JERICHO MOUNTAIN STATE PARK

Riding Area Master Trail Development Plan

February 2007

Prepared For:

NH Division of Parks and Recreation
Bureau of Trails
172 Pembroke Road
Concord, NH 03302

Prepared By:

Horizons Engineering, PLLC
34 School Street
Littleton, NH 03561

JERICHO MOUNTAIN STATE PARK
RIDING AREA MASTER TRAIL DEVELOPMENT PLAN
FOR THE
NEW HAMPSHIRE DIVISION OF PARKS AND RECREATION
BUREAU OF TRAILS

CONCORD, NEW HAMPSHIRE

FEBRUARY 2007

34 School Street
Littleton, NH 03561
Phone 603.444.4111
Fax 603.444.1343
Email @horizonsengineering.com

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

I. EXECUTIVE SUMMARY

A. Introduction

In 2006, the New Hampshire Department of Resources and Economic Development (DRED) purchased approximately 7,200 acres of land within the city limits of Berlin from The Dillon Company for the purpose of creating a high quality, OHRV riding area. The land acquired is in two parcels; one east of State Highway 110 which is referred in this master plan as the Head Pond Area and the other to the west of Route 110, referred to as the Jericho Lake Area.

In 2007, the Department also expects to receive a donation of an additional approximate 300 acres of prime recreation land from the City of Berlin in an area that has been used as a public recreation area since the 1970's at Jericho Lake. This section of land is considered to be critical to the future development of the riding area as it is in a prime location to become the hub or core of the future ATV Park.

Prior to these acquisitions by the State, a strategic plan was commissioned by the DRED to evaluate the need for additional OHRV trails within the State. The study was undertaken by Woodlot Alternatives of Topsham, Maine. The study evaluated recent trends in sales of OHRVs and registrations within the State as well as conditions of present and future supply and demand for trails and riding areas. The results of that study contributed to the impetus to acquire the lands noted above as well as the following observations and recommendations noted in their report:

- In order to keep pace with the rise in OHRV sales and registrations, the State will need to develop nearly 350 miles of new trails over a five year period.
- Given increased demand for OHRV trails and the sensitivity of private land owners to intensive use of their land, the report recommended that the State acquire, develop, and manage land for a comprehensive public riding area. The report recommended improved communication with private land owners as well as a high degree of rider education in order to optimize the opportunities for continued expansion of trails on private land.
- The report recommended that once the State acquired the appropriate parcel(s) of land that a riding area master plan be undertaken to provide a comprehensive plan to develop a new public OHRV riding area.

In August 2006 DRED awarded the contract for the riding area master plan to Horizons Engineering, PLLC of Littleton, New Hampshire. Horizons Engineering collaborated with Mr. Ted Burns, trail master of the North Country ATV Club in Stratford, to round out the team.

The planning team set out to create the master plan for what may be the largest and most comprehensive public OHRV trail system in the country. The guiding principles for the master plan are summarized below:

- The overall goal is to provide an all-inclusive, user-friendly facility that will attract OHRV enthusiasts from within New Hampshire as well as from out of State.
- Although the Park is primarily planned as an ATV park, trails and facilities will be designed for many different users, motorized and non-motorized, as well as individuals and families, leisure and aggressive riders, and day and overnight visitors.
- High quality overnight camping facilities will provide an opportunity for visitors to extend their stay in the area while exposing them to the natural beauty of the Jericho Lake site.
- Partnerships with local, state and federal agencies as well as private entities will be established to ensure that future planning and development efforts will be dedicated to preserving the natural resources in the Park for future generations.
- The Park will become the hub of North Country OHRV activity. As such, it will have widespread economic benefits to the local and regional economies.

While the name of the Park has not officially been designated, the name Jericho Mountain State Park has been suggested and will be presented to the State Legislature for approval in the near future. As such, the Park will be referred to as Jericho Mountain State Park in this report.

In August 2006 the Bureau of Trails, with the help of volunteers from the Androscoggin Valley ATV Club, opened approximately fourteen miles of OHRV trails at the new Jericho Mountain State Park facility. The majority of the new trails were established on existing gravel logging roads.

Also in August 2006, the State entered into a Memorandum of Agreement for Trail Monitoring and Maintenance with the Androscoggin Valley ATV Club (The Club) whereby The Club will act as the host club for the Park.

B. The ATV Park Master Plan

1. The Trail System Master Plan

The full build out of the trail system is approximately 136 miles of trails, including the 9 miles of trails outside the Park boundaries with easements currently in place, a 1 mile Junior ATV trail, 4.5 miles of 4 X 4 trail, and 5 miles of mountain bike/ATV trail.

Trails are designed and categorized by level of difficulty with green being easiest and black most difficult. Of the 136 miles of ATV trails, the distribution of difficulty levels is:

Green trails	20%
Blue trails	70%
Black trails	10%

Comfortable carrying capacity (CCC) calculations have been determined for the trail system itself as well as for the park as a whole. Trail density assumptions are applied to the mileage of trails within each level of difficulty to determine the comfortable carrying capacity of the trail system.

- Total trail system CCC 429 ATVs (active riders only)
- Total Park CCC 536 ATVs (includes active and inactive riders)
- Total Park, Peak Day 670 ATVs (accounts for occasional peak days when CCC may be exceeded by as much as 25%)
- Total Park, Peak Day Visitors 720 People (peak days may have 670 ATVers and +/- 50 non-ATV visitors)

There will be a variety of special use trails, including:

- A Jeep/4 wheel drive loop (that may be used by ATVs too)
- Gravel pits
- Junior trail (limited to 90 CC ATVs or trail bikes)
- Educational/training area
- Mountain biking (non-motorized with access to National Forest land)

2. The Campground Master Plan

The master plan identifies a campground development concept that is intended to satisfy a wide range of user preferences for a quality outdoor experience. United States Forest Service guidelines for camp site development are recommended for building and maintaining the camp sites.

The following types of sites have been planned in proximity to the lake and the core area of the Park:

26	Remote sites with limited access
81	RV sites with water and electric hookups
93	Tent/Pop-up trailer/Truck camper sites
200	Total sites

3. Core Area Facilities

Jericho Mountain State Park is more than simply an ATV trail system and more than a State camp ground, it is an integrated recreation complex with a focus on the lake, the trail system, the camping and family recreation opportunities, and to serve as the hub for access to other North Country attractions. The core area of the Park will be the hub of visitor activity.

Facilities that will be in the core include:

- ATV rider and visitor services
  - Parking areas
  - Lake Jericho beach, picnic, and pavilion areas
  - Event area and mud pit
  - Boat ramp
  - General store
  - Public washrooms with showers
  - Park maintenance and administration building with visitor welcome center and education/training facilities
  - ATV wash station
  - RV waste disposal station

C. Capital Costs and Phasing

1. Opinions of Cost

Engineering opinions of cost were prepared for each of the proposed items associated with the development of Jericho Mountain State Park. The opinions of cost are represented in today's dollars, and a 15% contingency was built into each category in an attempt to account for unanticipated site and economic conditions at the time of construction. The opinions of cost are intended to be used for planning purposes and do not represent actual quotes from vendors and/or contractors. Also, these costs assume that contracted labor and materials are used for construction of the entire facility, including the trail network.

The opinions of cost are summarized as follows:

Item	**Opinion of Cost for Construction (rounded)**
Site Work	$1,212,000
Utilities	$636,000
Buildings	$1,994,000
Camp Sites	$1,026,000
Miscellaneous	$668,000
Trails	$1,127,000
TOTAL OPINION OF COST	**$6,663,000**

2. Construction Phasing

Due to the significant size and cost of the overall project, it would not be practical to construct all aspects of the project during one construction season. Therefore, a five-year phasing plan was developed. This plan focuses on construction of the primary attractions to the Park early in the process. Other amenities that add to the experience of the facility but that are considered lesser priorities are proposed later in the construction schedule. In addition, focusing on the trail and campground construction first allows park revenue to be maximized through the build-out process.

Year 1

Approximately 55 miles of new trails will be added to the existing 15 miles, comprised of 33 miles of Blue Trail, 4.6 miles of mountain bike trail, 2.8 miles of new Black Trail, and upgrade approximately 15 miles of existing logging road to Green Trail.

Total Opinion of Cost Year 1 (rounded) - $423,000

Year 2

Remaining Black Trails and Blue Trails	$622,000
All campground roads and parking	$1,212,000
Water System and Core Area wastewater system and electrical service	$636,000
Gate House, and Core Area restroom buildings	$252,000
Approximately 26 remote campsites 47 tent/pop-up camper sites, and approximately 40 RV sites	$568,000

Total Opinion of Cost Year 2 (rounded) - $3,290,000

Year 3

Administration Building, store, pavilions, and additional restroom buildings	$1,742,000
Remaining 47 proposed tent/ pop-up camper sites	$123,000
ATV Wash	$316,000

Total Opinion of Cost Year 3 (rounded) - $2,181,000

Year 4

Complete RV campsites	$335,000

Total Opinion of Cost Year 4 (rounded) - $335,000

Year 5	
Beach Improvements	$37,000
Playgrounds	$122,000
Event Area and Mud Pit	$192,000
Trailside Rest Areas	$81,200

Total Opinion of Cost Year 5 (rounded) - $436,000

D. Economic Models

1. Model Assumptions

In order to assess the financial viability of the proposed Park facility, conceptual operating income and expense models were prepared based on potential revenue streams associated with the proposed Park, and estimated expenses associated with the operation and maintenance of the core area and trail system. The models assume that all construction costs will be directly allocated to the Park in the form of commercial or similar financing, and that the Park operations will be solely responsible for service on this debt. This may not, however, be the actual method of financing and repayment of debt. In fact, given the burden that repayment of principal and interest will place on the Park operation, it is likely that other sources of funding for construction of the Park will need to be established.

The annual revenue – expense models were constructed using anticipated revenue and expense criteria. The models were constructed using existing financial information from Pawtuckaway State Park as a basis.

2. Model Results

Model results indicate that both the Park and trail network will experience an operating loss during the construction phase. This is entirely the result of the high capital costs required early on in the phased construction program, and low revenue generation during the same period. The year 6-10 year model, which is considered to represent the operation of the Park following full build-out, also indicates an annual operating loss. This loss is solely a result of the inclusion of construction financing costs in the operating budget.

It is notable that the model indicates that the Park and trail network overall experience a net profit for Year 4, Year 5, and Years 6-10 and beyond if interest expense and capital amortization are not considered.

3. Financial Conclusions

Model results indicate that, while the Park operation would result in a net annual loss, this loss is solely the result of the cost of constructing the facility. Other conclusions from the models are as follows:

- The operation of the campground is clearly the primary revenue generator for the facility. Therefore, operational efforts for the core area should focus on maintaining a high occupancy rate in the campground.
- The facility fee represents a moderate proportion of the overall revenue for the Park. As it may be difficult to enforce this fee for those entering the park in areas other than the main entrance, additional consideration of the merit of this fee should be made to determine how this fee should be imposed.
- The store, ATV wash, and several minor amenities proposed for the core area are shown in the model as being either only slightly profitable or a net operating loss. As these features are important to the overall appeal of the Park, they should remain as part of the development plan.
- It appears that 4x4 truck access to the Park would result in a significant revenue source that can be directly allocated to the trail network. As this type of activity requires only a relatively small trail network compared to ATVs, the direct cost associated with 4x4 use would be relatively small, resulting in a relatively high profit margin for this activity.
- Volunteer labor and other funding sources for the construction and maintenance of the trail network could make a substantial difference in the operational budget of the facility. If the volunteer effort is high enough, it may be possible for the trail network to act as an overall revenue source for the Park, instead of the loss indicated by the financial models.

4. Regional Economic Benefit

Park visitors will provide a significant economic benefit to the surrounding region in the form of secondary economic benefits. According to a 2004 study of the impact of ATV and trail bike spending in New Hampshire completed by Plymouth State University, the induced (secondary) spending by ATV recreation in the State resulted in an additional $1.57 generated for every $1.00 of direct spending by ATV enthusiasts within the Park. The annual gross revenue for Jericho Mountain State Park at full build-out is approximately $889,000. Assuming direct spending is limited to revenue at the Park, the region would gain approximately an additional $1,396,000 annually in secondary economic benefit as a result of the Park operations.

Job creation is another aspect of the regional economic benefit that will result from the construction and operation of the Park. Not including jobs created during construction of the Park, for each job created in the Park operation another 1.7 jobs will be created in the region as a result of indirect and induced spending at businesses outside the Park. During the peak summer months there will be approximately 20 full-time equivalent jobs at the Park (in the core and on the trails). This will result in the creation of an additional approximately 34 full-time jobs throughout the region.

E. Review of Current Process for Development of ATV Trails on Public Lands

As the land is, or will soon be, owned by the State of New Hampshire all proposed ATV trails must meet the criteria set forth in New Hampshire Statute 215-A and specifically Sections 215-A:41-43. Section 215-A:42 of the Statute identifies the conditions required for a state-owned property to establish ATV trails which include meeting the coarse and fine filter criteria found in Section 215-A:43.

Based on information provided by the DRED, the Jericho Mountain State Park land currently meets the coarse filter criteria. Therefore, the consultant team has evaluated the conditions whereby the proposed trail development plan may or may not meet the 29 items which comprise the fine filter criteria set forth by Statute 215-A:43 II.
As far as the Phase I trail plan is concerned, the proposed addition of approximately 55 miles of new trails, scheduled for construction in 2007, will require field verification of the trail layout in order to assure compliance with the fine filter criteria. It is possible that the placement and configuration of some of the proposed new trails shown on the maps in this report will require adjustment. It is also possible that construction of some of the Phase I trails may need to be deferred pending the outcome of discussions concerning modifications of items in Statute Section 215-A:43.

There are several areas where some of the proposed full build-out trails cannot be constructed given the current Statutes. There are a number of instances where the criteria in the Statutes are more rigorous and stringent than the standards established by State regulatory agencies such as the Department of Environmental Services. The consultant team finds it hard to understand why the creation of ATV trails and a State Park should be subjected to a higher standard of environmental criteria than other projects throughout the State.

The criteria were initially developed by the land management agencies in State government to call for full input of concerns when developing ATV trails on State lands. The original intent of the criteria was to provide a base set of guidelines to follow when looking at trails development, with the flexibility for case by case variations. The criteria were not intended to be incorporated into statute and to be concrete parameters, as such all flexibility to use land contours and updated science on erosion control measures and trail construction cannot be addressed.

To allow for the best possible use of land, trail layout and feasibility of the Park's success we recommend revisiting the criteria as policy rather than statute, with case by case variances to be reviewed by the appropriate regulatory agency for final decisions. This recommendation was also made by Woodlot Alternatives in their Statewide Trails Development plan for ATV trails in NH, in 2003.

Specific items in the Statutes need to be revised so as not to hinder the success of the Park. In the opinion of the consultant team, a decrease in the mileage of trails proposed in this master plan will have a significant negative impact on the ability of the Park to attract ATV enthusiasts. It would also negatively impact the financial viability of the Park, particularly its ability to be self-supporting, as well as the ensuing economic benefits for the region.

F. Strategic Acquisitions

Due to the projected growth of ATV recreation in New Hampshire, it appears that the demand for trails in the Berlin area will eventually exceed the capacity of the Jericho Mountain State Park trail network as it is currently proposed. Additional land and trail easement acquisitions should therefore be considered a critical part of the overall master plan for Jericho Mountain State Park.

II. EXISTING CONDITIONS

A. The Physical Characteristics of the Site

1. Location and Site Character

Jericho Mountain State Park consists of two large parcels of land, Parcel 1, on the east side of Route 110, referred to as the Head Pond Area, is approximately 1625 acres, and Parcel 2, referred to as the Jericho Lake Area on the west side of Route 110, is approximately 5,525 acres. Both parcels are located several miles outside of the city proper but within the city limits of Berlin. The Park is accessed via State Highway 110 approximately 2.75 miles northeast of the limits of Berlin Proper.

There is an access road to the existing beach and trail head at the Jericho Lake Area that is roughly 1.75 miles from Route 110 to the beach area. This road has numerous potholes and the shoulders have eroded in some sections; it will need to be upgraded to handle the future increase in traffic and to convey a quality entry image for visitors to the State Park.

The Head Pond Area is also accessed via Route 110.

In 2006, the State of New Hampshire Department of Resources and Economic Development purchased the majority of the property from the Dillon Company and later in 2006 the balance of the property, the area around Jericho Lake, was placed under a Purchase and Sales Agreement with the City of Berlin.

The existing Jericho Lake Recreation Area was established in the 1970's by the City of Berlin with the construction of Jericho Lake, a flood control reservoir created by the construction of an earthen dam to regulate flow of the Dead River through the city center of Berlin located downstream. This popular city park has been in continuous use as a public facility throughout the period following its creation.

At present the Jericho Lake site has a small sandy beach, a boat landing (non-motorized water craft only are permitted), a picnic area and covered pavilion, and public washrooms. The mountain and lake scenery at the public facility are very attractive and, combined with favorable topography, it was evident to the planning team very early in the master planning process that this would be the best location for the future trailhead, campground, and Park headquarters.

The topography is varied throughout the two parcels with several high points in the Jericho Lake Area at elevations in the range of 2,000 feet above sea level and the highest point in the southwest corner of this area at slightly over 3,000 feet. Jericho Brook runs through the center of the Jericho Lake parcel flowing to the north into Jericho Lake from its headwaters on the northern flanks of Black Crescent Mountain and Sugar Mountain.

The topography in the Head Pond Area is generally flatter than the Jericho Lake Area with gently rising slopes from south to north and west to east. There are no major streams, wetlands, or steep slopes in the Head Pond Area.

Large portions of the land in the Jericho Lake Area have been harvested for forest products in the past several years by the Dillon Company. Although some sections have been extensively clear-cut, we believe this to be advantageous given the expansive views that have been created as a result. During the timber harvesting process many gravel roads and landing areas have been developed by the Dillon Company; these roads are suitable for integration into the future ATV trail network.

There are a number of open areas that have been created recently for the purpose of staging log removal and for chipping operations. These areas may have various uses in the future ATV trail system. For example, they may be used as safety zones for emergency assistance or for future rest areas with toilet facilities.

2. **The First Phase of Trail Development in the Park; Summer 2006**
   In August 2006 the Bureau of Trails, with the help of volunteers from the Androscoggin Valley ATV Club opened approximately fourteen miles of OHRV trails at the new Jericho Mountain State Park facility. The majority of the new trails were established on existing gravel logging roads.

Figure 1 depicts a *Regional Map* of the project area. ***Figure 2*** shows the *Existing Conditions Plan.*

PITTSBURG

TRAIL HEAD
GREAT NORTH WOODS ATV CLUB PITTSBURG
APPROXIMATELY 50 MILES OF TRAILS

CLARKSVILLE

ATKINSON AND GILMANTON ACADEMY GRANT

STEWARTSTOWN

DIXS GRANT

SECOND COLLEGE GRANT

POTENTIAL 12 MILE CONNECTOR TRAIL NOT ESTABLISHED

TRAIL HEAD
NORTH COUNTRY ATV CLUB STRATFORD
APPROXIMATELY 120 MILES OF TRAILS

COLEBROOK

TRAIL HEAD
ERROL ATV CLUB NORTH OF ERROL
APPROXIMATELY 16 MILES OF TRAILS

DIXVILLE

WENTWORTH LOCATION

COLUMBIA

MILLSFIELD

ERROL

TRAIL HEAD
MILLSFIELD ATV CLUB
ERROL MILLSFIELD AREA
APPROXIMATELY 120 MILES OF TRAILS

STRATFORD

ODELL

POTENTIAL 16 MILE CONNECTOR TRAIL NOT ESTABLISHED

DUMMER

CAMBRIDGE

TRAIL HEAD
ANDROSCOGGIN VALLEY ATV CLUB -JERICHO MOUNTAIN STATE PARK APPROXIMATELY 135 MILES OF TRAILS

STARK

POTENTIAL 5 MILE CONNECTOR TRAIL NOT ESTABLISHED

MILAN

NORTH-UMBERLAND

HEAD POND

KILKENNY

JERICHO LAKE

LANCASTER

SUCCESS

BERLIN

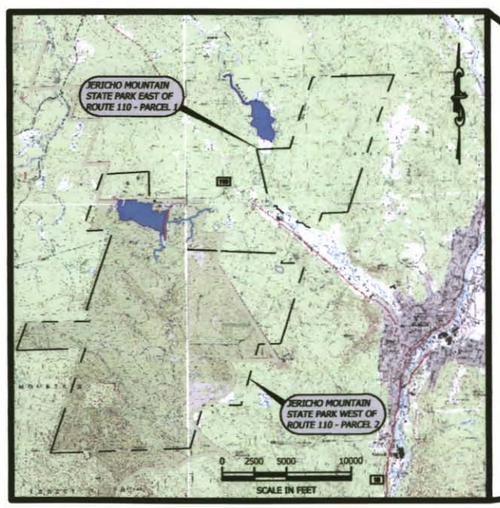
TRAIL HEAD
ANDROSCOGGIN VALLEY ATV CLUB - BERLIN SUCCESS AREA
APPROXIMATELY 20 MILES OF TRAILS

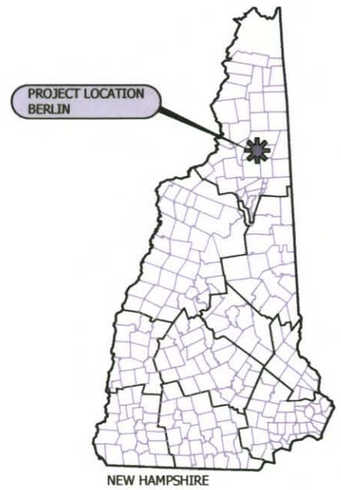
SHELBURNE

RANDOLPH

GORHAM

JEFFERSON





STATE LOCATION MAP

LEGEND

DESCRIPTION	SYMBOL
EXISTING CLUB TRAIL	
POTENTIAL CONNECTOR TRAIL NOT ESTABLISHED	

0 7,500 15,000 30,000
SCALE IN FEET

horizons engineering PLLC
34 School Street
Littleton, NH 03561
Phone 603.444.4111 - Fax 603.444.1343

NEW HAMPSHIRE DEPARTMENT OF RESOURCES AND ECONOMIC DEVELOPMENT
TRAILS BUREAU
JERICHO MOUNTAIN STATE PARK
BERLIN, NEW HAMPSHIRE

REGIONAL MAP

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: JAN 2007	PROJECT #: 06155
ENGIN'D BY: DEB	DRAWN BY: DEB
CHECK'D BY: WE	ARCHIVE #: N/A

FIGURE 1

TRAILS LEGEND

DESCRIPTION	SYMBOL
EXISTING GRAVEL ROAD/ATV TRAIL	
EXISTING DIRT ATV TRAIL INTERMEDIATE	
EXISTING GRAVEL ROADS	
EXISTING GRAVEL PITS	
PROPERTY LINE	

horizons Engineering inc
34 School Street
Littleton, NH 03561
Phone 603.444.4111 - Fax 603.444.1343

NEW HAMPSHIRE DEPARTMENT OF RESOURCES AND ECONOMIC DEVELOPMENT

TRAILS BUREAU
JERICHO MOUNTAIN STATE PARK

BERLIN, NEW HAMPSHIRE

EXISTING CONDITIONS PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: JAN 2007	PROJECT #: 06155
ENGIN'D BY: DEB	DRAWN BY: DEB
CHECK'D BY: WE	ARCHIVE #: N/A

FIGURE 2

B. The Market for OHRV and ATV Riding Areas

According to the industry sources *Powersports Business* and the *Motorcycle Industry Council*, sales of ATV's in the United States have grown 166% in the past ten years, from 293,000 units in 1995 to 780,430 units in 2005. Although industry financial analysts predict a slight slow down in sales of the traditional market leaders (Honda, Yamaha, Polaris, Arctic Cat, Suzuki, Kawasaki and Bombardier) for 2006, the current and anticipated growth rate of non-traditional Asian imports (mostly youth ATV's; estimated to be 150,000 to 200,000 units in 2006) points to continued double digit annual growth in total ATV sales.

With an understanding that this significant growth in ATV sales will lead to a significant increase in demand for riding areas, the State of New Hampshire, Department of Resources and Economic Development has taken the initiative to create an area specifically designed for ATV and other related off-highway uses. At present, the New Hampshire Bureau of Trails manages about 200 miles of wheeled off-highway recreational vehicle (OHRV) trails, over 250 miles of state-owned rail trails, and 6,000 miles of snowmobile trails. There are also approximately 700 miles of ATV trails on private land within the State that are operated and maintained by a number of ATV clubs.

Recent shifts in weather patterns have decreased the length and expanse of opportunities for snowmobiling in New Hampshire. Many people are turning to ATV's to fulfill their need for outdoor motorized adventure. This weather trend and other demographic trends have lead to greater demand for additional ATV trails throughout the State. Given that most of the current ATV trail systems are operated under agreements with private landowners, and increased use sometimes leads to increased strain on the willingness of private landowners to continue to allow use of their land, there is clearly a need for more public access to organized trail systems.

III. DESIGN CRITERIA

Horizons Engineering has researched a number of sources to establish the design criteria for the creation of the Riding Area Master Plan. The design criteria that have been utilized were taken from such diverse sources as OHRV trail development programs and initiatives from other states such as Wisconsin, Utah, and Virginia, the United States Forest Service, private operators of OHRV facilities, suppliers of ATVs and ATV products, and numerous interviews and solicitation of input from independent sources, stakeholders and parties with an interest in the Jericho Mountain State Park. Some aspects of the design criteria were created based on empirical findings taken from existing ATV operations or they were created by applying design criteria from other recreation-based land uses such as ski area design, snowmobile trail design and operation, and architectural criteria for the design of recreation facilities.

A. Trail Development

The master plan for the development of the trail system at Jericho Mountain State Park attempts to provide a range and diversity of trail opportunities that will satisfy a wide range of user groups. Although the Park is clearly being designed and developed as an ATV park, there are numerous other compatible user groups that are likely to take advantage of this great opportunity for outdoor recreation.

Naturally, there will be a wide range of users within the ATV market itself. There will be beginner riders as well as very accomplished riders. There will be those seeking a relaxing ride through the woods with family and friends as well as riders seeking a challenging, aggressive workout. Some riders will prefer to concentrate their time in a limited area such as a gravel pit or a steep, challenging section of trail while others will want to travel as many miles as possible in a day. This master plan has considered the aspirations of all user groups; the following design criteria have been applied to the trail system design.

1. **Levels of Difficulty**

   Trails are broken into three general categories based on the level of difficulty and the expectations of riders of varying ability levels. Green trails are for all users, blue trails for the more experienced riders, and black trails for the more aggressive, athletic riders. There are a number of criteria that differentiate trails by level of difficulty, including trail width and steepness, trail surface condition, placement of man-made or natural obstacles, and the number and types of anticipated users.

   The goal of the master plan is to create a system of trails for the enjoyment of all user groups. Enjoyment levels will be enhanced by having a wide range of trail difficulty levels, interesting features for different users, i.e. gravel pits, 4 X 4 truck trails, viewing areas, picnic areas, and un-crowded conditions.

Green trails have been established for the most part on existing gravel roads that run through most sections of the Park. These trails are considered very easy to ride and recommended for all users. Green trails are relatively wide, having a minimum width of 15 feet and are all intended for two-way travel. The maximum speed on these trials is 25 mph and the average speed that was applied for the purpose of calculating trail capacity is 20 mph.

Blue trails are designed and constructed in areas where a standard road vehicle could not pass. Trails are approximately 8 feet wide. These trails will wind through wooded areas and through old logging yards following existing logging trials. They will connect at the ends of green trails to create continuous riding throughout the ATV Park. These trails will receive the heaviest use throughout the Park and will constitute a lengthy day of riding. For the most part these trails are two-way, although there may be some places where one-way travel is desirable. The maximum speed on these trails will be 25 mph, but it is estimated the actual average speed on such a trail is more likely to be 10 mph. This average speed will be used to calculate trail capacity on the Park's blue trails.

Mountain bikers (non-motorized) may also be interested in using these trails with the understanding that the primary users of the system are ATVs and dirt bikes

Black trails are to be constructed with natural or man-made obstacles for the more aggressive riders. Obstacles such as rock climbs, boulder fields, stumps and sharp turns, often times in combination with steep slopes, will be used to create these trails. Black trails will vary in width, but generally they are narrow and some will only be barely wide enough for an ATV to squeeze through (no more than four feet wide). Black trails are typically intended for one-way travel. The average speed on these trails is 5 mph or less.

2. **Special Use Trails**

The Jericho Mountain State Park is intended to be a destination area with a special focus on OHRV use all well as other non-motorized uses. The proposed State run campground will provide facilities for families and other user groups to stay on site while taking advantage of a number of recreation opportunities within the Park and throughout the Great North Woods region of New Hampshire.

As part of the master planning process a number of other trail uses have been considered and, wherever possible, they have been integrated into the trail system in the Park. Some of those special uses include:

Junior trail – As part of the family orientation of the Park and the campground, a short loop for the use of young riders will be located near the camping area where parents can monitor their progress. The loop will be restricted to ATVs or trail bikes no larger than 90 cc and no fast or aggressive riding will be allowed.

Educational trails and learning area – There is a need to have educational facilities in the core area of the Park for the Androscoggin Valley ATV Club, NH Fish & Game and for the general use of visitors to the area. Educational facilities will consist of an outdoor open area about the size of a football field, a short loop track that may be observed by an instructor, and indoor classroom space. The educational facilities should be integrated with the Park administration/visitor center.

Bike paths/walking paths – Non-motorized mountain bikes and walking paths are considered to be another compatible type of recreation and use of the Park. We have shown a bike path that will run from the camping area around the lake and back to the core area. This trail has been located so as not to interfere with the ATV trails which could potentially cause a negative experience for the hiker or biker.

The Androscoggin Ranger District of the White Mountain National Forest has suggested that non-motorized use of National Forest land in concentrated areas is consistent with the 2005 Land and Resources Management Plan. In particular, the existing developed road in the area of the National Forest known as the Bog Dam Road to the west of the Park may be attractive for non-motorized mountain bike use. As such, the master plan shows a link between the State Park and the Bog Dam Road via the existing Pipeline Trail.

Event Area and Mud Pit – An area to the southeast of the core, near the main parking lot an area has been designated for holding ATV and related events. This area is approximately seven acres and there is a proposed mud pit for holding competitions and other spectator events. The financial models which accompany this master plan demonstrate that there are numerous opportunities for holding meets, competitions and special events within the Park, this special use area with its mud pit will provide the venue for holding such events.

Gravel Pits – There are several existing gravel pits within the Jericho Lake Area. These pits may be used for motocross loops and other activities for intermediate and aggressive riders of two and four wheel machines. The Bureau of Trails has indicated that extreme riding involving large jumps will not be allowed in the gravel pits.

Four Wheel Drive Vehicles - There is a strong interest in the use of 4 wheel drive vehicles at the Park. We feel that this would be a good mix of OHRV use for the Park. Statute 215-A:43.IV restricts the size of OHRVs to 50 inches wide and 1,000 ponds. An exception to this Statute should be approved to allow this use within the Park

3. Trail Comfortable Carrying Capacity, CCC

It is important to establish the comfortable carrying capacity of the trail system so that other facilities and management activities may be designed to be in balance with the trail capacity. Horizons Engineering has established base line trail densities (riders per mile of trail) based on empirical findings and the overarching goal to provide a pleasant recreational experience without unduly taxing the environment.

It should be noted that capacity calculations are determined for the trail system itself as well as for the park as a whole. With respect to ATV riders, those riders actually using the trails at any given time are considered active riders while those who are in other areas of the Park – resting in the core or the campground, pursuing other leisure activities, etc. – are considered inactive riders. For the purposes of calculating Park capacity, we have estimated that inactive riders will be about 25% of the active riders.

Additionally, it should be noted that there will be a number of days during the peak riding season when the number of visitors to the Park will exceed the theoretical comfortable carrying capacity. This may happen on holiday periods when the weather is ideal, when there is a large event at the Park, or sometimes it simply happens by coincidence. We do not view this as detrimental, as long as it does not occur to the point where the quality of the riding and leisure experience will suffer. Park management will need to monitor and potentially regulate usage of the Park during these busy periods.

Finally, as noted in Section IV of this report, The ATV Park Master Plan, certain aspects of the Park such as parking, water supply, and sewage treatment must be designed to handle the total of active, inactive, and peak day visitors to the Park.

a. <u>Trail Density Assumptions</u>

The following assumptions will be used to determine trail comfortable carrying capacity.

i. On average ATV riders travel in groups of 2 to 6 riders per group

ii. ATV riders on smooth trails will travel at a higher rate of speed, therefore, assumed average rates of travel are:
   - Green trails 20 mph
   - Blue trails 10 mph
   - Black trails 5 mph

iii. Assumed trail densities are:
   - Green trails will have 1 group of 2 to 4 (an average of 3) ATVs per mile
   - Blue trails will also have 1 group of 2 to 4 (an average of 3) ATVs per mile
   - Black trails will have 2 groups of 4 (an average of 7) ATVs per mile

The chart on the following page identified as ***Figure 3*** illustrates the basis for the trail density assumptions. The map titled Overall Site and Trail Layout as well as Section IV.A.4 describes the actual calculation of the trail system and Park comfortable carrying capacity.

b. Critical Access Trails
Critical access and egress on the main core trails (the trunk lines) should also be evaluated to confirm the carrying capacity of the trails system. In other words, the trunk line trails must be able to handle peak demand on a busy morning when riders leave the core area as well as when they return to the core in the afternoon.

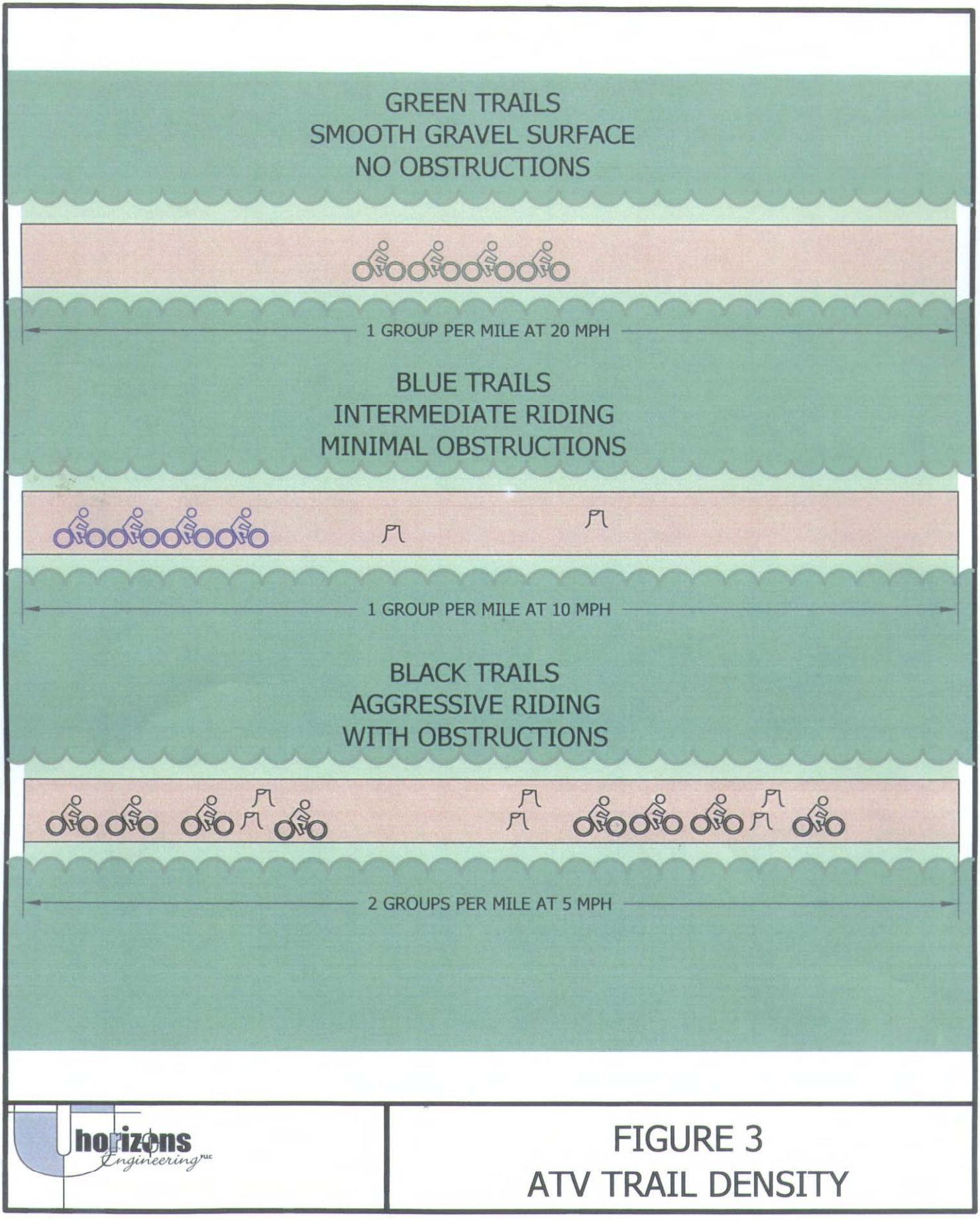
c. Managing Trail Density
In theory, it is possible that when the number of riders within the trail system has reached its capacity, additional riders will decide not to ride that day due to the perception that the trails will be crowded. In reality, however, Park management will need to monitor and regulate the number of riders that are allowed in the trail system. This may be accomplished by monitoring the number of campsites that are occupied by ATV riders and regulating use of the parking lot. It may require several years of monitoring and managing in order to establish the right number of riders that the trail system can handle.

