

TRAIL SYSTEM PLAN

DCR

Middlesex Fells Reservation



Section 1. Introduction	4
1.1. Mission of the Department of Conservation and Recreation	4
1.2. An Introduction to Trail System Planning	5
1.3. The Planning Process	6
1.4. Public Participation in Developing this Trail System Plan	7
Section 2. Existing Trail Conditions	8
2.1. Natural Resources	9
2.2. Cultural History	9
2.3. Ownership and Management	9
2.4. Trail System Development	10
2.5. Current Trail System	11
2.6. Trail Conditions	12
2.7. Administrative Roads	12
2.8. Current Uses	14
2.9. User Demands, Input, Behaviors and Conflict	16
Section 3. Goals, Features and Experiences	19
3.1. Trail System Management Goals	19
3.2. Features	20
3.3. Access Points and Connections	20
3.4. Recreational Experiences and Expectations	21
Section 4. Sensitive Natural and Cultural Resources	28
4.1. Ecological Impacts of Trail Activities	28
4.2. Water and Wetland Resources	28
4.3. Vernal Pools	29
4.4. Rare and Endangered Species	29
4.5. Natural Communities	29
4.6. Cultural Resources	30
Section 5. Staffing and Stewardship Partners	31
5.1. DCR Staffing	31
5.2. Friends of the Fells	31
5.3. New England Mountain Bike Association	32
5.4. Appalachian Mountain Club	32
5.5. Student Conservation Association	32
5.6. Other Stewardship Partners	32
Section 6. Management Recommendations	33
6.1. Reduce the Extent , Confusion and Impact within the Trail System	34
6.2. Maintain, Improve and Close Trails in Cooperation with Stewardship Partners	35
6.3. Improve Trail System Maps and Signage	35
6.4. Protect Sensitive Resources	36
6.5. Enhance Parking and Access	37
6.6. Enhance User Education, Information and Self-Enforcement	37

6.7.	Enhance Enforcement of Trail Rules and Etiquette	38
6.8.	Improve the Pedestrian Trail User Experience	38
6.9.	Improve the Mountain Biking Trail User Experience	39
6.10.	Provide legal, positive experience for dog-owners and their pets	39

Sub-Appendices

1.	Middlesex Fells Trail System Plan, Public / Trail User Input Form	40
2.	Closing and Restoring Trails	42
3.	Targeted Trail Closures	45
4.	DCR Trail Sign Standards, edited for the Middlesex Fells	46

Maps (available at <http://www.mass.gov/dcr/news/publicmeetings/greenwaysfellspast.htm>)

- A. DCR Middlesex Fells Reservation: 2008 Orthoimagery
- B. Topography and Hydrography
- C. Priority Natural Resources
- D. Soils Suitability for Paths and Trails
- E. Trail System
- F. Trail Density Analysis
- G. Trail Condition and Damage
- H. Public Meeting Input Compilation



(Reservoir Trail and Mountain Bike Loop. Photo by Paul Jahnige)

Section 1. Introduction

1.1. Mission of the Department of Conservation and Recreation

The Department of Conservation and Recreation (DCR) is responsible for the stewardship of approximately 450,000 acres of Massachusetts' forests, parks, reservations, greenways, historic sites and landscapes, seashores, lakes, ponds, reservoirs, and watersheds. It is one of the largest state parks systems in the country. The mission of the DCR is:

To protect, promote, and enhance our common wealth of natural, cultural, and recreational resources.

In meeting today's responsibilities and planning for tomorrow, the DCR's focus is on:

- Improving outdoor recreational opportunities and natural and cultural resource conservation.
- Restoring and improving DCR facilities.
- Expanding public involvement in carrying out the DCR mission.
- Establishing first-rate management systems and practices.

The DCR was created pursuant to state legislation that in 2004 merged the former Metropolitan District Commission (MDC) and

the former Department of Environmental Management (DEM). The DCR's Division of State Parks and Recreation manages nearly 300,000 acres of the state's forests, beaches, mountains, ponds, riverbanks, trails, and parks outside the Greater Boston area. The Division of Urban Parks and Recreation manages over 17,000 acres of woodland, river, and coastal reservations within the Greater Boston area and has broad management responsibilities for the preservation, maintenance and enhancement of the natural, scenic, historic, and aesthetic qualities within this area.

The health and happiness of people across Massachusetts depend on the accessibility and quality of our parks – our natural and cultural resources, recreation facilities, and great historic landscapes. The DCR enhances this vital connection between people and their environment.

1.2. An Introduction to Trail System Planning

Trails are more than just paths in the woods, or routes that connect one place to another. Trails create recreational experiences for users that are made up of series of visual, physical, and emotional events. Trails are also the venue through which we experience and interact with the natural and cultural environment around us. In many ways, trails are the intersection of Conservation and Recreation.

Trail Systems are integrated networks, and more than just the sum of the individual trails of which they are composed. Successful trail systems work seamlessly to highlight scenic features, protect sensitive resources, create valuable connections, discourage unwanted behaviors, and provide the desired range of high-quality recreational experiences to users.

A Trail System Plan assesses the function of the existing network, and makes recommendations

to guide the management of recreational trail assets within the context of the natural and culture environment under the stewardship of the DCR. These plans are intended to function both as a stand-alone trails management plan and as a component of a future Resource Management Plan (RMP).

The trails plan is intended to be a working document for setting priorities; allocating resources; and adapting to changing fiscal, social, and environmental conditions. The planning process provides a forum for communication and cooperation with park visitors, stakeholders and the surrounding communities to ensure transparency in DCR's stewardship efforts.

1.3. The Planning Process

The Middlesex Fells Trail System Plan is the first such plan undertaken by the agency. It is intended to serve as a template for future trail system plans. The Fells was selected for trail system planning as a result of three factors:

- The DCR Middlesex Fells Reservation is an extremely popular destination which experiences high levels of recreational use, particularly trail use.
- All trail uses have impacts to soils, water quality, wildlife, and vegetation. In the Fells, user-created trails, off-trail use, unsustainable trail designs, and redundant and overlapping trails compound these impacts.
- In the Fells, DCR receives many requests from various stakeholders for trail maintenance, programming, new trails, and changes in trail use designations to which we need to respond.

