Groveland Conceptual Trails Plan

Groveland, California

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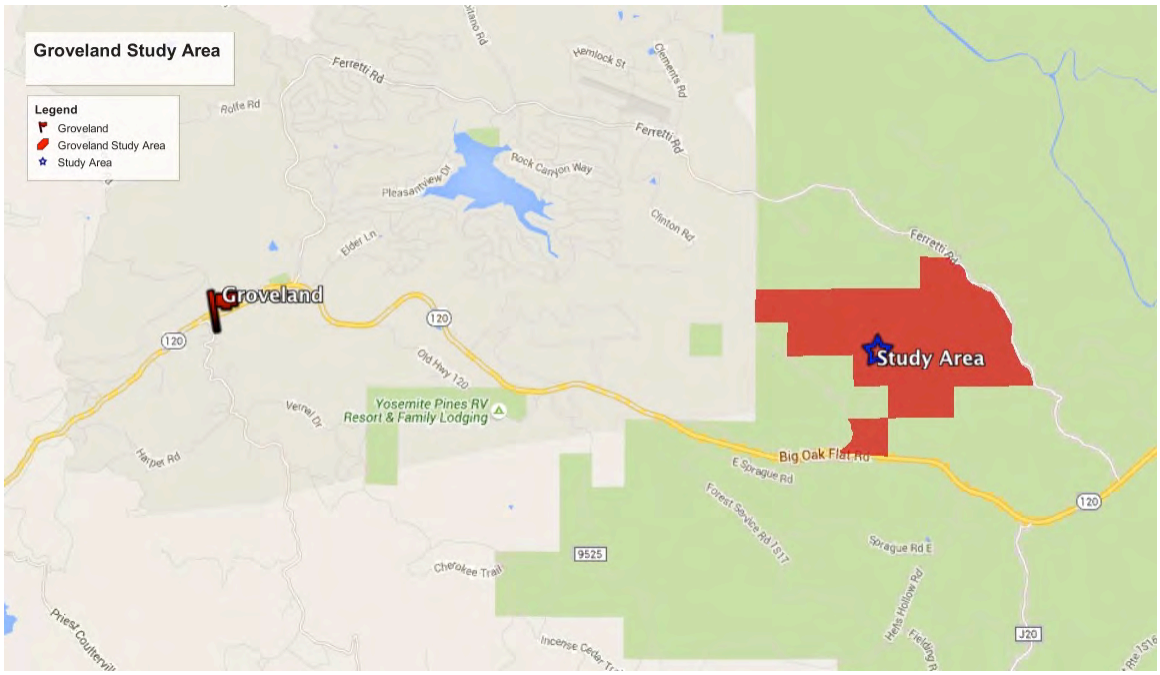
1. Overview

This conceptual plan provides guidance and suggestions for the creation of a destination-worthy mountain bike trail system. The area detailed in this proposal for the development of trails is a 500-acre fuel break situated just outside of downtown Groveland in the Groveland Ranger District of the Stanislaus National Forest. The purpose-built trail system will be possible because of a partnership between the International Mountain Bicycling Association (IMBA), the U.S. Forest Service and the local mountain bike club, the Groveland Trail Heads.

This 500-acre development is the springboard from which the development of a larger single-use and multi-use trail systems within the District will be launched. Building upon the success of the project in this proposal, the Groveland Trail Heads hope to eventually be able to proceed, with the full support of the Stanislaus National Forest and area landowners, to develop additional trail systems for biking, trail running, hiking, and equestrian use stretching from Groveland to Yosemite National Park. The main goal of the Groveland Trail Heads is to improve the economy of Groveland and its neighbors by creating a positive draw for area recreation. In addition to being a member of the Highway 120 Chamber of Commerce and Groveland Area Partnership, they have garnered support from the Tuolumne County Visitors Bureau, Economic Development Authority, Tuolumne County Transportation Council and local businesses. The Groveland Trail Heads

share a common goal with their partners: to improve the lives of all members of the community by creating a year-round draw for visitors and thereby improving area schools and amenities, creating a healthy outlet for youth and families, and providing a platform from which to encourage good forest stewardship. Beyond the Groveland Ranger District, the long term goal of the Groveland Trail Heads is to assist communities throughout the Stanislaus National Forest to accomplish the same goals by aiding in securing grants, selecting and hiring trail contractors, and training volunteers and club members in the building of sustainable trail systems.

The community of Groveland will be well served by the addition of this new trail system. The area's topography, scenic value, mixed conifer forest, proximity to the Central Valley and Bay Area, topped off by a desirable climate will ensure that a world-class mountain bike trail system will draw users throughout the year. Groveland's local economy is largely dependent on summer tourist traffic. The main draws of visitors to the area during summer months are Yosemite National Park, whitewater rafting and hiking. Groveland has accommodations, restaurants, and stores that are open year-round, but the lack of off season activities results in businesses struggling to cope with the economic crunch of fewer visitors. Many are forced to cut costs, which further depresses off-season economic activity in the community. The addition of a quality mountain bike trail system will create a new draw to the area during 'shoulder' seasons when businesses need it the most.



Groveland is a gateway to Yosemite National Park and lies at its western edge. Yosemite is one of America's most iconic National Parks and attracts roughly 4 million visitors to the area annually. Many of these visitors come from the San

Francisco Bay Area, Silicon Valley, Sacramento or Los Angeles, all of which lie within a six-hour drive of the project area. These population centers contain at least 20 million inhabitants of which we can estimate, according to the 2013 Outdoor Recreation Participation Report, a minimum of 3.2% are mountain bike enthusiasts and therefore are potential visitors to a top level mountain biking destination. With the addition of biking as a four season recreation option, Groveland becomes a desirable day or overnight trip for people living in nearby population centers. If the trail system provides enough variety and mileage, it will keep visitors of all abilities occupied and enthusiastic, which will result in multi day trips that increase the dollars spent in the local community.