B. Campground Planning and Design Criteria

The campground is considered a critical aspect in the future of the Park. The availability of overnight camping right in the core area of the Park will not only significantly improve the attraction of the Park; it will also provide the greatest area of revenue potential for the Park's operation. We envision high levels of occupancy in the campground throughout the peak summer season and overall the campground will become a hub of social activity that many visitors are looking for.

Several types of camp sites have been considered in order to appeal to as many users as possible. We have used several resources to help provide planning and design criteria for the campgrounds, including the USDA Forest Service Manual, *FSM 2300 – Recreation, Wilderness, and Related Resource Management* and the well-known book *Planning Parks for People* by Hultsman, Cottrell and Zales-Hultsman, 1987.

Applying the US Forest Service guidelines for site classification, the following types of campground sites are proposed. The quantity of each type of site has been determined on the basis of examples from other State and private camp grounds and our estimate of market demand. As will be discussed in the phasing plan later in this report, early phases of campground development should attempt to satisfy the full range of camp site demand in the marketplace; however the mix of types of sites may be adjusted prior to the construction of subsequent phases.



horizons Engineering PLLC

FIGURE 3
ATV TRAIL DENSITY

Also, there are limitations to the practical aspects of mixing some uses with the predominant user, the ATV enthusiast; some uses are simply not compatible with the presence of a large number of ATVs. Park management will need to monitor and perhaps regulate the mix of users wherein the goal is to try to accommodate as many different users as possible without compromising safety and user satisfaction.

E. Signs and Trail Markers

Proper signage is a critical component in the development of a user-friendly and safe trail network. Given the intensive trail network in the Park and the number of trail intersections, it will be especially important for management to adopt a comprehensive directional and informational signage program. Maintenance of the signs will be an almost daily requirement. There will be a signage shop located within the Park maintenance shop.

The NH Trails Bureau has created an ATV trail signage program. A copy of a more extensive trail signage program from the Hatfield-McCoy trail system in West Virginia is shown in ***Appendix III***. The Hatfield-McCoy examples show a good approach for trail marker design and use of materials for trail intersections. The State of Wisconsin Department of Natural Resources also provides some excellent guidelines and standards regarding trail signage.

IV. THE ATV PARK MASTER PLAN

The Jericho Mountain State Park ATV Master Plan reflects several guiding principles relative to the creation of a state-of-the-art, user-friendly, intensive use area that will satisfy the rapidly growing demand for OHRV opportunities in New Hampshire and the northeast region. The guiding principles for the creation of this master plan are:

- The overall goal is to provide an all-inclusive, user-friendly facility that will attract OHRV enthusiasts from within New Hampshire as well as from out of State.
- Although the Park is primarily planned as an ATV park, trails and facilities will be designed for many different users, motorized and non-motorized, as well as individuals and families, leisure and aggressive riders, and day and overnight visitors.
- High quality overnight camping facilities will provide an opportunity for visitors to extend their stay in the area while exposing them to the natural beauty of the Jericho Lake site.
- Partnerships with local, state and federal agencies as well as private entities will be established to ensure that future planning and development efforts will be dedicated to preserving the natural resources in the Park and surrounding lands for future generations.
- The Park will become the hub of North Country OHRV activity. As such it will have wide spread economic benefits to the local and regional economies.

With these principles in mind, Horizons Engineering has created the following master plan.

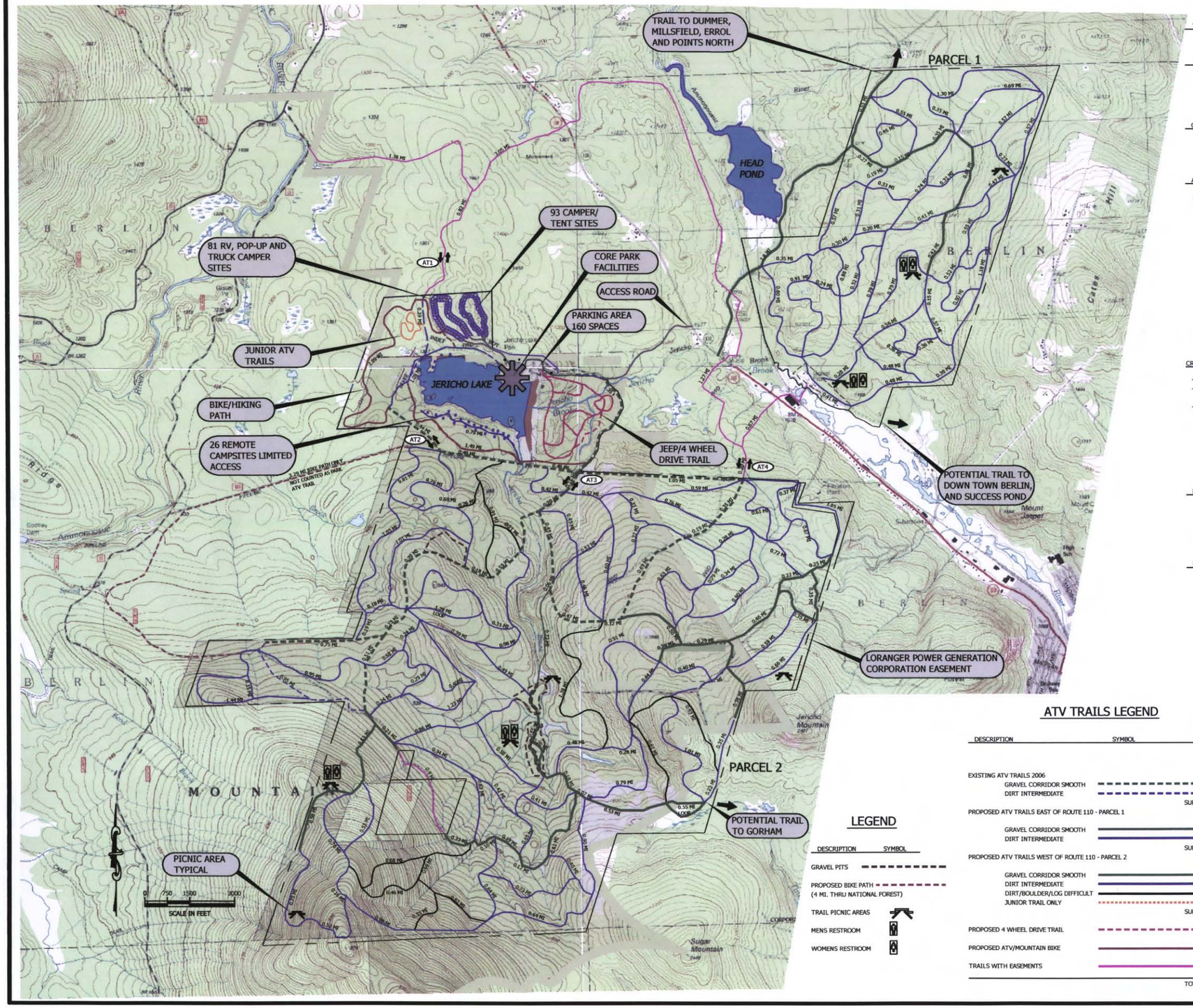
A. The Trail Development Plan

The Trail Development Plan has identified significant utilization of the approximate 7,500 acres of land in the Park. Although the proposed trail system represents a fairly intense use of the property, in order to preserve some sense of solitude for riders we have attempted to keep trails a minimum of 500 feet apart from one another. There are several instances, however, where trails are as close as 200 feet due to land use constraints, topography, etc.

The map on the following page identified as ***Figure 4*** *(Overall Site and Trail Layout)*, illustrates the proposed trail system layout, the location of the core area, and the potential link to other out-of-park trails.

1. Maximum Mileage Assessment

The full build out of the trails system is approximately 136 miles, including the 9 miles of trails with easements currently in place, the 1 mile junior ATV trail, the 4.5 miles of 4 X 4 trail, and the 5 miles of mountain bike/ATV trail. It should be noted that the plan for the full build out of trails is not in compliance with some items in the fine filter criteria of the current New Hampshire Statutes, Chapter 215-A:42 and 43. This matter is described in more detail in Section IX of this report.



PARK CAPACITY CALCULATIONS

TOTAL MILEAGE ASSESSMENT = 136

Mileage mapped = 108.44, adjusted upward by 25% >> 108.44 x .25 = 27.11 + 108.44 = 135.55 miles

MILEAGE BREAK DOWN:

Green trails (mild riding/all uses) = 27 mi. trails made of good gravel, no obstructions
Blue trails (intermediate riding) = 80 mi. trails in wooded areas with minimal obstructions
Black trails (aggressive riding) = 9 mi. trails through wooded areas with obstacles
Easement trails (limited disturbance) = 10 mi. trails with easements over Land owned by others

OTHER USES:

4 Wheel Drive Trails (aggressive) = 4.5 mi. trail with rock and timber obstacles, obstructions and hill climbs
Junior ATV trail (maximum 80cc motor) = 1 mi. trail on level ground lined with haybales
Bike path (trail to remote camp sites) = 5 mi. trail

ATV TRAIL COMFORTABLE CARRYING CAPACITY (CCC) = 429 ATV'S

Trail capacity is based on the following assumptions:
1) On average ATV riders travel in groups of 2, 4 or 6.
2) ATV'S on smooth trails will travel at higher rates of speed:
Therefore: Assumed average green trail speed is 20 mph
Assumed average blue trail speed is 10 mph
Assumed average black trail speed is 5 mph

Typical green trail >> assume 1 group of 4 ATV's every 3 minutes per mile at 20 mph
Typical blue trail >> assume 1 group of 4 ATV's every 6 minutes per mile at 10 mph
Typical black trail >> assume 2 groups of 4 ATV's every 12 minutes per mile at 5 mph

Green trials = 2-4 ATV'S per mile	3 ATV'S x 27 mi. =	81 ATV'S
Blue trails = 2-4 ATV'S per mile	3 ATV'S x 90 mi. =	270 ATV'S (includes trails on easements)
Black trails = 6-8 ATV'S per mile	7 ATV'S x 9 mi. =	63 ATV'S
Bike Path = 2-4 ATV'S per mile	3 ATV'S x 5 mi. =	15 ATV'S
		429 ATV's on the trail system
Inactive riders, 25% Trail CCC	429 ATV's x 25% =	107 ATV'S
	TOTAL	536 ATV'S in the Park

CRITICAL TRAILS

There are 4 trails that are critical for access into and egress out of the core area
These trails are designated by (AT1) (AT2) (AT3) (AT4)

Trails to and from the core area must support the comfortable carrying capacity of the trail system.
Assume a 2 hour time period between 8 am and 10 am for ATVs leaving the core area
Assume a 2 hour time period between 4 pm and 6 pm for ATVs returning to core area
Assume groups of 4 on average leave core every 5 min. over a 2 hour period
60 min. ÷ 5 min. = 12 groups per hour x 4 ATV'S per group = 48 ATV'S per hour
48 ATV'S per hour x 2 hour period = 96 ATV'S, round to 100 ATV'S
100 ATV'S x 4 critical trails = 400 ATV'S
400 ATV's on critical trails in 2 hours is comparable to trail CCC of 429 ATV's.

PROPOSED CAMP SITES = 200

Camp site break down:
RV, POP-UP and pickup truck sites = 81
Camper/Tent sites = 93
Primitive tent sites = 26
Assume average occupancy during peak months is 65% full >>> 200 x .65 = 130 sites occupied

PARKING REQUIREMENTS = 118 SPACES (site layout designed for 160 spaces)

Assume 65% of ATV's in the park are parked at the camp sites. 536 ATV'S x 0.65 = 348 ATV's
536 ATV's in the park - 348 ATV's at the camp sites = 188 required parking spaces for day use ATVers.
188 ATV's ÷ a minimum of 2 ATV's per parking space = 94 parking spaces, minimum required.
Assume a required 25% additional spaces for peak days. 94 spaces x .25 = 24 + 94 = 118 min. spaces
In addition to the public ATV parking area there are 35 parking spaces located adjacent to the administration building and the retail store. Adjacent to the pavilions and beach area there will be 30 parking spaces for day use only.

Other Users That Require Day Time Parking:
Mountain Biking
Boating/Fishing
Beach/Picnic use
Visitors center
4-Wheel Drive Trail Users

LEGEND

DESCRIPTION	SYMBOL
GRAVEL PITS	
PROPOSED BIKE PATH (4 MI. THRU NATIONAL FOREST)	
TRAIL PICNIC AREAS	
MENS RESTROOM	
WOMENS RESTROOM	

ATV TRAILS LEGEND

DESCRIPTION	SYMBOL	TOTAL MILES MAPPED	TOTAL MILES ESTIMATED (MAPPED + 25%)
EXISTING ATV TRAILS 2006			
GRAVEL CORRIDOR SMOOTH		9.36	11.70
DIRT INTERMEDIATE		2.04	2.55
	SUB-TOTAL	11.40	14.25
PROPOSED ATV TRAILS EAST OF ROUTE 110 - PARCEL 1			
GRAVEL CORRIDOR SMOOTH		4.15	5.19
DIRT INTERMEDIATE		20.04	25.05
	SUB-TOTAL	24.19	30.24
PROPOSED ATV TRAILS WEST OF ROUTE 110 - PARCEL 2			
GRAVEL CORRIDOR SMOOTH		7.73	9.66
DIRT INTERMEDIATE		41.99	52.49
DIRT/BOULDER/LOG DIFFICULT		6.78	8.47
JUNIOR TRAIL ONLY		0.75	0.94
	SUB-TOTAL	57.25	71.56
PROPOSED 4 WHEEL DRIVE TRAIL		3.60	4.50
PROPOSED ATV/MOUNTAIN BIKE		3.71	4.64
TRAILS WITH EASEMENTS		8.29	10.36
	TOTALS =	108.44	135.55

horizons Engineering PLLC
34 School Street
Littleton, NH 03561
Phone 603.444.4111 - Fax 603.444.1343

NEW HAMPSHIRE DEPARTMENT OF RESOURCES AND ECONOMIC DEVELOPMENT
TRAILS BUREAU
JERICHO MOUNTAIN STATE PARK
BERLIN, NEW HAMPSHIRE

OVERALL SITE AND TRAIL LAYOUT

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: JAN 2007	PROJECT #: 06155
ENGIN'D BY: DEB	DRAWN BY: DEB
CHECK'D BY: WE	ARCHIVE #: N/A

FIGURE 4

1. **Remote Sites**
   Remote sites will accessible only by ATV, mountain bike or by walking. Two of the sites will be accessible only by canoe or boat. The remote sites will have minimum site modification; spacing is informal and extended to minimize contact between camp sites. US Forest Service development scale: 2 (semi-primitive).

2. **Tent Sites**
   Tent sites will be designed for tents, pop-up trailers, and truck campers. The sites will include additional space for ATV parking (in addition to primary vehicle and trailer parking). The sites are moderate to heavily modified with adjacent facilities for comfort and convenience such as flush toilets, showers, water source nearby, trash disposal, play areas, etc. Access road is hard surface gravel. Sites will have a picnic table and fire pit. Forest Service development scale: 4 (rural).

3. **RV Sites**
   Sites for Recreational Vehicles (RVs) are designed for large vehicles that may also be towing a trailer for ATV's. These sites are moderate to heavily modified, they are large and their relationship to the access road will accommodate back-up and angled parking. Each site will have water and electric hook-up; sewage disposal will be at a central disposal site in the core area of the campground. Comfort and convenience facilities will be within several hundred feet, including flush toilets, showers, trash disposal, play areas, and walking paths. Forest Service development scale: between 4 and 5 (rural and urban).

C. Core Facilities

The core of the Park will include all of the facilities necessary to sustain and manage a full service recreation area and particularly to meet the requirements of ATV enthusiasts. The core area will include facilities for Park management functions such as a gate house, rules enforcement, first-aid/safety services, rider training and education, Park management, administration, and security, vehicle maintenance shop, signage shop, and trail maintenance equipment storage.

Visitor services located in the core area will include parking, public toilets, showers, laundromat, convenience store, ATV wash-off, sewage disposal station, informational and directional kiosks, beach area, boat landing, canoe rentals, walking path trailhead, picnic areas and covered pavilions.

D. Other Uses of Trails in the Park

Jericho Mountain State Park is intended to be used by many user groups. With respect to motorized vehicles, there is a limit on the size and weight whereby a vehicle is classified as an ATV. Although this is a State Park, and the trail system may be used by any person, there are certain restrictions whereby the State must protect users from potential injury while limiting the State's exposure to liability.

2. Levels of Difficulty

The trail system is characterized by varying levels of difficulty according to the design criteria described earlier in this report. The break down of trail mileage is:

Green trails	27 miles
Blue trails	90 miles (includes easement trails)
Black trails	9 miles
Mtn. bike/ATV trail	5 miles
	131 miles

Junior trail	1 mile
4 X 4 trail	4 miles (similar to black ATV trail)
Total	136 miles

3. Distribution of Levels of Difficulty

Of the 136 miles of ATV trails, the distribution of difficulty levels are:

Green trails	20%
Blue trails	70%
Black trails	10%

Overall, we believe that this distribution of difficulty levels is representative of market demand. There will, of course, be a range of difficulty within each category and some people may interpret the descriptions of difficulty level differently than others, therefore it will be important for Park management to educate riders on the meaning of the categories and to the fact that trail conditions change with weather, the time of year, the degree of maintenance, and variations that exist due to the natural features of the land. The signage program will be an important element in providing good directions and information throughout the trail system.

4. Trails System and Park Comfortable Carrying Capacity, (CCC)

As mentioned in the section covering Design Criteria, we have made assumptions of trail density, measured as ATVs per mile, in order to determine the comfortable carrying capacity of the trails system. The CCC is used throughout the master planning process to establish the size and parameters of other Park facilities such as parking, critical access trails, visitor facilities in the core, and infrastructure requirements so that all elements of the Park are in balance.

The CCC figure is also a significant factor in the economic models as it establishes the size of the business (in terms of average and peak visitation), the potential business volume that may be expected, and ultimately the costs to operate the business.

The trail system CCC calculation for the Park has been determined as follows:

Green trails	3 ATVs per mile X 27 miles	= 81 ATVs
Blue trails	3 ATVs per mile X 90 miles	= 270 ATVs
Black trails	7 ATVs per mile X 9 miles	= 63 ATVs
Bike/ATV	3 ATVs per mile X 5 miles	= 15 ATVs
Total trail system CCC		429 ATVs

The Trail CCC figure represents the total number of ATVs that may be using the trail network at any given time. Typically, this will occur only on busy days. ATVs that are actually on the trail system are considered active riders. It is appropriate to assume that there will also be a number of inactive riders, who at any given point in time are in the Park but not on the trails. They may be resting in the core area or in the campground, in the viewing areas, relaxing at other amenities in the core, etc. Empirical studies of other recreation facilities point out there may be an additional 25% inactive riders over and above the number of active riders; this would bring the total number of ATV enthusiasts (active and inactive riders) using the park to 536 people.

Trail CCC, Active riders	429 ATVs
Inactive riders, 25% Trail CCC	107 ATVs
Total Park Capacity CCC	536 ATVs

Empirical studies also point out that on a limited number of peak days the facility may exceed the Park CCC by as much as 25%. After that, management may need to consider closing the facility to additional visitors or, over time, the market place (especially local people) will realize that there are certain days when it is going to be very crowded and they may choose to stay away from the Park or enjoy some other activity on those particular days.

Under the assumption that the Park facilities will be able to accommodate a number of peak days wherein the total Park CCC is exceeded, the Park facilities must be master planned to handle these peak conditions.

Total Park CCC	536 ATVs
Peak day visitors, 25% of Park CCC	134 ATVs
Total Park, Peak Day Visitors	670 ATVs

Furthermore, it is understood that there will be some visitors to the Park who will not be ATV enthusiasts. They may be there to use the beach area, to go fishing, boating, walking, sight-seeing, etc. Some of these visitors will be staying in the campground (in which case their requirements for parking and infrastructure utilities will have been designed into the campground facilities), however some of these people will be day visitors, therefore parking and infrastructure utilities must be designed to handle these visitors as well. Assuming that there may be 50 people visiting the Park that are not ATV enthusiasts, this will bring the total number of visitors, ATV and non-ATV users, to 720 (670 ATVers + 50 non-ATVers = 720 total visitors).

In summary, the total number of visitors that may be in the Park on a peak day is 720. Parking and infrastructure utilities within the Park must be designed to handle this peak demand.

5. Critical Access Trails

- There are 4 critical trunk line trails leaving (and returning to) the core area.
- Assume that on average a group of 4 ATV riders leave (or return to) the core every five minutes.
- Therefore, 12 groups of 4 ATVs leave the core in an hour; 48 riders will leave the core per hour per trunk line trail; in a 2 hour period 96 ATVs will leave or return to the core per trunk line trail; round this to 100 ATVs per 2-hour period
- Over the 2 hour period and given the 4 trunk line trails, 400 ATVs may leave or return to the core

6. Special Use Trails

There are several designated types of trails for uses other than ATVs. There are few restrictions on who may use these public trails, yet for all practical purposes the Bureau of Trails, the Fish and Game Department, and the host club will need to coordinate with various user groups to determine the appropriate way to manage the Park and satisfy the majority of user groups. Inevitably, the use of the Park will evolve quickly over the initial years to the point where there is a cohesive, user-friendly management plan and representatives from the various user groups will work closely with management to help meet their special needs.

Some of the proposed other uses of the trail system are as follows:

- Jeep/4 wheel drive vehicles – A specific area near the core has been designated for this type of OHRV consisting of a 4.5 mile loop. This trail will be constructed to challenge the user and his vehicle with areas to avoid or bypass and obstacles that are too aggressive or difficult for the vehicle. As there is no state-wide fee structure for this type of vehicle (and they do not meet the definition of an OHRV as stated in RSA 215 A:43.IV), a daily fee will be required to use this area of the Park to offset the maintenance of such a trail system. An area club should be created to also help in the maintenance and patrolling of such a trail system. Horizons recommends that the State consult with representatives from this user group to help design and construct the loop. ATVs will be allowed on this trail if they choose.
- Gravel pits – There are several existing gravel pits within the Park. These pits may be used for two and four wheel riders seeking a confined area to do motocross, hill climbs, tight turns with speed bumps, etc. The State will not, however, permit large jumps and so called extreme riding. Park management and the host ATV club will monitor the activities in the gravel pits.

- Junior Trail – A one mile trail loop is planned to be near the campground in order to provide a place for young riders on ATVs or trail bikes no larger than 90cc to practice and play under the supervision of parents. Its proximity to the campground will enhance its value as an added amenity to the Park.
- Educational area – A 100' X 300' relatively flat area has been provided within the core area to provide a place for rider training, safety education, riding demonstrations, etc. The host club or Fish and Game Department may find that there are times when the Junior trail could also be used for training/educational purposes.
- Mountain biking (non-motorized) – As mentioned earlier, the US Forest Service would like there to be access from the Park to an area of the Forest west of the Park known as the Bog Dam Road. The US Forest Service does not allow motorized vehicles on their land yet they encourage access for non-motorized biking, hiking, etc. The master plan shows a mountain bike trail which departs from the core area to provide access along a pipeline trail to the Forest Service land to the west; the section of this trail that is in the Park may also be used by ATVs.
- It has been suggested by the NH Musher's Association that many of the green trails/logging roads would be great for dry-land training in the summer. Musher's use ATVs as tools for training the dogs. A team of dogs would train on approximately 15 miles of trials at a speed of about 10 mph. Given that Musher's are using an ATV as part of the training, we do not anticipate a conflict with other ATV riders. It has been suggested to designate specific trails and a certain time of day and day of week when training would be allowed on those trails. For all practical purposes, it should be a Park management decision based on day-to-day conditions as to where and when trails may be used by Mushers. Additionally, the Park may be an ideal place to hold winter events for dog sledding, again pending decisions by Park management. .

B. Campground Master Plan

As discussed in the section covering Design Criteria, the campground and related amenities are an integral component of the Jericho Mountain State Park. The goal of the integrated trail system and campground is to create a unique setting and experience for the enjoyment of OHRV enthusiasts. The end result of the integrated campground, trail system, and core amenities will be an attraction that will entice visitors to stay for several days while enjoying the Park itself as well as the surrounding attributes of New Hampshire's North Country. It is very likely that this unique State Park will become a significant attraction for visitors throughout the northeast as well as other parts of the country.

The master plan identifies a campground development concept that is intended to satisfy a wide range of user preferences for a quality outdoor experience. The concept plan identifies a limited number of remote camp sites that are accessible only by ATV, mountain bike or on foot, including two sites on small islands that will be accessible only by canoe or boat, as well as a significant number of drive-to camp sites that will accommodate tents, pop-up trailers, and large RV's. All drive-to sites are designed to handle vehicles hauling trailers with ATV's or other OHRV's.
Important aspects of the campground concept are the adjacent amenities and activities within the core area of the Park, including the junior riding trail that is within walking distance of the west side of the campground, walking paths around Lake Jericho, the beach and picnic areas with covered pavilions, the availability of showers, a general store, ATV wash off facilities, etc.

The Core Area Concept Plan on the following page shows the following breakdown of camp sites and the relationship to surrounding amenities.

26	Remote sites with limited access
81	RV sites with water and electric hookups
93	Tent/Pop-up trailer/Truck camper sites
200	Total sites

Figure 5 on the following page illustrates the *Core Area Concept Plan* for the Park.

Assuming that each camp site would be capable of accommodating (and be limited to) four to six people and four ATV's, the full capacity of the campground will be 800 to 1200 people. This is greater than the Trail System and Park Comfortable Carrying Capacity noted above, however it is unlikely that the campground will have more than 800 people staying there at one time and not all campers will be OHRV riders.

The tent/pop-up camp sites and the RV camp sites are both located in pods to the north of Jericho Lake on gently rising land with no apparent wet lands or streams to deal with. Slopes are in the order of ten percent which is conducive to camp site development and drainage as well as road construction. The two types of camping pods are each located around a distinct one-way loop road as shown on the Core Area Concept Plan.

Camp site roads are proposed to be eighteen feet wide constructed of a bank run gravel base and crushed gravel surface with appropriate drainage ditches on the uphill side and vegetation up to the road edges.

Each camp site pod will have two separate washroom facilities and one of these facilities in each pod will have showers for campers to use. Each campsite pod will also have a playground area with children's play equipment, horseshoes, volleyball, etc.

DUMPSTER TYPICAL
RESTROOMS WITH SHOWERS
WATER SERVICE TYP.
100 x 300 FOOT PLAY AREA TYPICAL
RESTROOMS NO SHOWERS
TENT SITE SUB-SURFACE WASTE-WATER SYSTEM
93 TENT/CAMPER SITES
24 FT WIDE ACCESS ROAD
RESTROOMS NO SHOWERS
RESTROOMS WITH SHOWERS
100 x 300 FOOT PLAY AREA TYPICAL
RV CAMP SITE SUB-SURFACE WASTE-WATER SYSTEM
81 CAMP SITES (RV, POP-UP AND TRUCK CAMPER)
ACCESS TRAIL
JUNIOR TRAIL MAX. 80cc MOTOR
MAIN ATV TRAIL
0 100 200 400
SCALE IN FEET

20'x40' MENS AND WOMENS RESTROOM, SHOWERS AND LAUNDRY ROOM
50'x50' STORE AND DELI WITH 25x40 PAVILION
LOAD/UNLOAD RAMP
MAIN GATE HOUSE
4 WHEEL DRIVE & ATV TRAIL TYP.
160 10'x46' SPACES
WELL, PUMP HOUSE & WATER STORAGE TANK
MAIN ENTRANCE FROM ROUTE 110
RV DUMP STATION
ACCESS TRAIL
75'x150' ADMINISTRATION/ MAINTENANCE FACILITY
EVENT AREA WITH MUD PIT
SUB-SURFACE WASTE-WATER SYSTEM
3 BAY ATV WASH STATION
EXISTING ADMINISTRATION AND RESTROOM BUILDING
RIDER TRAINING AREA 100'x300'
EARTHEN DAM
DAY PICNIC AREA
BOAT RAMP
BEACH AREA AND PLAYGROUND
DAY USE PARKING, 30 SPACES
EXISTING PAVILION
PROPOSED PAVILIONS TYP.
JERICHO LAKE
26 REMOTE CAMP SITES
ATV/BIKE TRAIL TO REMOTE CAMP SITES
BIKE/HIKING PATH

LEGEND

DESCRIPTION	SYMBOL
WATER MAIN	W
GRAVITY SEWER	S
SEWER MANHOLE	S
ELECTRICAL	E
PICNIC AREAS	
MENS TOILET	
WOMENS TOILET	
WATER SHUT OFF	
TRANSFORMER PAD	
DUMPSTER LOCATION	
EXISTING PAVED AREA	
PROPOSED ROAD	

horizons Engineering PLLC
34 School Street
Littleton, NH 03561
Phone 603.444.4111 - Fax 603.444.1343

NEW HAMPSHIRE DEPARTMENT OF RESOURCES AND ECONOMIC DEVELOPMENT
TRAILS BUREAU
JERICHO MOUNTAIN STATE PARK
BERLIN, NEW HAMPSHIRE

CORE AREA CONCEPT PLAN

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: JAN 2007	PROJECT #: 06155
ENGIN'D BY: DEB	DRAWN BY: DEB
CHECK'D BY: WE	ARCHIVE #: N/A

FIGURE 5

The camp sites themselves will be constructed according to United States Forest Service standards, with adjustments in size made to accommodate the fact that visitor's vehicles will be towing trailers. The tent/pop-up sites will have a gravel surface parking space, a soft surface tent area, a fabricated metal cooking stove, and a camp fire pit. Firewood and ice will be available at the general store.

Figures 6 and 7 on the following pages illustrate typical tent and RV camp sites.

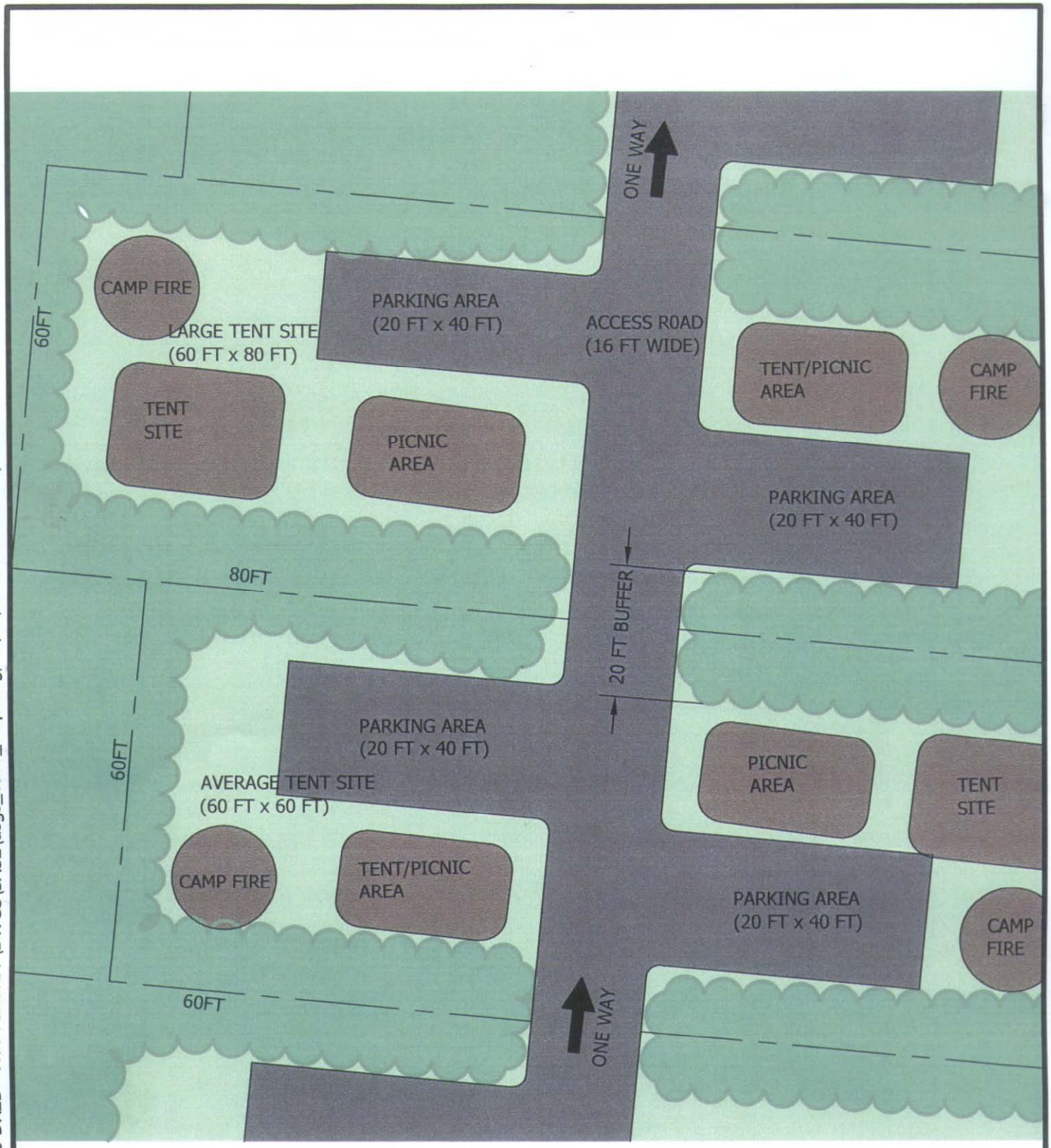
C. Core Area Facilities

The core area of the Park is planned to be a multi-purpose area with facilities for Park management and maintenance, visitor services, and Park amenities. As emphasized in other sections of this master plan, Jericho Mountain State Park is more than simply an ATV trail system and more than a State camp ground, it is an integrated recreation complex with a focus on the lake, the trail system, the camping and family recreation opportunities, and to serve as the hub for access to other North Country attractions. With this goal in mind, core area facilities have been planned to accommodate a high level of visitor interface for a high quality experience.

1. ATV Rider/Visitor Facilities and Services

Within the core area there will be the following facilities to manage and operate the Park and to satisfy the needs of visitors.