The development of the Middlesex Fells Trail System Plan will follow the basic process outlined in DCR's Trails Guidelines and Best Practices Manual (adopted, October 2008). This process includes the following steps:

1. Get to Know the Trails
 - Involve Stakeholders
 - Complete a Trail Inventory
 - Compile Resource Maps
 - Identify Critical Management Roads
 - Describe Use Patterns and Demand
2. Identify Scenic, Recreational and Cultural Destinations, Features and Experiences
 - Identify Your Main Parking and Access Points
 - Identify Desired Recreational Experiences
 - Identify Critical Connections to Make
3. Identify Constraints, Issues and Problem Areas
 - Highlight Trail Problem Areas
 - Identify Redundant Trails
 - Highlight Culturally and Ecologically Sensitive Sites and Areas
4. Make a Plan
 - Identify Potential Trail Closures
 - Designate Trail Uses
 - Re-route and Restore Problem Trails
 - Highlight Potential New Trails
 - Identify Stewardship Partners and Opportunities
 - Identify Necessary Trail Use Policies
 - Develop Education and Enforcement Strategies

As a part of this planning process, DCR completed its Road and Trail Inventory for the Middlesex Fells trail system. This inventory also allowed us to integrate critical natural and cultural resource information including priority habitat for rare and endangered species, vernal pools, priority natural communities, wetland resource areas, soils and steep slopes.

Following the above steps, this draft Trail System Plan was prepared and distributed within the DCR to the Operations, Recreation,

and Planning and Resource Protection staff for internal review. A revised draft has been produced for public review and comment.

The draft was made available to the public via the DCR web page, and a public meeting was convened. An overview of the Trail System Plan's findings and recommendations was presented at the meeting, and public comment solicited and recorded. These comments, and written comments received during the public comment period, will be used to develop the final trails plan.

1.4. Public Participation in Developing this Trail System Plan

Notice of the DCR's intent to prepare a Trail System Plan for the Middlesex Fells was made on DCR's web site on November 19, 2009 with additional announcement to major stakeholder groups via email. A "stakeholders' briefing" was held on September 24, 2009 to introduce the planning process and solicit feedback. Invitees to this meeting included Appalachian Mountain Club, Fells Dog, Friends of the Fells, Mass Audubon, Massachusetts Water Resources Authority, New England Mountain Bike Association, Sierra Club, State Police, Winchester Water Department, and area legislators.

Public comment was solicited on the Fells trail system through a set of guiding questions also listed on DCR's web site (Sub-Appendix N.1.).

A "public workshop" was held February 8, 2010 to solicit additional public and user input. This workshop was advertised via a press announcement to news outlets covering the Malden, Medford, Melrose, Stoneham and Winchester markets, and via emails announcements to key stakeholder groups. Over 200 people participated in the planning workshop providing feedback on the needs and potential solutions to key trail system issues

through a small group workshop process. The workshop presentation, summary notes and a Public Meeting Input Compilation map was completed based on this input (see <http://www.mass.gov/dcr/news/publicmeetings/greenwaysfellspast.htm>).

A second stakeholders' briefing was held on May 4, 2010 to brief key stakeholders on preliminary recommendations being considered.

The draft plan was presented to the public on September 20, 2010 and advertised in the Environmental Monitor on September 9. The draft was made available for download on the internet. A 60 comment period ran until November 19, 2010.

Following this public comment period, and in part in response to some comments, the DCR announced that most of the recommendations of the Trail Plan would be held in draft until the completion of a DCR Middlesex Fells Reservation Resource Management Plan (RMP). This Trail Plan has thus become integrated into and a component of that RMP.

Public process for the Middlesex Fells RMP is described in the RMP Section 1.3.



(Stone steps and erosion control structures on the Skyline Trail. Photo by Paul Jahnige)

Section 2. Existing Conditions

2.1 Natural Resource

The natural resources existing conditions for the Middlesex Fells are detailed in the Middlesex Fells Resource Management Plan Section 2.4.

2.2 Cultural History

The cultural resources existing conditions are detailed in the Middlesex Fells Resource Management Plan Section 2.5.

2.3 Ownership and Management

DCR owns and manages the DCR Middlesex Fells Reservation under the Division of Urban Parks. However, a number of highways and

roads bisect the park, and in-holdings of land exist within it.

Interstate 93, completed in 1962, bisects the Fells running parallel to Route 28. These roads create a significant barrier for both east-west trail connections and wildlife movement.

Within the Fells boundaries are five reservoirs. Spot Pond and Fells Reservoir are managed by the Massachusetts Water Resources Authority (MWRA) as backup water supply for the Boston metropolitan water system. Three reservoirs – North, Middle, and South – and the land surrounding them in the western Fells are owned and managed by the Winchester Water Department as active drinking water supply for

the town of Winchester. These ponds and the lands around them are clearly posted ‘No Trespassing’ to the public, but many roads and trails crisscross between DCR and town of Winchester lands.

The Stone Zoo, managed by Zoo New England, lies at the northeastern portion of the reservation. The former Boston Regional Medical Center in the eastern Fells is a private in-holding and currently proposed for mixed use re-development.

Surrounding the DCR Middlesex Fells Reservation are dense residential neighborhoods.

The trail system connects and intersect all of these areas, and this entwined pattern of ownership and management adds to the complexity of the Middlesex Fells for users and managers alike.

2.4 Trail System Development

In 1891, the first piece of the Fells, Virginia Wood, was donated as a public reservation, and by 1900, the park had grown to over over 1,800 acres and included 13 miles of woods road and eight miles of public road.

By 1919, a network of stacked loop carriage roads and bridal trails had been developed within the Fells to provide visitors with access to the ponds and woodlands of the reservation (see figure 1). Along with this network of wider roads and paths, pedestrian footpaths provided additional loops and connections particularly to the reservation’s hilltops and ledges. All told,

the system provided more than 50 miles of woodland recreational trail.