The proposed project area is situated minutes from downtown Groveland with easy access off of Highway 120. The acreage includes a Forest Service fuel break with multiple points of access via existing fire roads and affords beautiful views of the Stanislaus National Forest, Yosemite and the Wild and Scenic Tuolumne River drainage to the North. The future trail systems proximity to Groveland and the ease of access from the highway makes the acreage an ideal place to conscientiously develop into a destination-worthy trail network that will draw user groups of all abilities to the area. There are existing multi-use (non-motorized) dirt and gravel roads, along with limited user-created single track in place that will provide the framework for new trails. In addition, the variation in topography makes the acreage well suited for mountain bike trails for all ability levels. This project will be a measuring stick for future trail projects for all user groups in the Stanislaus National Forest.

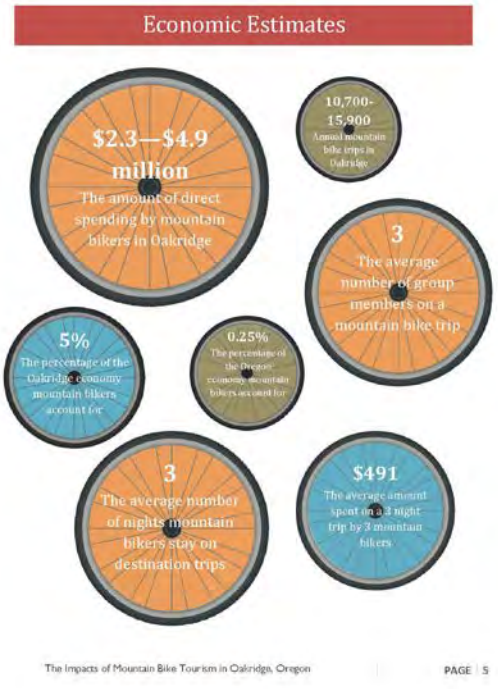
2. Project Approach and Objectives

This project is crafted with the idea of developing a wholly new network of trails that are *singletrack* or *purpose-built trails*. *Clusters* or *stacked loops* of trails will be crafted that feature sustainable design and construction, and meet conservation, education, and recreation objectives. These loops will create a progression of experiences and challenges as trail users explore them in more depth with each visit. Individual segments must provide consistent and expected experiences. The design of this system is similar to that of a well-designed ski trail system, with a collection of easier (green circle), more challenging (blue square), and most challenging (black diamond) trails. This network will be enhanced by efficient way-finding signage, and a variety of trail types. These characteristics will appeal to a broad cross section of off-road bicyclists (mountain bikers), from family-oriented entry-level riders to highly skilled enthusiasts.

While the quality of the trail experience provided is paramount, as a "destination" trail system, quantity must also be considered. To draw trail-focused visitors from nearby metro areas as well as visitors from across the state of California, this approach recommends that final implementation include 15 - 25 miles of high-quality singletrack trails be developed. This will provide a wide enough variety of experiences to draw riders from the large metropolitan areas as well as create a vital recreation amenity for the community of Groveland.

Objective: Economic benefits for the community

As an economic stimulator, the outdoor recreation sector as a whole, including all manufacturing, retail and service sector jobs related to hiking, bicycling, hunting, fishing, and other sports, provides more jobs than any other sector in the country, and grew at an annual growth rate of 5% over the last five years (OIA, 2012). As many of the rural communities surrounding mountain biking destinations have historically had natural resource based economies, they are starting to see the effect that recreation, and mountain bikers specifically, can have on their revenue streams. As communities develop economic strategies, facets of recreation are often left out due to their unknown impact. Struggling cities and towns must be made aware



of the positive impact mountain biking has on their economy[1].

[1] Adapting To The New Economy: The Impacts of Mountain Bike Tourism in Oakridge, Oregon. University of Oregon Department of Planning, Public Policy and Management. Meltzer, Nicholas S.

Case Study: Oakridge, Or

The city of Oakridge, Oregon is one rural community that has experienced an economy in transition. Located 35 miles Southeast of Eugene on the crest of the Cascade Range, it is a remote community with just over 3,200 residents. Originally founded due to the bountiful old growth timber surrounding the city, which later become the Willamette National Forest, Oakridge was a prosperous timber town for nearly 80 years until the Pope & Talbot mill closed in 1989. Struggling for the better part of the last 25 years, Oakridge is beginning to come to life again, this time as a premiere destination for mountain biking.

Percentage of visitors who . . .	
are visiting from out of the area	75%
listed mountain bicycling as the primary motivator for their trip	96%
have a college degree	40%
have a Masters or PhD	10%
have a technical degree	22%
stay in a campground	36%
stay in a hotel	22%
stay in a resort	16%
travel with children	22%
report $100,000 in annual income	50%
report over $150,000 in annual income	22%
will visit the national park	37%
will go for a hike	28%
plan on riding for 3 days	85%
plan repeat visits in the same season	51%

High-quality singletrack trails will attract mountain bicyclists, hikers, and trail runners that will boost the economic health of the region. The development of *model trails* and other high demand trail types will create experiences that draw visitors to the area and establish it as a mountain biking destination. Groveland's mild weather will attract visitors to enjoy the trail system year round, which is a valuable benefit to a community that needs more visitors in the slower fall, winter and spring seasons.

Through careful planning, design and construction, this trail network can become a critical component of the economic engine that sustains the community. It is critical to attract and satisfy visitor's desires with the full range of experiences for which they are looking. An inexperienced or not physically fit visitor may be forced to turn back if they encounter a mandatory obstacle on an otherwise "green"-rated trail. Similarly, a high level rider may not bother to visit a destination that lacks the physically challenging and technically demanding trails that an established location such as Sedona, AZ, is famous for.