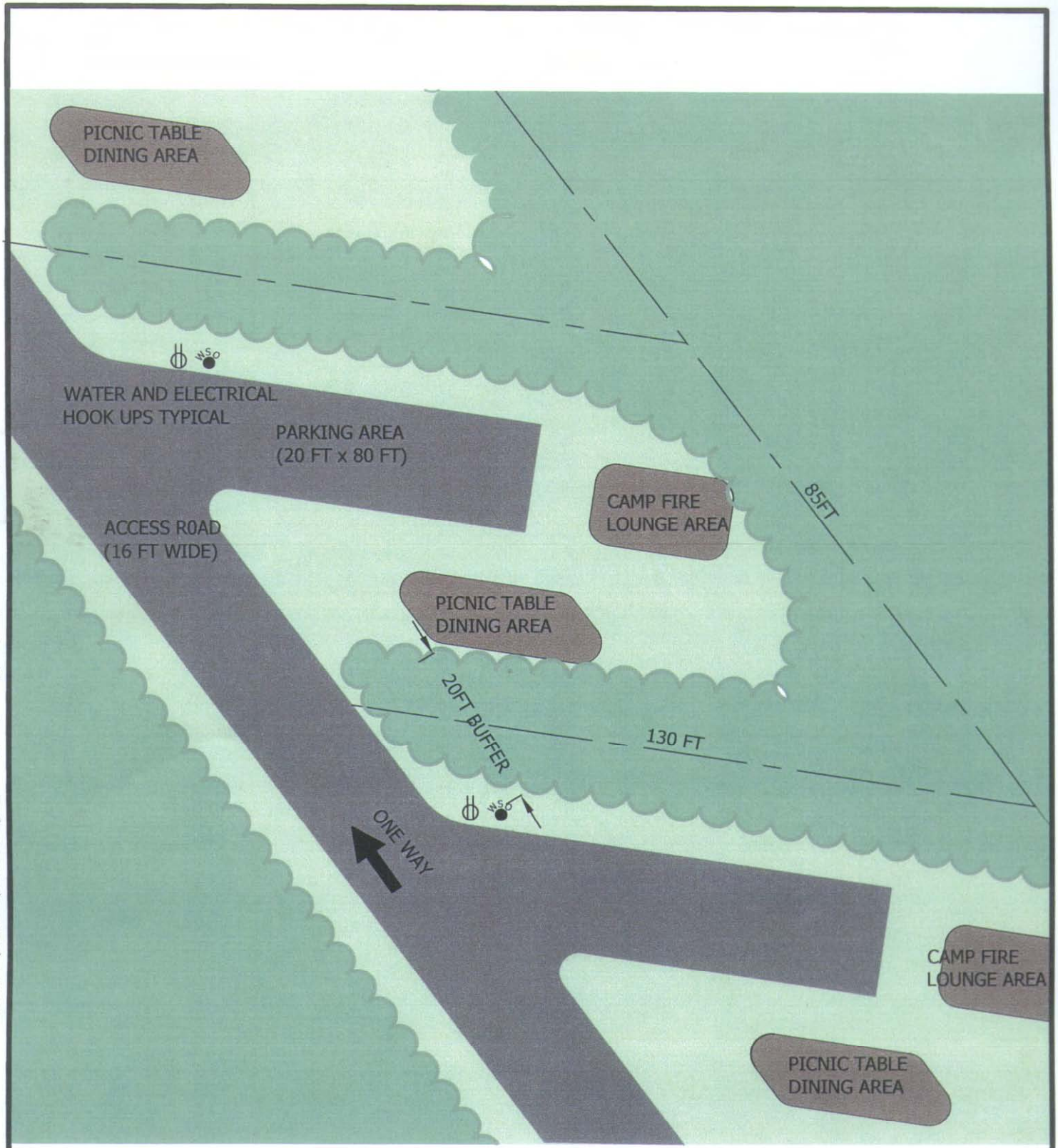
- Main Gate House – An entry feature/gate house will provide visitor information, issue passes and collect fees, and provide directions to users on how to access the Park's facilities.
- Main Parking Lot– A total of 160 parking spaces will be available in a new parking lot to the northeast of the existing parking lot; the 160 spaces at 10'x 46' will be double length to accommodate a vehicle and trailer. There are up to eight load/unload ramps positioned within the parking lot. The parking lot does not need to be paved; a well-drained gravel surface will be sufficient.
- Beach/Day Use Parking – An additional 30 spaces are provided near the beach/day use area for the use of non-ATV day visitors.
- Lake Jericho – This 120 acre pristine lake has awesome views and a natural shoreline that will be attractive for non-motorized canoeing and boating. There is a beach for swimming, there is good fishing in the lake, and the natural beauty of the scenery will be attractive for leisure boating.
- Boat Ramp – The existing boat ramp/landing area should be upgraded. Vehicles towing boat trailers should store their vehicle and trailer in the main parking lot after unloading.
- General Store – A 2,500 square foot general store will provide deli-type food to go, other food and convenience items, small repair items, air pump, clothing items related to ATV use, trail maps, etc. It is likely that the State will construct and own the building while choosing to lease the operation of the general store to an outside concessionaire.



horizons Engineering llc

FIGURE 6
TYPICAL TENT CAMP SITE

R:\06155 DRED - ATV Park RFP\DWGS\BASE\usgs_base_map.dwg, 11/29/2006 3:46:23 PM, dbouchard



horizons Engineering PLLC

FIGURE 7
TYPICAL RV CAMP SITE

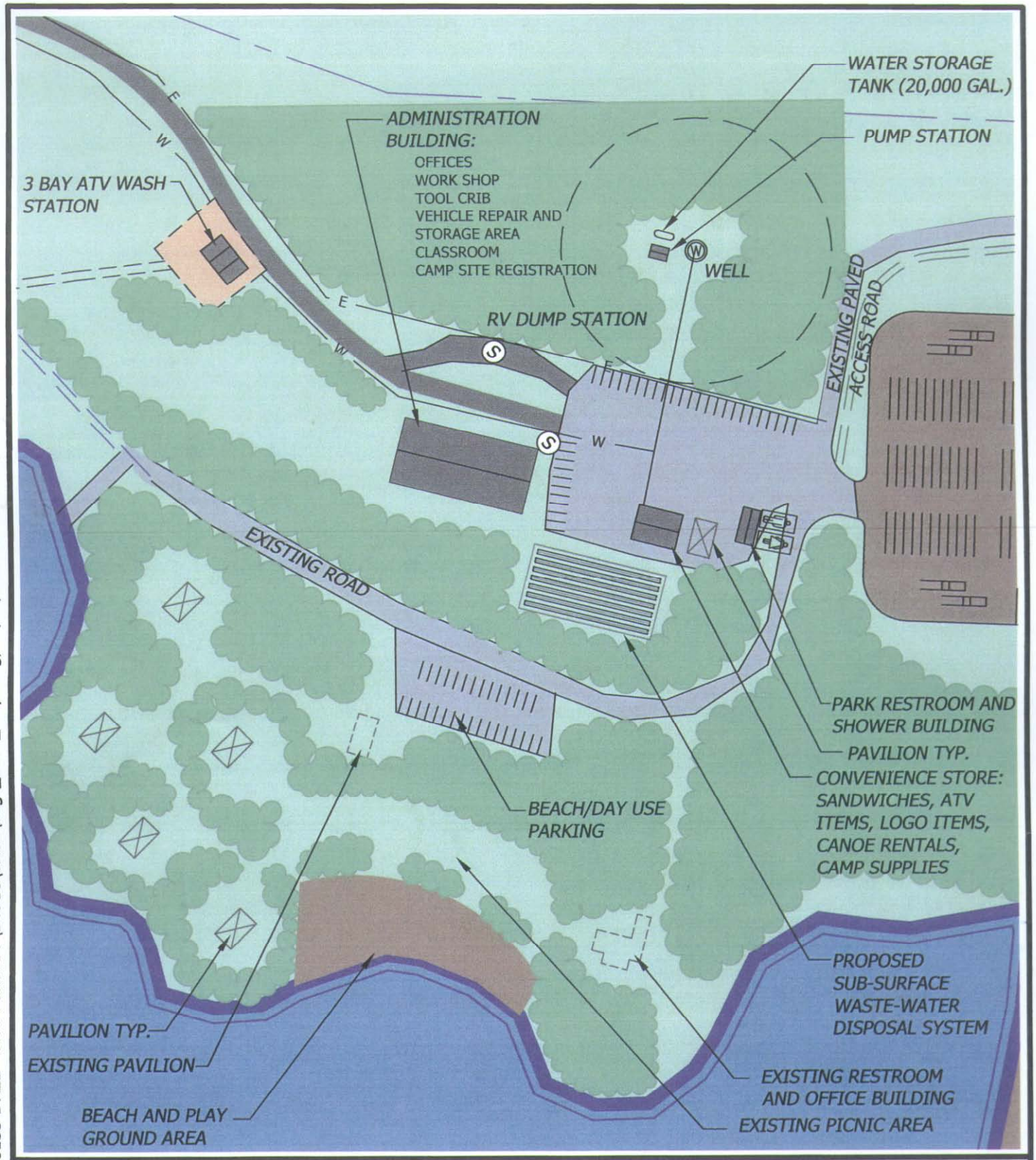
- Public Washrooms, Showers, and Laundromat – The core area will have public restroom facilities plus pay-per-use showers and a Laundromat. The footprint of the washroom and laundromat building is about 20' x 40' or 800 square feet. The public washroom facilities should have the following number of toilets, urinals and wash basins:

	Toilets	Urinals	Wash Basins
Men	3	3	4
Women	6		6

- Park Administration Building – This will be a multi-purpose building that may have a rustic character similar to the Park Headquarters building at Cannon Mountain/Franconia Notch State Park. The total square footage of this two-story building shall be in the order of 7,820 square feet (rounded up to 8,000 square feet). The following services and functions will be in this building:
  - Visitor/Welcome Center 300 SF
  - Public Washroom (ADA compatible) 70 SF
  - Offices, 4 400 SF
  - Staff Room 450 SF
  - Class Room 1,200 SF
  - Storage 300 SF
  - Maintenance Shop 5,000 SF
    - 4 work bays
    - Signage Shop
    - Parts and Equipment Storage
    - Employee Washrooms
  - Total Square Footage 7,820 SF
- ATV Wash Station – A three-bay, coin operated, low volume/high pressure wash station will be available for visitor's use. Due to environmental permitting requirements a sealed collection tank will be necessary. The tank will need to be emptied at regular intervals.
- RV Waste Disposal Station – RV campers will use this sewage disposal station. Sewage will be treated in the same subsurface system that is designed to treat sewage from the other core area facilities (as shown on the Core Area Concept Plan).
- Event Area and Mud Pit – An approximately seven-acre open area will be constructed for special events.
- Beach, Boat Landing and Picnic Pavilion Area – The core area will have a large, well landscaped area for visitors to use the beach, the boat landing and the picnic areas. A number of covered pavilions will be available for groups to rent or for use by the general public.

2. **Educational Facilities**
   There is a well established goal within the New Hampshire Division of Parks and Recreation that there should be appropriate measures taken to ensure adequate OHRV rider education and safety training. A portion of OHRV registration fees are dedicated for this purpose and the New Hampshire Fish and Game Department is responsible to implement safety education programs. To this end, the master plan identifies classroom space in the Park Administration Building to hold 25 to 30 students at one time for safety education. Additionally, the master plan shows an area roughly the size of a football field that would be used for rider training. Although it is further from the core area, the Junior riding trail may also be used for rider training, particularly for young riders.

***Figure 8**, Central Core Area Concept*, on the following page shows the placement and composition of the key elements of the central part of the Park core.



horizons Engineering PLLC

FIGURE 8
CENTRAL CORE AREA CONCEPT

R:\06155 DRED - ATV Park RFP\DWGS\BASE\usgs_base_map.dwg, 11/29/2006 3:40:41 PM, dbouchard

V. MANAGING THE PARK

A. Participating Government Agencies

There will be a number of agencies at many levels of government that will have direct or indirect roles in the on-going development and management of the Jericho Mountain State Park. Many of these agencies currently have representation on the State Park at Jericho Lake Advisory Committee noted below. The agencies and a general description of their role are described below.

Department of Resources and Economic Development (DRED) - DRED is the lead department with responsibility for the acquisition, development and management of Jericho Mountain State Park. DRED is comprised of a number of divisions that are involved with the Park, including:

- Division of Parks and Recreation – Parks and Recreation, through the Bureau of Trails, has the majority of responsibilities related to the Park. Parks and Recreation is responsible for administering the property, collecting and accounting for fees and for other financial aspects of the Park operations, taking reservations for the campgrounds, providing staff for the management and operation of the park, and contracting of construction activities.
  - The Bureau of Trails is the lead agency for the Park with the mandate to carry out the responsibilities of the Division of Parks and Recreation. In addition to their administrative and management responsibilities, the Bureau of Trails will have responsibilities for enforcement of off-highway regulations in the Park (in conjunction with the Fish and Game Department)
- Division of Forests and Lands – Forests and Lands has oversight of the management of the State-owned land including the legal aspects of ownership and decisions regarding future land uses such as logging. Forest Rangers from this division may provide resources for law enforcement in the Park.
- Division of Economic Development – The mandate of this division is to provide guidance to help businesses recognize and/or create local, regional and international opportunities to grow an existing business or start a new venture. The division helps to guide business owners towards grant programs, educational resources, and marketing opportunities. As stated elsewhere in this report, there will be significant economic benefits to the region as a result of the development and operation of Jericho Mountain State Park. Existing and potential local and regional businesses will have numerous opportunities to utilize the resources of the Division of Economic Development.
- Division of Travel and Tourism Development – This division will have the primary responsibility to undertake marketing and promotional initiatives related to the Park. This division will establish strategic and tactical marketing strategies to attract visitors to the Park and the North Country through advertising and public relations, traveler advisory services, print and internet marketing and support for businesses and organizations operating in the regional travel and tourism industry.

New Hampshire Fish and Game Department – As the guardian of the State's fish, wildlife and marine resources, the Fish and Game Department works in partnership with the public to:

- Conserve, manage and protect these resources and their habitats;
- Inform and educate the public about these resources, and;
- Provide the public with opportunities to use and appreciate these resources.

There are two divisions within the Fish and Game Department that will have responsibilities at Jericho Mountain State Park.

- The Law Enforcement Division has responsibility for OHRV registrations, safety, enforcement, and education related to off-highway recreational vehicle regulations. The Fish and Game Department anticipates that the primary responsibility for enforcement of rules within the Park will be contracted to the City of Berlin Police Department.
- The Wildlife Division manages and maintains the State's game and non-game species at levels consistent with available habitat, and promotes the security of that habitat. As such, the Wildlife Division will have responsibility for oversight of the wildlife habitat within the Park and on adjacent private property.

New Hampshire Department of Environmental Services (DES) – The protection and wise management of the State's environment are the goals of the Department of Environmental Services. The Department has a wide range of responsibilities covering water quality, air pollution, waste management, and managing water resources. DES has three divisions: Air Resources, Waste Management, and Water. Within the Jericho Mountain State Park the Water Division will have responsibility for oversight, permitting, and compliance of water supply and pollution control, and wetlands.

New Hampshire Department of Transportation (DOT) – The DOT District One office in Lancaster will have responsibility for oversight and permitting of the Park access road and designated ATV road crossings.

State Park at Jericho Lake Advisory Committee – The Advisory Committee is a multi-jurisdictional committee whose members have been appointed by the Governor. The committee was initially formed in June 2006; it has a three year sunset. The purpose of the committee is to provide a wide range of oversight to the planning and development process of the new riding area and State Park.

B. The Host Club

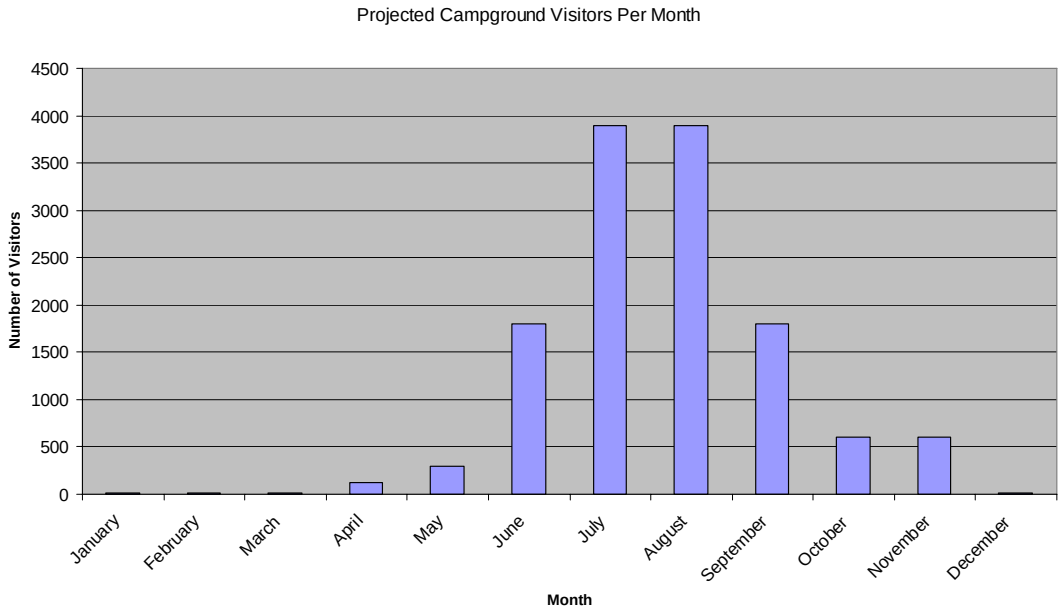
In August 2006, the State entered into a Memorandum of Agreement for Trail Monitoring and Maintenance with the Androscoggin Valley ATV Club (The Club) whereby The Club will act as the host club for the Park.

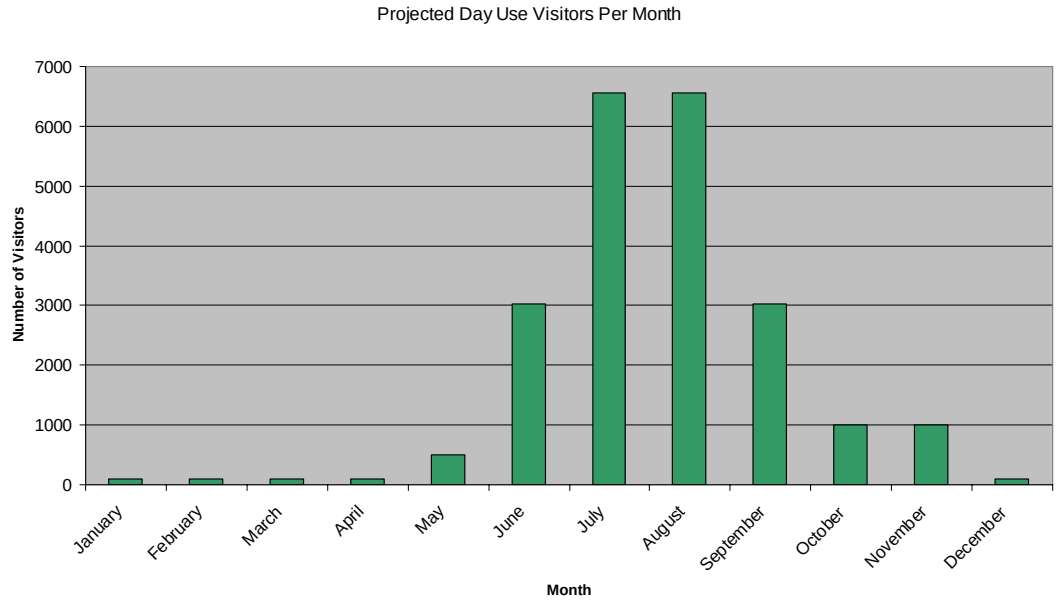
The Memorandum of Agreement assigns certain rights and responsibilities to The Club for a three year renewable period. In summary, the rights and responsibilities of the host club as identified in the Agreement are:

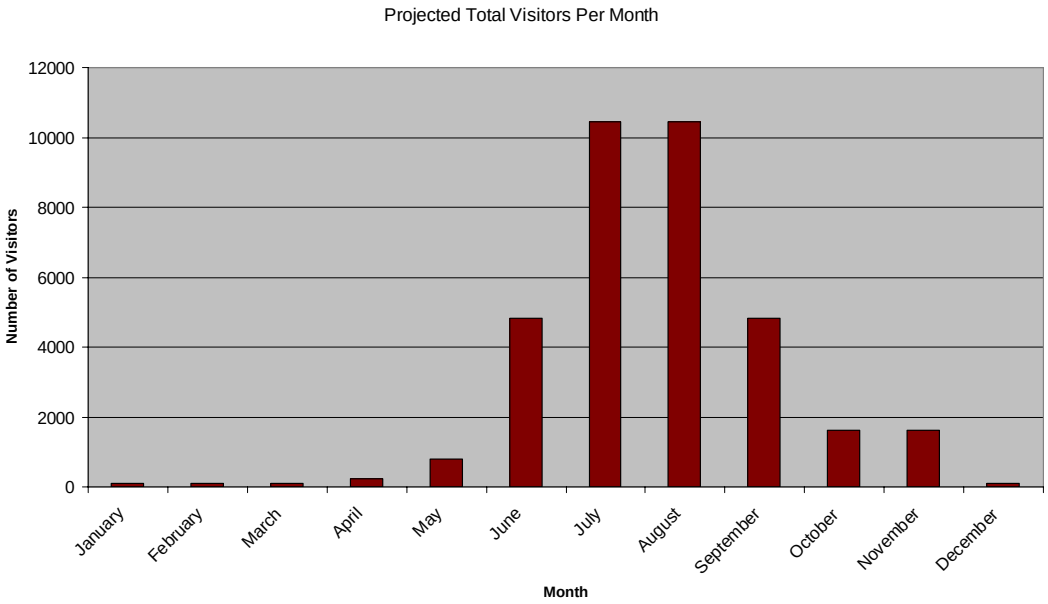
- To work cooperatively with the State in providing and maintaining an environmentally-sound, safe, functional, attractive, and user-friendly OHRV trail system.
- Exclusive rights to operate, manage, maintain and use, and to uphold the public right to use the trails, all in cooperation and coordination with the State.
- The trails will be open for OHRV seasonal use during the period May 23rd, or after continuous snow cover has melted, subject to closure as described in the Agreement. The trails are open to public use for non-motorized uses and are not limited to exclusive use by The Club.
- The Club shall work cooperatively with the State to mitigate the impact of the trails on natural resources and other uses of the property.
- The Club shall assist the State in maintenance of the trails and may apply for Grant-in-Aid funds for projects. The Club shall use best management practices as described in *Best Management Practices for Erosion Control during Trail Maintenance and Construction.* See ***Appendix I*****V**.
- The Club shall monitor trail use in cooperation and consultation with the State and communicate with users of the trails to promote public safety and ensure that ecological conditions are not substantially diminished by OHRV use.
- The Club will submit to the State an annual Trial Maintenance Work Plan.
- The Club will conduct an OHRV User Education program as prescribed by the State, known as the *Volunteer Trail Patrol Program.*
- Prior to designated use of the trails, the state shall mark the trails in accordance with the *Trail Signing Handbook; Guidelines for Signing Wheeled OHRV Trails.*

C. Park Operations

It is anticipated that upon full build-out, Jericho Mountain State Park will be operated as a year-round facility. Peak visitor volume will occur during the summer months of July and August, with visitation falling off in the spring and fall. It is likely that as a result of winter recreation activities such as snowmobiling, ice fishing, and limited winter camping, the Park will still receive a small number of visitors during the off-season. Depending on weather conditions, the lowest traffic period will occur during the early to mid spring immediately following the close of the snowmobile season but before the ATV trail network can be opened. An estimate of Park visitor volume by month has been prepared for use in the Park financial models based on an assumed utilization percentage of the projected comfortable carrying capacity of the trails and the average occupancy of the campground. The models indicate that average monthly visitor volume will reach 65% of the facility's capacity during the peak months of July and August.


Projected Campground Visitors Per Month
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Number of Visitors
January
February
March
April
May
June
July
August
September
October
November
December
Month


Projected Day Use Visitors Per Month
7000
6000
5000
4000
3000
2000
1000
0
Number of Visitors
January
February
March
April
May
June
July
August
September
October
November
December
Month



The average total daily visitor volume will vary widely, with the campground and trail system reaching and potentially exceeding their comfortable carrying capacity during busy summer weekends. Mid-week days will see lower visitor traffic.

D. Staffing and Operations

The trend of daily visitor volume is expected to closely mirror that of existing New Hampshire State Parks. Therefore, campground and core area staffing needs will closely follow those of similar State Parks with the exception of the particular needs of the ATV trail system.

Using data from Pawtuckaway State Park, the closest analogy to the Jericho Mountain facility identified in the New Hampshire State Park system, it is anticipated that approximately 30 part-time seasonal staff members will be required to operate the campground and core area during peak visitation periods. These staff members will likely work an average of 20 hours per week each. Staffing will include positions for lifeguards, security, maintenance, housekeeping, and administration. All core area operations, with the exception of the general store, will be completed by in-house staff. It is our opinion that the general store should be operated as a private concession, and therefore will be staffed by an outside vendor. A total of 2,400 part-time staff hours per month are anticipated during the peak summer season. A minimal number of part-time staff will be required during the off-season, including the winter months. As such, approximately 5 part-time staff working 20 hours a week may be required for the off-season, resulting in a total of 400 part-time staff hours per month.

Additional dedicated staff will be required to maintain the ATV trail network. As such, a total of four full-time seasonal staff members working approximately 640 staff hours per month are budgeted for trail maintenance. Seasonal trail maintenance staff will be required from snow-out in late April or early May through October. Only minimal trail maintenance is expected during the period from late fall through early spring.

Many of the existing and proposed ATV trails will be open and maintained for use by snowmobile and ATV enthusiasts throughout the winter months when there is sufficient snow cover. The Bureau of Trails has stated that there will be no fees for winter use of trails.

In order to coordinate operations in both the core area and trail network, two management positions will be required. A senior Park Manager will manage overall operations at the Park including those of both the trail network and general core area. An assistant manager will be needed to focus solely on operations of the campground and core area facility. Both are expected to be full-time, year-round positions with benefits.

E. Enforcement of Rules

The New Hampshire Fish and Game Department will have the primary responsibility to undertake the enforcement of rules and regulations on the trails and at the Park. It is anticipated that a full-time presence by enforcement officials will be necessary during the prime riding season. The full-time presence will be comprised of staff resources from several different entities. The Fish and Game Department, the Berlin City Police Department (under a contract with Fish and Game) and the Bureau of Trails will coordinate to provide the necessary resources for adequate coverage during the peak periods.

VI. CAPITAL COSTS AND PHASING

A. Opinions of Construction Cost

Engineering opinions of cost were prepared for each of the proposed infrastructure items associated with the development of Jericho Mountain State Park. The opinions of cost were developed using recent bid-based unit costs for similar infrastructure projects, along with information provided by NHDRED and numerous vendors. Where possible, costs are represented in a unit form (i.e. per mile of trail, square foot of building, individual camp site, etc.).

The opinions of cost are represented in today's dollars, and a 15% contingency was built into each opinion of cost in an attempt to account for unanticipated site and economic conditions at the time of construction. The opinions of cost are intended to be used for planning purposes and do not represent actual quotes from vendors and/or contractors. Also, these costs assume that contracted labor and materials are used for construction of the entire facility, including the trail network, i.e. volunteers and internal labor forces have not been considered..

Opinions of cost were developed by grouping related buildings, improvements, and infrastructure items together. These groups are summarized as follows:

Site Work-Includes construction of access roads and parking;

Utilities-Includes construction of the water system (well, pump house, and storage tank), water main to the buildings and campground areas, wastewater disposal systems (3 total), and electrical service;

Buildings- Includes construction of the Gate House, Administration/Shop Building, General Store, Restrooms and Showers, and Picnic Pavilions;

Camp Sites- Includes construction of the RV, Tent, and Remote campsites;

Miscellaneous – Includes improvements to the beach area, construction of the playgrounds, a modular 3-bay ATV wash station, and the event area and mud pit;

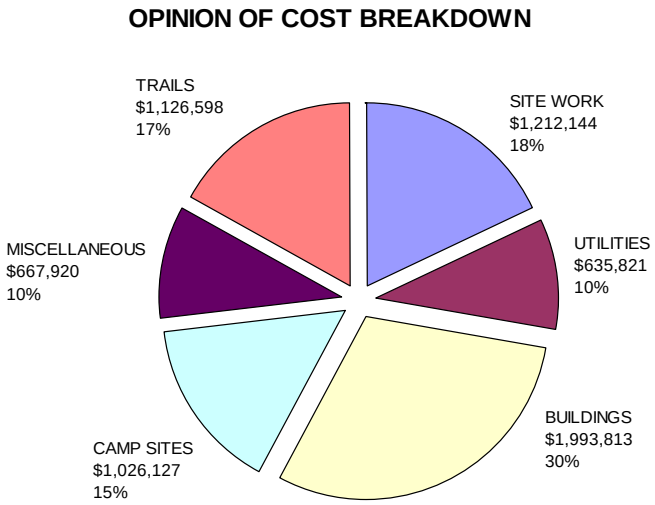
Trails- Includes upgrade of existing roads to green trails, and construction of new blue and black trails and eight trail-side picnic/viewing areas. Four of the trail-side picnic areas will have remote-style toilet facilities such as the Clivus

The Opinions of Cost are summarized as follows:

Item	Opinion of Cost for Construction (rounded)
Site Work	$1,212,000
Utilities	$636,000
Buildings	$1,994,000
Camp Sites	$1,026,000
Miscellaneous	$668,000
Trails	$1,127,000
TOTAL OPINION OF COST	**$6,663,000**

A detailed breakdown of all sub-items contained in each item is presented on the Opinion of Cost Construction Cost Summary and Phasing Sheet, appended for reference. Individual Opinions of Cost for each of the project items are also appended for reference.

The percentage of cost of each of the sub groups is summarized in the chart below:



B. Construction Phasing

Due to the significant size and cost of the overall project, it would not be practical to construct all aspects of the project during one construction season. Therefore, a five-year phasing plan has been developed. This plan focuses on construction of the primary attractions to the Park, including the trail network and camp sites and the less capital-intensive areas of the campground, early in the process. Other amenities that add to the experience of the facility but that are considered lesser priorities are proposed later in the construction schedule. In addition, focusing on the trail and campground construction first allows park revenue to be maximized through the build-out process. The proposed 5-year phasing plan is as follows:

Year 1 – As will be discussed further in Section IX of this plan, current NH Statutes limit total allowable trail construction to approximately 70 miles. Also, significant engineering, design, and permitting will be required for construction of the roads, parking, and utilities. Therefore, only minor temporary improvements such as a temporary field office and equipment area are proposed along with the trail construction for the first year. The costs for temporary improvements are not reflected in the capital construction costs, but are included in the financial models outlined later on in Section VII of this plan.

Proposed construction projects and associated costs (rounded to the nearest $1000) for year one is as follows:

Project Item	Opinion of Cost for Item
Approximately 33 miles of new Blue Trail, 4.6 miles of mountain bike trail, 2.8 miles of new Black Trail, and upgrade approximately 15 miles of existing logging road to Green Trail	$423,000
Total Opinion of Cost Year 1 (rounded)	**$423,000**

Year 2 – During Year 2, the construction of critical infrastructure items is proposed, along with a complete build-out of the trail network and remote campsites. In addition, partial construction of the tent and pop-up camper sites and RV sites is proposed. Proposed construction projects and associated costs (rounded to the nearest $1000) for year two are as follows:

Project Item	Opinion of Cost for Item
Remaining Black Trails and Blue Trails	$622,000
All campground roads and parking	$1,212,000
Water System and Core Area wastewater system and electrical service	$636,000
Gate House, and Core Area restroom buildings	$252,000
Approximately 26 remote campsites 47 tent/pop-up camper sites, and approximately 40 RV	$568,000
Total Opinion of Cost Year 2 (rounded)	**$3,290,000**

Year 3 – Year 3 is proposed to include continued expansion of the campground through complete build-out of the tent/ pop-up camper sites, along with construction of the Administration Building, store, wash station, and pavilions. Proposed construction projects and associated costs (rounded to the nearest $1000) for year three are as follows:

Project Item	Opinion of Cost for Item
Administration Building, store, additional restroom buildings, and all pavilions	$1,742,000
Remaining 47 proposed tent/ pop-up camper sites	$123,000
ATV Wash Station	$316,000
Total Opinion of Cost Year 3 (rounded)	**$2,180,000**

Year 4 – Year 4 construction includes total build-out of the campground RV sites. Proposed construction projects and associated costs (rounded to the nearest $1000) for year four are as follows:

Project Item	Opinion of Cost for Item
Complete RV campsites	$335,000
Total Opinion of Cost Year 4 (rounded)	**$335,000**

Year 5 – Year 5 construction includes the completion of the entire Jericho Mountain State Park facility. Major items include construction of the event area and mud pit, trailside rest areas, beach upgrades, and playgrounds. Proposed construction projects and associated costs (rounded to the nearest $1000) for year five are as follows:

Project Item	Opinion of Cost for Item
Beach Improvements	$37,000
Playgrounds	$122,000
Event Area and Mud Pit	$192,000
Trailside Rest Areas	$81,200
Total Opinion of Cost Year 5 (rounded)	**$436,000**

VII. ECONOMIC MODELS

In order to assess the financial viability of the proposed Park facility, conceptual operating income and expense models were prepared based on potential revenue streams associated with the proposed Park, and estimated expenses associated with the operation and maintenance of the Park core area and trail system. The models were constructed using existing financial information from Pawtuckaway State Park as a base. As the Pawtuckaway State Park campground is similar in size to the proposed Jericho Mountain facility, it appears that operational parameters, including fee structure and operating costs, would be similar.

While the Park is anticipated to be primarily a warm-weather destination, the models were structured assuming year-round operation. Individual financial models were developed for each of the five years of phased Park build-out. The models assume that all construction costs will be directly allocated to the Park in the form of commercial financing, and that the Park operations will be solely responsible for service on this debt. Capital costs are represented in the first five years of operation only as interest expense for cumulative construction costs for each year. A sixth model was constructed that represents operation beyond the five-year construction period through year 10 of the Park's operation. The Year 6-10 model includes interest expense and capital amortization based on common commercial financing terms, including a 20 year loan for core area and trail construction financed at 7.5% annual interest. The interest to capital expense ratio is represented in the model as the ratio in the first loan payment and does not vary during the modeled year. The loan expense was represented in this manner in an attempt to simplify the model and provide a consistent expense each operating month. Overall, the financial models are represented in today's dollars and do not account for inflation. **The six individual annual operations models are appended for reference.**

A. Revenue and Expense Assumptions

Each annual model was constructed using anticipated revenue and expense criteria. The models were constructed with as much detail as practical in an effort to best represent actual Park operations. However, the actual operational costs are likely to be highly variable. Therefore, while budget numbers for items such as heating fuel, insurance cost, electricity, etc. are included in the models, these costs are only best estimates and will likely deviate during actual operation of the park.

1. Trail Revenue Sources

Models assumed that approximately $50,000 in grant/aid would be available on an annual basis from NHDRED. However, the models assumed that no additional revenue would be generated by the registration of ATVs and trail bikes.

Other trail-related revenue sources that were identified include the following:

4x4 Vehicles – Based on research, it appears that significant trail-related revenue could be generated by allowing 4x4 access to a portion of the park. The financial models were therefore constructed assuming that 4x4 access would be allowed on a day-use fee basis. Research on existing pay-for-use facilities and input from the 4x4 community suggests that a day use fee of approximately $25 per vehicle would be acceptable.

Special Events **–** Because of the diversity of the park's terrain, it likely will be a desirable location for numerous organized motorized and non-motorized events such as trail bike and ATV races, snowmobile events, 4x4 rock crawling competitions, mountain bike races, and numerous other activities. As such, revenue from these events was included in the trail operation budget. Based on research, it appears that the facility could expect to receive in the range of 10%-50% of the total gate fees, depending on the size and type of event. As such, several small, medium, and large-scale events were incorporated into the operating model at an assumed ratio of 20% of the total gate revenue, with an average gate fee of $15.

Industry Sponsorship **–** Several attempts were made to contact major companies in the ATV industry regarding possible sponsorship at the Park. Results of these attempts yielded only one response. The responding manufacturer's representative indicated that trail-related grants are available, but are typically awarded to clubs. As such, corporate trail sponsorship was not included in the operational model.

2. Park Revenue Sources

Numerous park-related revenue sources were identified and incorporated into the model. These sources included major and minor revenue streams typically associated with campground operation, as well as opportunities directly related to the motorized focus of the Park:

Camp Sites- The most significant revenue source for the entire Park is anticipated to be the campsites. Campsite fees were established for the park models based on current fees at existing NHDRED Parks. As with other DRED facilities, premium fees are proposed for remote sites and sites with RV hookups. Total fees from camp sites were modeled on a monthly basis using assumed average monthly occupancy rates for the campground. The occupancy rates were developed based on industry standards.

Facility Entrance Fee – As with other NH State Parks, an entrance fee is proposed to access the Park during warm weather months (May through October). For the purposes of modeling the finances of the Park, it is assumed that all persons that access the Park, regardless of whether they are parked at the core area or enter via ATV, trail bike, or other means will be required to pay the entrance fee. It is not specified in the model how these fees would be collected, and how this policy would be enforced. At this time, a fixed fee of $5 per entrant (this fee is waived for campground occupants) was included in the financial models. The number of entrants was modeled on a monthly basis using an estimated percentage of an anticipated utilization of the trail system comfortable carrying capacity and campground occupancy.

Concession – It is anticipated that due to the relatively high volume of traffic that is projected for the core area of the Park, a convenience store and deli would generate reasonable revenue and would likely be profitable. As the operation of such facilities is relatively specialized, the financial models assume that a store building would be constructed, but operation of the store would be offered as concession. The model therefore includes a concession agreement based on monthly rental fee plus 10% of store profits.

ATV Wash - Due to the relatively high volume of ATV traffic anticipated at the core area of the Park, an ATV wash facility is proposed. The profitability of such as wash station appears to be somewhat limited due to high operational costs. However, the presence of such a facility would likely represent a desired amenity and therefore one was included in the financial models. Revenue from the ATV wash was modeled as a fixed fee per wash. The number of washes was assumed to be 20% of the average monthly capacity of the Park.

Park-Related Rentals and Minor Fees – Several minor revenue sources were identified in association with the operation of the campground and beach area. Such sources that were included in the financial models include pavilion rental, canoe and kayak rental, and bath house revenue. These fees were modeled based on a percentage of the anticipated occupancy of the Park campground.

3. Trail Expenses

For the purposes of the financial models, it was assumed that all expenses related to the maintenance of the trails within the Park would be the financial responsibility of the Park. As such, a staff of four full-time seasonal employees was included in the model to maintain the trail network, along with cost items for supplies, equipment, and shop related items. In addition, an expense item for a heavy equipment subcontractor was included for the peak operational months for major trail repairs. No volunteer maintenance of the trail network is included in the models. While it is likely that the volunteer effort will be relatively significant, this effort could not be quantified at this time and therefore was not included. Also, no enforcement costs were included in the models.

It is assumed that trails enforcement will be completed within the current registration fee allocation without resulting in direct cost to the Park or trail network. The required staffing and related expenses were developed using information provided by various sources including ATV user groups and contractors. In addition to maintenance-related expenses, line items for interest expense (all models) and capital amortization (6-10 year model only) were included to account for trail construction financing, if it is required.

4. **Park Expenses**
   General operational expenses for the Park were included in each of the operational models in proportion to the projected occupancy of the Park based on the number of available campsites and miles of trail open for use for each of the model years. Individual expenses were included based on a pro-rata of expenses recorded for Pawtuckaway State Park. Additional expenses were also added to account for the increased size of the facility, and additional amenities. Also, as with the trail expenses, interest expense only was included in the 5 construction year models and both interest expense and capital amortization were included in the 6-10 year model.