The 1930s brought the Civilian Conservation Corps and the Works Progress Administration to the Fells, and with them, the planting of over one million trees, and the continued maintenance and development of roads and trails within the Reservation.

The 1935 map of the DCR Middlesex Fells Reservation, includes Lawrence Woods (added in 1925), and shows the Skyline Trail. This seven-mile hiking trail connects the high points in the Reservation, circumnavigating the western part of the Fells with a spur to Cairn Hill and Black Rock in the eastern Fells. The Skyline Trail was the first of several longer-distance loop trails that essentially form a second trail system that has been overlaid on top of the original network.

Additionally, in 1934, public access to the Winchester watershed lands was closed off to protect water quality. This essentially cut out large segments of the original stack-loop trail system from public access, but these roads and trails were never discontinued.

The maps of the trail system changed little until 1989, when DCR and the Friends of the Fells organization produced a trail system map which highlighted the system of longer-distance hiking loop trails, including the Reservoir, Cross Fells, and Rock Circuit Trails, that had been established on top of the original system of carriage paths. This dual trail system contributes to the confusion on the ground.

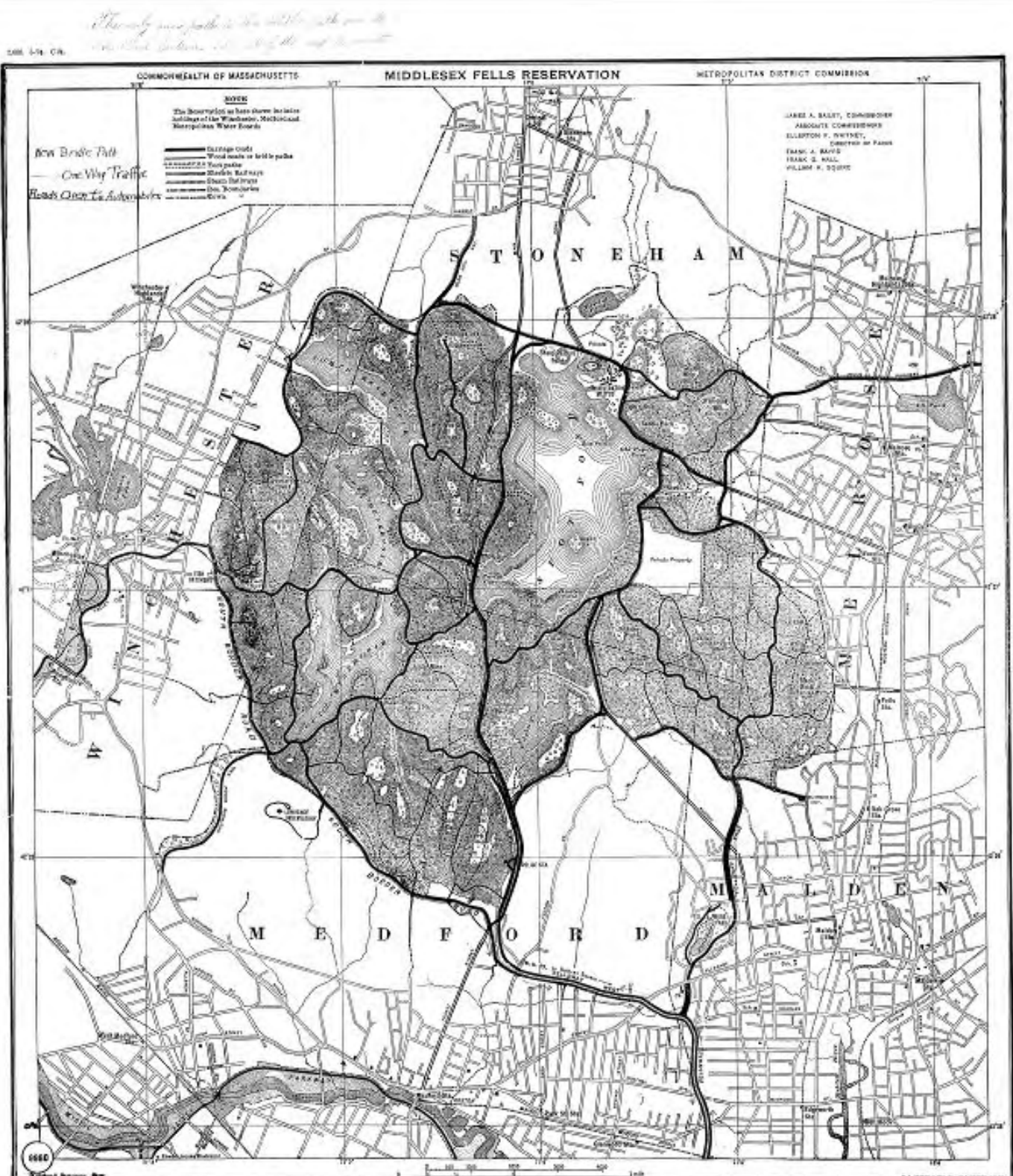


Figure 1: Middlesex Fells Reservation, 1919.

2.5 The Current Trail System

Today, the Middlesex Fells has an extensive and confusing trail network (see Maps E: Trail System and Map F: Trail Density Analysis at <http://www.mass.gov/dcr/news/publicmeetings/greenwaysfellspast.htm>.)

The 2009-2010 DCR Road and Trail inventory of the Fells found over 122 miles of woodland trails, user-created (rogue) trails, woods (or ‘fire’) roads and administrative management roads (101.7 miles within DCR owned lands).

In many cases, woodland single-track trails are overlapping and redundant with the woods roads and management access roads, a legacy of the two different trail systems in the Fells, and many roads and trails lead directly from DCR property to ‘posted’ watershed lands.

Unofficial, user-created (rogue) trails create additional connections and short cuts between existing trails, and in some areas, particularly north and south of Dark Hollow Pond and around Pine Hill, users have created extensive and confusing “spider web” trail networks (see figure 2 as an example).