Objective: Enhance community health and connect the population with the surrounding environment

The residents of Groveland should have safe and easy access to healthy recreation options. The proposed trail system in Groveland will accommodate the entire spectrum of abilities and ages. Everyone from beginner to advanced trail riders will enjoy the experience of riding a world-class sustainable mountain biking trail system in an incredibly beautiful forest.

In addition to enhancing community health, building trails through volunteerism builds community pride. Trail maintenance of the proposed trail system will be

managed by the Groveland Trail Heads and will rely on chapter membership and local volunteer efforts. Volunteering with the club will provide an opportunity for local people to connect with and learn about the forest around them.

Singletrack trails should tie directly into the community and provide opportunities for citizens to be active. By building trails that are close to the community, families are able to recreate together and reinforce the value of staying active and preserving nature among the youth. These health enhancing and group building activities are a vital asset to any community and are proven to improve quality of life.

Objective: Provide a venue for trail related events

A well-designed trail system that includes clear designation of trails that are compatible for bike related events also provides opportunities for events and competitions throughout the year. Having a well-known event draws visitors, boosts the area's economy, creates recreation based employment opportunities and serves as marketing for the community itself.

Some events attract thousands of participants and can provide a critical economic boost for the community. They also form an excellent case for why recreation, events and conservation can work hand in hand.

Objective: Become an IMBA Ride Center®

IMBA Ride Centers® are extensive trail networks, masterfully designed for mountain bicyclists of every skill level and built by professional trail builders. They serve as social and educational hubs, where visitors can connect and learn new riding techniques. Ride Centers® provide the full range of mountain bicycling experiences today's riders crave, from long singletrack journeys to family-friendly loops, and areas with expertly designed technical challenges for advanced riders.

Groveland Ride Center - By creating a high-quality purpose-built mountain bicycle trail system and in conjunction with trails in the surrounding region, the Groveland area has an opportunity to become an IMBA Ride Center®. This designation represents IMBA's recognition of large-scale mountain bike facilities that offer something for every rider. As an IMBA Ride Center®, The Groveland area can successfully promote itself as a well-respected destination that offers a complete mountain bicycling experience; from backcountry adventures to shuttle-served gravity trails, and from experts-only to family-friendly singletrack. With a ride center designation in place, visitors can be assured that they can expect to encounter the best the sport has to offer.

Being designated as a Ride Center® would clearly identify the Groveland area as being among the best places in the world to go mountain bicycling. This means

the community will see an increase in both visitors and improvements in quality of life for residents because of better opportunities for outdoor recreation.

Developing the trails and facilities that are required for Ride Center® status are not insignificant. In Groveland's case the costs will be considerable because of the current lack of legitimate sustainable purpose-built trails. The trails as outlined in Appendix B will significantly contribute toward meeting requirements for Ride Center® status at a cost of $408,492. Additionally, actual costs for constructing trails and amenities to fully meet the Ride Center® status requirements would be $1.0 - $2.5 million dollars over the next ten years.

Tourism Benefits - Ride Center® bring economic benefits to their host communities. Given the Groveland area's proximity to major population centers it is not unreasonable to assume that the Groveland area Ride Center® could in the future, up to 80,000 – 120,000 visitors annually coming for the purpose of riding the trails. It is assumed that most of these visitors will be staying at least one night and possibly two.

IMBA Ride Center Success Stories

Park City, UT

Several years ago, IMBA was searching for the ideal location to host the organization's biannual World Summit mountain bike gathering. The winning candidate was Park City because it offered a successful local mountain bike community, diverse riding opportunities, and jaw-dropping natural beauty.

That was 2008, and since then Park City has continued expanding and improving its facilities, so much that IMBA enthusiastically awarded it the highest level of Ride Center status. How did Park City become a gold-level designation? Through a combination of community support, master planning, and detailed execution. No location better exemplifies the Ride Center ideal of offering great options for any level of rider and any style of riding. From standout beginner-to-intermediate trails to technical challenge and expert-only terrain, the options are expansive, with the trails quickly being augmented by lift-served downhill runs and community bike parks. Not surprisingly, Park City offers all the lodging and dining options you'd expect from a world-class resort. At the heart of it all, the IMBA-affiliated Mountain Trails Foundation pulls riders into a true mountain bike community and keeps them energized with new projects. It all works together at Park City and has resulted in the resort being the "gold" standard for mountain biking.

Oakridge, OR

The Oakridge Area Ride Center embodies the notion that the whole can be more than the sum of its parts. Its an incredible place to ride, not just because of the gorgeous trails but because the entire community supports the network of trails that has brought life to this community.

When logging on federal lands decreased in the 1980s, dozens of towns in Washington, Oregon, and northern California became threatened. Many are former shells of themselves, with mills shuttered and main streets vacant. Oakridge was in a similar situation but a visionary group of citizens refused to give up on their hometown and instead began to look to mountain bicycling as a niche activity to provide them a livelihood. Over many years and countless volunteer hours, the City of Oakridge has firmly established itself as a "must ride" stop for the fat-tire crowd.

With this inspiring backstory it is no surprise that Oakridge is a silver-level Ride Center. The trails range from adventurous backcountry routes to close-to-town loops, with the stunning Cascades scenery as a backdrop. Local businesses have responded by developing bike-friendly lodging, an amazing pub geared towards hungry and thirsty riders, an extensive shuttle service to deliver the goods, and world-famous races and events. With the upcoming addition of more purpose-built trails the community is well on it's way to being upgraded to gold-level Ride Center status. That Oakridge is an international destination is not an exaggeration. Every year, visitors travel from Canada, Europe, Asia, and Australia to ride the epic singletrack. The famed Mountain Bike Oregon festival continues to be a mainstay of the town, providing recreation-based employment opportunities for residents in a town that refused to accept the fate of many of its timber-dependent neighbors, resulting a rural community that is determining its own future.

3. Existing Conditions and Opportunities

A wealth of public lands and cooperative land management

Groveland is surrounded by terrain that is ideal for trail development, publicly owned and appropriately designated for a trail system. The USFS has already indicated that it fully supports this initiative to develop a recreational trail system on USFS lands and connect them to the community through its partnership with the Groveland Trail Heads and IMBA.

The project is contained in a 500-acre parcel within the Stanislaus National Forest, Groveland Ranger District's 206,688 acres. The western edge of the District begins 8 miles outside of Groveland and terminates at the western boundary of Yosemite National Park. Parts of the federally designated Tuolumne Wild and Scenic River lie within the Groveland Ranger District, and many ridges offer breathtaking views of the watershed and the high country of Yosemite. The Groveland Ranger District is interested in improving access to recreational trail systems throughout this section of the Stanislaus National Forest and this project will set a precedent for the area. The Stanislaus National Forest's hiking trails in the Groveland Ranger District are often disused and ill maintained due to the lack of resources. Working with user groups and clubs like the Groveland Trail Heads allows the Forest Service to increase the number of recreational trails in the district while delegating much of the maintenance to club volunteers

Located on a major recreation corridor

Groveland's position as a gateway to Yosemite creates a unique opportunity to capture the interest of park visitors on their way through. The stretch of Highway 120 through downtown Groveland sees, on average, 10,700 cars per day, which outnumbers the foothill areas of highways 88 (Amador County) and 4 (Calaveras County) by up to 2,500 cars per day. A top quality trail system for mountain bikes would create a significant incentive for these travelers to stop and enjoy the trails. The National Park has funding opportunities that communities like Groveland could access and use for projects like this trail development.

Community connectivity

The Big Creek Shaft Trail if completed could provide an excellent path for the Groveland community to access the trail system. Its consistent grades and scenic value create a corridor that users of all abilities and modalities can share. This also has the potential to reduce the use of automobiles for accessing the trails.

The proposed project area lies just a few miles to the east of the community of Pine Mountain Lake. The community of Pine Mountain Lake was originally planned as a vacation community but is now home to a growing number of year-round residents. The community puts an emphasis on recreation with a private lake, pool, golf course, tennis courts, equestrian stables, campground, archery and shooting ranges, and walking trails. Pine Mountain Lake attracts vacationers who enjoy outdoor recreation and a recent poll has indicated a growing desire for more trail recreation. The community of Pine Mountain Lake can easily be connected to the proposed project area via a 3-mile section of the existing and partially developed Hetch Hetchy Railroad Grade (Big Creek Shaft Trailhead). This portion of the Hetch Hetchy Railroad Grade has been the subject of discussion for development into an interpretive trail by Tuolumne County and other organizations. If developed, this trailhead would connect users via bicycle to the Western boundary of the proposed project area.

Suitable terrain

The area has excellent terrain for the construction of sustainable purpose-built mountain bicycle trails. The topography of the proposed project area is varied and has a great mix of Conifer and Oak trees along with more open sections with Manzanita and Buck Brush. Wildflowers are abundant in the spring and can be seen from the main ridge and from several hilltops. There are beautiful views of mountain peaks, high ridges, and the Tuolumne River watershed. Views of Yosemite/Hetch Hetchy, Groveland, and Pine Mountain Lake are spectacular. There are plenty of shaded areas to stay cool during hot weather, and open sections to stay warm during cold weather. The elevation sits between 2,500 and 3,200 feet and remains relatively snow-free during the coldest winter months making it a perfect place for year-round use. The undulating terrain provides conditions well-suited for trail work and minimal maintenance if trails are carefully planned and well constructed.

Good paved road access

The project area is easily accessed via paved roads. Visitors can access either of the proposed trailheads via one of the two major transportation corridors: Highway 120 or Ferretti Road. Highway 120 has a wide shoulder, which makes it feasible for users to ride from town to the trailhead. Lightly traveled Ferretti Road also serves as the primary access to the community of Pine Mountain Lake and to the Tuolumne River.

Events

Events are excellent tools for attracting visitors and showcasing a destination. The trail system as planned would be an excellent venue for new events such as mountain bike races or festivals. Its' proximity to Groveland makes it well suited as an event focal point.

Good Weather

Groveland enjoys all four seasons. The climate is generally Mediterranean, with a mild Spring and Autumn, occasional snow in the Winter, and a warm, dry Summer. With 300+ days of sunshine, Groveland an attractive place to ride during all four seasons.

Wildfire management

Arid Summers and years of fire suppression has left over grown vegetation that can create very hazardous fire conditions. As a result of

disastrous wildfires in the past, the USFS maintains fire-lines within the project area by keeping brush such as manzanita cut low. The cutting of these corridors, if executed with trails in mind, could make trail development easier and less expensive. These trail corridors could provide additional protection from spreading wildfires.

Potential Conflict

There is occasional conflict between different user groups, most often because the current trails were not developed as recreational trails. In addition, there is also more demand for trail opportunities than currently exist which can lead to further disagreement. Building a modern trail system can alleviate these issues. Following are examples of potential conflicts within the Groveland project area, along with proposed solutions to those conflicts:

Potential Conflicts

1.The proposed area includes some dirt Forest Service roads that are currently illegally used by off-road vehicles. The proposed area's dirt Forest Service roads will need to be closed to recreational off road vehicle use to ensure the safety of the trail users.

2.The proposed area includes multi-use Forest Service roads currently used by equestrians. Existing roads and trails that are open for equestrian use will remain open to this user group.

Proposed Solutions To Conflicts

1. The Groveland Ranger District is currently developing an Off Highway Vehicle Area on existing Forest Service roads (unpaved) so Off Highway Vehicle use will be diverted where there will be an abundance of dirt roads for the Off Highway Vehicle user group.

2. All multi-use trails and dirt Forest Service roads will remain multi-use and equestrians will be able to continue to enjoy the places they currently ride. The Groveland Trail Heads are reaching out to the equestrian community and working to develop a mutually respectful relationship. Having a mountain biking specific trail system in place will reduce the frequency of equestrian and mountain bike encounters.

Strong Partnerships and funding potential

Communities have historically shown that strong partnerships can create powerful results. The partnership between the Groveland Trail Heads and the Groveland Ranger District of the SNF is an excellent example. These partnerships can also become the seed for generating project funding. Potential partners for the development of this trails concept include:

- Stanislaus National Forest, Groveland Ranger District
- Tuolumne County Transportation Council
- United States Fish & Wildlife Service
- Bureau of Land Management
- International Mountain Bicycling Association (IMBA)
- Highway 120 (Yosemite) Chamber of Commerce
- Groveland Area Partners (GAP)
- California Department of Transportation
- Pine Mountain Lake Homeowners Association
- City/County of San Francisco
- Evergreen Lodge
- Tuolumne County Visitors Bureau
- Tuolumne County Economic Development Authority

4. Proposed Trail Concept for the Planning Area

The following are guidelines for the construction and maintenance of existing and future trails. The natural environment is dynamic and unpredictable. The nature of recreational trails and roads, the desired user experience, and the constant forces acting on natural surface trails and roads make strict standards untenable and undesirable. As such, the guidelines below are simply that: best management practices that should be followed within environmental constraints.

Develop Sustainable Trails

A sustainable trail balances many elements. It has little impact on the environment, resists erosion through proper design, construction, and maintenance, and blends with the surrounding area. A sustainable trail also appeals to and serves a variety of users, adding an important element of recreation to the community. It is designed to provide enjoyable and challenging experiences for visitors by managing their expectations and their use effectively. Following sustainable trail design and construction guidelines allows for high-quality trail and education experiences for

users while protecting the land's sensitive resources. For additional trail design, construction, and maintenance techniques, refer to *Trail Solutions: IMBA's Guide to Building Sweet Singletrack*. These guidelines are appropriate for any hike, bike, or equestrian trail.

Market Segmentation and Corresponding Mountain Bicycle Trail Types

In the years since the late-1970s when the first mountain bicycles were put to use the market has matured and diversified. A well thought out and executed conceptual plan creates potential for these diversified user bases to successfully coexist. The Groveland area has potential for trails that cater to all of the following riding styles and bicycles that currently exist:

Cross-country (Traditional)
Characterized by the lightest-possible bicycles with a focus on pedaling efficiency over comfort or control, XC riding is primarily the domain of racers who compete on less-technical trails and for whom physical fitness is more important than riding skill. Prefers narrower traditional singletrack trail that is often multi-use.

Trail (Traditional & Flow)
Utilizing bikes with increasing amounts of front and rear suspension (4" – 5"), pedaling efficiency is marginally sacrificed for more stability and comfort. Riders in this category frequently endeavor themselves to long backcountry rides where solitude, challenge, and self-sufficiency are key. Prefers narrower traditional singletrack trail that is often multi-use but is not averse to purpose-built MTB trails.

All Mountain/Enduro (Flow)
Typically sporting between 5" – 7" of suspension travel in both the front and the rear of the bicycle, the AM category rider prizes descending but expects to use his or her own power to gain all or some of the necessary elevation. The trails most frequently used by AM bicyclists include both multi-use trails and bike-specific trails that optimize the fun and efficiency of a bicycle, particularly the undulating feel of a serpentine trail. This is currently the largest portion of the mountain bicycle market by volume of sales.

Skill level

In order for this trail system to provide the varied riding experiences and skill progression which mountain bikers seek, the trails must be built to provide relatively specific challenges & riding characteristics. The trails outlined in this concept have been given a target skill level that will help to guide the construction of these features.

The ridership within each category can be divided into the following groups: beginner, intermediate, advanced/expert. Using a basic bell curve distribution it can

be assumed the majority of mountain bicyclists in any category and as a whole are intermediate riders.

The Groveland trail system should utilize a consistent rating system. This will provide for a safer and more predictable experience for users. The Trail Difficulty Rating System is a basic method used to categorize the relative technical difficulty of recreation trails and should for the basis for a rating system in Groveland.

The Trail Difficulty Rating System can:
- Help trail users make informed decisions
- Encourage visitors to use trails that match their skill level
- Manage risk and minimize injuries
- Improve the outdoor experience for a wide variety of visitors
- Aid in the planning of trails and trail systems

This system was adapted from the International Trail Marking System used at ski areas throughout the world. Many trail networks use this type of system, most notably resort-based mountain biking trail networks. The system applies to mountain bikers best, and is also applicable to other visitors such as hikers and equestrians. These ratings should be posted on trail signage and in all maps and descriptions. Following is a summary of criteria to be considered when implementing a trail rating system.

Tread Width
The average width of the active tread or beaten path of the trail.

Tread Surface
The material and stability of the tread surface is a determining factor in the difficulty of travel on the trail. Some descriptive terms include: hardened (paved or surfaced), firm, stable, variable, widely variable, loose, and unpredictable.

Trail Grade (maximum and average)
Maximum grade is defined as the steepest section of trail that is more than approximately 10 feet in length and is measured in percent with a clinometer. Average grade is the steepness of the trail over its entire length. Average grade can be calculated by taking the total elevation gain of the trail, divided by the total distance, multiplied by 100 to equal a percent grade.

Natural Obstacles and Technical Trail Features
Objects that add challenge by impeding travel. Examples include: rocks, roots, logs, holes, ledges, drop-offs, etc. The height of each obstacle is measured from the tread surface to the top of the obstacle. If the obstacle is uneven in height, measure to the point over which it is most easily ridden.

Technical Trail Features are objects that have been introduced to the trail to add technical challenge. Examples include: rocks, logs, elevated bridges, teeter-totters, jumps, drop-offs, etc. Both the height and the width of the technical trail feature are measured.

After evaluating the above criteria the Trail Rating Guidelines below can be used to determine the correct difficulty level for each trail.

IMBA Trail Difficulty Rating System

	EASIEST WHITE CIRCLE	EASY GREEN CIRCLE	MORE DIFFICULT BLUE SQUARE	VERY DIFFICULT BLACK DIAMOND	EXTREMELY DIFFICULT DBL. BLACK DIAMOND
TRAIL WIDTH	72" (1,800 mm) or more	36" (900 mm) or more	24" (600 mm) or more	12" (300 mm) or more	6" (150 mm) or more
TREAD SURFACE	Hardened or surfaced	Firm and stable	Mostly stable with some variability	Widely variable	Widely variable and unpredictable
AVERAGE TRAIL GRADE	Less than 5%	5% or less	10% or less	15% or less	20% or more
MAXIMUM TRAIL GRADE	Max 10%	Max 15%	Max 15% or greater	Max 15% or greater	Max 15% or greater
NATURAL OBSTACLES AND TECHNICAL TRAIL FEATURES (TTF)	None	Unavoidable obstacles 2" (50 mm) tall or less Avoidable obstacles may be present Unavoidable bridges 36" (900 mm) or wider	Unavoidable obstacles 8" (200 mm) tall or less Avoidable obstacles may be present Unavoidable bridges 24" (600 mm) or wider TTF's 24" (600 mm) high or less, width of deck is greater than 1/2 the height	Unavoidable obstacles 15" (380 mm) tall or less Avoidable obstacles may be present May include loose rocks Unavoidable bridges 24" (600 mm) or wider TTF's 48" (1,200 mm) high or less, width of deck is less than 1/2 the height Short sections may exceed criteria	Unavoidable obstacles 15" (380 mm) tall or less Avoidable obstacles may be present May include loose rocks Unavoidable bridges 24" (600 mm) or narrower TTF's 48" (1,200 mm) high or greater, width of deck is unpredictable Many sections may exceed criteria

1. Rate Technical Challenge Only

The system focuses on rating the technical challenge of trails, not the physical exertion. It is not practical to rate both types of difficulty with one system. Consider,

for example, a smooth, wide trail that is 20 miles long. The technical challenge of this trail is easy, yet the distance would make the physical exertion difficult. The solution is to independently rate technical challenge, and indicate physical exertion by posting trail length, and possibly even elevation change.

2. Collect Trail Measurements
Use the accompanying table and collect trail measurements for each criterion. There is no prescribed method for tallying a "score" for each trail. Evaluate the trail against the table and combine with judgment to reach the final rating. It is unlikely that any particular trail will measure at the same difficulty level for every criterion. For example, a certain trail may rate as a green circle in three criteria, but a blue square in two different criteria.

3. Include Difficulty and Trail Length on Signs and Maps
Trail length is not a criterion of the system. Instead, trail length should be posted on signs in addition to the difficulty symbol. A sign displaying both length and difficulty provides lots of information, yet it is simple to create and easy to understand.

Likewise, elevation change is not a criterion. The amount of climbing on a trail is more an indicator of physical exertion than technical difficulty. Mountainous regions may consider including the amount of climbing on trail signs.

4. Evaluate Difficulty Relative to Local Trails
Trails should be rated relative to other trails in the region. Don't evaluate each trail in isolation. Consider all the trails in a region and how they compare to one another. This will help you rank the relative difficulty of each trail and will help trail users select an appropriate route. Trails will rate differently from region to region. A black diamond trail in one region may rate as a blue square in another region, but the ratings should be consistent locally.

5. Use Good Judgment
Rating a trail is not 100 percent objective. It's best to combine tangible data with subjective judgment to reach the final rating. For example, a trail may have a wide range of tread surfaces—most of the trail is easy, but some sections are more difficult. How would you rate it? Use your personal experience to consider all elements and select a rating that best matches the style of trail.

6. Consider Other Trail Qualities
Don't forget to consider trail qualities beyond the objective criteria. A wide variety of features could contribute to a trail's difficulty. For example, exposure—the feeling of empty space next to and below the trail tread—provides an added psychological challenge beyond the steepness or roughness of the trail. A three-inch rock seems like a boulder when a 50-foot drop looms on your side! Other qualities to think about are corridor clearance and turn radius.

7. Use Common Sense and Seek Input
No rating system can be totally objective or valid for every situation. This system is a tool to be combined with common sense. Look at trails with a discerning eye, and seek input from trail users before selecting the rating.

A diverse trail network with a variety of trail styles is a great way to ensure happy visitors. Provide both easy and difficult trails to spread visitors and meet a range of needs. By indicating the length and difficulty of trails with a clear signage system, visitors will be able to locate their preferred type of trail easily.

Trail System Summary

In this concept plan, the trail system is envisioned as a compact network of purpose-built singletrack trails. These trails will radiate from main access points that will be developed as trailheads with parking areas and connect to the community via the Big Shaft Creek Trail, Ferretti Road and State Route 120. The planning area is currently enjoyed by mountain bikers, hikers, and equestrians. The conceptual trail plan as illustrated in this document provides the trails that MTB users desire, while also protecting existing hiking and equestrian opportunities. Through good sight lines and appropriate signage the potential for conflict between user groups can be greatly reduced.

The trail system is planned to encourage users to ride or walk the trails in a counter-clockwise direction. This results in equestrians primarily sharing trails with MTB users when they are climbing and therefore traveling slower. Many of the planned trails are traditional singletrack that can be shared between MTB users and hikers. This includes a loop trail that circles much of the planning area. MTB only Flow trails descend from the top of the ridgeline at the center of the site. These trails use gravity to provide a swooping and exhilarating experience that all riders enjoy.

The Groveland system has one main trailhead that is approved for development. The trailhead is located just off Feretti Road on the north side of the project area and will be the primary access point. In the future, as the trail usage grows, it is recommended that an additional trailhead be developed on the western side of the project area.

Refer to the Conceptual Trail Plan Maps and Trail Index for additional details about the planned routes.

5. Next Steps

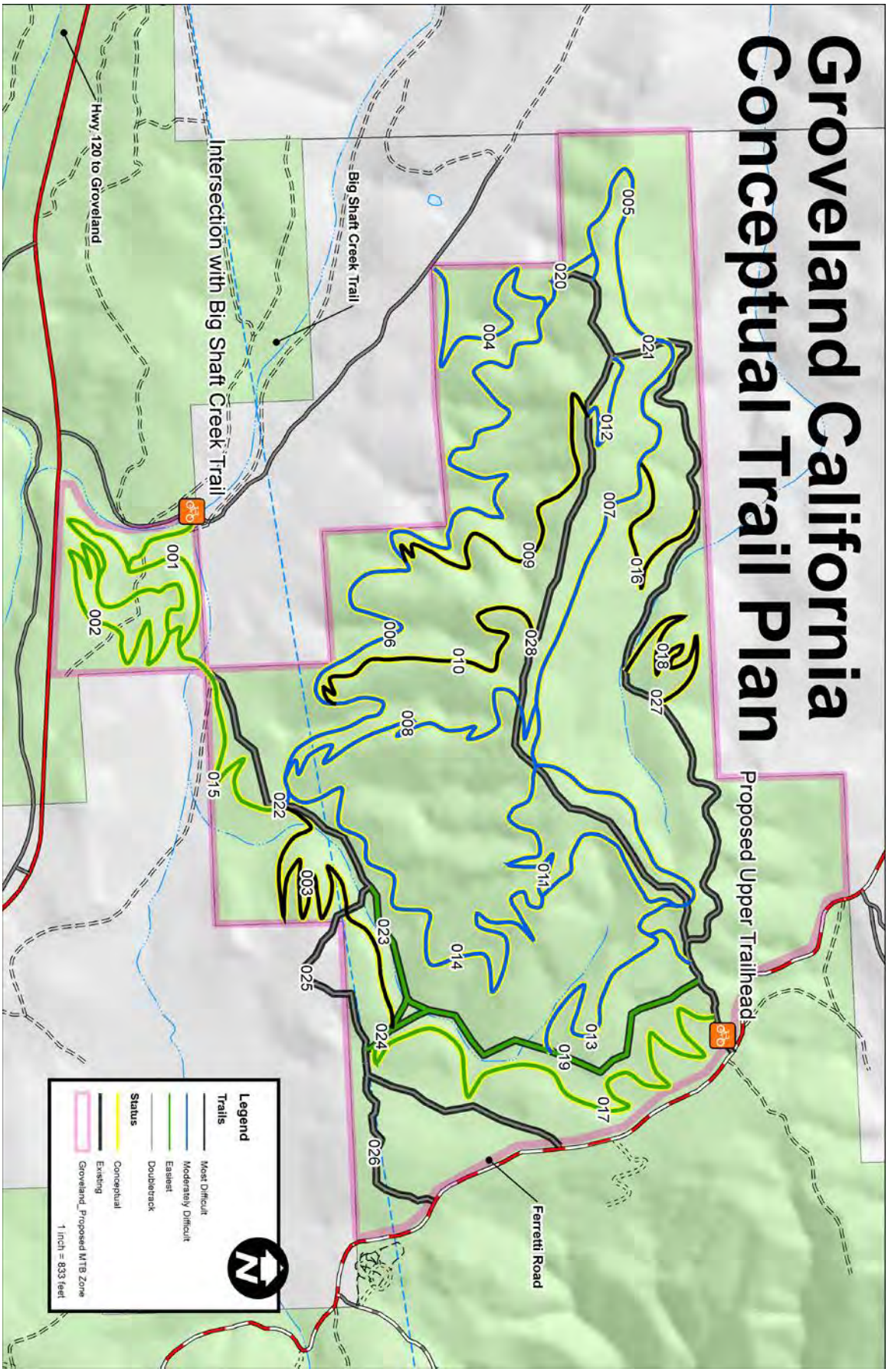
The most important step is to specify exact access points, trailheads, parking hubs, and other points of interest. The USFS will need time to go through the planning and contracting process to have appropriate parking and/or trailhead facilities built. Completion of the Big Creek Shaft Trail would provide valuable connectivity to the community as well as a "family" trail experience.

Once these *hubs* are pinpointed, trail corridor design begins, typically by mapping, collecting GPS data points, and finally flagging potential corridors deemed acceptable by the land manager. In the case of USFS lands, any new trail development will undergo National Environmental Policy Act review, and a series of walk-throughs to justify the layout.

It is optimal to flag the corridors just before the review team is available to physically tour the flag-line, so as not to lose flags from sunlight, wind, animal, human, and natural elements. Design and flagging costs will depend on conditions, accessibility, terrain, time of year, and other factors. A 5– 10 mile initial trail clearance goal is a good target for the first season of trail design and construction.

The synergy of creating traditional destination-worthy mountain bike singletrack trail combined with enticing MTB specific flow trails, will guarantee a unique destination, drawing riders from afar while giving local families and residents an exhilarating outdoor activity close to home. Groveland has limited existing singletrack trails. This allows for a fresh start and, if well planned, the opportunity to create an ideal mountain biking destination. For the short term, some double track roads and routes may be included in the overall design to reach more trail mileage and provide easy trail access.

Appendix A: Map of Planning Area



Appendix B: Conceptual Trails Index

This data has also been shared with the Groveland Trail Heads and the USFS as a Geographic Information System (GIS) database. This data can be accessed using software that is widely available.