B. Model Results

Model results indicate that both the Park and trail network will experience an operating loss during the construction phase. This is entirely the result of the high capital costs required early on in the phased construction program, and low revenue generation during the same period. The year 6-10 model, which is considered to represent the operation of the Park following full build-out, also indicates an annual operating loss. This loss is solely a result of the inclusion of construction financing costs in the operating budget. **The six individual annual operations models are appended for reference.** A summary of the revenue and expense models by year is as follows:

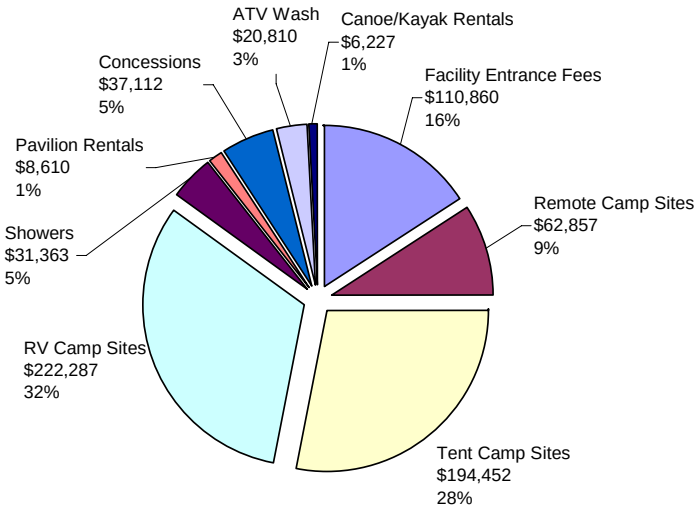
REVENUE AND EXPENSES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEARS 6-10
Park Revenue	$4,200	$177,135	$371,589	$542,469	$776,868	$777,061
Trail Revenue	$52,250	$56,563	$112,250	$112,250	$112,250	$112,250
Park Expenses	$227,298	$535,757	$833,981	$859,080	$882,094	$1,012,023
Trail Expenses	$119,399	$201,909	$188,470	$189,842	$189,842	$261,315
A - Net Gain (Loss)	($290,247)	($503,969)	($538,612)	($390,142)	($236,496)	($384,027)
B - Net Gain (Loss)	($290,247)	($225,425)	($96,494)	$77,074	$263,186	$256,779

*Notes: Net Gain A includes interest expense for all years and capital expense for years 6-10. Net Gain B does not include interest or capital expense.

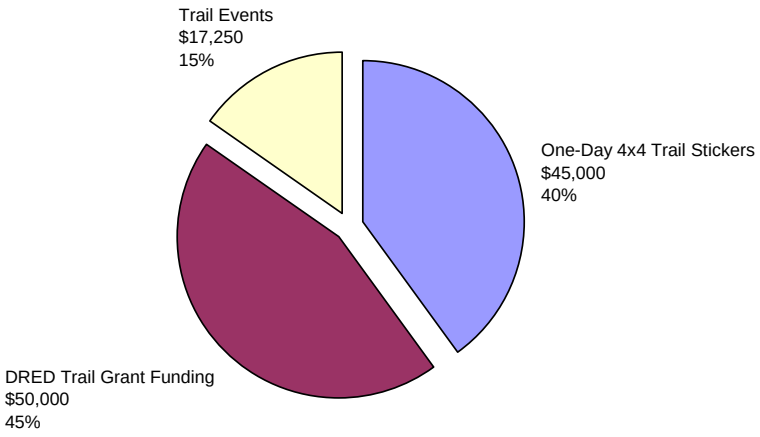
It should be noted that the model indicates that the park and trail network overall experienced a net profit for Year 4, Year 5, and Years 6-10 if interest expense and capital amortization are not considered. Also of note is that the Line B Net Gain dropped between Year 5 and Years 6-10. This is caused by the construction and operation of items not directly related to revenue generation including the playgrounds and event area. In general the model suggests that the campground will be the most significant source of revenue for the Park, followed by the facility fee. All other revenues areas are minor but important to the overall attraction and user satisfaction of the Park.

The magnitude of revenue generated by the individual revenue sources varied widely for both the core area and trails operation. The charts below depict the relative proportions of each of the revenue sources for the two operational units of the Park.

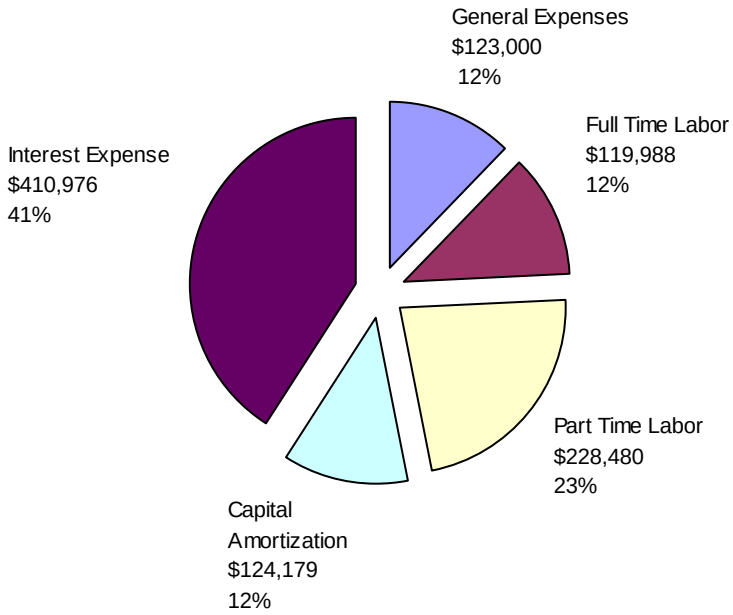
CORE AREA REVENUE BY SOURCE



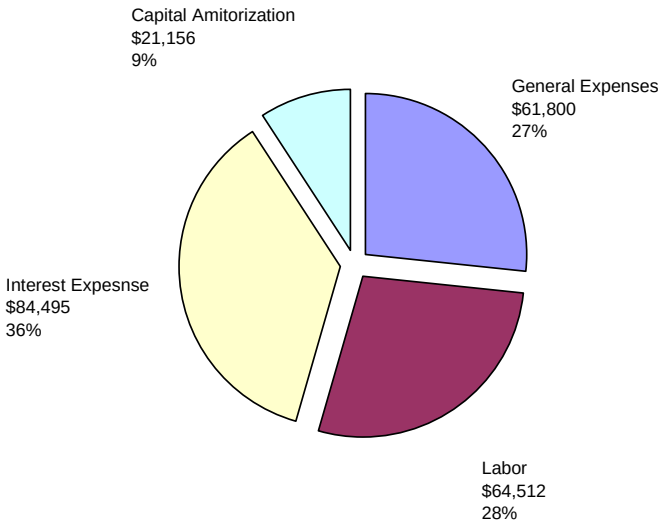
TRAILS REVENUE BY SOURCE



CORE AREA EXPENSES BY SOURCE



TRAILS EXPENSES BY SOURCE



As indicated in the Core Area Revenue Chart, approximately 69% of the modeled revenue is the result of camping fees. Facility entrance fees represent only 16% of the core area revenue, and all other revenue sources combined represent only 15% of the total core area revenue.

Trails revenue is dominated by DRED Trail Grant Funding, which comprises approximately 45% of the overall trail funding. However, this is almost equaled by the anticipated revenue from 4x4 fees, which comprise 40% of the modeled trail revenue. Event revenue, at 15% of the total, represents a relatively small portion of the total. Overall, combined debt service comprised 53% of the total annual expenses for the operation of the core area, and 45% of the total annual expenses for the trail network. Labor costs were the second largest expense, comprising 35% and 28% of the total annual expenses for the core area and trails, respectively.

C. Financial Conclusions

Model results indicate that, while the Park operation would result in a net annual loss, this loss is solely the result of the cost of constructing the facility. If more agreeable finance terms and/or outside funding can be obtained for the initial construction of the Park, the Park has the potential to act an overall revenue source for NHDRED.

Other conclusions from the models are as follows:

- The store, ATV wash, and several minor amenities proposed for the Core Area are represented by the model as being either only slightly profitable or a net operating loss. However, these features are important to the overall appeal of the Park and therefore indirectly affect revenue. As such it appears that they should remain as part of the development plan.
- It appears that 4x4 truck access to the Park would result in a significant revenue source that can be directly allocated to the trail network. As this type of activity requires only a relatively small trail network compared to ATVs, the direct cost associated with 4x4 use would be relatively small, resulting in a relatively high profit margin for this activity.
- The facility fee represents a moderate proportion of the overall revenue for the park. However, it is still a significant source of revenue and therefore will likely be important to the overall financial health of the facility.
- The operation of the campground is clearly the primary revenue generator for the facility. Therefore, operational efforts for the Core Area should focus on maintaining a high occupancy rate in the campground.
- Volunteer labor and other funding sources for the construction and maintenance of the trail network could make a substantial difference in the operational budget of the facility. If the volunteer effort is high enough, it may be possible for the trail network to act as an overall revenue source for the Park, instead of the loss indicated by the financial models.

D. Regional Economic Benefit

Park visitors are likely to provide a significant economic benefit to the communities in the Berlin area. According to a 2004 study of the impact of ATV and trail bike spending in New Hampshire completed by Plymouth State University, the sum of the indirect and induced spending by ATV recreation in the state resulted in an additional $1.57 generated within the State economy for every $1.00 of direct spending by ATV enthusiasts. The annual gross revenue for Jericho Mountain State Park at full build-out is approximately $889,000. Assuming direct spending is limited to revenue at the Park, the region would gain approximately an additional $1,396,000 annually in economic benefit from indirect and induced spending through sales at hotels, restaurants, stores, vehicle service stations, etc.

Job creation is another aspect of the regional economic benefit that will result from the construction and operation of the Park. Not including jobs created during construction of the Park, for each job created in the Park operation another 1.7 jobs will be created in the region as a result of indirect and induced spending at businesses outside the Park. During the peak summer months there will be approximately 20 full-time equivalent jobs at the Park (in the core and on the trails). This will result in the creation of an additional approximately 34 full-time jobs throughout the region as a result of the indirect and induced impact.

VIII. STATEGIC ACQUISITIONS BY THE STATE

Due to the projected growth of ATV recreation in New Hampshire, it appears that the demand for trails in the Berlin area will eventually exceed the capacity of the Jericho Mountain trail network as it is currently proposed. Additional land and trail easement acquisitions should therefore be considered a critical part of the overall master plan for Jericho Mountain State Park. The proposed generalized acquisition strategy is summarized for the two Park parcels as follows:

Parcel 1 (east of Rt 110) – Parcel 1 is bounded primarily by medium-sized rural properties on all sides. Optimal expansion of the trail network in Parcel 1 would feature land acquisitions or trail easements to the north and east/southeast. In addition to adding land for trail expansion within the Park, expansion to the north would assist in the potential future interconnection to the existing Millsfield and Stratford trail networks. Expansion to the south in the vicinity of Mt. Jasper would assist in potential future trail access to the City of Berlin and the existing Success Pond trail network.

Parcel 2 (west of Rt 110) – Parcel 2 is bounded by the National Forest to the west, medium to large private parcels to the north and south/southeast, and smaller private parcels to the east along Rt. 110. As the present White Mountain National Forest management plan does not include provisions for wheeled motorized recreation, the primary expansion opportunities would be to the north and south/southeast. Acquisitions and trail easements to the south and southeast in the area of Jericho, Sugar, and Forest Mountains would be strategically important as they would allow trail access to additional prime view areas and assist in ultimately developing trail access to the City of Berlin, Moose Brook State Park, and Town of Gorham.

IX. REVIEW OF CURRENT PROCESS FOR DEVELOPMENT OF ATV TRAILS ON PUBLIC LANDS

A critical intent of the master plan is to optimize the number of miles of trails in the Park in order to create an attractive and pleasurable experience for public use and to protect the ecologically important areas within the Park.

As the land is owned by the State of New Hampshire all proposed trails must meet New Hampshire Statute 215-A and specifically Sections 215-A:41-43. The following is a brief summary of these statutes.

Section 215-A:41 identifies the general intent of the statute, which is broken down into two subsections. The first sub-section indicates that the general court has declared that it is in the public interest to balance the demand for ATV use with other non-motorized recreational trail uses, potentially conflicting management goals for land use, and the protection of wild life and ecologically important areas. The second sub-section indicates that all state agencies that are custodians of the property will work to develop trail systems on public and private land that use private lands under voluntary agreement with land owners, use public lands that are suitable for ATV trails that are compatible with existing management goals and plans, are managed cooperatively with ATV clubs recognized by the Bureau, are monitored for over use and environmental degradation with curtailment of trail use if such conditions are found to exist, ensure safe and legal use consistent with laws set forth, and provides opportunities for public input in all decisions regarding development of new or revised trail systems.

Section 215-A:42 identifies the 4 conditions required for a state-owned property to establish ATV trails (which include meeting the coarse and fine filter criteria under section 215-A:43); the 3 conditions when a state-owned property may be closed to ATV use; and how and when the Bureau may permanently close a trail system.

Section 215-A:43 describes the 2 step evaluation process used to determine whether or not land is deemed appropriate for ATV trail development. The first step is defined as the coarse filter criteria and consists of 6 sub-sections. These 6 sub-sections are defined as: there shall be no deed restrictions, laws, or funding restrictions that prohibit ATV use on the property; less than 90 percent of the property consist, in combination, of exemplary natural communities identified by the Natural Heritage Bureau, the survival and breeding of endangered species, and forested wetlands consisting of group IIB soils as mapped by the Natural Resources Conservation Service; the self contained trail system is on at least 700 contiguous acres; if the trail is to be a corridor link, the trails to be connected exist or will exist when the link is established; the use of ATVs on the property does not conflict with the intent of the purchase of the land by the State; and the use of ATVs on the property is not prohibited by an existing management plan for the property.

Based on information, provided by the Department of Resources and Economic Development (DRED), the Jericho Mountain State Park land meets the coarse filter criteria. Therefore, under Statute 215-A:43 the master plan for the park will proceed to step 2 of the process and attempt to meet the 29 fine criteria set forth by Statute 215-A:43 II. Data for this section of the Statutes has been provided by DRED as well as from information compiled by Shawn C. Herrick of the Department of Natural Resources, University of New Hampshire.

As far as the Phase I trail plan is concerned, the master plan has identified approximately 55 miles of additional trails over and above the existing 15 miles of trails, bringing the proposed total trail mileage at the completion of Phase I to approximately 70 miles. The proposed addition of approximately 55 miles of new trails, scheduled for construction in 2007, will require field verification of the trail layout in order to assure compliance with the fine filter criteria. It is possible that the placement and configuration of some of the proposed new trails shown on the maps in this report will require adjustment. It is also possible that construction of some of the Phase I trails may need to be deferred pending the outcome of discussions concerning modifications of items in Statute Section 215-A:43.

The list of fine filter criteria items in Section 215-A:43 are paraphrased below in a format to illustrate that given the information known as of this writing and notwithstanding the comments raised in the paragraph directly above, the Phase I trail plan may comply with the Statutes.

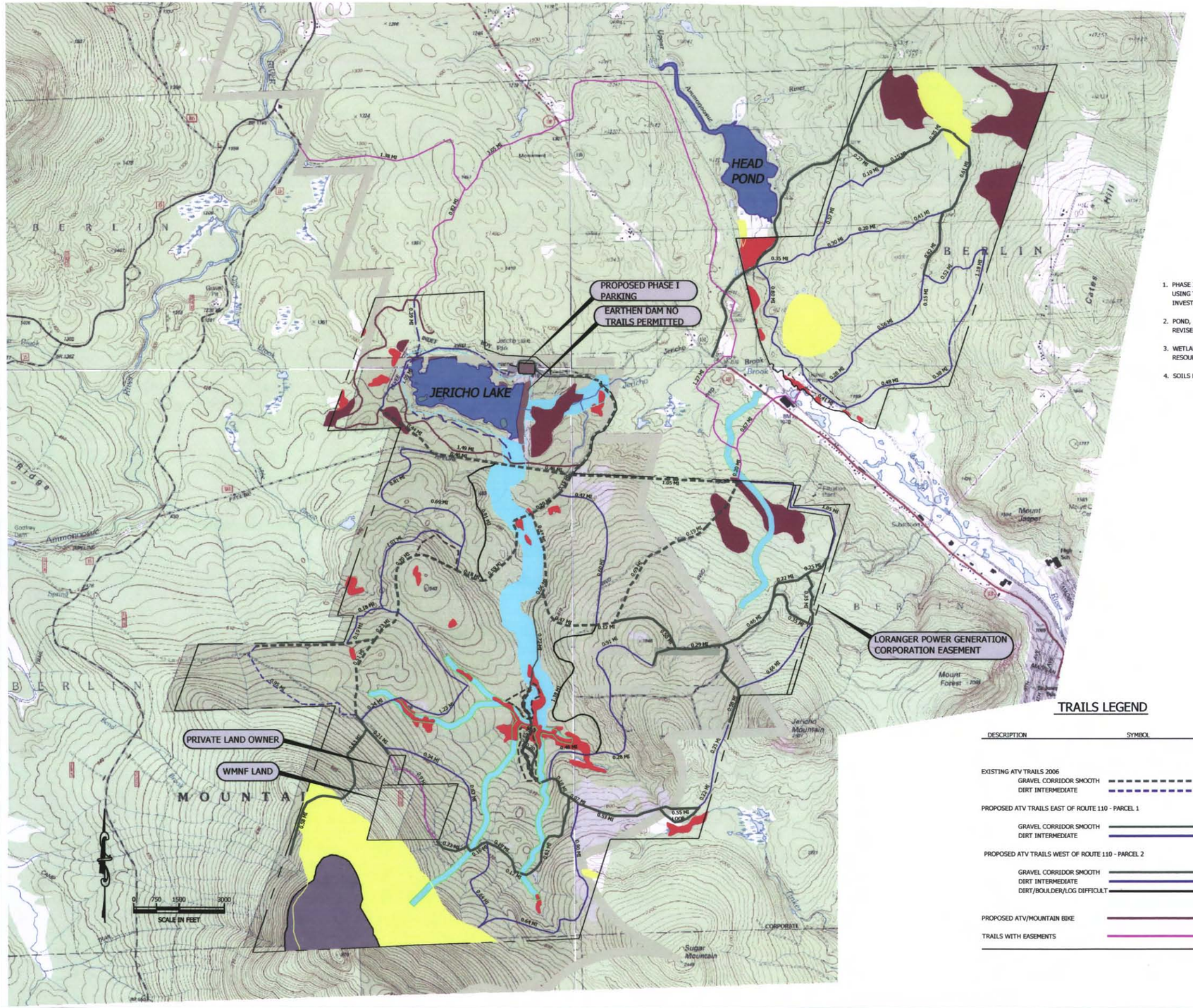
(a) The new trails will be supported by the Androscoggin Valley ATV Club.
(b) Signs at the Park will indicate that ATVs must comply with maximum decibel limits established by law.
(c) Adequate parking has been provided to handle an anticipated peak day use of 670 ATVs and 50 non-ATV visitors. Parking is supplied through a combination of parking in the camp sites, in the main parking lot, and in the day use parking area near the beach.
(d) The Park is in a Rural Residential Zone within the City of Berlin and is permitted with special exception.
(e) Approximately 1 mile of proposed trail passes through a parcel of land owned by the White Mountain National Forest, an easement will be required to establish this trial.
(f) The Club and the Bureau will give due consideration to local noise and obnoxious use ordinances.
(g) The Park land is currently used by snow machines, hikers, hunters and bikers.
(h) The Park will not intentionally violate federal, state or local laws.
(i) The Park staff, with the assistance of the local ATV club, will monitor and correct environmental impacts.
(j) For the most part, proposed trails are laid out on existing gravel logging roads.
(k) As most of the land has been harvested for timber, trails will be located along existing skid trails and through established logging yards.
(l) Proposed trails do not pass through wellhead protection areas.

(m) No proposed trails are located on the earthen dam at the east end of Jericho Lake.
(n) Proposed trails will avoid areas having soil types classified as important forest soil group IIA or IIB as mapped by the Natural Resources Conservation Service, unless existing soil conditions or surface roadways are used to reduce adverse environmental impact.
(o) Proposed trails are not within 100 feet of first and second order streams and 330 feet of third order streams. There are no fourth or higher order streams in the park.
(p) Proposed stream crossings will meet the 5-year flood criteria.
(q) Proposed trails are not within 200 feet of any body of water, known forested or non-forested wetland, or known vernal pools.
(r) Proposed trails will avoid elevations over 2700 feet.
(s) Proposed trails will avoid known important wild life habitat.
(t) Proposed trails will avoid known areas of endangered species.
(u) Proposed trails will avoid known areas with rare plants.
(v) Proposed trails will avoid alteration of unique geologic features.
(w) Proposed trails will avoid disturbance to cultural and historic features.
(x) Proposed trails are not within 330 feet of known raptor nest trees, or within 650 feet of known eagle or osprey nesting sites.
(y) Proposed trails will be more the 650 feet from known eagle winter roosting areas and 330 feet from the edge of wetlands containing known heron rookeries.
(z) Proposed trials will be laid out in a safe and appropriate manner.
(aa) Safety standards for highway crossings will be met.
(bb) Proposed trails designed for multi-use such as mountain biking, hiking or 4-wheel drive use will be marked accordingly for safe use.
(cc) The Berlin Police Department and State Fish and Game authorities have been contacted in regards to enforcement issues; there will be on-going dialog regarding enforcement issues.

Figure 9 on the following page illustrates the proposed *Phase I Trail Layout*, which is anticipated to be constructed in 2007. Trails in this phase have avoided the constraints listed in the Statutes to create approximately 70 miles of trials. Furthermore, 70 miles of trails is roughly equivalent to the mileage that the public has indicated they expect in the year 2007.

Figure 9 also shows the areas of the Park where the constraints identified in the Statutes will inhibit the construction of trails beyond the Phase I trails.

- Statutes a through d, f through i, k, l, p, and z through cc are statutes that do not require mapping.
- Statutes e, j, m, n, o, q, and r are mapped and shown on Figure 9.
- Statutes s through y have not been mapped as data for these statutes is not available at this time. Also, statutes s thru y will need specific field investigation to determine whether or not a trail can be constructed.



PLAN NOTES

1. PHASE I TRAIL LAYOUT IS IN COMPLIANCE WITH NEW HAMPSHIRE STATUES, SECTION 215-A:42 AND A:43 USING THE BEST AVAILABLE DATA. SOME DATA IS NOT CURRENTLY AVAILABLE AND FURTHER SITE INVESTIGATION WILL BE REQUIRED.
2. POND, LAKE, AND ELEVATION DATA PROVIDED BY UNITED STATES GEOLOGICAL SURVEY MAPS DATED 1989 AND REVISED BY THE USDA FOREST SERVICE IN 1995.
3. WETLANDS DATA PROVIDED BY GIS MAPPING COMPLETED BY SHAWN C. HERRICK DEPARTMENT OF NATURAL RESOURCES, UNIVERSITY OF NEW HAMPSHIRE.
4. SOILS DATA PROVIDED BY N.H. TRAILS BUREAU.

LEGEND

DESCRIPTION	SYMBOL
POND OR LAKE	
WETLANDS	
LAND OVER 2700 FEET	
FOREST SOILS IIA	
FOREST SOILS IIB	
FIRST, SECOND & THIRD ORDER STREAM BUFFER	

TRAILS LEGEND

DESCRIPTION	SYMBOL	TOTAL MILES MAPPED	TOTAL MILES ESTIMATED (MAPPED + 25%)
EXISTING ATV TRAILS 2006			
GRAVEL CORRIDOR SMOOTH		9.36	11.70
DIRT INTERMEDIATE		2.04	2.55
	SUB-TOTAL	11.40	14.25
PROPOSED ATV TRAILS EAST OF ROUTE 110 - PARCEL 1			
GRAVEL CORRIDOR SMOOTH		4.15	5.19
DIRT INTERMEDIATE		6.37	7.96
	SUB-TOTAL	10.52	13.15
PROPOSED ATV TRAILS WEST OF ROUTE 110 - PARCEL 2			
GRAVEL CORRIDOR SMOOTH		7.73	9.66
DIRT INTERMEDIATE		11.71	14.64
DIRT/BOULDER/LOG DIFFICULT		2.29	2.86
	SUB-TOTAL	21.73	27.16
PROPOSED ATV/MOUNTAIN BIKE		3.71	4.64
TRAILS WITH EASEMENTS		8.29	10.36
	TOTALS =	55.65	69.56

horizons Engineering inc
34 School Street
Littleton, NH 03561
Phone 603.444.4111 - Fax 603.444.1343

NEW HAMPSHIRE DEPARTMENT OF RESOURCES AND ECONOMIC DEVELOPMENT
TRAILS BUREAU
JERICHO MOUNTAIN STATE PARK
BERLIN, NEW HAMPSHIRE

PROPOSED PHASE I TRAIL LAYOUT

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: JAN 2007	PROJECT #: 06155
ENGIN'D BY: DEB	DRAWN BY: DEB
CHECK'D BY: WE	ARCHIVE #: N/A

FIGURE 9

As far as the full build-out of trails is concerned, the trail system shown earlier on Figure 4 has been laid out to maximize land use to create an attractive and enjoyable ATV riding experience. To the extent possible, known environmental constraints have been avoided. There are, however, several areas where some of the full build-out trails cannot be constructed given the current Statutes, specifically the following items in Section 215-A:43:

(n) In some cases sensitive soil groups cannot be avoided, but for the most part impacts are minor and limited to narrow trails (blue or black trails) that are designed for minimal earth disturbance. The trail development plan attempts to avoid these areas as much as feasible.

(o) There are no fourth or higher order streams in the Park. In most cases trails will cross first, second, and third order streams at near right angles resulting in minimal impact. There are, however, several areas where existing logging roads (that will be utilized as trails) and proposed trails are within the stream buffer.

(q) In some cases a proposed trail passes through a mapped wetland. The Statute should be modified to state that trails that may impact a wetland should do so with minimal disturbance. Limits may be placed upon the length of wetland crossing, but short distances should be tolerated. In many cases, it may be appropriate to undertake field investigations of mapped wetland areas to help locate new trails. New Hampshire Department of Environmental Services

(r) The south west corner of the Park is the highest point of land in the Park with elevations above 2,700 feet. This area of the park, due to its elevation, has the best views of the surrounding mountains and becomes a main attraction of the Park. Consideration should be given to the minimal disturbance that will be caused by the proposed trail and viewing site in this area. Furthermore, there have already been recent tree harvesting operations in this area.

(s), (t), (u), (x) and (y) Each of these criteria will require additional study and field work to determine if there is sensitive vegetation or wildlife habitat in the vicinity of proposed trails. Flexibility is the key to working with these items in the Statute, i.e. consideration should be given to the seasonality of the vegetation or wildlife sensitivity and the fact that sensitive sites may change from year to year.

In summary, it is unlikely that all 136 miles of proposed trails will be feasible given strict adherence to several of the fine filter criteria in the current Statutes. The criteria were initially developed by the land management agencies in State government to call for full input of concerns when developing ATV trails on State lands. The original intent of the criteria was to provide a base set of guidelines to follow when considering trail development, with the flexibility for case by case variations. The criteria were not intended to be incorporated into statute and to be concrete parameters, as such all flexibility to use land contours and updated science on erosion control measures and trail construction cannot be addressed. There are several instances where it is unclear how to apply certain criteria, for example, if an existing motorized trail/road is to be used as an ATV trail and it falls within the setbacks for streams or wetlands, is the use of an existing motorized corridor the focus or is it the setback distance?

As another example, it is inconceivable that a gravel or paved road for vehicles can be built closer to streams than recreational trails and that the recreational trails have a setback four times larger than other land disturbance activities in regards to wetlands and vernal pools. We recommend that serious consideration be given to reincorporating these criteria into policy with case by case variances to be reviewed by the appropriate regulatory agency for final decisions.

There are a number of instances where the criteria in the Statutes are more rigorous and stringent than the standards established by the New Hampshire Department of Environmental Services. The consultant team finds it hard to understand why the creation of ATV trails and a State Park should be subjected to a higher standard of environmental criteria than other projects throughout the State. To allow for the best possible use of land, trail layout and feasibility of Park success we recommend revisiting the criteria as policy rather than statute. This recommendation was also made by Woodlot Alternatives in their Statewide Trails Development plan for ATV trails in NH, in 2003. In the opinion of the consultant team, a decrease in the mileage of trails proposed in this master plan will have a significant negative impact on the ability of the Park to attract ATV enthusiasts. It would also negatively impact the financial viability of the Park, particularly its ability to be self-supporting, as well as the ensuing economic benefits for the region.

APPENDIX I

Opinions of Construction Cost

JERICHO MOUNTAIN STATE PARK
OPINION OF COST
SHEET A – ROADS AND PARKING
Prepared by Horizons Engineering, P.L.L.C.
November 2006

Item A1 – Parking (all areas except individual camp sites)

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Mobilization	LS	1.00	$5,000.00	$5,000
Clearing	AC	7.00	$3,500.00	$24,500
Grubbing (1)	CY	11,293.33	$7.00	$79,053
Cut and Fill (balanced)	CY	10,000.00	$7.00	$70,000
Bank Run Gravel (2)	CY	16,200.15	$9.00	$145,801
Crushed Gravel (3)	CY	4,050.04	$15.00	$60,751
Loam & Seed	SY	5,000.00	$5.00	$25,000
Drainage Structures	LS	1.00	$20,000.00	$20,000
Erosion Control	LS	1.00	$10,000.00	$10,000
Ledge Removal	CY	500.00	$100.00	$50,000
			Opinion of Construction Cost	$490,105
			15% Contingency	$73,516
			Opinion of Total Construction Cost	$563,621
			12% Engineering	$67,635
			Opinion of Total Item Cost	$631,256

Item A2 – Access and Campground Roads

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Mobilization	LS	1.00	$5,000.00	$5,000
Road Construction	LF	10,900.00	$40.00	$436,000
Erosion Control	LS	1.00	$10,000.00	$10,000
			Opinion of Construction Cost	$451,000
			15% Contingency	$67,650
			Opinion of Total Construction Cost	$518,650
			12% Engineering	$62,238
			Opinion of Total Item Cost	$580,888

JERICHO MOUNTAIN STATE PARK
OPINION OF COST
SHEET B – UTILITIES
Prepared by Horizons Engineering, P.L.L.C.
November 2006

ITEM B1 – WELL, PUMP HOUSE, STORAGE, AND WATER MAIN TO CORE AREA

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Mobilization	LS	1.00	$2,000.00	$2,000
Well and Pump	EA	1.00	$15,000.00	$15,000
Pump House and Storage	EA	1.00	$45,000.00	$45,000
Water Main (4)	LF	260.00	$20.00	$5,200
Erosion Control	LS	1.00	$1,000.00	$1,000
			Opinion of Construction Cost	$68,200
			15% Contingency	$10,230
			Opinion of Total Construction Cost	$78,430
			12% Engineering	$9,412
			Opinion of Total Item Cost	$87,842

ITEM B2 – WATER MAIN TO TENT SITE AREA

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Mobilization	LS	1.00	$2,000.00	$2,000
Water Main (4)	LF	4,885.00	$20.00	$97,700
Erosion Control	LS	1.00	$2,000.00	$2,000
			Opinion of Construction Cost	$101,700
			15% Contingency	$15,255
			Opinion of Total Construction Cost	$116,955
			12% Engineering	$14,035
			Opinion of Total Item Cost	$130,990

ITEM B3 – WATER MAIN TO RV SITE AREA

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Mobilization	LS	1.00	$2,000.00	$2,000
Water Main (4)	LF	2,660.00	$20.00	$53,200
Erosion Control	LS	1.00	$2,000.00	$2,000
			Opinion of Construction Cost	$57,200
			15% Contingency	$8,580
			Opinion of Total Construction Cost	$65,780
			12% Engineering	$7,894
			Opinion of Total Item Cost	$73,674

ITEM B4 – CORE AREA WASTEWATER SYSTEM

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Mobilization	LS	1.00	$1,000.00	$1,000
Leach Fields (2 Total) (5)	EA	2.00	$24,000.00	$48,000
Septic Tanks & Piping	EA	1.00	$7,500.00	$7,500
Dump Station	EA	1.00	$25,000.00	$25,000
Erosion Control	LS	1.00	$1,000.00	$1,000
				$82,500
			15% Contingency	$12,375
			Opinion of Total Construction Cost	$94,875
			12% Engineering	$11,385
			Opinion of Total Item Cost	$106,260

ITEM B5 – TENT AREA WASTEWATER SYSTEM

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Mobilization	LS	1.00	$1,000.00	$1,000
Leach Fields (1 Total) (5)	EA	1.00	$24,000.00	$24,000
Septic Tanks & Piping	EA	1.00	$7,500.00	$7,500
Erosion Control	LS	1.00	$1,000.00	$1,000
				$33,500
			15% Contingency	$5,025
			Opinion of Total Construction Cost	$38,525
			12% Engineering	$4,623
			Opinion of Total Item Cost	$43,148

ITEM B6 – RV AREA WASTEWATER SYSTEM

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Mobilization	LS	1.00	$1,000.00	$1,000
Leach Fields (1 Total) (5)	EA	1.00	$24,000.00	$24,000
Septic Tanks & Piping	EA	1.00	$7,500.00	$7,500
Erosion Control	LS	1.00	$1,000.00	$1,000
				$33,500
			15% Contingency	$5,025
			Opinion of Total Construction Cost	$38,525
			12% Engineering	$4,623
			Opinion of Total Item Cost	$43,148

ITEM B7 – ELECTRICAL TO CORE AREA

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Electrical Appurtenances	EA	1.00	$10,000.00	$10,000
Buried Electrical Service (6)	LF	500.00	$15.00	$7,500
				$17,500
			15% Contingency	$2,625
			Opinion of Total Construction Cost	$20,125
			12% Engineering	$2,415
			Opinion of Total Item Cost	$22,540

ITEM B8 – ELECTRICAL TO TENT SITE AREA

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Electrical Appurtenances	EA	1.00	$5,000.00	$5,000
Buried Electrical Service	LF	3,310.00	$15.00	$49,650
				$54,650
			15% Contingency	$8,198
			Opinion of Total Construction Cost	$62,848
			12% Engineering	$7,542
			Opinion of Total Item Cost	$70,389

ITEM B9 – ELECTRICAL TO RV SITE AREA

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Electrical Appurtenances	EA	1.00	$5,000.00	$5,000
Buried Electrical Service	LF	2,660.00	$15.00	$39,900
				$44,900
			15% Contingency	$6,735
			Opinion of Total Construction Cost	$51,635
			12% Engineering	$6,196
			Opinion of Total Item Cost	$57,831

JERICHO MOUNTAIN STATE PARK
OPINION OF COST
SHEET C – FACILITY BUILDINGS
Prepared by Horizons Engineering, P.L.L.C.
November 2006

ITEM C1 – SHOP/ADMINISTRATIVE BUILDING

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Administrative/Shop Building	SF	8,000.00	$100.00	$800,000
			Opinion of Construction Cost	$800,000
			15% Contingency	$120,000
			Opinion of Total Item Cost	$920,000

ITEM C2 – GATE HOUSE

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Gate House Building	SF	100.00	$100.00	$10,000
			Opinion of Construction Cost	$10,000
			15% Contingency	$1,500
			Opinion of Total Item Cost	$11,500

ITEM C3 – RESTROOM-NO SHOWERS (each)

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Block Bath House Building	SF	375.00	$125.00	$46,875
			Opinion of Construction Cost	$46,875
			15% Contingency	$7,031
			Opinion of Total Item Cost	$53,906

ITEM C4 – RESTROOM-SHOWERS (each)

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Block Bath House Building	SF	500.00	$125.00	$62,500
			Opinion of Construction Cost	$62,500
			15% Contingency	$9,375
			Opinion of Total Item Cost	$71,875

ITEM C5 – RESTROOM-SHOWERS AND LAUNDRY (each)

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Block Bath House Building	SF	800.00	$125.00	$100,000
			Opinion of Construction Cost	$100,000
			15% Contingency	$15,000
			Opinion of Total Item Cost	$115,000

ITEM C6 – STORE

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Store Building with Food Servic	SF	2,500.00	$130.00	$325,000
			Opinion of Construction Cost	$325,000
			15% Contingency	$48,750
			Opinion of Total Item Cost	$373,750

ITEM C7 – PAVILIONS (each)

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Pavilion Building	SF	1,000.00	$40.00	$40,000
			Opinion of Construction Cost	$40,000
			15% Contingency	$6,000
			Opinion of Total Item Cost	$46,000

JERICHO MOUNTAIN STATE PARK
OPINION OF COST
SHEET D – CAMP SITES
Prepared by Horizons Engineering, P.L.L.C.
November 2006

Item D1 – RV Sites W/ 2-Way Hookups (each)

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Clearing	AC	0.15	$3,500.00	$522
Grubbing (1)	CY	240.74	$7.00	$1,685
Bank Run Gravel (2)	CY	59.26	$9.00	$533
Crushed Gravel (3)	CY	29.63	$15.00	$444
Appurtenances	LS	1.00	$1,000.00	$1,000
Electrical Service	LS	1.00	$1,500.00	$1,500
Water Service	LS	1.00	$1,500.00	$1,500
			Opinion of Construction Cost	$7,185
			15% Contingency	$1,078
			Opinion of Total Construction Cost	$8,263

Item D2 – Tent Campsites (each)

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Clearing	AC	0.06	$3,500.00	$193
Grubbing (1)	CY	88.89	$7.00	$622
Bank Run Gravel (2)	CY	29.63	$9.00	$267
Crushed Gravel (3)	CY	14.81	$15.00	$222
Appurtenances	LS	1.00	$1,000.00	$1,000
			Opinion of Construction Cost	$2,304
			15% Contingency	$346
			Opinion of Total Construction Cost	$2,650

Item D3 – Remote Campsites (each)