The management of and public access to the reservoirs and watershed lands as in-holdings within the DCR Middlesex Fells Reservation adds another layer of confusion for the trail user. Most lands around the MWRA Fells Reservoir are currently open to the public. However, in accordance with MWRA-DCR MOUs (Appendix U), MWRA reserves the right to amend public access policies around the reservoirs. Swimming is prohibited in all reservoirs and existing signage details restrictions.

The Winchester Reservoir lands are clearly posted ‘No Trespassing’ and occasionally patrolled, although, as noted, many roads and trails connect from the DCR trail system

through the watershed lands, and provide attractive loops and views. As a result most users ignore the posted signs.

Water supply management roads around both the Fells Reservoir and the Winchester Reservoirs are not parts of the DCR trail system and public access to these management roads is / may be restricted.

Although signage and marking has been improved in recent years, there is still a lack of sufficient signage, particularly intersection directional signs. Many of the longer-distance loop trails - particularly the Skyline, Reservoir and Mountain Bike Loop - cross each other multiple times and share trail sections at numerous points. For example, the Skyline Trail intersects the Mountain Bike loop 11 times and shares 3 segments of tread. This creates trail segments where multiple blazes on overlapping trails can be both confusing and intrusive.

The history of trail development, multiple ownership, lack of signage, and user-created trails have resulted in a Middlesex Fells Trail System that is extensive, complex, and confusing to the typical user. This confusion is exemplified by statistics from the recent DCR trail inventory. Within the reservation there are:

- 122 miles of trail
- 110 trail system access points
- 132 dead end trails
- 42 trails that cross on to posted watershed lands
- 1,949 intersections (16 / mile)

2.6 Trail Conditions

Based on the recent DCR inventory, the condition of trails within the Fells is relatively good, particularly when compared to other trails systems within DCR’s state and urban parks properties across the state (figures 3 and 4). The inventory indicates that 65% of the trails are currently in good condition, 33% are in fair

condition and only 2% are in poor condition. This compares favorably to DCR trails statewide for which only 46% of trails are in good condition, 46% in fair condition and 9% in poor condition (see Map G: Trail Condition at <http://www.mass.gov/dcr/news/publicmeetings/greenwaysfellsplast.htm>).

However, the inventory did find 497 trail damage points such as washouts, trail braiding,

The most common type of trail damage is areas of soil loss caused by water running down the trail (washouts). These typically occur on sections of trail with a “fall line” alignment (running straight downhill), and although they can be stemmed with erosion control structures such as waterbars, in many cases, fall line trails are unsustainable and should be re-routed to a contour alignment. This will allow water to run off the trail and will reduce soil erosion.

Other types of damage points in the Fells include protruding roots and rocks, braided trails, and wet areas.

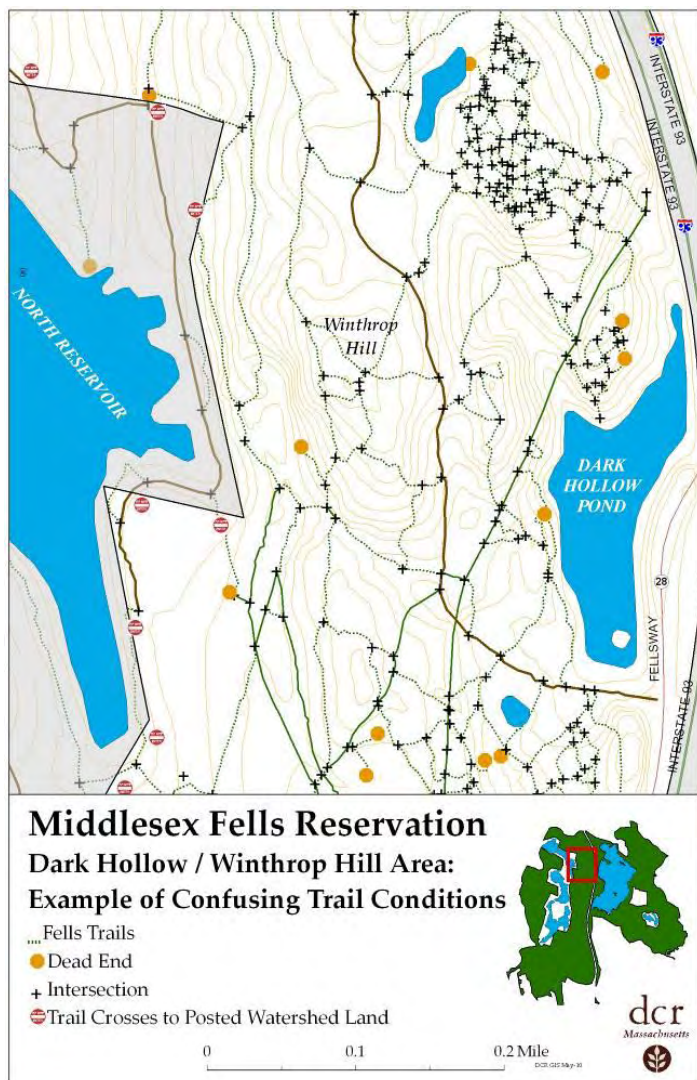
2.7 Administrative Roads

There are a number of administrative roads within the Fells maintained and used by MWRA, Town of Winchester and DCR.

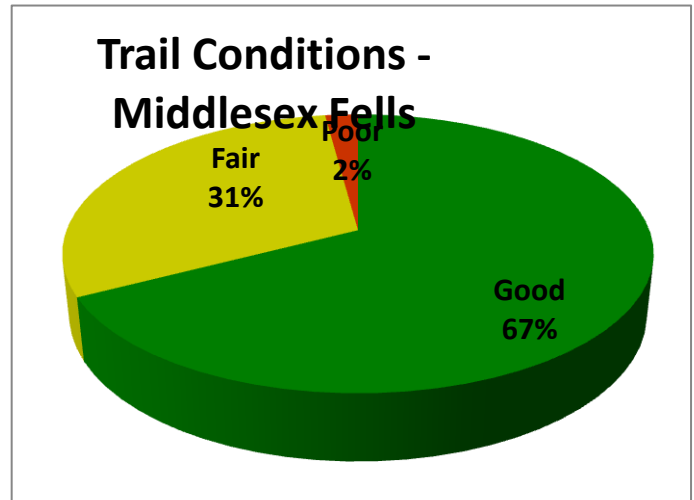
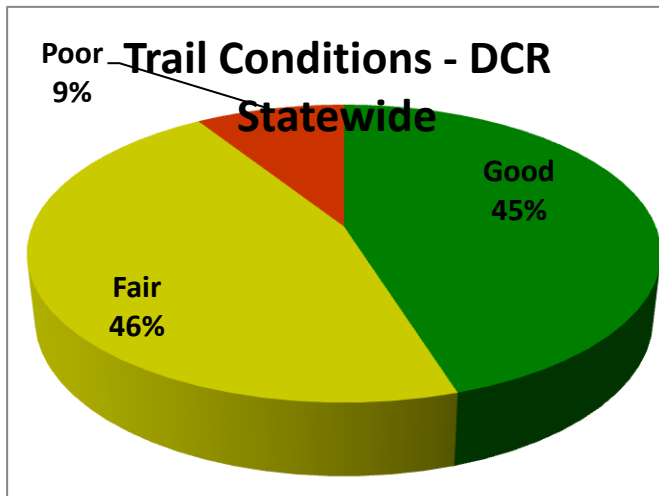
In particular, MWRA maintains a road to the Bear Hill Water Tower, to their building south of Spot Pond, and to and around the Fells High Service Reservoir.

Town of Winchester Water Department maintains South Dam, West Dam, and North Dam Roads around their three reservoirs for patrolling and maintenance. These are primarily accessed in the north, from gate 18 off of Reservoir Road, and in the south, from gates 9 and 12. While there are additional access roads that connect to the Dam Roads, Winchester Water Department reports that they could be closed and restored.

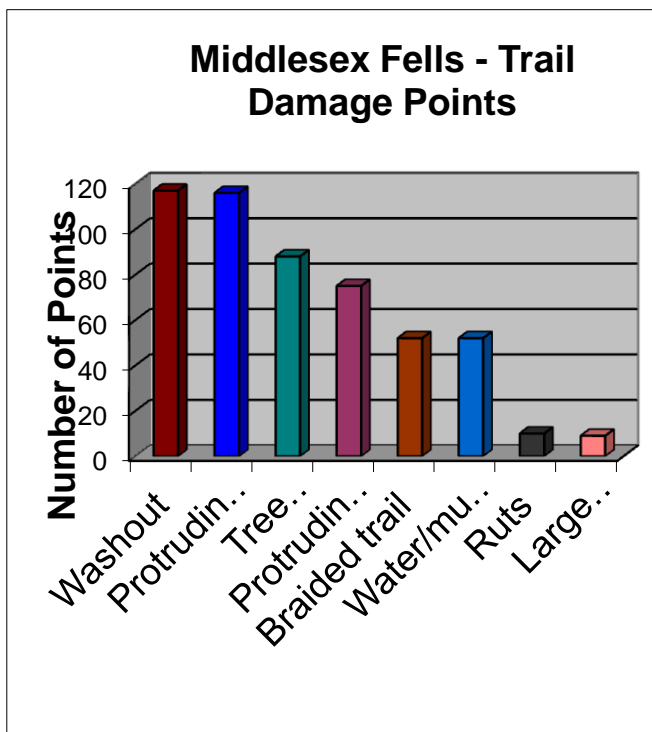
DCR does not maintain specific roads or trails for vehicle access, except to Wright’s Tower. Although many forest ways are known as, “fire roads,” many of these are not necessary for vehicle access for park management or emergency access, and many could be allowed to re-vegetate to narrower trails, or closed and restored.



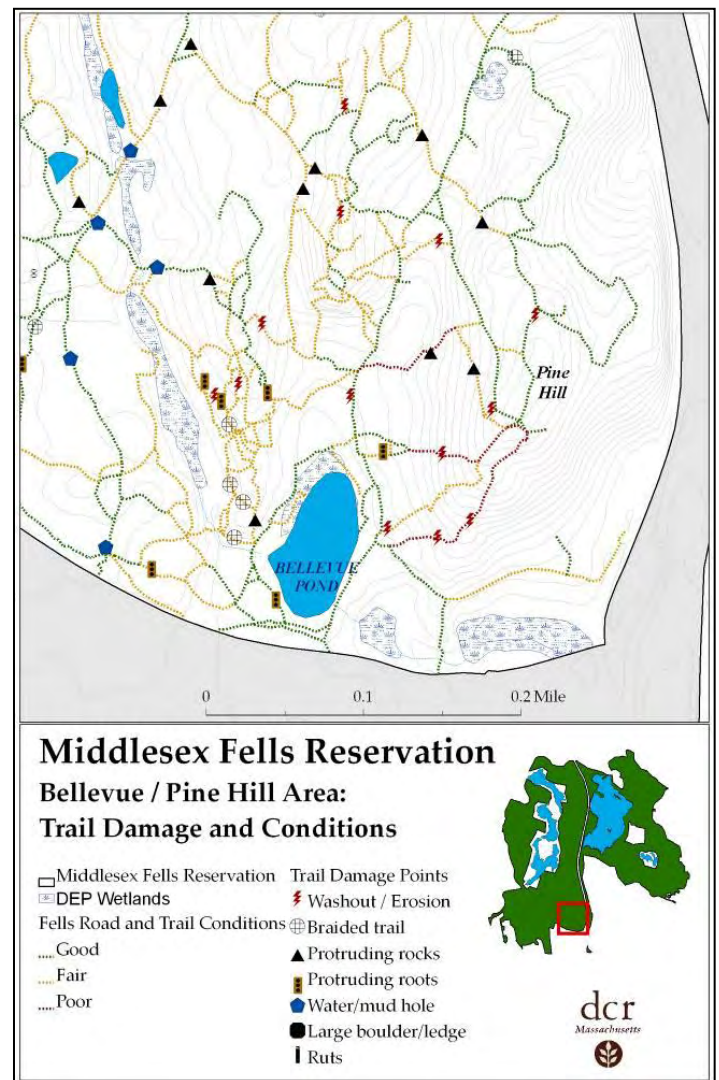
and mud holes that should ideally be repaired or restored to maintain trail function, minimize potential impacts and provide the most positive user experiences (figures 5 and 6).



Figures 3 and 4: Trail Conditions, Statewide and in the Middlesex Fells



Figures 5: Trail Damage Point Types



Figures 6: Example of Trail Damage and Conditions

2.8 Current Uses

As an “urban oasis,” the Middlesex Fells trail system is used at all times of the day and in all seasons, but it sees especially heavy use after work and on weekends during the Spring, Summer and Fall. Primary trail uses include walking / hiking, running, mountain biking and dog walking. Secondary uses include fishing access, horseback riding, snowshoeing, and cross-country skiing. All of these experiences are enjoyed by families, and parents experiencing nature with their children is a notable use. In addition, illicit activities also occur within the Fells including partying and most notably individuals seeking sexual experiences.

To help quantify use, DCR conducted trail counts during the Fall of 2009, both mid-week and weekend, at three access points – Flynn Rink, Belleview Pond, and the Sheepfold (figures 7 and 8). It is important to note that the counts did not differentiate dog-walkers from walkers without dogs, but did record the number of dogs and whether or not they were on leash.

These counts indicated high usage mid-week particularly by walkers and dog-walkers, but notably higher usage on the weekends by mountain bikers and runners. The Sheepfold was the most active access point surveyed, again especially by walkers, dog walkers, and “others,” some of whom were noted as “live parkers” or people who stayed in their cars. Walking / hiking is the most prevalent trail use. The vast majority of dogs visit the Fells off-leash (85%).

A (non-random) on-line survey also conducted this fall, by a graduate student and volunteer

for the Friends of the Fells, asked questions about use of the Fells (figure 9, n=122). This survey found that most respondents reported visiting the Fells in the spring, summer, and fall months primarily, but almost half also visited in the winter. While a small proportion visited almost daily (7%), one-third (33%) reported going weekly, almost a quarter (24%) monthly, and one-third only occasionally (33%). Most respondent visit on weekends (84%), but over half also visit on weekdays (51%).

When they visited, respondents most often hiked (90%), enjoyed solitude (67%), climbed observation towers (60%), observed geologic features (49%), took photographs (46%), mountain biked (43%), picnicked (41%), walked their dog (39%), or went snowshoeing (24%).

While neither of these samples is statistically representative of all trail use within the Fells, the users counts and survey do offer data about the relative types of use, magnitude of uses, and popularity of main access points.

Fells Trail Uses
User Counts, October-November 2009
Flynn Rink, Belleview Pond, and Sheepfold

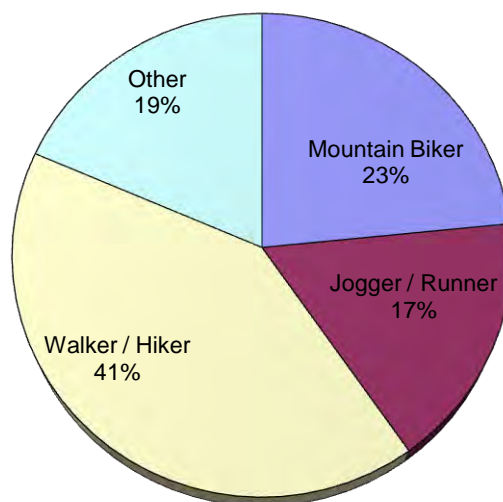


Figure 7

**User Counts, October-November, 2009
4 One-Hour Slots, Mid-week and Weekend**

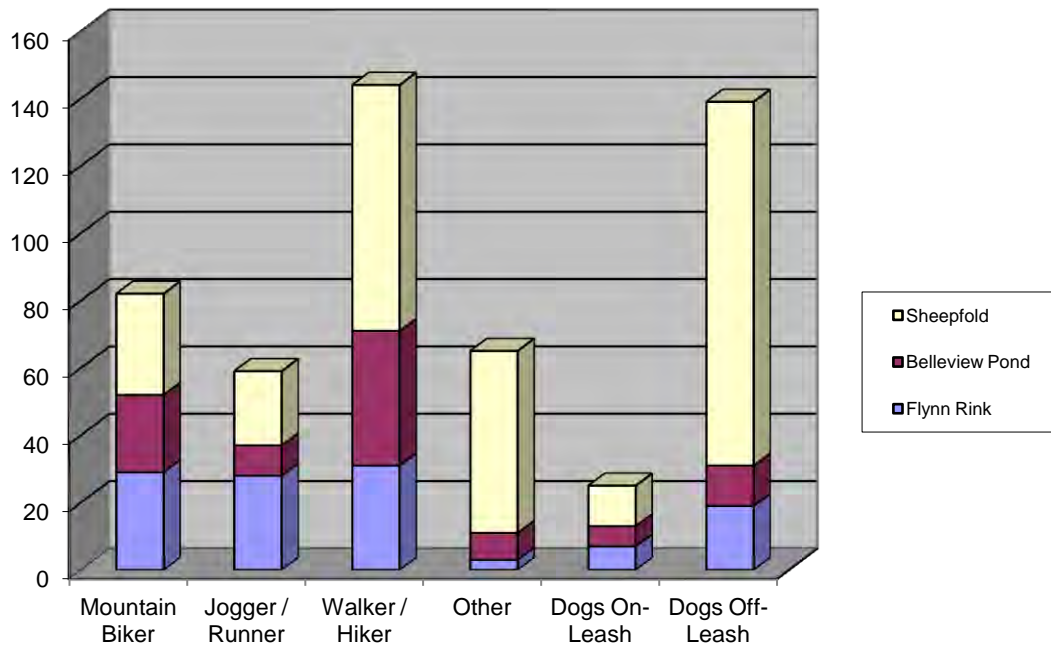


Figure 8

Fells On-Line User Survey (Fall, 2009)

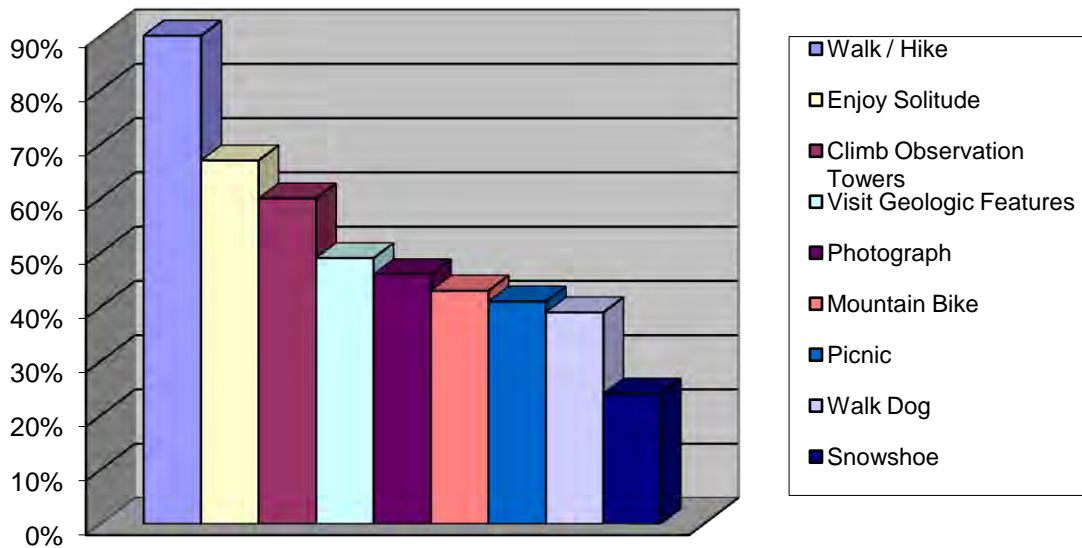


Figure 9

2.9 User Demands, Input, Behaviors and Conflict

Recreational demands, user attitudes and behaviors, and user conflict at the Middlesex Fells are described in Section 2.6 of the RMP.

User and stakeholder input collected during the Trail System planning process is illustrated in Figure 10.

To help understand trail conflict, the Federal Highway Administration and the National Recreational Trails Advisory Committee have produced “Conflicts on Multiple-Use Trails Synthesis of the Literature and State of Practice,” available at www.fhwa.dot.gov/environment/conflicts/conflict.htm. The executive summary of this review notes that conflict in outdoor recreation settings (such as trails) can best be defined as goal interference attributed to another's behavior. Trail conflict has been found to be related to

- Activity style (mode of travel, level of technology, etc.)
- Focus of trip
- User expectations
- Perceptions of the environment
- Level of tolerance for others
- Different norms held by different users.

The following 12 principles for minimizing conflicts on multiple-use trails are recommended. Adherence to these principles will help improve sharing and cooperation on multiple-use trails.

1. **Recognize Conflict as Goal Interference:** Do not treat conflict as an inherent incompatibility among different trail activities, but goal interference attributed to another's behavior. For example, if a user's goal is to see wildlife, a group of screaming teens can interfere with that goal.
2. **Provide Adequate Trail Opportunities to Minimize Contacts:** Offer adequate trail mileage and provide opportunities for a variety of trail experiences. This will help reduce congestion and allow users to choose the conditions that are best suited to the experiences they desire.
3. **Establish Appropriate User Expectations:** If users expect to find the conditions and uses that they actually encounter, they are more likely to be tolerant of them. Use signage, interpretive information, and trail design to establish appropriate expectations.
4. **Involve Users as Early as Possible:** Identify the present and likely future users of each trail and involve them in the process of avoiding and resolving conflicts as early as possible, preferably before conflicts occur.
5. **Understand User Needs:** Determine the motivations, desired experiences, norms, setting preferences, and other needs of the present and likely future users of each trail.
6. **Identify the Actual Sources of Conflict:** Help users to identify the specific tangible causes of any conflicts they are experiencing. In other words, get beyond emotions and stereotypes as quickly as possible, and get to the roots of any problems that exist.
7. **Work with Affected Users:** Work with all parties involved to reach mutually agreeable solutions to these specific issues.
8. **Promote Trail Etiquette:** Minimize the possibility that any particular trail contact will result in conflict by actively and aggressively promoting responsible trail behavior. Use existing educational materials or modify them to better meet local needs.
9. **Encourage Positive Interaction Among Different Users:** Trail users are usually not as different from one another as they believe. Providing positive interactions both on and off the trail will help break down barriers and stereotypes, and build understanding, good will, and cooperation.
10. **Favor "Light-Handed Management":** This is essential in order to provide the freedom of choice and natural environments that are so important to trail-based

recreation. Intrusive design, too many signs and coercive management are not compatible with high-quality trail experiences.

11. **Plan and Act Locally:** Whenever possible, address issues regarding multiple-use trails at the local level. This allows greater sensitivity to local needs and provides better flexibility for addressing difficult issues on a case-by-case basis.
12. **Monitor Progress:** Monitor the ongoing effectiveness of the decisions made and programs implemented.

Stakeholder / User Input

"If you could make changes with the Fells Trail System, what would they be?"

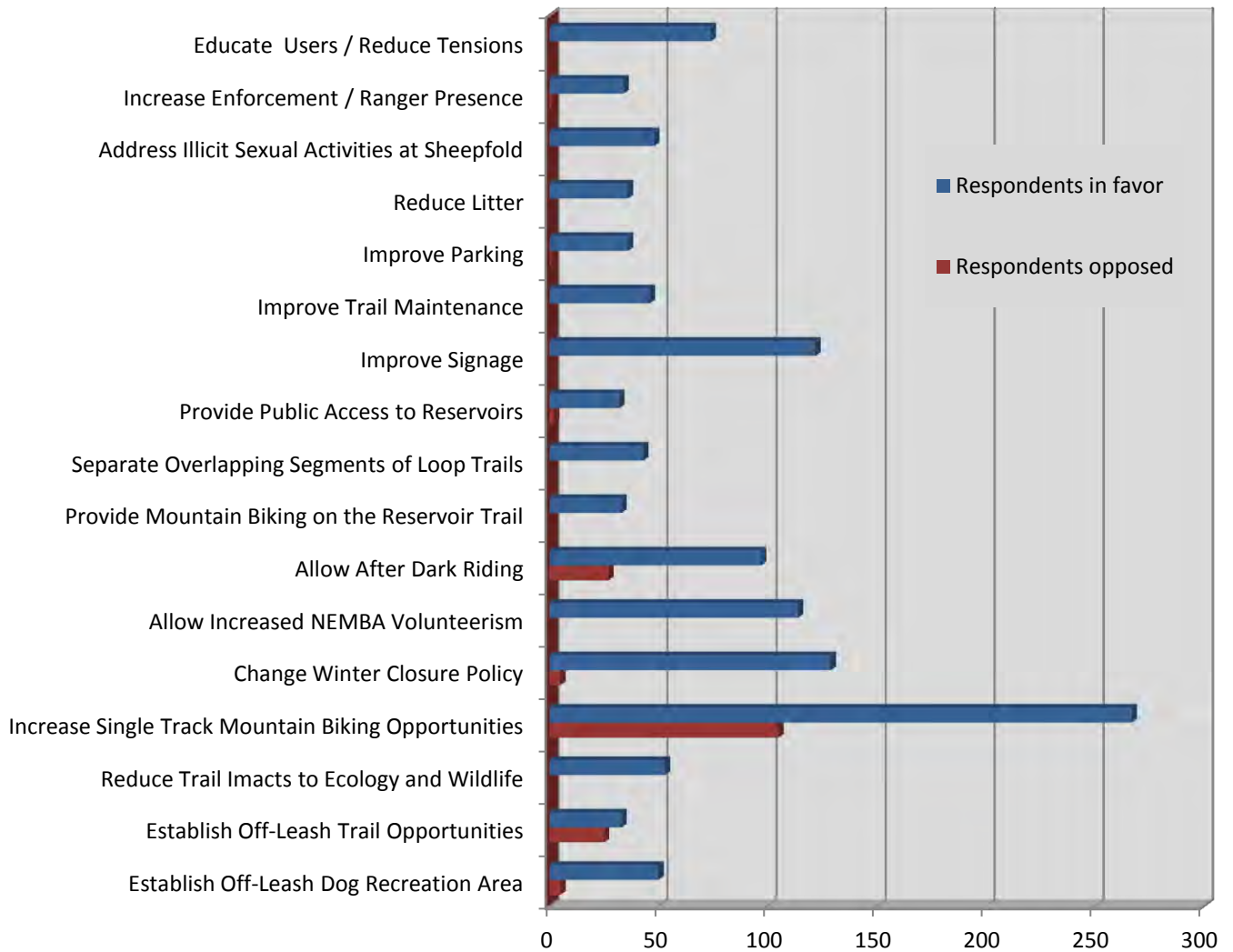


Figure 10



(Hikers ascending a section of the Skyline Trail. Photo courtesy of Jack Boudreau)

Section 3. Management Goals, Features, Experiences and Expectations

3.1 Trail System Management Goals

The trail system at the Middlesex Fells, ideally, will be designed and managed to help DCR achieve four broad goals:

- Provide the public with opportunities to experience, appreciate and interact with the beauty and wonder of nature
- Provide the public with opportunities for a range of recreational experiences and physical activities within a natural setting
- Provide for the protection and stewardship of our common wealth of natural and cultural resources
- Provide opportunities for individuals, families, groups and communities to strengthen their social bonds through interaction with nature and recreational activities

To achieve these goals, the trail system should effectively contribute to three primary objectives:

- Highlight natural, scenic, and cultural features within the Fells Reservation

- Provide a variety of desired non-motorized recreational experiences to users
- Connect important features, destinations, access points, and neighboring communities

It should achieve these while simultaneously:

- Avoiding sensitive natural resources
- Meeting the expectations of users
- Minimizing ecological impacts
- Minimizing maintenance costs and management requirements

3.2 Features

Nearly all users and stakeholders who submitted public comments to this plan agreed that the two greatest features of the Fells were:

- Its diverse woodlands, views, landscapes and habitats
- The ability to experience nature and recreate in a natural setting in close proximity to a highly urbanized metropolitan area

The trail system provides users with access to these features as the trails meander through different woodlands, climb rocky hills, and provide views of forest groves, water features and the Boston skyline.

The trail system itself is also an important feature of the Fells. Ranging from wide, relatively flat “fire roads” with stable surfaces to rugged, rocky, narrow and occasionally steep paths; the trail system offers a variety of levels of challenge, distances, loops and terrains for a variety of trail users. This system also connects the multiple parking areas and community entrance points of the park to its multiple features and destinations.

The opportunity to find solitude within a natural setting so close to where so many people live,

work, learn and play is a feature of the Fells that can feel rare and special to many. The size of the Fells, its varied terrain, the number of trails, and even the lack of signage and staff, allow users to experience a sense of escape from a crowded urban environment, and even an opportunity to “get lost” in the woods. Within this solitude, some users find freedom, some find privacy and some find a sense of serenity.

Finally, the Middlesex Fells contains many particular points of interest that draw trail users, serve as destinations and combine to create a sequence of events that enhances the outdoor experience. These include:

- Bear Hill Tower
- Wright’s Tower
- Stone Zoo
- Winchester Reservoirs
- Sheepfold meadow
- Long Pond
- Spot Pond
- Fells Reservoir
- Virginia Wood’s history trail, waterfall and hemlock grove
- Lawrence Woods’ 90 mm site and butterfly area
- Panther Cave
- Quarry sites
- