancy whose mission “to preserve, enhance, and restore the native biodiversity and ecosystem values of the Ranch and the Tehachapi Range for the benefit of California’s future generations” can conflict with its goal to provide recreation and other public access programs (Tejon Ranch Conservancy, 2011). McCool et al. (2007) state that the agency or organization’s primary goal of sustaining the natural environment is the “constraining goal.” The constraining goal can, however, be somewhat compromised to allow for the goal of providing recreation or public access (McCool et al., 2007). This concept can allow for degradation of natural conditions; however, limits on degradation and zoning for levels of activity should be decided in advance of implementing programs and access (McCool et al, 2007).

Based on this description, LAC is the most applicable framework as the Conservancy plans for public access and recreation, especially if the Conservancy allows for open access on any parts of the Ranch in the future. While the LAC planning system does not address identifying indicators or thresholds of change (Stankey et al., 1984), other plans based on LAC provide examples of good indicators (USFS, 1992). Social indicators can be used in the adaptive management framework we provide, while resource indicators can be put into an ecological adaptive management framework to mitigate recreation impacts on the landscape (Chapter 9: Adaptive Management; Appendix O: Indicators).

The final framework McCool et al. (2007) describe, Benefits-Based Management (BBM), focuses on quantifying and maximizing the user benefits of public recreation through management. BBM uses the positive outcomes of engaging in recreational

activities (e.g. physical, mental, social, economic, environmental, etc.) rather than “the provision of recreation activities or the number of people who participate in them” (Borrie & Roggenbuck, 1995). Positive outcomes can benefit the individual, communities, economies, and the environment (Borrie & Roggenbuck, 1995).

BBM first identifies “potential benefits sought by users and other stakeholder groups,” which goes beyond simply identifying demand for certain activities. This step also seeks to identify potential or unmet benefits to the surrounding community. Once benefits are identified, implementation through activities, sites, and services can be performed (Stynes, 1999; Borrie & Roggenbuck, 1995). The Conservancy can use BBM to “capture a specific benefit” (McCool et al., 2007), such as physical benefits derived from hiking, educational benefits from a specific program or mental, emotional and physical benefits received from performing volunteer work.

Review of available literature shows there is no single framework that fits the specific needs of the Conservancy for planning recreation and other public access opportunities because the Ranch is very different from the lands for which the frameworks were developed. Tejon Ranch is on the scale of a national park or forest, yet is privately owned and continues to be a working landscape. The Ranch is thus managed differently than public and other private lands. Several frameworks described above do, however, have relevant concepts applicable to the Ranch.

Accordingly, we developed a new framework that incorporates these concepts to account for the Ranch’s unique attributes. The rest of this report is based on these planning concepts, research, spatial analysis, and individual knowledge of the Ranch. Report chapters combine to form a guide for the Conservancy to use in preparing a unique and well-managed public access plan.

Chapter 3: Current Public Access at Tejon Ranch

The RWA's definition of public access gives the Conservancy considerable scope in developing public access (RWA, 2008, Section 1.124), allowing the Conservancy to consider recreational activities, as well as community service, citizen science, and volunteer restoration work. Since the Conservancy was established in 2008, it has made substantial progress towards significant public access on the Ranch through outreach to specific organizations, by partnering with the Resource Groups, and serving the general public. The Conservancy consistently offers community hikes and drives through various parts of the Ranch and has a very active birding program, which includes birding hikes, hosting Audubon's Christmas Bird Count, a Breeding Bird Blitz event, and a Purple Martin survey (S. Pipkin, personal communication, 2012; TRC, 2011; (Appendix D: List of Current Public Access Activities on Tejon Ranch)).

Outreach

The Conservancy actively organizes special access events. For example, the Conservancy has promoted youth education by inviting a Boy Scout troop from Torrance, CA, to the Ranch to help clean up Big Sycamore Canyon and build picnic benches as part of an Eagle Scouts project. The Conservancy has also welcomed the Kern county Boys and Girls Club—comprised of students from the local El Tejon School and Debs Park Junior Naturalists from northeast Los Angeles—to the Ranch for a guided Ranch tour and educational program led by Conservancy staff. Conducting outreach and providing opportunities for youth to experience and connect with Tejon Ranch will have impacts extending far into the future.

The Conservancy strives to include diverse opportunities in its public access program that engage the community in activities ranging from art to science. The Conservancy and TRC have invited Plein Air artists out to paint the Ranch's beautiful landscapes. The Conservancy has also hosted field trips for the International Association of Vegetation Scientists, Cal-Pac section of the Society for Range Management, the North American Field Herping Association (NAFHA), and the California Native Plant Society (CNPS).

Through these various activities, the Conservancy has engaged and educated youth, removed trash, performed restoration, and advanced scientific knowledge and inventory of the Ranch's many ecosystems and species. As the Conservancy's public access program evolves in the future, many of these events should become more consistently offered to increase education based activities on the Ranch (S. Pipkin, personal communication, 2012; TRC, 2011).

Resource Groups

The Conservancy orchestrates a handful of public access activities specifically for nonprofit environmental organizations, such as local Sierra Club and Audubon chapters, and Natural Resources Defense Council staff and interns. The Sierra Club and Audubon Society participated in drafting and signing the RWA. As a result, these groups have a standing relationship with the Conservancy and plan several visits to the Ranch each year.

The Audubon Society participates in birding surveys and other more casual birding trips. The Sierra Club plans hikes and driving tours on the Ranch. Resource Group interest in participating in the Conservancy's public access program signifies the Ranch's position as a natural, beautiful, and diverse landscape worth visiting (S. Pipkin, personal communication, 2012; TRC, 2011).

Engaging the General Public

The Conservancy currently attracts approximately 1000 visitors to the Ranch each year. While public access is offered throughout much of the year, spring is the busiest season, during which the Ranch hosts half its visitors. Spring is an excellent time for wildflower viewing on the grasslands of both the Antelope Valley and the San Joaquin Valley, as well as a comfortable time for pleasant weather while viewing all areas of the Ranch and its wildlife.

The community drive and hike program is one of the Conservancy's most popular public access programs. This program is mainly active in spring and fall and showcases the Ranch through a series of trips to different locations throughout the Ranch, usually over the course of four to five hours. The trips are geared toward a broad audience as participants generally have different experiences and relationships with nature. Up to 30 visitors can participate per trip and have the opportunity to view some of the Ranch's landscapes and wildlife. Visitor feedback is generally positive and many visitors return for additional trips. Routes for the

community drive and hike program were chosen over the course of several seasons, and the Conservancy continually refines them to maximize visitor satisfaction. Our viewshed analysis (Chapter 6: Opportunities & Constraints) calculated the viewshed area of all current routes. This analysis estimates that current routes provide visitors the opportunity to see about 77% of the total landscape within Ranch boundaries (Figure 6-4). This demonstrates the Conservancy's efforts to show visitors as much of the Ranch as possible. As development of this public access program continues, the Conservancy hopes to attract more people of different ages, backgrounds, and demographics to the Ranch (S. Pipkin, personal communication, 2012).

Chapter 4: Stakeholders

Introduction

Because public access serves a broad array of stakeholders, it is imperative to understand who those stakeholders are and how best to align their interests. For public access, these stakeholders can include anyone who can potentially access the land, anyone who lives near the Ranch, those who live on the land, owners of private inholdings, those who manage the land, cattle grazing lessees and others who work on the land, California citizens whose taxes funded the purchase of easements on the Ranch, and anyone who cares about open-space conservation. Stakeholders also include school/youth groups and people who want to participate in conservation science because of the unique opportunities the Ranch provides for citizen science and research.

For this project, we focused on the parties of the Agreement (the Conservancy, TRC, and the Resource Groups) and resource users: current and past visitors, regional populations, and underserved populations. We sought to understand the motivation and goals of public access on the Ranch by surveying the Conservancy's Board whose members represent the signers of the Agreement. The Conservancy needs to balance the public's demands and desires for access with those goals to develop attractive public access programs that tie back to the Conservancy's mission. Thus, we surveyed past visitors about their experience visiting the Ranch. Finally, we compared demographics of Kern and Los Angeles Counties to those of the Ranch's visitors and National Forest Visitors to identify underserved communities.

Approach

Board of Directors Survey

A primary objective of surveying the Conservancy's 12 board members was to define what was meant by use of "significant" and "underserved" in the Agreement. We were also interested in using the board member survey to discover why a public access program was mandated in the Agreement and what the Board felt is an appropriate amount of public access on the Ranch. This includes the types of activities offered, target audience, number of visitors per year, and during what season public access should be offered. The board member survey used 6 multiple-

choice questions and 3 open-ended questions (Appendix E: Board Member and Past Visitor Survey).

Past Visitors Survey

A primary objective of surveying past visitors was to reach people who understood the Ranch's unique size, management, and diversity and were thus likely to provide constructive feedback for the survey. We wanted the respondents to have familiarity with the Ranch and with the partnership between the Company and the Conservancy to avoid unrealistic answers and requests for activities that are incompatible with the Agreement and the Conservancy's mission. The survey asked past visitors what activities they did on the Ranch, what they thought of the Ranch and their experience on it, and what they might like to see changed in the Conservancy's public access program for the future. The past visitors survey used a combination of 14 multiple-choice and 3 open-ended questions (Appendix E: Past Visitors Survey).

Results

Board of Directors Survey

We received responses from 7 of the 12 board members surveyed. Because of the small number of respondents representing just over half of the Board, these trends are only informative and do not necessarily represent the views of the Board as a whole. However, they do provide a glimpse into some of the perspectives held by some of the board members.

Why public access?

One board member explained the inclusion of public access in the RWA as a way to provide people with more opportunities for accessing nature and encourage learning about Tejon's unique landscape. Others pointed to the general goal of allowing the public to enjoy the Ranch, consistent with the Conservancy's mission of conservation. Another member mentioned the use of public acquisition funds to secure some of the easements, which in turn should provide for public access.

What is "significant" public access?

"Significant" was commonly defined in terms of impact rather than sheer numbers of visitors. That is, the activities at the Ranch should provide a meaningful experience to its visitors. The board members also recognized the importance

balancing public access with conservation so the natural resources on Tejon Ranch do not become degraded as a result of public access.

Who are underserved populations?

Most respondents defined “underserved” as those who lack access to nature. Specifically, responses highlighted minorities and low-income communities who may have difficulty accessing nature because of economic circumstances, particularly those in Los Angeles and Kern Counties. As a result, we broadly defined underserved populations as those who face barriers to accessing nature, which we narrowed to target specific populations. The definition of underserved populations remains a working definition because it must be able to accommodate changes in demographics and be updated as populations become adequately served.

To address specific populations under our definition of underserved, we looked at regional populations based on race, age, income, and gender. We compared regional demographics to visitor demographics of surrounding National Forests¹ and of current and past visitors to the Ranch² to identify those populations that are underrepresented (See Appendix F: Underserved Communities and Populations for process details).

Thus, we have identified the following as underserved populations:

- Hispanic communities (Figure 4-1 shows areas with high percentage of Hispanic and Latino populations in the region)
- Adolescent youth (16-19)
- Low-income households

¹ As determined by the National Visitor Use Monitoring Program (NVUMP) for the Angeles, Los Padres, San

² As determined by our Visitor Survey.

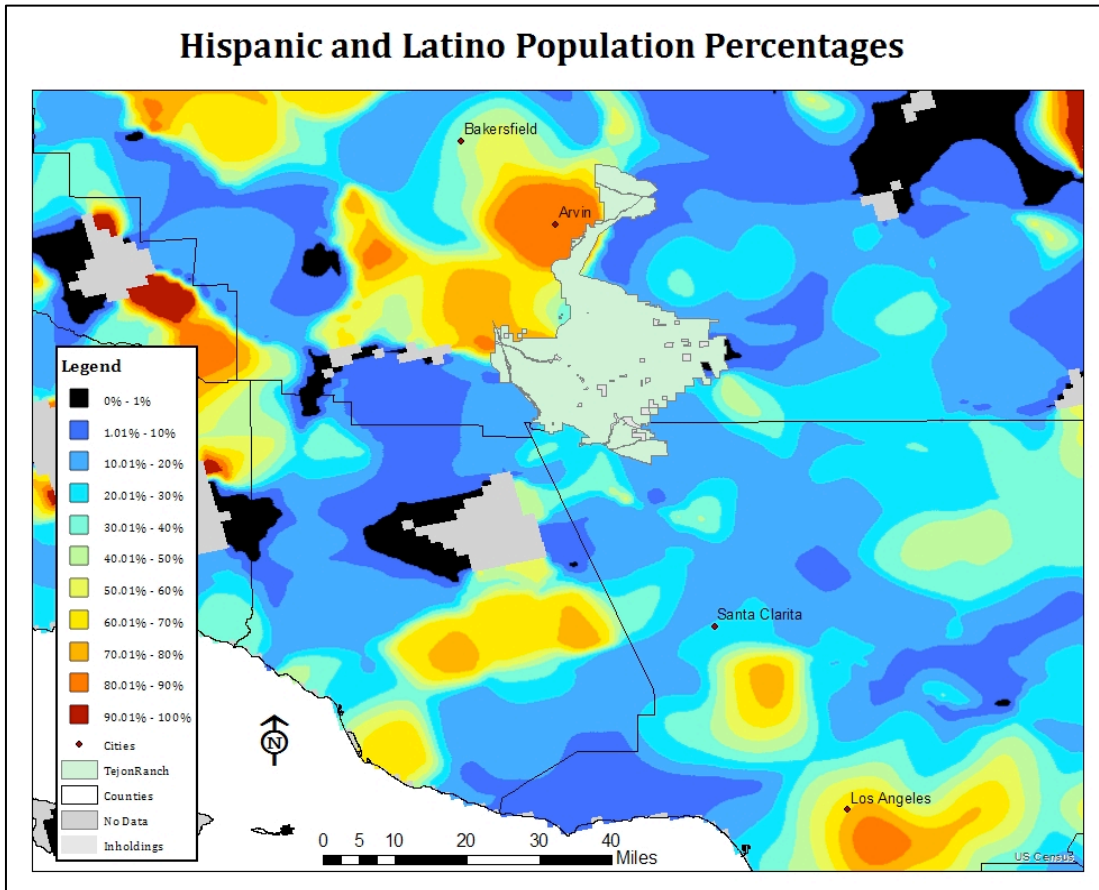


Figure 4-1. Hispanic and Latino Populations surrounding Tejon Ranch.

Multiple-choice questions

- Regarding what activities to provide in the next five years, respondents focused on educational activities including outdoor education, nature study, and citizen science.
- Over the next five years, respondents would also like to focus on providing public access to communities immediately surrounding Tejon Ranch (e.g. residents of Frazier Park and the mountain communities, Antelope Valley, and San Joaquin Valley), as well as to school groups and potential donors.
- All respondents felt day hiking and volunteering are most compatible with the Conservancy's mission and the RWA.
- There was little agreement on how many trips to offer per year; answers ranged from less than 30 to 75.
- Most respondents felt the Conservancy should devote 15-30% of its resources to public access.

Past Visitors Survey

Multiple-Choice Survey Responses

Multiple choice questions helped create a profile of past visitors regarding their general experiences and preferences with outdoor recreation and assessed their visit to the Ranch. Most respondents enjoy hiking, wildflower and wildlife viewing, birdwatching, and camping and want to see those activities offered on the Ranch. Mountain biking and horseback riding were the least popular activities and respondents are unlikely to visit to participate in those activities. All visitors enjoyed their visit and a majority (62%) rated their visit a five out of five. Just under half (46%) of respondents preferred unguided activities over guided and self-guided activities (Appendix E: Past Visitor Multiple Choice Questions for details).

□

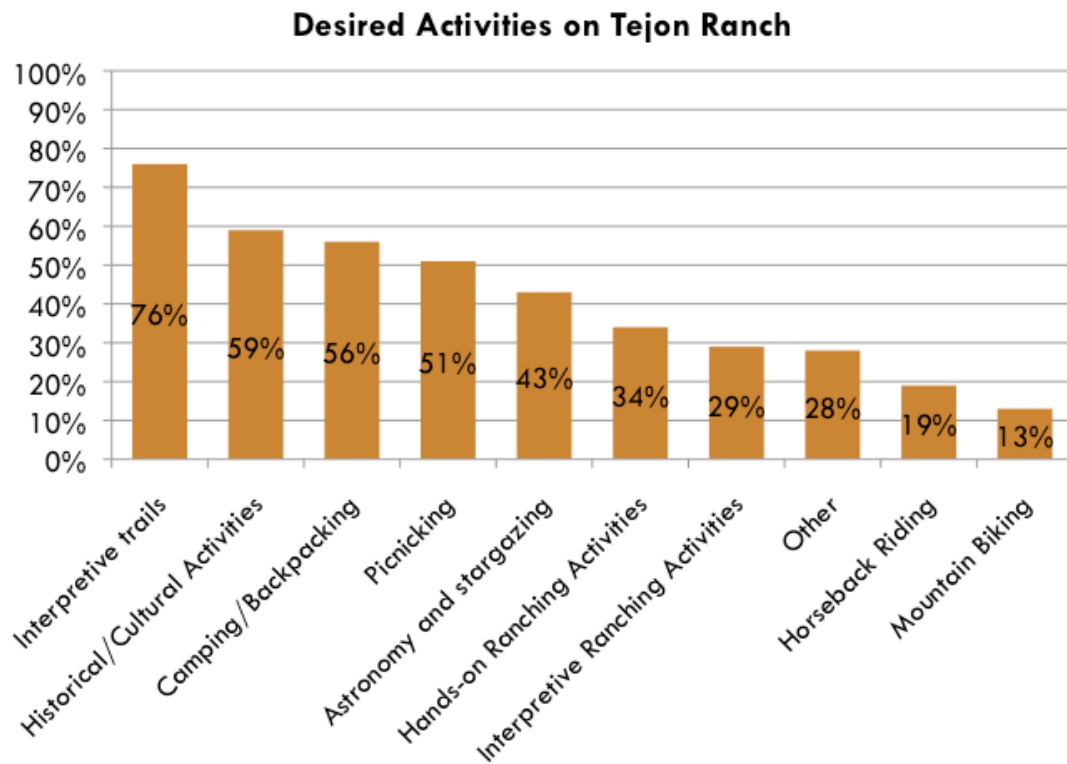


Figure 4-2. Desired Activities on Tejon Ranch. The y-axis shows percent of respondents. The x-axis shows desired activities.

Open-Ended Survey Responses

In addition to the multiple-choice questions, survey respondents were asked three open-ended questions. A full list of open-ended survey codes, code and category

explanations, and accompanying response data in raw counts and percentages are provided in Appendix E: Past Visitor Open Ended Questions.

Likes & Dislikes

Question: *Please describe what you liked and disliked about your visit to the Ranch.*

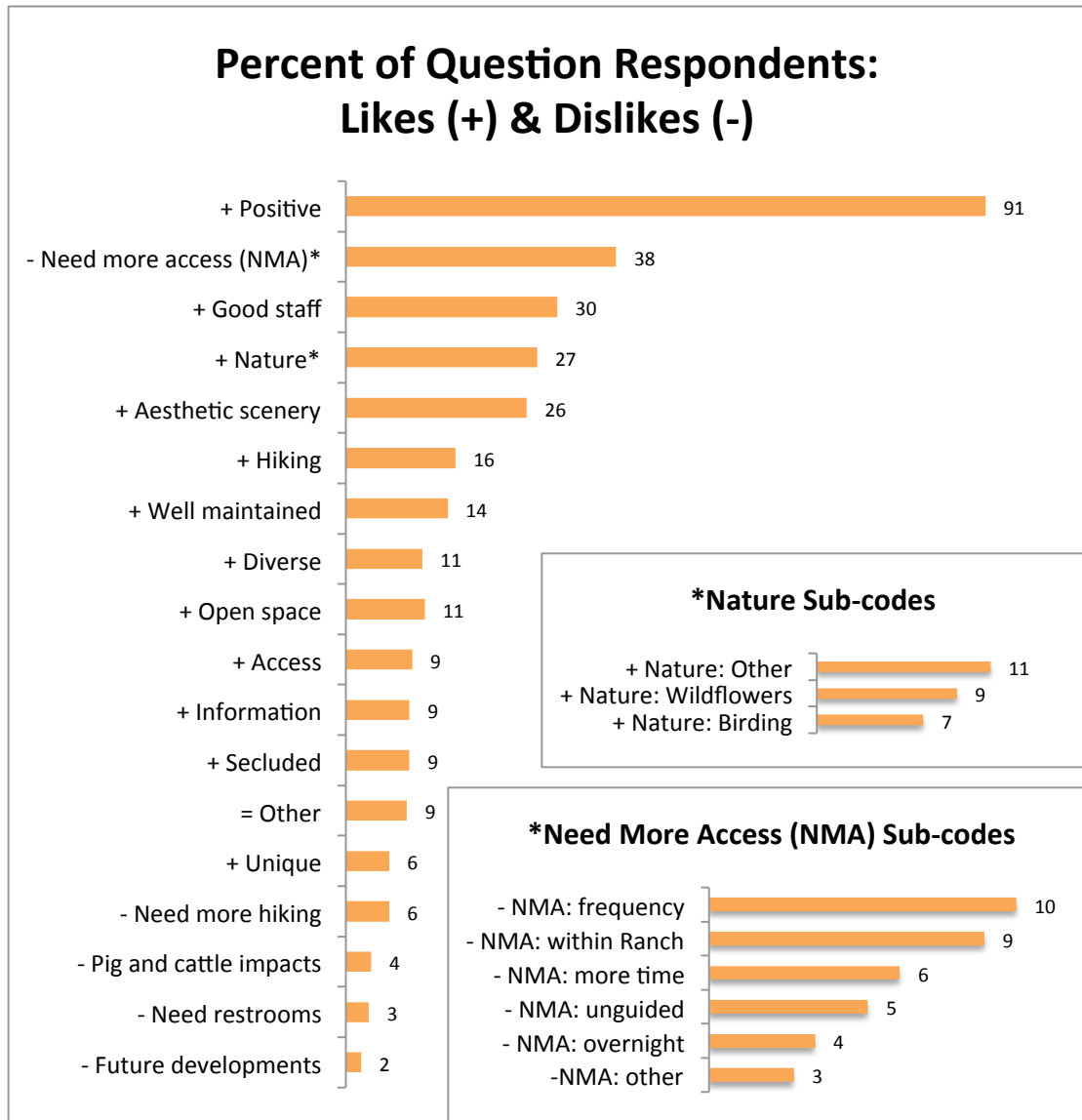


Figure 4-3 Percent of respondent who expressed ways in which they enjoyed (indicated with +) their public access experience on the Ranch or expressed areas where the Ranch could improve its public access programs (indicated with -). Other includes all comments that did not fall into a like or dislike code (labeled with =). Responses do not add up to 100%. Note: sub-codes are provided in the inset graph; they show what amount of the main code percentage is made up of a particular sub-code.

Of 341 survey respondents, 286 had visited the Ranch and were presented with this question. Of the respondents that had visited the Ranch, 277 chose to answer this question. Results provide insight into user experience accessing the Ranch (Figure 4-3). This includes: commentary on what distinguishes Tejon from other public access areas offering nature-based experiences in the general area; aspects of Tejon’s public access program well received by visitors; and aspects in which Tejon’s public access program could use improvement according to some visitors. Further results and explanations of codes are provided in Appendix E: Likes & Dislikes.

Overall, Likes & Dislikes question respondents expressed having good experiences accessing Tejon and were generally appreciative of the opportunity to visit and to provide feedback on their visit(s). Apparent from responses, past visitors distinguish Tejon from other public access areas in the region through its size, relative undeveloped state, unique combination of diverse habitats and species, and high quality staff and guides.

Ideal Visit

Question: *Please describe your ideal visit at Tejon Ranch.*



Figure 4-4 A visual representation of responses to the Ideal Visit question created with Wordle™. The size of the word is proportional to the frequency of that word in responses. E.g. ‘hike’ was the most used word in the Ideal Visit responses.

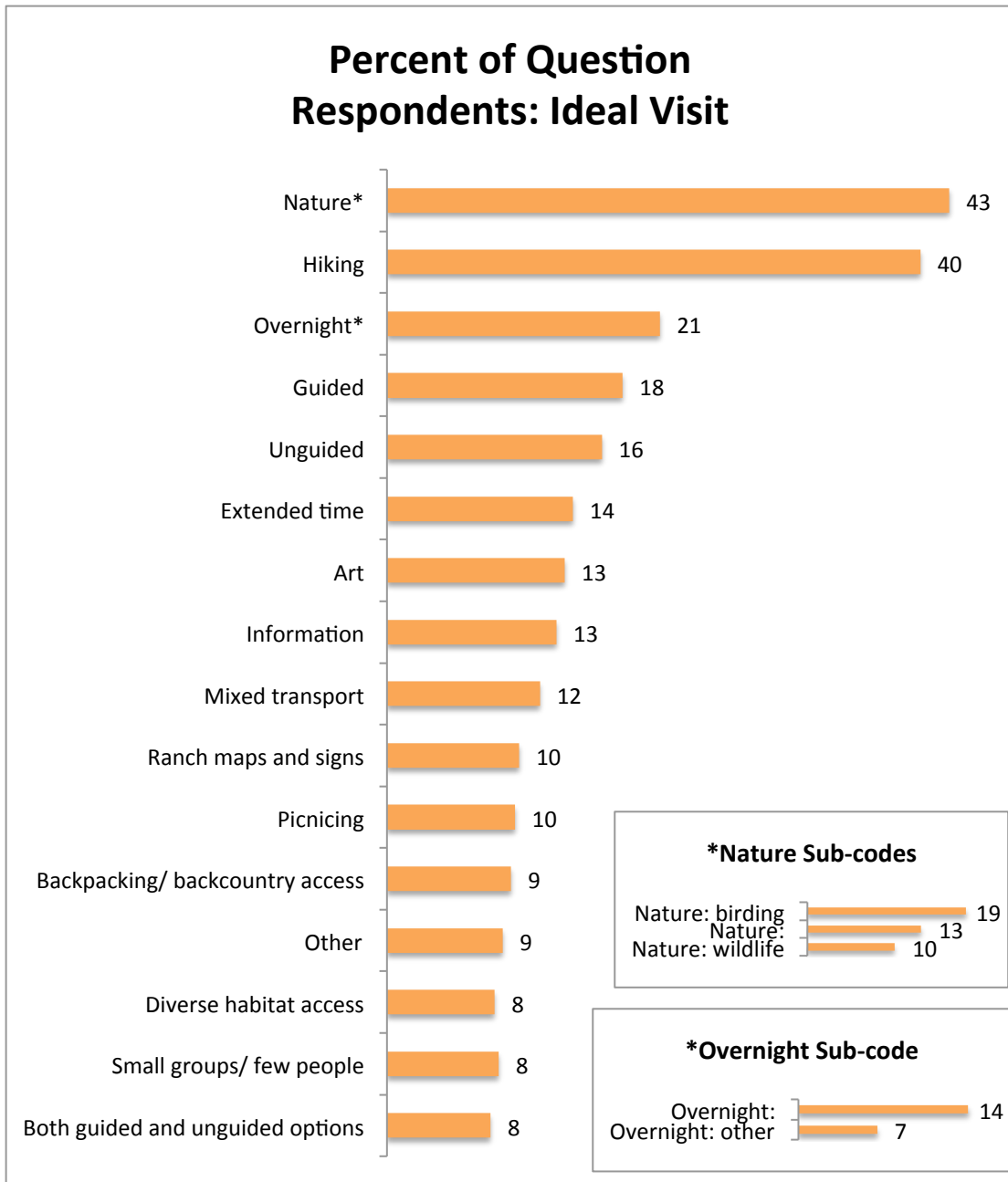


Figure 4-5 Percent of respondent who described their ideal visit on the Ranch as having the coded aspects. Responses do not add up to 100% Note: sub-codes are provided in the inset graph; they show what amount of the main code percentage is made up of a particular sub-code.

Because this question does not necessitate that respondents had previously visited the Ranch, all of the 341 survey respondents were presented with this question and 320 chose to answer this question. Results from the question provide insight into what users might be looking for during a visit to Tejon Ranch (Figure 4-4 & Figure

4-5). This includes: commentary on what Tejon Ranch already does that is “ideal”; what adjustments the Ranch could make to expand their public access offerings; what types of development the Ranch might focus on to improve and/or increase visitor experience and attraction to Tejon; and, what Tejon might want to stay away from when moving forward with their public access program. Further results and explanations of codes are provided in Appendix E: Ideal Visit.

Overall, Ideal Visit question respondents expressed the general desire for more access options on the Ranch while maintaining Tejon’s unique characteristics—seclusion away from large crowds and developments; opportunities to see diverse wildlife, vegetation, and habitats; and, access to high quality information on the natural landscape and its cultural and historical significance. Many respondents described ideal visits close to what they might find at a National Park in terms of activities and access type (i.e. unguided or guided).

Additional Comments

Question: *Please provide any additional comments.*

This question was optional and provided respondents with the opportunity to voice any opinions not otherwise captured in the survey. Of 341 respondents, 154 answered this question. Because of the undirected nature of this question, strong trends did not emerge (See breakdown of responses in Appendix E: Additional Comments). The strongest trend was that 20 respondents expressed thanks in general. Therefore, we have highlighted some general takeaways expressed in Additional Comments:

- The Ranch is viewed as “unique”, “a treasure”, “pristine”, and “wild”.
- Visitors enjoyed having friendly and knowledgeable guides. One person said the guides made them feel part of a special group, not just a bunch of visitors.
- While people like the idea of more access, they understand the need to limit it to avoid the negative impacts of overuse.
- Some visitors live far from the Ranch and would like more information about the activities before visiting.
- Respondents appreciated being able to provide feedback.

Some of these takeaways are also reflected in the Likes & Dislikes and Ideal Visit questions.

Summary of Past Visitor Survey Trends

Survey respondents generally seemed to enjoy their visits and are excited by the prospect of more public access on the Ranch. Activities the Conservancy currently provides appear to satisfy much of the demand for public access on Tejon Ranch. Conservancy staff and guides are a highlight for many visitors and distinguish the Ranch from other open spaces offering public access programs. Visitors identify the Ranch as a unique and diverse landscape with rich wildlife, wildflowers, and scenery. Visitors also recognize the Ranch as a place of cultural and historical significance that is important to protect. The relative undeveloped and secluded state of the Ranch is also a quality that visitor's expressed wanting to see maintained.

Recommendations

The board member survey responses, research on underserved populations, and past visitor responses provide guidance for the Conservancy to continue to develop its public access programs. While the surveys are certainly not the only factor in deciding the future of public access on the Ranch, responses do offer some key suggestions:

- Continue with plans to build a Visitor Center to address the following requests and concerns regarding public access on Tejon: need for restrooms; requests for Ranch maps; desire for interpretive activities and signage; unguided access; clearer information about Ranch public access activities; and, picnicking opportunities. The Visitor Center could address these requests by providing: restrooms; Ranch map distribution; portal for information distribution and interpretive programs; center point for unguided access; picnic location; and, visitor monitoring
- Make descriptions of activity offerings clearer to help visitors decide which trips match their preferences, ability level, and willingness to travel to the Ranch for a given activity. Information could include specifications on level of difficulty, length in miles, average time, trip elevation profile, on-road or trail, season, and specific area. Other suggestions included providing a map of the route and what can be seen on the route.
- Offer access options that are extended time—all-day or overnight (Figure 4-5)—to make it more worth the long drive for potential visitors far from the Ranch. This could include allowing car camping at or near entrances before activities that start early or at dawn and/or list “amenities” in activity

descriptions that includes nearby campsites, hotels, and other local accommodations.

- Develop interpretive trails and/or create a network of signage on the Ranch to provide unguided access options that encourage visitors to stay on the designated route (Appendix M: 290th St. Case Study Site Selection).
- Establish a stronger public outreach program to spread word about Tejon's public access offerings and encourage visits.
- Continue providing high quality guides and staff.

Underserved populations

In addition to the general recommendations above, recommendations for reaching underserved populations include:

- Install infrastructure conducive to family-oriented activities, such as picnic tables, in access areas to accommodate underserved communities.
- Include outreach media in English and Spanish.
- Recruit bilingual staff and/or volunteers who can speak Spanish, particularly those with Hispanic heritage, to help members of the Hispanic community feel more welcomed at the Ranch.
- Continue to provide vocational training opportunities for adolescent youth like the Conservancy's partnership with the FIELD program.
- Provide gear during activities so that those who lack the appropriate equipment (because they do not know what gear is appropriate or do not have the resources to obtain them) are able to participate.
- Keep activities free to the public to allow access by low-income households.

Additional Stakeholder Recommendations

As stated above, stakeholders affected by public access include the Tejon Ranch Company, the cattle grazing lessees, and owners of the private inholdings. While these parties may not directly participate in public access, they are directly or indirectly affected by the activities and the presence of additional people on the Ranch, which could potentially lead to conflicts. Potential conflicts may include encounters between hunters and visitors, encounters between people and cattle, and trespassing onto inholding properties. To avoid or diffuse these conflicts, it is important to maintain open communication between the Conservancy and the other parties to understand the potential issues and raise potential solutions. Additionally,

the Conservancy could survey the Company, lessees, and inholding owners to monitor their relationships and address concerns early on.

Conclusion

Though stakeholders provide insight into the current public access program at Tejon, it is important to keep in mind the limitations. The surveys and underserved research are just one consideration for public access management on the Ranch. Subsequent chapters in this report provide further analysis. Additionally, most survey respondents participate in outdoor recreation regularly (at least once a week), were aged 55 or older, Caucasian, and in the income range of \$50,000-\$100,000. Therefore, our sample of respondents is not representative of the general public, so results must be considered in this context.

Results must also be taken in context of what is feasible on the Ranch given the nature of how it is managed by both TRC and the Conservancy in accordance with the RWA. Currently, public access on the Ranch is focused on guided activities, but there are plans for a Visitor Center and considerations for a possible self-guided trail. Further discussion of feasibility on the Ranch can be found in Chapter 6: Opportunities & Constraints, as well as in Chapter 7: Case Studies.

Finally, surveying past visitors provides a starting point—or baseline—of current public access on the Ranch and positions the Conservancy to monitor future changes in access population. This should prove useful by serving as a measure for how changes to future public access programs on the Ranch compare to its current public access program. Comparisons could address questions such as:

- Is the visitor population changing and, if so, in what ways? How should the Conservancy address these changes?
- Is the public access program reaching more people or making a more significant impact?
- Are visitors enjoying their experience?
- Are there obvious gaps in programming?

Chapter 9: Adaptive Management explores these questions in more detail.

Chapter 5: Regional & Private Lands

Context

Regional Lands

Numerous open space areas surround Tejon Ranch and also offer recreational opportunities including National Forests, state parks, preserves, and reserves (Appendix G: Regional & Private Open-Space Lands). While most of these areas are public lands, a few are privately owned and/or managed by non-profit organizations. Abundant accessible open space in the area makes it important to determine the special and unique opportunities Tejon Ranch can provide. We define the region around Tejon Ranch as Kern and Los Angeles Counties.

Approach

Based on a list of open space areas surrounding Tejon Ranch compiled by 2M Associates (Miller et al., 2010), we analyzed activities and landscape characteristics of 25 surrounding open space areas and organizations to better understand the opportunities afforded by this region (Table 5-1 at the end of this chapter). We reviewed the websites of these open spaces for activities and programs offered. Where possible, we examined any reports or management plans to identify issues encountered and solutions employed by the open space manager.

Public Access Trends

In this region, general hiking is offered most (15/25), followed by wildlife viewing/birding (11/25) and camping (10/25). Ecological reserves in the area often list only wildlife viewing as an activity and not hiking. The USFS's National Visitor Use Monitoring Program (NVUMP) reports for the Angeles (USFS, 2006a), Los Padres (USFS, 2009a), San Bernardino (USFS, 2009b) and Sequoia National Forests (USFS, 2006b), lists hiking as the most popular activity (responses ranged from 47% to 66% for each forest). However, visitors often participated in multiple activities during their visit, with about a third of visitors identifying hiking as their primary activity (NVUMP).

Based on the NVUMP, regional National Forests visitors tend to go to these areas more for the activity than for the location (i.e. the location of the activity was substitutable). Many visitors responded that if they could not do the activity they

wanted at the surveyed location, they would “go elsewhere for the same activity” instead of the other response options of “come back another time,” “gone elsewhere for a different activity,” “gone to work,” “had some other substitute,” and “stayed at home” (NVUMP).

Because of the myriad of activities offered in surrounding open-space areas, some activities may not need to be offered on Tejon, particularly those that are popular but may be incompatible with the Conservancy’s mission. For example, the Los Padres National Forest offers numerous trails for mountain biking, so Tejon Ranch may not need to offer mountain biking. Likewise, some respondents to our survey expressed a desire for engaging in astronomy on the Ranch. However, Mount Piños, located just west of the Ranch, is known for attracting astronomers and is an arguably better vantage point at an elevation of about 8300 ft, about 1500 feet higher than the highest point on the Ranch.

Physical Characteristics

With 240,000 acres of protected land, Tejon Ranch is among the largest open space areas in the region. Other areas with over 100,000 acres included the Angeles National Forest, Carrizo Plain National Monument, Los Padres National Forest, and San Bernardino National Forest. Tejon Ranch is the largest privately owned area. Wind Wolves is 95,000 acres (Table 5-1) and most of the open space areas in the region are less than 10,000 acres. Thus, the size and private ownership of the Ranch positions it as a unique opportunity for providing public access on a grand scale while maintaining a high level of control over activities provided and land management approach.

The National Forests, Carrizo Plain National Monument, Hungry Valley State Vehicular Recreation Area, and Red Rock Canyon State Park all hold recreation as one of their primary goals. In contrast, the mission of most other open space areas in the region is to protect natural and/or cultural resources, with recreation as a supplementary goal. The Conservancy reflects this latter group with conservation as their primary objective.

The 25 locations listed (Table 5-1) encompass a variety of landscapes that are both similar and different to those on Tejon Ranch. Red Rock Canyon State Park consists of desert cliffs and rock formations, which are not found on the Ranch. The protected lands of the Ranch where public access occurs lack large water features available elsewhere, such as the rivers in the Angeles National Forest or Castaic

Lake. However, some surrounding areas have similar landscapes and vegetation communities to Tejon Ranch. The Antelope Valley Poppy Preserve, just south of the Ranch, contains wildflower fields on rolling hills. The Carrizo Plain National Monument has large patches of grasslands and wildflower fields. The Angeles National Forest boasts many patches of vegetation communities and eco-tones similar to Tejon Ranch, such as mixed chaparral, oak woodland, Joshua tree stands, and pinyon pine forests. Despite similarities of surrounding lands to the Ranch, other regional open spaces do not have as many diverse vegetation communities in such close proximity to one another—a factor that distinguishes the Ranch.

Of the 25 surrounding open space areas, only three—Wind Wolves Preserve, Audubon California’s Kern River Preserve, and Parker Ranch—are privately owned; the rest are public lands. Of those private lands, Parker Ranch does not currently offer access. Some public lands have cattle grazing and ranching on their lands, but neither Audubon California’s Kern River Preserve nor Wind Wolves Preserve practice livestock ranching. Carrizo Plain National Monument retained some of its historical ranching structures and equipment to inform public access programming about its ranching history. However, livestock grazing does not currently occur on the land. Thus, Tejon Ranch is the only privately owned active ranch that is permitting public access in the region. Ranching and the other industrial operations on Tejon, like mining and cement production, provide an opportunity to not only tell the Ranch’s history, but also show how cattle ranching operates today and demonstrate other contributions it makes to the current economy.

Issues Encountered

Vandalism, graffiti, litter, and dumping appear to be issues that commonly occur in areas near urban centers (e.g. Angeles NF (USFS, 2005a), Los Padres NF (USFS, 2005b)). Likewise, unauthorized trails or unauthorized off-trail use tend to occur near more densely populated areas. However, despite Carrizo Plains encouraging off-trail, cross-country hiking, visitors tend to remain on trail because they are accustomed to doing so (R. A. Cooper, personal communication, October 9, 2012). Areas with water tend to experience concentrated use, mostly from families and “cultures associated with recent immigration to this country” (USFS, 2005a). Chronic overuse of concentrated use areas can lead to erosion, soil compaction, vegetation loss, and pollution (USFS, 2005a).

The Antelope Valley Poppy Preserve noted language was a barrier for its docents and volunteers while managing visitors and keeping them on trail. Many of its visitors during wildflower season are Asian and arrive in large groups on tour buses (K. Weatherman, personal communication, October 8, 2012). To deal with the language barrier, the preserve produced handouts in multiple languages in addition to having volunteers on hand. While Antelope Valley Poppy Preserve is only open during the wildflower bloom period, it has about 7,500 visitors per year. The Carrizo Plain National Monument reports spikes in visitorship during peak wildflower season from “6-10 people per day that may not even stop” to “400-500 people per day going through the Visitor Center” (R. A. Cooper, personal communication, October 9, 2012).

Other challenges include protecting sensitive species, conflicts between visitors and with private landowners, and multi-use trail conflicts. The Los Padres and Angeles National Forests and the Antelope Poppy Preserve recommend education to mediate or resolve infrastructural and human conflict issues (USFS, 2005a; USFS, 2005b, CA Department of Parks and Recreation, 1978). Education includes multilingual signs and interpretive education to promote greater understanding of sensitive resources and general trail etiquette. For sensitive species management, the National Forests recommend increasing enforcement and developing facilities that redirect people’s use to non-sensitive areas. That is, facilities in sensitive areas should be decommissioned and use discontinued to steer visitors away from those areas. Carrying capacity should also be established to prevent overuse (USFS, 2005a; USFS, 2005b).

Open Space Research Results

Table 5-1. Activities advertised on the websites of 25 regional open-space areas. These 25 areas were adopted from a list produced by 2M Associates in the Tejon Ranch Master Public Access Plan (unpublished). A dot indicates that the activity is offered.

Location	Size (000's of Acres)	Public /Private	Working lands (Ranching)	Hiking	Wildlife viewing / Birding	Camping	Self-guided hikes	Equestrian	Wildflowers	Picnicking	Cultural/ Historical	Mountain Biking	Guided hikes	OHV	Backpacking	Equestrian Camping	Winter sports	Vehicle Tours	Water sports
Angeles NF	100+	Public		•	•	•	•	•	•	•	•	•		•	•	•	•		
Carrizo Plain NM (BLM)	100+	Public		•	•	•	•		•			•	•	•					
Los Padres NF	100+	Public	•	•		•	•	•	•		•	•		•	•	•	•		
San Bernardino NF	100+	Public	•	•		•	•	•	•	•	•	•		•	•	•	•		
Castaic Lake State Recreation Area	10+	Public		•		•		•		•									•
Hungry Valley State Vehicular Recreation Area	10+	Public		•					•			•		•					
Red Rock Canyon State Park	10+	Public		•	•	•		•	•		•	•	•	•					
Wind Wolves Preserve	10+	Private		•	•	•	•		•		•	•						•	
Los Angeles Co. Wildflower/Wildlife Sanctuaries (many sites)	<10 total with 7 sites	Public		•	•			•	•			•							

Buttonwillow Ecological Reserve	<10	Public			•													
Antelope Valley Poppy	<10	Public		•			•		•				•					
Arthur B. Ripley Desert Woodland State Natural Area	<10	Public					•			•								
Audubon California - Kern River Preserve	<10	Private					•						•					
Canebrake Ecological Reserve	<10	Public	•	•	•					•								
Fort Tejon State Historic Park	<10	Public				•				•	•							
Fremont Valley Ecological Reserve	<10	Public			•													
Lokern Ecological Reserve	<10	Public			•													
Parker Ranch (no access)	<10	Private	•															
Ritter Ranch Park	<10	Public		•				•				•						
Saddleback Butte State Park	<10	Public		•	•	•	•	•		•								
South Fork Wildlife Area	<10	Public		•														•

Tehachapi Mountain County Park	<10	Public		•		•	•	•											
Tomo-Kahni State Historic Park	<10	Public									•		•						
Tule Elk State Natural Reserve	<10	Public			•					•								•	
TOTAL			3	15	11	10	10	9	9	8	7	7	7	6	3	3	3	2	2

Private Lands

In contrast to access on public lands, access on private lands differs in the range of activities offered, issues encountered, and management tools employed. Because Tejon Ranch is private land, it is beneficial to examine these differences and identify advantages of private lands for use in further developing the Conservancy's public access program. However, Tejon Ranch's unique position as one of the region's few private lands offering public access on an active cattle ranch reflects the dearth of private lands offering access in the region. As a result, we expanded our research to all of California and the rest of the nation.

Approach

Research focused on private lands most comparable to Tejon Ranch, particularly those that are working ranches. Websites ranging from land trust associations, specific land-trust sites, and land conservation databases were used to identify private lands similar to Tejon Ranch. Interviews with managers at several properties were also conducted (Appendix G: Summary of Research on Private Lands Comparable to Tejon Ranch).

Public Access Trends

The private lands research further highlighted the unique status Tejon Ranch has in permitting public access onto its private working ranchlands. Within California, only 5 out of 74 land trusts were discovered to offer public access on lands comparable to the Ranch. (Appendix G: Summary of Research on Private Lands Comparable to Tejon Ranch). Expanding the research outside of California only identified five more similar properties. Therefore, Tejon Ranch stands rare among both regional and private lands by allowing for public access on a working ranch.