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Clearing	AC	0.06	$3,500.00	$193
Appurtenances	LS	1.00	$1,000.00	$1,000
Pit Toilet	EA	1.00	$2,500.00	$2,500
			Opinion of Construction Cost	$3,693
			15% Contingency	$554
			Opinion of Total Construction Cost	$4,247

JERICHO MOUNTAIN STATE PARK
OPINION OF COST
SHEET E – TRAIL CONSTRUCTION
Prepared by Horizons Engineering, P.L.L.C.
November 2006

Item E1 – GREEN TRAILS (upgrade of existing gravel road, per mile)

ITEM	UNITS	NO. UNITS	UNIT COST	
Trail Labor	Hr	32	$25.00	$800.00
Tools and Equipment	Day	2	$250.00	$500.00
Excavator and Operator	Day	1	$1,500.00	$1,500.00
Culverts	Ea	3	$500.00	$1,500.00
			Total Opinion of Cost	$4,300.00

Item E2 – BLUE TRAIL (new construction, per mile)

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Trail Labor	Hr	80	$25.00	$2,000.00
Tools and Equipment	Day	5	$250.00	$1,250.00
Bridge Labor	Hr	32	$25.00	$800.00
Bridge Materials	Ea	1	$2,000.00	$2,000.00
Excavator and Operator	Day	1	$1,500.00	$1,500.00
Culverts	Ea	3	$500.00	$1,500.00
			Total Opinion of Cost	$9,050.00

Item E3 – BLACK TRAIL (new construction, per mile)

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Trail Labor	Hr	80	$25.00	$2,000.00
Tools and Equipment	Day	5	$250.00	$1,250.00
Bridge Labor	Hr	16	$25.00	$400.00
Bridge Materials	Ea	1	$1,000.00	$1,000.00
Excavator and Operator	Day	0.5	$1,500.00	$750.00
Culverts	Ea	3	$500.00	$1,500.00
			Total Opinion of Cost	$6,900.00

Item E4 –Trail Rest Areas

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Labor	Hr	32	$25.00	$800.00
Tools and Equipment	Day	2	$250.00	$500.00
Picnic Table and Grill	Ea	5	$500.00	$2,500.00
Excavator and Operator	Day	1	$1,500.00	$1,500.00
Pit Toilet	Ea	1	$15,000.00	$15,000.00
			Total Opinion of Cost	$20,300.00

JERICHO MOUNTAIN STATE PARK
OPINION OF COST
SHEET F – MISCELLANEOUS IMPROVEMENTS
Prepared by Horizons Engineering, P.L.L.C.
November 2006

Item F1 – BEACH AREA IMPROVEMENTS

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Beach Improvements	Ea	1	$10,000.00	$10,000
Picnic Sites (grill and table)	Ea	15	$500.00	$7,500
Misc Improvements	Ea	1	$15,000.00	$15,000
			Opinion of Construction Cost	$32,500
			15% Contingency	$4,875
			Total Opinion of Cost	$37,375

Item F2 – EVENT AREA AND MUD PIT

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Clearing	AC	6.50	$3,500.00	$22,750
Grubbing (1)	CY	10,486.67	$7.00	$73,407
Loam and Seed	SY	31460	$5.00	$157,300
Other Improvements	Ea	1	$10,000.00	$10,000
			Opinion of Construction Cost	$167,300
			15% Contingency	$25,095
			Total Opinion of Cost	$192,395

Item F3 – PLAYGROUND

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Clearing	AC	0.34	$3,500.00	$1,205
Grubbing (1)	CY	190.00	$7.00	$1,330
Loam and Seed	SY	600	$5.00	$3,000
Playground Equipment	Ea	1	$40,000.00	$40,000
Surface Improvements	Ea	1	$10,000.00	$10,000
			Opinion of Construction Cost	$53,000
			15% Contingency	$7,950
			Total Opinion of Cost	$60,950

Item F4 – WASH STATION (3 bay modular)

ITEM	UNITS	NO. UNITS	UNIT COST	TOTAL COST
Pad and Water Tank	Ea	1.00	$45,000.00	$45,000
Modular Wash Station	Ea	1.00	$230,000.00	$230,000
			Opinion of Construction Cost	$275,000
			15% Contingency	$41,250
			Total Opinion of Cost	$316,250

JERICHO MOUNTAIN STATE PARK
OPINION OF COST
CONSTRUCTION COST SUMMARY AND PHASING
Prepared by Horizons Engineering, P.L.L.C.
November 2006

CORE AREA	OPINION OF COST	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
SITE WORK						
Access Roads	$631,256	$0	$631,256	$0	$0	$0
Parking	$580,888	$0	$580,888	$0	$0	$0
	$1,212,144	$0	$1,212,144	$0	$0	$0
UTILITIES						
Well, Pump House, Storage, and Water Main to Core Area	$87,842	$0	$87,842	$0	$0	$0
Water Main to Tent Site Area	$130,990	$0	$130,990	$0	$0	$0
Water Main to RV Site Area	$73,674	$0	$73,674	$0	$0	$0
Core Area Wastewater System and Dump Station	$106,260	$0	$106,260	$0	$0	$0
Tent Site Area Wastewater System	$43,148	$0	$43,148	$0	$0	$0
RV Site Area Wastewater System	$43,148	$0	$43,148	$0	$0	$0
Electrical to Core Area	$22,540	$0	$22,540	$0	$0	$0
Electrical to Tent Site Area	$70,389	$0	$70,389	$0	$0	$0
Electrical to RV Site Area	$57,831	$0	$57,831	$0	$0	$0
	$635,821	$0	$635,821	$0	$0	$0
BUILDINGS						
Administration and Shop	$920,000	$0	$0	$920,000	$0	$0
Gate House	$11,500	$0	$11,500	$0	$0	$0
Store	$373,750	$0	$0	$373,750	$0	$0
Restrooms-No Showers	$53,906	$0	$53,906	$0	$0	$0
Restrooms-No Showers	$53,906	$0	$0	$53,906	$0	$0
Restrooms-Showers	$71,875	$0	$71,875	$0	$0	$0
Restrooms-Showers	$71,875	$0	$0	$71,875	$0	$0
Rest Rooms-Showers and Laundry	$115,000	$0	$115,000	$0	$0	$0
Pavilions (7)	$322,000	$0	$0	$322,000	$0	$0
	$1,993,813	$0	$252,281	$1,741,531	$0	$0

CORE AREA (continued)	OPINION OF COST	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
CAMP SITES						
Sites W/ 2-Way Hookups (81)	$669,304	$0	$334,652	$0	$334,652	$0
Tent/Camper Sites (93)	$246,407	$0	$123,204	$123,204	$0	$0
Remote Sites (26)	$110,416	$0	$110,416	$0	$0	$0
	$1,026,127	$0	$568,272	$123,204	$334,652	$0
MISCELLANEOUS						
Beach Area Improvements	$37,375	$0	$0	$0	$0	$37,375
Tent Area Playground	$60,950	$0	$0	$0	$0	$60,950
RV Area Playground	$60,950	$0	$0	$0	$0	$60,950
Event Area and Mud Pit	$192,395	$0	$0	$0	$0	$192,395
ATV/Car Wash	$316,250	$0	$0	$316,250	$0	$0
	$667,920	$0	$0	$316,250	$0	$351,670
OPINION OF COST - CORE AREA BUILD OUT	**$5,535,825**	**$0**	**$2,668,518**	**$2,180,985**	**$334,652**	**$351,670**
CUMULATIVE COST BY YEAR		**$0**	**$2,668,518**	**$4,849,503**	**$5,184,155**	**$5,535,825**
CUMULATIVE INTEREST ONLY EXPENSE (7.5%)		**$0**	**$200,139**	**$363,713**	**$388,812**	**$415,187**

TRAILS	OPINION OF COST	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
TRAILS						
Green Trails (upgrade of existing roads)	$63,855	$63,855	$0	$0	$0	$0
Blue Trails (new construction)	$923,100	$340,280	$582,820	$0	$0	$0
Black Trails (new construction)	$58,443	$19,320	$39,123	$0	$0	$0
Trailside Rest Areas (4)	$81,200	$0	$0	$0	$0	$81,200
	$1,126,598	$423,455	$621,943	$0	$0	$81,200
OPINION OF COST - TRAILS BUILD OUT	**$1,126,598**	**$423,455**	**$621,943**	**$0**	**$0**	**$81,200**
CUMULATIVE COST BY YEAR		**$423,455**	**$1,045,398**	**$1,045,398**	**$1,045,398**	**$1,126,598**
CUMULATIVE INTEREST ONLY EXPENSE (7.5%)		**$31,759**	**$78,405**	**$78,405**	**$78,405**	**$84,495**

APPENDIX II
Financial Models

JERICHO MOUNTAIN STATE PARK
YEAR 1 OPERATIONS MODEL
Prepared By Horizons Engineering, P.L.L.C.
November 2006

CAMPGROUND AND PARK

Revenue	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***	***Percent of Total***
Facility Fees	$0	$0	$0	$300	$300	$600	$900	$900	$600	$600	$0	$0	*$4,200*	100%
Remote Camp Sites	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Tent Camp Sites	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
RV Camp Sites	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Showers	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Pavilion Rentals	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Concessions	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
ATV Wash	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Canoe/Kayak Rentals	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Total Revenue	*$0*	*$0*	*$0*	*$300*	*$300*	*$600*	*$900*	*$900*	*$600*	*$600*	*$0*	*$0*	*$4,200*	
Expenses														
Supplies	$500	$500	$500	$500	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$500	$500	*$16,200*	7%
Telephone	$150	$150	$150	$150	$300	$300	$300	$300	$300	$300	$150	$150	*$2,700*	1%
Contract Repairs (sub)	$0	$0	$0	$0	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$0	$0	*$6,000*	3%
In House Repairs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Heating Fuel	$0	$0	$0	$0	$0	$0	$0	$0	$0	$100	$200	$300	*$600*	0%
Vehicles	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	*$12,000*	5%
Advertising	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	*$6,000*	3%
Insurance	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	*$12,000*	5%
Office Equipment	$0	$0	$0	$0	$100	$100	$100	$100	$100	$100	$100	$200	*$900*	0%
Trash Removal	$0	$0	$0	$0	$200	$200	$200	$200	$200	$200	$200	$200	*$1,600*	1%
Wash Station	$0	$0	$0	$0	$200	$500	$1,000	$1,000	$500	$200	$0	$0	*$3,400*	1%
Interest Expense (20 Yr)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Capital Amortization (20 Yr)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Electric	$0	$0	$0	$150	$150	$150	$150	$150	$150	$150	$150	$150	*$1,350*	1%
Misc Expenses	$0	$0	$0	$200	$400	$40	$400	$400	$400	$400	$400	$0	*$2,640*	1%
Water/Sewer	$0	$0	$0	$0	$200	$200	$200	$200	$200	$200	$200	$200	*$1,600*	1%
Salaries / Benefits (FT)	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	*$119,988*	53%
Salaries (PT)	$0	$0	$0	$0	$6,720	$6,720	$6,720	$6,720	$6,720	$6,720	$0	$0	*$40,320*	18%
Total Expenses	*$13,149*	*$13,149*	*$13,149*	*$13,499*	*$23,969*	*$23,909*	*$24,769*	*$24,769*	*$24,269*	*$24,069*	*$14,399*	*$14,199*	*$227,298*	
Net Gain (Loss) - Park	**($13,149)**	**($13,149)**	**($13,149)**	**($13,199)**	**($23,669)**	**($23,309)**	**($23,869)**	**($23,869)**	**($23,669)**	**($23,469)**	**($14,399)**	**($14,199)**	**($223,098)**	
Net Gain (Loss) - Trails	**$220**	**$220**	**($280)**	**($8,000)**	**($10,500)**	**($9,000)**	**($9,937)**	**($9,937)**	**($8,437)**	**($9,937)**	**($1,780)**	**$220**	**($67,149)**	
Total Net Gain (Loss)	**($12,929)**	**($12,929)**	**($13,429)**	**($21,199)**	**($34,169)**	**($32,309)**	**($33,806)**	**($33,806)**	**($32,106)**	**($33,406)**	**($16,179)**	**($13,979)**	**($290,247)**	

MODEL ASSUMPTIONS

Usage Per Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Remote Camp Site Days	0	0	0	0	0	0	0	0	0	0	0	0
Tent Camp Site Days	0	0	0	0	0	0	0	0	0	0	0	0
RV Camp Site Days	0	0	0	0	0	0	0	0	0	0	0	0
Campground and Park Occupancy	0%	0%	0%	1%	1%	2%	3%	3%	2%	2%	1%	0%
Canoe/Kayak Rentals	0	0	0	0	0	0	0	0	0	0	0	0
Facility Day Pass	0	0	0	60	60	120	180	180	120	120	60	0
Pavilion Rentals	0	0	0	0	0	0	0	0	0	0	0	0
ATV Wash	0	0	0	12	12	24	36	36	24	24	12	0
4x4 Day Passes	0	0	0	0	0	0	0	0	0	0	0	0
CCC of Park	200											

Fees

RV Camp Sites	$47	Night
Tent Camp Sites	$37	Night
Remote Sites	$47	Night
Canoe/Kayak Rentals	$25	Day
Facility Day Fee	$5	Day
Pavilion Rental	$300	Day
ATV Wash	$3	Each
Showers	$3	Each
4x4 Day Pass	$25	Each

Staff Salaries and Benefits

Full Time	$5,000	Month
Part Time	$1,344	Month

Staffing Requirements	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Full Time Staff	2	2	2	2	2	2	2	2	2	2	2	2
Part Time Staff	0	0	0	0	5	5	5	5	5	5	0	0

Facility Inventory	**Number of Sites Available**
RV Sites	0
Tent Sites	0
Remote Sites	0
Pavilions	0

JERICHO MOUNTAIN STATE PARK
YEAR 1 OPERATIONS MODEL - TRAILS

Prepared By Horizons Engineering, P.L.L.C.
November, 2006

TRAILS

Income	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***
Annual 4x4 Trail Stickers	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*
One-Day 4x4 Trail Stickers	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*
DRED Trail Grant Funding	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	*$50,000*
Trail Events	$0	$0	$0	$0	$0	$0	$563	$563	$563	$563	$0	$0	*$2,250*
Total Revenue	*$4,167*	*$4,167*	*$4,167*	*$4,167*	*$4,167*	*$4,167*	*$4,729*	*$4,729*	*$4,729*	*$4,729*	*$4,167*	*$4,167*	*$52,250*
Expenses													
Vehicles and Equipment	$1,000	$1,000	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,000	*$9,000*
Insurance	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	*$1,800*
Interest Expense (20 Yr)	$2,647	$2,647	$2,647	$2,647	$2,647	$2,647	$2,647	$2,647	$2,647	$2,647	$2,647	$2,647	*$31,759*
Capital Amortization (20 Yr)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*
Trail Supplies	$0	$0	$0	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$0	*$6,000*
Electric (Shop)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*
Shop Supplies	$0	$0	$0	$0	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$500	$0	*$6,000*
Heavy Equipment (sub)	$0	$0	$0	$0	$1,500	$0	$1,500	$1,500	$0	$1,500	$0	$0	*$6,000*
Salaries (FT seasonal)	$0	$0	$0	$6,720	$6,720	$6,720	$6,720	$6,720	$6,720	$6,720	$0	$0	*$40,320*
Total Expenses	*$3,947*	*$3,947*	*$4,447*	*$12,167*	*$14,667*	*$13,167*	*$14,667*	*$14,667*	*$13,167*	*$14,667*	*$5,947*	*$3,947*	*$119,399*
Net Gain (Loss) - Trails	**$220**	**$220**	**($280)**	**($8,000)**	**($10,500)**	**($9,000)**	**($9,937)**	**($9,937)**	**($8,437)**	**($9,937)**	**($1,780)**	**$220**	**($67,149)**

MODEL ASSUMPTIONS

Staff Salaries and Benefits

Full Time Seasonal $2,688 Month

Staffing Requirements	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Full Time Seasonal Staff	0	0	0	2	2	2	2	2	2	2	0	0

Event Attendance

Small Event	150
Medium Event	500
Large Event	1000
Average gate fee per attendee	$15.00

Number of Events/Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Small Event	0	0	0	0	0	0	1	1	1	1	0	0
Medium Event	0	0	0	0	0	0	0	0	0	0	0	0
Large Event	0	0	0	0	0	0	0	0	0	0	0	0

Event Revenue	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***
Small Event	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$562.50	$562.50	$562.50	$562.50	$0.00	$0.00	*$2,250*
Medium Event	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	*$0*
Large Event	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	*$0*
Total Event Revenue	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$562.50	$562.50	$562.50	$562.50	$0.00	$0.00	*$2,250*

JERICHO MOUNTAIN STATE PARK
YEAR 2 OPERATIONS MODEL
Prepared By Horizons Engineering, P.L.L.C.
November 2006

CAMPGROUND AND PARK

Income	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***	***Percent of Total***
Facility Fees	$0	$0	$0	$0	$1,710	$10,260	$22,230	$22,230	$10,260	$3,420	$0	$0	*$70,110*	40%
Remote Camp Sites	$0	$0	$0	$0	$0	$0	$0	$23,829	$10,998	$3,666	$3,666	$73	*$42,232*	24%
Tent Camp Sites	$0	$0	$0	$0	$0	$0	$0	$33,189	$15,318	$5,106	$5,106	$102	*$58,821*	33%
RV Camp Sites	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Showers	$0	$0	$0	$0	$0	$0	$0	$3,370	$1,555	$518	$518	$10	*$5,972*	3%
Pavilion Rentals	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Concessions	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
ATV Wash	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Canoe/Kayak Rentals	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Total Revenue	*$0*	*$0*	*$0*	*$0*	*$1,710*	*$10,260*	*$22,230*	*$82,618*	*$38,131*	*$12,710*	*$9,290*	*$186*	*$177,135*	
Expenses														
Supplies	$500	$500	$500	$500	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$500	$500	*$16,200*	3%
Telephone	$150	$150	$150	$150	$300	$300	$300	$300	$300	$300	$150	$150	*$2,700*	1%
Contract Repairs (sub)	$0	$0	$0	$0	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$0	$0	*$6,000*	1%
In House Repairs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Heating Fuel	$0	$0	$0	$0	$0	$0	$0	$0	$0	$100	$200	$300	*$600*	0%
Vehicles	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	*$12,000*	2%
Advertising	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	*$6,000*	1%
Insurance	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$2,000	*$13,000*	2%
Office Equipment	$0	$0	$0	$0	$100	$100	$100	$100	$100	$100	$100	$200	*$900*	0%
Trash Removal	$0	$0	$0	$0	$200	$200	$200	$200	$200	$200	$200	$0	*$1,400*	0%
Wash Station	$0	$0	$0	$0	$200	$500	$1,000	$1,000	$500	$200	$0	$0	*$3,400*	1%
Interest Expense (20 Yr)	$16,678	$16,678	$16,678	$16,678	$16,678	$16,678	$16,678	$16,678	$16,678	$16,678	$16,678	$16,678	*$200,139*	37%
Capital Amortization (20 Yr)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Electric	$0	$0	$0	$150	$150	$150	$150	$150	$150	$150	$150	$150	*$1,350*	0%
Misc Expenses	$0	$0	$0	$200	$400	$40	$400	$400	$400	$400	$400	$0	*$2,640*	0%
Water/Sewer	$0	$0	$0	$0	$200	$200	$200	$200	$200	$200	$200	$200	*$1,600*	0%
Salaries / Benefits (FT)	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	*$119,988*	22%
Salaries (PT)	$6,720	$6,720	$6,720	$6,720	$6,720	$20,160	$26,880	$26,880	$20,160	$6,720	$6,720	$6,720	*$147,840*	28%
Total Expenses	*$36,547*	*$36,547*	*$36,547*	*$36,897*	*$40,647*	*$54,027*	*$61,607*	*$61,607*	*$54,387*	*$40,747*	*$37,797*	*$38,397*	*$535,757*	
Net Gain (Loss) - Park	**($36,547)**	**($36,547)**	**($36,547)**	**($36,897)**	**($38,937)**	**($43,767)**	**($39,377)**	**$21,010**	**($16,256)**	**($28,037)**	**($28,507)**	**($38,211)**	**($358,621)**	
Net Gain (Loss) - Trails	**($4,467)**	**($4,467)**	**($4,467)**	**($20,907)**	**($26,107)**	**($25,545)**	**($23,670)**	**($23,670)**	**($25,545)**	**($25,545)**	**($7,467)**	**($4,467)**	**($145,347)**	
Total Net Gain (Loss)	**($41,014)**	**($41,014)**	**($41,014)**	**($57,804)**	**($65,044)**	**($69,312)**	**($63,047)**	**($2,659)**	**($41,801)**	**($53,581)**	**($35,974)**	**($42,678)**	**($503,969)**	

MODEL ASSUMPTIONS

Usage Per Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Remote Camp Site Days	2	2	2	16	39	234	507	507	234	78	78	2
Tent Camp Site Days	3	3	3	28	69	414	897	897	414	138	138	3
RV Camp Site Days	0	0	0	0	0	0	0	0	0	0	0	0
Campground and Park Occupancy	0%	0%	0%	2%	5%	30%	65%	65%	30%	10%	10%	0%
Canoe/Kayak Rentals	0	0	0	0	0	0	0	0	0	0	0	0
Facility Day Pass	14	14	14	137	342	2052	4446	4446	2052	684	684	14
Pavilion Rentals	0	0	0	0	0	0	0	0	0	0	0	0
ATV Wash	4	4	4	36	90	540	1170	1170	540	180	180	4
4x4 Day Passes	0	0	0	0	0	0	0	0	0	0	0	0
CCC of Park	300											

Fees

RV Camp Sites	$47	Night
Tent Camp Sites	$37	Night
Remote Sites	$47	Night
Canoe/Kayak Rentals	$25	Day
Facility Day Fee	$5	Day
Pavilion Rental	$300	Day
ATV Wash	$3	Each
Showers	$3	Each
4x4 Day Pass	$25	Each

Staff Salaries and Benefits

Full Time	$5,000	Month
Part Time	$1,344	Month

Staffing Requirements	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Full Time Staff	2	2	2	2	2	2	2	2	2	2	2	2
Part Time Staff	5	5	5	5	5	15	20	20	15	5	5	5

Facility Inventory	Number of Sites Available
RV Sites	0
Tent Sites	46
Remote Sites	26
Pavilions	0

JERICHO MOUNTAIN STATE PARK
YEAR 2 OPERATIONS MODEL – TRAILS

Prepared By Horizons Engineering, P.L.L.C.
November 2006

TRAILS

Revenue	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***	**Percent of Total**
4x4 Trail Day Stickers	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
DRED Trail Grant Funding	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	*$50,000*	88%
Trail Events	$0	$0	$0	$0	$0	$563	$2,438	$2,438	$563	$563	$0	$0	*$6,563*	12%
Total Revenue	*$4,167*	*$4,167*	*$4,167*	*$4,167*	*$4,167*	*$4,729*	*$6,604*	*$6,604*	*$4,729*	*$4,729*	*$4,167*	*$4,167*	*$56,563*	
Expenses														
Vehicles and Equipment	$1,500.00	$1,500.00	$1,500.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$1,500.00	*$18,000.00*	9%
Insurance	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	*$1,800.00*	1%
Interest Expense (20 Yr)	$6,533.74	$6,533.74	$6,533.74	$6,533.74	$6,533.74	$6,533.74	$6,533.74	$6,533.74	$6,533.74	$6,533.74	$6,533.74	$6,533.74	*$78,404.85*	39%
Capital Amortization (20 Yr)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	*$0.00*	0%
Trail Supplies	$0.00	$0.00	$0.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$0.00	*$6,000.00*	3%
Electric (Shop)	$300.00	$300.00	$300.00	$300.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$300.00	$300.00	*$3,000.00*	1%
Shop Supplies	$0.00	$0.00	$0.00	$500.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$500.00	$0.00	*$6,000.00*	3%
Heavy Equipment (sub)	$0.00	$0.00	$0.00	$0.00	$4,500.00	$4,500.00	$4,500.00	$4,500.00	$4,500.00	$4,500.00	$0.00	$0.00	*$27,000.00*	13%
Salaries (FT seasonal)	$0.00	$0.00	$0.00	$13,440.00	$13,440.00	$13,440.00	$13,440.00	$13,440.00	$13,440.00	$13,440.00	$0.00	$0.00	*$80,640.00*	40%
Total Expenses	*$8,633.74*	*$8,633.74*	*$8,633.74*	*$25,073.74*	*$30,273.74*	*$30,273.74*	*$30,273.74*	*$30,273.74*	*$30,273.74*	*$30,273.74*	*$11,633.74*	*$8,633.74*	*$201,909.90*	
Net Gain (Loss) - Trails	**($4,467.07)**	**($4,467.07)**	**($4,467.07)**	**($20,907.07)**	**($26,107.07)**	**($25,544.57)**	**($23,669.57)**	**($23,669.57)**	**($25,544.57)**	**($25,544.57)**	**($7,467.07)**	**($4,467.00)**	**($145,347.40)**	

MODEL ASSUMPTIONS
Staff Salaries and Benefits
Full Time Seasonal $2,688 Month

Staffing Requirements	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Full Time Seasonal Staff	0	0	0	4	4	4	4	4	4	4	0	0

Event Attendance

Small Event	150
Medium Event	500
Large Event	1000
Average gate fee per attendee	$15.00

Number of Events/Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Small Event	0	0	0	0	0	1	1	1	1	1	0	0
Medium Event	0	0	0	0	0	0	1	1	0	0	0	0
Large Event	0	0	0	0	0	0	0	0	0	0	0	0

Event Revenue	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***
Small Event	$0.00	$0.00	$0.00	$0.00	$0.00	$562.50	$562.50	$562.50	$562.50	$562.50	$0.00	$0.00	*$2,813*
Medium Event	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,875.00	$1,875.00	$0.00	$0.00	$0.00	$0.00	*$3,750*
Large Event	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	*$0*
Total Event Revenue	$0.00	$0.00	$0.00	$0.00	$0.00	$562.50	$2,437.50	$2,437.50	$562.50	$562.50	$0.00	$0.00	*$6,563*

JERICHO MOUNTAIN STATE PARK
YEAR 3 OPERATIONS MODEL
Prepared By Horizons Engineering, P.L.L.C.
November 2006

CAMPGROUND AND PARK

Income	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***	***Percent of Total***
Facility Fees	$0	$0	$0	$0	$1,410	$8,460	$18,330	$18,330	$8,460	$2,820	$0	$0	*$57,810*	16%
Remote Camp Sites	$73	$73	$73	$733	$1,833	$10,998	$23,829	$23,829	$10,998	$3,666	$3,666	$73	*$79,845*	21%
Tent Camp Sites	$102	$102	$102	$1,021	$2,553	$15,318	$33,189	$33,189	$15,318	$5,106	$5,106	$102	*$111,209*	30%
RV Camp Sites	$113	$0	$0	$0	$0	$0	$0	$36,660	$16,920	$5,640	$5,640	$113	*$65,086*	18%
Showers	$16	$16	$16	$161	$403	$2,419	$5,242	$5,242	$2,419	$806	$806	$16	*$17,563*	5%
Pavilion Rentals	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Concessions	$1,013	$1,013	$1,013	$1,128	$1,320	$2,919	$5,157	$5,157	$2,919	$1,640	$1,640	$1,013	*$25,930*	7%
ATV Wash	$0	$0	$0	$0	$270	$1,620	$3,510	$3,510	$1,620	$540	$0	$0	*$11,070*	3%
Canoe/Kayak Rentals	$0	$0	$0	$0	$75	$450	$975	$975	$450	$150	$0	$0	*$3,075*	1%
Total Revenue	*$1,317*	*$1,204*	*$1,204*	*$3,044*	*$7,864*	*$42,184*	*$90,232*	*$126,892*	*$59,104*	*$20,368*	*$16,858*	*$1,317*	*$371,589*	
Expenses														
Supplies	$500	$500	$500	$500	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$500	$500	*$16,200*	2%
Telephone	$150	$150	$150	$150	$300	$300	$300	$300	$300	$300	$150	$150	*$2,700*	0%
Contract Repairs (sub)	$0	$0	$0	$0	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$0	$0	*$6,000*	1%
In House Repairs	$0	$0	$0	$0	$500	$500	$500	$500	$500	$500	$0	$0	*$3,000*	0%
Heating Fuel	$500	$500	$500	$100	$0	$0	$0	$0	$0	$100	$100	$500	*$2,300*	0%
Vehicles	$1,000	$1,000	$1,000	$1,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$1,000	$1,000	*$18,000*	2%
Advertising	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	*$6,000*	1%
Insurance	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	*$24,000*	3%
Office Equipment	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	*$2,400*	0%
Trash Removal	$200	$200	$200	$200	$1,000	$2,000	$5,000	$5,000	$2,000	$1,000	$200	$200	*$17,200*	2%
Wash Station	$0	$0	$0	$0	$400	$1,000	$2,000	$2,000	$1,000	$400	$0	$0	*$6,800*	1%
Interest Expense (20 Yr)	$30,309	$30,309	$30,309	$30,309	$30,309	$30,309	$30,309	$30,309	$30,309	$30,309	$30,309	$30,309	*$363,713*	44%
Capital Amortization (20 Yr)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Electric	$400	$400	$400	$400	$800	$1,200	$1,800	$1,800	$1,200	$800	$400	$400	*$10,000*	1%
Misc Expenses	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	*$3,600*	0%
Water/Sewer	$100	$100	$100	$100	$500	$500	$500	$500	$500	$500	$100	$100	*$3,600*	0%
Salaries / Benefits (FT)	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	*$119,988*	14%
Salaries (PT)	$6,720	$6,720	$6,720	$6,720	$13,440	$40,320	$40,320	$40,320	$40,320	$13,440	$6,720	$6,720	*$228,480*	27%
Total Expenses	*$52,878*	*$52,878*	*$52,878*	*$52,478*	*$65,448*	*$94,328*	*$98,928*	*$98,928*	*$94,328*	*$65,548*	*$52,478*	*$52,878*	*$833,981*	
Net Gain (Loss) - Park	**($51,561)**	**($51,674)**	**($51,674)**	**($49,435)**	**($57,584)**	**($52,144)**	**($8,696)**	**$27,964**	**($35,224)**	**($45,180)**	**($35,620)**	**($51,561)**	**($462,392)**	
Net Gain (Loss) - Trails	**($4,467)**	**($4,467)**	**($4,467)**	**($18,667)**	**($23,305)**	**($11,430)**	**($5,742)**	**($5,742)**	**($11,430)**	**($23,305)**	**($7,467)**	**($4,467)**	**($76,220)**	
Total Net Gain (Loss)	**($56,028)**	**($56,141)**	**($56,141)**	**($68,102)**	**($80,889)**	**($63,574)**	**($14,438)**	**$22,222**	**($46,654)**	**($68,485)**	**($43,087)**	**($56,028)**	**($538,612)**	

MODEL ASSUMPTIONS

Usage Per Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Remote Camp Site Days	2	2	2	16	39	234	507	507	234	78	78	2
Tent Camp Site Days	3	3	3	28	69	414	897	897	414	138	138	3
RV Camp Site Days	2	2	2	24	60	360	780	780	360	120	120	2
Campground and Park Occupancy	0%	0%	0%	2%	5%	30%	65%	65%	30%	10%	10%	0%
Canoe/Kayak Rentals	0	0	0	0	3	18	39	39	18	6	0	0
Facility Day Pass	11	11	11	113	282	1692	3666	3666	1692	564	564	11
Pavilion Rentals	0	0	0	0	0	0	0	0	0	0	0	0
ATV Wash	4	4	4	36	90	540	1170	1170	540	180	180	4
4x4 Day Passes	0	0	0	0	0	400	500	500	400	0	0	0
CCC of Park	300											

Fees

RV Camp Sites	$47	Night
Tent Camp Sites	$37	Night
Remote Sites	$47	Night
Canoe/Kayak Rentals	$25	Day
Facility Day Fee	$5	Day
Pavilion Rental	$300	Day
ATV Wash	$3	Each
Showers	$3	Each
4x4 Day Pass	$25	Each

Staff Salaries and Benefits

Full Time	$5,000	Month
Part Time	$1,344	Month

Staffing Requirements	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Full Time Staff	2	2	2	2	2	2	2	2	2	2	2	2
Part Time Staff	5	5	5	5	10	30	30	30	30	10	5	5

Facility Inventory	Number of Sites Available
RV Sites	40
Tent Sites	46
Remote Sites	26
Pavilions	0

JERICHO MOUNTAIN STATE PARK
YEAR 3 OPERATIONS MODEL – TRAILS

Prepared By Horizons Engineering, P.L.L.C.
November 2006

TRAILS

Revenue	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***	**Percent of Total**
One-Day 4x4 Trail Stickers	$0	$0	$0	$0	$0	$10,000	$12,500	$12,500	$10,000	$0	$0	$0	*$45,000*	40%
DRED Trail Grant Funding	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	*$50,000*	45%
Trail Events	$0	$0	$0	$0	$563	$2,438	$5,625	$5,625	$2,438	$563	$0	$0	*$17,250*	15%
Total Revenue	*$4,167*	*$4,167*	*$4,167*	*$4,167*	*$4,729*	*$16,604*	*$22,292*	*$22,292*	*$16,604*	*$4,729*	*$4,167*	*$4,167*	*$112,250*	
Expenses														
Vehicles and Equipment	1500	1500	1500	3000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$1,500	*$18,000*	10%
Insurance	300	300	300	300	$300	$300	$300	$300	$300	$300	$300	$300	*$1,800*	1%
Interest Expense (20 Yr)	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	*$78,405*	42%
Capital Amortization (20 Yr)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Trail Supplies	$0	$0	$0	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$0	*$6,000*	3%
Electric (Shop)	$300	$300	$300	$300	$500	$500	$500	$500	$500	$500	$300	$300	*$3,000*	2%
Shop Supplies	$0	$0	$0	$500	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$500	$0	*$6,000*	3%
Heavy Equipment (sub)	$0	$0	$0	$0	$4,500	$4,500	$4,500	$4,500	$4,500	$4,500	$0	$0	*$27,000*	14%
Salaries (FT seasonal)	$0	$0	$0	$11,200	$11,200	$11,200	$11,200	$11,200	$11,200	$11,200	$0	$0	*$67,200*	36%
Total Expenses	*$8,634*	*$8,634*	*$8,634*	*$22,834*	*$28,034*	*$28,034*	*$28,034*	*$28,034*	*$28,034*	*$28,034*	*$11,634*	*$8,634*	*$188,470*	
Net Gain (Loss) - Trails	**($4,467)**	**($4,467)**	**($4,467)**	**($18,667)**	**($23,305)**	**($11,430)**	**($5,742)**	**($5,742)**	**($11,430)**	**($23,305)**	**($7,467)**	**($4,467)**	**($76,220)**	

MODEL ASSUMPTIONS

Staff Salaries and Benefits

Full Time Seasonal	$2,240 Month

Staffing Requirements	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Full Time Seasonal Staff	0	0	0	4	4	4	4	4	4	4	0	0

Event Attendance

Small Event	150
Medium Event	500
Large Event	1000
Average gate fee per attendee	$15.00

Number of Events/Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***
Small Event	0	0	0	0	1	1	0	0	1	1	0	0	*4*
Medium Event	0	0	0	0	0	1	1	1	1	0	0	0	*4*
Large Event	0	0	0	0	0	0	1	1	0	0	0	0	*2*

Event Revenue	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***
Small Event	$0.00	$0.00	$0.00	$0.00	$562.50	$562.50	$0.00	$0.00	$562.50	$562.50	$0.00	$0.00	*$2,250*
Medium Event	$0.00	$0.00	$0.00	$0.00	$0.00	$1,875.00	$1,875.00	$1,875.00	$1,875.00	$0.00	$0.00	$0.00	*$7,500*
Large Event	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3,750.00	$3,750.00	$0.00	$0.00	$0.00	$0.00	*$7,500*
Total Event Revenue	$0.00	$0.00	$0.00	$0.00	$562.50	$2,437.50	$5,625.00	$5,625.00	$2,437.50	$562.50	$0.00	$0.00	*$17,250*

JERICHO MOUNTAIN STATE PARK
YEAR 4 OPERATIONS MODEL

Prepared By Horizons Engineering, P.L.L.C.