Route ID	Skill Level	Trail Type	User Type	Status	Action	Length Feet	Length Miles	Per Foot	Estimated Cost
001	Green	Traditional	Multi-Use	Conceptual	Construct	2877	0.5	$4	$11,506
002	Green	Traditional	MTB	Conceptual	Construct	7578	1.4	$4	$30,312
003	Black	Traditional	Multi-Use	Conceptual	Construct	6077	1.2	$4	$24,307
004	Blue	Traditional	MTB	Conceptual	Construct	3438	0.7	$4	$13,751
005	Blue	Traditional	MTB	Conceptual	Construct	3351	0.6	$4	$13,405
006	Blue	Traditional	MTB	Conceptual	Construct	11567	2.2	$4	$46,269
007	Blue	Flow	MTB	Conceptual	Construct	5756	1.1	$6	$34,537
008	Blue	Flow	MTB	Conceptual	Construct	4289	0.8	$6	$25,733
009	Black	Flow	MTB	Conceptual	Construct	4367	0.8	$6	$26,202
010	Black	Flow	MTB	Conceptual	Construct	3874	0.7	$6	$23,242
011	Blue	Traditional	MTB	Conceptual	Construct	8416	1.6	$4	$33,662
012	Blue	Traditional	MTB	Conceptual	Construct	1523	0.3	$4	$6,094
013	Blue	Traditional	MTB	Conceptual	Construct	2883	0.5	$4	$11,533
014	Blue	Traditional	MTB	Conceptual	Construct	6716	1.3	$4	$26,866
015	Green	Traditional	MTB	Conceptual	Construct	2638	0.5	$4	$10,552
016	Black	Flow	MTB	Conceptual	Construct	2453	0.5	$6	$14,717
017	Green	Flow	MTB	Conceptual	Construct	6939	1.3	$6	$41,632
018	Black	Traditional	Multi-Use	Conceptual	Construct	3543	0.7	$4	$14,173
019	Green	Traditional	Multi-Use	Existing	Maintain	4340	0.8	$0	$0
020	NA	Doubletrack	MTB	Existing	Abandon	425	0.1	$0	$0
021	NA	Doubletrack	Multi-Use	Existing	Maintain	838	0.2	$0	$0
022	NA	Doubletrack	Multi-Use	Existing	Maintain	3031	0.6	$0	$0
023	Green	Traditional	Multi-Use	Existing	Maintain	1239	0.2	$0	$0
024	Green	Doubletrack	Multi-Use	Existing	Maintain	717	0.1	$0	$0
025	NA	Doubletrack	Multi-Use	Existing	Maintain	4830	0.9	$0	$0

026	NA	Doubletrack	Multi-Use	Existing	Maintain	1857	0.4	$0	$0
027	NA	Doubletrack	Multi-Use	Existing	Maintain	9070	1.7	$0	$0
028	NA	Doubletrack	Multi-Use	Existing	Maintain	8104	1.5	$0	$0
						Total Miles	23	Total Cost	$408,492

Appendix C: About IMBA

About IMBA and it's partnership with the U.S. Forest Service and the Groveland Trail Heads organization

The International Mountain Bicycling Association (IMBA) is a 501(c)(3) non-profit educational association whose mission is to create, enhance, and preserve great mountain bicycling experiences. Since 1988, IMBA has been bringing out the best in conservation-minded mountain bicyclists by encouraging low-impact riding, volunteer trail work participation, cooperation among different trail user groups, grassroots advocacy, and innovative trail management solutions.

Based in Boulder, CO, and with staff distributed across the country and the world, IMBA works to meet many of its goals through technical assistance programs, notably the Trail Care Crew (TCC) and Trail Solutions (TS) consulting teams.

IMBA has a strong history of working with the United States Forest Service (FS), including a national-level Memorandum Of Understanding (06-SU-11132424-076) that encourages:

- The FS and IMBA seek to work cooperatively to encourage responsible use of federal lands by visitors participating in mountain bicycling and recreational activities. The FS and IMBA have an interest in disseminating information to the public regarding conservation, recreation, and natural resource activities related to mountain bicycling.

- The FS, IMBA and its affiliates to identify appropriate cooperative opportunities (such as trail projects, administrative studies, educational programs, tourism initiatives, and special events). Contingent upon availability of funds and personnel, jointly pursue these projects in conjunction with the mountain bicycling community and FS Ranger Districts nationwide.

- Sharing the technical expertise between the FS, IMBA and its affiliates in developing FS educational programs related to mountain bicycling.

- Participation in projects that develop mountain bicycling opportunities on NFS lands, within the budget and resource capabilities of local FS staff.

- Work between IMBA and local FS staff to identify opportunities and areas for

specialized mountain bicycling in accordance with special use permit requirements and other applicable legal requirements. Identify opportunities to promote the public health and fitness benefits of mountain bicycling. The commitment of both parties in realizing the mutual benefits of this national agreement, are inherent to this project and the suite of outcomes will further demonstrate this ongoing partnership.

The Groveland Trail Heads is an IMBA Chapter, whose mission is to create, enhance and preserve great trail experiences for mountain bikers while promoting the local commerce and community of Groveland, California. The Groveland Trail Heads seek to preserve, protect and promote mountain bike access to diverse and sustainable riding opportunities throughout Tuolomne County's public and private lands. Since 2013, the Groveland Trail Heads have been working with the support of the Forest Service at the Groveland Ranger District to facilitate the design, building, and maintenance of a multi-use trail system with an emphasis on mountain biking. The Groveland Trail Heads is a non-profit organization made up of community members whose ultimate goal is to provide world-class mountain biking trails as well as trails for all user groups in order to improve the year-round economic potential of the city. The Groveland Trail Heads' established partnerships with the United States Forest Service, Stanislaus National Forest, Groveland Ranger District and other landowners in the area are an important part of the successful execution of this plan.