From the interviews conducted, it appears private lands restrict their public access program to mainly passive forms (non-motorized uses) in order to protect the habitat's integrity and lower chances of liability. The limited resources of land trusts—personnel and finances—also limit the breadth of public access. As a result, private lands were found to restrict public access to the following forms:

- Hiking
- Camping
- Citizen Science
- Education
- Fishing
- Horseback Riding
- Hunting
- Mountain Biking
- Restoration
- Photography
- Skiing
- Snowshoeing

As displayed in Appendix G, hiking appears to consistently be the most popular form of public access on private lands. In contrast, horseback riding ranges from low popularity (e.g. Half Circle Ranch) to high (e.g. Deer Creek Hills Preserve and Heart Mountain Ranch). Mountain biking when offered seems to be well liked (e.g. Deer Creek Hills Preserve). Citizen science and restoration are public access activities done on all these private properties. Educational programs in contrast are only available on less than half of these private lands (e.g. Carpenter Ranch, Deer Creek Hills Preserve, and Heart Mountain Ranch). And camping appears to be a rare access opportunity offered (e.g. Deer Creek Hills Preserve and Save Mount Diablo properties) and is provided only under supervision. Some of these private lands allow the public open access onto their properties, while others exert more control on the public by restricting activities to only guided access (e.g. Deer Creek Hills Preserve, Vallejo and Eastern Swett and King Ranches, and Save Mount Diablo properties).

The Conservancy's current suite of activities – hiking, citizen science, and restoration – and its near future development of educational activities make the Conservancy's public access program comparable to any of the private lands found. Even the Conservancy's current visitation rate of an estimated 1000 people per year is on par with that of the researched private lands. Thus, when viewed in contrast to these private lands, Tejon Ranch Conservancy's current public access program can be described as healthy and strong.

For public access activities, the Conservancy currently charges no fees, which is followed by all the interviewed private lands except for one – Deer Creek Hills Preserve (Appendix G: Interviews). Private lands' tendency to allow the public free access to their properties is best explained in the words of Peter Brown, Stewardship Manager of Gallatin Valley Land Trust, "...as long as public conservation funding mechanisms exist, we do not think that we will begin charging a fee for the trails that we help to build with public support" (P. Brown, personal communication, January 2013).

Issues Encountered

Like public land management agencies, land trusts often have limited access to resources. However, land trusts hold more power to limit the public spatially, temporally, and activity-wise on their properties. The authority to spatially and temporally segregate access helps land trusts resolve issues such as multi-use

conflicts (e.g. Deer Creek Hills Preserve), hunting conflicts (e.g. Carpenter Ranch and Heart Mountain Ranch) or cattle conflicts (e.g. Carpenter Ranch). Cattle conflict includes situations where cattle bump or charge visitors, as well as, cattle licking or bumping visitors' cars.

Other common issues that occur are littering and vandalism (e.g. Carpenter Ranch, Deer Creek Hills Preserve, Half Circle Ranch, and Heart Mountain Ranch).

Countermeasures used to deal with these issues range from the closure of affected areas (Carpenter Ranch) to clean up. Deer Creek Hills Preserve found that cleaning up an affected area and having a more onsite staff presence helped to reduce the littering and vandalism on the private land parcels where public roads run through.

Off-trail uses pose some concern for a few private lands like Heart Mountain and Red Canyon Ranch, two of the largest researched private lands. Red Canyon Ranch states that they "find it very hard to keep people on trail. We have signs on the trail heads, and remind them to stay on trail when we grant access" (R. Wesley, personal communication, January 18, 2013). Besides signs and warnings, other private lands have success controlling off-trail use by limiting public access to only docent-led activities (e.g. Vallejo and East Swett and King Ranches). Another strategy that is employed to reduce off-trail occurrences is patrolling the trails with docents (e.g. Deer Creek Hills Preserve).

Impacts on flora and fauna can also occur from the public regularly accessing a property. For instance, Heart Mountain Ranch has found that they "are starting to have damage of some of our rare and sensitive plant populations . . . [and] that many of the animals that used to hang out near the trail area . . . just don't spend much time there anymore because of the constant foot traffic" (C. Peters, personal communication, January 2013). Heart Mountain Ranch plans to manage this resource damage and wildlife impacts by building awareness through education and signs, seasonal closure of impacted areas, and installation of boardwalks and benches to deter off-trail use. Similarly, the Irvine Ranch Conservancy has implemented a rotational approach to access on their lands to disperse impacts (IRC Management Plan).

While increased visitation is a positive indication of a public access program's success, having more visitors does lead to a need for increased visitor amenities, and improved amenities attract more visitors. This creates a dilemma as Carrie Peters, the Conservation Practitioner from Heart Mountain Ranch, elaborates: "we are

seeing a real need for some kind of restroom here at our trailhead. However, we really don't WANT to put in a toilet. Not only is it expensive [around \$40K+], but it requires constant maintenance." Thus, the growth of the public access program can strain the private land's finances and staff workload more than anticipated.

Trespassing is an issue that can lead to a number of problems – i.e. littering, vandalism, off-trail use, resource damage, and wildlife impacts. However, none of the interviewed private lands that have experienced trespassing (e.g. Heart Mountain Ranch and Red Canyon Ranch) have found effective solutions to deal with this issue. Gates and signs do not appear to be useful. The Irvine Ranch Conservancy does try to ensure that no visitors stay behind by keeping a count of the number of visitors followed by a patrol of the area at the end of the day (Irvine Ranch Conservancy, n.d.).

Recommendations

As the Conservancy's public access program grows, investment in expansion of its hiking trails and hiking program would be worthwhile because of hiking's high popularity on both regional and private lands. If winter access were to occur, it must be focused on lower elevations and in areas with favorable road conditions (See Chapter 6: Opportunities & Constraints, Erosion). Additionally, winter activities, such as cross-country skiing and snowshoeing, are offered at Mount Piños in the Los Padres National Forest just west of the Ranch.

Furthermore, activities offered at Tejon Ranch should be unique to the landscape, such that the location of the activity is not substitutable. For example, guided hikes with information specific to the area would be less substitutable than an unguided hike. Likewise, unique features of the location, such as the close proximity of diverse ecosystems or the working landscape, should be emphasized so that the location is the attraction rather than the activity.

Chapter 6: Opportunities & Constraints

Introduction

Several geospatial elements are relevant to public access and useful to consider when planning activities in different locations of the Ranch. These elements include: travel time to different areas, relative erosion risk of an area, species of concern that may be in an area, fire risk, unique vegetation communities likely to occur in an area or along a route, viewshed area of the best vistas, and elevation profile of a tour or hiking route.

Travel time and elevation profile are informational elements useful in describing the difficulty of a hike, as evidenced by their use in guidebooks. They may also be useful to a public access planner for comparing possible routes and activity locations. We group the other geospatial elements into two categories: opportunities and constraints. Opportunities for public enjoyment of the Ranch surface from knowing vegetation communities and viewsheds at a particular location or along a route. Constraints surface from knowing environmental impacts that might accrue from visiting a certain area. These may include, but are not limited to, erosion, fire risk, and disturbance of wildlife.

Constraints may be of greatest concern when planning public access activities. Erosion is a well-recognized impact of hiking trails and unpaved roads; limiting erosion will help maintain trail conditions, water quality, and aquatic ecosystem health. It is also important to recognize certain species that may be most impacted by public access activities, and to minimize those impacts on the behavior and range of the species. Lastly, it is important to characterize fire risk in areas where planned activities occur and implement measures, like visitor education, to reduce fire risk.

It is a manager's responsibility to balance opportunities and constraints when planning public access programs. Having the tools to do so and acknowledging how elements can change drastically from site to site can be very useful. To aid in the public access planning process, we took the considerations described above and generated an ArcMap model tool to apply those considerations to a specific route or site (Figure 6-1). This information tool allows the user to gain relevant information about an area or route of interest simply by inputting the route of interest into the

model tool. The tool can be used to compare two routes or sites based on a certain activity or to simply provide information on an area.

Site Analysis Tool

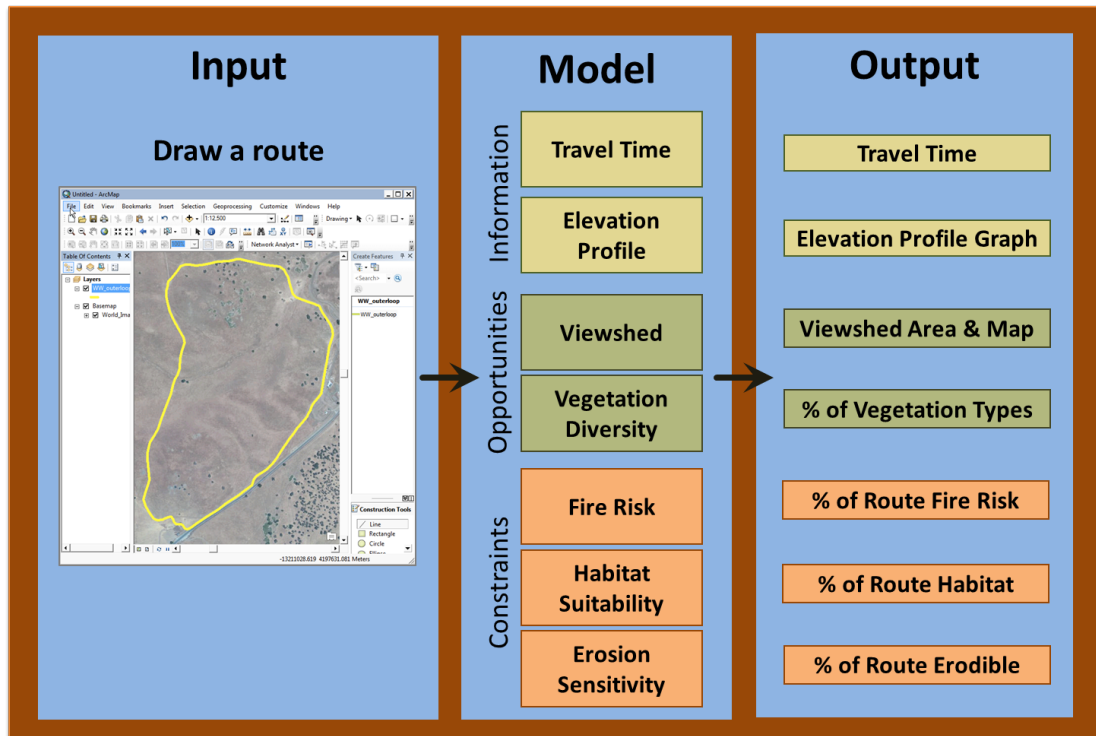


Figure 6-1 Illustration of the opportunities and constraints ArcMap model tool. The interface allows the user to select a route or area. From the selection several data attributes are considered and a report is generated providing information on each.

The rest of this chapter defines each element in more detail, our element-specific approach, and why they are relevant to the Ranch. The final section describes how the model tool works in further detail.

Informational Elements

Travel Time

To expand hiking and driving tour routes on the Ranch, the Conservancy will need to account for travel time along routes. This consideration is especially important for the Conservancy, because it can take hours to travel by vehicle across the 240,000 conserved acres on the Ranch. We developed a travel time tool that allows managers to select an access point and generate a map with hiking and driving time

contours. The tool can also be used to estimate the travel time of a route according to the selected mode of transportation - hiking or driving. Figure 6-2 below provides an example of the use of the travel time tool to create a hiking time contour map from the 300th St staging area and estimates an almost five hour hiking time for a hypothesized loop-trail starting from 300th St. The hiking travel time zones on the map can be used to adjust the trail's length for a shorter or longer hike.

For further details about the travel time tool, refer to Appendix H. Appendix H also provides hiking and driving time contour maps for the staging areas at 300th St., Sebastian, and White Wolf. These staging areas are currently where the Conservancy begins a large majority of their public access activities. As a result, additional hiking and driving routes will likely begin at these staging areas and travel time contour maps will prove useful when doing so.



Hiking Travel Time Zones from 300th St

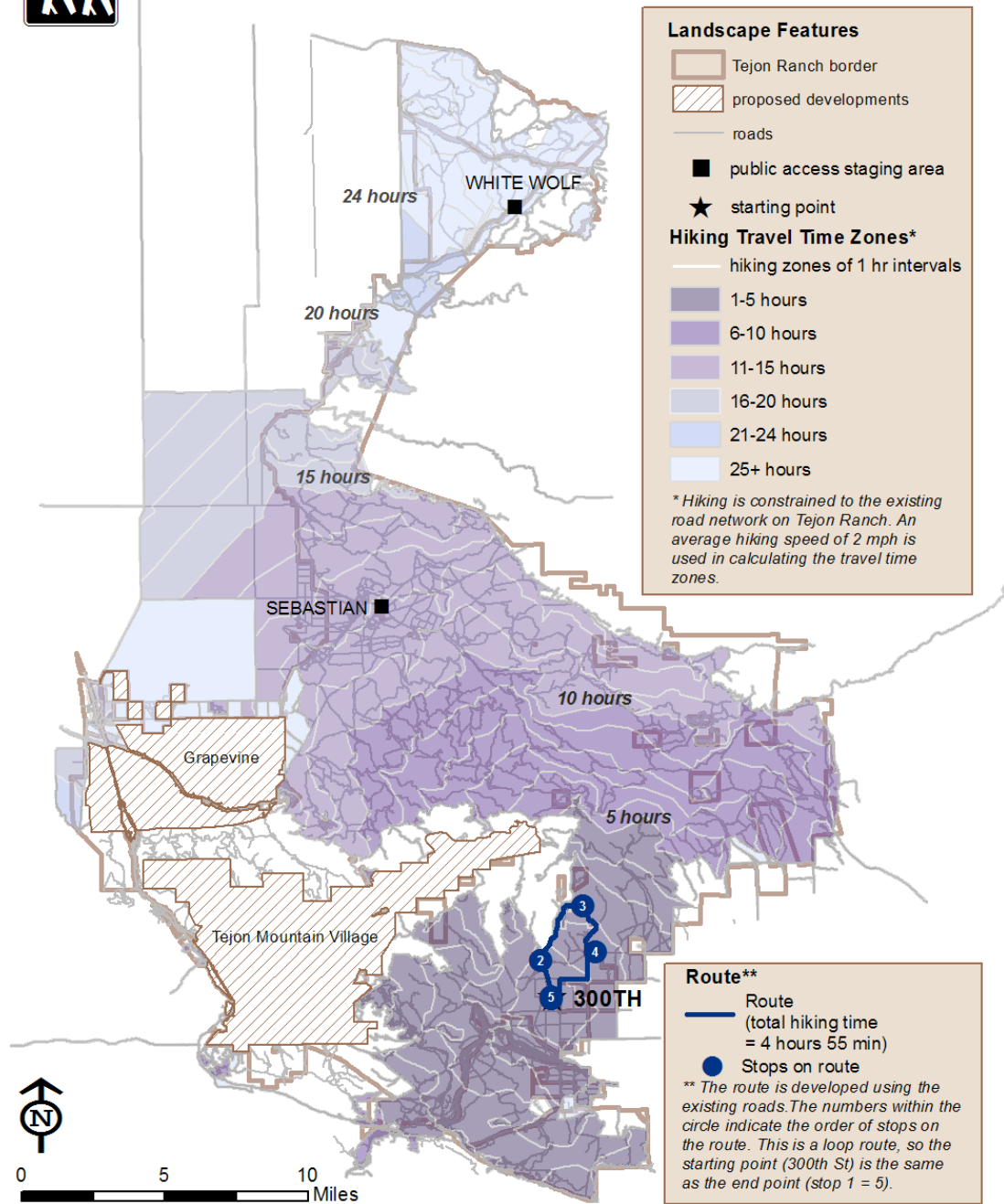


Figure 6-2 Using our customized Network Analyst tool for Tejon Ranch, a new hiking route on existing Ranch roads from the 300th St. staging area was created. The hiking travel time zones are used as a guideline to help estimate the desired length of the new route.

Elevation Profile

Elevation profile graphs are used to show elevation gain and/or loss along a route. The graphs are especially useful for conveying the difficulty of a hiking trail, and can be published along with the description of a hike for the public. These graphs help communicate the strenuousness of different hiking routes to visitors before they sign up.

We devised a simplified process for creating elevation profile graphs. Like our other models, a route must first be selected. This route is put into a model that adds elevation data to the route and outputs a table and elevation profile graph (see Chapter 7: Case Studies for examples).

This tool performs best when the route has two distinct end points or when the end points connect. If the route has a switchback, semi-loop, or more than two vertices, the output may not result in a clear elevation profile graph.

Opportunities

Vegetation

Based on our research of the regional context (Chapter 5: Regional & Private Lands Context), one of the major factors that makes Tejon Ranch unique and attractive to visitors is the diversity of vegetation communities accessible in one trip. Therefore, we included the vegetation types a route would go through as a criterion to consider when planning public access.

Approach

The vegetation type layer provided by TRC was used as is.

Results

Figure 6-3 shows 55 different vegetation types as classified by TRC. The Tehachapi Mountains appear to have the highest diversity of vegetation types. With Tejon Ranch's extensive road network, it is easy to see many routes that will be able to capture some of the diversity of vegetation on the Ranch.

Vegetation Types

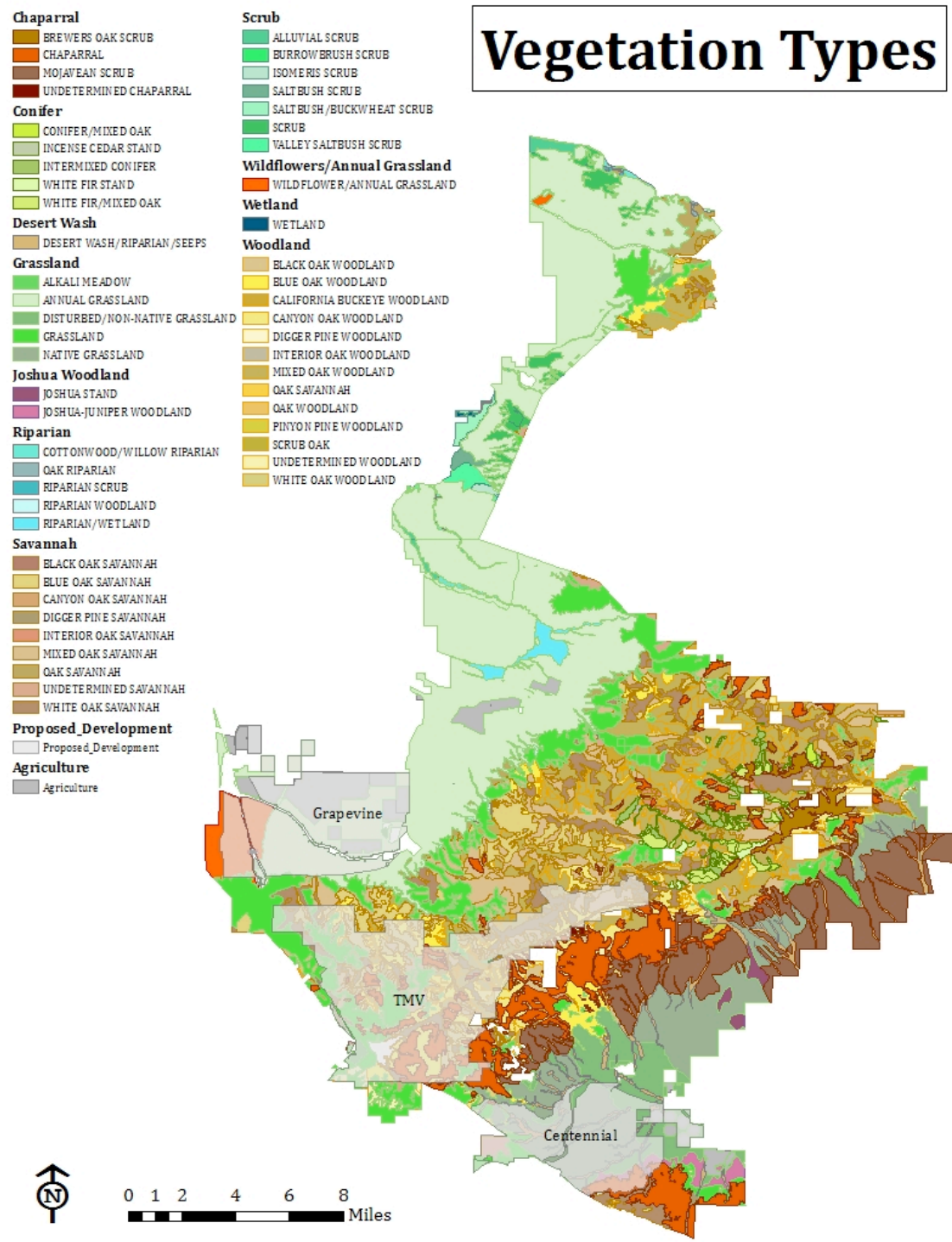


Figure 6-3 Map of Vegetation Communities on Tejon Ranch

Viewshed

Significance

Clay and Daniel (2000) point out “a major component of an encounter with the natural environment is visual or scenic quality.” Viewsheds add value to scenic quality, as studies have shown expansive views framed by interesting features—such as trees and mountains—are preferable to views with decreased depth of view (Clay & Daniel, 2000). Tejon Ranch offers numerous opportunities for expansive views of the Antelope and San Joaquin Valleys, as well as views of the Tehachapi Range, San Emigdio Mountains, I-5 corridor through the Grapevine, and the Sierra Nevada (Figure 6-4). The Viewshed component of our model will allow the Conservancy to input a selected hiking or driving route and have the model output a map showing the potential viewshed from that route. This can help the Conservancy plan hikes and driving tours, compare viewsheds along different routes, and find potential observation points.

Approach

We created a viewshed model in Model Builder of ArcGIS. The model uses the standard ArcGIS Viewshed Tool among others. The model uses an input driving or hiking route and ridgeline data to select potential observation points. We assume these observation points (intersections between the route and ridgelines) are the highest elevation points along the route, and thus have the greatest potential for viewshed quality (see Appendix L for additional viewshed models).

Our model was designed to reduce the run time of the Viewshed Tool and is best used for long routes, such as those that cross the Ranch. However, short routes that do not cross ridgelines will work in this model as well (see Chapter 7: Case Studies).

Results

Figure 6-4 shows the potential viewshed from the current public access routes. Calculation of this viewshed area shows that approximately 77% of the Ranch is visible from these routes.

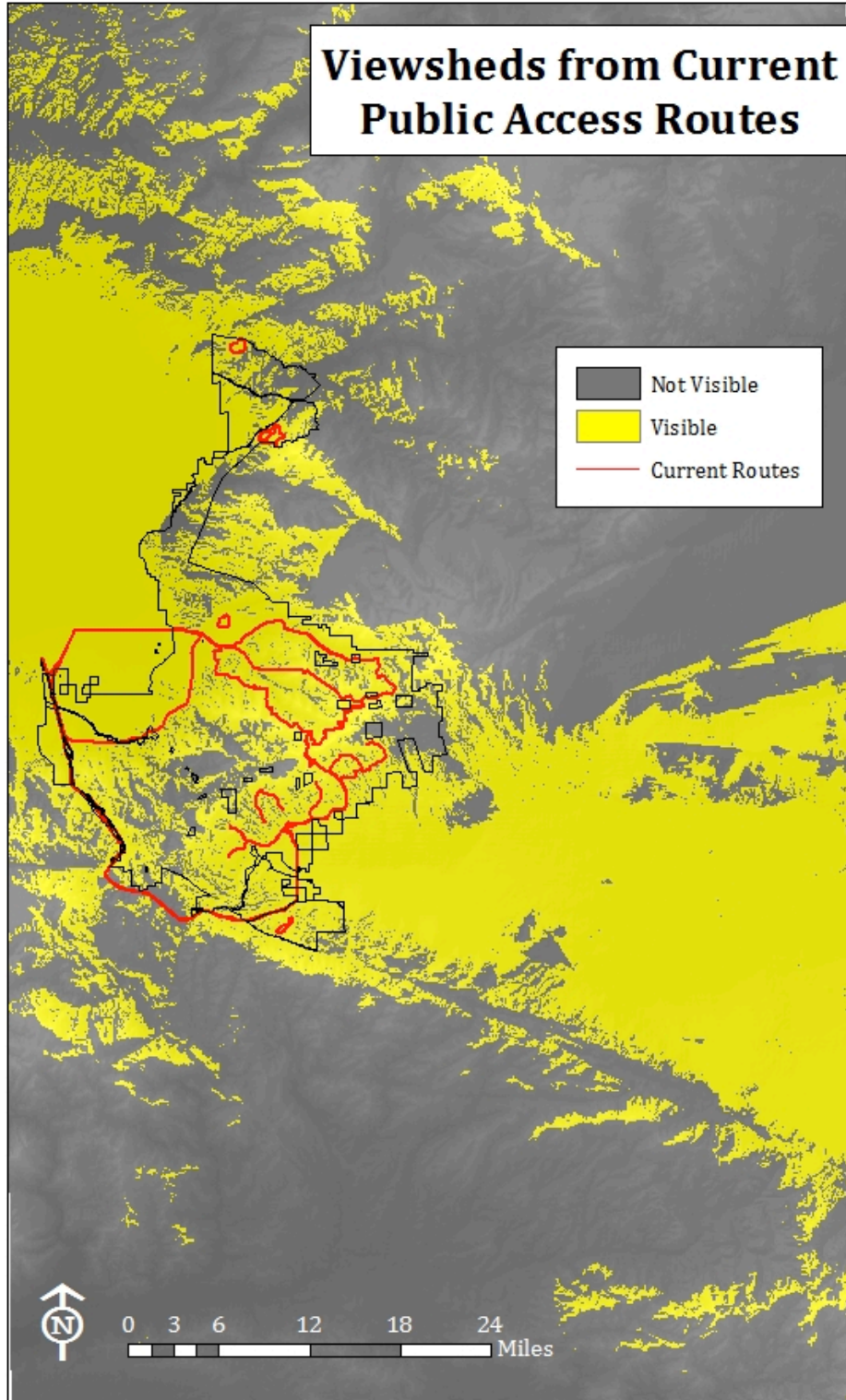


Figure 6-4. Viewsheds from all current public access routes. Yellow = viewable area.

Constraints

Erosion

Significance

Erosion and fine sediment mobilization are of concern for many types of public access. Erosion can degrade infrastructure and increase maintenance needs. Transported sediment can impact aquatic habitat, riparian areas, and wetlands. Unpaved roads, trails, picnic areas, campgrounds, and other public access infrastructure can be sources of erosion and sediment.

Clearing land to construct roads, trails, and other infrastructure concentrates water flow pathways over the surface, creating sediment sources and erosive conditions. This is mainly due to three factors: vegetation removal, organic layer removal, and compaction (Foltz et al., 2009; Ziegler et al., 2001; Singer & Bissonais, 1998). Vegetation cover slows overland flow, allows more time for filtration, and reduces rain drop impact. Plant roots and organic content also create pores and channels in surface soils that increase infiltration (Foltz et al., 2009; Singer & Bissonais, 1998). When roads, trails, and other recreation infrastructure are built it can greatly reduce surface infiltration capacity compared to that of the surrounding natural landscape (Foltz et al., 2009; Fu et al., 2010).

Reduced infiltration capacity lessens the intensity of rainstorms needed to generate surface runoff (Ziegler et al., 2001). If the surface has a gradient and water is not channeled off it, a flow's erosive energy will increase. In most disturbed bare soil areas, flow energy and rainsplash from raindrop impact are responsible for the majority of sediment transport (Fu et al., 2010).

Many factors affect erosion rates, including: the physical properties of soil, topography, antecedent moisture, rainfall intensity and duration, land use, and vegetation cover. Studies of non-surfaced trails and roads show silty clay soils can have several times greater erosion rates than gravelly soils. Generally speaking, coarser soils produce much less sediment than finer soils (Luce & Black, 1999; Olive & Marion, 2009). Another factor strongly correlated with increased erosion is the hill slope gradient (Luce & Black, 1999).

Roads

Ranch roads are one of the greatest erosion concerns on the property. The Ranch has an extensive unpaved road network, but only a couple footpaths. The

Conservancy uses roads as established hiking and driving routes across the Ranch. The Louisiana State University Agricultural Center states unpaved forest roads that are poorly placed, designed, and maintained are the largest nonpoint sources of pollution of any forest activities; roads on steep slopes, on erodible soils, or in stream crossings may have the greatest impact (LSU AgCenter, 2012). The EPA has similarly stated that road construction and use are the largest nonpoint sources of pollution on forest lands (EPA, 2012).

Several studies have looked at the effect of road maintenance and traffic on erosion rates from roads and discovered maintenance and traffic can significantly increase erosion (Foltz et al., 2009; Reid & Dunne, 1984; Ziegler et al., 2001). Pulverizing soil particles leaves the surface susceptible to surface sealing, which increases surface runoff and erosion (Singer & Bissonais, 1998). Increased road maintenance and traffic between rain events amplifies erosion rates during rain events and boosts sediment sources by detaching and redistributing soil particle (Ziegler et al., 2001).

Dirt road erosion leads to more frequent and costly maintenance, which exacerbates the pollution problem and creates more fine sediments and tailings (Ziegler et al., 2001). Although the Ranch has several factors impacting its riparian areas, fine sediment input from the road network may be a contributing impact. While riparian and aquatic habitat impacts will be localized to the few riparian areas on the Ranch, degraded roads and increased maintenance could be a more widespread problem. Public access activities may exacerbate road erosion, which in the worst cases may disrupt programing and require increased road maintenance.

Some studies of road networks noted the variability between road segments is large and the majority of sediment yield from roads—especially that contributing to streams—can be traced back to relatively few road segments (Fu et al., 2009; Luce & Black, 1999). This highlights the need to be able to identify areas of the Ranch landscape that may be more erodible than others and to consider how current and future public access may affect these areas.

Approach

To identify areas of the Ranch that may have high erosion risk, we used parameters from the Universal Soil Loss Equation (USLE), which calculates annual soil as:

$$A = R \times K \times LS \times C \times P$$

Refer to Appendix I for equation background and explanation.

To assess the erosion risk or erodibility (E) over the landscape of the Ranch, we used the erodibility factor of the soil (K) and slope factor (S) from USLE to come up with the following equation:

$$E = S \times K$$

Other USLE variables—slope length factor (L), crop cover factor (C), and rainfall factor (R)—were held constant at 1 because our goal of identifying erosion risk does not require quantifying the volume or mass of eroded material. We thus can hold the slope length constant and consider the same crop cover factor of bare dirt roads or trails. We also held R constant in our calculations, even though it varies across the Ranch, because we are interested in the erodibility of different Ranch areas under rainstorm conditions of equal intensity and duration (Appendix I: USLE Background and Explanation).

Erosion Map

A map of the terrain's erosion potential was created in ArcGIS (Figure 6-5; Appendix I: Erosion Map Details). As shown in the map, topography slope has a strong influence on erosion potential. The highest erosion potential is in the mountainous interior of the Ranch, where soils were classified with a high erodibility factor (K). Some of the most erodible areas are in the upper portion of the El Paso Creek watershed.

This map is a useful tool for narrowing the scope of public access areas. Specifically, it can be used to flag areas that may be at higher risk of erosion so they can be investigated further to determine if BMP implementation is needed. This map cannot, however, be substituted for on-the-ground investigation of specific sites.

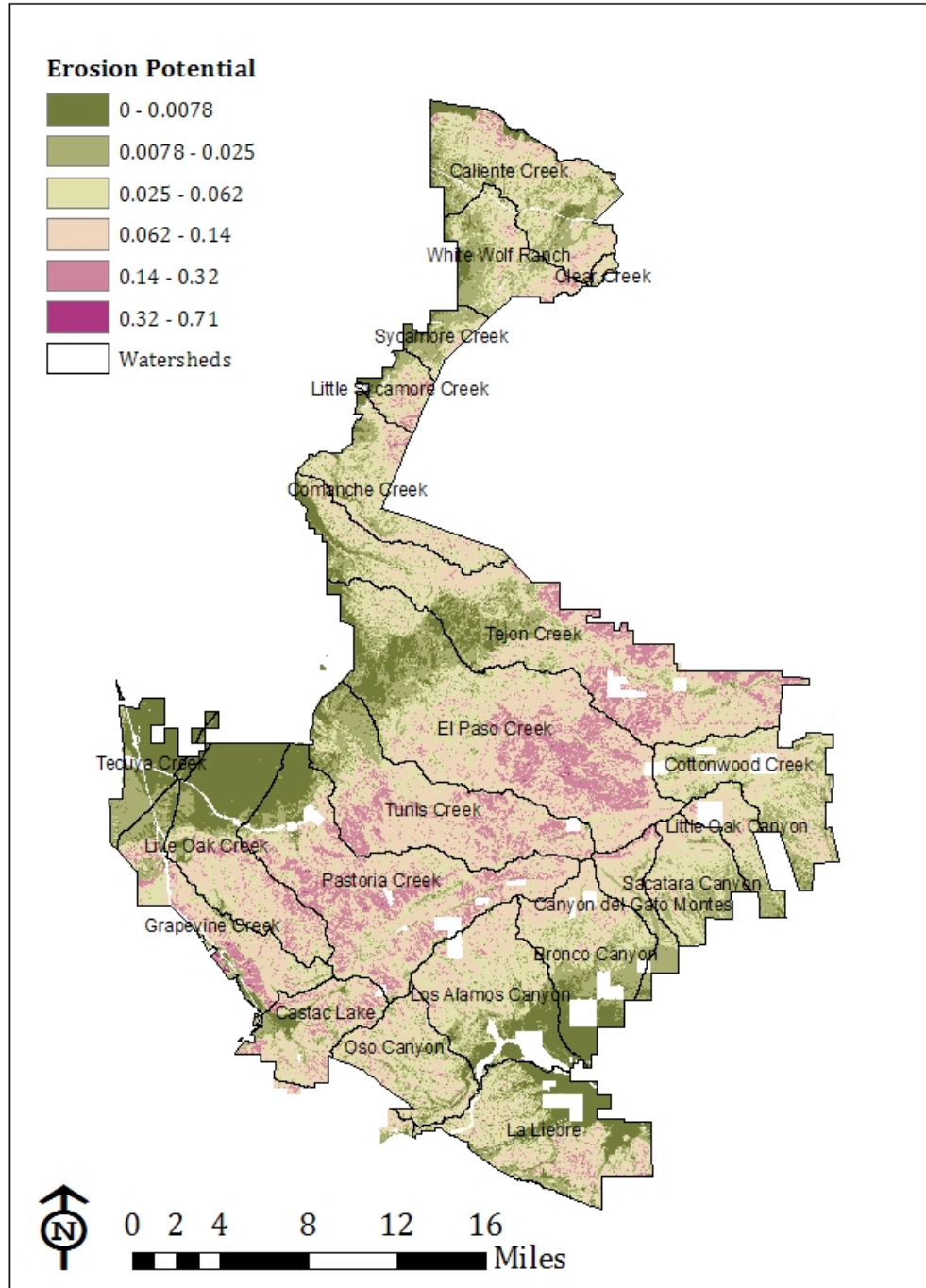


Figure 6-5. This map displays the erosion potential across Tejon Ranch based on the erodibility of the soils and the slope of the terrain. The erosion potential is classed into seven classes.

Erosion Mitigation and BMPs

There are several management approaches and BMPs that can help mitigate erosion. The USFS, US Park Service, and Bureau of Land Management (BLM) are just a few government agencies that work to reduce erosion caused by recreation and other activities. The USFS's "Pacific Southwest Region has concluded that the greatest opportunity for improving water quality [in the region] is to improve implementation of [its] BMPs, particularly for recreation activities and mining" (USFS, 2012).

BMPs to reduce soil erosion include: limit soil disturbance, retain vegetation cover, reduce traffic, and channel surface water off compacted and disturbed areas. On regularly used roads or trails that have high levels of disturbance and cannot retain vegetation cover, limit erosion by not allowing surface water to accumulate and amplify in erosive energy. Place water erosion control features, such as water bars, in areas with the highest susceptibility to erosion. Areas with steep slopes and erodible soils that have been identified as problem areas should receive these features (Refer to Appendix I for more specific erosion control BMPs).

Disturbance of Wildlife

Significance

Human presence can cause wildlife to respond with avoidance, attraction, or habituation (Whittaker & Knight, 1998). According to the Irvine Ranch Conservancy (IRC) (n.d.), these responses vary depending on the species. Flight behavior is the most common response to human disturbance, which can impact the animal's health and reproductive success. Additionally, avoidance of humans can increase stress levels in individuals and cause them to avoid using suitable habitat. Hikers appear to have the greatest disturbance with ungulates compared to other users. Off-trail hiking has greater effects than on-trail hiking (Irvine Ranch Conservancy, n.d.). IRC (n.d.) looked at correlations between human activity and seven species: coyote, bobcat, striped skunk, mule deer, raccoon, mountain lion, and gray fox. They found all seven species were negatively correlated with human activity, with mule deer having the strongest negative correlation.

Beyond the impact to individual animals, human disturbance can also have wider ranging ecological effects. Displacement or removal of top-level carnivores due to human presence can cause trophic cascades and have unforeseen consequences for entire ecosystems (Ripple & Beschta, 2006; Ripple & Larsen, 2000). Ripple and

Beschta (2006) found human visitation in Zion National Park displaced cougars, which led to higher mule deer densities. Higher mule deer densities increased browsing pressure on riparian cottonwoods, reducing their recruitment, increasing bank erosion, and reducing species abundance of both terrestrial and aquatic species. Treves and Karanth (2003) found encroachment on carnivore habitat and increased human presence on landscapes leads to greater human-carnivore conflicts, especially with inadequate understanding of predator roles in the ecosystem. These studies (Ripple & Beschta, 2006; Treves & Karanth, 2003) suggest that even a small increase in human presence can have impacts on top trophic level species behavior and existence, and result in trophic cascades.

Therefore, in planning for public access on Tejon Ranch, it is important to understand the potential distribution of wildlife. We selected the mountain lion (*Puma concolor*), bobcat (*Lynx rufus*), and American black bear (*Ursus americanus*) as representative top predators to analyze. Human recreational conflicts with American black bears have been well documented (Matthews et al., 2003). We also included the pronghorn (*Antilocapra americana*) because it was of interest to the Conservancy (M. White, personal communication, 2013).

In addition to the negative impacts human presence and disturbance can have on wildlife, TRC and the Conservancy are subject to requirements of the Tehachapi Upland Multispecies Habitat Conservation Plan (TUMSHCP). The TUMSHCP covers 27 species and has recreational restrictions specific to those species that must be taken into consideration when planning public access. Recreational restrictions for most of the species generally require avoidance of the species, minimized impacts, and education of visitors to Tejon on those species. However, the California condor (*Gymnogyps californianus*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), peregrine falcon (*Falco peregrinus*), and white-tailed kite (*Elanus leucurus*) have specific restrictions on recreation. Raptor nests are also a primary concern; each species has its own recommended buffer distance around nest sites where recreational activities should not occur until after fledging (Table 6-1). Additionally, raptors in general may be particularly vulnerable to human activities as suggested by flushing studies (Irvine Ranch Conservancy, n.d.). We included some of these bird species in our analysis.

Tejon Ranch represents 21% of condor critical habitat in California and is used for foraging, roosting, and as a link to other areas in the state (Dudek, 2012). The California condor's story of recovery provides an opportunity to educate the public

about the significant role the Ranch plays in conservation and its importance to biodiversity. The prospect of seeing a live condor also serves as an attraction for visitors because of its rarity. However, providing the public with access to condor habitat presents risks to condor populations, particularly in the form of microtrash. “Microtrash, small bits of plastic and metal, such as bottle caps, pop-tops, PVC pipe fragments, and broken glass, that are inadvertently fed to hatchlings by their parents, is an important factor affecting condor breeding activity” (Dudek, 2012). Thus, education through interpretation and handouts about what microtrash is and the harm it poses to condors as well as informational signs reminding visitors to pack out all trash will be crucial to minimizing its presence on the Ranch.

Table 6-1 TUMSCHP required nest buffer distances for recreation

Species	Nest buffer distance
Golden Eagle	0.25 miles
White-tailed Kite	500 ft.
Peregrine Falcon	1000 ft.
Bald Eagle	N/A

Finally, we included the San Joaquin kit fox (*Vulpes macrotis mutica*) and blunt-nosed leopard lizard (*Gambelia silia*) in our analysis because they are both federally endangered species.

Approach

We used the California Wildlife Habitat Relationship (CWHR) database to model habitat suitability for our species of interest on the Ranch (mountain lion, bobcat, American black bear, pronghorn, golden eagle, bald eagle, peregrine falcon, white-tailed kite, kit fox, and blunt-nosed leopard lizard).

After reviewing the distribution for each species and verifying them against life history accounts, we omitted the California condor, American peregrine falcon and bald eagle because the output did not appear realistic. We clipped the pronghorn to the Antelope Valley portion of the Ranch and the kit fox and blunt-nosed leopard lizard to the San Joaquin portion because they are not known to exist on the Ranch outside those areas (F. Davis & S. Pipkin, personal communication, 2013). We created layers of high habitat suitability for each species by selecting vegetation types with at least a 0.66 suitability score, with the exception of white-tailed kite,

where the suitability score was lowered to at least 0.55 because the output appeared too restrictive (refer to Appendix J for more detailed methodology and data manipulation).

Results

Based on analysis outputs, much of the Ranch is highly suitable potential habitat for at least one species (Figure 6-6). When interpreting the maps, it is important to keep in mind these maps are meant to serve as a coarse guide to alert the Conservancy where species sensitive to recreation may occur so they can proceed with caution when planning activities in those areas. Surveys of raptor nests are needed to identify the actual locations of nests in order to abide by the TUMSCHP restrictions. The higher elevations of the Tehachapi Mountains appear to be highly suitable potential habitat for mountain lions and American black bears, while bobcats have a wider potential range across the Tehachapi Mountains and the higher elevations in the eastern portion of White Wolf. Highly suitable potential areas for white-tailed kite reproduction and golden eagle reproduction overlap much of the bobcat habitat. The kit fox and blunt-nosed leopard lizard also share potentially highly suitable habitats in the grasslands of the San Joaquin Valley up through White Wolf.

Potentially Highly Suitable Habitat for Select Species on Tejon Ranch

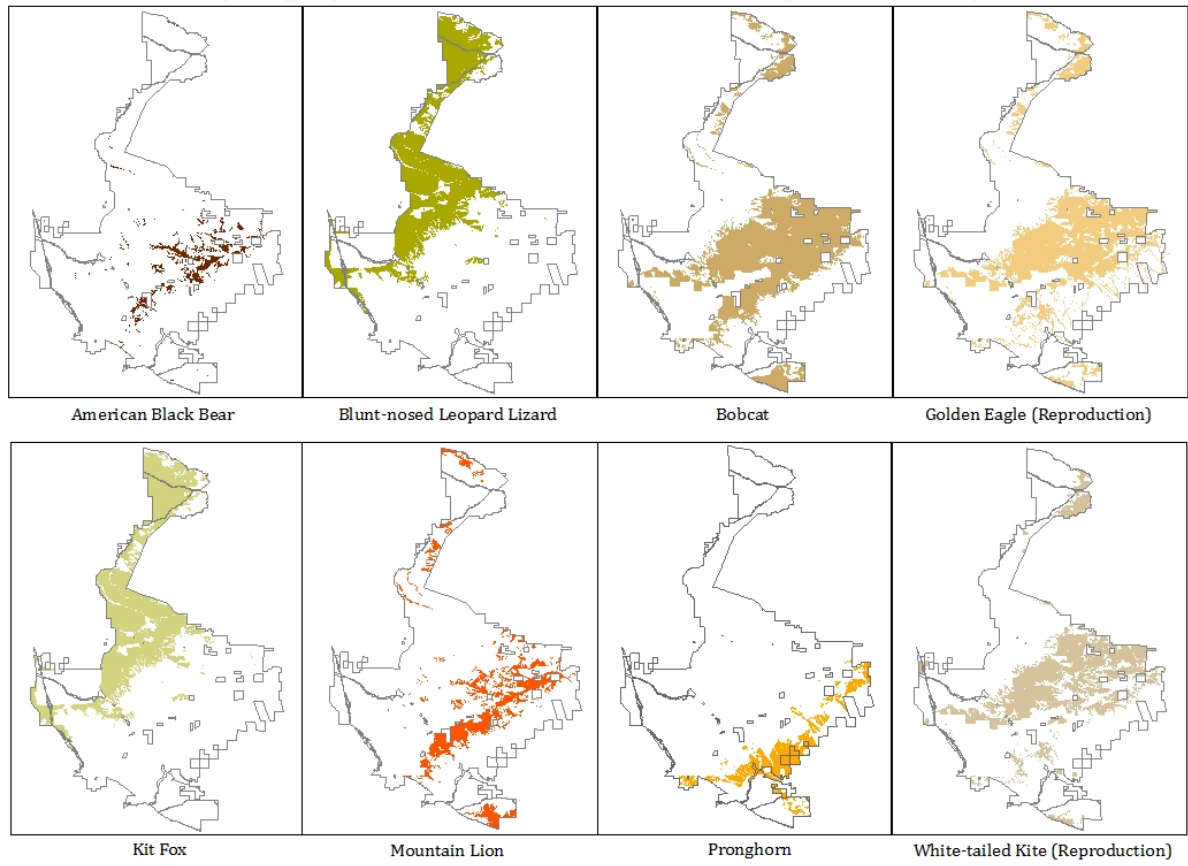


Figure 6-6. Potentially highly suitable habitat for 8 species on Tejon Ranch using the CWHR database. These maps serve only as a general guide and require ground-truthing.

Discussion and Recommendations

The IRC (n.d.) found wildlife exhibited strong avoidance behaviors to all modes of recreation. Pedestrians had the strongest negative impact on wildlife, followed by bikes and vehicles, and horses with riders had the least negative impact. Therefore, the level of caution for planning trips in these habitats may vary depending on the mode of activity (hiking, vehicle tour, biking, or horseback riding).

The IRC (n.d.) made several recommendations to minimize impacts on wildlife based on their results. The IRC, where their study was done, staggered and rotated access to balance providing public access and allowing the area to recover (Irvine Ranch Conservancy, n.d.). Because wildlife tend to avoid areas where humans have been for the day, IRC also concentrated access to particular sites or areas so the impact only affects the wildlife in that area for a day. Concentrating access helps minimize exposure of wildlife to humans over space and time. After a high level of access for a day, the area was allowed to rest for three days to allow the wildlife to return. Additionally, the IRC recommends setting a daily maximum amount of public activity (Irvine Ranch Conservancy, n.d.). The Conservancy can follow these recommendations along with an adaptive management approach to monitoring and adjusting activities to wildlife sensitivities (See Chapter 9: Adaptive Management).

Fire

Increased human presence through public access could increase the risk of ignition on the Ranch (Baumgarten et al., 2012). This risk will be even higher with the establishment of the future developments, TMV and Centennial. Vehicles are one of the highest sources of fire ignition on the Ranch, second only to unknown and miscellaneous sources (Baumgarten et al., 2012). Vehicle tours and other activities will increase vehicle traffic on the Ranch and likely increase the risk of ignition. Other potential sources of ignition from public access may include cooking, campfires, and smoking (Babrauskas, 2005). While smoking is not allowed on the Ranch, cooking and campfires (outside of Kern County fire season) may be allowed on the PCT (T. Maloney, personal communication, 2013) and will be a concern if camping is added to public access programming.

The seasonality of public access and fire are also important considerations. Most public access activities are expected to occur in spring and fall because summer temperatures are too hot and winter limits road accessibility (S. Pipkin, personal communication, October 12, 2012). Fire season on Tejon Ranch begins in early

summer (Minnich, 1980). However, fires in fall tend to be larger compared to summer (Baumgarten et al., 2012). Therefore, fire risk is an especially important consideration for public access in fall.

If ignition were to occur, potential fire severity is an important consideration because it reflects the amount of organic matter consumed by the fire (Keeley, 2009). Severity is likely correlated to the ease or difficulty of controlling a fire. For example, a stand-replacing fire in grassland would be less severe compared to a stand-replacing fire in a conifer forest because the latter has much more organic matter—and thus higher fuel loads—to burn in a conifer forest. Therefore, we evaluated both ignition risk and potential fire severity.

A previous Bren Group Project by Baumgarten et al. (2012) entitled *Developing Fire Management Strategies in Support of Adaptive Management at Tejon Ranch, CA* specifically addressed fire management on the Ranch. Our report simply addresses the relative risk of an area or route based on vegetation mapping, and does not go into in-depth fire management strategies. For Ranch fire risk and management details refer to Baumgarten et al. (2012).

Methods

Evaluating fire risk is a complex process with many factors to consider. Parameters for the National Fire Danger Rating System include fuel moisture content, duration of precipitation, fuel type, fuel load, slope, and wind (Cohen & Deeming, 1985). While it is beyond the scope of this project to perform a complete fire risk analysis on the Ranch, it is important to get a sense of general fire risk when planning public access activities. Therefore, we developed a general rating scheme for ignition risk and potential severity of general vegetation types on the Ranch based on Baumgarten et al.'s (2012) report on fire management strategies at the Ranch (Table 6-2) These ratings do not consider topography or weather. Our reasoning behind these ratings can be found in Appendix K. Table 6-2 was joined with the vegetation layer to produce a fire ignition risk map and a potential fire severity map (Figure 6-7 & Figure 6-8).

Table 6-2. Ignition risk and potential severity of general vegetation communities on Tejon Ranch based on Baumgarten et al. 2012; H=High, M=Medium, L=Low. General Vegetation Communities based on general classification used in the vegetation layer provided by Tejon Ranch.

General Vegetation Community	Ignition Risk	Potential Severity
Chaparral	M	H
Conifer	M	H
Grassland	H	L
Joshua	L	L
Open Woodland	H	L
Riparian	L	H
Savannah	H	L
Scrub (on San Joaquin side)	L	M
Desert Wash	L	L
Wetland	L	L
Wildflower/Annual Grassland	H	L
Woodland	M	L

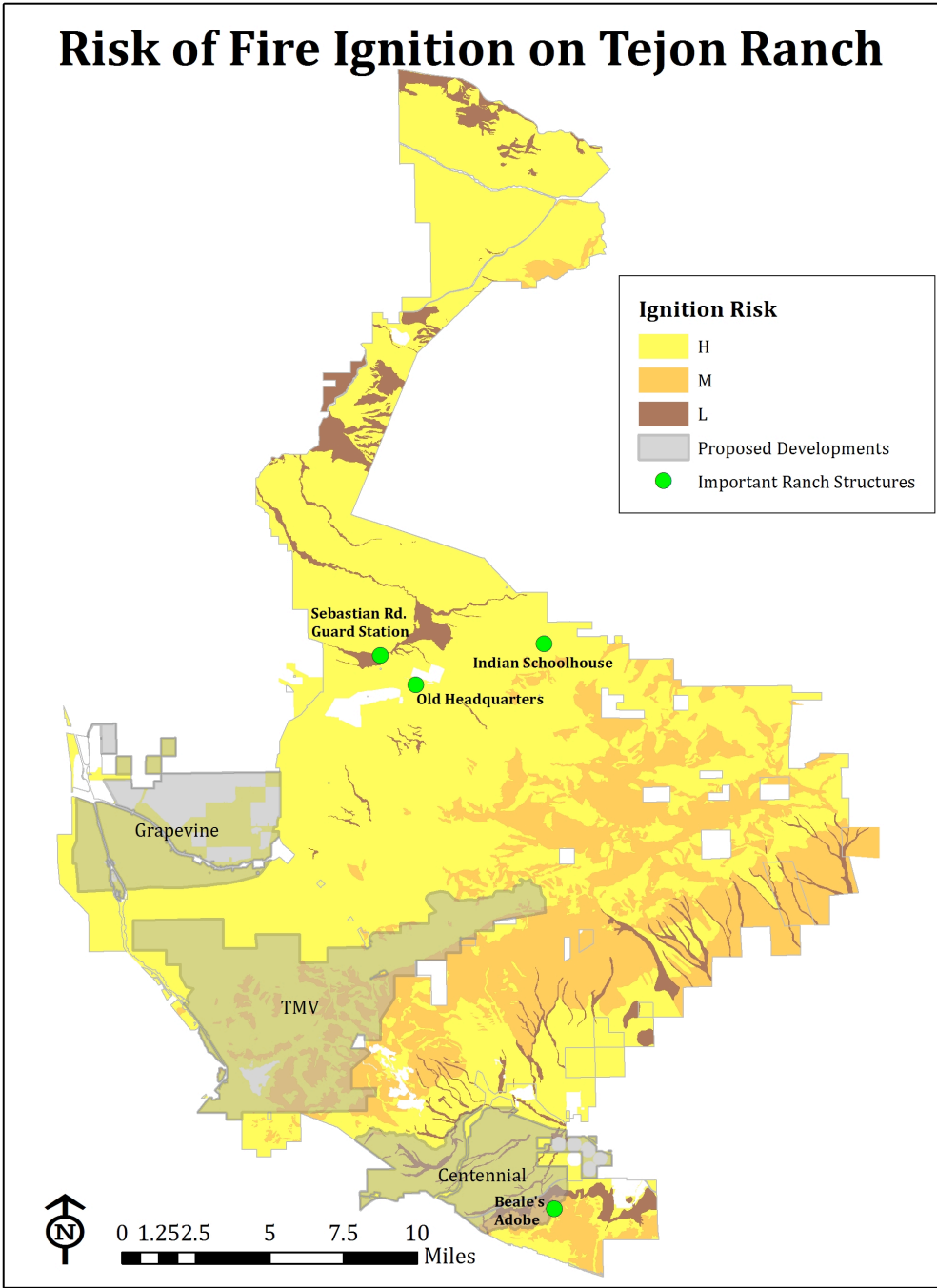


Figure 6-7. Fire ignition risk on Tejon Ranch. Brown represents high risk, orange represents medium risk, and yellow represents low risk. The green dots represent some of the important structures on the Ranch, but not all structures are represented.

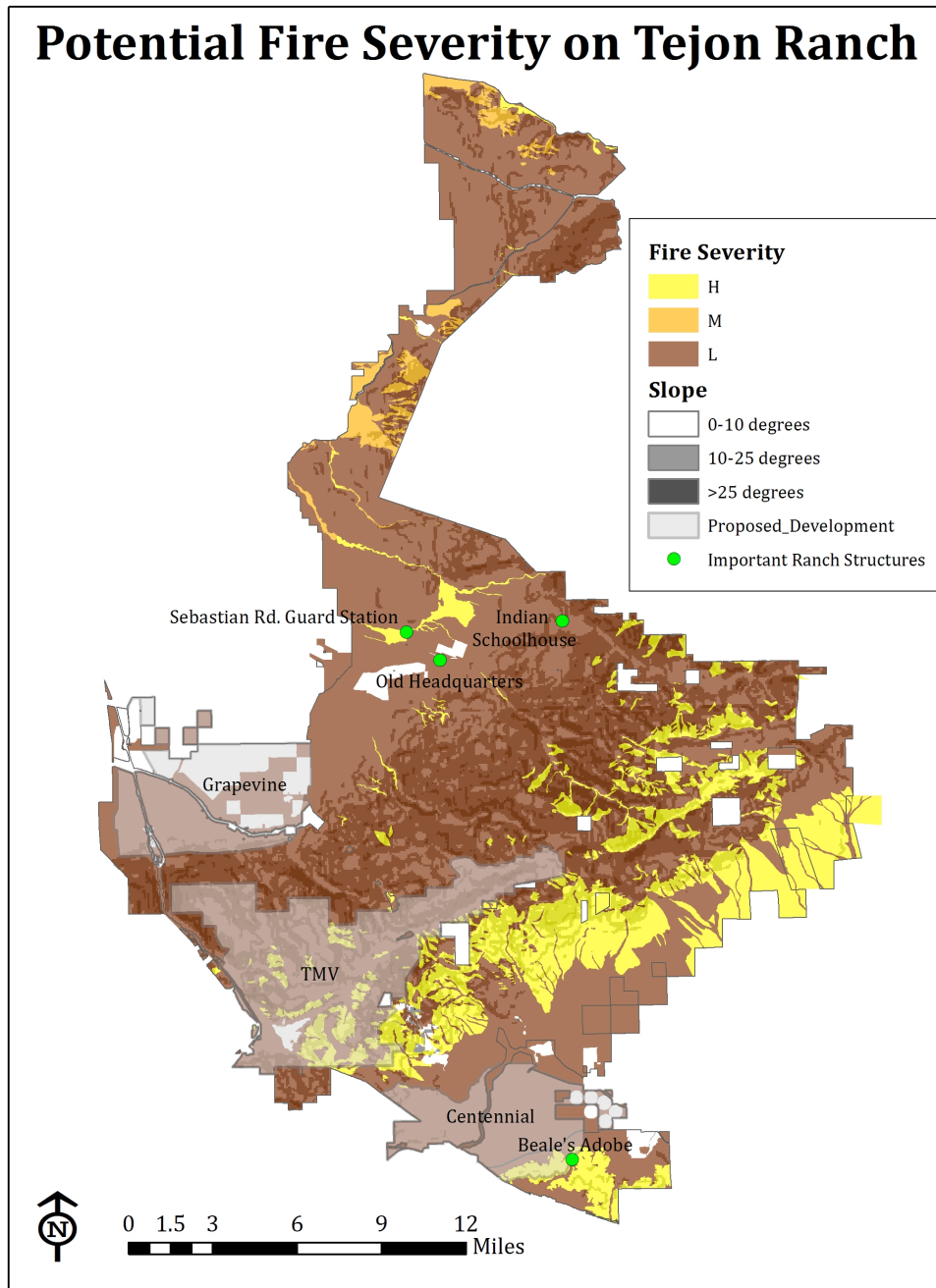


Figure 6-8. Potential fire severity on Tejon Ranch. Brown represents areas with potentially high severity, orange represents potentially medium severity, and yellow represents potentially low severity. The green dots represent some of the important structures on the Ranch, but not all structures are represented. Within each color, lighter areas represent slopes of 0 to 10 degrees, medium shaded areas are 10 to 25 degrees slope, and darker areas indicate slopes greater than 25 degrees. The steeper the slope, the faster fire will spread and the more difficult it will be to control.

Results

Ignition

Figure 6-7 shows much of the Ranch has high ignition risk because most Ranch terrain consists of grasslands, open woodlands, and savannahs. High ignition risk is especially important to consider with fall activities because larger fires tend to occur during that season (Baumgarten et al., 2012). Much of the southern slopes of Blue Ridge are of medium ignition risk because they are predominately covered by chaparral. However, it is important to consider southern slopes and ridgetops are more fire-prone and may increase the ignition risk of these chaparral areas during the dry season (Baumgarten et al., 2012).

Severity

Figure 6-8 shows if a fire were to start, much of the Ranch would burn with low severity. However the southern slopes and ridge tops of the Tehachapi Mountains that consist predominately of chaparral and conifers and the chaparral in the High Desert Hunt Club area are prone to potentially severe fires. Were a fire to start in these areas, it would be difficult to control and extinguish because of topography and high fuel loads.

Terrain

Darkened areas in Figure 6-8 indicate areas with steeper slopes, which increase the rate of fire spread. Butler et al. (2007) found no increase in fire spread rate for slopes of 0 to 10 degrees, a slight increase at slopes of 10 to 25 degrees, and a rapid increase in the spread of fire at slopes greater than 25 degrees. Therefore, areas with no shading have the lowest risk of spread (0 to 10 degree slope), areas with moderate shading have medium risk of spread (10-25 degree slope), and areas with dark shading have high risk of spread (25+ degree slope).

Important Ranch Structures

In addition to ignition risk, potential severity, and terrain, we looked at the location of a few important ranch structures—future developments, the Old Schoolhouse, Beale Adobe, Old Headquarters, and Sebastian Road Guard Station. All of these structures are at or near high ignition risk areas. Most of these areas have vegetation and topography that a fire would potentially burn with low-severity; the presence of these structures increases the severity because of the potential loss of those structures. Therefore, precautions should be taken to install fuel breaks to protect the structures as well as to increase caution when planning public access in

these areas. While this list is not comprehensive, it provides an example of things to consider with regard to fire and buildings on the Ranch.

Discussion and Recommendations

Because our fire risk analysis on the Ranch is based solely on general vegetation types, it is a very simplistic view of fire risk. However, we believe it is sufficient to provide general guidance for precaution when planning public access activities, particularly during drier periods where fire risk is inherently greater. To get a more accurate assessment of fire risk, many other factors need to be taken into consideration, including topography, wind and weather patterns, and season of access.

Because of the high ignition risk on much of the Ranch, the Conservancy should continue to take precautions in carrying fire extinguishers and shovels with vehicles to extinguish fires if ignition occurs. The smoking ban should continue on the Ranch. Visitors—particularly those who may be camping on the PCT—should be educated about fire risks and reminded to be sure campfires are fully extinguished (if allowed outside of Kern County fire season) and to be careful with cooking stoves. During Kern County fire season, campfires should not be allowed.

Public Access Opportunities & Constraints Model

The model works by using a selected route or area as an input. Figure 6-1 illustrates the basics of the model. Once the route and activity are selected, the model will place a buffer on the route or area and determine the erosion sensitivity, species habitat suitability, fire ignition and severity, and vegetation cover attributes within the buffer. These attributes are based on input data from the above analyses and vegetation mapping. The model also calculates the viewshed and elevation profile of the area or route.

The final model output reports the distance and travel time, the viewshed area from key vista points, the percentage of the buffer area with different erosion, species, and fire concerns, and the percentage of the buffer area with different vegetation types. Additionally, the model will generate a graph of the elevation profile and a map of the viewshed area.

The Conservancy can run this model on one route to get a sense of the potential impacts the route may have. By comparing the outputs of two routes, the Conservancy can select the route with less potential impacts. Chapter 7: Case

Studies provides examples of this model's output and how it can be used to guide public access planning. However, this tool is not intended to be definitive of the route impacts and the Conservancy should continue to ground-truth routes as part of their public access planning. This model does, however, provide a way for the Conservancy to narrow down the countless route options as well as guide the Conservancy's focus for ground-truthing potential routes.

Chapter 7: Case Studies

Introduction

We provide the Conservancy with a few case studies to show how our research, model, and recommendations can be used to plan for specific access sites and activities on the Ranch. The case studies include:

- 1) The crest segment of the proposed Pacific Crest Trail (PCT) realignment
- 2) A loop-trail near 290th St. in the Antelope Valley
- 3) A loop-trail at White Wolf

PCT

As a result of the RWA, the PCT will be re-routed through the Ranch and onto the crest of the Tehachapi Mountains. While the proposed realignment goes through several areas of the Ranch, our case study focuses on the section that traverses the crest (Figure 7-1) from Campground 1 to Campground 3 before the trail goes into Cottonwood Creek. This section of trail goes through the TUMSHCP area and the Condor Study Area (CSA). The CSA is the area of predominant use by the condor and is of particular concern for microtrash and other effects on the endangered bird. However, as previously explained, condors are not included in our analysis.

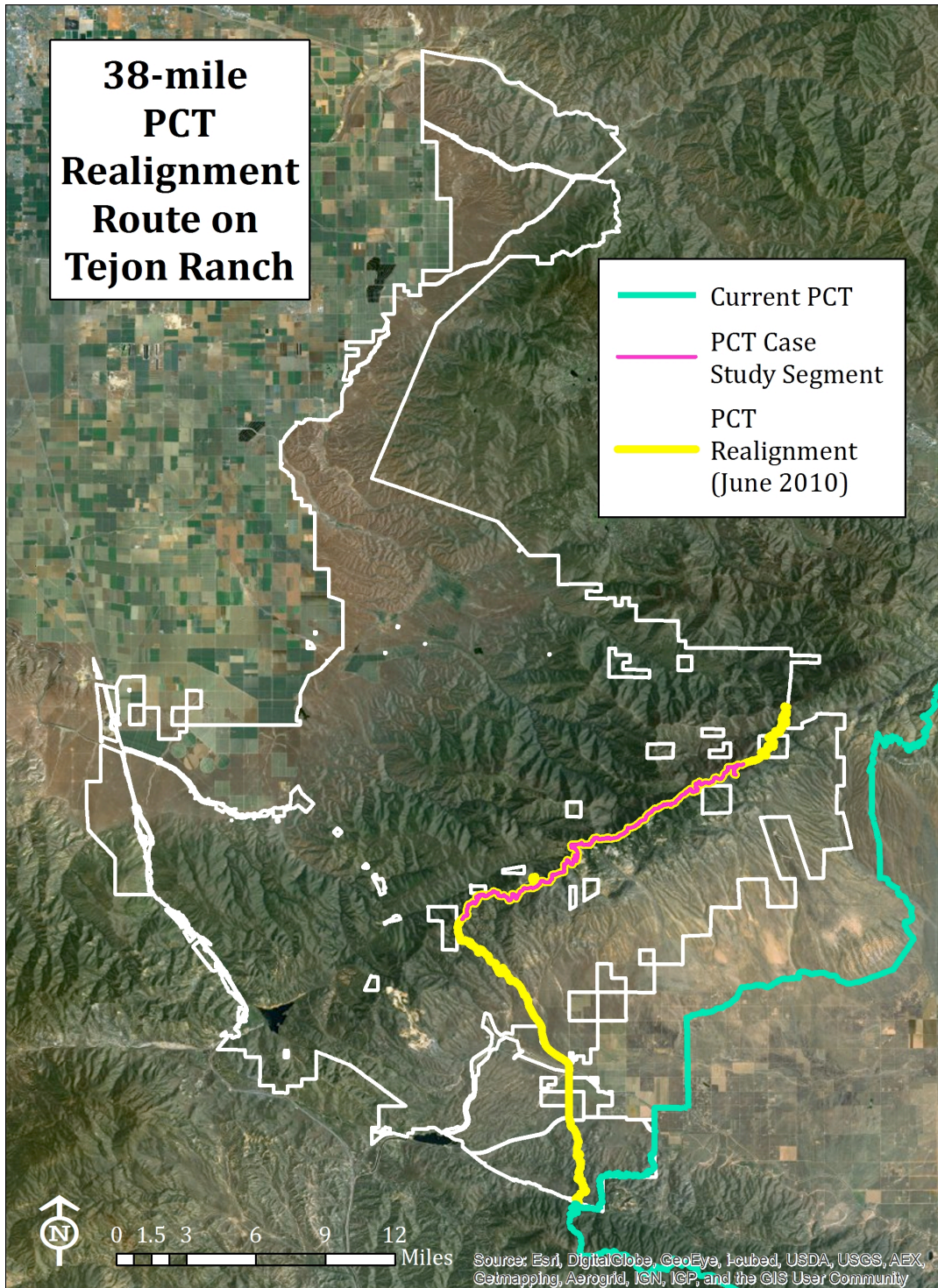


Figure 7-1. 38-mile realignment of the Pacific Crest Trail on Tejon Ranch. Case study segment is highlighted in purple.

Model

Travel Time (South to North)

This segment of the PCT stretches approximately 17.3 miles. Assuming an average hiking speed of 2 miles per hour, the trail is expected to take about 8.5 hours with continuous hiking. With an average horseback riding speed of 4 miles per hour, an equestrian user of the PCT should expect to take just over 4 hours of continuous riding to complete this section (Table 7-1).

Table 7-1. Travel time durations for hiking and horseback riding on a 17-mile segment of the PCT realignment.

Mode of Recreation	Average Speed (miles per hour)	Duration of Travel
Hiking	2	8 hours 32 minutes
Horseback Riding	4	4 hours 16 minutes

Erosion

Much of this segment has an erosion risk of 2 or 3, which indicates a relatively low to moderate risk of erosion (perhaps because it is on the ridge of the mountains) (Table 7-2). However, attention should be paid to those areas where the erosion risk is at 4 or 5 to prevent actions that may increase erosion in those areas (Figure 7-2).

Table 7-2. Erosion risk for 17-mile segment of the PCT.

Erosion Risk (1=Low; 6=High)	Area (m ²)	Percentage of Route
1	500,775	10
2	2,381,366	46
3	1,875,685	36
4	405,449	8
5	45,367	1

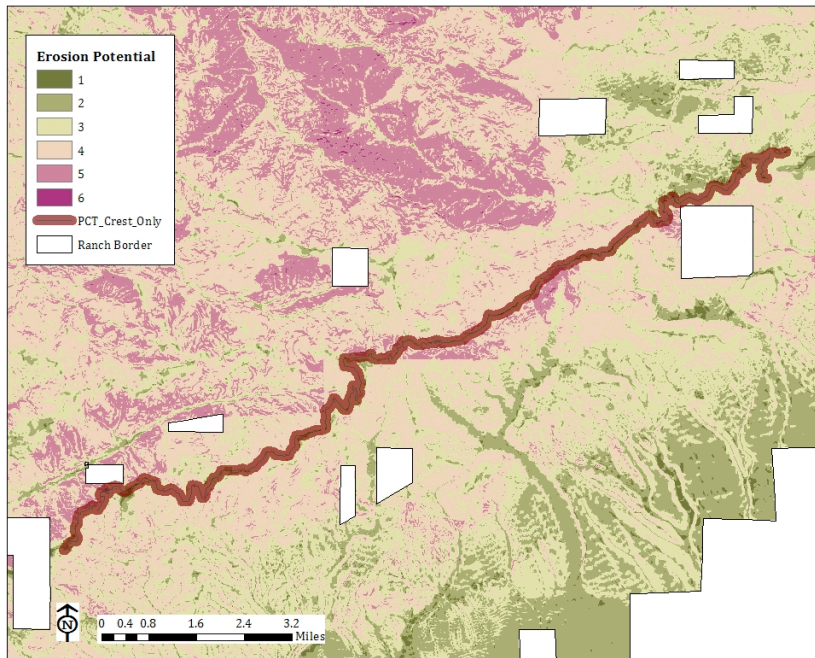


Figure 7-2. Erosion potential along the PCT Case Study Segment. Pink areas indicate high erosion potential and green areas indicate low erosion potential.

Wildlife

Much of this route is potentially highly suitable mountain lion and bobcat habitat (Table 7-3). Therefore, it may be advisable to avoid hiking or horseback riding at dawn or dusk on this segment when these species are most active. If PCT users are hiking during dawn or dusk, they should take caution. A majority of this area is also potentially highly suitable golden eagle reproduction habitat. Thus, a nest survey should be performed to identify any nests along this segment so that trail use can abide by the requirements set forth by the TUMSCHP (i.e. recreation should be ¼ mile away from any active nests).

Table 7-3. Percentage of 17-mile PCT realignment segment that is potentially highly suitable habitat for selected species. Percentages do not add to 100% because of overlapping habitats between species.

Species	Area (m²)	Percentage of Route
Mountain Lion	3,984,045	76
Black Bear	1,847,704	35
Bobcat	5,214,184	100
White-tailed Kite (Reproduction)	1,230,139	24
Golden Eagle (Reproduction)	3,077,843	59

Fire

Because much of the PCT goes through chaparral, oak woodland, and conifers, the ignition risk in the area is mostly medium with a few patches where it is high (Table 7-4). About half this area has the potential for high severity fire given the terrain and the fuel loads (Table 7-5). Ridgetops (where the PCT is located) are prone to fires (Baumgarten et al., 2012). Therefore, while the top of the ridge may be flat, the ignition risk and fire severity is compounded with the steep terrain leading to the ridgetop. Thus, PCT users should be cautious with campfires and camp stoves, particularly during fire season. There are no major structures of importance to the Ranch near the PCT, so the risk of structural damage due to fire is low.

Table 7-4. Percentage of 17-mile PCT realignment segment with low, medium, or high fire risk.

Ignition Risk	Area (m ²)	Percentage of Route
H	10,461,570	19
M	45,655,960	81

Table 7-5. Percentage of 17-mile PCT realignment segment with low, medium, or high potential fire severity.

Potential Severity	Area (m ²)	Percentage of Route
H	27,440,797	49
L	28,676,733	51

Vegetation

This segment of the PCT goes through 13 different vegetation types, which will make for a visually interesting hike with differing vegetation densities that showcase the Ranch's diverse vegetation. Much of the route goes through canyon oak woodland, chaparral, or mixed oak woodland (Table 7-6).

Table 7-6. Vegetation types traversed by the 17-mile PCT realignment segment.

Vegetation Type	Area (m ²)	Percentage of Route
Black Oak Woodland	865,835	2
Brewers Oak Scrub	11,092,650	20
Canyon Oak Woodland	14,481,430	26
Chaparral	11,672,387	21
Interior Oak Woodland	89,899	0
Intermixed Conifer	449,437	1
Mixed Oak Savannah	854,807	2
Mixed Oak Woodland	8,633,256	15
Undetermined Chaparral	136,997	0

Undetermined Woodland	79,659	0
White Fir Stand	1,926,172	3
White Fir/Mixed Oak	2,162,650	4
White Oak Savannah	3,671,386	7

Elevation Profile

The elevation profile shows an elevation change from 1358m (4455 ft) to 2040m (6693 ft), a difference of 682m (2238ft) (Figure 7-3).

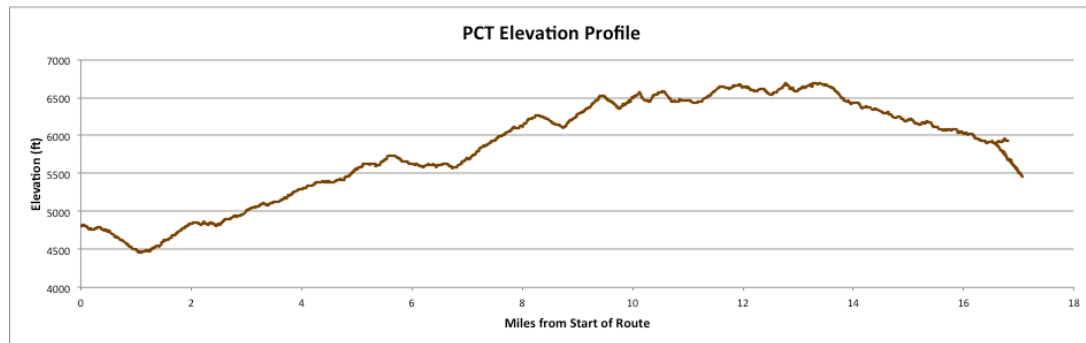


Figure 7-3. Elevation profile for 17-mile segment of PCT. The y-axis shows elevation in feet, and the x-axis shows miles from start of route.

Viewshed

The model created 23 observation points along the PCT. The combined viewsheds for these points show that the Mojave, Central Valley, areas of the Ranch interior and Sierra Nevada are visible (Figure 7-4).

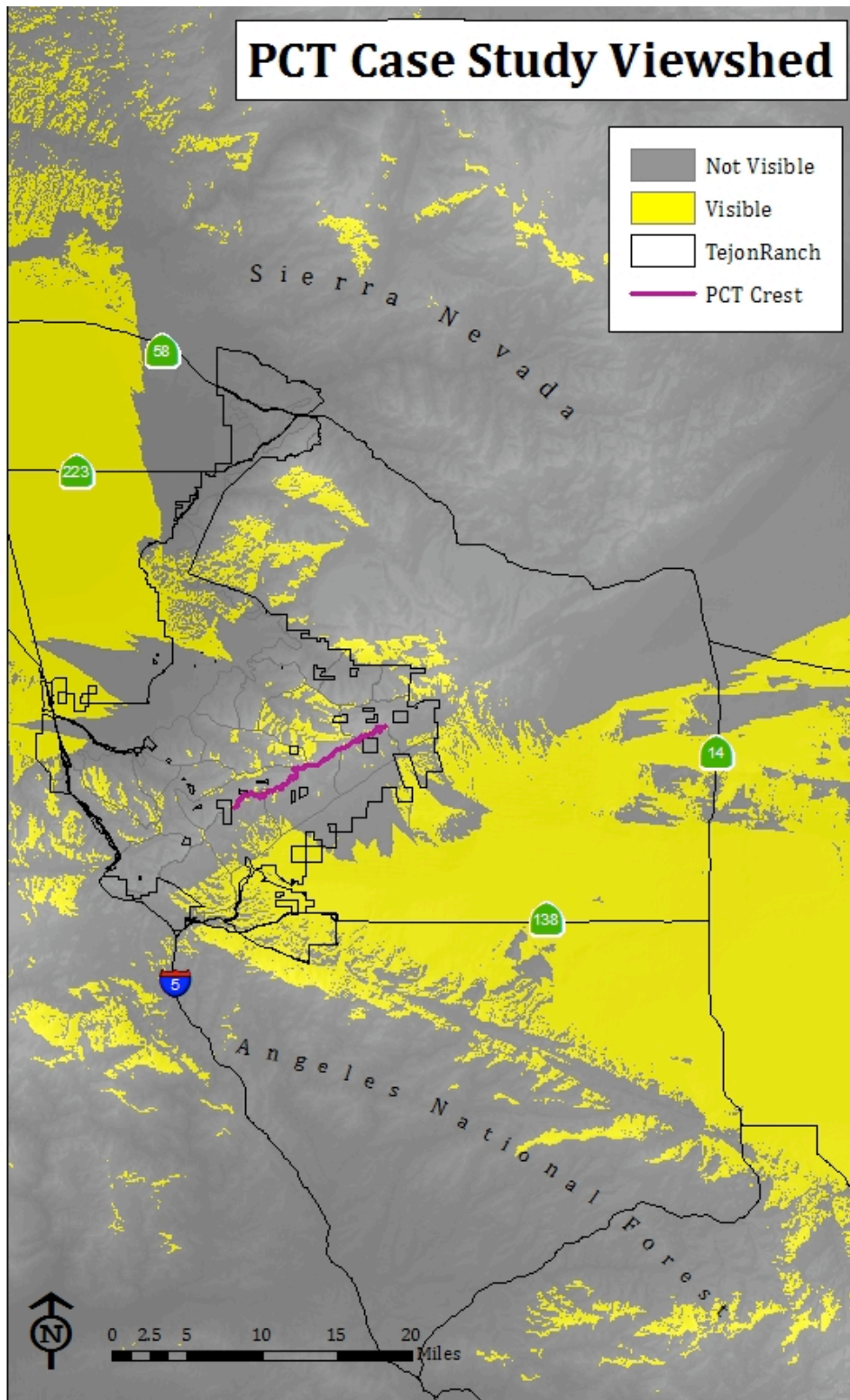


Figure 7-4. Viewshed from 17-mile segment of the PCT. Yellow = visible.

290th St.

The Conservancy is currently looking to build a short loop-trail on the Ranch for day hikers (S. Pipkin, personal communication, Dec. 13, 2012). This site was chosen for accessibility among other factors (See Appendix M: 290th St. Case Study Site Selection for site selection analysis.)

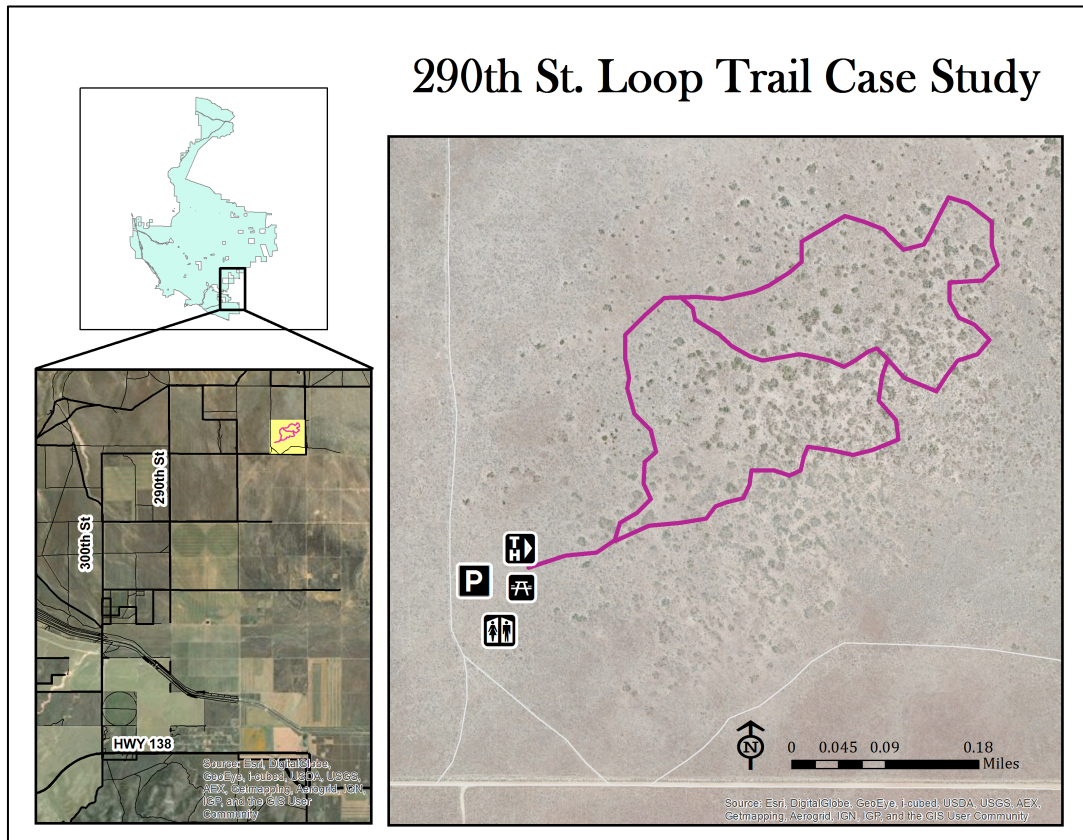


Figure 7-5. 290th Loop-trail

Model

Travel Time

The loop-trail we designed is about 1.2 miles long with an inner turnaround loop about halfway (Figure 7-5). Assuming an average hiking speed of 2 miles per hour, a visitor can expect to finish this loop-trail in 1 hour 12 minutes.

Erosion

According to our model, erosion risk is very low in this area. This aligns with our observations from visiting the site. The soils in this area have high gravel content and no observable clay. Furthermore, the slopes are very low. This result does not mean

erosion mitigation should not be considered; however, water bars and water erosion control features are unlikely necessary. The dominant type of erosion expected in this area would be trampling by visitors. Displacing soil particles and disrupting the soil structure could have adverse impacts on the desert plant communities in this area. For this reason, the best erosion control measure is a well-designed trail that confines users to the trail and has features that reduce soil particle displacement.

Wildlife

The species portion of the model, similarly to the erosion output, raised no red flags for this area. The model indicated this area is not highly suitable habitat for any of the species of concern. Therefore, no output table was produced. Again this does not definitively mean that no measures should be taken to limit wildlife conflicts. If species deemed sensitive are seen in the area, appropriate measures should be taken to not disturb them.

Fire

The trail is fully in a stand of Joshua trees with little horizontal continuity of fuels because much of the land is bare soil; thus, it has a low risk of ignition and potentially low severity if a fire were to start. Therefore, this area is at relatively low risk for fire.

Vegetation

According to the vegetation map, the trail is in a stand of Joshua trees and does not cross any other vegetation types. Although the area is of one dominant vegetation type, we ground-truthed the area and observed bunch grasses, buckwheat, and cacti, which provide character to the landscape along with the Joshua trees.

Elevation Profile

The outer loop-hike at the 290th St. site was used to create the elevation profile graph. Figure 7-6 shows an approximate elevation gain of 20 meters.

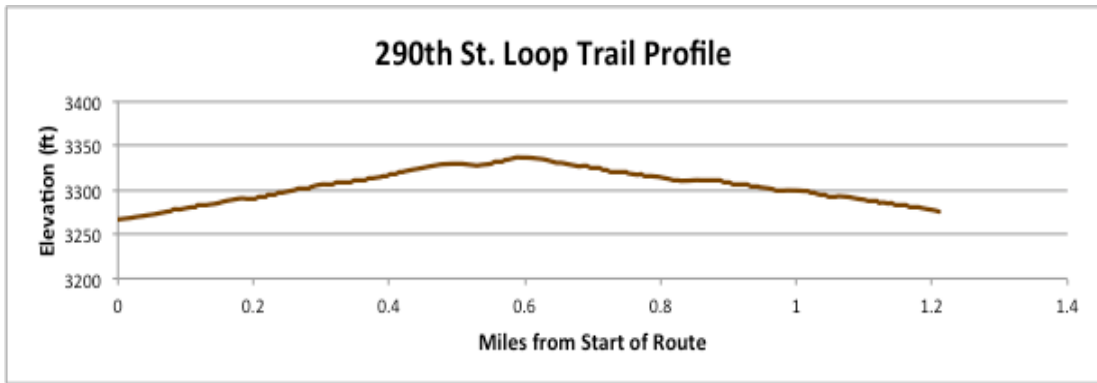


Figure 7-6. Elevation profile graph of 290th outer-loop.

Viewsheds

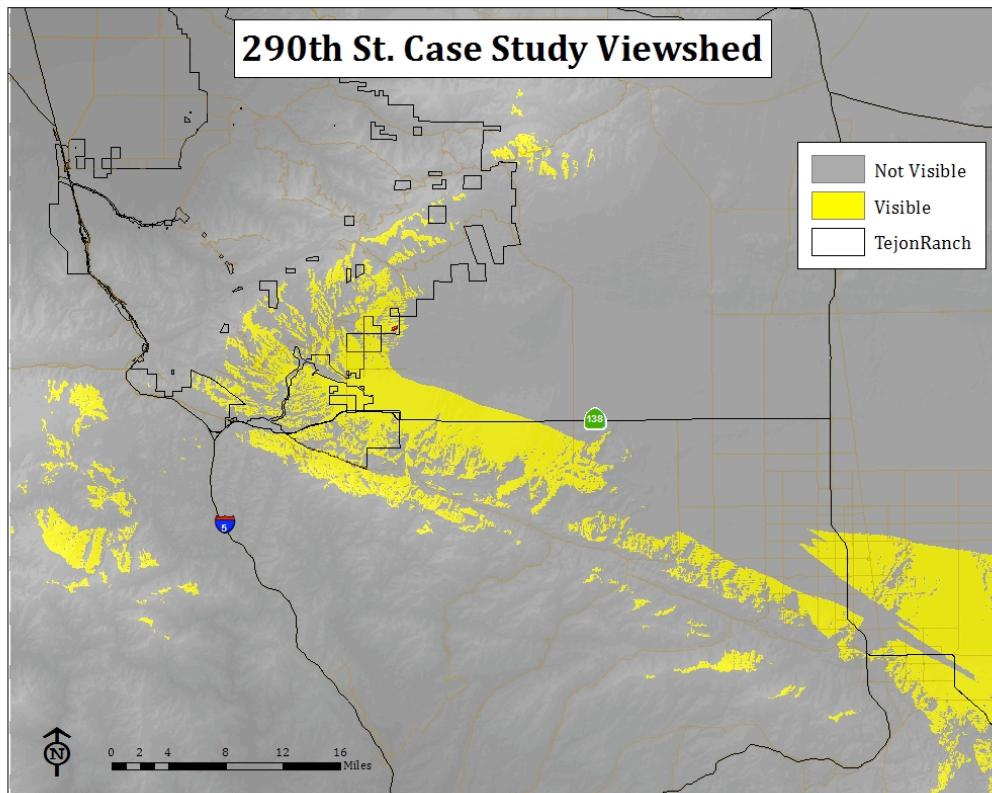


Figure 7-7. Viewshed from 290th Loop-trail.

Figure 7-7 shows the area visible from the route in yellow. The Tehachapi Mountains are clearly visible and the view stretches out across the Mojave Desert as well. The foothills in the Angeles National Forest and higher elevations in the San Emigdio Range can also be seen.

White Wolf

For comparison, we ran the model on a loop-trail in White Wolf. White Wolf is the northernmost area of the Ranch (Figure 7-8). The Conservancy seeks to utilize this area for public access because it is close to the city of Arvin and is easily accessed from Highways 58 and 223. The White Wolf loop-trail is primarily on a Ranch road. Thus, trail construction is not necessary. Our model can still be used to show opportunities and any areas of concern for public access at this site.

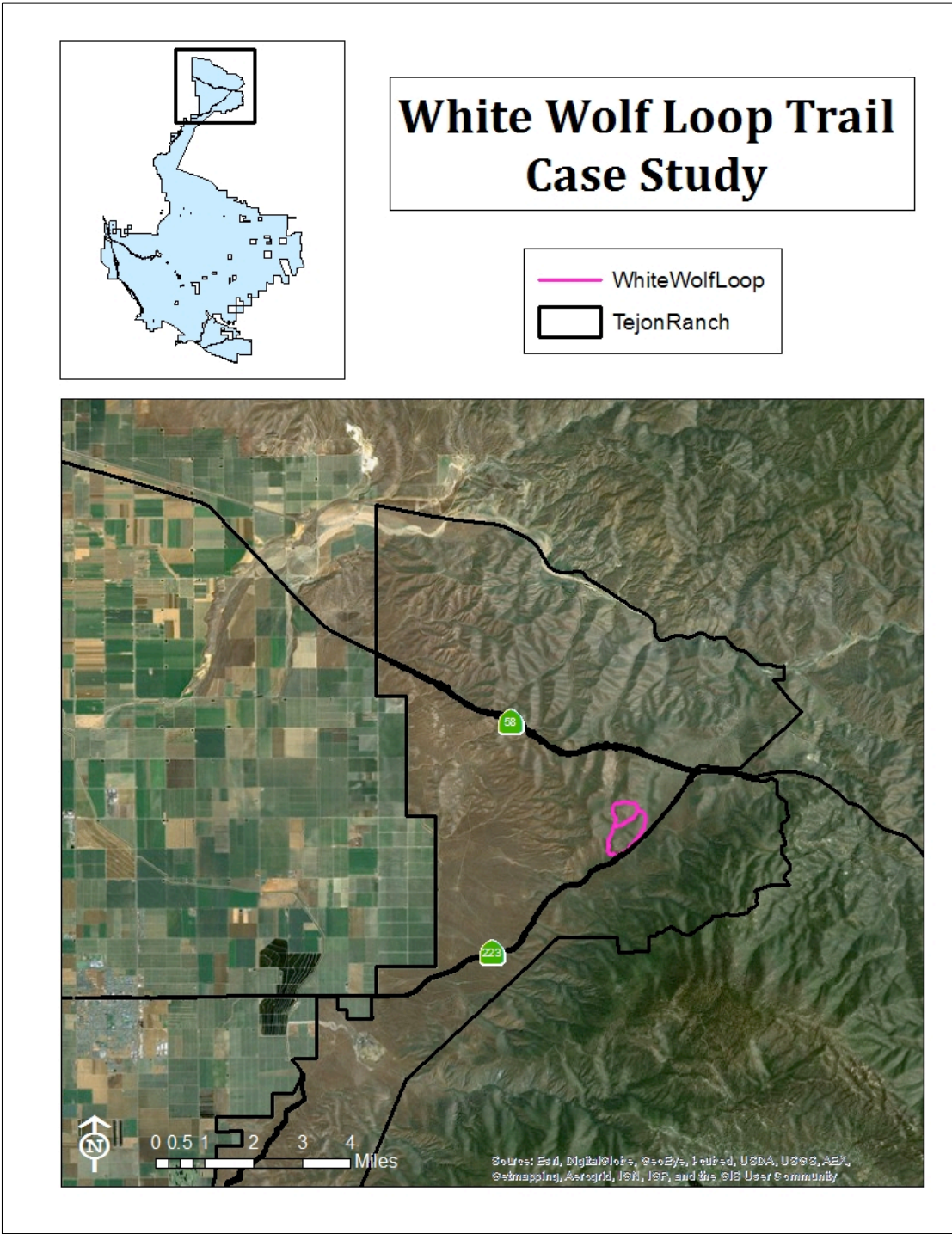


Figure 7-8. White Wolf Loop-trail.

Model

Travel Time

The loop-trail for White Wolf has an inner-loop and an outer-loop. Assuming an average hiking speed of 2 miles per hour, a visitor can expect to finish the inner-loop in less than an hour and the outer-loop within 1 hour and 18 minutes.

Erosion

Table 7-7. Erosion risk of White Wolf trail.

Erosion Risk (1=low, 6=high)	Area (m ²)	Percentage of Route
1	15,934	11
2	95,936	63
3	39,863	26
4	49	0

Much of the White Wolf trail appears to have low to moderate erosion risk. Consider erosion BMPs where needed (Table 7-7).

Species

Table 7-8. Percentage of route intersecting potentially highly suitable habitat.

Species	Area (m ²)	Percentage of Route
Kit Fox	92,027	96
Bobcat	41,118	4
White-Tailed Kite (reproduction)	41,118	4
Golden Eagle (reproduction)	41,118	4
Blunt-nosed Leopard Lizard	920,247	96

According to Table 7-8, much of the loop-trail in White Wolf is potentially highly suitable habitat for kit fox and blunt-nosed leopard lizard (about 96% of the trail for each). In comparison, the output for the 290th loop-trail did not indicate potential highly suitable habitat for any of our species of interest. However, encountering a kit fox or a blunt-nosed leopard lizard in this area is unlikely (S. Pipkin and M. White,

Personal Communication, Mar. 15, 2013), which demonstrates the limitations of our tool based on the coarse CWHR data we used and the need for ground-truthing outputs. Finer-scaled data will allow for more precise estimates of suitable habitats for wildlife.

Fire

Because the trail is only in grasslands, it has a high risk of ignition and potentially low severity if a fire were to start. Therefore, precautions should be taken to prevent ignition from occurring, particularly in the dry season.

Vegetation

The White Wolf loop is predominantly in grassland with small portions of the northeastern section in oak savannah, annual grassland, and disturbed/non-native grassland. Therefore, the area may not be particularly interesting in terms of vegetation because it is relatively homogeneous.

Elevation Profile

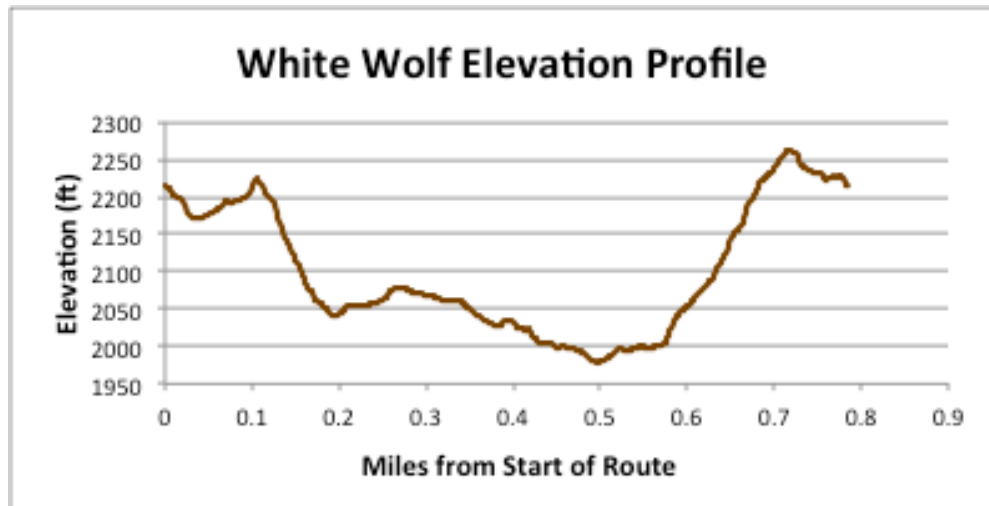


Figure 7-9. Elevation profile graph of White Wolf outer-loop

The outer-loop at White Wolf was used to create the elevation profile above. The elevation along this trail ranges from approximately 662 meters to 690 meters (Figure 7-9).

Viewsheds

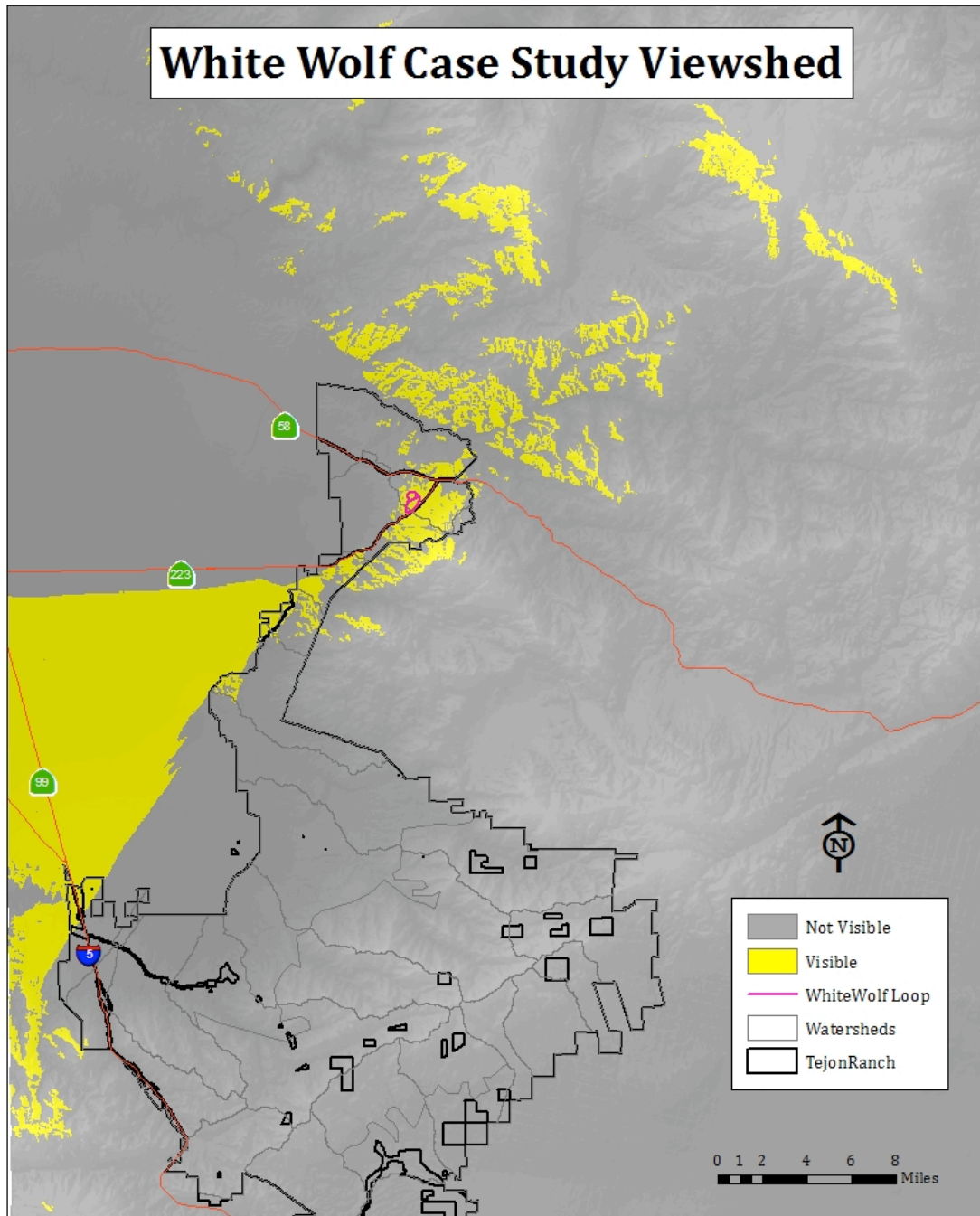


Figure 7-10. The Sierra Nevada is visible from the trail as well as the Central Valley.

Recommendations

Regional Context

To set itself apart from the other surrounding lands, the 290th loop-trail area should be advertised for its unique features, such as the accessibility of the Joshua trees. The views along the White Wolf loop-trail should be advertised as a unique attraction. Additionally, White Wolf's proximity to Arvin and Bakersfield makes it a conveniently located area for reaching residents of these cities, especially farm-working communities and Hispanic visitors.

Issues

Because of the proximity of the 290th loop-trail to roads, this area may become more prone to vandalism, graffiti, and litter. The area already has evidence of dumping—old tires and roof shingles were found when we visited the area. White Wolf does not currently have any evidence of littering, graffiti, or vandalism. However, if access were to increase in this area, these issues may emerge. To deter these issues, it is important to maintain a management presence in the area—e.g. docent patrols and TRC security—and well-kept facilities.

Increasing access to these areas can also lead to resource damage—i.e. vegetation loss or erosion. The strategic placement of interpretive signs can help reduce such impacts by acting as an educational tool to help the public understand the damages their actions can cause. In addition, these interpretive signs can be employed to encourage visitors to “leave no trace,” stay on trail, and share the unique features of the area.

Underserved

To encourage visitation by underserved communities in this area, promotional material and interpretive signs should be in both English and Spanish. Picnic tables should be installed near the parking lots to allow for group and family-oriented activities. Additionally, Spanish-speaking staff or docents can give tours of the area. Activities should be developed to engage the youth. Access should remain free of charge to visitors.

Docents

The 290th loop-trail is a great location to test unguided access and/or a docent led program on the Ranch. Its location on the Ranch border allows for easier management as well as easy access by the docents. The docent program for this

location may take many forms and we recommend two options that can be implemented separately or together.

One option for the docent program consists of docent led hikes. Visitors can either sign-up online following current protocol or simply meet docents at scheduled times at the trailhead. The docents will then lead visitors on an interpretive hike around the trail. Another program option is to have docents at the trailhead and along the trail to answer questions and monitor use, while visitors freely come and go from the site and walk the trail unguided. In this program, docents can work set hours, such as 10am to 2pm on weekends, and can lock and unlock a gate at the parking area, ensuring that visitors are not on the site outside of designated hours. This type of program will allow the Conservancy to have an authoritative presence at the site while allowing unguided access on the Ranch. A similar approach can be used with the White Wolf loop-trail.

Chapter 8: Future Considerations

Our report mainly focuses on providing a public access framework supporting the Conservancy's development of a public access plan within the next five years (2013-2018). As a result, our framework is built assessing trends and conditions that are ecologically, socially, and managerially relevant to the Ranch currently. However, future developments on the Ranch, if and when carried out, will greatly alter the landscape context for the Conserved Lands. In this section, we use the insights gained from developing our public access framework to assess potential issues that may arise with the occurrence of these future developments.

Grapevine Industrial Center

Description

Previously known as Tejon Industrial Complex, this commerce center lies near interstate 5 (I-5) in the San Joaquin Valley (See Appendix A: Proposed Developments on Tejon Ranch). Development has already begun for this commerce center, and it currently provides a rest stop along the Grapevine with gas stations, fast food restaurants, travel stores, and two motels. Famous Footwear and IKEA have also decided to locate their distribution centers in this commerce center (Tejon Ranch Commerce Center, 2011).

Potential Issues

Presently, the Conservancy has not experienced any significant problems arising from the Tejon Ranch Commerce Center bordering the Conserved Lands. This is most likely due to the transient nature of the area as a rest stop for people traveling up and down the I-5. Expansion of this center in the future will lead to increased human density near the Ranch borders, and thus, potentially increase the risk of trespassing and its associated issues of littering, vandalism and resource damage (Chapter 5: Regional & Private Lands Context).

Centennial

Description

Centennial is a planned city of 60,000-70,000 people that will sit between Highway 138 and the Kern County-Los Angeles County border (See Appendix A: Proposed Developments on Tejon Ranch). This proposed community is intended to be a completely self-sustaining city with shops, restaurants, and other amenities. However, L.A. County has yet to grant permission to develop Centennial, therefore, development of this region of the Ranch remains uncertain.

Potential Issues

Such a large development, if it were to occur, will lead to increased visitation on the Ranch. However, a number of problems may arise given Centennial residences' easy accessibility to the Ranch grounds. Trespassing and off-trail use can occur leading to unforeseen resource degradation, erosion, wildlife impacts, littering, and vandalism. Problems with unauthorized access mainly occur within the first several miles from an urban development (J. Lichter, personal communication, January 27, 2013). Building the Conservancy's onsite presence around the vicinity of Centennial through docent patrols, camera traps, and educational signs can help curb these problems. Creating a trail for Centennial residents to the future Visitor Center can help provide an avenue to meet residents' desire to access the Ranch, while allowing the Conservancy a measure of control in directing people along a route they can control and monitor for impacts. (See Appendix N: Visitor Campus for information on the proposed Visitor Center).

Another concern that arises with the Centennial development is pets accessing the Ranch. TRC currently prohibits bringing dogs on the Ranch, and an outreach effort to inform Centennial residents of this no dogs allowed rule should be initiated. Dogs and cats may also attract predators, such as coyotes, bobcats, and mountain lions. This creates a danger for both Centennial residents and their pets and the predatory species. Efforts should be made to inform and educate residents of this danger.

Furthermore, conflicts may arise between PCT users and the residents of Centennial. The rerouted PCT (further described below) will run adjacent to Centennial, and residents may see the trail as an opportunity for prohibited recreation, such as off-highway vehicle use or mountain biking. Signs prohibiting such use should be placed

along the trail and enforcement will need to be implemented. The proximity of Centennial to the PCT also opens the Ranch up to the risks of timber harvesting, poaching, and other forms of vandalism. Increased patrolling, well developed and maintained signage (Chavez, 2002), and camera traps may be used to control and monitor access and activities on the Ranch.

Tejon Mountain Village (TMV)

Description

This village is a planned low-density community in the Grapevine Hills (see Appendix A: Proposed Developments on Tejon Ranch). Unlike Centennial, the development at TMV has recently been permitted by Kern County. TMV's design will include residential homes, trails, amenities, and a destination resort (Tejon Mountain Village, 2012).

Potential Issues

Issues described for Centennial, minus conflicts with the PCT, also arise at TMV. Higher fire risk potential also exists around TMV compared to Centennial (Appendix K). Thus, plans for fire control should be developed to decrease the fire risk arising from the potential increase of ignition.

Pacific Crest Trail (PCT)

Description

A conservation easement of about 10,000 acres will provide for the realignment of approximately 38 miles of the 2,650 mile PCT onto Tejon Ranch. This realignment will help transition thru-hikers and riders from southern California to the Sierra Nevada. This stretch of trail is remarkable as it travels through several different vegetation communities, including grasslands, oak savanna, chaparral, and conifer forests.

Potential Issues

The realignment of the PCT gives rise to concerns such as multi-user conflicts, off-trail use, erosion, and spread of invasive species. An in-depth examination of these issues was conducted by two project members during the summer of 2012. Their analysis can be found in Appendix N: PCT Case Study.

California State Park

Description

The RWA allows “for discussions on the potential for a California State Park at Tejon Ranch.” TRC, the Conservancy, and the Resource Groups have been in discussions with the California Department of State Parks and Recreation in regards to this potential development providing “significant Public Access while also providing for the long-term stewardship of the Ranch” (TRC & Tejon Ranch Conservancy, 2009).

Potential Issues

Because a California State Park is public land, management of activities on the park may differ from that preferred by the Conservancy and give rise to a number of issues. For instance, activities are unguided on state parks, which can lead to a potential for CA State park visitors to walk out of the perimeter of the park and onto Ranch lands. This trespassing possibility becomes a large concern if public access on the Ranch remains guided. Also, public parks usually have limited enforcement potential, so issues like resource damage, littering, or off-trail use may become large concerns that remain unregulated (see Chapter 5: Regional Lands & Private Land Context).

University of California Natural Reserve

Description

The RWA also provides for the possibility of the establishment of a UC Natural Reserve or dedication of a portion of the conservation easement to be “utilized for scientific study by the University of California.” Current discussions between the UC Natural Reserve System, TRC, and the Conservancy concerning this development are “centered on the concept of providing a dedicated core area in which TRC and Conservancy operations would be limited to allow for priority research, and a larger area, subject to regular TRC and Conservancy operations, that would be available for additional research” (TRC & Tejon Ranch Conservancy, 2009).

Potential Issues

The scientific usage that will occur within this proposed UC Natural Reserve has the potential to complement and expand the Conservancy’s public access activities. The results from scientists’ research experiments conducted on the UC Natural Reserve can be used to support the Conservancy’s citizen science program in gathering

baseline and monitoring data on the resource and wildlife impacts of public access activities. Also, these research scientists can become a good resource for educational programs.

Because research scientists are confined to a specific area within the Ranch and their activities/experiments are planned out in advance, it can be easy to track and monitor these scientists and control for potential conflicts.

Chapter 9: Adaptive Management

Introduction

The Conservancy's Adaptive Management Framework establishes its approach to conservation activities as adaptive and guided by Best Management Practices (BMPs). The Conservancy uses this approach to ecosystem management on the Ranch and has several examples of doing so.

The Conservancy is also committed to implementing Adaptive Management (AM) and BMPs for managing public access on the Ranch. Doing so will help balance the Conservancy's mission to "preserve, enhance, and restore the native biodiversity and ecosystem values" with its goal to "provide public opportunities to learn about, explore, and experience firsthand the beauty and diversity of the Ranch" (Tejon Ranch Conservancy, 2012).

This chapter outlines an AM Framework for public access on Tejon that focuses on the achievements of the public access program and the potential impacts on the landscape and wildlife of the Ranch.

Background

Adaptive Management (AM) is a tool for making action-oriented decisions in the face of uncertainty through "learning by doing" (Enck et al., 2006; Gregory et al., 2006; Ohlson & Arvai, 2006; Haney & Power, 1996; Martin et al., 2011). The process is a continuous cycle of actions, learning, and adapting in order to systematically reduce uncertainty. The iterative structure results in robust decision making and is followed by system monitoring to reduce uncertainty through time. Therefore, AM is highly appealing to many managers (Gregory et al., 2006).

AM is a step-by-step process in which monitoring is constant and cyclical. Enck et al. (2006) outline the process:

1. Analyze the management situation through information gathering, problem defining, and objectives outlining
2. Develop hypotheses about ecological and human interaction and operation
3. Identify management alternatives
4. Monitor and evaluate outcomes
5. Adjust approach and return to previous steps when needed

Haney and Power (1996) add that options can be evaluated or rated based on political feasibility, technical and ecological feasibility, and efficacy.

Theoretically, AM encourages learning from an array of management activities across landscapes and promotes adaptability throughout the management process. AM can be both passive and active. Active AM involves controlled "active" management experiments, while passive AM does not incorporate controlled experiments (Gregory et al., 2006). For example, continually revisiting a site to check for vandalism is passive AM. In contrast, asking, "What is the carrying capacity of this trail in terms of number of people a day who can use it without unacceptable degradation?" and continually monitoring to reduce uncertainty is an example of active AM.

Gregory et al. (2006) reference how AM is notoriously difficult to implement. They offer four explicit criteria for managers and decision makers to determine the appropriateness of passive or active AM in light of uncertainty in environmental management:

1. **Dealing with spatial and temporal scale:** considers management and decision-making timelines, the feasibility of scaling up AM to a large spatial extent, and possible external effects of management actions.
2. **Dimensions of uncertainty:** considers parameter uncertainty, structural uncertainty, stochastic uncertainty, and confidence in AM design.
3. **Evaluation of costs and benefits:** considers documentation of costs and benefits, the ability of AM to make a real difference for managers, the power of AM to address multiple objectives and stakeholders, and the likelihood of AM reducing risk.
4. **Institutional and stakeholder support:** considers the presence of leadership support for AM, management flexibility in decision-making, the chance of avoiding tradeoffs taboo to some stakeholders, and the ability of staff to implement and monitor AM plans (Gregory et al., 2006).

AM frameworks should not only be focused ecologically, but must also consider economic, political, and social consequences because problems over the course of management can arise in these other management arenas as well. Gregory et al. (2006) conclude AM is most feasible and likely to succeed with an application context that is "small and relatively simple, so that only few regulatory bodies are

involved, the number of interest groups is small and the impact on them are not severe, and the risk to any species is low" (p. 2413).

Chavez (2002) is an example of successful implementation of AM in public access. Chavez (2002) used AM to manage public access at the Applewhite Picnic Area (AWPA) in the San Bernardino National Forest in southern California. The study considered multicultural visitor experience with the site—picnic tables, open space, parking lot, bathrooms, river access, etc.—in its evaluation. Site conditions were also taken into account and included creation of unofficial sites, vandalism, and river water quality.

Key to the study's effectiveness was consistent revisiting of objectives developed directly from public input at the site. Furthermore, AWPA users were not only surveyed once about their experiences, but continuously throughout site development to gauge project successfulness. Chavez (2002) concluded AM should continue at the site, particularly in light of the increasingly diverse demographics of visitors to southern California wildland recreation areas. Therefore, human elements as well as traditional biological and physical elements should be taken into account for AM (Chavez, 2002) and considered when developing an AM approach to public access on the Ranch.

Adaptive Management on Tejon Ranch

Tejon is positioned for successful implementation of AM in public access management for a number of reasons. To begin, the Conservancy is already familiar with AM through its Adaptive Management Framework for managing the Ranch's ecosystems, which was supported by the 2010 Tejon Group Project *Development of conceptual models and ecological baselines to support the creation of an adaptive management plan for Tejon Ranch, California* (Appelbaum et al., 2010). Applying AM to the Conservancy's public access management is another step forward.

Tejon Ranch is also a good fit for AM in the context of Gregory et al.'s (2006) findings for AM feasibility and likelihood of success. The Conservancy and the Company are the principal managers of the Ranch, which makes coordination between regulatory bodies relatively simple. USFWS is also an important actor in Ranch management through the provisions of the TUMSCHP (see Chapter 1: Introduction for details). The Ranch also has extensive knowledge of relevant interests groups, many of which are defined in Chapter 4: Stakeholders and Chapter 5: Regional & Private Lands Context. The stakeholder surveys suggest stakeholders generally have vested

interested in the continuation of public access on Tejon Ranch. Applying AM to the public access program will help evaluate the successes of the program as indicated by visitor experience and landscape effects. Doing so will help the Conservancy keep the Ranch open for public access while also sustaining the Conservancy's mission to protect the Ranch and its natural ecosystems.

Adaptive Management for Public Access on Tejon Ranch

There are several key steps needed to establish an AM framework for public access on the Ranch. Goals and objectives for the public access program must first be developed and put in context of baseline conditions on the Ranch. In other words, what is currently occurring on the Ranch and where does the Conservancy want to go with its public access program in the future?

The Conservancy must also be aware of uncertainties and indicators associated with public access on Tejon. This includes possible impacts associated with recreation in natural areas and accompanying uncertainties, as well as the degree of user satisfaction when visiting the Ranch. Identifying these factors helps focus management strategies on the ones most likely to efficiently and effectively manage visitor impacts on the Ranch.

Finally, a crucial component of AM is monitoring. Monitoring actions and impacts informs the manager whether the implemented actions are working for their intended purpose, what impacts are resulting from the actions, and what changes might be necessary.

The rest of this chapter expands on these steps by first providing an AM model to represent the interaction between the steps and then breaks down the steps into more detail. The model includes reference to other chapters, including Chapter 4: Stakeholders and Chapter 6: Opportunities & Constraints.

Adaptive Management Model for Public Access on Tejon

An AM model for public access is useful for recording baseline conditions, documenting management actions and targeted outcomes, and tracking implementation and adjustments. It diagrams the interaction between public access activities on the Ranch, people's experiences accessing the Ranch, and the potential effect public access has on the Ranch's ecosystems. The AM model is also useful for anticipating outcomes of public access management decisions. Figure 9-1 below

provides a diagrammed model of the general AM framework for public access on Tejon Ranch. Subsequent sections provide further detail.

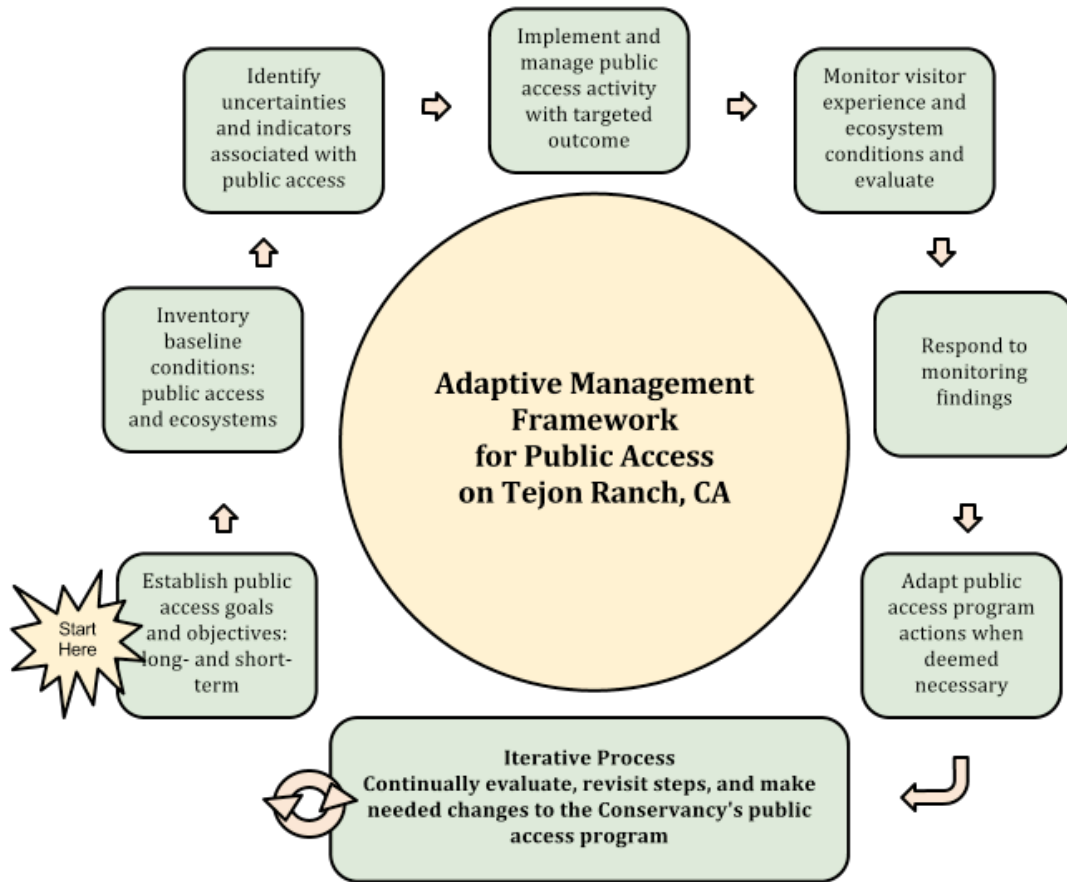


Figure 9-1. AM framework for public access

Public Access Goals and Objectives

The Agreement pairs the Conservancy’s overarching mission to manage the Ranch for preservation, enhancement, and restoration with the task of implementing a public access program. In the short term, the Conservancy seeks to manage a public access program that offers opportunities for education of, exploration in, and experience with the Ranch’s unique beauty and diversity. Public access goals reflect the vision of the Agreement and help drive the AM process (Appendix B: Tejon Ranch Conservancy’s Public Access Goals).

Baseline Conditions

In order to implement an effective AM strategy for public access, the Conservancy must first document the baseline conditions of current public access on the Ranch.

The nature of AM for public access necessitates focusing on baseline data for users while simultaneously interacting with the ecological AM Framework that is already established. The Conservancy currently monitors ecological conditions on the Ranch. The RWMP also provides details on baseline conditions. Furthermore, past group projects collected baseline data for the various ecosystems on the Ranch, which help inform the Ranch's current ecological AM Framework. For example, Tejon AM (Appelbaum et al., 2010) established baseline data for eight identified distinct vegetation communities on the Ranch (Appendix O).

Baseline data for public access on the Ranch is attainable from a few main sources. Because current access is guided, the Conservancy knows what types of public access activities are currently occurring on the Ranch and in what amount. The Conservancy estimates about 1,000 visitors access the Ranch each year for activities considered public access (Appendix D: List of Current Public Access Activities on Tejon Ranch). In addition to the Conservancy's data, the past visitors survey conducted for this project provides insight into baseline conditions of public access on the Ranch (Chapter 4: Stakeholders).

Based on the available data, current public access on the Ranch is mainly comprised of guided trips with mixed car and hiking access, special group outings, and a few citizen science and service project activities. The survey also suggests that the overwhelming majority of past visitors had an overall positive experience visiting the Ranch.

Uncertainties and Indicators

AM helps managers make decisions in the face of uncertainty and helps reduce uncertainty through time. It does so by providing managers with current information on visitor use and associated impacts as the information becomes available through monitoring (NPS, 2009). Key uncertainties for the Conservancy as it moves forward with public access on the Ranch include:

- How do the ecosystem impacts of public access differ from those of other sources of impacts (e.g. climate, weather, wildlife)? Does general ecological monitoring capture potential impacts of recreation?
- How might visitors respond to changes in the Conservancy's public access program? After implementing a new public access activity, do they enjoy their visit to Tejon more or less?

- How are the demographics of Ranch visitors changing in response to the public access program? How can the Conservancy reach underserved populations?
- How does the Conservancy know if it is reaching its public access objectives?
- What might act as barriers to implementation of a public access plan? Where are the areas in need of more information?
- How can the Conservancy engage citizen science participants and docents in monitoring and mitigating recreation impacts on the Ranch? What should they measure?
- Is there a visitor carrying capacity for sustainable public access on the Ranch? How can the Conservancy know what the “right” number of visitors is on the Ranch?

In order to address these uncertainties through adaptive management, the Conservancy needs to be able to track changes on the Ranch and with visitors that occur as a result of a public access activity. Doing so means developing a list of indicators that are measurable and reflect the state of the Ranch’s resources and quality of visitor experiences (Manning, 2007; NPS, 2009; USFS, 1992). An indicator must be specific enough to have a clear way in which it should be measured and monitored. Additional desirable attributes of indicators include: reliability; cost-effectiveness; significance; relevance; sensitivity; efficiency; and, responsiveness. For the purposes of the public access program, indicators should be limited to those changes that result from human activities (USFS, 1992).

Choosing indicators to adopt can be a long process and requires careful analysis for suitability at each site. However, past research has identified some common impacts linked to public access in natural systems. Users affect natural ecosystems in large part through modified physical, chemical, and biological properties of the locations they visit (Buckley, 2004; Hadwen et al., 2007; Kuss et al., 1990; Leung & Marion, 2000; Newsome et al., 2001; USFS, 1992).

A compiled list of indicators frequently linked to public access and applicable the Tejon Ranch is provided in Appendix O. Indicators cover trail conditions, soil conditions, vegetation, wildlife, infrastructure, and visitor experience. As part of the AM process, the Conservancy should evaluate indicators for their suitability to a specific site once the site is chosen for public access (Buckley, 2004; Hadwen et al., 2007; Kuss et al., 1990; Leung & Marion, 2000; Newsome et al., 2001; USFS, 1992).

When an indicator is deemed suitable for a site, it is made specific enough to be clear how it should be measured. For example, a trail conditions indicator could be the number of undesignated trails present per 1-mile stretch of trail (USFS, 1992). The obvious way to measure this parameter is by counting (via ground truthing or aerial photographs) the number of user created trails per 1-mile stretch of trail and comparing it to the baseline conditions of that trail.

Implement and Manage Public Access Activities

The next step to adaptively managing public access on the Ranch is actually implementing and managing a chosen public access activity and doing so with a targeted outcome. In a way, this step is similar to an experimental design process. After identifying baseline conditions, uncertainties, and indicators, a manager tests management actions over time to reduce uncertainty.

For example, the public access manager might want to find out if visitors absorb more educational material from an interpretive trail or from a hike operated by a knowledgeable guide. The manager could design two different hikes: 1) a trail with interpretive signage throughout where visitors take a self-guided hike; 2) a trail through which visitors join a naturalist guide or docent and stop for discussions about the area throughout the hike. The manager could then ask participants of both hikes to fill out a survey that gauges how much information the participant absorbed during his or her respective hike. This could continue until it becomes apparent which form of hiking is more effective in reaching visitors or if there is no significant difference between the two forms of hiking.

Applied to public access on Tejon Ranch, implementing and managing recreation activities adaptively calls for this “learn-as-you-go” mindset that makes decisions based on incomplete information and/or involving trade-offs. While the Ranch is a unique purveyor of public access, there are still established management strategies that can be of use as the Conservancy continues to move forward with public access.

Newsome et. al (2001) describe management as strategies and actions taken to protect and/or enhance ecosystems while, in this case, allowing for public access. Strategies are general approaches to management often guided by an objective while actions are what must be done. The following is a list of established management strategies from Newsome et. al (2001) for natural area public access. Deciding which management strategies to use depends on a number of factors, including “location and extent of the impact of concern, the cost and ease of

implementation of actions and their effectiveness, and the preferences of visitors and managers” (Newsome et. al, 2001).

Zoning in Time and Space

This approach separates uses and users by zones—distinguished by different times (e.g. seasons) or by different locations. This approach helps reduce impacts of recreation and separates incompatible uses in time and space.

To this degree, Tejon Ranch already has spatial and temporal zones. Spatially, the Ranch has development zones (TMV, Centennial, industrial area), inholding zones, conserved areas zones (including the TUMSCHP), and areas already used for public access (e.g. Sebastian Gate and 300th Street). Temporally, some areas of the Ranch are reserved for TRC hunting parties during certain times of the year. These pre-existing zones reinforce the Conservancy’s approach to choosing areas on the outer borders of the Ranch to first develop for public access.

There is potential for the Conservancy to further specify temporal and spatial zones on the Ranch in its approach to public access management. Possibilities include:

- Associate public access goals and objectives with zones on the Ranch and establish management approaches for each zone, as opposed to focusing on every individual section of road or trail.
- Establish zones for different types of recreation to separate incompatible uses and provide a choice of experiences for recreation. This can include different levels of site developments for each zone ranging from minimal facilities and high solitude to developed sites including restrooms and a Visitor Center.
- Identify zones that provide habitat to species of concern (Chapter 6: Opportunities & Constraints) and either exclude visitors or types of use at all times or at certain times of year (e.g. breeding season).
- Create zones using travel time (Chapter 6: Opportunities & Constraints) to make clear what areas of the Ranch are accessible from different access points within a given timeframe.

Site Management

Site management—as opposed to visitor management (discussed next)—seeks to manage visitors through actions at the locations where public access occurs. It “manipulate[s] infrastructure and the natural environment to influence where visitors go and what they do” (Newsome et. al, 2001). The approach involves

focusing use on the more durable parts of a landscape and designing sites and facilities to minimize visitor impacts. Site management indirectly influences visitors through use of tools such as:

- Locate facilities away from sensitive areas. Consider soil type and erodibility, drainage, vegetation, species, visual impacts, and user desirability.
- Manage facilities so they are wanted and used by visitors. This can include site hardening, vegetation management or landscaping, shade, water, waste disposal, and interpretive centers.
- Establish site restoration techniques to help mitigate recreation impacts. Examples include temporary site closure to allow regeneration, trail rerouting where deemed necessary, and active site restoration (e.g. seeding, planting).
- Consider road and trail design. Key influences include natural drainage patterns, soil type and erodibility, slope, location, and accessibility.

Visitor Management

In contrast to site management, visitor management uses direct and indirect management of the visitors themselves. Direct approaches decrease a visitor's sense of freedom through actions including limiting group size, closing areas off from visitors, and prohibiting certain activities such as smoking. In contrast, indirect approaches are subtler and include distributing educational brochures, installing interpretive signs, and initiating personal contact by docents (Daniels & Marion, 2006). Using both direct and indirect approaches can be especially valuable when the indirect site management approaches are deemed ineffective in site protection and enhancement. Doing so focuses on influencing the "amount, type, timing, and distribution of use as well as visitor behavior" (Newsome et. al, 2001). Visitor management actions include:

- Regulate visitor numbers as a direct approach to protecting a site. Doing so *before* reaching or surpassing a site's carrying capacity is ideal. When carrying capacity is unknown, start small and increase visitation when deemed okay to do so.
- Control group size as a direct approach to providing ecological and social benefits.
- Manage length of stay as a direct way to limit visitor impacts. This includes distinguishing between day use and overnight use. However, limiting length

of stay appears to reduce impact less than other types of visitor management.

- Enforce regulations as a direct way to deter inappropriate visitor behavior. In some cases, the mere presence of a uniformed employee is enough to prevent misuse of a site.
- Provide information and education as an indirect approach to managing impacts, especially those associated with illegal, unskilled, uninformed, and careless actions. Education is most effective when used as a longer-term management strategy and can include interpretive signs, brochures, and direct contact with staff and volunteers.
- Charge use fees as an indirect approach to managing visitor numbers. In theory, this discourages potential visitors with low value placed on visiting a site. Fees do, however, risk excluding individuals based on socio-economic standing (Newsome et. al, 2001).

Monitor and Adapt Public Access Program

An essential part of AM—and largely what separates it from more traditional forms of management—is its iterative process of monitoring and adapting. Monitoring is “the systematic gathering and analysis of data over time” (Newsome et. al, 2001). It is how management programs can be evaluated and areas in need of improvement identified. For natural area public access, this means implementing a chosen public access activity and then monitoring it for program effectiveness and impacts, and visitor experience. In other words, it means monitoring both the natural ecosystems and its visitors.

Setting a monitoring program requires planning and direction. Objective identification comes first, followed by an evaluation of monitoring options. Monitoring procedures specific to a management action are then necessary, along with monitoring protocols. The monitoring itself can then begin and be accompanied by analysis and reporting procedures and application to management (Newsome et. al, 2001).

Monitoring the visitors themselves is important and often consists of gathering information about (Newsome et. al, 2001):

- **Park use:** quantitative information covering mode of transportation to the site, point of entry, and total visitor counts.

- **Site use:** mostly quantitative data on which sites users visit, during what seasons, in what group size, for how long, at what frequency, and for which activities.
- **Visitor profiling:** both quantitative and qualitative demographic and socio-economic information of individuals. This includes their reasons for visiting, motivations, attitudes, preferences, expectations, and information requirements.
- **Visitor outcomes:** both quantitative and qualitative information and user experiences, including their level of satisfaction, disappointments, suggestions, and general comments.

Techniques for gathering monitoring information about visitors include (Newsome et. al, 2001):

- **Visitor counts:** takes raw numbers of visitors through automated or manual methods. Automated methods can include infrared, photoelectric and seismic pad counters on a trail and counters triggered by vehicle wheels on roads. Manual methods include estimates from staff or volunteers, sign-in sheets, and aerial photos.
- **Visitor surveys:** questionnaires that provide detailed information on visitor activities, experiences, and expectations. (Chapter 4: Stakeholders).
- **Visitor interviews:** method of collecting detailed information from visitors by speaking to them directly.
- **Visitor observation:** used to observe visitor behaviors and numbers, particular when other methods are not available.
- **Interactive techniques:** assess a range of ideas through focus groups or user task forces to attain consensus over time regarding standards and indicators.

Monitoring techniques for natural environments include (Newsome et. al, 2001):

- **Sampling-based rapid surveys:** a generalized survey that places evaluation points systematically but non-permanently (i.e. they change each survey). For example, picking systematic, non-permanent points on a trail to evaluate and then generalizing to an entire trail system.
- **Problem-based rapid surveys:** a census approach to taking inventory of the location and extent of problems in a system. For example, surveying an entire trail system for issues and details of their location and extent.

- **Permanent point surveys:** an approach that permanently places evaluation points for repeated surveying and can be arranged to generalize a system or placed in target areas of interest. For example, placing evaluation points along a trail where specific management actions are implemented. This could include use of photo points.

Choosing a monitoring strategy—or a combination of strategies—depends on the objectives of the monitoring system, the AM approach as a whole, and the particulars and indicators of a specific site and activities. Available funding and resources can also affect which monitoring techniques best fit.

Finally, where identified necessary through monitoring, managers need to respond by returning to previous AM steps, adapting to account for the new information, and moving forward through the steps once again. Doing so contributes to reducing uncertainty in the management setting as new information continually informs adaptive decisions. Thus, even though there are distinct steps in AM, there is no set order and revisiting steps is an integral part of the process.

Conclusion & Recommendations

This chapter covers a wide range of information pertaining to AM for public access on Tejon Ranch. While the AM mechanism presented is comparative to that for ecological systems, AM for public access is unique in explicitly considering how users interact with the landscape and the consequences of those interactions—for both the people and the ecosystems.

Keeping in mind the uncertainties outlined earlier in this chapter (see section on Uncertainties and Indicators), there are a few recommendations that can be made:

How do the ecosystem impacts of public access differ from those of other sources of impacts (e.g. climate, weather, wildlife)? Does general ecological monitoring capture potential impacts of recreation?

- Focus monitoring at locations experiencing the heaviest use by visitors. This could mean using permanent point surveys where specific public access management actions are implemented and evaluating conditions periodically.

How might visitors respond to changes in the Conservancy's public access program? After implementing a new public access activity, do they enjoy their visit to Tejon more or less?

- Ask visitors to fill out a survey after their visit to Tejon that asks about their experience and, if they have been to the Ranch more than once, ask them to compare their latest visit to past ones. This survey could be general for all public access on the Ranch or be specific to each type of activity. To make data management minimal, surveys could be kept short and all multiple-choice so programs like Google Forms can automatically generate report summaries. Use data to continually revisit public access goals and objectives and develop adjustments if deemed necessary.

How are the demographics of Ranch visitors changing in response to the public access program? How can the Conservancy reach underserved populations?

- Include demographic information questions (Chapter 4: Stakeholders) in visitor surveys described above. Make sure questions reflect what it means to be “underserved” (Chapter 4: Stakeholders and Chapter 5: Regional & Private Lands Context).

How does the Conservancy know if it is reaching its public access objectives?

- Undergo periodic review of the Conservancy's public access programs. This could take the form of an audit of the program that monitors and evaluates its performance environmentally and socially (i.e. ecological and visitor impacts).

What might act as barriers to implementation of a public access plan? Where are the areas in need of more information?

- Keep detailed records of the process as new public access actions are implemented so they can be revisited should barriers or gaps in information become apparent. Be especially cautious in implementing new public access actions where the RWMP or TUMSHCP have already identified sensitive areas.

How can the Conservancy engage citizen science participants and docents in monitoring and mitigating recreation impacts on the Ranch? What should they measure?

- After deciding upon a public access activity, the Conservancy can recruit volunteers to help document baseline conditions, establish indicators, and monitor as the activity is implemented. Volunteers may be recruited through general portals like Facebook and the mailing list, as well as through partnering with environmental groups and other community groups to put together citizen teams.

*Is there a visitor carrying capacity for sustainable public access on the Ranch?
How can the Conservancy know what the “right” number of visitors is on the Ranch?*

- Employ the precautionary principle by starting public access actions off with small numbers and then scaling up incrementally when it is known that a carrying capacity has not yet been reached. This process can be done until the Conservancy feels it has reached an optimal amount of public access (which may or may not reach up to carrying capacity). Starting well below carrying capacity helps protect against overwhelming the system and then having to backtrack and take away access.

These recommendations are not comprehensive as they are based on general findings of natural area recreation impacts and management. More specific findings can be drawn once the AM process is played out on the ground at the Ranch. This chapter does, however, provide a starting point and framework for moving forward and testing out new public access actions. It also offers a way to document the process systematically so the process is transparent and justifiable. Finally, the rest of this chapter is dedicated to an AM case study focusing on using docents to adaptively manage the 290th loop trail (Chapter 7: Case Studies).

AM Case Study: Docents at the 290th St. Loop-Trail

The 290th St. loop-trail case study can be expanded as a case study in AM. In addition to providing an opportunity to test unguided access and a docent led programming on the Ranch, the 290th St. loop-trail can be used to test AM for public access using docents. Chapter 7: Case Studies justified use of docents at the 290th St. loop-trail; the trail location on the Ranch border allows for easier management as well as easy access by the docents. The docents can help manage visitors as well as help monitor public access and provide feedback for AM at the trail. This case study breaks down

the AM process for docents at the 290th St. loop-trail into the steps of the AM framework for public access (Figure 9-1).

Public Access Goals and Objectives

Using docents to help implement AM for public access at the 290th St. loop-trail will directly support the Conservancy's mission by opening up the land to public access while adaptively managing the program for its compatibility with the preservation, enhancement, and restoration of the Ranch. Docents can help ensure that public access at the 290th St. loop-trail is responsive to visitor experience and does not degrade the land or ecosystem.

Baseline Conditions

The Conservancy can partner with docents to record baseline conditions of the 290th St. loop-trail, particularly regarding landscape, vegetation, and ecosystem conditions. Specifically, docents can aid the Conservancy in verifying the 290th street outputs of the site analysis tool (Chapter 6: Opportunities & Constraints and Chapter 7: Case Studies). For example, the tool identified the location as entirely Joshua tree; a site visit confirmed the vegetation type and added that a few other species (e.g. grasses) are dispersed throughout the woodland. The site analysis tool also found no flags for species of concern in the area; docents could help verify this by recording wildlife sightings while at the site.

After building the trail at 290th street, docents can re-analyze the site for baseline conditions. For example, this could include initially measuring sensitive plants and invasives for distribution, size, and growth within a few meter buffer distance in multiple sections of a newly built trail. The buffers could then be repeatedly measured annually for changes in sensitive plant and invasive species conditions.

Furthermore, in addition to the seven attributes from the site analysis tool (travel time, erosion, species, fire, vegetation, viewshed, elevation profile), docents can take specific inventory on trail conditions, soil conditions, and infrastructure.

Baselines from a public access perspective are in large part already available through known current access on the Ranch (Chapter 3: Current Public Access at Tejon Ranch) and past visitor survey results (Chapter 4: Stakeholders).

Uncertainties and Indicators

Key uncertainties for the Conservancy regarding the 290th St. loop-trail include:

- Will developing the loop-trail cause ecosystem impacts from public access (e.g. affect Joshua tree survival)?
- Will visitors perceive the self-guided loop-trail as a satisfactory alternative to guided access on the Ranch? After opening the loop-trail to visitors, do they enjoy their visit to Tejon more or less?
- How will the demographics of Ranch visitors change in response to developing the 290th loop-trail? Does the trail reach underserved populations?
- How successful is the use of docents at the 290th loop-trail to manage and monitor unguided public access on the Ranch?
- Is there a visitor carrying capacity for public access on the 290th loop-trail?

Appendix P provides a list of indicators to address these uncertainties, including indicators for trail conditions, soil conditions, vegetation, wildlife, infrastructure, and visitor experience.

Implement and Manage Public Access Activities

If the Conservancy chooses to install the 290th St. loop-trail and use docents to manage it, management should include identifying uncertainties and working to gain better knowledge regarding them. For an active approach, implementation of the 290th St. loop-trail can be done concurrently with implementation of the White Wolf trail and compare results on ecosystem impacts and visitor experience. If docents identify issues after implementation, the Conservancy may decide to use one or more management strategies outlined earlier: zoning in time and space, site management, and visitor management.

For example, if site impacts at 290th street require a break from public access so the ecosystem can recover, the Conservancy can temporarily close the location and send visitors to the White Wolf trail. This is an example of zoning in space. If the Conservancy chooses to manage the site itself instead, they might decide the trail needs to be turned into a boardwalk to decrease impacts. Or, if the Conservancy decides to focus on visitor management, they might choose to cap daily visitor numbers to minimize impacts. In each of these three approaches to public access management, docents can play a key role in implementing the changes and ensuring visitors follow the changes.

Monitor and Adapt Public Access Program

Docents can be extremely useful monitors of the 290th St. loop-trail because they would be on location frequently and present when visitors are accessing the site.

Docents are thus positioned to consistently assess both visitor experience and site conditions. To monitor visitor experience, this can mean docents informally speaking with visitors on site and formally surveying visitors by distributing a link to an online follow-up survey. Information that docents can gather on site (e.g. using a sign-in sheet) includes daily total visitor counts, average time spent at the site, and general visitor reactions to the site. To gather more specific and qualitative data, docents can also hand out small cards to visitors that direct them via a web link and QR code to an online follow-up survey. Appendix P provides a future visitor survey based on the past visitor survey questions and responses (Chapter 4: Stakeholders). Results from the future visitor survey can be compared against results from the past visitor survey baseline data to monitor changes in visitor experience and demographics.

To monitor site conditions at the 290th location, docents could use one or more of the different monitoring techniques for natural environments described earlier in this chapter. The 290th St. loop-trail lends itself well to both sampling-based rapid surveys and permanent point surveys. The latter technique could be used to minimize inconsistency between different docents. Setting up a permanent point survey to examine trail conditions at the 290th St. loop-trail would involve establishing evaluation points along the trail and using the same points for each subsequent survey. Locations of interpretive signs could be used as permanent evaluation points since visitors are likely to spend more time at the signs on average than elsewhere on the trail. Docents could check these points on a regular basis to evaluate site conditions.

Results from visitor and site monitoring by docents at the 290th St. loop-trail would help the Conservancy evaluate how well public access at the site advances the Conservancy's public access program and supports its mission. Docent-led monitoring activities will also help the Conservancy recognize what is working well at the site, minimize uncertainties associated with the site, and identify what the Conservancy needs to adapt in order to continue moving forward.

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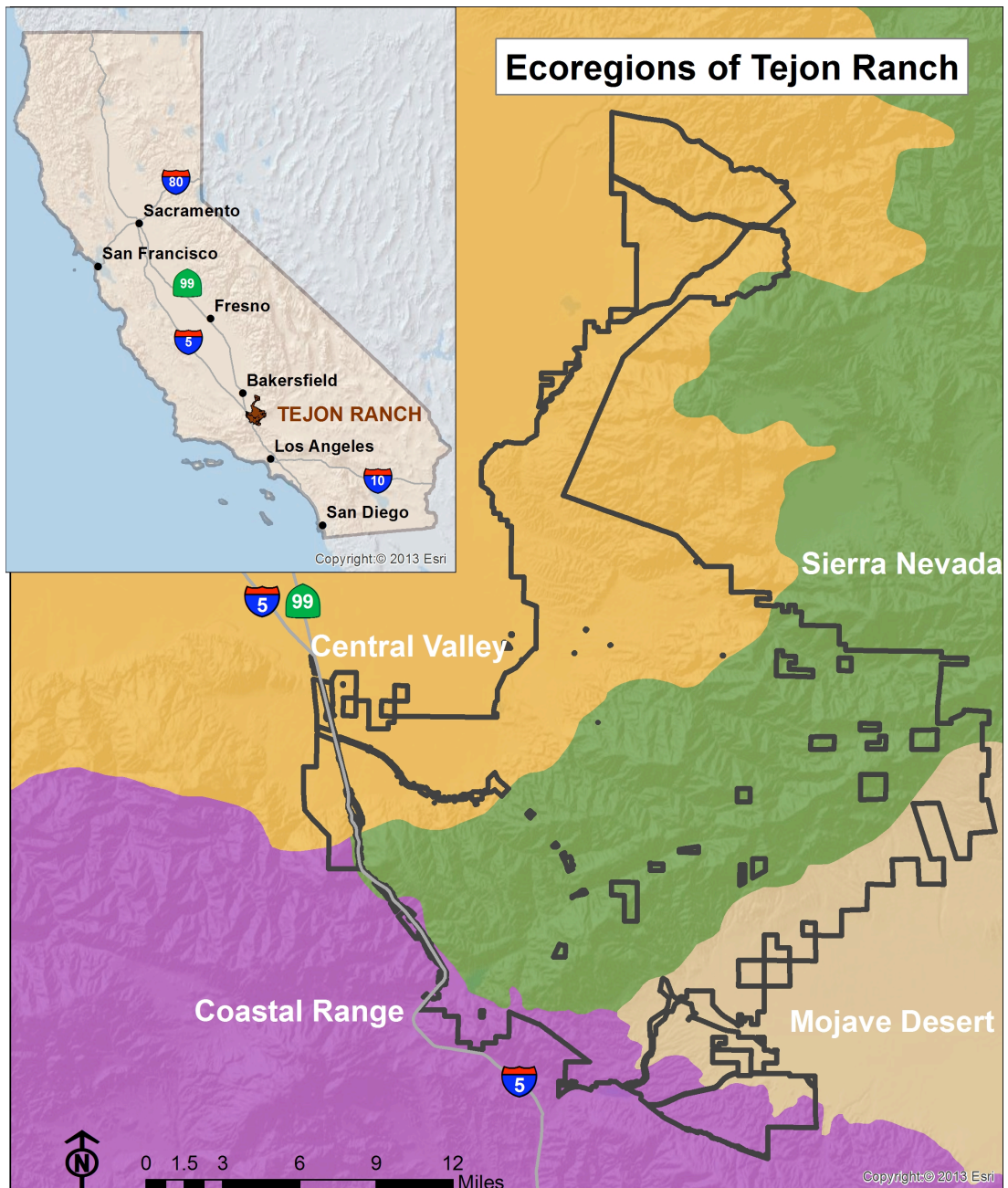
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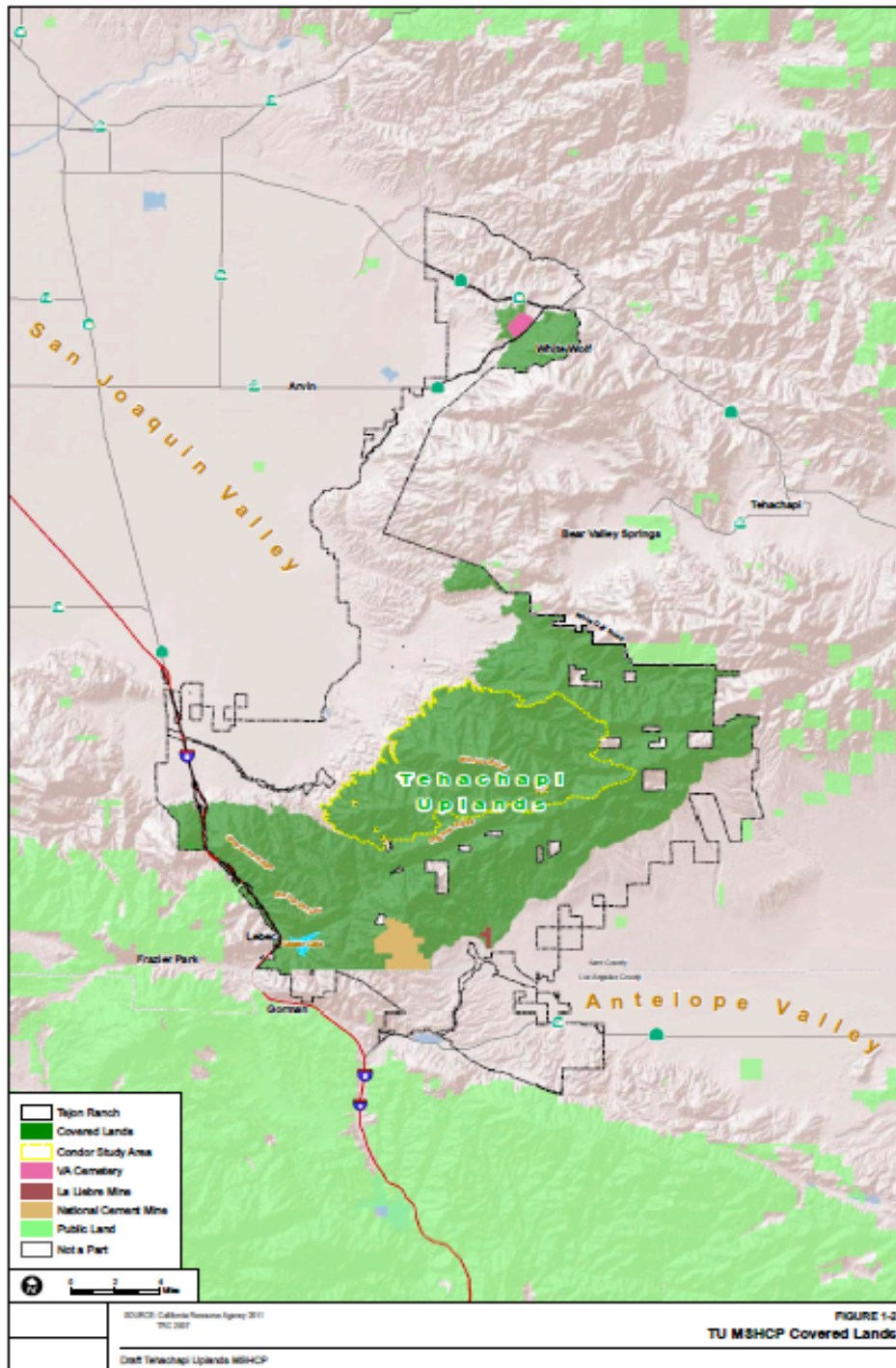
Appendix A:

Location and Ecoregions of Tejon Ranch



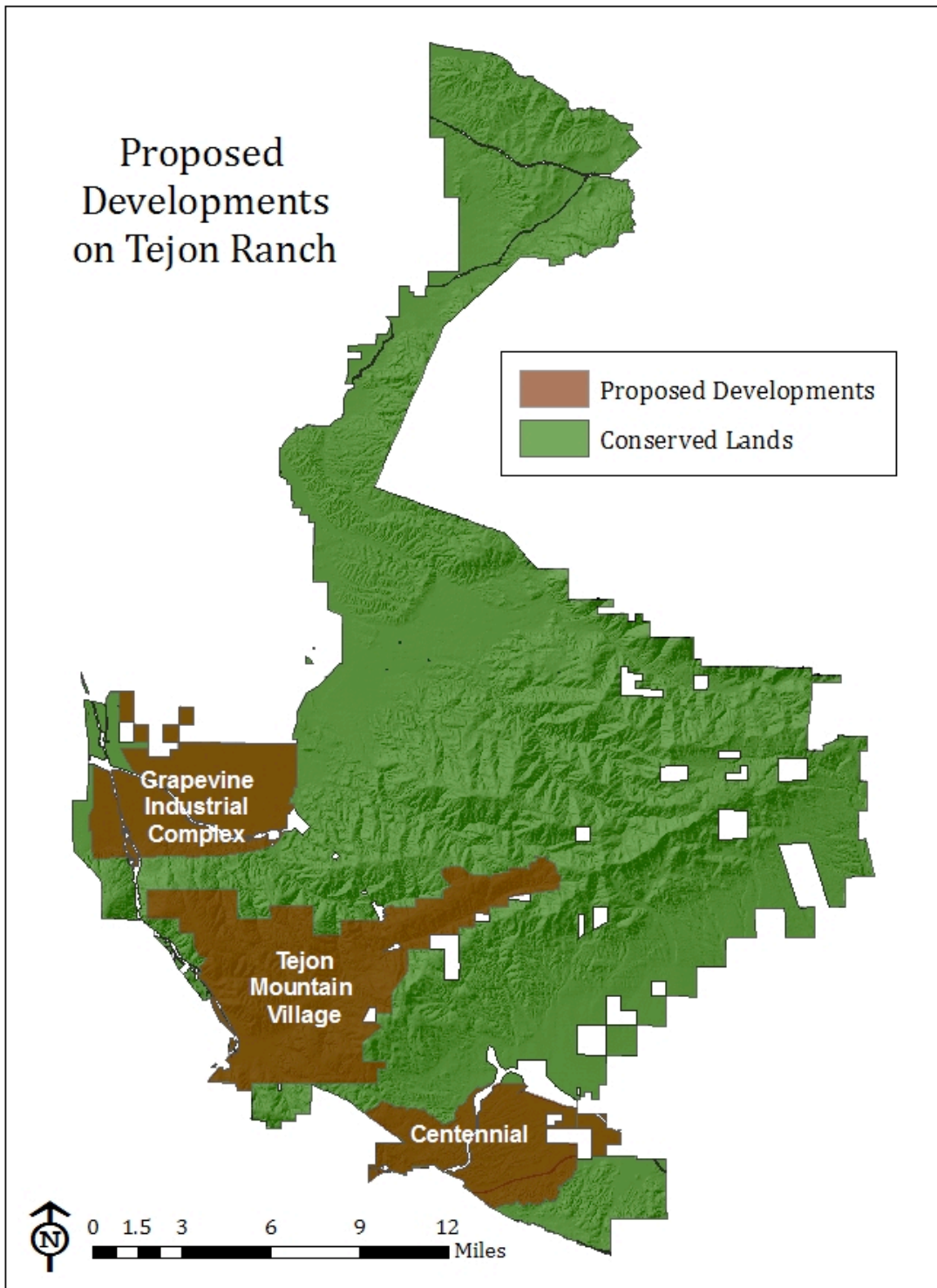
A - Figure A-1. Ecoregions of Tejon Ranch

TUMSHCP Covered Lands



A - Figure A-2. Covered Lands of the Tehachapi Uplands Multiple Species Habitat Conservation Plan (TUMSHCP)

Proposed Developments on Tejon Ranch



A - Figure A-3 Proposed development areas shown in brown.

Appendix B:

Tejon Ranch Conservancy's Public Access Goals

- A) Establish significant, diverse public access programs/activities on Tejon Ranch that are compatible with the Conservancy's conservation goals.
- B) Raise awareness about and demonstrate the extraordinary partnership between the Conservancy and Tejon Ranch Company in providing public access opportunities on a private working Ranch.
- C) Identify sensitive resource areas and design appropriate public access activities that avoid negative impacts.
- D) Provide underserved populations with an opportunity to experience Tejon Ranch's natural processes, habitats and working landscapes.
- E) Identify and develop Tejon Ranch Conservancy's unique regional niche in public access programming.
- F) Develop environmental education curricula that are informative, culturally relevant and promote strong land stewardship.
- G) Continue to collaborate with the Pacific Crest Trail Association, US Forest Service and Tejon Ranch Company on a realignment of the Pacific Crest Trail on Tejon Ranch.
- H) Continue to focus reasonable efforts to establish a California State Park on Tejon Ranch.
- I) Collaborate with the University of California Natural Reserve System to explore long-term research opportunities on Tejon Ranch.
- J) Develop and implement public access programs to Bear Trap Canyon under the terms of the license agreement with Tejon Ranch Company.
- K) Initiate planning to establish a visitor center and permanent office space for the Conservancy.
- L) Enhance and promote the Conservancy identity through the design of public access facilities on Tejon Ranch.
- M) Develop a robust volunteer program focused on interpretation, stewardship and citizen science.
- N) Maximize visitor safety in a remote outdoor setting.
- o) Identify adaptive management measures specific to public access to protect biodiversity.

Appendix C:

Additional Public Access Planning Frameworks

Frameworks similar to Limited Acceptable Change (LAC) are the Visitor Impact and Resource Protection (VERP) framework developed by the National Park Service (NPS) and the Visitor Impact Management (VIM) framework developed by a scientific team at the University of Maryland. VERP is specific to parks where the users are unguided and create their own experiences. It has also not been as widely used as LAC, and NPS has yet to complete the framework's entire process in any park. The distinction between VIM and LAC is the scale at which the framework focuses. VIM is a site-specific framework, while LAC is oriented toward the management of areas. Like VERP, VIM has also not been widely used (McCool et al., 2007).

In 2010, the United States Forest Service (USFS) created the Sustainable Recreation Framework (SRF). SRF grew from the realization that recreation can no longer be managed as it had in the past in order to “meet the environmental, social, and economic needs of present and future generations” (USFS, 2010). Unlike the other frameworks, this planning document is specific to the USFS and outlines the agency's guiding principles, goals and areas of focus for recreation. Among these are fostering citizen stewardship by connecting people to nature, making decisions through a lens of sustainability, restoring and adapting recreation settings, and reducing the agency's environmental footprint through the implementation of green operations (USFS, 2010).

Two other frameworks described by Newsome et al. (2002) are the Tourism Optimisation Management Model (TOMM) and the Visitor Activity Management Process (VAMP). TOMM was developed by a consulting firm in Australia “specifically for tourism planning in natural areas” (Newsome et al., 2002). This framework differs from the others as it can be applied to a region rather than a specific park, area or site. It calls for the planners to identify the economic, social, cultural and political context within which the recreation or tourism will take place and puts emphasis on involving stakeholders throughout the planning process (Newsome et al., 2002). VAMP was developed by Parks Canada in the 1980s as part of a national park planning framework. VAMP focuses on incorporating visitor input along with resource opportunities into the planning process (Newsome et al., 2002). While stakeholder input is invaluable in public access planning on the Ranch, value

judgments for where recreation takes place, the types of recreation allowed, levels of activity, development associated with recreation or visitors, etc. will primarily come from the Conservancy Board.

Relevant Public Access Planning Frameworks

A - Table C-1. Recreation Planning Frameworks Relevant to Tejon Ranch

Framework Name	Relevant Concepts	Source(s)
Recreation Opportunity Spectrum (ROS)	<ul style="list-style-type: none"> The ROS is useful for thinking about how recreation developments change the setting of a place. Certain activities are more compatible with more infrastructure (boating for instance), while participants in other activities, such as backpacking, may be interested in solitude and naturalness. Environmental settings for different activities can range from developed or semi-developed natural to primitive or completely undeveloped except for the presence of a trail. Visitors are examples of developed settings, while backcountry areas 3 miles or more from a road are considered primitive. 	United States Department of Agriculture, Forest Service. (1982). <i>ROS Users Guide</i> .
Limits of Acceptable Change (LAC)	<ul style="list-style-type: none"> Incorporates adaptive management into the planning framework. Calls for planners/managers to identify indicators that represent acceptable resource and social conditions for specific environments/opportunity classes. Examples are: <i>amount of bare ground at campsites</i> or <i>number of other groups encountered per day</i>. Once indicators are identified, standards are set for each indicator. Standards can range depending on the opportunity class. Examples include: <i>the bare ground at a developed campsite must be no greater than 40 sq. ft.</i> or <i>the maximum number of other groups encounter per day on a backcountry trail is 5.</i> 	Stankey, G. H., McCool, S. F., & Stokes, G. L. (1984). Limits of acceptable change: a new framework for managing the Bob Marshall Wilderness complex. <i>Western Wildlands</i> . 10(3). 33-37.

Framework Name	Relevant Concepts	Source(s)
Benefits-Based Management (BBM)	<ul style="list-style-type: none"> • Focuses on the positive outcomes or benefits to the user and community the park/land reaches • Benefits include but are not limited to: physical, psychological, economic, social 	Borrie, W. T., & Roggenbuck, J. W. (1995). <i>Proceedings of The Second Symposium on Social Aspects and Recreation Research: Community based research for an urban recreation application of benefits-based management.</i> Albany, CA: Chavez
Sustainable Recreation Framework (SRF)	<ul style="list-style-type: none"> • Goals include: creating and fostering stewardship by connecting people to nature, involving the surrounding community in the planning process and restoring impacted recreation settings 	United States Forest Service. (2010). <i>Connecting people with America's great outdoors: a framework for sustainable recreation.</i>

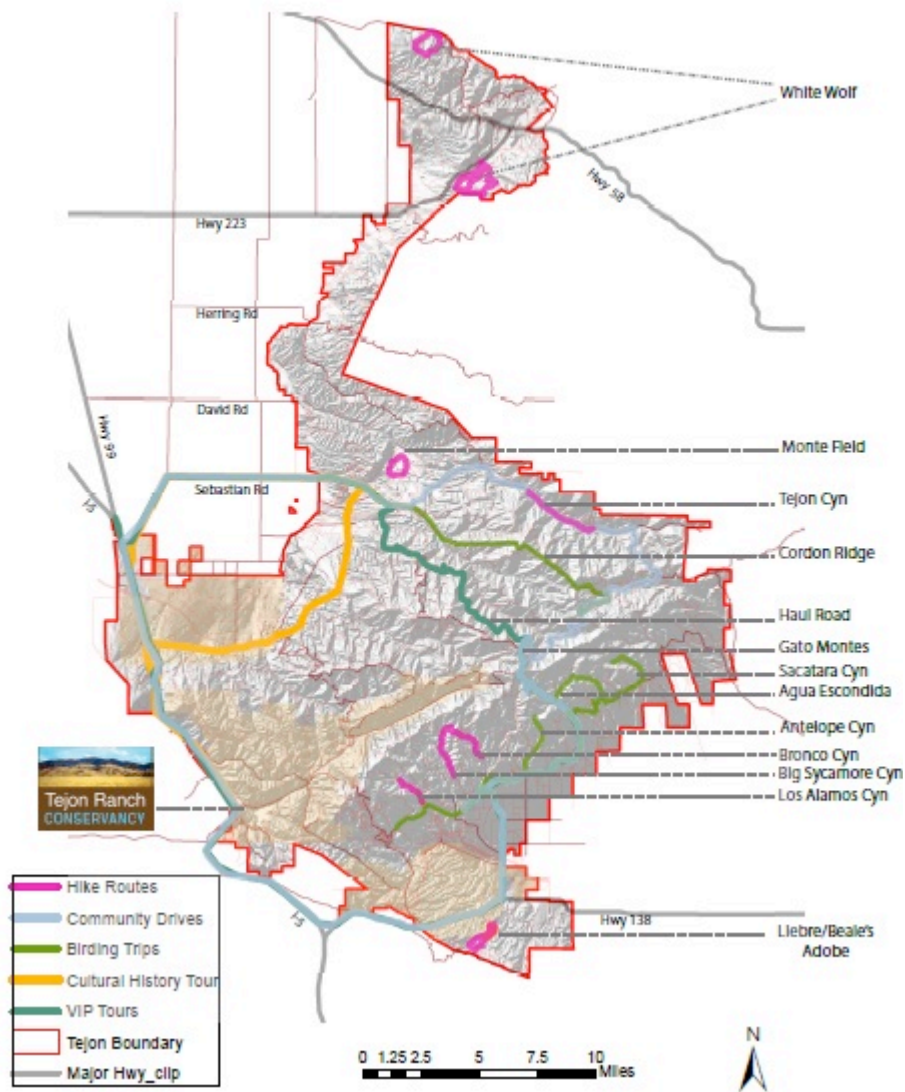
References

McCool, S.F., Clark, R. N., & Stankey. G.H. (2007). *An assessment of frameworks useful for public land recreation planning.* Gen. Tech Rep. PNW-GTR-705. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 125 p.

Newsome, D., S.A. Moore, & R.K. Dowling. (2001). *Natural area tourism: Ecology impacts and management.* Clevedon, Eng: Channel View Publications.

Appendix D:

Tejon Ranch Conservancy Public Access Events TEJON RANCH CONSERVANCY PUBLIC ACCESS EVENTS



A - Figure D-1. Conservancy public access events. Colored lines correspond to different routes for different activities.

List of Current Public Access Activities on Tejon Ranch

- Community hikes
 - Vehicle tours
 - Birding trips
 - Wildflower tours
- Cultural history tours
- Resource group hikes
- School field trips
- Citizen science activities
 - Planned activities (e.g. Christmas Bird Count, Breeding Bird Blitz, Purple Martin Survey)
 - Conservancy-hosted trips (e.g. Audubon trips, NAHFA trips, CNPS trips)
- Service projects or volunteer work
- Docent training
- Educational programs or field trips
- Art (e.g. plein air painting, photography)
- Special events

Appendix E:

Board Member and Past Visitor Surveys

Board Member Survey

We partnered with Conservancy staff to distribute the board member survey (displayed below) via email through SurveyMonkey. Reminder emails were sent out two weeks later to encourage response. There was no close date for the survey, but only one additional response was received after the reminder was sent out.

The survey used both multiple choice and open-ended questions. It asked board members for answers based on their personal opinion and experiences surrounding public access on the Ranch and was designed to get at the intent of public access in the Agreement. Responses to multiple-choice questions were summarized automatically by SurveyMonkey. Open-ended questions were analyzed manually by reading each response and extracting common themes and important points.

Conservancy Board Member survey on public access

2/15/13

[SURVEY PREVIEW MODE] Bren Public Access Survey

Bren Public Access Survey

1. Why was public access included and emphasized in the drafting of the Ranch-Wide Agreement?

2. The Ranch-Wide Agreement calls for "significant" public access. What does "significant" mean to you?

3. The Ranch-Wide Agreement also calls for offering public access to "underserved populations." Whom do you consider as "underserved" in this context?

4. What public access activities do you envision for the next five years on Tejon Ranch?

- Driving tours
- Overnight trips
- Picnicking
- Cultural history tours
- Astronomy/night sky viewing
- Nature study
- Outdoor education
- Citizen Science
- Self-guided access

Other (please specify)

www.surveymonkey.com/s.aspx?PREVIEW_MODE=DO_NOT_USE_THIS_LINK_FOR_COLLECTION&sm=H6w1eSHwiQyoL5fq5OIIKPUO%2f78WPsdG... 1/3

5. Who do you think the target audience(s) should be for the next five years of public access on Tejon Ranch?

- | | |
|--|--|
| <input type="checkbox"/> Mountain Communities (Lebec, Frazier Park, Lockwood Valley, Pine Mountain Club) residents | <input type="checkbox"/> Resource group constituents |
| <input type="checkbox"/> Southern San Joaquin Valley residents | <input type="checkbox"/> School groups |
| <input type="checkbox"/> Antelope Valley residents | <input type="checkbox"/> Youth organizations |
| <input type="checkbox"/> L.A. Basin residents | <input type="checkbox"/> Potential donors |
| <input type="checkbox"/> General public | |

6. What recreational modalities do you think are most compatible with the mission of the Conservancy and the tenants of the Ranch-Wide Agreement?

- Day hiking
- Overnight hiking
- Car/RV Camping
- Mountain biking
- Equestrian
- Trail running
- Geocaching
- Volunteering

Other (please specify)

7. For the next five years, about how many public access trips per year should the Conservancy host?

- Less than 30
- 30-50
- 50-75
- 75-150
- Pfft. Those numbers are small potatoes. Host trips ALL THE TIME!

8. At what time of year should the Conservancy focus on leading trips?

- Winter

- Spring
- Summer
- Fall
- Year round

9. What percent of the Conservancy's resources (e.g. staff time, budget, grant writing efforts) should be dedicated to public access?

- <15%
- 15-30%
- 30-50%
- >50%

Other (please specify)

Done

Powered by **SurveyMonkey**
Check out our [sample surveys](#) and create your own now!

Past Visitors Survey

We partnered with Conservancy staff to send out an online survey through Google Forms to the Conservancy's mailing list (1189 subscribers at time of distribution) and through the Conservancy's Facebook page (444 "Likes" at time of distribution) for a total of about 1633 people. Reminder emails were sent out after two weeks to encourage response. The survey closed after 30 days. We received 341 responses for an estimated 21% (341/1633) response rate.

To ensure only the survey respondents who had previously been to the Ranch were answering questions about their experience on the Ranch and thoughts on its public access program, the survey had a screening question at the beginning that asked how many times the respondent had been to the Ranch. If they answered zero, they were automatically skipped past questions about their visit to the Ranch and taken to questions regarding potential activities, which are not directed towards specific experiences on the Ranch.

At the end of the survey, respondents were also given the option to answer five demographic questions for use in analyzing the survey population. Responses to multiple-choice questions were summarized automatically by Google Forms. Open-ended questions were analyzed manually by first reading each response in its entirety. Once each response was read, common themes were identified and turned into codes. The codes are intended to be specific enough to provide insight while broad enough to still be manageable. Once the codes were established, each response was read a second time to sum how many times a code was present in each response. This meticulous approach to analyzing the open-ended questions was chosen in attempt to best capture the diverse ideas expressed by the survey respondents.

Past Visitor Multiple Choice Questions

Multiple Choice

The multiple choice questions helped create a profile of past visitors regarding their general experiences and preferences with outdoor recreation and assessed their visit on the Ranch.

Respondent Profile

- About half of the respondents (52%) participate in outdoor recreation activities at least once a week.

- Generally, most respondents participate in hiking (86%), followed by wildflower viewing (71%), wildlife viewing (65%), birdwatching (57%), and camping (49%).
- Generally, mountain biking (11%), horseback riding (9%), and hunting (6%) are the least popular activities.
- Most respondents (76%) visit both public and private lands for recreation. However, “I don’t know” was not an option so these results may be high.

Demographics (responses were optional)

- Respondents were about evenly split among males and females (52% and 47%, respectively).
- 68% of respondents were aged 55 or older.
- 93% of respondents were Caucasian.
- The most common income range of respondents was \$50,000-\$100,000 (38%).

Ranch Experience

- 84% of respondents have visited the Ranch at least once. Those who have not visited were not presented with questions regarding their experience on the Ranch.
- Many of the visitors’ experiences on the Ranch are recent. 44% visited within the last 6 months of the survey’s distribution.
- 34% of the visitors heard about visiting the Ranch from friends and family, 30% heard from the Conservancy website, and 21% heard from a non-profit organization.
- Most visitors (60%) went for a planned activity by the Conservancy.
- Most visitors went on a guided hike (65%) or a driving tour (38%).
- 62% rated their visit a 5 on a scale of 1-5 with 5 being “enjoyed their visit a lot”. None rated their visit a 2 or 1.

Desired Experience on Ranch

- Interpretive trails on the Ranch (76%) are the most desired activity. Following the respondents’ general preferences for activities, mountain biking (13%) and horseback riding (19%) were least desirable on the Ranch (Figure 4-2).
- On a scale of “will definitely visit, likely to visit, unlikely to visit, and will not visit,” respondents indicated that they were “likely to visit” the Ranch for many activities (A - Table E-1), none responded that they “will definitely visit” for any of the activities. Following the trend, horseback riding and mountain biking

were the only activities where respondents said that they “will not visit” for those activities.

A - Table E-1. Likelihood of visiting the Ranch based on activities offered. Activities marked by a (*) were the only activities where "will not visit" received the highest response.

“Likely to Visit”	“Unlikely to Visit”
<ul style="list-style-type: none"> • Volunteer work • Educational programs & field trips • Camping/backpacking • Interpretive trails • Astronomy & star gazing • Historical & Cultural Activities 	<ul style="list-style-type: none"> • Art • Horseback riding* • Mountain biking* • Hands-on ranching activities • Interpretive ranching activities

- When respondents were only allowed to select one, 46% preferred unguided activities, 30% preferred guided, 23% preferred self-guided.
- Over 50% of all respondents indicated interest in each of the citizen science fields (A - Table E-2).

A - Table E-2. . Percentage of survey respondents interested in various fields of citizen science from survey of past visitors. More than one answer was allowed.

Citizen Science Field	Percentage of Responses
Botany	75%
Ornithology	75%
Mammology	65%
Anthropology	57%
Herpetology	50%
I am not interested in citizen science at Tejon Ranch.	6%
Other	5%

- 91% of those who responded to the optional question of how best to inform them of activities indicated that email was most preferred.

Past Visitor Open Ended Questions

Because responses could cover more than one general theme and thus be coded in more than one code, results for percent of survey respondents will *not* sum to 100%. In some cases, codes were broken down into sub-codes in order to provide more detail (note: percentages in sub-codes are *a proportion* of the main code percentage).

Likes & Dislikes

The 277 question respondents combined for a total of 1031 recorded responses. Some highlights:

- Nearly 30% of question respondents commented on the quality of the Conservancy's staff and guides. Not a single respondent suggested need for staff or guide improvement.
- Nearly 11% of question respondents pointed out the Ranch's diverse landscape and nearly 26% commented on the aesthetic scenery or beauty of the Ranch.
- About 14% of question respondents believe the Ranch landscape is well maintained and in good or "unspoiled" condition.
- About 9% of question respondents expressed appreciation for the wildflower displays on the Ranch.
- About 38% of question respondents commented in some way about a need for expanded access on the Ranch. Nearly 11% focused on needing more frequent options for public access and about 9% focused on needing access to more areas within the Ranch.

Ideal Visit

The 320 question respondents combined for a total of 986 recorded responses. Some highlights:

- Nearly 43% of question respondents commented specifically on accessing the Ranch for nature, including plants, animals, and scenery.
- Over 40% of question respondents expressed desire for some form of hiking. Many requested additional hiking options with a bit more flexibility built in.
- Over 20% of question respondents requested overnight access on the Ranch, the majority of which specified camping. A few requested RV access or rustic cabins.

- Over 14% of question respondents mentioned guided access while over 16% requested unguided access. Additionally, about 8% requested that both guided and unguided options be available for Ranch access.
- Over 14% of question respondents requested extended time on the Ranch, including early morning access, late evening access, and/or all day access.
- About 10% of question respondents requested that Ranch maps be available for visitors with roads and trails marked on the maps and by physical signage. This includes requests for interpretive trails on the Ranch.

Additional Comments

154 out of 341 people responded to this question. Those who answered with “None” were not counted as a response.

Specific comments regarding public access

- 18 commented positively about the land (unique, beautiful, etc.)
- 17 wanted more public access
- 16 did not want over-use/too much public access
- 11 commented about how the Ranch was far from them, so they are unable to visit often
- 10 talked about the great guides and staff
- 9 made some mention of the importance of conservation
- 9 expressed willingness to help (e.g. volunteer, docent)
- 7 wanted to see unguided or self-guided access
- 6 appreciated the current level of access
- 5 expressed having a positive experience (e.g. “I enjoyed my visit”)
- 5 wanted to see more of the Ranch
- 5 wanted to keep access guided
- 5 wanted to camp or backpack
- 5 wanted trails
- 4 did not want any development on the Ranch
- 4 wanted more information on hikes (map of locations, seasonal sightings, what to expect to see)
- 4 wanted to visit (had not visited)
- 3 wanted longer hikes (tied to distance traveled to get to the Ranch)
- 3 expressed the need for better marketing/outreach/advertisements

General comments

- 20 comments expressed thanks in general.
- 10 appreciated the opportunity to express their opinions on public access
- 10 comments were general positive comments. (e.g. “I love Tejon Ranch”)
- 5 comments were motivational or supportive (e.g. “Keep it up.”)

Other interesting responses

- Some expressed the desire to volunteer, but they live too far from the Ranch.
- One person suggested partnering up with Fort Tejon State Park for camping.
- Having a tour based on the stage coaches that used Tejon Canyon as a pass.
- Introducing activities as “pilots” to avoid “Pandora’s box effect” (i.e. harder to take away once it’s offered).
- One person recommended looking at Santa Rosa Ecological Preserve as a model.

Charts of Coded Responses

A - Table E-3 provides (per column, left to right):

- *Code*: the label given to a general theme from responses. Note: a + means these responses were considered ‘positive’ experiences and/or comments; a – means they were considered ‘negative’ experiences and/or comments; a = means the code is neutral.
- *Description*: a more detailed explanation for what the code includes.
- *Count*: how many responses fitting in the particular code were recorded. Note: a couple codes encompass other codes. Thus, their percentage and count includes the sub-code counts for an overall code percentage.
- *Percent of Survey Respondents*: the number of total survey respondents within given code (e.g. #/286)
- *Percent of Question Respondents*: the number of respondents that answered the question within given code (e.g. #/277)
- *Percent of Responses*: the number of recorded responses within given code (e.g. #/1031). Note: question responses could be coded as more than one code if they covered more than one general theme.
- *Example Response*: an example of a response from the survey coded within given code

A - Table E-4 provides (per column, left to right):

- *Code*: the label given to a general theme from responses.
- *Description*: a more detailed explanation for what the code includes.
- *Count*: how many responses fitting in the particular code were recorded. Note: a couple codes encompass other codes. Thus, their percentage and count includes the sub-code counts for an overall code percentage.
- *Percent of Survey Respondents*: the number of total survey respondents within given code (e.g. #/341)
- *Percent of Question Respondents*: the number of respondents that answered the question within given code (e.g. #/320)
- *Percent of Responses*: the number of recorded responses within given code (e.g. #/986). Note: question responses could be coded as more than one code if they covered more than one general theme.
- *Example Response*: an example of a response from the survey coded within given code.

Likes & Dislikes Coded Survey Responses

A - Table E-3. Chart of coded responses from the Likes & Dislikes question.

Code	Description	Count	Percent of Survey Respondents	Percent of Question Respondents	Percent of Responses	Example Response
+ Positive	Expressed general overall satisfaction with visit	251	73.61	90.61	24.35	Very well organized. What's not to love?
+ Good staff	Commented on how TRC's staff and/or guides are excellent, knowledgeable, helpful, etc.	83	24.34	29.96	8.05	The folks at the conservancy are excellent.
+ Nature	Commented on the nature found on Tejon, including flora, fauna, and wildlife. The code includes Wildflower and Birding sub-codes given their frequency.	75	21.99	27.08	7.27	I really enjoyed the wilderness and landscape. It made me feel happy to know there is still land that is being conserved where wildlife, flora and fauna can continue to survive.
+ Nature: Wildflowers	Commented on the wildflowers that seasonally cover the Ranch.	25	7.33	9.03	2.42	Perhaps some of the best wildflower displays in north America in a good year.

+ Nature: Birding	Commented on the birding opportunities on the Ranch.	19	5.57	6.86	1.84	A nearly pristine property with outstanding birding opportunities.
+ Aesthetic scenery	Commented about beautiful landscape, scenery, vistas, or similar aspects of the Ranch	71	20.82	25.63	6.89	The Ranch is overall beautiful and I LOVE being there.
+ Hiking	Commented on enjoying their hiking experience. Includes enjoying fellow hikers' company.	43	12.61	15.52	4.17	I appreciate the guided hikes where I often learn more about the wildlife and areas that help inform and have added value for me during these outings. I also like the communal nature of my fellow hikers.
+ Well maintained	Commented on the management, pristine condition, and/or sustainability of the Ranch.	40	11.73	14.44	3.88	A great chance to see unspoiled and wild country.
+ Diverse	Commented on how Tejon is diverse, with many different things to see and experience	30	8.80	10.83	2.91	I like the exceptional diversity of the ranch.
+ Open space	Commented on how Tejon is a big piece of open land, largely undeveloped, and/or	31	9.09	11.19	3.01	Love the open space and beauty, especially in the spring wildflower season.

	vast.					
+ Access	Expressed appreciation for having access to the Ranch, sometimes referencing how this was previously not an option.	26	7.62	9.39	2.52	Liked the wildflowers and the open invitation to visit. It's too bad they closed access for several years, but I'm pleased there is new, though limited, access again.
+ Information	Commented on the educational opportunities and information provided on trip, including the history of the Ranch.	25	7.33	9.03	2.42	It was an overall great experience. I liked learning about all the aspects of the Tejon Ranch; livestock grazing, conservation, and development.
+ Secluded	Commented on the secluded and solitary nature of the Ranch and the ability to be somewhere with few people. Includes comments about sense of place.	25	7.33	9.03	2.42	I liked being in places not terribly marked by humans; places not regularly visited.
+ Unique	Commented on how Tejon is unique and/or unlike	17	4.99	6.14	1.65	Liked the ranch itself and the opportunity to visit uncrowded land and unique ecosystems.

	anywhere else					
- Need more access (NMA)	Commented in some way on a need for more access on the Ranch. This code is broken down into sub-codes for clarity.	106	31.09	38.27	10.28	It would be great if you could have outings for those of us who can't hike so we, too, can enjoy the beauty of the ranch, either with a scenic drive or just by parking in a convenient location and walking in the immediate vicinity.
- NMA: frequency	Expressed desire for more chances to access the Ranch, such as through offerings of more guided trips.	29	8.50	10.47	2.81	Difficult to plan far in advance for a limited amount of spots.
- NMA: within Ranch	Expressed desire for options to visit more areas within the Ranch, such as a different trail or canyon.	26	7.62	9.39	2.52	Only down side, which was understandable, was we could not go back into Tejon Canyon as it was hunting season

- NMA: more time	Expressed need for longer trips and time on the Ranch, especially to make it worth the trip for those not close to the Ranch. This code includes respondents who wish for longer time specifically for painting and/or photography.	18	5.28	6.50	1.75	There was nothing I disliked about my two visits (guided hikes). However, virtually all of the guided hikes that have been offered in the past three years have been way too short (in terms of distance) to justify driving from Los Angeles to participate.
- NMA: unguided	Expressed desire for unguided access on the Ranch, usually on own or in small groups.	15	4.40	5.42	1.45	I think ultimately you may want to go to having some trails open on a non-guided basis, or nature trails with features marked, etc.
- NMA: overnight	Expressed need for overnight access on the Ranch, including the option to car camp at an entrance before an early morning hike etc.	10	2.93	3.61	0.97	Would like to be able to car camp (or just sleep in car) at entrances for early morning expeditions since it is a long drive to participate in pre-dawn activities.

- Need more hiking	Commented in some way on a need for more hiking options and opportunities on the Ranch. Includes: comments asking for more route options, such as non-road trails; longer hikes; hikes that are more or less strenuous.	17	4.99	6.14	1.65	I enjoyed the scenery and wildlife, but the "hike" was really just a walk along a dirt road. The description of the hike was a little misleading.
- Pig and cattle impacts	Expressed concern over the pigs and/or cattle on the Ranch and their negative impacts on the landscape, such as overgrazing.	10	2.93	3.61	0.97	I was really concerned about the damage done to sensitive habitat, particularly riparian areas of the Ranch.
- Need restrooms	Expressed need for restrooms on the Ranch. This could mean a simple port-a-potty at the entrance or a more developed "rest area."	9	2.64	3.25	0.87	Would like port-a-potties available at entrances.

- Future developments	Expressed concern about the proposed future developments on the Ranch and their potential to impact the land in a negative way.	6	1.76	2.17	0.58	Dislike: Proposed cluster development that is creates new suburbia.
= Other	Commented on something that did not fit well into a code and not frequent enough to warrant its own code. This includes comments on weather, expanding environmental education, and roads, for example.	24	7.04	8.66	2.33	Dislike: The inability during Christmas Bird Counts to break up into smaller count parties to cover smaller territories and more overall TR acreage within the count circle in order to secure more comprehensive and complete results is frustrating. The Tejon Ranch CBC circle is one of the few, if not only, count circles anywhere where the entire circle is potentially open for complete coverage due to a single landowner. This seems to offer an outstanding opportunity to see what happens (results) when a CBC circle is truly covered in its entirety.
= No response	Did not respond to this question.	9	2.64	—	0.87	—
TOTAL	—	1031	—	—	100.00	—

Ideal Visit Coded Survey Responses

A - Table E-4. Chart of coded responses from the Ideal Visit question.

Code	Description	Count	Percent of Survey Respondents	Percent of Question Respondents	Percent of Responses	Example Response
Nature	Expressed desire to access natural aspects of the Ranch, including plants, animals, and scenery. This code has sub-codes for further detail.	136	40	42.50	13.79	Meeting new and interesting people, learning new things, getting some exercise, and communing with nature is about as optimum of a day as I can imagine.
Nature: wildflowers	Expressed desire to view the wildflowers blooms on the Ranch.	43	13	13.44	4.36	A long hike on a cool Spring day with wildflowers in bloom and a naturalist or docent leading the group.
Nature: wildlife	Expressed desire to view the wildlife on the Ranch.	33	10	10.31	3.35	A visit with lots of trees, opportunities to view wildlife, beautiful flora and fauna!
Nature: birding	Expressed desire to participate in birding on the Ranch. Includes condor comments. Note: these were not	60	18	18.75	6.09	Maintained trails in habitat good for birdwatching; easy access -- especially early mornings and evenings.

	double-counted in the wildlife code.					
Hiking	Expressed desire to hike on Ranch in some capacity. Includes walking.	129	38	40.31	13.08	My ideal visit would be an 8 - 10 mile hike, limited to a group of 10 - 15 people, accompanied by two Conservancy employees knowledgeable about the flora and fauna that we see. The hike would be on a trail, not on roads or cross-country and would be moderate to strenuous, perhaps with enough elevation gain to pass through different habitats.
Overnight	Expressed desire to access Ranch overnight in some form. This code has a sub-code for camping.	66	19	20.63	6.69	Overnight with interpretive supervision available.
Overnight: camping	Specifically called for camping. Includes car camping.	45	13	14.06	4.56	A camping trip with my family that allows me to reserve a space (online reservation and a system that allows me to pick the spot I want and to know that I have a definite spot when I get there).

Guided	Expressed desire to have guided access to the Ranch and did not mention unguided.	57	17	17.81	5.78	Guided tour starting off early, lasting most of the day, with pauses for lunch, short hikes, wildlife viewing and informational talks by docents or guides.
Unguided	Expressed desire to have unguided access to the Ranch and did not mention guided. Includes comments about open exploration on the Ranch.	52	15	16.25	5.27	Without any supervision, I and my companion are allowed to drive to a trailhead then walk several miles in wilderness. We are not obligated to make a reservation unless we plan to camp overnight. We see lots of flowers and wildlife.
Extended time	Expressed desire to have more time on the Ranch, including early morning, evening, and all-day access.	45	13	14.06	4.56	Ideally we would need a weekend to visit, as it is quite a distance from San Diego, our home.
Art	Expressed desire to have time and access on the Ranch to make art, namely photography and painting.	43	13	13.44	4.36	I like to photograph California wild lands. However, I can't walk very fast or far at one time so I would like unguided access where I can take my time without holding up a guided activity.

Information	Expressed desire to receive information during Ranch visits, including history and cultural information.	41	12	12.81	4.16	I would love to visit and get some guidance as to the best areas to visit, information about the history of the ranch, maybe some lectures/information about the plants and animals, and then be allowed to go venture out on my own and explore what I've just learned about.
Mixed transport	Expressed desire for mixed transportation options on the Ranch, including vehicles and OHVs.	37	11	11.56	3.75	Park at a designated trailhead and hike on an established trail that goes through the scenic beauty of the ranch. I would prefer the hike to be during the wildflower peak and have had already downloaded a trail map ahead of time.
Backpacking/backcountry access	Expressed desire to have the option to backpack in Tejon and/or access the backcountry areas on the Ranch. This might mean overnight access, but comments were not counted as Overnight unless explicitly stated as such.	30	9	9.38	3.04	An ideal visit might be to camp at a back country base camp for a couple of nights and be free to explore in the area looking for plants and birds and other wildlife.

Picnicking	Expressed desire to be able to have picnics on the Ranch.	31	9	9.69	3.14	A hike along a riparian stream with beautiful flowers and trees and great company. There would be nice picnic benches at the end of the trail where we can eat lunch and relax.
Ranch maps and signs	Expressed desire to have access to Ranch maps with roads and trails marked. Also includes requests for marked signage throughout the Ranch and requests for interpretive trails.	32	9	10.00	3.25	To walk at one's own pace on some of the trails with key guideposts or signage to keep from getting lost. A way to rate the trails for length and steepness so one knows before attempting them what to expect.
Diverse habitat access	Expressed desire to have access to tours of the diverse habitats and/or climates of the Ranch.	26	8	8.13	2.64	I would be able to access different areas for the purpose of watching birds. More roads and access to different habitats would be optimal. I would likely spend an entire day and perhaps camp.
Other	Commented on something that did not fit well into a code and not frequent enough to warrant its own code. This includes comments on winter activities, PCT, and	28	8	8.75	2.84	I picture it ran as a National Park.

astronomy.

Small groups/ few people	Expressed desire for accessing the Ranch in small groups away from crowds.	27	8	8.44	2.74	Unguided, few people, quiet, nature, no signs of development.
Both guided and unguided options	Expressed desire to have the option for both guided and unguided activities on the Ranch.	25	7	7.81	2.54	I would enjoy being able to have a combination of self-guided exploration of trails and docent guided tours with information about the cultural significance of the ranch. Helping with research would also be awesome!
No response	Did not respond to this question.	21	6	—	2.13	—
TOTAL	—	986	—	—	100.00	

Survey for past visitors to Tejon Ranch

2/15/13

Edit form - [Public Access on Tejon Ranch, CA] - Google Docs

Public Access on Tejon Ranch, CA

Thank you for participating in this online survey. Your anonymous input will be used in a University of California, Santa Barbara Bren School Master's thesis project. In partnership with the Tejon Ranch Conservancy, our project will assess public access options on Tejon Ranch.

This survey is designed to collect information about your past experience(s) visiting Tejon Ranch. This survey should take approximately 10-15 minutes to complete.

Disclaimer: There are no risks associated with this survey, and no sensitive information will be collected. We will have exclusive access to the answers you provide and any personal information will be kept confidential. Your participation is voluntary and you are free to stop taking the survey at any time. You must be at least 18 years of age to participate in this survey. If you are younger than 18, we will remove your submission from the data we receive.

If you have any questions or concerns regarding this survey or would like to withdraw your responses, please email tejonaccess@lists.bren.ucsb.edu. If you have any concerns about the intentions or procedures used in this survey, you can email UC Santa Barbara's research ethics committee at hsc@research.ucsb.edu.

Your participation is greatly appreciated. Thank you.

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In general, how often do you participate in outdoor recreation activities? *

- Daily
- Weekly (at least once a week)
- Monthly (at least once a month)
- Several times a year
- Less than once a year
- Never

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In which of the following types of outdoor recreation activities do you typically participate? (please check all that apply) *

- Astronomy and stargazing
- Backpacking
- Bird watching
- Camping

<https://docs.google.com/spreadsheets/gform?key=0A1M8T5pKUPFwwdGpxdmczMTAyWIRDcmxMVmFUNndSLWc#edit>

1/7

- Educational activities
- Hiking
- Historical or cultural activities
- Horseback riding
- Hunting
- Mountain biking
- Picnicking
- Wildflower viewing
- Wildlife viewing
- Other:

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Where do you participate in outdoor recreation activities? *

- Public lands (ex: California State Parks, National Parks, National Forests)
- Private protected lands (ex: Wind Wolves Preserve, Audubon California Kern River Preserve)
- Both public and private lands
- Other:

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How many times have you visited Tejon Ranch? *

- 0
- 1
- 2
- 3
- 4
- Other:

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Note: "Go to page" selections will override this navigation. [Learn more.](#)

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When did you last visit Tejon Ranch? *

- 0-6 months ago

- 6-12 months ago
 1-2 years ago
 2-3 years ago
 Over 3 years ago

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Note: "Go to page" selections will override this navigation. [Learn more.](#)

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How did you hear about visiting Tejon Ranch? *

- Tejon Ranch Conservancy website
 Tejon Ranch Conservancy newsletter
 Internet search (ex: Google)
 Friends or family
 Non-profit website or newsletter (ex: Sierra Club)
 School
 Other:

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What brought you to Tejon Ranch? (please check all that apply) *

- Planned activity through Tejon Ranch Conservancy
 Planned activity through other non-profit (ex: Audubon Society)
 Educational activity through school
 Science or research
 Business (ex: meeting)
 Special event invitation
 Other:

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Overall, how do you rate your visit(s) to Tejon Ranch? *

1 2 3 4 5
 did not enjoy it at all enjoyed it a lot

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For each activity listed below, how likely would you would visit Tejon Ranch if it was offered? *

	Will not visit	Unlikely to visit	Likely to visit	Will definitely visit
Volunteer work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Educational programs or field trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Art	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Camping/Backpacking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Horseback riding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interpretive trails	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mountain biking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Astronomy and star gazing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Historical or cultural activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Picnicking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hands-on ranching activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interpretive ranching activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Would you prefer to participate in guided, self-guided, or unguided activities on Tejon Ranch? *

- Guided activities (ex: docent led activities)
- Self-guided activities (ex: activities with an audio tour or interpretive signs)
- Unguided activities (ex: activities with minimal signs for direction only)

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Which of the following citizen science fields would you be interested in at Tejon Ranch? (please check all that apply) *

- Botany (plants)
- Ornithology (birds)
- Herpetology (reptiles and amphibians)
- Mammology (mammals)

- Anthropology (human culture and history)
- I am not interested in citizen science at Tejon Ranch.
- Other:

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How would you like to hear about public access activities offered at Tejon Ranch? (optional - please check all that apply)

- Email newsletter
- Tejon Ranch Conservancy website
- via Non-profit organization
- Facebook
- Twitter
- Mailed newsletter
- None of the above
- Other:

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Please describe your ideal visit at Tejon Ranch. *

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Please provide any additional comments.

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The following questions are optional but will be helpful to our project.

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What is your zip-code? (If you are not from the United States, please enter "international")**What age group are you in?**

- Under 18
 18-24
 25-34
 35-44
 45-54
 55-64
 65+

What is your gender?

- Male
 Female

Which ethnic group(s) do you most closely identify with? (please check all that apply)

- Caucasian
 Hispanic
 African American
 Asian
 Native American
 Other:

What is your total annual household income?

- Less than \$25,000
 \$25,000-\$50,000
 \$50,000-\$100,000
 \$100,000-\$150,000
 \$150,000-\$200,000
 Over \$200,000

Appendix F:

Underserved Communities and Populations

Defining “Underserved”

A review of studies suggests a definition of “underserved” that is consistent with our definition. According to the United States Forest Service (USFS) Sustainable Recreation Framework (2010), 80% of the US population lives in cities and many are only exposed to nature through television or their computer. Louv (2005) coined the term “Nature Deficit Disorder” to describe this trend of increasing detachment with nature, particularly among children. In a study by the Pacific Forest and Watershed Lands Steward Ship Council, the underserved has been defined as all young people and communities of color (Tides Foundation, 2005). Often, outreach, facilities, and programs in parks and other open-space areas are culturally misaligned with these communities (USFS, 2010; Tides Foundation, 2005). For example, there are no staff members that speak their language or look like them (Tides Foundation, 2005). Some are unwilling to venture out into the outdoors due to fears of the wilderness and safety concerns (Tides Foundation, 2005; Roberts & Chitewere, 2011).

Importance of Addressing Underserved Communities

Studies have shown that increasing outdoor activity and interaction with nature can have public health benefits such as helping to reduce physical and mental health issues (including obesity, diabetes, heart disease, stress, and depression) and increasing one’s lifespan. Poudyal et al. (2008), found that counties with high proportions of “forests, farmland, rangeland, and water bodies” and those with or near federal or state parks had increased life expectancies at birth. Velarde et al. (2007) found that even just viewing natural landscapes has positive health effects. Therefore, it is important to provide opportunities to those who have difficulty or are unable to access natural areas.

Identifying Underserved Communities

Urban Areas

In looking at zip codes of past visitors in the Conservancy’s database, we see that visitors have come from across California. The highest number of visitors is from zip-codes immediately adjacent to the Ranch (A – Figure F-1) 93225 (Frazier Park; 36

visitors), 93243 (Lebec; 26 visitors), 93306 (Bakersfield; 25 visitors), 93309 (Bakersfield; 24 visitors), and 91355 (Valencia; 24).

Because other open-space access opportunities, such as the Angeles National Forest, are in closer proximity to the urban areas of Los Angeles County, these urban zip-codes may be more aptly served by the National Forest and other open-space areas. However, the Ranch's proximity to Bakersfield may provide an opportunity to reach urban populations. While urban areas could be considered underserved because of their distance from natural areas, the size and diversity of the populations in Bakersfield and Los Angeles (the population centers of Kern and Los Angeles Counties, respectively) are so great that it is difficult to effectively target these urban population underserved communities.



A - Figure F-1. Urban population centers around Tejon Ranch.

Ethnicity

The 2010 US Census reported that Kern and Los Angeles Counties were predominately Hispanic, 50% and 48%, respectively (A - Table F-1; A - Table F-1). However, the USFS National Visitor Use Monitoring Program (NVUMP) reports indicated that about 90% of their visitors are white and less than 20% are Hispanic (A - Table F-2). Similarly, 93% of our survey respondents identified themselves most closely with Caucasian. Thus, Hispanic populations appear to be greatly underrepresented in regional nature areas.

A - Table F-1. Race demographics of Kern and Los Angeles Counties (US Census Bureau, 2010).

	Kern (%)	Los Angeles (%)
Hispanic	50.0	48.1
White	37.9	27.6
Black	6.3	9.3
Asian	4.7	14.2
Two or more races	3.0	2.8
Native American	2.7	1.5

A - Table F-2. Visitor race demographics for Angeles, Los Padres, Sequoia, and San Bernardino NF (NVUMP).

Ethnicity	Percent of Visitors
Hispanic	14.6-19.5
White	83.9-91.8
Black	1.1-4.9
Asian	4.2-10.0
Native American	2.9-7.9

Age

In terms of age, the USFS NVUMP reports show an even distribution of about 20% across different age groups of visitors, with the exception of 16 to 19 year olds (3 to 5%), 60 to 69 year olds (about 5%), and 70+ year olds (about 2%) (A - Table F-3). Although the 15-19, 60-69, and 70+ age ranges are similarly lower in the regional age distributions (A - Table F-4) these age classes do appear to be slightly underrepresented among National Forest visitors at about 2-5% below the regional age distributions.

Because our survey was restricted to visitors that were 18 years or older, we do not have data on age groups younger than 18. Most of our survey respondents were 55 to 64 years old (35%) or 65 or older (33%), which represent a much higher proportion of visitors in those age groups than those visiting the National Forests

and of the general population in California. Therefore, the Conservancy appears to be addressing the needs of senior citizens where the National Forests are not.

A - Table F-3. Visitor age distribution at Angeles, Los Padres, Sequoia, San Bernardino NF (NVUMP).

Age	Percent of Visitors
<16	17.5-29.5
16-19	3.0-5.9
20-29	12.0-18.1
30-39	14.4-18.5
40-49	19.7-21.7
50-59	12.9-17.9
60-69	4.8-6.9
70+	1.8-2.1

A - Table F-4. Estimated Age Distribution for Kern and Los Angeles Counties in 2011 (US Census, 2011).

Age	Kern (%)	Los Angeles (%)
<15	24.9	19.7
15-19	8.3	7.4
20-29	15.7	15.6
30-39	13.6	14.4
40-49	12.8	14.4
50-59	11.7	12.7
60-69	7.0	8.2
70+	6.1	7.7

Income

Comparing the incomes of National Forest visitors (A - Table F-5) to the income distribution of Kern and Los Angeles Counties (A - Table F-6), incomes of \$50,000 or greater appear to be over-represented in the National Forests relative to the counties' income distribution. Those in the \$25,000-49,999 income range appear to be slightly under represented, while those making less than \$25,000 appear greatly under-represented. Our survey reveals a similar trend, with 10% of visitors in the \$25,000-\$50,000 range, 6% with less than \$25,000 and an over-representation in the other ranges.

A – Table F-5. Visitor annual household income ranges from Angeles, Los Padres, Sequoia, San Bernardino NF (NVUMP).

Income (\$)	Percent of Visitors
<25,000	6.4-13.1
25,000-49,999	14.4-20.2
50,000-74,999	21.5-24.6
75,000-99,999	13.0-16.1
100,000-149,999	13.4-23.8
150,000+	11.6-16.4

A – Table F-6. Estimated annual household income ranges for Kern and Los Angeles Counties in 2011 (US Census, 2011).

Income (\$)	Kern	Los Angeles
<25,000	28.9	24.8
25,000-49,999	25.1	23.0
50,000-74,999	18.2	16.9
75,000-99,999	11.0	11.4
100,000-149,999	10.3	12.8
150,000+	6.6	11.1

Gender

According to the US Census Bureau (2011a), Kern County has a sex ratio of 106.4 males to 100 females (51.6%) and Los Angeles County has 97.3 males to 100 females (49.3%). NVUMP reports that about 60% to 67% of their visitors are male. In contrast, our survey of past visitors showed a more even distribution of visitors with 52% males and 47% females. Thus, the Conservancy appears to be adequately serving both genders.

Recommendations

Based on this analysis, the Conservancy should currently focus on Hispanic populations, the 16-19 age group (“adolescent youth”), and low-income populations (particularly those with household incomes of less than \$25,000) as underserved communities. Using an adaptive management approach, the Conservancy should monitor their progress in serving these communities and reevaluate their identification of “underserved communities” as some of these communities become adequately served (See Chapter 9: Adaptive Management).

Barriers to access and concerns about open-space share some overlap between these underserved communities (A - Table F-7). Several studies have found that Hispanic families lacked knowledge about access opportunities to surrounding open-space areas (Church et al., 2011; Roberts & Chitewere, 2011; Po’e et al., 2012; Tides Foundation, 2005). In addition to the lack of knowledge, there is a perception that these areas are not for their use, which can be attributed to the lack of culturally relevant activities or programming, lack of ethnic representation on staff, and lack of

materials in their language (Roberts & Chitewere, 2011; Po'e et al., 2012; Tides Foundation, 2005). There is also a concern about the conditions and safety of open-space areas, including cleanliness of bathrooms, fears due to the reporting of violent crimes by the media, trail safety, and encounters with poison oak, cliffs, and wildlife (Roberts & Chitewere, 2011).

Similarly, among adolescent youths, there is a lack of relatable role models, appropriate and appealing activities, and a concern for safety (particularly among their parents). There is also the lack of transportation resources and the fear of a lack of gear needed for certain activities. The fear of the lack of gear ties in with the lack of financial resources to purchase those items (Tides Foundation, 2005).

A - Table F-7. Summary of barriers to access for underserved communities (Roberts & Chitewere, 2011; Po'e et al., 2012; Tides Foundation, 2005; Burns et al., 2006; Ostergren et al., 2005; California State Parks, 2009).

Barriers to access		
Hispanic	Adolescent Youth	Low-Income
<ul style="list-style-type: none"> • Lack of knowledge about surrounding open-spaces • Perception that facilities are not for their use • Safety concerns 	<ul style="list-style-type: none"> • Fear of nature • Lack of gear and transportation • Safety concerns (from parents) 	<ul style="list-style-type: none"> • Recreation fees • Overall cost of trips

Roberts and Chitewere (2011) found that the desire to visit these open-space areas is present, but the barriers need to be overcome. To improve knowledge of access opportunities and dispel the perception that these areas are not for their use, outreach efforts must be culturally relevant. Po'e et al. (2012) found that culturally tailored programs that invite Latino families to Community Recreation Centers increased sustained use of these centers and demonstrated to the families that these facilities are available for their use. While this study was on recreation centers in urban environments, these findings can also be applicable to open-space areas. Roberts and Chitewere (2011) also found that parents often learn about open-space areas as chaperones on school field trips. Thus, field trips should indicate how parents could return to enjoy the area with their families on their own. Safety

concerns and fears can also be alleviated with increased outreach and education (Tides Foundation, 2005).

Integrating more culturally relevant activities and a more relatable presence can help dispel the perception that open-space areas are not for these communities. Hispanic communities have a preference for highly developed areas (California State Parks, 2009) and family-oriented activities, such as playing soccer (Tides Foundation, 2005). They are less likely to use trails and scenic areas. The California State Parks survey (2009) also found that both Hispanics and non-Hispanics tended to visit parks in groups of about five, but Hispanic groups tend to have more individuals under the age of 18. Additionally, they are more likely to visit with family and friends rather than with organized groups or groups of friends. Increasing the presence of Hispanic staff members that can speak Spanish and the presence of materials in Spanish will help provide a greater sense of belonging and inclusion as well as providing culturally relevant role models to youth (Tides Foundation, 2005; Roberts & Chitewere, 2011).

A study by Thapa et al. (2001) noted that different ethnic groups prefer different types of communication when seeking out recreational information. For example, Hispanics prefer print communication, such as signs and brochures, when learning about rules and regulations. Hispanics were also less likely than Whites to seek out rangers or staff for park information and relied more heavily than other ethnic groups on gaining information through family and friends (Thapa et al., 2001). Differing ways of seeking information among ethnic groups should be noted so that the most effective communication of recreational information on Tejon Ranch can be employed.

The Tides Foundation (2005) also highlighted that youths would prefer to have jobs to volunteering because of their financial obligations and constraints. Scholarships and gear are necessary to help families afford letting their children participate in some of these outdoor activities. Looking at low-income communities over all, Ostergren, Solop, and Hagen (2005) found that low-income communities are more sensitive to fee increases at National Parks and are disproportionately affected by the introduction or increase of fees. Additionally, they found that the total cost of the trip (hotel, food, etc.) to a National Park poses a greater barrier to low-income households than the recreation fee alone. Burns and Graefe (2006) found support across surveyed income classes for free passes to be given in exchange for volunteer work, rather than simply giving a discount or free passes to low-income households.

They also found strong support across income classes for monthly “free days”. Therefore, providing local opportunities to low-income households helps to reduce the total trip cost, and maintaining low or no fees provides accessibility to these areas by low-income households.

Based on the recommendations above, the Conservancy should install infrastructure conducive to family-oriented activities, such as picnic tables, to accommodate underserved communities. Additionally, outreach should include media in English and Spanish as well as staff and/or volunteers who can speak Spanish. Recruiting an ethnically diverse staff and/or team of docents, particularly those with Hispanic heritage can help members of the Hispanic community feel more welcomed at the Ranch.

The Conservancy has already made efforts to reach out to underserved communities through their partnership with the Farmworker Institute of Education & Leadership Development (FIELD). Their partnership provides naturalist training to Latino students in the region to prepare them to lead wildflower tours in the spring (FIELD, 2013). Many of the recommendations for outreach to underserved communities are encompassed by this partnership by providing adolescent youth with vocational training while developing docents who reflect the ethnic makeup of the region.

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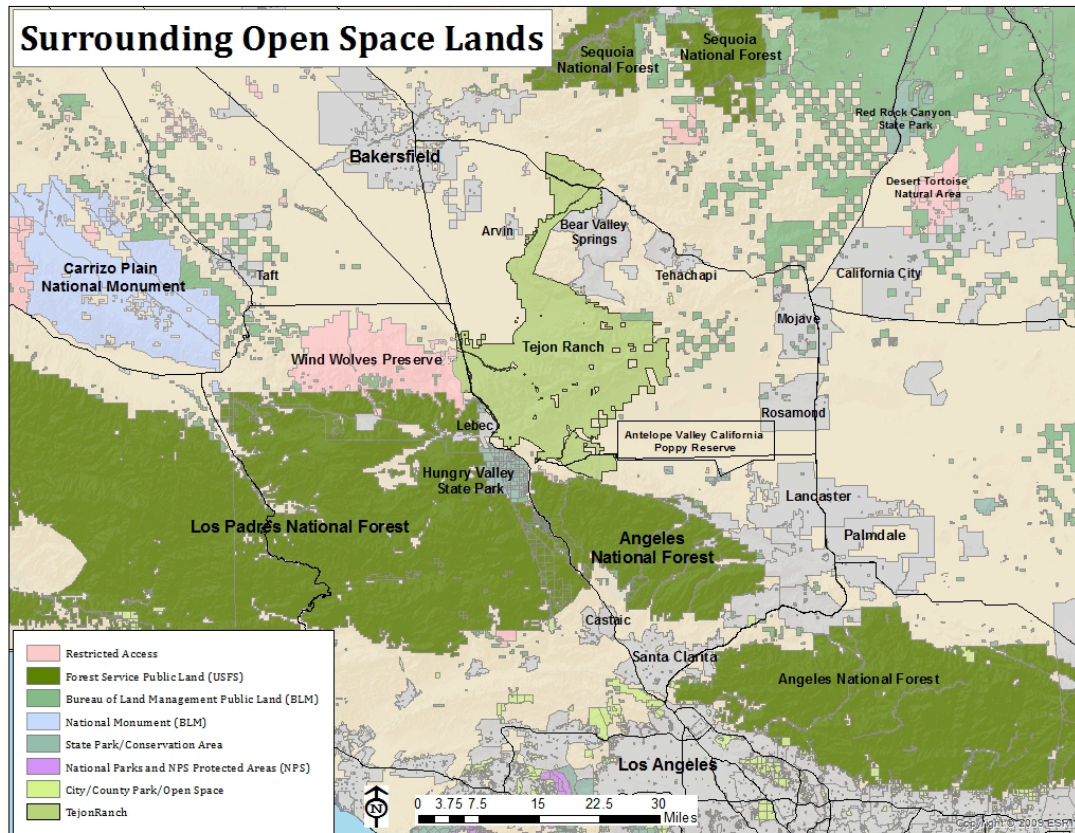
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Appendix G:

Regional & Private Open-Space Lands



A - Figure G-1. Surrounding open spaces. Tejon Ranch is sage green.

Summary of Research on Private Lands Comparable to Tejon Ranch

A - Table G-1. A table displaying the online resources used to research for private lands comparable to Tejon Ranch and the results found. These resources range from land trust associations, specific land trusts sites, and land conservation databases.

Website		Results
Name	HTML Address	
California Council of Land Trusts	http://www.calandtrusts.org/trusts.cfm	Out of 75 land trusts found 6 <ul style="list-style-type: none"> ● CA Rangeland Trust (4 properties including Tejon Ranch) ● Irvine Ranch Conservancy ● Save Mount Diablo ● Solano Land Trust (3 properties – Vallejo Swett Ranch, Eastern Swett Ranch, and King Ranch) ● Sacramento Valley Conservancy (1 property – Deer Creek Hills Preserve) ● Tejon Ranch Conservancy also listed
Colorado Coalition of Land Trusts	http://www.cclt.org/cclt/unlisted/163-cclt-member-list.html	Out of 37 land trusts found 2 <ul style="list-style-type: none"> ● The Nature Conservancy ● Trust for Public Land

<p>The Nature Conservancy</p> <p><i>Protected ~15 million acres in the United States</i></p>	<p>http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/index.htm</p>	<p>4 feasible properties, but only able to contact 3</p> <ul style="list-style-type: none"> ● Bohart Ranch ● Carpenter Ranch ● Heart Mountain Ranch ● Red Canyon Ranch
<p>The Trust for Public Land</p>	<p>http://www.tpl.org/what-we-do/initiatives/working-lands/</p>	<p>Found only 1 property</p> <ul style="list-style-type: none"> ● Half Circle Ranch
<p>The Conservation Fund</p> <p><i>Land trust that has protected 7 million acres of land in the U.S.</i></p>	<p>http://www.conservationfund.org/</p>	<p>None that specifically parallels with Tejon because those that offer public access are concentrated along rivers (e.g. Bair Family Ranch, Fish Creek Flying W Ranches)</p>
<p>Land Trust Alliance</p> <p><i>Database of member land trusts throughout the U.S.</i></p>	<p>http://www.landtrustalliance.org/</p>	<p>Did not find any relevant land trusts in addition to ones already found when searching through land trusts in states highly likely to contain ranching – CA, WY, CO, KS, NE, SD, TX</p>
<p>National Conservation Easement Database</p>	<p>http://nced.conservationregistry.org/</p>	<p>Out of 95,448 conservation easements on record, no property was found that was comparable to Tejon as a private working ranch offering public access. The following criteria was inputted into their</p>

<p><i>First national conservation easement information portal</i></p>		<p>search engine</p> <ul style="list-style-type: none"> ● Easement Purposes include "Open Space - Ranch"; Easement Public Access include "Open Access"; - 8 results, but not relevant ● Easement Purposes include "Open Space - Ranch"; Easement Public Access include "Restricted Access" - 3 results, but not relevant
<p>The Conservation Registry</p> <p><i>Online database of over 110,000 conservation, restoration, and wildlife projects across the U.S.</i></p>	<p>http://www.conservationregistry.org/</p>	<p>None</p>
<p>LandScope America</p> <p><i>Online guide developed by NatureServe and the National Geographic Society to show land conservation efforts throughout the US</i></p>	<p>http://www.landscape.org/</p>	<p>None</p>

Open Space Interview Guide

Background

- 1) How was your public access plan conceived?
- 2) What are the goals of the public access programs you offer (mandated, education, conservation, awareness)?
- 3) Are the public access programs geared towards a specific theme like education, adventure, or conservation? If so, what kind of themes?
- 4) Are some activities more popular than others?
- 5) Were there any infrastructural changes implemented to successfully carry out these activities?

Visitors

- 1) On average, how many visitors do you get? Could you describe their demographics (age, ethnicity, gender)?
- 2) Typically, what are people looking for when they come to your site?
- 3) Do you target your activities to particular audiences?
- 4) What kind of outreach/marketing do you do for your activities?
- 5) Are there populations you would consider “underserved”? How do you reach out to these populations?
- 6) Do you charge a fee for your activities or access to your site? Why or why not?

Issues Encountered

- 1) What issues have you encountered with public access? Were these issues you anticipated?
 - a) How do you keep visitors from going “off-trail”, especially into sensitive environments?
- 2) How has the public access plan changed over the years? Why?
- 3) Is there anything you would like to change about your public access programs?

Interviews

Adams, Seth. Land Programs Director at Save Mount Diablo. Phone interview by Jenny Low. Walnut Creek, CA. December 3, 2012.

Brown, Peter. Stewardship Manager of Gallatin Valley Land Trust. Email interview by Jenny Low. Bozeman, MT. January 14, 2013.

Cooper, Ryan. Outdoor Recreation Planner for Bureau of Land Management. Phone interview by Jenny Low and Linda Kwong. October 9, 2012.

DuMont, Natalie. Volunteer & Outreach Coordinator at Solano Land Trust. Phone and email interview by Jenny Low. Fairfield, CA. October 30 - November 1, 2012.

Jeff. Project Director of Carpenter Ranch. Phone interview by Jenny Low. Colorado. December 19, 2012.

Moffitt, Bill. Ranger at Tule Elk State Natural Reserve. Phone interview by Jenny Low. Buttonwillow, CA. December 12, 2012.

Peters, Carrie I. Conservation Practitioner at The Nature Conservancy - Heart Mountain Ranch. Email interview by Jenny Low. Powell, WY. January 3-28, 2013.

Phillips, George. Land Conservation Association at Save Mount Diablo. Phone and email interview by Jenny Low. Walnut Creek, CA. November 1 – December 26, 2012.

Rutledge, Aimee. Executive Director of Sacramento Valley Conservancy. Phone interview by Jenny Low. Sacramento, CA. January 2, 2013.

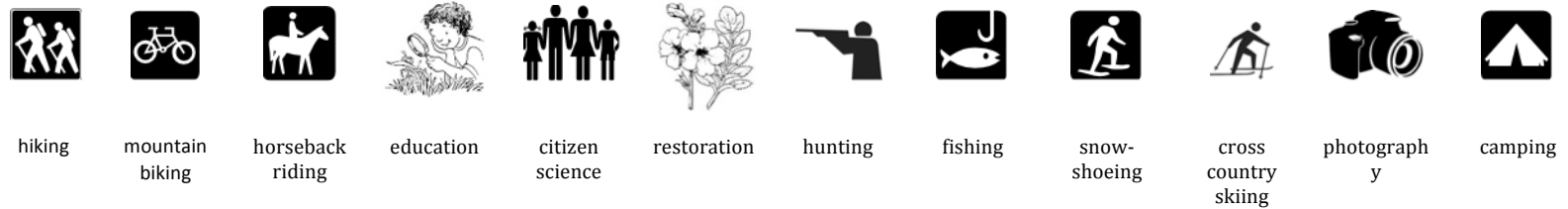
Weatherman, Kathy. District Superintendent CA State Parks Tehachapi District. Phone interview by Jenny Low and Linda Kwong. October 8, 2012.

Wesley, Robert. Red Canyon Ranch Manager. Email interview by Jenny Low. Wyoming. January 17-18, 2013.














Wickman, Sue. Project Manager at Solano Land Trust. Email interview by Jenny Low. Fairfield, CA. October 31 - December 21, 2012.




Summary of Private Lands Research: Visitors and Activities











A reference guide for the activity symbols used in A – Table G-2 provided below:



A - Table G-2. A summary table of the interviewed private lands' visitation and activities.

Property				Visitation (visitors per year)	Activities
Title	Land Trust Involved	State	Acres		
Carpenter Ranch	The Nature Conservancy	CO	906	1200	      Notes <ul style="list-style-type: none"> lots of retired couples fishermen are young, in 20s hunters – all age groups Notes <ul style="list-style-type: none"> <i>Education</i> – school group visits; has developed site based education curriculum; teacher training; do not always actively engaged or have staff with the school children and teacher <i>Citizen Science</i> – International Birding Day <i>Restoration</i> – fixing up buildings, planting; not successful with river restoration
Deer Creek Hills Preserve	Sacramento Valley Conservancy (and other collaborators)	CA	4062	~2000	       Notes <ul style="list-style-type: none"> <i>Hiking</i> – biological, historical, geographical <i>Mountain biking</i> – occur from June - Oct <i>Education & Camping</i> – youth group day trips & overnight trips (YES – Youth Education & Stewardship) Activity isn't introduced unless a capable docent is available – hiking was introduced first, equestrian was second and mountain biking was last Hiking was popular at first, but currently hiking, mountain biking, and horseback riding are all equally popular

Half Circle Ranch	Forest Service (originally by Trust for Public Land + Gallatin Valley Land Trust) *public property once legal access transfers to Forest Service	MO	400		 <p>Notes</p> <ul style="list-style-type: none"> • <i>Hiking</i> – currently most popular activity • <i>Horseback riding</i> – low popularity
Heart Mountain Ranch	The Nature Conservancy	WY	15,000	1500-2000 Notes <ul style="list-style-type: none"> • more locals (30s & 40s) than tourists (60s) • mainly Caucasians • 50/50 male/female 	 <p>Notes</p> <ul style="list-style-type: none"> • <i>Hiking</i> – currently most popular activity; bird watching; “host an annual Community Hike where we bring in professionals in natural resource management for a day of hiking with interested community members” • <i>Education</i> – cultural events, school projects, and field trips are common • <i>Horseback riding</i> – popular. “Most of the horseback riders are local people and there are definitely a few people or groups of people that we see often . . . It’s really only a day’s worth of riding.” • <i>Hunting</i> – popular • “fair number of people who use the mountain to get in shape or train for things...races, firefighting, etc.” • <i>Team building</i> events are increasing
Red Canyon Ranch	The Nature Conservancy	WY	~35,000	200-300	 <p>Notes</p> <ul style="list-style-type: none"> • <i>Fishing</i> is the number one activity followed by <i>hiking</i> • <i>Rock climbing</i> can be done • <i>Motorized access</i> is only allowed with special permission • Programs are targeted towards local cattle ranchers, college students, and “occasionally other agriculture related groups from other states/countries that tour the ranch”

Vallejo Swett Ranch, Eastern Swett Ranch, and King Ranch	Solano Land Trust	CA	3930	40-90 <u>Notes</u> <ul style="list-style-type: none"> • Large age range from ~ 8 to 80s • Estimate ethnicity of hikers roughly matches the ethnic ratio Solano County's population 	   <u>Notes</u> <ul style="list-style-type: none"> • Only available to the public once a month through docent led hikes
Various Properties	Save Mount Diablo privately owned	CA	100,000+	~750 <u>Notes</u> <ul style="list-style-type: none"> • hiking (40-70) • restoration - high school crowd and more male oriented 	       <u>Notes</u> <ul style="list-style-type: none"> • <i>Hiking</i> – all are docent led. Most popular activity because it is an “exclusive” opportunity to visit Save Mount Diablo’s Lands. • <i>Citizen Science</i> – BioBlitz • <i>Camping</i> – offered to strengthen relationships with current donors and potential board members. Has done a camping event this year targeted toward underserve communities through a partnership with a local community group. • <i>Special events</i> – marathons, auction, live music • All activities are supervised. • “...often lead hikes/events on our properties to educate the public about land use issues in the surrounding areas.”

Additional Management Recommendation from Surrounding Lands Research

Our regional and private lands research has revealed a number of strategies the Conservancy can employ to deal with a range of potential public access issues as outlined below:

- 1) Littering and Vandalism
 - a) Countermeasure: closure of affected areas, clean up, increased onsite staff presence, education
- 2) Human conflicts – i.e. multi-use conflict, hunting conflict and cattle conflict
 - a) Countermeasure: spatial and temporal segregation, limitation of activities, education
- 3) Communication barriers – i.e. language
 - a) Countermeasure: multilingual signs and handouts
- 4) Off-trail use
 - a) Countermeasure: Signs, verbal warnings, docent patrols, and limiting activities to only docent-led
- 5) Resource damage – i.e. damage to sensitive plant species and erosion
 - a) Countermeasure: education, signs, seasonal closure of affected areas, installation of boardwalks and benches, establishing a carrying capacity for area, concentration of impacts through “Open Access Days”
- 6) Wildlife impacts
 - a) Countermeasure: Similar strategies to those employed for resource damage
- 7) Trespassing
 - a) Countermeasure: patrols, camera traps (M. O’Connell, personal communications, May 23, 2012)

Use of management tools listed above can help manage many public access issues—multi-use conflict, cattle conflict, hunting conflict, littering and vandalism, off-road use, and impacts on flora and fauna. If the Conservancy continues to only offer guided public access activities, then there will be even less concern for issues like cattle conflict and unauthorized off-trail use.

Appendix H:

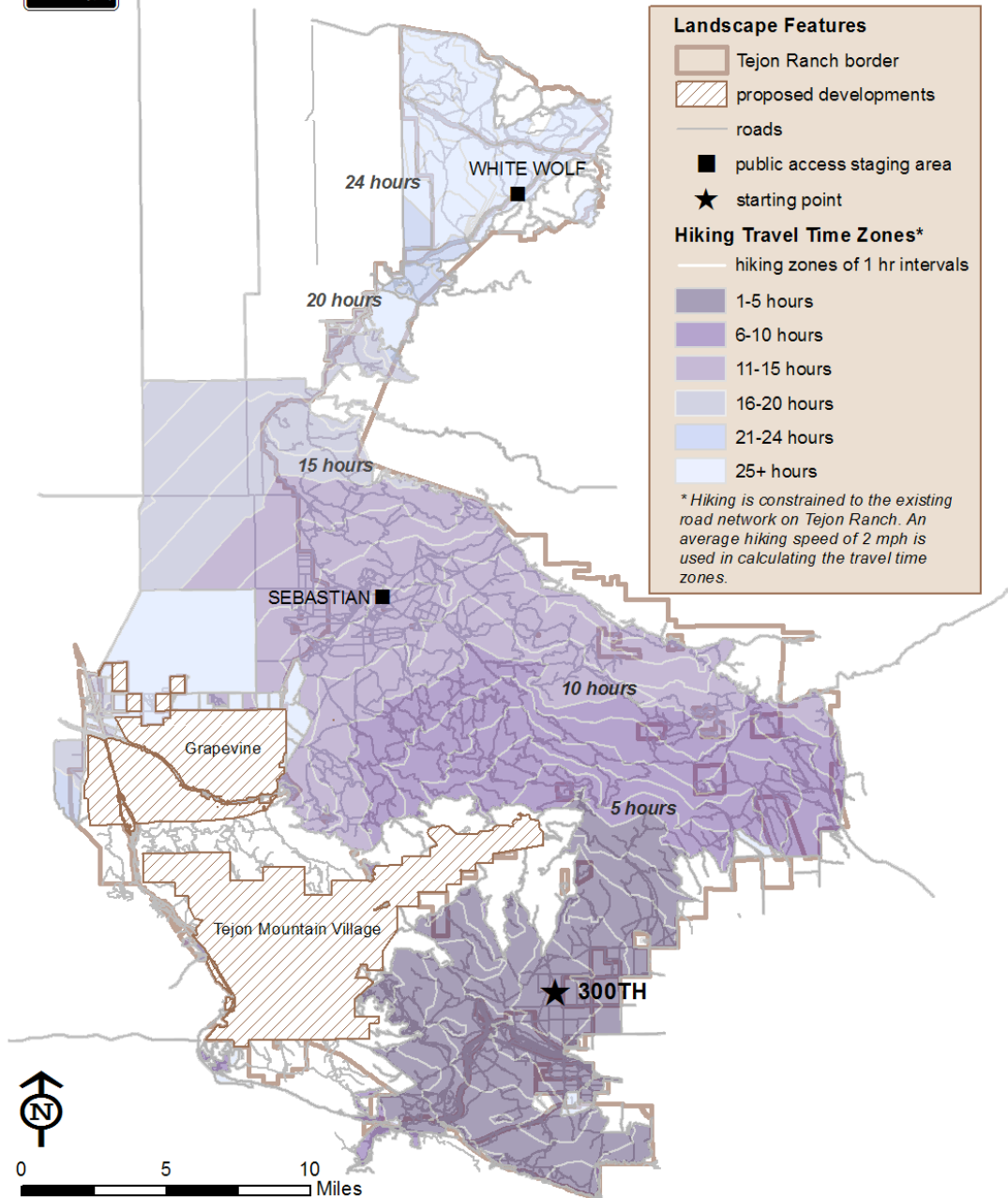
Travel Time

We developed a travel time tool to help the Conservancy plan future routes for two different transportation modes, driving and hiking. The tool uses ArcGIS's Network Analyst tool to (1) develop a travel time zoning map using the Service Area feature and (2) estimate a route's travel time using the New Route feature. Because the majority of terrain on Tejon Ranch is relatively steep, we used an average hiking speed of 2 miles per hour (mph). We used an average driving speed of 20 mph (the speed limit on the Ranch is 25mph).

TRC provided road data in the shapefiles Roads_Major.shp and Roads_Minor.shp., which were used to create the road network. Roads running through the proposed development areas of Grapevine and TMV were not used because travel on these roads is restricted. However, because the Centennial proposed development is not yet approved, roads in this area were included in the analysis. Provided below are driving and hiking travel time maps from 300th St. (A - Figure H-1 & A - Figure H-2), Sebastian Gate (A - Figure H-3 & A - Figure H-4), and White Wolf (A - Figure H-5 & A - Figure H-6).

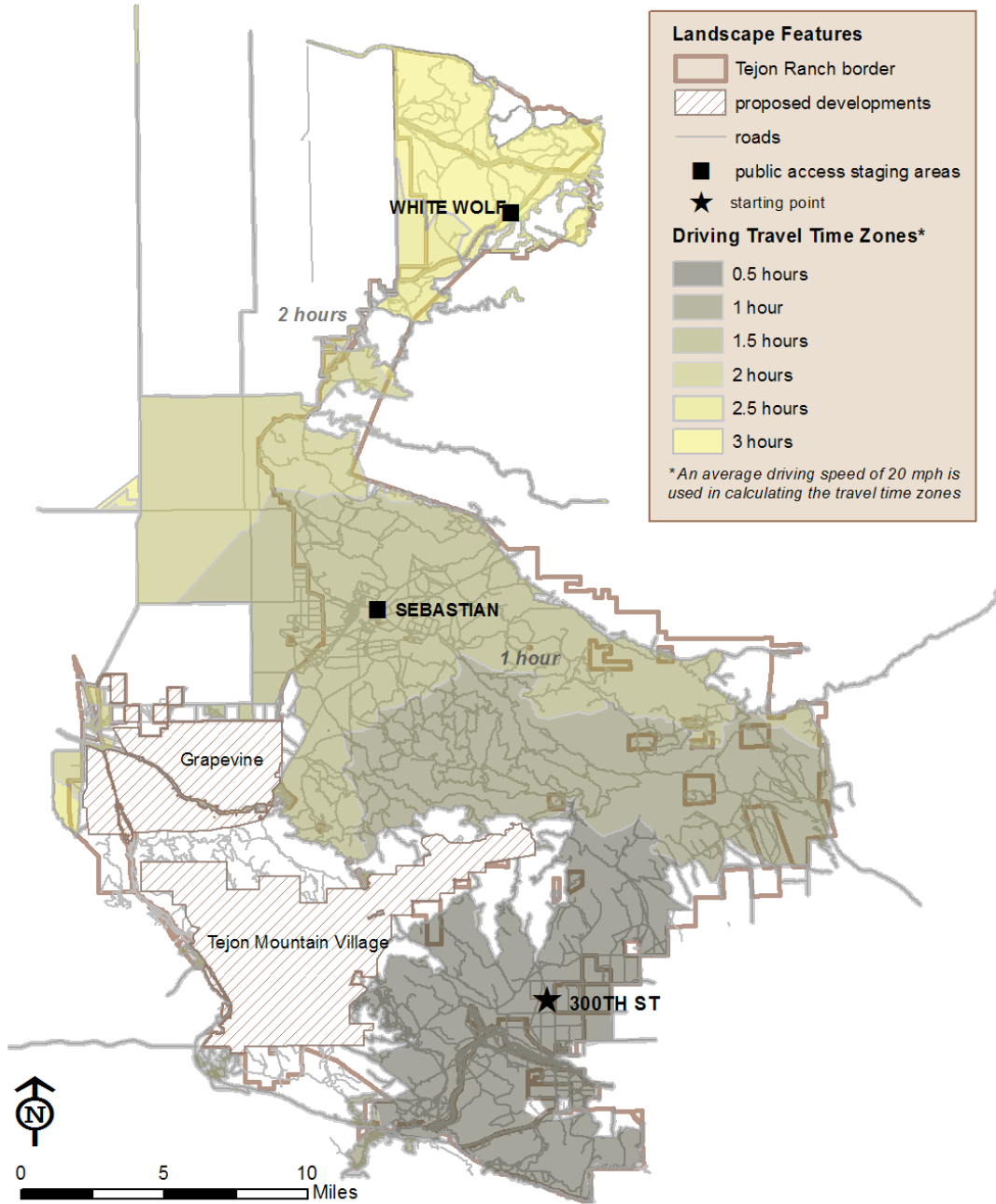


Hiking Travel Time Zones from 300th St



A - Figure H-1. A hiking travel time zoning map from 300th St. The hiking is limited to travel on the road network on Tejon Ranch and the average hiking speed is assumed to be 2 mph.

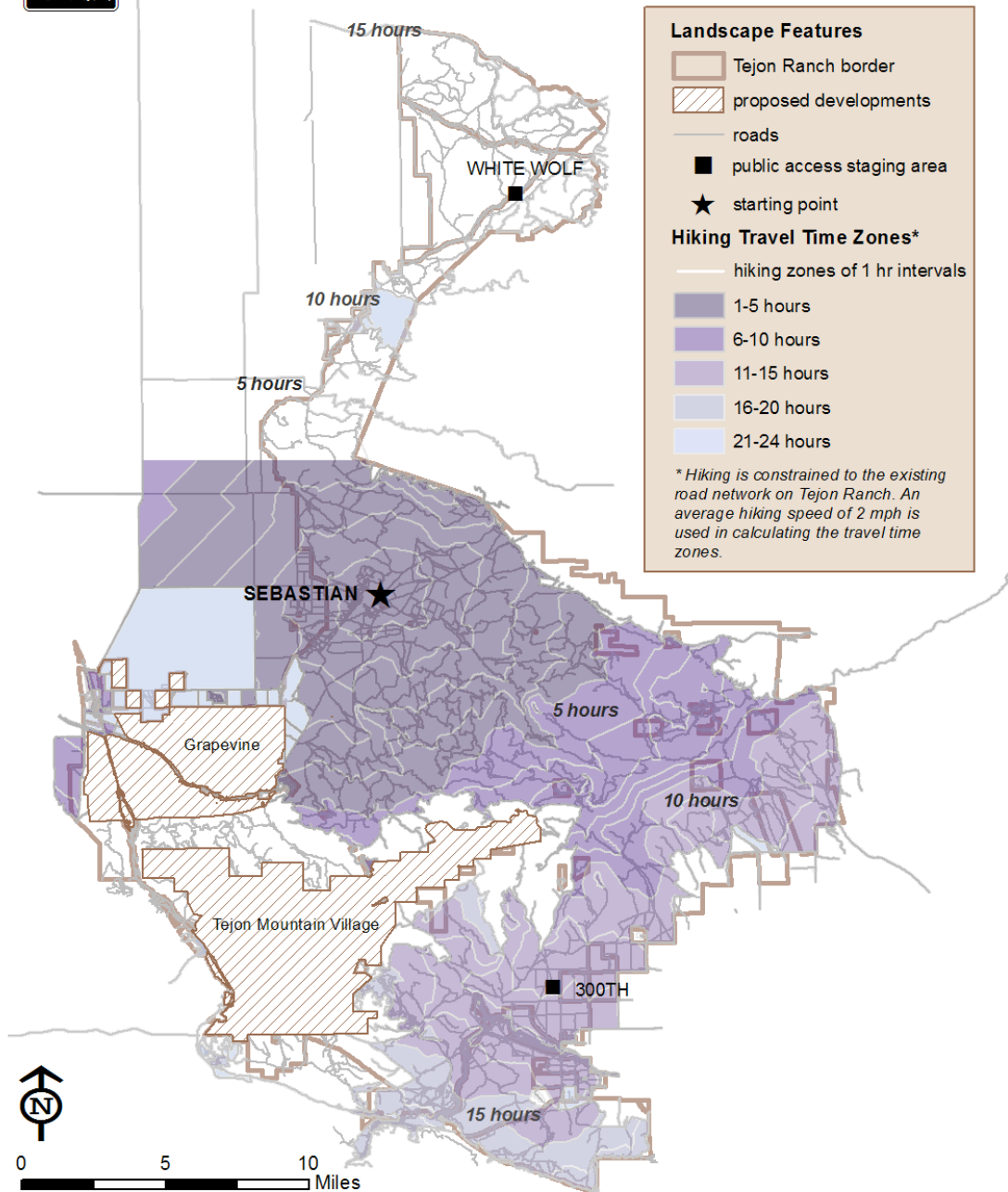
 **Driving Travel Time Zones from 300th St**



A - Figure H-2. A driving travel time zoning map from 300th St. The average driving speed is assumed to be 20 mph.

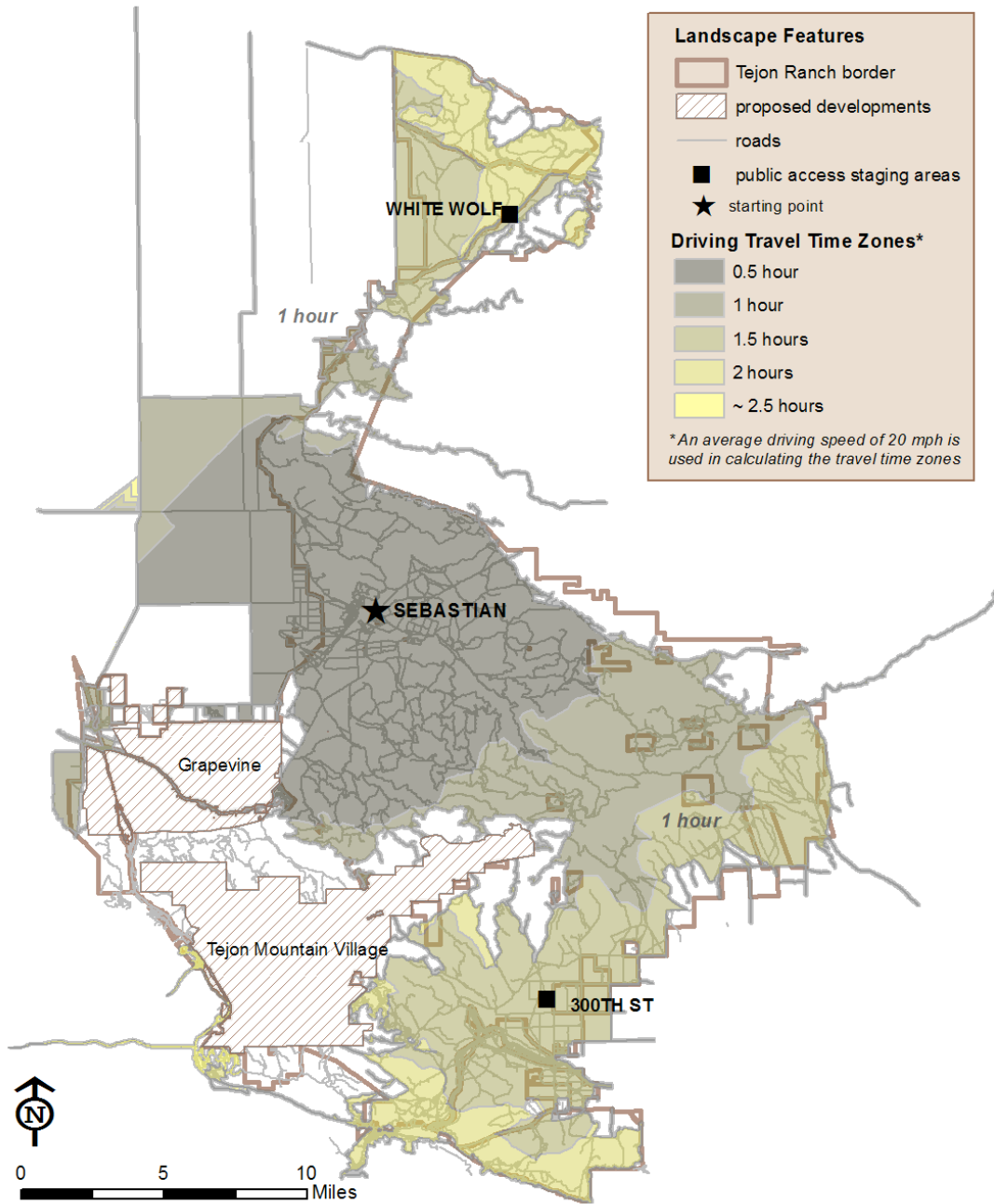


Hiking Travel Time Zones from Sebastian



A - Figure H-3. A hiking travel time zoning map from Sebastian. The hiking is limited to travel on the road network on Tejon Ranch and the average hiking speed is assumed to be 2 mph.

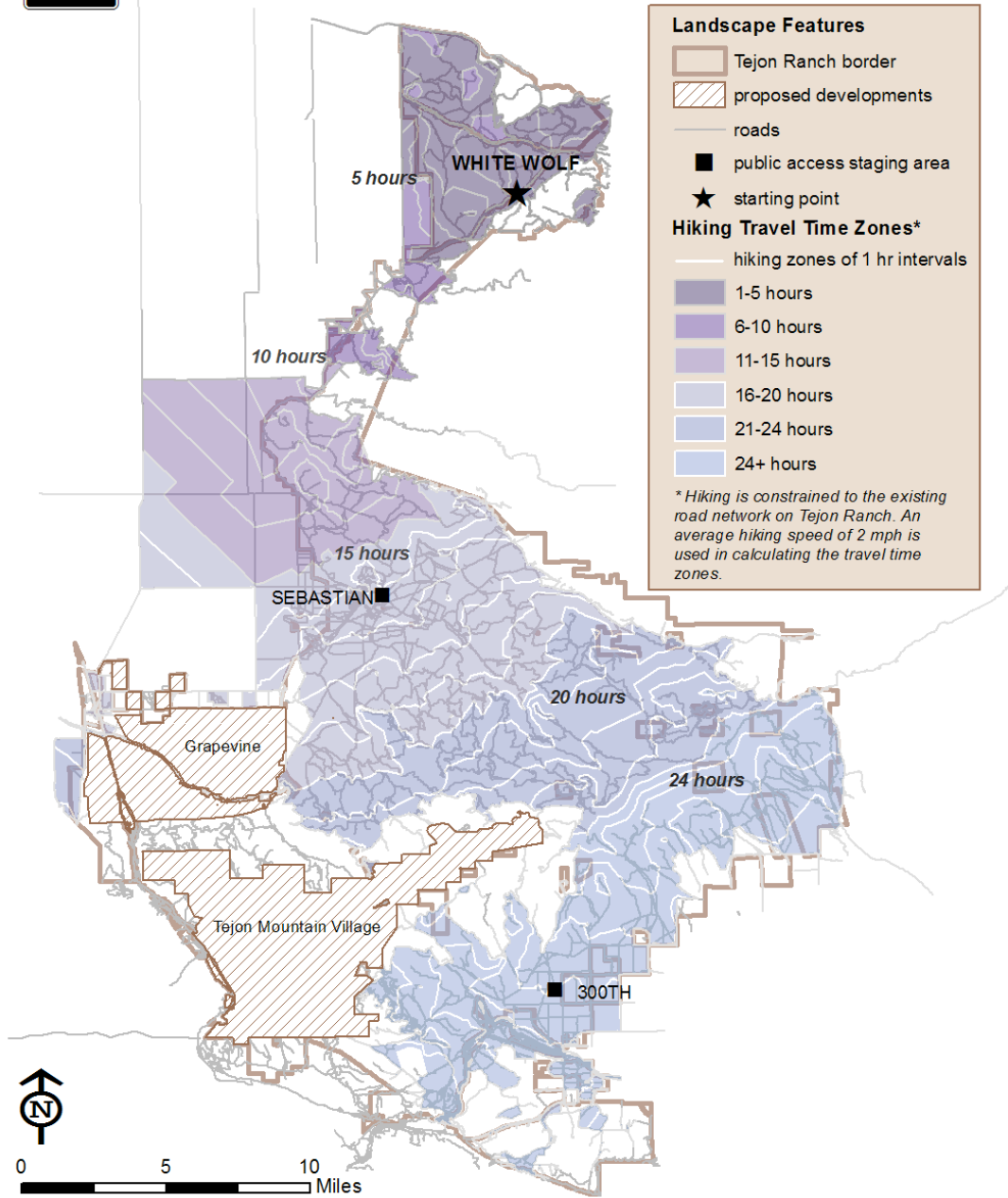
Driving Travel Time Zones from Sebastian




A - Figure H-4. A driving travel time zoning map from Sebastian. The average driving speed is assumed to be 20 mph.

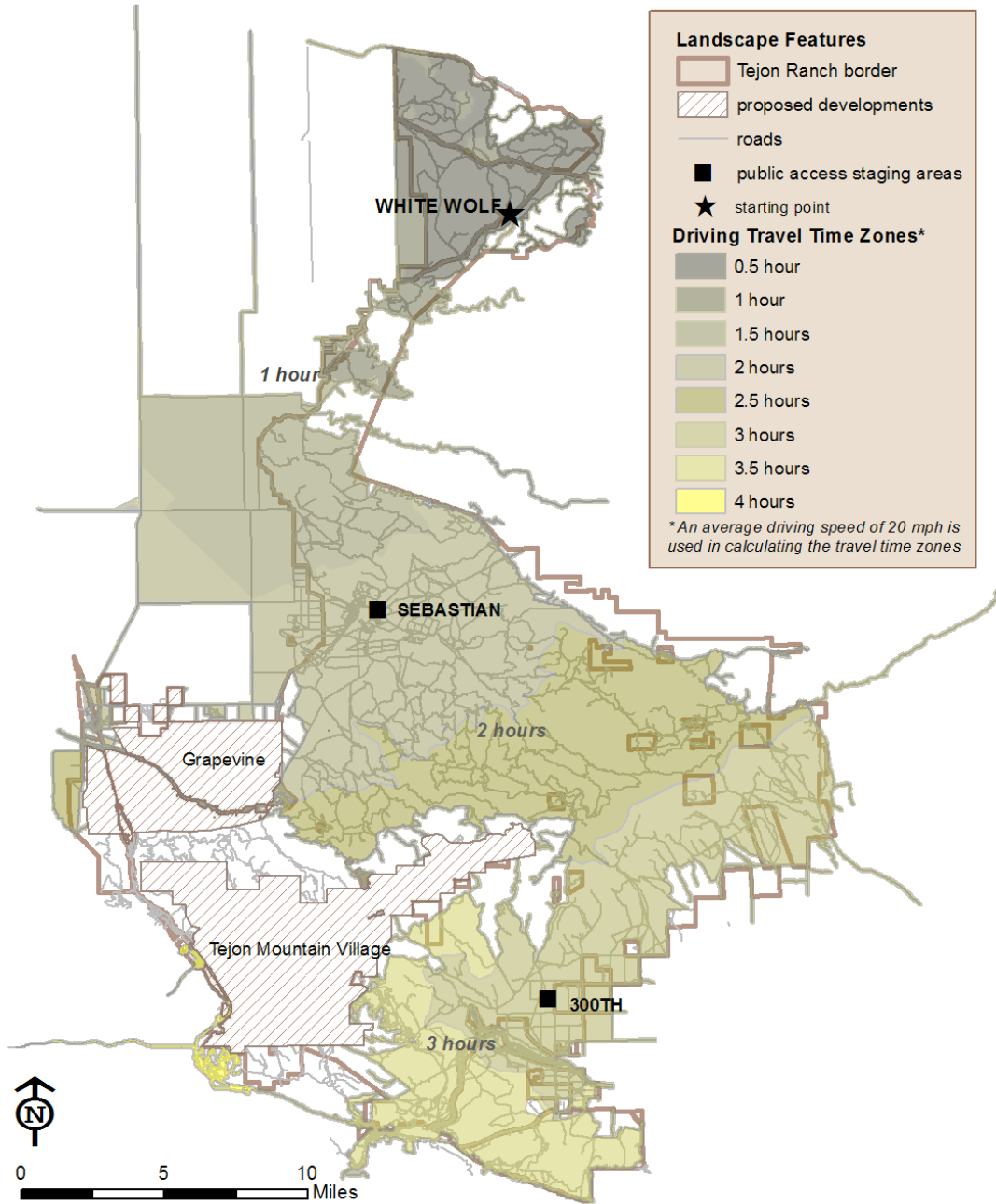


Hiking Travel Time Zones from White Wolf



A - Figure H-5. A hiking travel time zoning map from White Wolf. The hiking is limited to travel on the road network on Tejon Ranch and the average hiking speed is assumed to be 2 mph.

 **Driving Travel Time Zones from White Wolf**



A - Figure H-6. A driving travel time zoning map from White Wolf. The average driving speed is assumed to be 20 mph.

Appendix I:

USLE Background and Explanation

The Universal Soil Loss Equation (USLE) is an empirical model developed in the 1950s from over 10,000 study plots with simulated and natural rainfall (Fu et al., 2010).

The model is advantageous due to its low data requirements and general applicability to many areas (Croke & Nethery, 2006). Although the USLE was developed for agricultural application, it has been used to estimate erosion in a variety of environments from hill slopes, road surfaces, and trail networks (Croke & Nethery, 2006; Fu et al., 2010; Tomczyk, 2011)

The USLE calculates annual soil as:

$$A = R \times K \times LS \times C \times P$$

Where A is the annual soil loss in tons per acre, R is the rainfall and runoff erosivity index, K is the erodability factor, LS is the slope-length and slope gradient factor, C is the crop cover factor, and P is the conservation practices factor.

The universal soil loss equation can be broken into two parts—erosivity and erodibility—that, when multiplied together, quantifies the soil loss (Selby, 1993). The erosivity is characterized by the amount and intensity of rainfall (R factor), or the energy needed to entrain particles (Selby, 1993). The erodibility is characterized by the physical properties of the soil, the topography, and the land use and land management practices (The K, LS, C, and P factors; Selby, 1993).

To assess the erosion risk or erodibility (E) over the landscape of the Ranch, we used the erodibility factor of the soil (K) and slope factor (S) from USLE to come up with the following equation:

$$E = S \times K$$

To compute a slope factor with the same magnitude as our soil erodibility factor that does not include a slope length component, we used the tangent of the slope. The tangent captures the vertical or gravity component of the slope and the variation in slope from location to location. When comparing the slope factor (S) to the original slope-length and slope gradient factor (LS), we see S is approximately equivalent to computing the LS parameter using a slope length of 10 centimeters.

Erosion Map Details

The soil erodibility factor (K) was acquired from the USDA SURRGO soil map database (USDA). The kw-factor was used from SURRGO because it included the effect of rock fragments on soil erodibility. Where SURRGO data was not available, the kw-factor values from the USDA STASGO database were used.

Slope was derived from the USGS National Elevation Dataset (USGS). Once the tangent of the slope was taken, the kw-factor (K) and the tangent of the slope (S) were multiplied together to get a map of the erosion potential across the Ranch.

The erosion potential map was classified into six classes using a geometric interval to make interpretation easier (Figure 6-5).

Possible Erosion BMPS:

The following is a list of BMPs that can reduce erosion. All BMPs do at least one of the following: limit soil disturbance, retain vegetation cover, reduce or remove traffic, and channel surface water off compacted and disturbed areas. All of these BMPs were either taken directly from or strongly relate to the BMPs outlined in the National Best Management Practices for Water Quality Management on National Forest System Lands Technical Guide (USDA, 2012). They were designed to “avoid, minimize, or mitigate adverse effects to soil, water quality, and riparian resources.”

- **Mowing not grading:** allowing vegetation to grow can significantly reduce erosion (Foltz et al, 2009).
- **Retiring problem roads:** converting roads to hiking trails with a few water bars can reduce traffic and impact. Steep gradient roads should be considered for retirement.
- **Seasonal closures or week after rain closures:** open once the soil moisture content is below a predetermined level.
- **Temporarily close trails/roads for rehabilitation:** when there is unacceptable degradation, temporary closure and rehabilitation can reduce cumulative impact.
- **Water bars and rolling dips:** channel water off the road or trail as quickly and frequently as possible.
- **Minimize the number of stream crossings**

- **Adequately sized culverts:** maintains aquatic organism passage and ensures high flows can pass through the culvert instead of bypassing over the road surface.
- **Out sloped roads and trails:** roads and trails designed to channel water off the edge of the road and not into the inboard ditch.
- **Leadoffs:** dirt, rock, or culvert type with energy dissipating rocks at the bottom. Used to protect points where runoff leaves the road and has the potential to erode gullies and the road fillslope.
- **Gravel cover:** can significantly reduce road and trail erosion
- **Encourage roads and trails on ridge tops:** ridge tops typically have low gradients, less water accumulation, and are far away from streams and riparian areas.
- **Avoid roads and trails in floodplains or in and around wet areas:** this includes wetlands, springs/seeps, and riparian areas.

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USGS. (2006). National Elevation Dataset. *U.S. Department of the Interior*. Retrieved from <http://ned.usgs.gov/>.

Appendix J:

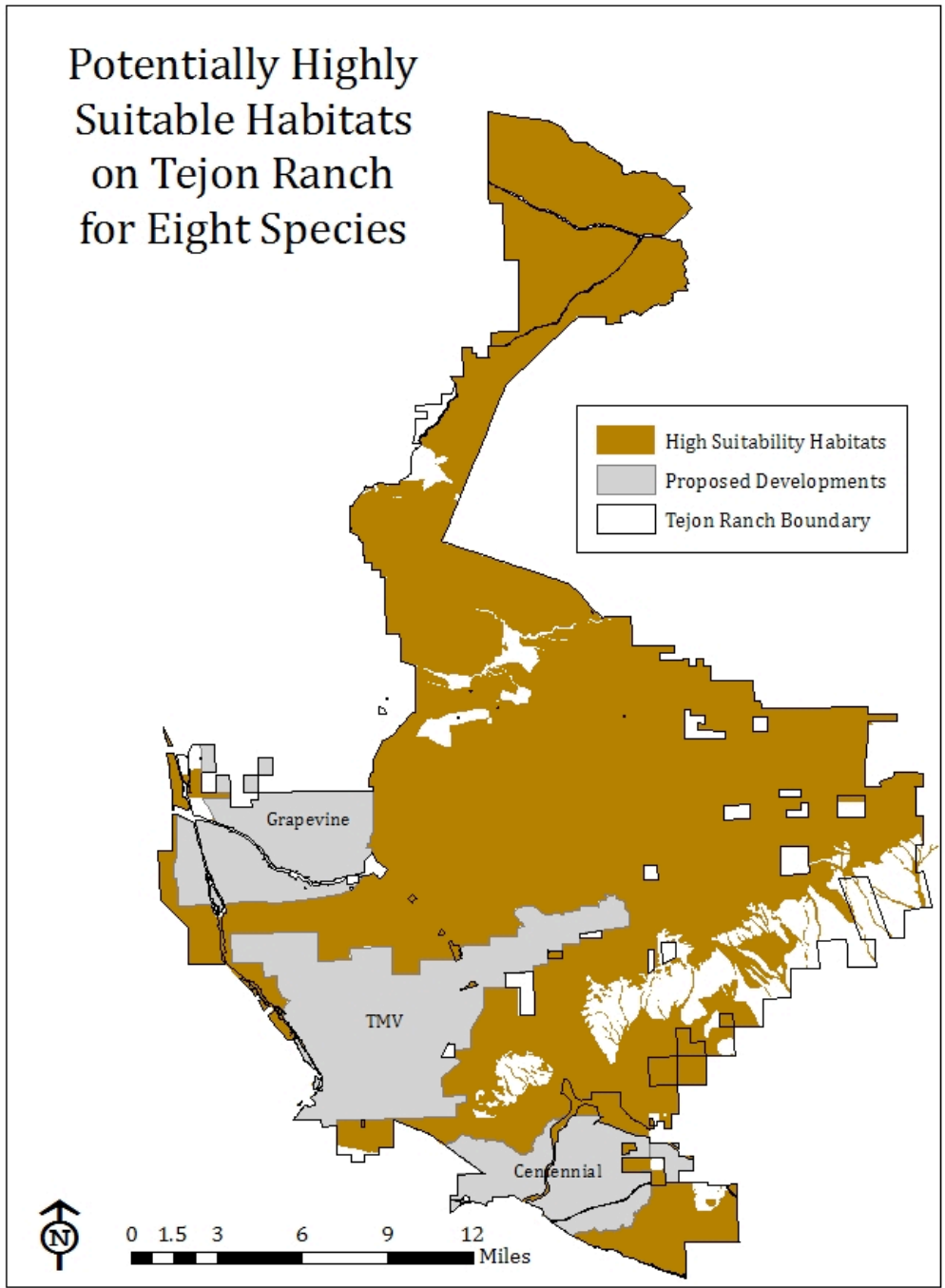
Species Details

Because we could not install the California Wildlife Habitat Relationships software on our computer systems, we imported the HABITAT.DBF, SPECIES.DBF, XWALK.DBF, and HABCODES.DBF tables into MS Access and ran a SQL query to filter the relevant species and habitat types for Tejon. SPECIES.DBF was joined to HABITAT.DBF in Excel prior to importation. Because the classifications of the vegetation data provided by Tejon Ranch did not match the crosswalks, we manually matched the crosswalks up to the vegetation categories. To more accurately reflect the vegetation structure on the Ranch, we restricted the vegetation classes, limiting shrubs and trees to mature size classes with moderate to dense canopy cover for shrubs and open to moderate canopy covers for trees based on our personal observations and satellite imagery of the Ranch (A - Table J-1). Suitability values were determined by averaging across suitability for feeding, reproduction, and cover, with the exception of the golden eagle, bald eagle, peregrine falcon, and white-tailed kite where only reproduction suitability was averaged because of the restrictions put forth in the TUMSCHP. We then averaged the suitability values across the restricted size classes and canopy covers for each vegetation type. A map compiled of all evaluated species habitat was also produced (A - Figure J-1).

We joined the output of this query to the vegetation layer provided by Tejon Ranch in ArcGIS 10.1.

A - Table J-1. Size Class and Canopy Cover query restrictions for CWHR.

General Vegetation Types	Size Class Restriction	Canopy Cover Restriction
Grass and other	None	None
Shrub	3,4	M (moderate), D (dense)
Trees	5, 6	P (open), M (moderate)



A - Figure J-1. Most of the Ranch is potentially highly suitable habitat for the eight species of interest.

Appendix K:

Fire Risk Details

Fire Ignition Risk and Potential Severity by Vegetation Types adapted from Baumgarten et al., 2012.

“Chaparral” - Chaparral is susceptible to ignition, but fuels are less fine than grass and pine needles, so risk of ignition is moderate. However, once it catches, it burns with high intensity, stand replacing fires that are hard to control because they tend to grow on steep slopes. There is also the risk of having the fire spread to other vegetation communities.

“Conifer” – While dry pine needles are more susceptible to ignition than dry grass (Babrauskas, 2005), the shade in conifer forests tend to increase the moisture retained, and therefore conifer forests have moderate ignition risk. Once the litter is ignited, there is a higher risk of a severe crown fire because of ladder fuels and dense stands. Because conifers occur at higher elevations on the Ranch, they are harder to reach. Therefore, it is more difficult to extinguish a fire in these stands.

“Grassland” and “Annual Wildflower/Annual Grassland” - Grasslands are highly ignitable but burn quickly so the severity is relatively low compared to other vegetation types. While fire is likely to spread more quickly in grasslands, it is also easier to control because it burns out quickly and is usually on flatter terrain. However, there is a risk of spreading into other vegetation communities by wind.

“Joshua” and “Wash” - Joshua woodlands and desert wash have low ignition risk because their fuel loads are low. Fires would be of low severity and easy to control because there is little horizontal connectivity or ladder fuels, so fires would not spread easily.

“Open woodlands” and “Savannahs” – Open woodlands and savannahs have high ignition risks because of the grass in the understory, but low severity because many oaks are fire-resistant species and fuel loads are not above historical averages on the Ranch.

“Riparian” - Riparian areas have low ignition risk because of the high moisture content of the vegetation. However, they have high potential fire severity because

of high vegetation density (e.g. areas with overgrown California grape (*Vitis californica*)) and the potential for that vegetation to serve as ladder fuels.

“*Scrub*” – Because the scrub category occurs on the San Joaquin Valley side of the Ranch, it is reasonable to assume that the dominant vegetation is saltbrush and not desert scrub. Saltbrush has low ignition risk and medium fire severity, because they are less flammable than chaparral and can be used as fuel breaks in chaparral.

“*Wetlands*” - Wetlands have low ignition risk because of the moisture content in the vegetation and low severity because soils remain wet.

“*Woodlands*” - Woodlands have medium ignition risk compared to open woodlands and savannahs because the higher density canopies prevent grass from growing as readily underneath. Fires would be of low severity because of the oaks’ fire tolerance and low fuel loads in the understory.

Agriculture was omitted because there will not be public access in agricultural areas and it is highly managed by people. Eucalyptus was omitted because there is only a single, relatively small patch (18.3 acres) occurring near Old Headquarters, which is inhabited and will have little to no public access (S. Pipkin, personal communication, January 27, 2013).

References

Babrauskas, V. (2005). *Risk of ignition of forest fires from black powder or muzzle-loading firearms: A study prepared for the U.S. Forest Service, San Dimas T&D Center*. U.S. Forest Service.

Baumgarten, S. A., Gilreath, A., Knecht, E., Livingston, A., Phipps, N., & Prossner, A. (2012). Developing fire management strategies in support of adaptive management at Tejon Ranch, CA (Master’s thesis). Retrieved from http://www.bren.ucsb.edu/research/2012Group_Projects/documents/tejonfire_report.pdf

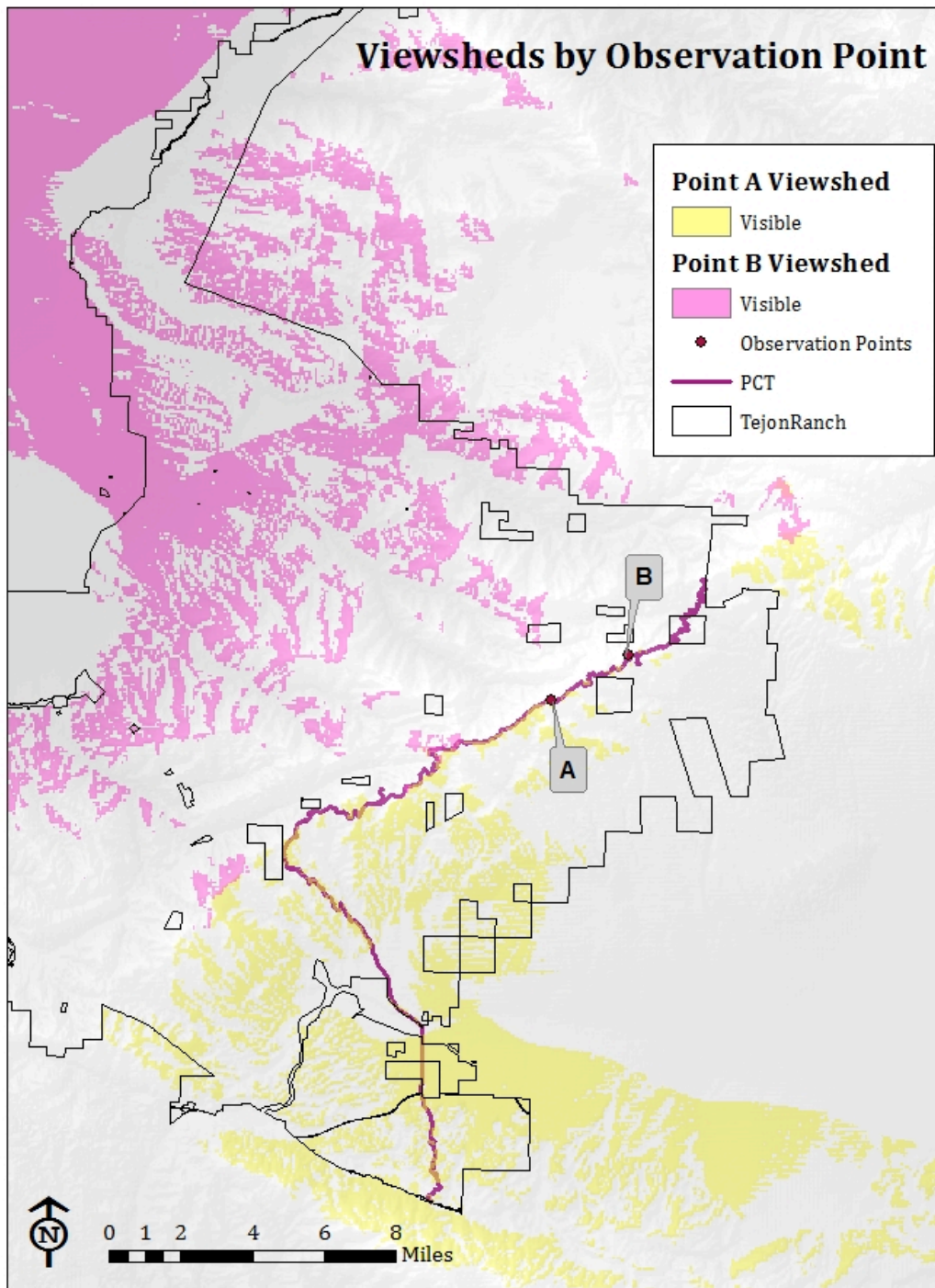
Appendix L:

Additional Viewshed Models

We created two additional viewshed models (VM2 and VM3) along with the viewshed model (VM1) described in Chapter 6: Opportunities & Constraints.

VM2

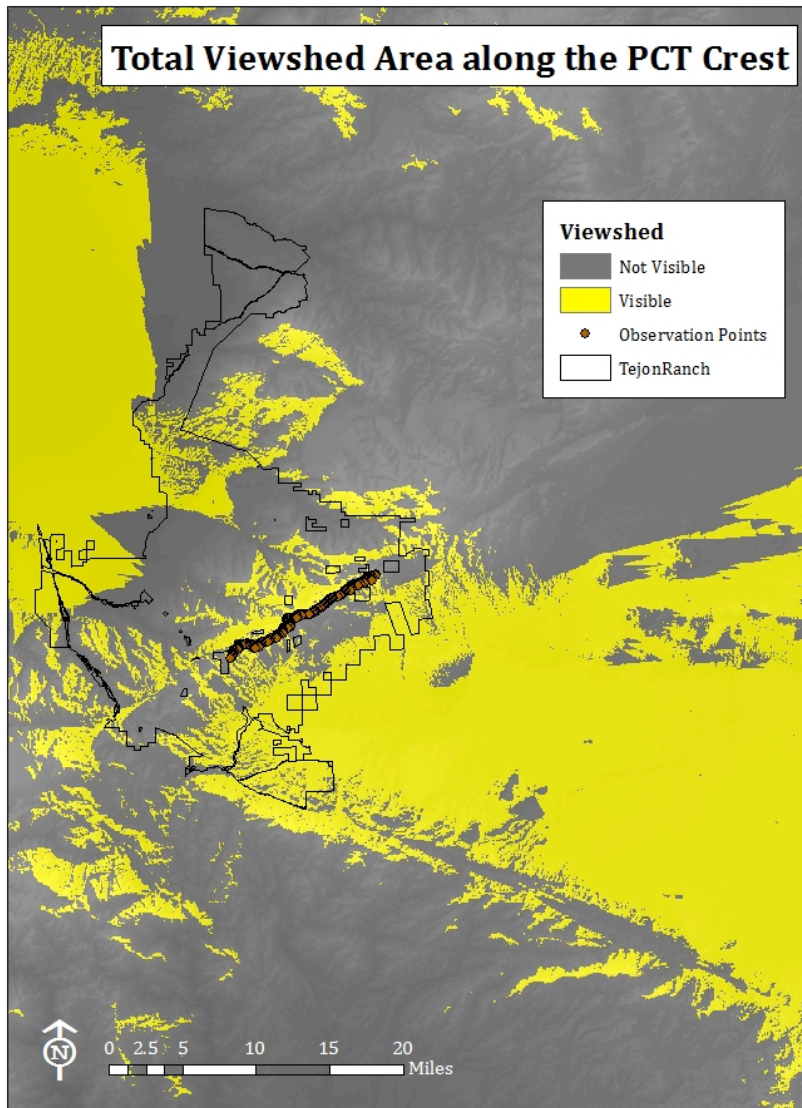
This model uses pre-selected observation points and an iterative process to output specific viewsheds for each point. Thus, either known points or randomly selected points must be picked prior to using the model. The model will output several viewshed layers (one per point). Input points should be as few as possible. Fewer observation points will create a clear map with differentiated viewsheds (A - Figure L-1).



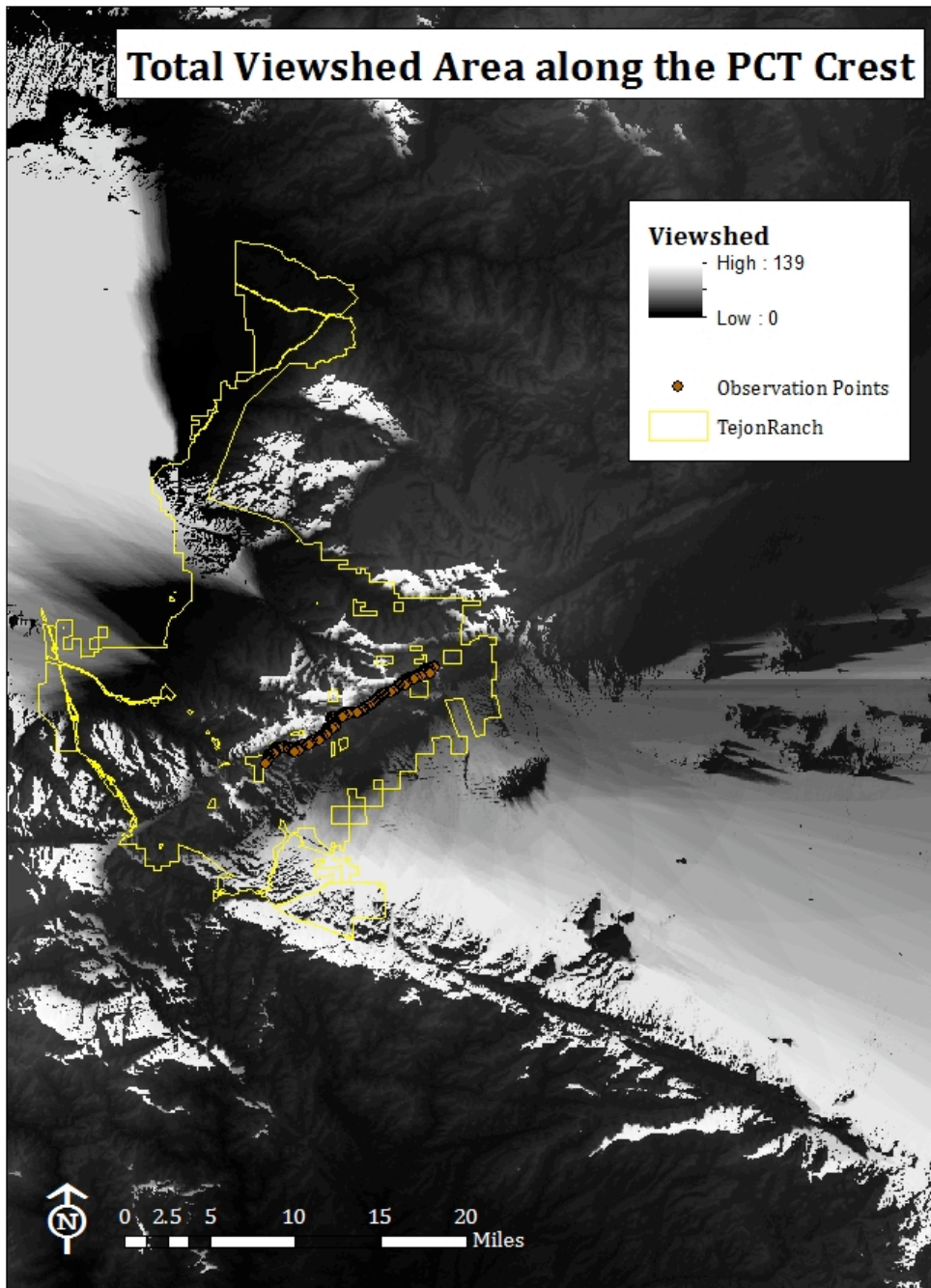
A - Figure L-1. Viewsheds for two points along the proposed Pacific Crest Trail route. Yellow = viewshed for Point A. Pink = viewshed for Point B.

VM3

This model quantifies the viewshed area along a specified route. The selected route is input into the model and the route line is converted to points. The model calculates the viewshed for each point and a field is then added to the viewshed output attribute table. This field displays the potential square kilometers visible from each point. The viewshed layer can be displayed as “Visible, Not Visible,” which shows the viewshed as a single color (A - Figure L-2) or the display can be a range of what is visible (A - Figure L-3).



A - Figure L-2. The viewshed output of “Visible, Not Visible” model for a segment of the proposed PCT route. Yellow = Visible.



A - Figure L-3. The viewshed output for the model showing the range of what's visible for a segment of the proposed PCT route.

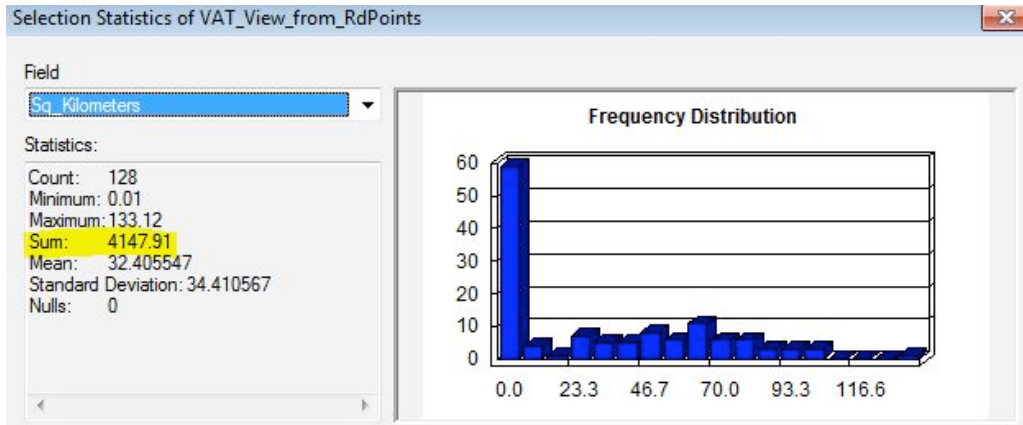
A - Table L-1. Attribute table for VM3.

OBJECTID	Value	Count	Sq_Kilometers
1	0	161513	16151.37
2	1	8562	85.62
3	2	6671	66.71
4	3	5624	56.24
5	4	5235	52.35
6	5	4055	40.55
7	6	4881	48.81
8	7	4481	44.81
9	8	5084	50.84
10	9	5506	55.06
11	10	4907	49.07
12	11	9087	90.87
13	12	13312	133.12
14	13	8134	81.34
15	14	8231	82.31
16	15	6406	64.06
17	16	6308	63.08
18	17	6297	62.97
19	18	8565	85.65
20	19	8327	83.27
21	20	6685	66.85
22	21	7674	76.74
23	22	6064	60.64
24	23	5846	58.46
25	24	10127	101.27

The attribute table (A - Table L-1) displays the square kilometers visible for each point along the route. OID 1 displays the square kilometers that are not visible from the route.

VM3 is best used to quantitatively compare viewshed areas of different routes. To get the total visible square kilometers along the route, open the attribute table. Select the row for Rowid 0. Click on the Switch Selection icon at the top of the window. Right-click the SQ_KILOMETERS column. Click on Statistics... A new window will pop up. This window will display the sum of the visible square kilometers along with other statistics for that attribute column.

A - Figure L-4 shows the sum square kilometers for the viewshed.



A - Figure L-4. Selection Statistics window for the sum sq. kilometers of the viewshed. The sum is highlighted here in yellow.

Appendix M:

290th St. Case Study Site Selection

The Conservancy is currently looking to build a short loop-trail on the Ranch for day hikers (S. Pipkin, personal communication, Dec. 13, 2012). A short loop-trail will provide an opportunity for the public to see and experience the Ranch through a short hike rather than the full day excursions or specific activities, such as bird watching, that are currently offered. Short hikes may be appealing to families traveling with small children or others with a short timeframe to visit the Ranch. Building a loop-trail that is compliant with the Americans with Disabilities Act (ADA) is another goal the Conservancy would like to accomplish with such a trail. Thus, creating a loop-trail that is easily accessible may attract families and other visitors that would like to visit the Ranch but have time or feasibility constraints.

With this in mind, we selected a site close to Hwy 138 off of 290th St. in the Antelope Valley. Proximity to the highway makes the site easy to access for 2-wheel drive vehicles and decreases driving time between the highway and the activity site. We found that people may be more likely to visit if driving time to the Ranch is reduced and time spent on the Ranch is increased (Chapter 4: Stakeholders).

We also wanted to pick a site that is relatively close to the proposed Visitor Center (Appendix N: Visitor Campus). The Visitor Center will likely attract more people to the Ranch in the future. Thus, siting the loop-trail and Visitor Center close to one another will concentrate development and use on the Ranch. To accommodate visitors who are accustomed to semi-developed natural areas we also sited restrooms and a picnic area near the trailhead. The picnic area will require shade structures, as the only trees on site are Joshua trees. The picnic and restroom facilities will allow visitors to relax and spend more time at the site as well.

Furthermore, this site was chosen for its interesting vegetation community of Joshua trees, cacti, native bunch grasses and wildflowers during the blooming season, along with its spectacular views of the Tehachapi Mountains and the Angeles National Forest, its relatively flat terrain on which an ADA compliant trail or boardwalk can be built, and its year-round accessibility. The loop-trail itself is approximately 1.2 miles long with an added switchback trail for variety. The length of this trail makes for an easy hike for families with small children and others seeking a short distance hike in

a beautiful setting. The trail does not cross any roads, keeping it in line with several trail recommendations (USFS, 1982; USFS, 2011; USFS, 2007).

The location, length, and other features associated with the trail make this site an ideal area if the Conservancy chooses to allow self-guided or unguided access on the Ranch. Implementing interpretive signs that include information on the surrounding vegetation community, the Ranch itself, and cultural and historical relevance of the area would allow visitors to guide and educate themselves along the trail. A fence north of the site would keep cars and individuals from accessing other areas of the Ranch, and the location is close enough to the highway for emergency vehicles to easily access if ever needed. The Visitor Center building will also house the Conservancy office, which will allow the Conservancy staff to more easily monitor the site for impacts or undesignated uses.

References

United States Forest Service. (1982). ROS Users Guide.

United States Forest Service. (2007). Trail Construction and Maintenance Notebook. Technology and Development Program. Missoula, MT.

United States Forest Service. (2011). Trail Fundamentals and Trail Management Objectives Training Reference Package.

Appendix N:

PCT Case Study

Introduction

TRC is committed to providing a conservation easement of about 10,000 acres for the realignment of approximately 38 miles of the 2,650 mile Pacific Crest Trail (PCT) onto Tejon Ranch through the RWA. Every year, about 300 hikers attempt to “thru-hike” the entire length of the PCT over 6 to 8 months, with countless more users traveling through various sections of the trail throughout the year (PCTA 2012). This realignment will help fulfill the original vision of the PCT to have the trail follow “generally along the mountain ranges of the west coast States” (SEC. 5. [16USC1244] (a) (2), P.L. 90-543) by moving the trail from its current location in the Mojave Desert onto the crest of the Tehachapi Mountains (Figure 7-1). Additionally, re-routing the PCT onto the Ranch helps to satisfy TRC’s commitment to public access put forth in the Ranch-Wide Agreement by letting users experience Tejon Ranch and learn about its conservation values. TRC, the Resource Organizations, and the Tejon Ranch Conservancy will ensure that no significant adverse impacts from the PCT will affect any conservation values on the Ranch by using the highest conservation principles and an adaptive management approach to design and manage the PCT realignment.

History

The PCT was established by the National Trails System Act of 1968 (P.L. 90-543) to provide opportunities for outdoor recreation and preservation, enjoyment, and appreciation of the outdoors. According to the “Pacific Crest Trail Route Selection” published in the Federal Register on January 30, 1973, the original route of the PCT was planned to pass through Tejon Ranch:

From State Highway 58 and Tehachapi Pass, the Pacific Crest Trail turns southwesterly through the El Tejon Ranch, follows Cameron Creek and Oak Creek and climbs into the Tehachapi Mountains, passing to the south of Double Mountain, switch backs into Cottonwood Creek, crosses Cottonwood Creek road, and climbs to Liebre Twins. It continues southwesterly on the ridge between Little Oak Creek and El Paso Creek. Staying on the ridge, the Trail passes Marble Springs Canyon. It continues along the ridge of the Tehachapi Mountains between Beartrap

Canyon and Sycamore Canyon to the head of Cottonwood (Los Alamos) Canyon. The Trail turns southeasterly down Cottonwood Canyon to the Kern County-Los Angeles County line. It then turns southerly to Quail Lake and the San Andreas Rift Zone and enters the Angeles National Forest to the east of Bald Mountain. (USFS, 1973, p. 2836)

However, at the time of the trail proposal, the United States Forest Service (USFS) was unable to obtain an easement to construct the PCT through Tejon Ranch, so the trail was re-routed in 1982. This re-route placed the trail in the Mojave Desert along the California Aqueduct and along the border of the southeastern tip of Tejon Ranch north of the Angeles National Forest.

The proposed realignment generally follows the original 1973 PCT route selection through Tejon Ranch, except that the trail turns to the southeast down Big Sycamore Canyon instead of Cottonwood Canyon and follows 300th Street towards the Kern County-Los Angeles County Line to join with the existing route to the south in the Angeles National Forest.

Involved Parties

The Conservancy and TRC are working with the Pacific Crest Trail Association (PCTA) and the USFS to plan and finalize the realignment of the PCT while observing best management practices (BMP) for trail construction, conservation, and allowing for continued Ranch operations. The USFS is the government agency overseeing the PCT and the PCTA is a 501(c)3 non-profit organization that provides stewardship for the PCT. The PCTA and USFS will be managing the realigned trail and are providing their expertise in trail planning, construction, and maintenance to TRC and the Conservancy to help ensure that the highest conservation principles are upheld.

In the summer of 2012, two interns and the Public Access Coordinator from the Conservancy hiked the proposed realignment and explored proposed campsites as part of a pre-scoping project to identify opportunities and constraints concerning trail placement. This pre-scoping was guided by the RWA, the Tehachapi Uplands Multiple Species Habitat Conservation Plan (TUMSHCP), and the vision of the PCT. In particular, the following aspects of the proposed trail were considered: grade; aspect; viewsheds and any necessary visual mitigation; general soil characteristics; dominant vegetation communities; TUMSHCP species and their modeled habitats; water sources; locations for rest and shade; road and fence crossings; potential

signage for information or deterrence; wildlife corridors; and cultural and historical sites.

TUMSHCP

The Tehachapi Uplands Multiple Species Habitat Conservation Plan (TUMSHCP) provides for the conservation and management of 27 species and their habitats, including the federally endangered California condor (*Gymnogyps californianus*). Most of the proposed PCT realignment falls within the area managed by the TUMSHCP. Therefore, the trail will need to be planned in accordance to the regulations set forth by the TUMSHCP to protect those 27 species and their habitats (A - Table N-1).

A - Table N-1. TUMSCHP Covered Species in PCT easement (based on modeled habitat (Dudek, 2012) and/or sightings)

	Segments (Miles from South to North)											
	0-4	4-10*	10-15	15-19	19-21	21-24	24-26	26-28	28-32	32-35	35-38	Overall
Invertebrates												
Valley elderberry longhorn beetle (<i>Desmocerus californicus dimorphus</i>)	Not in Covered Lands											
Amphibians												
Tehachapi slender salamander (<i>Batrachoseps stebbinsi</i>)	Not in Covered Lands	.	.		.					.	.	.
Yellow-blotched salamander (<i>Ensatina eschscholtzii croceater</i>)		.	.	.	.	.	.	.	.	.	.	.

Western spadefoot (<i>Spea hammondi</i>)			•									•
Reptiles												
Two-striped garter snake (<i>Thamnophis hammondi</i>)	Not in Covered Lands											
Coast horned lizard (<i>Phrynosoma coronatum</i>)		•	•	•	•	•	•	•	•	•	•	•
Birds												
Tricolored blackbird (<i>Agelaius tricolor</i>)	Not in Covered Lands	•	•									•
Burrowing owl (<i>Athene cunicularia</i>)		•	•								•	•
Golden Eagle (<i>Aquila chrysaetos</i>)		•	•	•	•	•	•	•	•	•	•	•
Western yellow-billed cuckoo (<i>Coccyzus americanus occidentalis</i>)			•									•
Yellow warbler (<i>Dendroica petechia brewsteri</i>)		•	•	•	•	•	•	•	•	•	•	•
White-tailed kite (<i>Elanus leucurus</i>)						•						•

Little willow flycatcher (<i>Empidonax traillii brewsteri</i>)			•									•	
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)			•									•	
American peregrine falcon (<i>Falco peregrinus anatum</i>)		•	•			•	•	•			•	•	
California condor (<i>Gymnogyps californianus</i>)		•	•	•	•	•	•	(CSA)	•	(CSA)	•	•	•
Bald eagle (<i>Haliaeetus leucocephalus</i>)													
Purple martin (<i>Progne subis</i>)		•	•	•	•	•	•	•	•	•	•	•	•
Least Bell's vireo (<i>Vireo bellii pusillus</i>)			•										•
Mammals													
Ringtail (<i>Bassariscus astutus</i>)	Not in Covered Lands	•	•	•	•	•	•	•	•	•	•	•	
Tehachapi pocket mouse (<i>Perognathus alticolus inexpectatus</i>)												•	•
Plants													
Kusche's sandwort (<i>Eremogone macradenia</i>)	Covered		•	•		•						•	

var. <i>arcuifolia</i>)												
Tehachapi Buckwheat (<i>Eriogonum callistum</i>)			•	•	•							•
Fort Tejon woolly sunflower (<i>Eriophyllum lanatum</i> var. <i>hallii</i>)		•	•	•	•				•	•		•
Round-leaved filaree (<i>California macrophyllum</i>)	•	•	•						•			•
Tejon poppy (<i>Eschscholzia lemmonii</i> ssp. <i>kernensis</i>)	•	•										•
Striped adobe lily (<i>Fritillaria striata</i>)	•	•										•

PCT Overview

Those traveling on the PCT through the Ranch will have the opportunity to see the Ranch's four eco-regions (Mojave Desert, Coastal Range, Sierra Nevada, San Joaquin Valley) along the trail. Travel on the PCT is limited to hikers and equestrians. Hikers and riders will trek off of the Angeles Crest, through the west end of the Mojave Desert to the Tehachapi Mountains. High up on the Tehachapis, travelers will be able to enjoy views of the expansive Antelope Valley in the Mojave Desert, the San Joaquin Valley, and glimpses of the Sierra Nevada. The approximately 38 miles of PCT realignment through the Ranch will help to transition thru-hikers and riders from southern California to the Sierra Nevada. This stretch of trail is also remarkable on its own as it travels through several different vegetation communities, including grasslands, oak savanna, chaparral, and conifer forests.

While the wonderful views and varied ecosystems on the Ranch provide opportunities for the PCT realignment, there are also constraints associated with re-routing it through this large private landholding. The PCT Comprehensive Plan provides the following guidelines for route selection:

The routes of national scenic trails should be so located as to provide for maximum outdoor-recreation potential and for the conservation and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas through which such trails may pass. They should avoid, insofar as practicable, established highways, motor roads, mining areas, power transmission lines, existing commercial and industrial developments, range fences and improvements, private operations, and any other activities that would be incompatible with the protection of the trail in its natural condition and its use for outdoor recreation. (USFS, 1982, p.3)

Because of Tejon Ranch's operations, including cattle ranching, mining, cement production, and development, many of the undesirable features listed above are unavoidable and visual mitigation will be/may be necessary to minimize their impact on the viewshed. The following will provide an overview of these and other constraints as well as the major opportunities for the PCT on Tejon Ranch.

Centennial

Centennial is a planned development on the Ranch that will sit between Highway 138 and the Kern County-Los Angeles County border. This proposed community of

about 60,000-70,000 people is intended to be a completely self-sustaining city with shops, restaurants, and other amenities. Such a large development will be visible along much of the trail and will likely increase visitation to Tejon Ranch's open-space areas. Conflicts may arise between PCT users and the residents of Centennial who may see the trail as an opportunity for prohibited recreation, such as off-highway vehicle use or mountain biking. Signs prohibiting such use should be placed along the trail and enforcement will need to be implemented. Centennial residents, especially those living on the north side of the city, may also try to hike north around the aqueduct and afterbay to the proposed trailhead and visitor center site instead of using the trail along 300th street. Currently, this proposed visitor campus is located in the grassland foothills of Big Sycamore Canyon. A trail for pedestrians and hikers may need to be created from the north end of the city to the proposed campus to deter user-created trail networks that would lead to habitat fragmentation, soil compaction, and vegetation trampling in the backcountry. The proximity of Centennial to the PCT also opens the Ranch up to the risks of timber harvesting, poaching, and other forms of vandalism. Increased patrolling, well developed and maintained signage (Chavez, 2002), and camera traps may be used to control and monitor access and activities on the Ranch. The city will, however, provide thru- hikers and those with pack animals an opportunity to rest and resupply food and water.

Visitor Campus

Because development is set to take place in the Centennial area, it may be an ideal location for an adjacent visitor center and trailhead. An interpretive campus closer to Centennial will concentrate development on Tejon Ranch and decrease disturbance in the backcountry, particularly with respect to burrowing owls (*Athene cunicularia*), pronghorn (*Antilocapra americana*), and native grasses that inhabit this area. The visitor center and trailhead in this location would also serve as a gateway to the PCT and allow the Conservancy to better manage access to the Ranch's open spaces. The parking area for this campus will help concentrate vehicular traffic on the Ranch, but an appropriate number of parking spaces will need to be determined to allow user access but not invite overuse. Paid parking may help regulate the number of vehicles in the parking area.

Stewardship and Interpretation

The unique landscape and history of Tejon Ranch provide many opportunities for education, interpretation, and stewardship along the PCT. Since public access to the

Ranch has been extremely limited in the past, it is viewed as alluring to many potential visitors. The Tehachapi Mountains are part of the Transverse Ranges, which is geographically considered to divide Central and Southern California. These ranges display the unique geology of the region through rock outcroppings on the Ranch. The uniquely preserved biodiversity on the Ranch presents an incredible story of natural history. Many operations occur on the Ranch within the viewshed of the PCT including ranching, mining, and cement production. These industries dot the landscape and offer visitors an idea of the many resources provided by the Ranch. A visitor center and trailhead will highlight these attributes through interpretive signs and displays. Local community members may become involved with the Ranch by volunteering to build and maintain the PCT with the PCTA. Once the trail opens to the public, citizen science can be implemented to aid in monitoring resources through such activities as bird and plant surveys and reporting trail conditions, which will contribute to the Conservancy's adaptive management goals. However, a balance will need to be struck between providing interpretive facilities and preserving the primitive atmosphere of the PCT. Therefore, interpretive signs may be highly limited in the backcountry, but widely used at the trailhead and visitor center.

A study by Thapa et al. (2001) noted that different ethnic groups prefer different types of communication when seeking out recreational information. For example, Hispanics prefer print communication, such as signs and brochures, when learning about rules and regulations. Hispanics were also less likely than Whites to seek out rangers or staff for park information and relied more heavily than other ethnic groups on gaining information through family and friends (Thapa et al., 2001). Differing ways of seeking information among ethnic groups should be noted so that the most effective communication of recreational information on Tejon Ranch can be employed.

California Condor (*Gymnogyps californianus*) and Microtrash

"The California condor is federally and state-listed as an endangered species and is classified by California as a fully protected species" (Dudek, 2012). Due to this protection, the condor is listed as a covered species in the TUMSHCP. Tejon Ranch, which represents 21% of condor critical habitat in California, is used for foraging, roosting, and as a link to other areas in the state (Dudek, 2012). The California condor's story of recovery provides an opportunity to educate the public about the significant role the Ranch plays in conservation and its importance to biodiversity.

The prospect of seeing a live condor also serves as an attraction for visitors because of its rarity. However, providing the public with access to condor habitat presents risks to condor populations, particularly in the form of microtrash. "Microtrash, small bits of plastic and metal, such as bottle caps, pop-tops, PVC pipe fragments, and broken glass, that are inadvertently fed to hatchlings by their parents, is an important factor affecting condor breeding activity" (Dudek, 2012). Thus, education through interpretation and handouts about what microtrash is and the harm it poses to condors as well as informational signs reminding visitors to pack out all trash will be crucial to minimizing its presence on the Ranch.

Golden Eagle (*Aquila chrysaetos*)

The golden eagle is a fully protected species in California and protected by the "Bald Eagle and Golden Eagle Protection Act of 1940" (USFWS 2010). This means that any take of the golden eagle, with "take" defined by the Act as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb," is prohibited (USFWS2010). On Tejon Ranch, the golden eagle's habitat covers 94% of the Covered Lands and falls within all sections of the PCT realignment. The TUMSCHP explicitly restricts any recreation from being within one-quarter mile of golden eagle nests (Dudek 2012). This restriction presents a challenge to re-routing the PCT onto the Ranch, because all golden eagle nests need to be mapped and accounted for before determining the final placement of the trail.

Tehachapi Buckwheat (*Eriogonum callistum*)

The Tehachapi buckwheat is a rare, new species described in 2006 that is endemic to the limestone outcroppings of the Tehachapi Mountains on the Ranch. During the summer 2012 pre-scoping of the PCT, new populations of the Tehachapi buckwheat were found on the proposed (ca. June 2010) PCT route. To avoid trampling and removal of individuals from these populations, a different route should be selected for the trail. A more detailed discussion of PCT routing and the Tehachapi Buckwheat is in the "Camp 2 to Martinez Ridge" section below.

Roads

Tejon Ranch remains a working ranch with over 2,000 miles of roads. The roads have become a part of the landscape, demonstrating the multiple uses that occur on the Ranch. However, the proposed PCT alignment follows along, next to, and crosses several roads. Thus, placement of the trail will need to be carefully planned to mitigate undesirable views of such roads. Decommissioning some of the minor roads

not actively used by the Ranch and converting them to trails can minimize encounters with roads. These roads would be selected based on USFS and PCT trail building guidelines, particularly with respect to grade, to minimize erosion. Other alternatives include placing the trail above or below the road such that they are hidden by the topography or vegetation.

“Day-use” and “Thru” Hikers and Riders

While about 300 hikers attempt to “thru-hike” the PCT from end to end, the vast majority of the expected use on the PCT realignment is by day-use hikers and riders and both user groups need to be appropriately accommodated. Strategic placement of campgrounds and water sources is necessary to provide for backpackers on multi-day trips while minimizing their impact and to deter day-users from undesirable, high impact activities that degrade used areas. Thus, the first campground 5 miles north (mile 15 of realignment) from the proposed trailhead will be an undeveloped, dry camp, while the first wet camp will be roughly 14 miles (mile 19 of realignment) from the trailhead.

Water Availability

According to the PCTA website, travelers on the PCT in Southern California are faced with “a constant quest for water” because water sources are often 20 or more miles apart, temperatures can exceed 100 degrees, and there is often little shade (PCTA 2012). On the Ranch, there will be two wet camps from which hikers can retrieve water. One of these campgrounds will have water available to pack animals as well. These proposed campsites (Camp 2 and Camp 3) both have spring fed ponds from which livestock will be excluded and thus provide cleaner water. Camps 2 and 3 are about 12 miles apart; therefore, the Ranch will offer water at distances much less than the average for the first 700 miles of the PCT. Monitoring the number of campers, particularly those who are not thru-hiking the PCT, through user registration will be necessary to determine whether human waste will pose a problem to water sources at these campgrounds.

Invasive species

With increased foot and equestrian traffic through sensitive habitats on the Ranch, the transportation of invasive species is a major concern. Hikers can spread invasive species from their clothing and boots as they travel through the Ranch. Horses that are fed non-native or non-pelletized feed may contribute to the spread of invasives through their manure (Irvine Ranch Conservancy, n.d.). Therefore, requiring pelleted

feed and encouraging hikers to clean their equipment before continuing on the trail may minimize transport of invasive species.

Steep Slopes, Loose Soil, and Erosion Potential

Construction of trails on mountains presents the challenge of erosion control. The proposed alignment of the PCT through Tejon Ranch traverses several slopes of grades ranging from 0% to 70%. According to the Pacific Crest National Scenic Trail Comprehensive Plan (USFS, 1982), the optimal grade range for the trail itself is no steeper than 15% on side slopes of 10% to 70%. Avoidance of switchbacks is preferable, but due to the prevalence of steep slopes on the Ranch, some switchbacks may be necessary. Where possible, climbing turns should be used for steep slopes instead (USFS, 1982). Along with steep slopes, loose soil presents an added challenge to constructing and maintaining a sustainable trail. Generally, north-facing slopes in the Tehachapi Mountains consist of gravelly loam and soil complexes, while the south-facing slopes consist of sand and sandy loam (Dudek, 2012). Technical expertise will be needed during construction to minimize soil creep and erosion potential along the trail.

Hunting and Ranching

Hunting and ranching are two major operations that occur on the Ranch. Two high-use hunting areas are situated near the trail: in the High Desert Hunt Club (mile 0-4 of the realignment) and near the White Oak section (mile 33 to end). These areas may pose potential conflicts between PCT users and hunters, both with regard to safety and desired atmosphere. Hunting season starts in the fall and goes into spring (September through March), so there is the possibility of overlap in timing with the thru-hikers who may travel through the Ranch in the spring. However, the main concern is with overlapping use by day-users, who may be using the trail throughout the year. Coordination between the PCTA and TRC in these areas will be necessary to avoid user conflict. Alternatively, the PCT can be closed to hikers during fall and winter.

Cattle ranching occurs throughout most of the Ranch and will continue to occur along the realignment of the PCT. Although users are unlikely to encounter cattle directly on the ridge of the Tehachapis, encounters may happen all along the trail and in the campgrounds. Users should be informed not to disturb the cattle or tamper with any Ranch infrastructure along the path. However, some fences may need to be removed to better accommodate the trail.

Adaptive Management Framework

The Conservancy will take an adaptive approach to managing public access on the Ranch and to overseeing the management of the PCT by the PCTA and USFS. The adaptive management approach for the PCT realignment will include regular monitoring of the trail and viewshed easements for environmental sensitivities and use, such as soil erosion, water quality, invasive species, disturbance of wildlife, camping impacts within and outside of designated areas, and fire potential. Approaches to monitoring may include the use of camera traps, field surveys, citizen science, and visitor surveys and/or registration. As conditions are revealed through such monitoring, management of the area will change accordingly to continue to meet BMPs and uphold the highest conservation principles. Additionally, the Public Access Plan as part of the Ranch-Wide Management Plan (RWMP) will undergo a review and revision every 5 years to determine necessary management changes.

Five-year Operational Objectives and PCTA Proposed Schedule

The Ranch-wide Agreement stipulates that the RWMP and the Public Access Plan be revised every 5 years. For the first iteration of the RWMP, the Conservancy has set the following operational objectives with regard to the PCT:

- Draft easement for the trail and viewshed.
- Finalize route of PCT realignment based on considerations uncovered by “pre-scoping” and further field research.
- Complete initial draft of NEPA for commenting.

The PCTA has also proposed a schedule for planning and constructing the trail:

- USFS realignment and NEPA budgeting in 2014 federal budget.
- 2 years of permitting for realignment.
- 10 years to build the trail.
- Grand opening in 2026.

PCT Realignment Segments

High Desert Hunt Club (Miles 0-4; Elevation 3900'-3000')

The PCT descends from the mountains of the Angeles National Forest and enters the southern end of Tejon Ranch into the High Desert Hunt Club, crossing Pine Canyon Road. On the north side of Pine Canyon Road, the trail must carve through a tall (6' or 7') roadcut as it enters the Ranch. Heading north from the entrance, the trail

follows the hilltops through dense chaparral, dominated by chamise (*Adenostoma fasciculatum*) and canyon live oak (*Quercus chrysolepis*). These hilltops provide panoramic views of the grasslands and Blue Ridge can be seen to the north. The canyon below the trail may contain an intermittent stream when precipitation is high. Continuing north, the vegetation changes from chaparral to stands of grey pines (*Pinus sabiniana*) with grasses and buckwheat (*Eriogonum sp.*) in the understory. The geology in this area transitions from sandy loam soil to patches of red volcanic rocks to gravelly limestone with patches of serpentine towards the southern end of First Canyon. As the trail traverses the west side of First Canyon, it parallels a minor dirt road. When the trail exits First Canyon onto 300th Street, the terrain flattens out to grassland where houses and paved roads can be seen to the north. Continuing to 300th Street, the trail crosses Highway 138, currently a two-lane highway to be converted to a six-lane highway to accommodate Centennial. An overpass or underpass may be necessary to assist hikers in safely crossing the highway. Barbed wire fences flank the beginning and end of this segment along Pine Canyon Road and Highway 138. Throughout this section, the trail alternates between northern and southern exposures with little shade except for that provided by a few scattered trees. As stated above, coordination between the Conservancy, TRC, USFS, and PCTA with regard to hunting, especially for the month of March, will be necessary to avoid user conflict.

300th St. & Grasslands (Miles 4-10; Elevation 3000'-3400')

From the High Desert Hunt Club, the trail follows along 300th Street for about 2 miles. 300th Street is a straight, flat, paved road with agriculture and homes to the east and open grasslands to the west. National Cement, a cement manufacturing facility, is visible in the distance in the grasslands. However, as previously noted, the landscape to the west will change drastically with the development of Centennial, which may offer trail users opportunities for water, rest, and supplies. Signs and clearly marked trails should be employed to keep users on the trail and prevent trespassing. With Centennial's sizeable population, this segment has the potential to be highly used. Therefore, the trail along Centennial should be split into dedicated equestrian and hiking trails to avoid conflict between pack animals and local pedestrians.

Continuing north, the trail crosses a barbed wire fence and heads northwest, passing the eastern end of the Tehachapi North Afterbay. The trail then goes through flat, open grasslands and crosses Contour Road to the first alluvial terrace of Big

Sycamore Canyon. Toward the foothills to the east of the trail is the aptly named “Africa Tree”, a large valley oak (*Quercus lobata*) that looks like an acacia, where much filming occurs; to the west is a sizeable colony of burrowing owls (*Athene cunicularia* var. *hypugea*). At the base of the foothills is the proposed site for a trailhead and a campus with a visitor center and other interpretive facilities that can educate users on the area’s natural history, its conservation values, stewardship, and the historic Ranch-Wide Agreement that protects the land for California’s current and future generations³. In the spring, the grasslands are covered with large wildflower blooms, which provide great opportunities for guided tours and other activities. These facilities and the wildflower displays may attract large groups of visitors because the campus would allow for vehicular access to this area. However, burrowing owls are a species of special concern in California and are thus a covered species in the TUMSHCP. Therefore, to avoid disturbing sensitive burrowing owl habitat, a more suitable site may need to be selected for these facilities. An alternative site for the campus and trailhead may be closer to 300th street and the California Aqueduct, adjacent to the Centennial development (Fig X). This site would limit the amount of paved road and disturbance to the grasslands and would increase the distance from the burrowing owl habitat. Once Centennial is built, this section would likely be the only section of the proposed realignment that is classified as urban or rural on the USFS Recreation Opportunity Spectrum (ROS). This segment would also be the only segment of the entire PCT with a visitor center.

The Ascent & Camp 1 (Miles 10-15; Elevation 3400’-4800’)

As the trail ascends the west side of Big Sycamore Canyon, the vegetation communities transition from grasslands at the foothills to oak savanna with patches of scrub oaks, followed by blue oak (*Quercus douglasii*) woodland, and then chaparral as the trail approaches Camp 1. In the grassland and chaparral areas, the trail is exposed to sun and wind. At about mile 12, there is a spring fed livestock pond to the west of the trail and a livestock trough to the east.

The trail follows along a fairly steep minor dirt road (10%-20% grade) on a south-facing slope for most of the ascent with occasional contours in steeper sections. However, where the trail contours, the road is a shorter distance and trail users may opt to follow the road instead of the trail. Therefore, the trail should be routed such that the road is not visible, is difficult to access, or such that the trail is a more

attractive option. However, this road is on the fall line and will most likely be seen at a distance along the trail. Sections of the road have exposed bedrock, which may be an indicator of high erosion susceptibility. Therefore, conversion of this road for the trail may not be an attractive option.

At the top of the ascent where the trail begins to turn northeast onto Blue Ridge is Camp 1. Camp 1 is a dry camp with a patch of grassland surrounded by black oaks (*Quercus kelloggii*) bordered by a barbed wire fence and cattle gate to the west. Both the trail and the minor road cross through this campsite. Continuous, panoramic views of the Antelope Valley and Angeles National Forest are visible to the south from Camp 1 and along the trail, although La Liebre Mine and National Cement can also be seen in the distance.

Camp 1 to Camp 2 (Miles 15-19; Elevation 4800'-5200')

From Camp 1, the trail follows along a very steep (~70% grade) decommissioned road onto Blue Ridge. The trail may need to employ climbing turns or switchbacks here to maximize sustainability and hiker comfort. The trail then contours along the north slope before crossing a minor road onto the south slope at mile 17. Along the south slope of the ridge, the trail continues to contour before crossing back onto the north slope near Camp 2 where large oaks offer shade. Patches of scrub oaks, buckwheat, and grass leave the south slope exposed to wind until it transitions to a stand of pinyon pines (*Pinus monophylla*) toward Camp 2. Highly used game trails parallel the route, contouring the south slopes of the ridge, which may provide an opportunity for easier trail construction. However, Irvine Ranch Conservancy (2012) found that human use might affect wildlife behavior, causing avoidance, attraction, or acclimatization, depending on the species. For example, mule deer and coyotes tend to avoid areas with high human use and mammals shifted their activity to become more nocturnal in high use areas as compared to low use areas (Irvine Ranch Conservancy, n.d.). Therefore, monitoring of game trail use by wildlife, possibly via camera traps, prior to trail construction is necessary to avoid significant disturbance to species in the area.

Camp 2 (Mile 19; Elevation 5200')

A steep, one-half mile spur trail from the PCT follows along a minor road to Camp 2 on the north slope of Blue Ridge. Camp 2 is a sheltered patch of grassland surrounded by large valley oaks and hills with limestone outcroppings. Currently, a stock pond is the primary water source for this campground. This pond will be

fenced off from cattle to provide water for hikers. Spring boxes can also be found in the campground.

Camp 2 to Martinez Ridge (Miles 19-21; Elevation 5200'-5600')

Going northeast from Camp 2, the vegetation transitions from the valley oaks surrounding the campground to denser Brewer's oak (*Quercus garryana* var. *breweri*) and canyon live oak. The trail contours along the steep north slope of the ridge on soft, loose, gravelly loam soils, passing through downed branches and scrub oaks as it makes its way toward the ridgetop. Swarms of mosquitoes lie in waiting underneath the oaks. Near the ridgetop, windblown pinyon pines appear, followed by patches of chaparral and exposed sandy soil with limestone. In the limestone are populations of the endemic and rare Tehachapi Buckwheat (*Eriogonum callistum*). To avoid trampling the populations of Tehachapi Buckwheat, the trail should be routed downslope of the ridge, contouring the north slope, and away from these populations. Although placing the trail on the north side hides the panoramic southern view of the Antelope Valley, the trail would be less exposed and allow users to see more of the Ranch. Views of the Antelope Valley can also be seen along several other sections of the trail. Therefore, travel off of the trail to the ridge will likely be minimal because this view would have previously been seen. Placement on the north side of the ridge would also allow for easy connection with the next trail segment that lies on the north slope. The south side of the ridge also contains a large area of modeled habitat for the buckwheat. However, further in-depth surveying of the area is necessary to ultimately decide final trail placement.

Martinez Ridge (Miles 21-24; Elevation 5600'-6400')

The trail continues northeast on the north slope through patches of chaparral, buckwheat, and limestone outcroppings. More populations of Tehachapi buckwheat inhabit the exposed limestone patches on the north face of the ridge. A seismometer can be seen from the trail near the ridge and a fence may be necessary to avoid tampering by curious travelers. Following the trail northward, the chaparral transitions to scrub oaks until it reaches the steep, grassy hills overlooking Martinez Ridge to the northwest. Among the hills are sandy soils with large rock outcroppings and the occasional wind swept Jeffrey pine (*Pinus jeffreyi*). Strong winds blow across the hills and rock outcroppings. The overlook offers spectacular views of both the Antelope and San Joaquin Valleys and glimpses of mountains in the Los Padres National Forest. Large valley oaks provide refuge and shade north of the overlook. The trail continues downhill on the south slope into Canyon Del Gato Montes

through scrub oaks and sagebrush (*Artemisia tridentata*) on sandy soils. It crosses a barbed wire fence several times as it goes downhill and a major dirt road in the canyon. However, the trail may be routed such that it only crosses the fence once. The fence may also be removed if it is determined unnecessary for ranching operations.

Conifer Forest (Miles 24-26; Elevation 6400'-6674': Diorite)

A particularly stunning segment of trail on Tejon Ranch, this portion provides outstanding views of much of the Ranch, Antelope Valley, Mojave Desert, San Joaquin Valley, and the Southern Sierras. White firs (*Abies concolor*) are the dominant trees along the trail, however black oaks and white thorn (*Ceanothus cordulatus*) inhabit the area as well. One of the highest elevation segments of the realignment, this portion is characteristic of the Ranch's unique "Sierra sky islands" and provides a preview of the Sierra Nevada for those traveling south to north. Downed trees and branches, due to extreme wind conditions on exposed areas of the ridge, will need to be cleared and paths will need to be made through the white thorn. Standing trees, however, provide copious amounts of shade. This section does not cross or follow along any roads. The trail travels almost directly on the ridge, so few if any switchbacks or climbing turns will be needed. Gravelly loam is the dominant soil beneath the conifers and black oaks. Marble outcroppings are interesting geologic features in this area and add to the beauty of this segment.

This habitat has been modeled as primary breeding habitat for the golden eagle (*Aquila chrysaetos*), a fully protected species under California State Law. As a result of this protection, the golden eagle is listed as a species of concern in the TUMSHCP, and the trail will not be allowed within one-quarter mile of a nest. Furthermore, use of the trail will be "restricted between 0.25 and 0.5 mile from an active primary or active alternate golden eagle nest during the nesting season" of February 1 through June 1 (Dudek, 2012). Trail use may be allowed during the nesting season, if it is determined that the trail use would not affect nesting golden eagles or that the nest has become inactive. Placement of the trail is pertinent to these restrictions as recreation near a nest may cause adults to abandon the nest, resulting in a take of the golden eagle. Another species of concern for this segment is the California condor (*Gymnogyps californianus*). The trail enters the Condor Study Area (CSA) at mile 26. Signs reminding hikers and riders to be aware of microtrash may be necessary.

White Thorn (Miles 26-28, Elevation 6674'-6550')

This section is covered by white thorn, which will need to be cleared or avoided. The trail follows along the ridge and is quite exposed to the sun and other elements as there are very few trees and mainly low lying vegetation. Although shade is scarce, the magnificent viewsheds are unobstructed. The proposed placement of this segment travels by the highest peak on the Ranch (elevation 6803') and through the edge of the CSA. This segment also skirts the edge of modeled primary breeding habitat for the golden eagle. As with the Conifer Forest segment, White Thorn does not cross any roads.

Black Oak Forest & Liebre Twins (Miles 28-32, Elevation 6550'-5960')

Once the white thorn is left behind, the trail enters a stand of even-aged black oaks. As the trail leaves this black oak forest, it travels along the southern side of the ridge into a vegetation community composed of buckwheat (*Eriogonum sp.*) and sagebrush with patches of scrub oaks. With this change in vegetation, a hiker or rider traveling through this section may feel as though they traveled from an east coast forest to the high desert in a matter of minutes. The trail then traverses a steep, rocky slope where the vegetation alternates between dense patches of scrub oaks, *Ceanothus sp.*, flannel bush (*Fremontodendron californicum*), and sagebrush as the trail makes its way toward Camp 3. Most of mile 28 runs through the CSA and along modeled golden eagle primary breeding habitat. Signage regarding microtrash should be considered for those traveling into the CSA from the north end of the trail. The Antelope Valley and Mojave Desert, including the newly constructed wind farm, can clearly be seen along this portion of the trail due to the trail's southern exposure. However, the beauty of the immediate environment is not overshadowed by the wind farm and is quite different from any other area along Blue Ridge. Panoramic views out to the San Bernardino Mountains are most prominent at mile 29 due to the east-facing slopes the trail traverses.

Camp 3 (Mile 32, Elevation 5680')

Camp 3 is accessible by spur trail one-half mile south of the PCT. The camp contains a spring fed pond and is surrounded by valley oaks that provide shade. Next to Camp 3 and along the spur trail, the vegetation changes from valley oak savanna to buckwheat and sagebrush. This campground would be sited in modeled primary breeding habitat for the golden eagle. Several other species of birds were heard and

seen during pre-scoping of this site as well. Views of Antelope Valley are clear from this campground.

Camp 3 to Cottonwood Creek (Miles 32-35, Elevation 5960'-4500')

From Camp 3 the trail turns north and makes its way off of Blue Ridge to Cottonwood Creek. This section is steep, with an elevation loss of 1460 ft. This north-facing slope is dense with scrub oaks, valley and black oaks, and conifers. Due to the grade (>15%) and overgrowth in this section, switchbacks and clearing will be required for trail construction. As the trail descends off the ridge, it crosses a minor road that contours the slope. The trail then reaches the creek for crossing. Cottonwood Creek is perennial, though it may not have flowing water at the trail crossing during the summer. The banks of the creek were examined and it was determined that even at bank-full the creek would be crossable. The floodplain of the creek is relatively open and flat with sagebrush, buckwheat, and grasses, so travelers may see this area as a nice place to camp. Power lines are visible in this segment as the trail passes underneath them on its descent to the creek. Data regarding modeled habitat for the golden eagle is unavailable, because this segment currently runs through an inholding.

White Oak (Miles 35 – 38, Elevation 4500'-5900')

Ascending from Cottonwood Creek, the trail switchbacks up a south-facing slope covered mostly by valley oak savanna with annual grasses and ripgut (*Bromus diandrus*) in the understory. The trail crosses through modeled golden eagle primary breeding habitat. This area is also heavily used by elk (*Cervus canadensis nelsoni*), which were sighted during the summer 2012 pre-scoping of the trail. As the trail increases in elevation, it crosses a major ranch road and continues to climb. Placement of trail markers may be needed at the road crossing to keep users on the trail. Beyond the road, the terrain is steep and grassy with scattered oaks, grey pines, and a dense stand of scrub oaks. A clearing through the scrub oaks will be necessary as the proposed trail currently runs through this stand. Wind turbines and power lines continue to be noticeable at about mile 35. Through miles 36 to 38, wind turbines and power lines can be still seen, but are dwarfed by the beauty of the Ranch and the dramatic views of the Antelope and San Joaquin Valleys.

Conclusion

As the PCT realignment exits the Ranch across a barbed wire fence, it will need further realignment to connect with the current route into the Sierra Nevada.

Negotiations with the PCTA, USFS, and private landowners between the eastern border of the Ranch and the current PCT are necessary to facilitate this connection. These negotiations may occur over several years, during which the Conservancy and TRC will continue to carefully plan the realignment on the Ranch. Best management practices and the highest conservation standards will continue to be observed throughout this planning process.

Because Tejon Ranch is a working ranch, some constraints to realigning the PCT are inevitable. The roads, ranching operations, and industrial facilities reflect the working landscape on the Ranch and tell part of its story. With proper mitigation and careful planning, the realignment will provide opportunities for education, stewardship, conservation, and public access on the Ranch. The 38-mile realignment of the PCT on Tejon Ranch represents a unique and historic opportunity to fulfill the original vision of the PCT. Not only does it provide PCT users with an improved experience, it serves as a gateway for outdoor enthusiasts to experience Tejon Ranch and learn about its importance to California's natural heritage and its global significance for conservation.

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Appendix O:

Baseline Data

Vegetation

Tejon AM (Appelbaum et al., 2010) established baseline data for eight identified distinct vegetation communities on the Ranch:

- Chaparral
- Joshua Tree Woodlands
- Montane Mixed Hardwood & Conifer Forests
- San Joaquin Valley Grasslands
- Antelope Valley Grasslands
- Riparian
- Valley Oak Savanna
- Foothill Blue Oak Woodlands

Indicators

Trail Conditions

- Vegetative encroachment
- Erosion
- Undesignated trails (e.g. user-created)
- Cleanliness (e.g. littering and vandalism)

Soil Conditions

- Compaction
- Erosion
- Soil loss
- Soil stability

Vegetation

- Plant community composition changes
- Damage or devegetation
- Amount of dead and down materials
- Trampling
- Invasive species

Wildlife

- Wildlife encounters
- Invasive species
- Wildlife populations
- Habitat change
- Indicator species
- Wildlife displacement
- Wildlife exposure to human food

Infrastructure

- Condition of built materials
- Use of built materials
- Vandalism
- Cleanliness

Visitor Experience

- Return visitation
- Quality of experience
- Complaints
- Degree of isolation
- Overall satisfaction

- Extent of visitor use
- Parking availability
- Distance willing to travel to the Ranch
- User demographics
- Knowledge of the RWA, TRC, and the Conservancy
- Understanding of the Ranch's conservation significance
- Knowledge of the management presence

Appendix P:

Future visitor survey

“Visitor Satisfaction Survey”

[Distribute online using Google Forms & use Past Visitor Survey as a reference. Note: this is a draft and can be modified to best fit the Conservancy’s needs as it moves forward with public access on the Ranch.]

Directions

Thank you for your participation in this online survey. This survey should take no longer than 5-10 minutes to complete. Your responses will help the Tejon Ranch Conservancy continue to improve public access on the Ranch.

If you have any questions or concerns, please email the Conservancy’s Public Access Coordinator Scot Pipkin (spipkin@tejonconservancy.org).

Visitor Satisfaction Survey

1. When did you last visit Tejon Ranch? Please answer the rest of this survey with respect to your most recent visit.
 - a. 0-3 months ago
 - b. 3-6 months ago
 - c. 6-12 months ago
 - d. Over 1 year ago
2. Is this your first visit to Tejon Ranch?
 - a. Yes
 - b. No
 - i. If no, how many times have you visited Tejon Ranch?
3. How did you hear about Tejon Ranch?
 - a. Tejon Ranch Conservancy’s website
 - b. Tejon Ranch Conservancy newsletter
 - c. Internet search (e.g. Google)
 - d. Friends or family
 - e. Non-profit website or newsletter (e.g. Sierra Club)
 - f. School
 - g. Other
4. Why did you choose to visit Tejon Ranch? (please check all that apply)

- a. Close to home
 - b. Tejon Ranch scenery
 - c. Tejon Ranch vegetation and wildlife diversity
 - d. Tejon Ranch history
 - e. Tejon Ranch public access activities
 - f. Other
5. What public access activities did you participate in during your most recent visit to Tejon Ranch? (please check all that apply) *[use the follow-up questions after each activity (i.e. if respondent checked the activity, s/he will be asked follow-up questions about the checked activity next)]*
- a. Hiking
 - b. Vehicle tour
 - c. Wildflower tour
 - d. Birding trip
 - e. Cultural history tour
 - f. Service project or volunteer work
 - g. Citizen Science
 - h. Other
- i. *Follow-up questions for selected activities:*
 1. How do you rate the activity's level of difficulty?
 - a. Scale 1 (too easy) to 5 (too difficult)
 - b. Not applicable
 2. How satisfied are you with the scenery visited during the activity?
 - a. Scale 1 (very dissatisfied) to 5 (very satisfied)
 - b. Not applicable
 3. How do you rate the amount of time spent doing the activity?
 - a. Scale 1 (too short) to 5 (too long)
 4. How satisfied are you with the guides during the activity?
 - a. Scale 1 (very dissatisfied) to 5 (very satisfied)
 - b. Not applicable
 5. How satisfied are you with the activity description provided before the visit? (i.e. Did the activity description prepare you for what to expect on your visit?)
 - a. Scale 1 (very dissatisfied) to 5 (very satisfied)
 - b. Not applicable
 6. Overall, how satisfied are you with the activity?
 - a. Scale 1 (very dissatisfied) to 5 (very satisfied)

6. Overall, how do you rate your most recent visit to Tejon Ranch?
 - a. Scale 1 (very dissatisfied) to 5 (very satisfied)
7. Please provide any additional comments. (Optional)
 - a. *[open box to type in open-ended response]*

The following questions are optional but will be helpful to the Conservancy. Answers to these questions will remain anonymous and will not be paired with your answers to the rest of the survey.

1. What is your zip-code? (If you are not from the United States, please enter "international")
 - a. *[open box to type zip-code into]*
2. What age group are you in?
 - a. Under 18
 - b. 18-24
 - c. 25-34
 - d. 35-44
 - e. 45-54
 - f. 55-64
 - g. 65+
3. What is your gender?
 - a. Male
 - b. Female
4. Which ethnic group(s) do you most closely identify with? (please check all that apply)
 - a. Caucasian
 - b. Hispanic
 - c. African American
 - d. Asian
 - e. Native American
 - f. Other *[open box to type in]*
5. What is your total annual household income?
 - a. Less than \$25,000
 - b. \$35,000-\$50,000
 - c. \$50,000-\$100,000
 - d. \$100,000-\$150,000
 - e. \$150,000-\$200,000
 - f. Over \$200,000

Other possible questions if/when applicable

1. How do you rate the facilities offered on Tejon Ranch (e.g. bathrooms, picnic tables)?
2. How do you rate your experience at the Visitor's Center?
3. How do you rate your experience on the interpretive trail?
4. Does the self-guided loop-trail provide a satisfactory alternative to guided access on Tejon Ranch?
5. How do you rate the quality of the docents?