November 2006

CAMPGROUND AND PARK

Revenue	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***	***Percent of Total***
Facility Fees	$0	$0	$0	$0	$1,808	$10,845	$23,498	$23,498	$10,845	$3,615	$0	$0	*$74,108*	14%
Remote Camp Sites	$73	$73	$73	$733	$1,833	$10,998	$23,829	$23,829	$10,998	$3,666	$3,666	$73	*$79,845*	15%
Tent Camp Sites	$206	$206	$206	$2,065	$5,162	$30,969	$67,100	$67,100	$30,969	$10,323	$10,323	$206	*$224,835*	41%
RV Camp Sites	$0	$0	$0	$0	$0	$0	$0	$36,660	$16,920	$5,640	$5,640	$113	*$64,973*	12%
Showers	$23	$23	$23	$229	$572	$3,434	$7,441	$7,441	$3,434	$1,145	$1,145	$23	*$24,934*	5%
Pavilion Rentals	$0	$0	$0	$0	$630	$3,780	$8,190	$8,190	$3,780	$1,260	$0	$25	*$25,855*	5%
Concessions	$1,017	$1,017	$1,017	$1,166	$1,415	$3,491	$6,397	$6,397	$3,491	$1,830	$1,830	$1,017	*$30,084*	6%
ATV Wash	$0	$0	$0	$0	$360	$2,160	$4,680	$4,680	$2,160	$720	$0	$0	*$14,760*	3%
Canoe/Kayak Rentals	$0	$0	$0	$0	$75	$450	$975	$975	$450	$150	$0	$0	*$3,075*	1%
Total Revenue	*$1,319*	*$1,319*	*$1,319*	*$4,193*	*$11,855*	*$66,127*	*$142,109*	*$178,769*	*$83,047*	*$28,349*	*$22,604*	*$1,457*	*$542,469*	
Expenses														
Supplies	$500	$500	$500	$500	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$500	$500	*$16,200*	2%
Telephone	$150	$150	$150	$150	$300	$300	$300	$300	$300	$300	$150	$150	*$2,700*	0%
Contract Repairs (sub)	$0	$0	$0	$0	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$0	$0	*$6,000*	1%
In House Repairs	$0	$0	$0	$0	$500	$500	$500	$500	$500	$500	$0	$0	*$3,000*	0%
Heating Fuel	$500	$500	$500	$100	$0	$0	$0	$0	$0	$100	$100	$500	*$2,300*	0%
Vehicles	$1,000	$1,000	$1,000	$1,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$1,000	$1,000	*$18,000*	2%
Advertising	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	*$6,000*	1%
Insurance	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	*$24,000*	3%
Office Equipment	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	*$2,400*	0%
Trash Removal	$200	$200	$200	$200	$1,000	$2,000	$5,000	$5,000	$2,000	$1,000	$200	$200	*$17,200*	2%
Wash Station	$0	$0	$0	$0	$400	$1,000	$2,000	$2,000	$1,000	$400	$0	$0	*$6,800*	1%
Interest Expense (20 Yr)	$32,401	$32,401	$32,401	$32,401	$32,401	$32,401	$32,401	$32,401	$32,401	$32,401	$32,401	$32,401	*$388,812*	45%
Capital Amortization (20 Yr)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Electric	$400	$400	$400	$400	$800	$1,200	$1,800	$1,800	$1,200	$800	$400	$400	*$10,000*	1%
Misc Expenses	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	*$3,600*	0%
Water/Sewer	$100	$100	$100	$100	$500	$500	$500	$500	$500	$500	$100	$100	*$3,600*	0%
Salaries / Benefits (FT)	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	*$119,988*	14%
Salaries (PT)	$6,720	$6,720	$6,720	$6,720	$13,440	$40,320	$40,320	$40,320	$40,320	$13,440	$6,720	$6,720	*$228,480*	27%
Total Expenses	*$54,970*	*$54,970*	*$54,970*	*$54,570*	*$67,540*	*$96,420*	*$101,020*	*$101,020*	*$96,420*	*$67,640*	*$54,570*	*$54,970*	*$859,080*	
Net Gain (Loss) - Park	**($53,651)**	**($53,651)**	**($53,651)**	**($50,377)**	**($55,685)**	**($30,293)**	**$41,089**	**$77,749**	**($13,373)**	**($39,291)**	**($31,966)**	**($53,513)**	**($316,610)**	
Net Gain (Loss) - Trails	**($4,467)**	**($4,467)**	**($4,467)**	**($18,667)**	**($23,305)**	**($11,430)**	**($5,742)**	**($5,742)**	**($11,430)**	**($23,305)**	**($7,467)**	**($4,467)**	**($73,532)**	
Total Net Gain (Loss)	**($58,118)**	**($58,118)**	**($58,118)**	**($69,044)**	**($78,990)**	**($41,722)**	**$35,347**	**$72,007**	**($24,802)**	**($62,595)**	**($39,433)**	**($57,980)**	**($390,142)**	

MODEL ASSUMPTIONS

Usage Per Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Remote Camp Site Days	2	2	2	16	39	234	507	507	234	78	78	2
Tent Camp Site Days	6	6	6	56	140	837	1814	1814	837	279	279	6
RV Camp Site Days	2	2	2	24	60	360	780	780	360	120	120	2
Campground and Park Occupancy	0%	0%	0%	2%	5%	30%	65%	65%	30%	10%	10%	0%
Canoe/Kayak Rentals	0	0	0	0	3	18	39	39	18	6	0	0
Facility Day Pass	14	14	14	145	362	2169	4700	4700	2169	723	723	14
Pavilion Rentals	0	0	0	1	2	13	27	27	13	4	0	0
ATV Wash	5	5	5	48	120	720	1560	1560	720	240	240	5
4x4 Day Passes	0	0	0	0	0	400	500	500	400	0	0	0
CCC of Park	400											

Fees

RV Camp Sites	$47	Night
Tent Camp Sites	$37	Night
Remote Sites	$47	Night
Canoe/Kayak Rentals	$25	Day
Facility Day Fee	$5	Day
Pavilion Rental	$300	Day
ATV Wash	$3	Each
Showers	$3	Each
4x4 Day Pass	$25	Each

Staff Salaries and Benefits

Full Time	$5,000	Month
Part Time	$1,344	Month

Staffing Requirements	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Full Time Staff	2	2	2	2	2	2	2	2	2	2	2	2
Part Time Staff	5	5	5	5	10	30	30	30	30	10	5	5

Facility Inventory	Number of Sites Available
RV Sites	40
Tent Sites	93
Remote Sites	26
Pavilions	7

JERICHO MOUNTAIN STATE PARK
YEAR 4 OPERATIONS MODEL – TRAILS

Prepared By Horizons Engineering, P.L.L.C.
November 2006

TRAILS

Revenue	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***	**Percent of Total**
One-Day 4x4 Trail Stickers	$0	$0	$0	$0	$0	$10,000	$12,500	$12,500	$10,000	$0	$0	$0	*$45,000*	40%
DRED Trail Grant Funding	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	*$50,000*	45%
Trail Events	$0	$0	$0	$0	$563	$2,438	$5,625	$5,625	$2,438	$563	$0	$0	*$17,250*	15%
Total Revenue	*$4,167*	*$4,167*	*$4,167*	*$4,167*	*$4,729*	*$16,604*	*$22,292*	*$22,292*	*$16,604*	*$4,729*	*$4,167*	*$4,167*	*$112,250*	
Expenses														
Vehicles and Equipment	1500	1500	1500	3000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$1,500	*$18,000*	10%
Insurance	300	300	300	300	$300	$300	$300	$300	$300	$300	$300	$300	*$1,800*	1%
Interest Expense (20 Yr)	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	*$78,405*	42%
Capital Amortization (20 Yr)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Trail Supplies	0	0	0	1000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$0	*$6,000*	3%
Electric (Shop)	300	300	300	300	$500	$500	$500	$500	$500	$500	$300	$300	*$3,000*	2%
Shop Supplies	0	0	0	500	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$500	$0	*$6,000*	3%
Heavy Equipment (sub)	0	0	0	0	$4,500	$4,500	$4,500	$4,500	$4,500	$4,500	$0	$0	*$27,000*	15%
Salaries (FT seasonal)	$0	$0	$0	$10,752	$10,752	$10,752	$10,752	$10,752	$10,752	$10,752	$0	$0	*$64,512*	35%
Total Expenses	*$8,634*	*$8,634*	*$8,634*	*$22,386*	*$27,586*	*$27,586*	*$27,586*	*$27,586*	*$27,586*	*$27,586*	*$11,634*	*$8,634*	*$185,782*	
Net Gain (Loss) - Trails	**($4,467)**	**($4,467)**	**($4,467)**	**($18,219)**	**($22,857)**	**($10,982)**	**($5,294)**	**($5,294)**	**($10,982)**	**($22,857)**	**($7,467)**	**($4,467)**	**($73,532)**	

MODEL ASSUMPTIONS
Staff Salaries and Benefits
Full Time Seasonal $2,688 Month

Staffing Requirements	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Full Time Seasonal Staff	0	0	0	4	4	4	4	4	4	4	0	0

Event Attendance

Small Event	150
Medium Event	500
Large Event	1000
Average gate fee per attendee	$15.00

Number of Events/Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***
Small Event	0	0	0	0	1	1	0	0	1	1	0	0	*4*
Medium Event	0	0	0	0	0	1	1	1	1	0	0	0	*4*
Large Event	0	0	0	0	0	0	1	1	0	0	0	0	*2*

Event Revenue	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***
Small Event	$0.00	$0.00	$0.00	$0.00	$562.50	$562.50	$0.00	$0.00	$562.50	$562.50	$0.00	$0.00	*$2,250*
Medium Event	$0.00	$0.00	$0.00	$0.00	$0.00	$1,875.00	$1,875.00	$1,875.00	$1,875.00	$0.00	$0.00	$0.00	*$7,500*
Large Event	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3,750.00	$3,750.00	$0.00	$0.00	$0.00	$0.00	*$7,500*
Total Event Revenue	$0.00	$0.00	$0.00	$0.00	$562.50	$2,437.50	$5,625.00	$5,625.00	$2,437.50	$562.50	$0.00	$0.00	*$17,250*

JERICHO MOUNTAIN STATE PARK
YEAR 5 OPERATIONS MODEL
Prepared By Horizons Engineering, P.L.L.C.
November 2006

FINANCIAL MODEL

Income	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***	***Percent of Total***
Facility Fees	$0	$0	$0	$0	$2,520	$15,120	$32,760	$32,760	$15,120	$5,040	$0	$0	*$103,320*	13%
Remote Camp Sites	$73	$73	$73	$733	$1,833	$10,998	$23,829	$23,829	$10,998	$3,666	$3,666	$73	*$79,845*	10%
Tent Camp Sites	$206	$206	$206	$2,065	$5,162	$30,969	$67,100	$67,100	$30,969	$10,323	$10,323	$206	*$224,835*	29%
RV Camp Sites	$228	$228	$228	$2,284	$5,711	$34,263	$74,237	$74,237	$34,263	$11,421	$11,421	$228	*$248,749*	32%
Showers	$29	$29	$29	$288	$720	$4,320	$9,360	$9,360	$4,320	$1,440	$1,440	$29	*$31,363*	4%
Pavilion Rentals	$0	$0	$0	$0	$630	$3,780	$8,190	$8,190	$3,780	$1,260	$0	$25	*$25,855*	3%
Concessions	$1,023	$1,023	$1,023	$1,229	$1,572	$4,429	$8,430	$8,430	$4,429	$2,143	$2,143	$1,023	*$36,895*	5%
ATV Wash	$0	$0	$0	$0	$482	$2,894	$6,271	$6,271	$2,894	$965	$0	$0	*$19,778*	3%
Canoe/Kayak Rentals	$0	$0	$0	$0	$152	$911	$1,974	$1,974	$911	$304	$0	$0	*$6,227*	1%
Total Revenue	*$1,560*	*$1,560*	*$1,560*	*$6,599*	*$18,781*	*$107,685*	*$232,150*	*$232,150*	*$107,685*	*$36,562*	*$28,993*	*$1,585*	*$776,868*	
Expenses														
Supplies	$500	$500	$500	$500	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$500	$500	*$16,200*	2%
Telephone	$150	$150	$150	$150	$300	$300	$300	$300	$300	$300	$150	$150	*$2,700*	0%
Contract Repairs (sub)	$0	$0	$0	$0	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$0	$0	*$6,000*	1%
In House Repairs	$0	$0	$0	$0	$500	$500	$500	$500	$500	$500	$0	$0	*$3,000*	0%
Heating Fuel	$500	$500	$500	$100	$0	$0	$0	$0	$0	$100	$100	$500	*$2,300*	0%
Vehicles	$1,000	$1,000	$1,000	$1,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$1,000	$1,000	*$18,000*	2%
Advertising	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	*$6,000*	1%
Insurance	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	*$24,000*	3%
Office Equipment	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	*$2,400*	0%
Trash Removal	$200	$200	$200	$200	$1,000	$2,000	$5,000	$5,000	$2,000	$1,000	$200	$200	*$17,200*	2%
Wash Station	$0	$0	$0	$0	$400	$1,000	$2,000	$2,000	$1,000	$400	$0	$0	*$6,800*	1%
Interest Expense (20 Yr)	$34,599	$34,599	$34,599	$34,599	$34,599	$34,599	$34,599	$34,599	$34,599	$34,599	$34,599	$34,599	*$415,187*	47%
Capital Amortization (20 Yr)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Electric	$400	$400	$400	$400	$800	$1,200	$1,800	$1,800	$1,200	$800	$400	$400	*$10,000*	1%
Misc Expenses	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	*$3,600*	0%
Water/Sewer	$100	$100	$100	$100	$500	$500	$500	$500	$500	$500	$100	$100	*$3,600*	0%
Salaries / Benefits (FT)	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	*$119,988*	14%
Salaries (PT)	$6,720	$6,720	$6,720	$6,720	$13,440	$40,320	$40,320	$40,320	$40,320	$13,440	$6,720	$6,720	*$228,480*	26%
Total Expenses	*$57,168*	*$57,168*	*$57,168*	*$56,768*	*$69,738*	*$98,618*	*$103,218*	*$103,218*	*$98,618*	*$69,838*	*$56,768*	*$57,168*	*$885,455*	
Net Gain (Loss) - Park	**($55,608)**	**($55,608)**	**($55,608)**	**($50,169)**	**($50,957)**	**$9,067**	**$128,932**	**$128,932**	**$9,067**	**($33,276)**	**($27,775)**	**($55,583)**	**($108,587)**	
Net Gain (Loss) - Trails	**($4,467)**	**($4,467)**	**($4,467)**	**($18,667)**	**($23,305)**	**($11,430)**	**($5,742)**	**($5,742)**	**($11,430)**	**($23,305)**	**($7,467)**	**($4,467)**	**($127,909)**	
Total Net Gain (Loss)	**($60,075)**	**($60,075)**	**($60,075)**	**($68,836)**	**($74,262)**	**($2,363)**	**$123,190**	**$123,190**	**($2,363)**	**($56,581)**	**($35,242)**	**($60,050)**	**($236,496)**	

MODEL ASSUMPTIONS

Usage Per Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Remote Camp Site Days	2	2	2	16	39	234	507	507	234	78	78	2
Tent Camp Site Days	6	6	6	56	140	837	1814	1814	837	279	279	6
RV Camp Site Days	5	5	5	49	122	729	1580	1580	729	243	243	5
Campground and Park Occupancy	0%	0%	0%	2%	5%	30%	65%	65%	30%	10%	10%	0%
Canoe/Kayak Rentals	0	0	0	0	6	36	79	79	36	12	0	0
Facility Day Pass	20	20	20	202	504	3024	6552	6552	3024	1008	1008	20
Pavilion Rentals	0	0	0	1	2	13	27	27	13	4	0	0
ATV Wash	0	0	0	64	161	965	2090	2090	965	322	0	0
4x4 Day Passes	0	0	0	0	0	400	500	500	400	0	0	0
CCC of Park	536											

Fees

RV Camp Sites	$47	Night
Tent Camp Sites	$37	Night
Remote Sites	$47	Night
Canoe/Kayak Rentals	$25	Day
Facility Day Fee	$5	Day
Pavilion Rental	$300	Day
ATV Wash	$3	Each
Showers	$3	Each
4x4 Day Pass	$25	Each

Staff Salaries and Benefits

Full Time	$5,000	Month
Part Time	$1,344	Month

Assumed Staffing Requirements	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Full Time Staff	2	2	2	2	2	2	2	2	2	2	2	2
Part Time Staff	5	5	5	5	10	30	30	30	30	10	5	5

Facility Inventory	Number of Sites Available
RV Sites	81
Tent Sites	93
Remote Sites	26
Pavilions	7

JERICHO MOUNTAIN STATE PARK
YEAR 5 OPERATIONS MODEL – TRAILS

Prepared By Horizons Engineering, P.L.L.C.
November 2006

TRAILS

Revenue	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***	**Percent of Total**
One-Day 4x4 Trail Stickers	$0	$0	$0	$0	$0	$10,000	$12,500	$12,500	$10,000	$0	$0	$0	*$45,000*	40%
DRED Trail Grant Funding	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	*$50,000*	45%
Trail Events	$0	$0	$0	$0	$563	$2,438	$5,625	$5,625	$2,438	$563	$0	$0	*$17,250*	15%
Total Revenue	*$4,167*	*$4,167*	*$4,167*	*$4,167*	*$4,729*	*$16,604*	*$22,292*	*$22,292*	*$16,604*	*$4,729*	*$4,167*	*$4,167*	*$112,250*	
Expenses														
Vehicles and Equipment	1500	1500	1500	3000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$1,500	*$18,000*	7%
Insurance	300	300	300	300	$300	$300	$300	$300	$300	$300	$300	$300	*$1,800*	1%
Interest Expense (20 Yr)	$7,041	$7,041	$7,041	$7,041	$7,041	$7,041	$7,041	$7,041	$7,041	$7,041	$7,041	$7,041	*$84,495*	35%
Capital Amortization (20 Yr)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	*$0*	0%
Trail Supplies	0	0	0	1000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$0	*$6,000*	2%
Electric (Shop)	300	300	300	300	$500	$500	$500	$500	$500	$500	$300	$300	*$3,000*	1%
Shop Supplies	0	0	0	500	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$500	$0	*$6,000*	2%
Heavy Equipment (sub)	0	0	0	0	$4,500	$4,500	$4,500	$4,500	$4,500	$4,500	$0	$0	*$27,000*	11%
Salaries (FT seasonal)	$0	$0	$0	$10,752	$10,752	$10,752	$10,752	$10,752	$10,752	$10,752	$0	$0	*$64,512*	27%
Total Expenses	*$9,141*	*$9,141*	*$9,141*	*$22,893*	*$28,093*	*$28,093*	*$28,093*	*$28,093*	*$28,093*	*$28,093*	*$12,141*	*$9,141*	*$240,159*	
Net Gain (Loss) - Trails	**($4,975)**	**($4,975)**	**($4,975)**	**($18,727)**	**($23,364)**	**($11,489)**	**($5,802)**	**($5,802)**	**($11,489)**	**($23,364)**	**($7,975)**	**($4,975)**	**($127,909)**	

MODEL ASSUMPTIONS

Staff Salaries

Full Time Seasonal $2,688 Month (per employee)

Assumed Staffing Requiremer	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Full Time Seasonal Staff	0	0	0	4	4	4	4	4	4	4	0	0

Assumed Event Attendance

Small Event	150
Medium Event	500
Large Event	1000
Average gate fee per attendee	$15.00

Number of Events/Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***
Small Event	0	0	0	0	1	1		0	1	1	0	0	*4*
Medium Event	0	0	0	0	0	1	1	1	1	0	0	0	*4*
Large Event	0	0	0	0	0	0	1	1	0	0	0	0	*2*

Event Revenue	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***
Small Event	$0.00	$0.00	$0.00	$0.00	$562.50	$562.50	$0.00	$0.00	$562.50	$562.50	$0.00	$0.00	*$2,250*
Medium Event	$0.00	$0.00	$0.00	$0.00	$0.00	$1,875.00	$1,875.00	$1,875.00	$1,875.00	$0.00	$0.00	$0.00	*$7,500*
Large Event	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3,750.00	$3,750.00	$0.00	$0.00	$0.00	$0.00	*$7,500*
Total Event Revenue	$0.00	$0.00	$0.00	$0.00	$562.50	$2,437.50	$5,625.00	$5,625.00	$2,437.50	$562.50	$0.00	$0.00	*$17,250*

JERICHO MOUNTAIN STATE PARK
YEARS 6-10 ANNUAL OPERATIONS MODEL

Prepared By Horizons Engineering, P.L.L.C.
November, 2006

FINANCIAL MODEL

Revenue	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***	**Percent of Total**
Facility Entrance Fees	$0	$0	$0	$0	$2,520	$15,120	$32,760	$32,760	$15,120	$5,040	$0	$0	*$103,320*	13%
Remote Camp Sites	$73	$73	$73	$733	$1,833	$10,998	$23,829	$23,829	$10,998	$3,666	$3,666	$73	*$79,845*	10%
Tent Camp Sites	$206	$206	$206	$2,065	$5,162	$30,969	$67,100	$67,100	$30,969	$10,323	$10,323	$206	*$224,835*	29%
RV Camp Sites	$228	$228	$228	$2,284	$5,711	$34,263	$74,237	$74,237	$34,263	$11,421	$11,421	$228	*$248,749*	32%
Showers	$29	$29	$29	$288	$720	$4,320	$9,360	$9,360	$4,320	$1,440	$1,440	$29	*$31,363*	4%
Pavilion Rentals	$0	$0	$0	$0	$630	$3,780	$8,190	$8,190	$3,780	$1,260	$0	$0	*$25,830*	3%
Concessions	$1,103	$1,103	$1,103	$1,127	$1,572	$4,429	$8,430	$8,430	$4,429	$2,143	$2,143	$1,103	*$37,112*	5%
ATV Wash	$0	$0	$0	$0	$482	$2,894	$6,271	$6,271	$2,894	$965	$0	$0	*$19,778*	3%
Canoe/Kayak Rentals	$0	$0	$0	$0	$152	$911	$1,974	$1,974	$911	$304	$0	$0	*$6,227*	1%
Total Revenue	*$1,640*	*$1,640*	*$1,640*	*$6,497*	*$18,781*	*$107,685*	*$232,150*	*$232,150*	*$107,685*	*$36,562*	*$28,993*	*$1,640*	*$777,061*	
Expenses														
Supplies	$500	$500	$500	$500	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$500	$500	*$16,200*	2%
Telephone	$150	$150	$150	$150	$300	$300	$300	$300	$300	$300	$150	$150	*$2,700*	0%
Contract Repairs (sub)	$0	$0	$0	$1,000	$2,000	$2,000	$2,000	$2,000	$2,000	$1,000	$0	$0	*$12,000*	1%
In House Repairs	$0	$0	$0	$0	$500	$500	$1,000	$1,000	$1,000	$1,000	$0	$0	*$5,000*	0%
Heating Fuel	$500	$500	$500	$100	$0	$0	$0	$0	$0	$100	$100	$500	*$2,300*	0%
Vehicles	$1,000	$1,000	$1,000	$1,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$1,000	$1,000	*$18,000*	2%
Advertising	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	*$6,000*	1%
Insurance	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	*$24,000*	2%
Office Equipment	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	*$2,400*	0%
Trash Removal	$200	$200	$200	$200	$1,000	$2,000	$5,000	$5,000	$2,000	$1,000	$200	$200	*$17,200*	2%
Wash Station	$0	$0	$0	$0	$200	$1,000	$1,500	$1,500	$1,000	$200	$0	$0	*$5,400*	1%
Interest Expense (20 Yr)	$34,248	$34,248	$34,248	$34,248	$34,248	$34,248	$34,248	$34,248	$34,248	$34,248	$34,248	$34,248	*$410,976*	41%
Capital Amortization (20 Yr)	$10,348	$10,348	$10,348	$10,348	$10,348	$10,348	$10,348	$10,348	$10,348	$10,348	$10,348	$10,348	*$124,179*	12%
Electric	$400	$400	$400	$400	$800	$1,200	$1,800	$1,800	$1,200	$800	$400	$400	*$10,000*	1%
Misc Expenses	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	*$3,600*	0%
Water/Sewer	$100	$100	$100	$100	$500	$500	$500	$500	$500	$500	$100	$100	*$3,600*	0%
Salaries / Benefits (FT)	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	$9,999	*$119,988*	12%
Salaries (PT)	$6,720	$6,720	$6,720	$6,720	$13,440	$40,320	$40,320	$40,320	$40,320	$13,440	$6,720	$6,720	*$228,480*	23%
Total Expenses	*$67,165*	*$67,165*	*$67,165*	*$67,765*	*$80,535*	*$109,615*	*$114,215*	*$114,215*	*$110,115*	*$80,135*	*$66,765*	*$67,165*	*$1,012,023*	
Net Gain (Loss) - Park	**($65,526)**	**($65,526)**	**($65,526)**	**($61,268)**	**($61,754)**	**($1,931)**	**$117,935**	**$117,935**	**($2,431)**	**($43,574)**	**($37,772)**	**($65,526)**	**($234,962)**	
Net Gain (Loss) - Trails	**($6,738)**	**($6,738)**	**($6,738)**	**($20,490)**	**($25,127)**	**($13,252)**	**($7,565)**	**($7,565)**	**($13,252)**	**($25,127)**	**($9,738)**	**($6,738)**	**($149,065)**	
Total Net Gain (Loss)	**($72,263)**	**($72,263)**	**($72,263)**	**($81,758)**	**($86,882)**	**($15,183)**	**$110,370**	**$110,370**	**($15,683)**	**($68,701)**	**($47,510)**	**($72,263)**	**($384,027)**	

MODEL ASSUMPTIONS

Usage Per Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Remote Camp Site Days	2	2	2	16	39	234	507	507	234	78	78	2
Tent Camp Site Days	6	6	6	56	140	837	1814	1814	837	279	279	6
RV Camp Site Days	5	5	5	49	122	729	1580	1580	729	243	243	5
Campground and Park Occupancy	0%	0%	0%	2%	5%	30%	65%	65%	30%	10%	10%	0%
Canoe/Kayak Rentals	0	0	0	0	6	36	79	79	36	12	0	0
Facility Day Pass	100	100	100	100	504	3024	6552	6552	3024	1008	1008	100
Pavilion Rentals	0	0	0	1	2	13	27	27	13	4	0	0
ATV Wash	22	22	22	44	161	965	2090	2090	965	322	322	22
4x4 Day Passes	0	0	0	0	0	400	500	500	400	0	0	0
CCC of Park	536											

Fees

RV Camp Sites	$47 Night
Tent Camp Sites	$37 Night
Remote Sites	$47 Night
Canoe/Kayak Rentals	$25 Day
Facility Day Fee	$5 Day
Pavilion Rental	$300 Day
ATV Wash	$3 Each
Showers	$3 Each
4x4 Day Pass	$25 Each

Staff Salaries and Benefits (per employee)

Full Time	$5,000 Month
Part Time	$1,344 Month

Staffing Requirements	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Full Time Staff	2	2	2	2	2	2	2	2	2	2	2	2
Part Time Staff	5	5	5	5	10	30	30	30	30	10	5	5

Facility Inventory	Number of Sites Available
RV Sites	81
Tent Sites	93
Remote Sites	26
Pavilions	7

JERICHO MOUNTAIN STATE PARK
YEARS 6-10 ANNUAL OPERATIONS MODEL – TRAILS

Prepared By Horizons Engineering, P.L.L.C.
November 2006

TRAILS

Income	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***	**Percent of Total**
One-Day 4x4 Trail Stickers	$0	$0	$0	$0	$0	$10,000	$12,500	$12,500	$10,000	$0	$0	$0	*$45,000*	40%
DRED Trail Grant Funding	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	$4,167	*$50,000*	45%
Trail Events	$0	$0	$0	$0	$563	$2,438	$5,625	$5,625	$2,438	$563	$0	$0	*$17,250*	15%
Total Revenue	*$4,167*	*$4,167*	*$4,167*	*$4,167*	*$4,729*	*$16,604*	*$22,292*	*$22,292*	*$16,604*	*$4,729*	*$4,167*	*$4,167*	*$112,250*	
Expenses														
Vehicles and Equipment	$1,500	$1,500	$1,500	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$1,500	*$18,000*	7%
Insurance	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	*$1,800*	1%
Interest Expense (20 Yr)	$7,041	$7,041	$7,041	$7,041	$7,041	$7,041	$7,041	$7,041	$7,041	$7,041	$7,041	$7,041	*$84,495*	32%
Capital Amortization (20 Yr)	$1,763	$1,763	$1,763	$1,763	$1,763	$1,763	$1,763	$1,763	$1,763	$1,763	$1,763	$1,763	*$21,156*	8%
Trail Supplies	$0	$0	$0	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$0	*$6,000*	2%
Electric (Shop)	$300	$300	$300	$300	$500	$500	$500	$500	$500	$500	$300	$300	*$3,000*	1%
Shop Supplies	$0	$0	$0	$500	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$500	$0	*$6,000*	2%
Heavy Equipment (sub)	$0	$0	$0	$0	$4,500	$4,500	$4,500	$4,500	$4,500	$4,500	$0	$0	*$27,000*	10%
Salaries (FT seasonal)	$0	$0	$0	$10,752	$10,752	$10,752	$10,752	$10,752	$10,752	$10,752	$0	$0	*$64,512*	25%
Total Expenses	*$10,904*	*$10,904*	*$10,904*	*$24,656*	*$29,856*	*$29,856*	*$29,856*	*$29,856*	*$29,856*	*$29,856*	*$13,904*	*$10,904*	*$261,315*	
Net Gain (Loss) - Trails	**($6,738)**	**($6,738)**	**($6,738)**	**($20,490)**	**($25,127)**	**($13,252)**	**($7,565)**	**($7,565)**	**($13,252)**	**($25,127)**	**($9,738)**	**($6,738)**	**($149,065)**	

MODEL ASSUMPTIONS

Staff Salaries and Benefits

Full Time Seasonal $2,688 Month (per employee)

Staffing Requirements	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Full Time Seasonal Staff	0	0	0	4	4	4	4	4	4	4	0	0

Event Attendance

Small Event	150
Medium Event	500
Large Event	1000
Average gate fee per attendee	$15.00

Number of Events/Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***
Small Event	0	0	0	0	1	1	0	0	1	1	0	0	*4*
Medium Event	0	0	0	0	0	1	1	1	1	0	0	0	*4*
Large Event	0	0	0	0	0	0	1	1	0	0	0	0	*2*
Event Revenue	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	***Total***
Small Event	$0	$0	$0	$0	$563	$563	$0	$0	$563	$563	$0	$0	*$2,250*
Medium Event	$0	$0	$0	$0	$0	$1,875	$1,875	$1,875	$1,875	$0	$0	$0	*$7,500*
Large Event	$0	$0	$0	$0	$0	$0	$3,750	$3,750	$0	$0	$0	$0	*$7,500*
Total Event Revenue	$0	$0	$0	$0	$563	$2,438	$5,625	$5,625	$2,438	$563	$0	$0	*$17,250*

APPENDIX III

Hatfield-McCoy Trail System Signage

SAFETY! SAFETY! SAFETY!

SIGNAGE

Open to / Closed to

Open to motorcycles

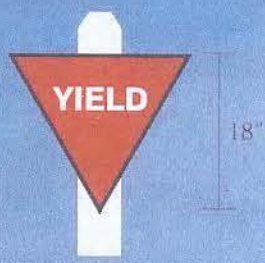
Open to All Terrain Vehicles less than 50" in width or the following; Kawasaki Mules, Suzuki QUV, Polaris Ranger, Yamaha Rhino, and Arctic Cat Prowler.

Signs with a red slash indicate the route is not open for the particular use.

Traffic Control

(located where licensed street vehicle traffic is likely)

Stop Ahead and Yield Ahead signs precede stop and yield signs.



Confidence Markers

(indicates you are on trail #10)

4" post

---Hatfield-McCoy logo

---Trail number

SAFETY! SAFETY! SAFETY!

SAFETY! SAFETY! SAFETY!

Intersection marker

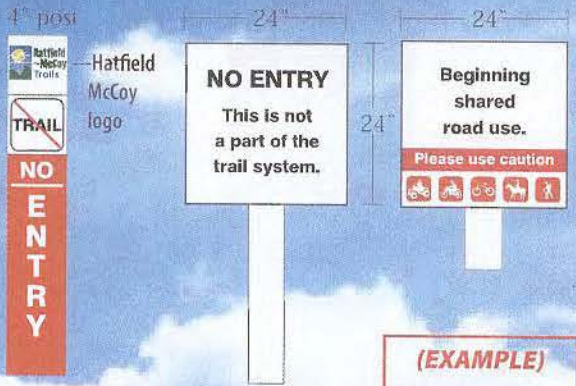
(EXAMPLE)

Trail #10, an easiest trail goes straight ahead.

Trail #32, a more difficult trail, goes left.

Trail Management

No entry signs indicate off-limit areas.



Trail is closed due to construction or repair.

4" post

TEMPORARY CLOSURE

Trail Hazard Ahead.

4" post

CAUTION

(EXAMPLE)

Heavily traveled with authorized non-trail traffic.

- Coal Trucks
- Emergency Vehicles
- Heavy Equipment
- Land Owners

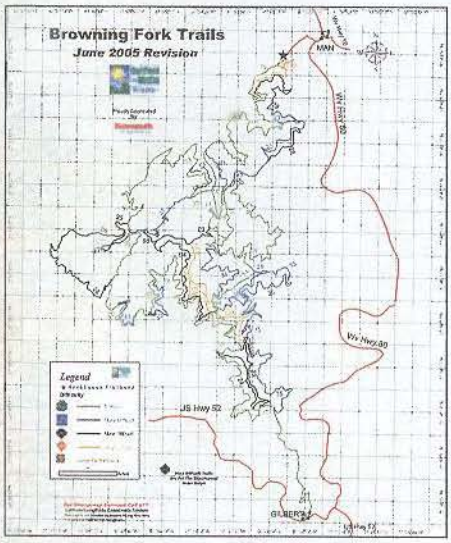
SAFETY! SAFETY! SAFETY!

Trail Description

Browning Fork

The Browning Fork Trail System consists of approximately 115 total miles of trail. "Rockhouse," as it's most commonly known, has the largest total amount of trails of each of our trail systems. The breakdown in trail percentage is as follows: 49% are green trails (easiest), 23% are blue trails (more difficult), 21% are black trails (most difficult), and 7% are orange trails (single track only). This trail system has direct access to the cities of Gilbert and Man WV, gas, full service food, and lodging.

(Map not intended for trail use. Be sure to get an updated map every time you ride.)

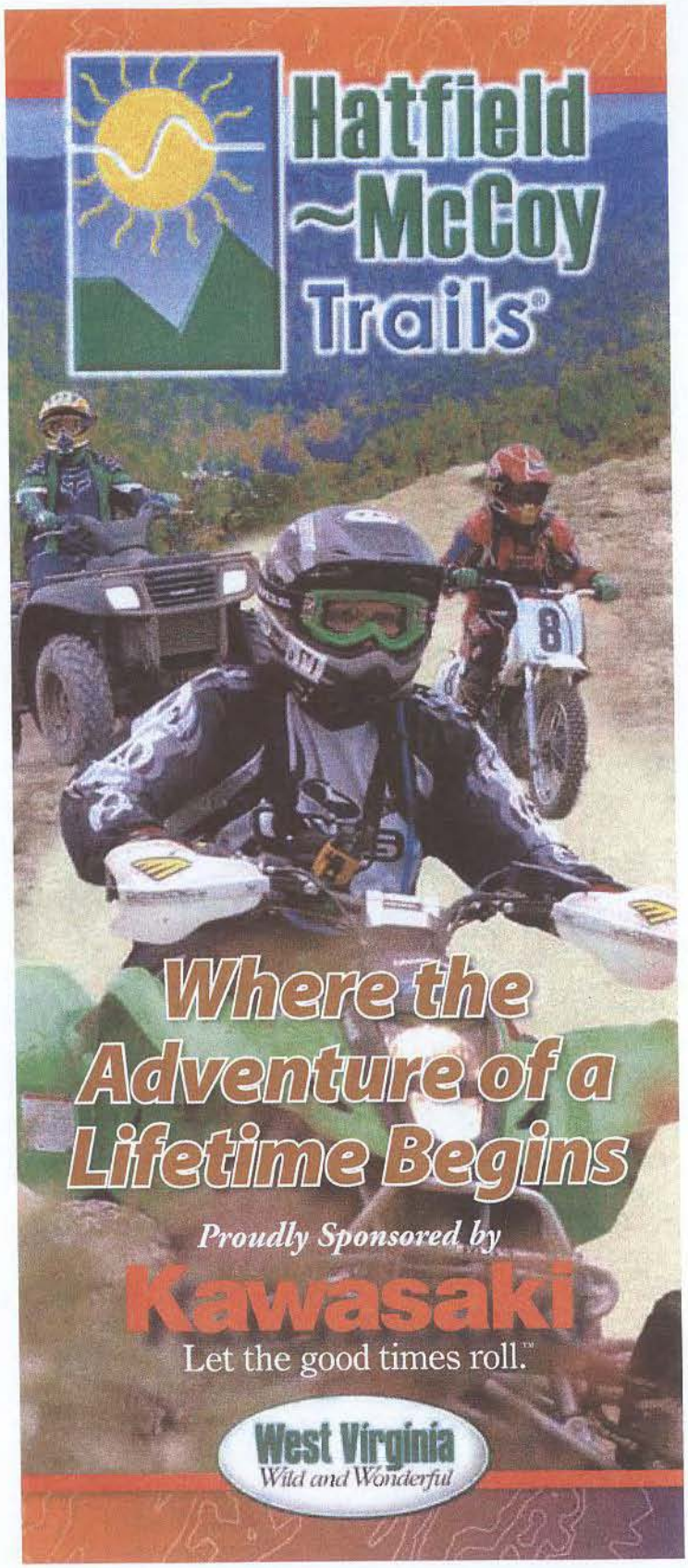


Trailhead Directions

Rockhouse Trailhead

Driving north or south on Rt. 119, take the Logan exit. Follow Rt. 73 east to Rt. 10 south. Take Rt. 10 for 16 miles to Rt. 80 south. Bear right onto Rt. 80, cross the bridge and the railroad tracks. Go straight, cross the river, and make a left at the stop sign. Follow the road approximately ½ mile to the trailhead center. This trail system is approximately .5 miles to the nearest town of Man and 12 miles to Gilbert, WV.

www.TrailsHeaven.com


Hatfield
~McCoy
Trails®
Where the
Adventure of a
Lifetime Begins
Proudly Sponsored by
Kawasaki
Let the good times roll.™
West Virginia
Wild and Wonderful

The Trails Heaven Adventure

Come visit the place where wild and wonderful mountains have combined with trails heaven to create the nationally recognized Hatfield-McCoy Trails. The trails are located in the rich mountains of Appalachia in southern West Virginia. Deep valleys mixed with tight and twisting trails which tempt the daring soul to push further, whether the chosen form of transportation is an ATV, dirt bike, a horse, mountain bike or your own two legs. West Virginia is known as "Almost Heaven" and it's no coincidence the Hatfield-McCoy Trails have become known as "Trails Heaven." Southern hospitality combines with over 500 miles of trails (more in progress) to form life-long memories and create an experience you will want to repeat again and again. Come with us to Trails Heaven...

In this brochure you'll find everything you need to have an enjoyable stay in Hatfield-McCoy country. There are sections on safety (our number one priority) trail descriptions, driving directions to trailheads, lodging facilities, where to buy your trail permits, places of interest around the trails, and advertisements from our sponsors, without whom this project wouldn't be possible. We thank them for helping us to preserve trails for you.

If at any time during your stay in West Virginia you have questions, please contact our offices at 1-800-592-2217. Many people call West Virginia, "Almost Heaven," and as for the Hatfield-McCoy Trails, you are about to experience TRAILS HEAVEN!

www.TrailsHeaven.com

User Permits

- Permits are required to ride on the Hatfield-McCoy Trail System -

How you purchase permits.

You can purchase permits in the following ways:

1. On our website 24 hours a day (for advanced purchases only).
2. At our administrative office weekdays from 9am to 5pm. For more information contact us at 1-800-592-2217.
3. At each of our trailheads from 9am to 11am eastern.
4. From one of many convenient local vendors including hotels, campgrounds, and dealerships.

Please contact the businesses for their hours of operation.

Annual permits

West Virginia riders	$26.50**
Out-of-State riders	$79.50*

Permits expire one year from the date of purchase.

3-7 Day permits	$37.00*
1 Day permits	$19.00*

Prices shown include 6% West Virginia Sales Tax.
** Prices are subject to change without prior notice.*
*** West Virginians are paying less than riders from out-of-state because tax-payer money has helped fund the development of the trail system.*

www.TrailsHeaven.com

SAFETY! SAFETY! SAFETY!

TRAIL RULES

- All trail users must have a Hatfield-McCoy Trail permit on their person at all times.
- All trail users, except hikers, must wear a DOT, SNELL, or other approved helmet, protective eyewear, and over the ankle footwear.
- Motorized vehicles must have a properly functioning muffler and USFS approved spark arrestor.
- No passengers on any ATV, unless the ATV is manufactured for a passenger, in which case, the operator must be 18 years of age, and the passenger must meet the manufacturers age requirements.
- Motorized users must meet manufacturers minimum age requirement.
- The trail system is open from sunrise to sunset. You must be off the trail by sunset.
- Stop if you are signaled by a Ranger.
- All trail users must enter and exit the trail system at, and only at, a Hatfield-McCoy Trailhead or town access point.
- All Off-Highway Vehicles on the trail must be 50 inches wide or less except the following; Kawasaki Mules, Suzuki QUV, Polaris Ranger, Yamaha Rhino, and Arctic Cat Prowler.
- No alcoholic beverages may be consumed or carried on the trails.
- No camping or fires are permitted on or around the trails or trailheads.
- Please do not leave any litter on the trails.
- Those who litter will be cited and prosecuted.
- Adult supervision is required for all children under the age of 18.
- Do not enter any gated or "No Trail Entry" areas for any reason.
- Carry photo identification at all times.

SAFETY! SAFETY! SAFETY!

SAFETY! SAFETY! SAFETY! SAFETY! SAFETY! SAFETY!

SAFETY! SAFETY! SAFETY!

SAFETY!

Professionally Trained Personnel

- Trail Rangers are West Virginia State Police Academy and ATV Safety Institute certified.
- Guided tour service personnel are ATV Safety Institute and First Aid certified, as well as licensed by the Hatfield-McCoy Regional Recreation Authority. Remember to ask your guide if they are licensed, or call our offices to find out.

Trail Construction and Maintenance

- To meet Federal Standards, trails are developed in conjunction with the Bureau of Land Management.
- Trails are mapped using Geographic Information System (GIS) technology.
- Field crews perform daily inspections and maintenance on each of the five trail systems.
- All trails are well marked and rated according to skill level:

- Trail maps are updated constantly and kept in supply at each trailhead to alert riders of any changes in the trail system.

Emergency Services

- For any trail emergency, dial 911
- Hatfield-McCoy Rangers work with local emergency response teams to ensure quick response times in the event of an accident.

SAFETY! SAFETY! SAFETY!

SAFETY! SAFETY! SAFETY! SAFETY! SAFETY! SAFETY! SAFETY!

SAFETY! SAFETY! SAFETY!

THE BEST DEFENSE IS COMMON SENSE

We spare no effort to ensure your safety, but ultimately the best guardian of your safety is you. We can provide you with a safe place to ride, but we can't take the ride for you. There isn't all that much to remember - just exercise a little common sense.

- Follow all rules and regulations
- Check and test your vehicle before riding
- Always ride with someone else
- Keep a safe riding distance from others
- Be mindful of the weather; dress appropriately
- Be prepared. Carry a first aid kit, tools and spare equipment, and a cell phone or two-way radio.

YOUR SAFETY IS OUR #1 PRIORITY

As ATV ownership continues to grow, so does the need for properly managed areas where ATVs may be operated legally and safely. Yet even as demand for such areas is rising, their availability is shrinking. This situation not only creates safety risks for ATV riders, it also creates liability and maintenance risks for owners of non-managed lands.

That's where the Hatfield-McCoy Regional Recreation Area steps in. The HMRRA "provides a safe, legal and managed place for ATV riders." The HMRRA's ATV trails are professionally managed, and they are the most enjoyable in the country. Every user of our trails is a paying guest, and we welcome them with West Virginia's legendary hospitality.

Our trails are professionally mapped and marked for safety. Rangers patrol each trail system and enforce all applicable safety laws and policies. Our staff works hard everyday to maintain the quality of the trails and land.

SAFETY! SAFETY! SAFETY!

SAFETY! SAFETY! SAFETY! SAFETY! SAFETY! SAFETY! SAFETY!

SAFETY! SAFETY! SAFETY!

WEST VIRGINIA HIGHWAYS ATV LAW

West Virginia State Law states:
No ATV may be operated in this state:

- On any interstate highway except by public safety personnel responding to emergencies.
- On any road or highway with a center line or more than two lanes except for the purpose of crossing the road, street, or highway, if:
  - The crossing is made at an angle of approximately 90 degrees to the direction of the highway and at a place where no obstruction prevents a quick and safe crossing.
  - The vehicle is brought to a complete stop before crossing the shoulder or main traveled way of the highway.
  - The operator yields his or her right-of-way to all oncoming traffic that constitutes an immediate potential hazard.
  - Both the headlight and taillight are illuminated when the crossing is made if the vehicle is so equipped.
  - An all-terrain vehicle may, for the sole purpose of getting from one trail, field or area of operation to another, be operated upon the shoulder of a road, street, or highway as long as the crossing is made at an angle of approximately 90 degrees to the direction of the highway and at a place where no obstruction prevents a quick and safe crossing.

Local Government Authority

- The government of a municipality may regulate in any manner or prohibit, by lawfully enacted ordinance, the operation of ATVs upon any street, road or avenue within the municipal corporate limits.
- The county commission of any county which has in effect and is operating under a countywide comprehensive plan may by lawfully enacted ordinance regulate or prohibit the operation of ATVs on any road in the county, except interstate highways.

ATV Friendly Towns

Directly Accessible Municipalities which have passed ordinances allowing special use of ATVs:

- Delbarton, WV
- Gilbert, WV
- Man, WV
- Matewan, WV
- Pineville, WV
- Williamson, WV

The above laws apply only to West Virginia roads and highways and do not apply to the Hatfield-McCoy Trails. These laws are enforced by State, County and Local Law Enforcement Agencies. Hatfield-McCoy Regional Recreation Authority Law Enforcement Division Rangers are West Virginia State Police Academy certified police officers who patrol the more than 500 miles of trails enforcing Hatfield-McCoy Regional Recreation Authority Rules and Regulations (which are State Law), as well as any other State Law violation committed on the trails. Any questions may be directed to:

W.S. Simpkins, Chief Ranger
Hatfield-McCoy Regional Recreation Authority
Law Enforcement Division
P.O. Box 539
Lyburn, WV 25632
304-752-3255
ssimpkins@trailsheaven.com

SAFETY! SAFETY! SAFETY!

SAFETY! SAFETY! SAFETY! SAFETY! SAFETY! SAFETY! SAFETY!

APPENDIX IV

Best Management Practices for Erosion Control
During Trail Maintenance and Construction

Best Management Practices For Erosion Control During Trail Maintenance and Construction

STATE OF NEW HAMPSHIRE
Department of Resources and Economic Development
Division of Parks and Recreation
Bureau of Trails

State of New Hampshire
Department of Resources and Economic Development
Division of Parks and Recreation
Bureau of Trails
172 Pembroke Road, PO Box 1856
Concord, New Hampshire 03302-1856
(603)271-3254
www.nhtrails.org

TABLE OF CONTENTS

I. ACKNOWLEDGMENTS

The following state agencies contributed technical assistance in the revision and update of this document:

Department of Resources and Economic Development - Bureau of Trails
Department of Resources and Economic Development - Division of Forests and Lands
Department of Environmental Services - Wetlands Bureau

A number of agencies contributed technical assistance in the development of the original document:

Alaska Department of Environmental Conservation
Federal Energy Management Agency
New England Sled Dog Club
New Hampshire Department of Transportation
New Hampshire Division of Forests and Lands
New Hampshire Division of Parks and Recreation
New Hampshire Statewide Trails Advisory Committee
Office of State Planning
Trailworks
U.S.D.A. Forest Service
U.S.D.A. Soil Conservation Service
Virginia Department of Conservation and Recreation
Water Supply and Pollution Control Division

II. PURPOSE

In addition to providing recreation, trails foster an appreciation and respect of nature. Trail construction and maintenance may involve impacts to wetlands and other natural resources. This publication attempts to create an understanding of these impacts and provide the methods necessary to minimize them. It has been developed as a reference tool to help public land managers, trail clubs, landowners and recreational trail users work together to protect our state's natural resources. It is necessary to develop erosion control plans for trail projects to minimize erosion, sedimentation and resulting water degradation prior to the initiation of construction and maintenance activities.

Impacts to wetlands, rivers, and stream areas are regulated by the State of New Hampshire's Department of Environmental Services (DES) Wetlands Bureau. **It is necessary to file an application and receive a permit from the Wetlands Bureau prior to beginning trail maintenance and construction which may impact wetlands.** This publication outlines the various classifications relative to the potential wetlands impact and can serve as a resource for the best management practices in accordance with wetlands regulations.

NOTE: Compliance with these BMPs is a criterion for Minimum Impact Projects per DES Administrative Rule: PART Wt 303.04 Minimum Impact Projects. Minimum Impact Projects shall be those projects that meet any of the following criteria:

(y) Construction of trails in accordance with the "Best Management Practices for Erosion Control During Trail Maintenance and Construction," 1996 that involve less than 3000 square feet of impact to wetlands per crossing, and that cross stream channels less than 10 feet wide.

This document does not specifically address trail standards as they relate to the Americans with Disabilities Act (ADA). Full accessibility should be strived for wherever it is possible to do so, but such standards may be impossible to meet in many backcountry settings.

III. DEFINITIONS

Bedrock. The solid rock that lies under the soil or that is exposed at the surface as trail ledges.

Best Management Practices (BMP's). Best management practices are those practices that are currently believed to provide the most effective, practicable means of preventing or reducing the likelihood for soil erosion and sedimentation problems. NOTE: for the DES Trails Notification process, the use of these BMPs is mandatory.

Geotextile. Water permeable textile material (fabrics, etc) used as an underlay to conserve gravel on trails and stabilize erodible surfaces. Textile allows for water to pass through it but keeps soil layers from mixing and breaking down.

Hardpan. A hardened or cemented soil layer that contains soil consisting of sand, loam, or clay and can be cemented by iron oxide, silica, calcium carbonate, or other substances. A hardpan layer prevents precipitation from draining through the soil layers.

Hydric Soil. Soil that is saturated or flooded during a sufficient portion of the growing season to develop anaerobic conditions in the upper soil layers.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration.

Hydrology. The science dealing with the properties, distribution, and circulation of water on the surface of the land, in the soil, and below the ground surface in the underlying rocks, and in the atmosphere. Commonly used to describe the distribution and circulation of water in a particular area.

Hydrophytic vegetation. Plants which are adapted to growing in saturated, poorly, or very poorly drained soils.

Peat. Unconsolidated material, largely undecomposed organic matter, mostly sphagnum mosses, that have accumulated due to continued saturation.

Rill. A steep-sided channel resulting from accelerated erosion in unstable soils.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff.

Vernal pool. A seasonal pool, usually occurring as a result of spring rains or snow melts, which provides crucial breeding habitat to some species of wildlife, such as wood frogs, spotted salamanders, fairy shrimp, and fingernail clams. Vernal pools dry up in the summer, but may still be identified as small topographical depressions with or without vegetation.

Channel. A waterway that contains moving water either periodically or continuously. A channel has a definite bed and banks that confine the water.

Riprap. A layer of large, durable materials (usually rocks) used to protect a stream bank or lake shore from erosion; may also refer to the materials used.

Runoff. The part of precipitation and snowmelt that reaches streams by flowing over the ground.

Sediment. Fragments of rock, soil, and organic material transported and deposited by water, wind, or other natural phenomena. The term can refer to any size of particles but often refers to fragments smaller than 6mm.

Angle of Repose. The maximum slope or angle at which a material, such as soil or loose rock, remains stable.

Berm. A low earth ledge constructed at the side of a road or trail to divert the direction of flowing water.

1. Wetlands and Water Quality

Wetlands

In 1967, the N.H. State Legislature enacted a law relative to projects located in tidal surface water bodies and wetlands. In 1969, the law was amended to protect freshwater, non-tidal wetlands, and surface waters. Currently the permit and enforcement authority for this law is delegated to the Department of Environmental Services (DES) Wetlands Bureau.

The purpose of the law is to protect surface waters, freshwater, and tidal wetlands from unregulated activities. The determination was made that wetlands areas were of value as fishery and wildlife habitat, potential habitat for endangered and threatened plants and animals, storm-water control, nutrient/sediment/toxicant filtering, groundwater discharge and recharge, and for aesthetics and recreation.

The DES Wetlands Bureau regulates two general categories of resources: 1) *Flowing and standing surface water bodies.* Rivers, perennial, and intermittent streams can be categorized as flowing. Lakes (natural and man-made), ponds (natural, man-made, or beaver constructed), and oceans are standing. Jurisdiction also includes the banks of those water bodies (sloped land above them). 2) *Freshwater and tidal wetlands.* The state defines a wetland area as being saturated with ground or surface water for a sufficient duration to support vegetation adapted to wet soil conditions. **Therefore, in order to identify whether an area is a wetland it must exhibit three characteristics: hydric soil, hydrophytic vegetation, and presence of water.** Some common indications of wetland areas:

* water present at or near the ground surface (small test pit shows pooling water within 20" below soil surface).
* change in vegetation types or increase in density.
* saturated or wet leaf litter visible during dry conditions.
* ponding water during wet conditions.
* change in topography from slope to level areas.
* presence of surface water with adjacent low-lying level area.

The DES Wetlands Bureau regulates activities such as excavation, dredging, filling, and construction of any structures in the surface waters, wetlands, and certain other protected resources (such as upland tidal buffer zones and lands adjacent to Prime Wetlands). Any person (includes individual, company, association, corporation, municipality or government) proposing a project is required by law to file an application with the DES Wetlands Bureau and receive a permit prior to conducting that activity. Each application is reviewed according to specific criteria and evaluated on degree of impact a project has to the wetland or water resource and whether the applicant has avoided or minimized their activities in relation to the wetland or waterbody.

Wetlands Regulatory Situation

CLASSIFICATION OF PROJECTS

Before trail maintenance and/or construction operations may be done in wetlands, a permit must be obtained from, or a notification sent to, the DES Wetlands Bureau. Depending on the size of the projects and the type of wetland area to be affected, the Wetlands Bureau has developed the following project classifications. The Wetlands Bureau staff should be contacted at 603-271-2147 if there is a question concerning project classification. Projects which avoid wetlands or have minimized the proposed impact are subject to a more expedient review, provided the applications have been filed with a set of complete supporting information and the project and wetlands have been clearly delineated. Projects which have been designated to meet the minimum impact classification can file a simple notification form, with the appropriate documentation.

Projects in jurisdiction that do not require a permit

- Mowing or cutting of vegetation in a wet meadow, swamp, or forested wetland, provided roots of vegetation are not disturbed, and the ground is frozen or sufficiently dry to avoid making ruts, and the area is stabilized once thawed and the project is not located in a bog or adjacent to a prime wetland.
- Installation of a culvert in an area where waters flow during runoff to such a limited extent as not to create a defined, scoured channel nor maintain wetlands vegetation or wetlands soils.

Minimum Impact Projects (Trails Notification Form)

- Projects, which involve impacts of less than 3,000 square feet in swamps or wet meadows that are not in or adjacent to municipality-designated prime wetlands.
- Installation of a bridge provided no work is done in the water or wetland; fill does not exceed 3,000 square feet on the banks or bed of a river, and is not located in bogs and marshes or adjacent to or in prime wetlands.
- Maintenance dredging of nontidal drainage ditches and plugged culverts within the bounds of a constructed project.
- Projects that disturb less than 50 linear feet of a seasonal stream during periods of non-flow.
- Repair in-kind of culverts, bridges, riprap slopes, and retaining walls.

Minor Impact Projects (Permit)

- Projects involving less than 20,000 square feet of alteration in the aggregate in nontidal wetlands, nontidal surface waters, or banks adjacent to nontidal surface waters.
- Projects that disturb less than 200 linear feet of a stream, riverbanks, or channel.
- Construction of boardwalks in a marsh or swamp.
- Those projects located in jurisdiction that do not meet the definition of minimum or major.

Major Impact Projects

- Projects in or adjacent to municipality-designated prime wetlands, sand dunes, tidal wetlands, upland tidal buffer zones, or bogs.
- Projects within 100 linear feet of the highest observable tide line that alter any bank, flat, wetland, surface water, or undeveloped upland tidal buffer zone.
- Projects that involve alteration of nontidal wetlands, nontidal surface waters, and banks adjacent to nontidal surface waters in excess of 20,000 square feet in the aggregate.
- Projects that disturb more than 200 linear feet of an intermittent or perennial stream, river, lake, or pond.
- Projects in a wetland that has been identified by the Natural Heritage Bureau (DRED) as an exemplary natural community, or that has documented occurrence of state or federally listed Endangered or Threatened species.
- Projects classified as major require a field inspection by DES Wetlands staff. Projects that propose to impact areas adjacent to or in prime wetlands require a public hearing.

Water Quality

SOIL EROSION AND SEDIMENTATION CONTROL

Soil erosion is defined as the loss of soil by the actions of water, ice, gravity, or wind, and includes both the detachment and transportation of soil particles. Soils which contain high proportions of silt and fine sands are more vulnerable to erosion. The potential for soil erosion decreases as the percentages of organic matter increases. The most important factors which affect the potential for soil erosion include: soil particle size, soil structure, soil permeability, and percentage of organic content. Vegetation, slope, and climate are also important considerations which affect the potential erodibility of soil.

Vegetation acts as a natural buffer to protect wetlands from erosion and sedimentation. The maintenance of existing vegetation on stream banks is a fundamental principle of erosion and sedimentation control. Vegetation filters runoff and provides a protective cover to the soil from the impact of rain and flowing water.

Soil erosion control practices will help to protect water quality, maintain recreational trails, and reduce the costs of maintenance. Such measures include mulching with hay, vegetative restoration, and scheduling trail construction to be done in phases to keep the amount of unstabilized areas at a minimum. In order to maximize effectiveness, erosion control measures must be properly chosen, located, and implemented in a timely manner. Many erosion control practices will not only protect water quality, but also maintain trail integrity and improve usability.

Sedimentation is the end-product of erosion. Sedimentation refers to the settling out of soil particles which have been detached and transported, usually by water, in the process of erosion. Sedimentation is minimized by erosion control. The first step in planning for sedimentation control is to control erosion. The second step is to trap sediments which are transported by runoff before they reach streams or wetlands.

Sedimentation occurs when moving water in which the soil particles are suspended is slowed to a degree which allows the soil particles to settle out of suspension. Larger, heavier particles, such as sand and gravel, settle out more quickly than smaller, lighter particles, such as clay and silt. This can be seen at the base of slopes on the flatter areas of a trail where small sandy patches or deltas develop.

SLOPES AND SOIL

Soil which has eroded contributes to both onsite and offsite damages, usually to wetlands and surface waters. The depth, structure, and composition of the soil, as well as the soil's permeability, texture, and drainage capacity, are all significant in the soil's ability to withstand erosion. ***Soil compaction*** occurring on recreational trails restricts the natural absorption of water. ***Churning*** of the soil loosens surface soil particles, which then can be carried away by wind or water.

Slopes are especially susceptible to erosion due to the relationship between the grade of the slope and the potential for increased water velocity. Trail construction or maintenance work that is to be performed on hillsides should be carefully planned so as to minimize the trail grade and to incorporate proper cross-drainage.

The most effective way to decrease erosion is to avoid modifying slopes. Trails in areas with long, steep slopes should be designed to follow the contours to minimize accelerated soil churning and erosion. Modifying a slope by clearing existing vegetative cover also increases its vulnerability to erosion. Vegetation helps filter runoff water and holds soil particles in place. Vegetation also maintains the soil's capacity to absorb precipitation.

During trail planning and construction, the most desirable slope grade is less than or equal to 5%. This will minimize potential erosion and sedimentation problems. Slope grades in excess of 10% increase the need for maintenance and the potential for erosion.

2. Trail Planning and Design

Trail Planning Guidelines

The ideal recreational trail is one that requires minimal maintenance. When planning a trail and its construction, you should take advantage of the natural features of the environment rather than transforming the landscape to meet the proposed project's needs. The materials that will be used, the construction and maintenance techniques, and the size of the trail project will help identify the scale of the environmental impact to soils and wetlands. **The best wetlands protection is avoidance.** Should modification to the landscape be required, it is imperative to minimize soil disturbance near wetlands. The first step in trail planning is to visually inspect the area. In general, look for routes that are dry, of moderate grade, and in need of little terrain modifications in order to minimize potential erosion and sedimentation problems. **Survey the trail during wet months!**

In addition to concern for protecting wetlands and preserving water quality when performing trail work, consideration for potential impact to rare flora and fauna is recommended. The New Hampshire Natural Heritage Bureau must be contacted if a permit is required or a trail notification is filed. The New Hampshire Heritage Bureau can be contacted at the Department of Resources and Economic Development (603-271-3623).

TRAIL DESIGN

Poorly designed, located, constructed, and maintained trails can cause significant erosion and sedimentation problems. The first rule of trail design is to avoid crossing wetlands, or other sensitive areas, such as vernal pools. This may mean planning a longer route that minimizes the impact to environmentally sensitive areas, as well as reducing the need for future remedial actions.

Where wetlands crossings are unavoidable, crossings should be properly designed and placed at the narrowest wetland location. Trail design should always ensure that runoff water and drainage from the trail is collected in a stabilized area or sediment basin. Natural drainage patterns should not be disrupted or moved, as the runoff water and surface water may be providing moisture to wetlands downslope or downstream. The design of these drainageways ensures that runoff volume and velocity is handled without risk of erosion or sedimentation. Surveying the trail during wet months will help determine drainage patterns and the location of wetlands and saturated soils. Water is a powerful attractant to people. Typically, many trails have been built too close to the water, with resulting environmental and maintenance problems. Good trail design can balance the desire to be near water with environmental protection by incorporating scenic viewpoints, vegetative buffer zones, and by minimizing the number of wetland crossings.

General Guidelines

- Know the type of trail being constructed. Design for all potential uses.
- Good planning and design of recommended trail work should prevent many potential erosion problems.
- Whenever possible, use vegetative means of erosion control, such as seeding or planting small trees or other ground cover.
- Avoid using heavy equipment whenever possible, thus reducing the amount of disturbances to the natural resources.
- Certain forms of recreational trail use can create serious erosion and sedimentation problems. It is essential to integrate erosion control measures when planning, constructing, and maintaining trails, and to assure the measures are appropriate for the type of recreational use the trail receives.
- The steeper the slope, the greater the potential for problems.
- Multiple-use trails should be designed to the most limiting standard. For example, a snowmobile and cross country ski trail design should not exceed 20% slope, the maximum grade guideline for cross country ski trails.
- The following chart consists of guidelines for recommended grades for recreational trail use which should be considered during the planning and design process.

RECOMMENDED TRAIL GRADES

Trail Type	Grade
Hiking/Interpretive	10-12% sustained, pitch grades that are considerably steeper are acceptable if short in duration
Cross Country Skiing	8-17% sustained, 20% maximum
Snowmobiling	Avoid grades of greater than 25%
Mountain Biking	4% sustained, average of 3%, pitched grades of 8% or greater, 5% for long runs, grades of 10% can be considered
Equestrian	8% sustained, 15% for a maximum of 200 feet and include a 4% easing-off section of at least 500 feet in length where practical; avoid steeper than 15%, although short sections are acceptable where they avoid sensitive environmental areas
Dog Sledding	20% maximum for winter use
ATV/Motorcyle	Avoid grades of greater than 30%

Planning and Design Resources

Soil information, hydrologic data, and topographic and soil survey maps are valuable tools which should be used to plan trail construction and maintenance. Soil maps developed by the Natural Resources Conservation Service using the National Cooperative Soil Survey procedures help to identify an area's predominant soil. These maps can be useful when attempting to identify appropriate areas to locate the trail. Due to the scale on which the maps are produced and the accuracy of soil boundaries, soil maps are useful for planning but not for site-specific purposes. Actual onsite review is the only way to identify whether the location is capable of supporting a trail. Soil maps are available through the NRCS in each county.

Prime wetlands have been designated and adopted in many N.H. communities, under RSA 482-A:15. ***Maps*** have been prepared for these communities as part of a comprehensive wetlands evaluation. These maps are used to identify prime wetlands. If an area is designated as a prime wetland, a proposed trail project would be considered a major impact project. There is no size limitation for regulated wetlands. Not all wetlands can be located on a map, at which case an onsite review would be required while planning trail work. For information on whether a particular wetlands is designated as a prime wetlands, contact the local conservation commission. For more information on prime wetlands, contact the Department of Environmental Services Wetlands Bureau (603-271-2147) or www.des.state.nh.us/wetlands.

Topographical maps developed by the United States Geological Survey are one of the most useful and comprehensive reference tools when planning trail construction or maintenance. They provide valuable data regarding elevation, contour, large wetlands areas, and existing trails. Typically, these maps are scaled so that 1 inch = 2000 feet. Topographical maps are available at many bookstores and outdoor sporting good stores.

3. Trail Construction and Maintenance

General Guidelines

Obtain permits or notifications first.

- Before beginning any trail construction, install necessary measures to minimize and prevent erosion.
- Stabilizing slopes, creating natural vegetation buffers, diverting runoff from exposed areas, controlling the volume and velocity of runoff, and conveying that runoff away from the construction area all serve to reduce erosion.
- Careful trail planning and design will create a stable trail that will result in fewer problems with soil erosion and sedimentation.
- During trail construction, minimize the amount of soil disturbance at stream crossings.
- Trail construction is best done during the dry months when soil saturation and water levels are at their lowest.
- The three most important factors to consider during trail construction are the character of the land itself (soil, slope, and vegetative cover), the type of expected use, and the volume of that expected use.
- Some trail construction areas may need to be stabilized if heavy traffic is expected on the trail.
- Install temporary erosion control measures such as hay bales before construction begins. Keep them in place and maintained during construction and remove them only after the site has been stabilized.
- Trails through wet areas may have to be closed during the spring or other wet periods. Plan an alternate route, if possible.

Erosion and Sedimentation Control Techniques

SEDIMENT BARRIERS

Definition

An erosion control device installed across and at the toe of a slope, usually consisting of hay, straw bales, or geotextile materials, to prevent sediment from entering wetlands or open water.

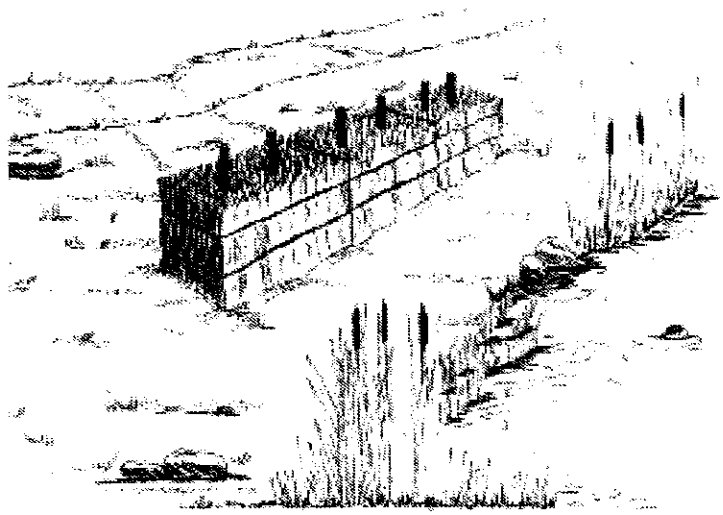
Conditions where appropriate

- When the erosion which would likely occur is in the form of sheet or rill erosion.
- Where temporary sediment retention is necessary until permanent vegetation is firmly established.

Bales

Guidelines for bale installation

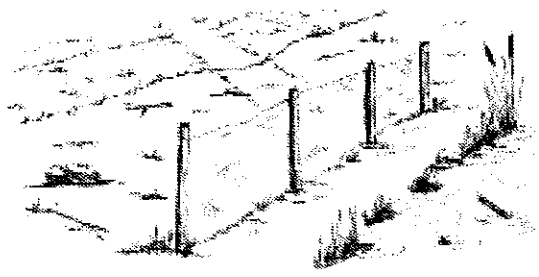
- Bales shall be placed in a single row on the contour with the ends tightly adjoining, not to exceed 600 feet in length. Turn up the ends and begin a new row, if needed.
- The bales should be embedded into the ground at least 4" deep.
- After placing bales, they should be anchored in place with two stakes per bale driven through the bale and into the ground.
- Bales should be used where the area below the barrier has exposed soils and would be impacted by water flowing through a barrier.
- Inspections should be frequent. Repair or replacement should be done promptly, as needed.



Silt Fencing

Guidelines for silt fencing

- If wooden stakes are utilized for silt fence construction, they must have a diameter of 2" when oak is used and 4" when pine is used.



- The filter fabric should be purchased in a continuous roll and cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter cloth should be spliced together only at a support post, with a minimum of a six-inch overlap, and sealed.
- When wire support is used, a standard-strength filter cloth may be used. When wire support is not being used, extra-strength cloth should be used.
- The fabric should be stapled or wired to the fence and a minimum of 4" of the fabric should be extended into the trench.
- The trench should be backfilled and the soil compacted over the filter fabric.

Additional considerations

- Inspect bales and barriers after heavy rains.
- Sediment deposits should be removed when the level of deposits reaches one-half of the height of the bale or the silt fencing.
- Barriers should be removed when the area has revegetated and the barriers are no longer needed. The sediment should be removed or graded out before removal.

- Straw and hay bale barriers require more maintenance than geotextiles due to the permeability of the bales being less than that of silt fencing.
- Silt fences should be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.
- For specific information regarding the different types of geotextile materials and their construction and maintenance guidelines, contact the Department of Environmental Services, county conservation district, or a local industrial supplier.

RETAINING WALLS (REVETMENTS)/CRIBBING

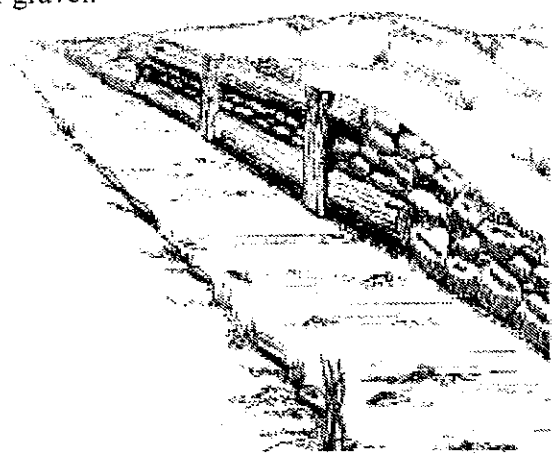
Note: Retaining walls and riprap along streams or in wetlands need to be permitted.

Definition

Structures used to provide stability and strength to the edge of a trail, usually made of logs or rocks.

Conditions where appropriate

- Where vegetation will not provide sufficient protection from soil erosion and sedimentation problems.
- Retaining walls are used on unstable slopes where space is limited and the trail would be "lost" if the slope collapsed.
- Retaining walls are often used when a slope is too steep to establish and maintain vegetation, as well as to reduce extreme slopes.
- Where loosely structured soils are encountered, such as sands or gravel.



Guidelines

- Clear debris and loose rock from the area requiring retaining walls.
- The logs should be at least 10" in diameter and peeled.
- Dig a trench, then stack and fit together rocks or logs along the lower edge of the trail. Construct the cribbing as high as the trail requires to create a level and stable surface.
- The logs can be secured by spiking them together.
- Fill and pack down soil in layers to create the treadway behind the cribbing.
- Slope the trail surface to provide for proper drainage.

Additional considerations

- As log revetments gain height, they may require additional bracing and/or support.
- Rock cribs are preferred to log cribs due to greater durability and less maintenance.
- The heavier the log, the more likely it will be able to support the weight of the use the trail receives.
- Be sure to provide for drainage from behind the cribbing wall.

FILTER STRIP

Definition

An area of undisturbed soil, vegetation, and forest litter situated between an area of exposed soil, such as a trail, and a body of water or a wetland. A filter strip allows surface runoff to drop sediment before it reaches environmentally-sensitive areas.

Conditions where appropriate

- Maintaining a filter strip at the base of a slope retains sediment on site and is considered to be the preferred method for erosion control.
- In areas adjacent to any body of water or wetlands.
- At the outlet of drainage structures such as culverts, waterbars, and ditches after the water passes through an energy dissipater or spreader ditch.

Guidelines

- If slope is 0-10%, filter strip width should be 50 feet.
- If slope is 11-20%, filter strip width should be 70 feet.
- When planting a new filter strip a temporary diversion should be used to divert water flow away from the filter strip until dense vegetation is established.

Additional considerations

- Dense vegetative cover of forest litter is necessary for a well-functioning filter strip. If this is not available, seeding, planting, or other erosion-control measures can be substituted.
- Filter strips are less effective as the slope increases.

STABILIZATION

Definition

Establishing vegetation on highly erodible or disturbed areas by sowing seed and other plants and/or mulching.

Conditions where appropriate

- In areas where permanent vegetative cover is necessary to stabilize the soil.
- In areas of trail where the soil is badly eroded and requires stabilization in order to continue potential trail use.
- Generally applicable where bankfull flow velocity does not exceed five feet/second and soils are erosion-resistant.

Guidelines

- An analysis of the soil may be necessary to decide how much and what kind of seed is appropriate.
- It is necessary to first drain existing water when preparing the seedbed in water-diversion structures.
- Guidelines for proper seeding can be found on the seed bag, or information can be obtained from the dealer where the seed is purchased. (See seeding chart in Appendix III.)
- Lime and fertilizer may be applied prior to or at the time of seeding and incorporated into the soil. Application rates will be determined by conditions at the specific site. **No** fertilizer should be applied if near surface water or wetlands.
- Seed mix should consist of native materials, if possible.

Additional considerations

- Once an area has been seeded, it should be covered with hay or straw for protection from sun and rain and anchored.
- Mulching is recommended as a good practice for protecting exposed areas even if seeding is not expected to be done. Mulch must be anchored to prevent wind or water from moving it.
- The most commonly used materials for mulching are hay and wood chips. When these materials are not available, brush can be substituted.
- Grass and legumes are the most commonly used plant materials for seeding.
- Native seed mixes are desirable but may be difficult to obtain.
- This practice does not apply where tidal conditions exist.

- Disadvantages of seeding include the potential for erosion during the establishment stage, the need to reseed areas which fail to establish vegetation, and limited periods of time during the year which are conducive to successful seeding.
- Grass seeding has limited success in preventing surface erosion from slopes exceeding the angle of repose, or that angle at which a particular slope is stabilized. Some grass has limited success due to shallow root systems.

Drainage

General Guidelines

- Proper drainage will carry the water either over the trail, under the trail, or will intercept the water before it crosses the trail.
- Surface runoff which is intercepted by erosion-control measures must be collected by drainageways and discharged in stabilized areas or sediment basins.
- The drier the terrain, the more stable the trail, which keeps potential erosion problems at a minimum.
- Examine topography, surface flow patterns, soils, and the water table to help determine the area's potential wetness, preferably during the wettest months of the year, to help prevent future erosion problems.
- The ideal trail would be located on soil which has a seasonal high water table of two to four feet below the surface.
- Poor drainage is the primary cause of a majority of trail maintenance problems which can be avoided with proper planning.
- Cross-drainage techniques, such as swales, culverts, and water bars, should be utilized to divert water off of the trail as soon as possible.
- Attempts should always be made to maintain natural drainage patterns.

OUTSLOPING/INSLOPING

Definition

Outsloping is a process where the trail surface is sloped in the same direction (with) as the slope on which it is located. Insloping is a process where the trail surface is sloped in the opposite direction (against) of the slope on which it is located.

Conditions where appropriate

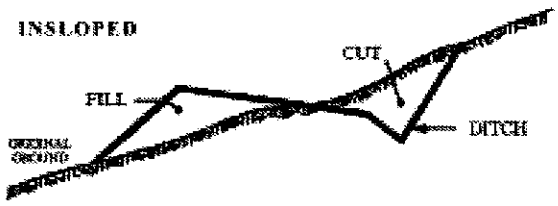
- Outsloping and insloping are appropriate in areas where the grade of the slope is relatively high.
- In areas where the amount of water flow is relatively low.

Guidelines

- Be sure to maintain the slope pitch at approximately 1-2%.
- No intermittent or perennial streams should cross over the trail.
- No drainage ditches should be laid on the upslope side of the trail.

Additional considerations

- Make sure the water is not being diverted towards streams or other bodies of water. If water drainage is unavoidable in areas adjacent to streams, make sure there are vegetative buffers.
- If water flow is more extensive than outsloping/insloping can control, larger structures such as diversion ditches may be necessary.



SWALES/DIPS/BERMS

Definition

A depression constructed across a slope, above and in conjunction with an earthen berm.

Conditions where appropriate

- In areas where surface runoff might create erosion problems running across a trail.
- On slopes which have a trail grade less than 10%.
- This technique may be most appropriate for cross country skiing, dog sledding, and mountain biking trails.

Guidelines

- Install swales at the top of any slope and at proper spacing along sloping sections of the trail.
- The swale can be as shallow or as deep as necessary, taking into consideration the expected trail use and the conditions.
- Soil should be removed from the swale and transferred to the downhill side to form the berm.
- The swale should be constructed at a 30-45 degree angle downslope from a line perpendicular to the direction of the trail.
- The downhill end of the swale should extend far enough to disperse the water flow away from the trail.
- If erosion is a potential problem at the outlet (downhill end) of the swale, riprap or other velocity dissipaters should be utilized.
- The uphill end of the swale should extend far enough beyond the trail in order to fully intercept the flow of water.

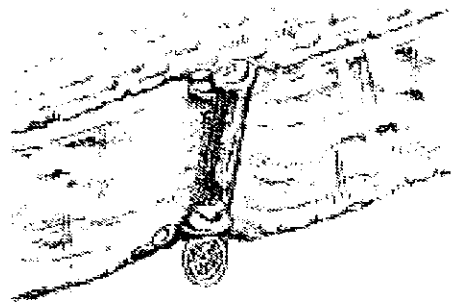
Additional considerations

- Alternative water drainage techniques may be required if the swales are consistently becoming filled or breached.
- The frequency that the swale and the berm may need to be cleaned or restored depends on the amount of sedimentation which occurs.
- A broad-based dip is the recommended practice on trails where distinct bumps pose an erosion problem.

WATER BARS

Definition

A rock, earthen, or log barrier, or excavated channel, angled across a trail to divert the runoff water off of a trail.



Conditions where appropriate

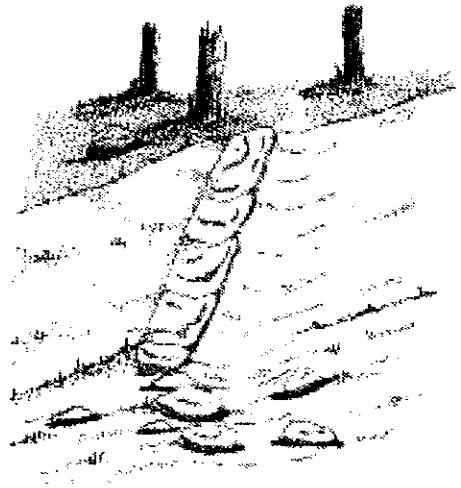
- In general, the greater the slope and the higher the velocity or volume of water, the greater the need for waterbars as opposed to other drainage techniques.

Guidelines

- Place each rock or log solidly into the ground, preferably using flat rocks or rot-resistant logs.
- Install waterbars at the top of slopes and at steep sections of the trail as needed.
- The waterbar should be constructed at a 30-45 degree angle downslope from a line perpendicular to the direction of the trail.
- Extend the outlet end of the waterbar beyond the edge of the trail and place rocks or logs there to filter the water.
- Construct the waterbar so that it extends at least 12" beyond both sides of the trail.
- As a minimum, the waterbar should drain at a 3% outslope.
- In a rock waterbar, each rock should overlap the rock below it and be overlapped by the rock directly above it.
- A log waterbar should be constructed with peeled logs at least 10" in diameter.
- Log waterbars should be held in place with large stones.

Additional considerations

- Observe the trail during a rainstorm to more accurately determine the need for waterbars.
- The channel created by the waterbar outlet and the waterbar itself can be lined with stone to reduce erosion.
- Species appropriate for log waterbars include spruce, hemlock, beech, and oak trees.
- Alternative drainage measures should be taken for trails frequented by mountain bikers, snowmobilers, cross country skiers, and dog sledders, as protrusions in the trail may damage tracks, skis, or wheels.
- One type of waterbar that may be appropriate on multiple-use trails utilizes flexible rubber belts imbedded in the trail's surface.
- Consider using box culverts where the bumps caused by waterbars pose a problem.



SPACING FOR WATER BARS

Road/Trail Grade (percent)	Spacing Between Water Bars (feet)
2	250
5	135
10	80
15	60
20	45
30	35

REVERSE GRADE

Definition

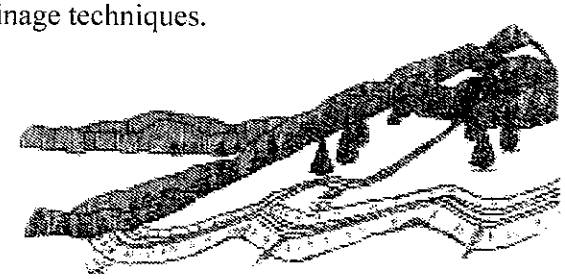
A short rise in a trail which traverses a slope and forces any water in the trail to drain off the side.

Conditions where appropriate

- When the trail climbs up or traverses a hill with a 10-15% slope, a reverse grade should be used to take advantage of natural cross-drainage.
- When it becomes necessary to break the grade of the trail to help limit the steep slope length.
- Can be used in conjunction with additional water drainage techniques.
- In areas of trail where waterbars cannot be used.

Guidelines

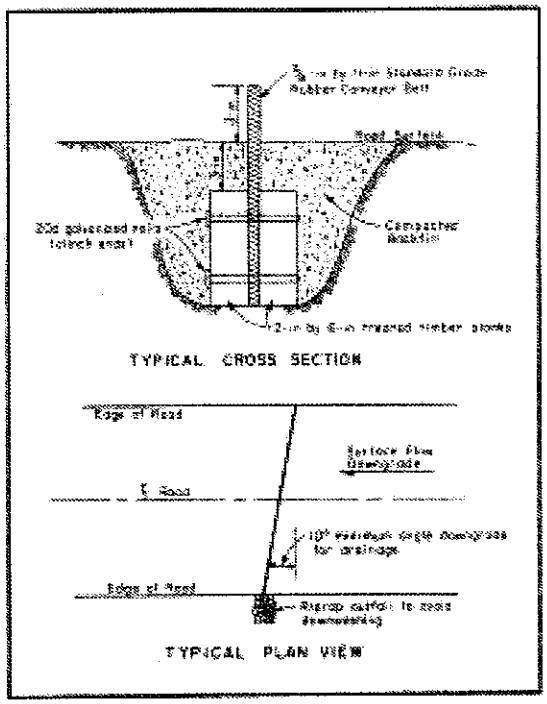
- Try to blend reverse grades into natural terrain.



DEFLECTORS

Definition

Rubber belting fastened to treated timbers which are placed in the ground to deflect water off of a trail.



Conditions where appropriate

- Areas where low water volume is expected for drainage.
- Areas where an open-top culvert might be considered.
- Roadways or trail corridors where water runoff can cause erosion issues.
- Heavily traveled trails where motorized use is expected.
- Trails or roads where grading is typically not a maintenance activity.
- Trails or roads where broad-based dips may pose problems for equipment.

Guidelines

- Bury lumber in gravel so that approximately 3" of rubber belting is exposed over trail surface. Keep sediment cleaned from uphill side of deflector.

CULVERTS

Definition

A metal, plastic, cement, or wood pipe placed under a trail to permit crossing an intermittent or active stream.

Conditions where appropriate

- On trails where water consists of small or intermittent flows.
- In general, cross-drainage culverts are more effective for drainage areas under ten acres.
- This is the preferred method of water drainage on trails frequented by mountain bikers, snowmobilers, cross country skiers, and dog sledders, because the construction is such that there are no external obstructions on the trail.

Guidelines

- A dredge and fill permit or notification is required for work within the body of a stream or waterbody, or within the banks of a stream and in an adjacent wetland.
- Culverts should be of a size appropriate to carry potential maximum water flow. The minimum size recommended is 12" to facilitate cleaning with a shovel.
- The culvert should extend one foot beyond the base of the trail on either side.
- Culverts should be sloped at least 6% to produce water velocities that will prevent the pipe from becoming unduly silted.

- It may be necessary to construct a berm across the side ditch to assist in water removal.
- Stream alignment should be straight at the point of crossing and of uniform profile so as not to obstruct the flow of water.
- For larger water flows, a corrugated metal culvert is recommended.
- Seat the pipe, backfill to half the diameter with clean fill, and tamp. Then fill over and around the culvert and tamp at six inch intervals to help prevent erosion, add strength to the pipe, and to prevent seepage along the pipe. Cover the pipe with a minimum of 12" of soil.
- Build up headwalls around and above the pipe.

Additional considerations

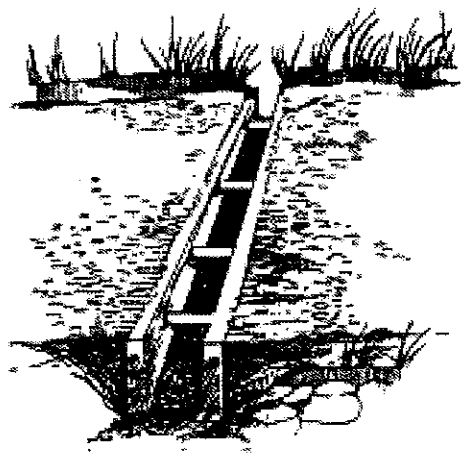
SIZING PIPE CULVERTS FOR STREAM CROSSINGS

Acres of Drainage		
Shallow and High Elevation Soils	Normal Forest Soils	Recommended Pipe Culvert Diameter in Inches
2	9	12
4	16	15
7	25	18
12	40	21
16	55	24
27	84	30
47	130	36
64	190	42
90	260	48
120	335	54
160	400	60
205	550	66
250	640	72

Open-top culvert

Guidelines

- Can be constructed of either stone or sawn timber, depending on the availability of materials.
- Log culverts may be constructed with two 6-10" logs set into the trail and pinned to prevent movement.
- Line the base of the culvert with riprap and install spreaders if necessary.
- Sawn timber open-top culverts are usually constructed of two 3" x 8" planks set on a 3" x 12" plank, spiked at the bottom. This would create a water flow area 8" deep x 6" wide.
- Open-top culverts are most appropriate when water runoff is light.
- Caution if an equestrian or bike trail.



Box culvert

Guidelines

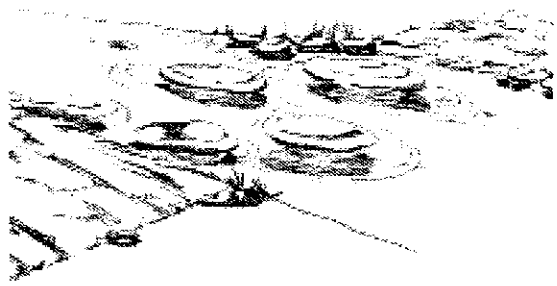
- The top of the culvert should be flush with the surface of the trail to provide for an uninterrupted tread.
- Can be constructed of wood or stone.
- If stones are used, align them so that there are no protruding edges which will catch debris, and cap the culvert with flat stone. Pack the sides with gravel up to the top of the culvert and cover with native materials or flat stones.
- For log culverts, set two 6" or 8" diameter logs 30 degrees across the trail about 4" apart. Cap the logs with a 3" x 8" plank which has a 3" x 4" piece of wood nailed down the middle to act as a spreader.

Water Crossings

General Guidelines

- Water crossings are a major concern in the construction and use of trails because of the potential for large amounts of sediment to enter a stream.
- Avoid water crossings if at all possible. Rerouting the trail away from water crossings will save construction time and money, as well as create less of an impact to the environment.
- When needed, crossing sites should be selected at right angles to the stream and should not interfere with natural water flow.
- Erosion and sedimentation-control devices should be utilized whenever trail construction occurs in or near a wetland, stream, or water body.
- Before constructing any type of water crossing on trails, a permit or notification from the Wetlands Bureau is required.

STEPPING STONES



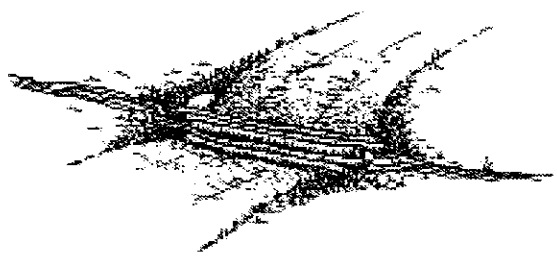
- When trails lie in low wet areas and the surrounding soil surface is plagued with destruction due to users attempting to avoid these areas.
- Stepping stones are the option of least environmental impact that accomplishes the objective of protecting the environment and providing dry passage.
- The ideal location for placing stepping stones is in shallow streams with light to moderate water flows and should be avoided where dangerous stream flooding may occur.
- Stepping stones minimize silting of water by decreasing stream bed and bank disturbance.

Guidelines

- When placing stepping stones, set stones approximately one and a half feet apart with the flat surface facing up.
- Stepping stones must begin before or at the edge of the stream to allow for dry passage that does not create stream bank erosion from use and minimizes water undercutting into the bank.
- If the stepping stones are unsteady, they may not be set correctly or be large enough. Replace with larger stones.

Additional considerations

- Stepping stones are generally appropriate for hiking and walking trails.
- Stagger stones to reduce potential damming of debris between the stones.
- Stepping stones are not universally accessible.
- The distance between stepping stones can be adjusted to accommodate the majority of users.
- Stepping stone surface area should be a minimum of one square foot in size.
- Wet areas or streams with soft mucky bottoms may not adequately support stepping stones.



FORDS

Definition

A shallow stream crossing that utilizes the streambed.

Conditions where appropriate

- Use only on perennial streams having intermittent flow.
- Fording should be a last resort due to the potential impacts on water quality.
- Where the streambed is hard or easily hardened.
- Where recreational use in non-motorized.
- When no other stream crossing alternative is viable or permitted.

Guidelines

- Attempt to minimize extensive work within the streambed.
- Provide for a hardened stream bank to prevent bank erosion.

Additional considerations

- Fording can generate bank erosion, disturb aquatic life, may be potentially dangerous for the user, and is illegal for motorized use, if water turbidity is increased.
- Fording may create water quality problems due to the disturbing of the natural stability of the streambed.
- Pad made of large stone (stone ford) can allow water to pass through stones while hikers cross without coming into contact with water.

BRIDGES

Culvert bridge

Definition

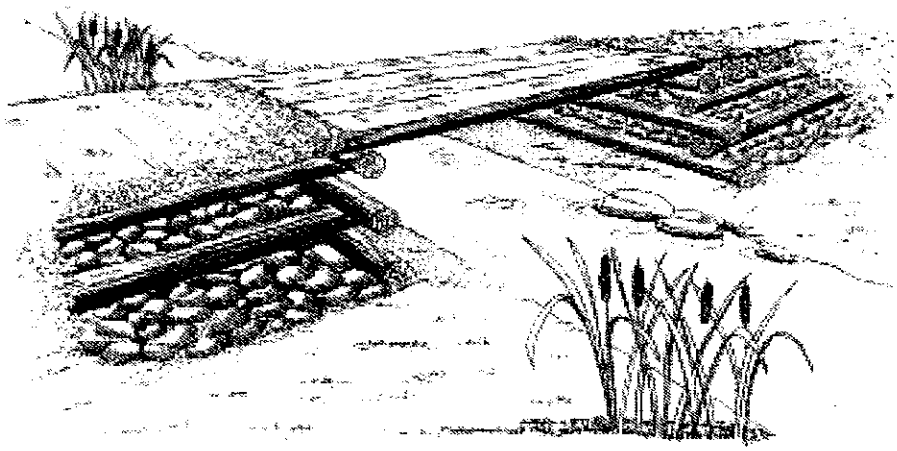
A permanent structure designed and constructed to transmit water under the trail.

Conditions where appropriate

- When topography or other circumstances make it necessary for a stream crossing.
- When a trail is frequented by a variety of different user groups.
- When planning for a universally accessible or multiple-use trail.

Guidelines

- Culvert size selection should be based upon the size of the drainage area of a watershed and should be able to handle the largest potential stream flow, such as a ten-year storm flow.
- The length of the pipe will be determined by the width of the trail.
- Seat the pipe on undisturbed soil, backfill to half the diameter of the pipe with clean fill or stone, hand tamp, and then cover the culvert with clean fill or stone to a depth of at least half the diameter of the pipe.
- Place the culvert on the same grade as the streambed, or lower, not above it. The minimum culvert grade for a bridge is approximately 2-4%.
- Protect the upstream and downstream end of the fill around the culvert from erosion by the placement of headers. The side slopes can be further stabilized for erosion control by seeding or mulching or by placing riprap on the slopes.



Additional considerations

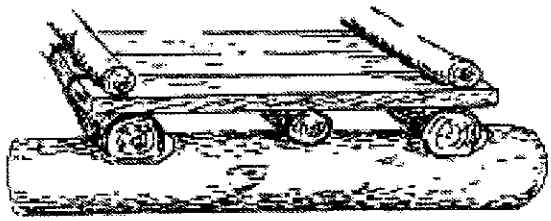
- One large culvert is preferred to many small pipes.
- The culvert should be built with an emergency spillway, not located over the pipe.

- Culverts should be at least 12" in diameter so that hand tools can be used to clean accumulated debris.
- Bridges can be a maintenance liability, whereas culverts are not as expensive and are easier to maintain.
  NOTE: Culverts do require regular maintenance and cleaning to keep debris clear.

Constructed bridge

Definition

Structures designed to cross open water, wetlands, or ravines. A variety of designs are employed but all generally involve fixing both ends of the structure to dry land.



Conditions where appropriate

- When the water flow is such that it cannot be managed by culverts.
- When the terrain is not conducive to any other type of construction or there is a need to protect/maintain the stream bed in an unaltered condition.
- Where seasonal water levels or expected use would prohibit the use of culverts as a form of water crossing.

Guidelines

- The preferred type of bridge is a structure incorporating sills, abutments, and wingwalls. Attempts should be made to place the sills back from the top of the bank and have no work or materials within the banks (bank-to-bank bridge).
- The bridge should span the total width of a stream and its adjacent flood plain.
- It is a good idea to be prepared for washouts by anchoring one end of the bridge with a cable, so that in the event of the bridge being swept away, it can be retrieved and reset.
- Use large rocks or ledges as abutments whenever possible.
- For larger streams, complete hydrologic studies to compute peak flow rates for proper design of the bridge.
- A dredge and fill permit or notification is required for work within the body of a stream or waterbody, or within the banks of a stream and in any adjacent seasonal wetlands.

Additional considerations

- Bridges should use native materials compatible with the adjacent trail environment whenever possible.
- Construction of bridges is usually viewed as a last resort after all other options have been considered. Bank-to-bank bridges (outside top of banks) are preferred.
- Because of the proximity to wetlands, it is especially important to have erosion-control measures in place before bridge work begins.
- Rocks or crushed stone should be used as fill around logs to bring the trail surface up to the level of the bridge deck to allow for drainage.
- Abutments, such as rock, logs, and sawn timbers should be firmly anchored into the stream bank and placed parallel to the stream thread.
- There are many different types of bridges that can fulfill specific needs. Most of these bridges require consulting with engineers.

Wet Soil Crossings

General Guidelines

- Avoid constructing new trails through wet soils and consider rerouting those sections of existing trails that cross wet soils.
- Trails located on wet soils may not be appropriate for frozen ground conditions.

- When designing trails, attempt to provide alternative routes during wet seasons.
- Wet soil crossings require a permit or notification from the DES Wetlands Bureau.

STEPPING STONES

Refer to guidelines for stepping stones under "water crossings."

Definition

Refers to any material which is laid down on a trail which lessens compaction of soil, provides a dry surface for users, and prevents potential erosion and abrasion.

Conditions where appropriate

- It is necessary due to the natural surface being either damaged or destroyed.
- When the existing material is unstable and needs protecting and strengthening.
- When an environmentally sensitive area needs protection and the trail cannot be rerouted.

Guidelines

- The surface material to be used will depend on the kind and amount of use the trail receives.
- Ideally, native materials should be used as the surfacing material.
- When native materials cannot be acquired, materials which blend with and preserve the natural environment should be used.
- In some cases, a single layer of surfacing will be sufficient. In other cases, a sub-base may be required, such as in areas of wet ground and peat or on trails which flood easily. In these cases, the base is the load-bearing part of the trail and will comprise the bulk of the material to be used and should have adequate drainage to keep the surface dry.

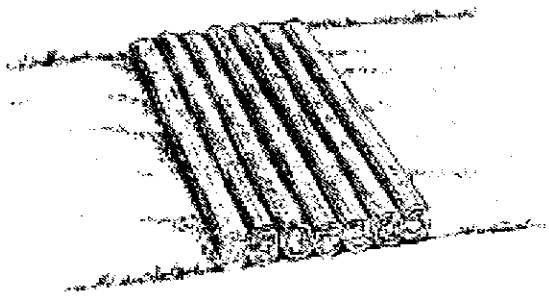
Additional considerations

- Each situation which requires surfacing will be unique. How the trail will be hardened will depend on the soil type, slope, depth of the water saturation, the sensitivity of the environment, the trail's expected use, and the availability of native materials.

CORDUROY

Definition

A structural unit composed of a series of logs or other material placed perpendicular on the trail to provide a method of crossing wet areas.



Conditions where appropriate

- Can be used as a temporary means of stabilizing a wet area of the trail until more extensive construction can be arranged.
- Can be used on winter-use trails to protect wet areas which are usually frozen but may soften occasionally during the winter months.

Guidelines

- Lay a mat of green brush, posts, or small logs parallel to the direction of the trail.
- Use geotextile fabric or other appropriate bedding if needed.
- Cover the mat with a series of logs laid side by side, perpendicular to the trail.
- The corduroy should be removed in the spring to prevent damage to the area and should be left in place during the summer until drainage problems can be corrected or until trail rerouting can be completed.
- Cover logs with gravel to create the treadway.

Additional considerations

- An alternative to constructing corduroy is geotextiles with gravel cover.
- The construction of corduroy is a time-consuming construction which requires a large quantity of wood and maintenance.

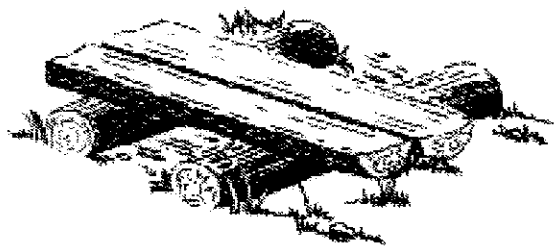
PUNCHEON

Definition

A footway, walkway, or travel corridor constructed of wood, usually logs, to provide a dry treadway on fragile, wet terrain.

Conditions where appropriate

- In bogs, mud flats, and marshy areas where there is frequently little rock and the underlying soil is mucky or peaty and saturated during part of the year when the trail may be in use.
- In areas prone to flooding, puncheons are not recommended as they may float away.



Guidelines

- In trail planning and construction, attempt to avoid areas where this labor-intensive and highly impactive technique is necessary.
- The simplest type of puncheon is a topped-log puncheon, made with two stringers that form the treadway and set on top of two base logs that serve as the sills.
- Hew the timbers to make a flat walking surface and score the surface with an axe.
- Level each sill and cut notches where the stringers will be attached.
- Sills should be set 2" into the soil surface to provide for added stability.
- For stringer spans over 10', a center sill should be used.

Additional considerations

- Natural rot-resistant wood such as cedar, spruce, and hemlock are preferred.
- Some puncheons can be constructed of native materials, while others may require milled lumber.
- Treated timber reduces the potential for decay.

BOARDWALKS

Definition

A fixed planked structure, usually built on pilings, erected in areas of wet soils or water to provide for dry crossing.

Conditions where appropriate

- When other forms of wet soil crossings are inappropriate due to the restriction of surface flow.
- In areas that are susceptible to flooding.
- In areas of fragile habitat such as bogs, where interpretive nature trails may be appropriate.
- Boardwalks are the recommended practice when attempting to provide universal accessibility on trails.

Guidelines

- All wood used in construction should be either pressure-treated or naturally rot-resistant species.
- The planks should be placed perpendicular to the direction of travel.
- The width of the boardwalk will depend on the expected use and whether the trail will be designed for one or two-way travel.

Additional considerations

- Handrails may be added as a safety feature, depending on the expected use of the trail.
- Treated timber reduces potential for decay.
- Design standards are available for universally accessible boardwalks.

Floating boardwalks

Definition

A floating planked structure constructed on areas of wet soil to provide for dry crossing.

Conditions where appropriate

- In wet areas where the depth below the surface of which hardpan is found is such that it would be easier to build a floating structure.
- In areas which are susceptible to flooding.
- In areas which may be used only seasonally and the structures will be removed.

Guidelines

- Floating boardwalks can be constructed of styrofoam, wood, or plastic barrels.
- See boardwalk guidelines.

Additional considerations

- Side railing may be constructed, depending on boardwalk location and usage.

TURNPIKING, CROWNS, AND DITCHES

Definition

A raised section of the trail which usually consists of trenches on one or both sides to improve drainage on wet areas of trail.

Conditions where appropriate

- In flat wet areas where soils are easily saturated or highly erodible.
- Where subsurface water is recurrent and the trail needs to be raised.

Guidelines

- Dig a drainage ditch on one or both sides of the causeway using the material removed to construct a crown or turnpike to provide for dry trail surface.
- Crowns should be sloped 2-4% from the center line to the outside edges of the trail.

Additional considerations

- The raised surface should consist of native materials.
- If necessary, reinforce the causeway with logs or rocks to provide extra stability.
- The topography of the land will generally dictate the types of soil that exist on the trail.
- The material removed from the ditches may not be appropriate for use in the construction of the turnpike, crown, or ditch, and it may be necessary to bring in material from somewhere else.
- To improve water passage, use riprap as the base material underneath a geotextile mat with soil or sand placed on top and use culverts where needed to provide proper cross-drainage.

Assistance and References

Department of Resources and Economic Development
Division of Parks and Recreation
Bureau of Trails
P.O. Box 1856
Concord, NH 03302-1856
(603) 271-3254
www.nhtrails.org

Department of Environmental Services
Water Division
Wetlands Bureau
P.O. Box 95, 29 Hazen Drive
Concord, NH 03302-0095
(603) 271-2147
www.des.state.nh.us/wetlands

Department of Resources and Economic Development
Division of Forests & Lands
Natural Heritage Bureau
P.O. Box 1856
Concord, NH 03302-1856
(603) 271-3623
www.nhdfl.org

Technical Assistance Available

Assistance in using this manual may be obtained at the following locations from the local conservation district serving each county throughout the state.

Belknap County Conservation District
Federal Building, Room 203
719 No. Main Street
Laconia, NH 03246
(603) 527-5880

Carroll County Conservation District
44 Main Street
P.O. Box 533
Conway, NH 03818
(603) 447-2771

Cheshire County Conservation District
11 Industrial Park Drive
Walpole, NH 03608
(603) 756-2988 X116

Merrimack County Conservation District
The Concord Center
10 Ferry Street, Box 312
Concord, NH 03301
(603) 225-6401

Coos County Conservation District
Box 235, RFD #2
Lancaster, NH 03584
(603) 788-4651

Rockingham County Conservation District
110 North Road
Brentwood, NH 03042
(603) 679-2790

Grafton County Conservation District
Swiftwater Road
RR2, Box 148B
Woodsville, NH 03785
(603) 747-2001

Strafford County Conservation District
259 County Farm Road
Unit 3
Dover, NH 03820
(603) 749-3037

Hillsborough County Conservation District
Chappell Professional Center
468 Route 13, South
Milford, NH 03055
(603) 673-2409 X9

Sullivan County Conservation District
24 Main Street
Newport, NH 03773-1500
(603) 863-4297

Bibliography

Agate, Elizabeth. Footpaths, 1983, British Trust for Conservation Volunteers, Wallingford, Oxfordshire, England.

Bureau of State Parks, Division of Outdoor Recreation, Virginia Department of Conservation and Recreation, Virginia Erosion and Sediment Control Handbook, 1992, Richmond, VA.

Cullen, J.B., 2000 Department of Resources and Economic Development, State of New Hampshire, Best Management Practices for Erosion Control on Timber Harvesting Operation, Concord, NH.

Department of Ecology, State of Washington, Stormwater Management Manual for the Puget Sound Basin, February, 1992, Olympia, WA.

Department of Environmental Services, State of New Hampshire, Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials, 1993, Concord, NH.

Division of Engineering and Operations Standards, Department of Transportation, State of Alaska, Contractor Guidance for Preparing and Executing Storm Water Pollution Prevention Plans, 1992, Juneau, AK.

Division of Soil and Water Conservation, Department of Conservation and Recreation, State of Virginia, Virginia Erosion and Sediment Control Handbook, 1992, Richmond, VA.

Hartung, Robert and Kress, James, Soil Conservation Service, United States Department of Agriculture, Woodlands of the Northeast: Erosion and Sediment Control Guides, 1977, Broomall, PA.

Forest Service, United States Department of Agriculture, Snowmobile Trails Manual, Laconia, NH.

Forest Service, United States Department of Agriculture, Soil and Water Conservation Handbook, 1993, Juneau, AK.

Forest Service, United States Department of Agriculture, Standard Specifications for Construction of Trails, June, 1984, Washington, D.C.

McCoy, Michael and Stoner, MaryAlice., Mountain Bike Trails: Techniques for Design, Construction and Maintenance, BikeCentennial, Missoula, MT.

Rockingham County Conservation District, Soil Conservation Service, United States Department of Agriculture, Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire, 1992, Exeter, NH.

Soil Conservation Service, United States Department of Agriculture, Engineering Field Handbook, October, 1992, Washington, D.C.

Appendix I.
Other Resources

RESOURCES **(Publications)**

Soil Stabilizers on Universally Accessible Trails
USDA Forest Service for USDOT, Federal Highway Administration. 2300 Recreation Management, September 2000. 0023-1202-SDTDC

Managing Degraded Off-Highway Vehicle Trails in Wet, Unstable, and Sensitive Environments
USDA Forest Service. 2300 Publication, October 2002. 0223-2821-MTDC

Geosynthetics for Trails in Wet Areas
USDA Forest Service. 2300 Recreation, August 2000. 0023-2838-MTDC

Wetland Trail Design and Construction
USDA Forest Service. 2300 Recreation, September 2001. 0123-2833-MTDC

Floating Trail Bridges and Docks
USDA Forest Service. 2300 Recreation, July 2002. 0223-2812-MTDC

BMP for Erosion Control on Timber Harvesting Operations in New Hampshire
UNH Cooperative Extension and N.H. Division of Forests & Lands

Trail Construction and Maintenance Notebook, 2000 edition.
USDA Forest Service. 2300 Recreation, August 2000. 0023-2839-MTDC-P

Appendix II.
Seeding Mixtures for Temporary Seedings[1]

For Excessively Well to Somewhat Poorly Drained Soils

Area/Purpose	Soil pH	Shade	AppropriateMixture[2]	(lbs./Ac.)
Roads Trails Landings Burned Over	4.5-7.5	Heavy to None	Creeping Red Fescue Redtop	40 2
Roads Trails Landings	5.5-7.5	Heavy to None	Annual Ryegrass	40
Roads Trails Landings Wildlife	5.5-7.5	Moderate to None	Winter Rye	112

[1]Seeding Dates. Seed disturbed areas as soon as possible. Seed as early in the spring as the ground can be worked and in the late summer/early fall based on local recommendations.

[2]On critical areas or droughty sites, apply hay or straw mulch at the of 90 lbs./1000 sq. ft. Anchor mulch on steep slopes or where subjected to concentrated flow.

Appendix III.
Communities with Designated Prime Wetlands (as of December 2002):

Andover, Barrington, Bow, Brookline, Derry, Enfield, Exeter, Frement, Gilford, Holderness, Hooksett, Meredith, Nashua, New London, Northwood, Pelham, Salem, Sanbornton, Sandwich, Tamworth, Weare and Wolfeboro.

Prime wetlands are designated by a municipality according to the requirements of RSA 482-A:15 and Chapter Wt 700 of the DES administrative rules.

Typically, the evaluation method used is the "Method for Comparative Evaluation of Nontidal Wetlands in New Hampshire" (1991) or "Method for the Evaluation and Inventory of Vegetated Tidal Marshes in New Hampshire" (Coastal Method) (1993).

All projects that are in or adjacent to a prime wetland are classified as major projects. All major projects require a filed inspection by DES and all prime wetland projects require a public hearing to be conducted by DES.

Appendix IV.
Clues to Identifying Forested Wetlands

Wetlands perform many functions that are important to the health of our environment — they protect water quality in our lakes and for drinking, help ensure adequate water supplies, and provide wildlife habitat, flood control, and nurseries for finfish and shellfish. It is for these reasons that wetlands are protected under New Hampshire state law.

There are several types of wetlands in New Hampshire. Some wetlands have herbaceous plants – such as marshes, wet meadows, and bogs. Wetlands that have woody plants or trees are forested wetlands or swamps, scrub-shrub wetlands, bogs, and vernal pools. Since the state of New Hampshire is more than 80 per cent forested, and about 6 to 10 percent of the state is considered wetlands, there are a lot of forested wetlands in New Hampshire!

Wetlands are identified based upon three criteria; the presence of plants adapted to survive in wet soil conditions, the presence of water at or near the surface for more than two weeks during the growing season, and the presence of hydric soils. Although wetland identification may require a trained professional such as a wetland scientist, if you have some knowledge of plants or a field guide, and good observation skills, you may be able to get an idea of where wetlands are located.

The following questions are provided to guide you in observing some characteristics of forested wetlands. You will need to know how to identify some plants to answer some of these questions. If you answer "yes" to one or more of the following questions about a site, a forested wetland may be present on the property.

- Do you see natural drainage routes, which are defined by a small channel or scouring?
- Is the ground soggy or spongy under foot at any time during the growing season (May to September)?
- Is *Sphagnum* moss present?
- Do you see low spots or depressions where water lies or pools for more than seven days during the growing season?
- Does the ground have areas of depressions and mounds (also called pit and mound topography)?
- Do you see springs or seeps? (Water may be trickling out of the ground.)
- Do you see areas that cannot be crossed by vehicle, tractor, or other machinery because it might get stuck in the soft, wet ground?
- Do you see any water-stained leaves on the ground? (These look blacker than plain dry leaves.)
- Do you see trees blown down ("windthrows"), which expose shallow but extensive root systems?
- Do you see fine silt or sediment deposits on leaves on the ground or on stems or tree trunks?
- Do you see drift lines where sticks, leaves and other water-carried debris have lodged against the base of vegetation (especially on one side)?
- Do you see any of these herbaceous plants: jewelweed, sensitive fern, cinnamon fern, royal fern, skunk cabbage, jack-in-the-pulpit, goldthread?

- Do you see any of these shrubs present: highbush blueberry, winterberry holly, speckled alder, northern arrowwood, silky or red-osier dogwood?
- Do you see any of these deciduous trees present: black or green ash, American elm, black willow, swamp white oak, red maple, silver maple, black gum, yellow or grey birch?
- Do you see any of these evergreen or needle-bearing trees present: balsam fir, black spruce, larch or tamarack, northern white cedar, or Atlantic white cedar?
- Do you see a black organic layer (may look like decomposing leaves and roots) below the surface that is at least 4 inches thick? (You will need to clear away some of the leaves and surface materials to observe this characteristic.)
- If you dig to a depth of 18 inches, is the soil color grayish or marked with rust-colored spots, streaks, or lines of different color. (In agricultural fields, these characteristics are observed below the depth that a plow can reach.)
- If you dig a pit to a depth of 18 inches, does it fill with water or does water trickle down the inside? (You may need to wait 20 minutes or so after you have dug the pit to observe this.)

If you answer "yes" to any of these questions about a site, a forested wetland may be present.

Most projects that propose impacts (of any size) to wetlands require a "dredge and fill" permit from the New Hampshire Department of Environmental Services - Wetlands Bureau. Contact the Wetlands Bureau for more information:

NH DES Wetlands Bureau
29 Hazen Drive
PO Box 95
Concord NH 03302
Phone: (603) 271-2147
Fax: (603) 271-6588
www.des.state.nh.us/wetlands
email: wetmail@des.state.nh.us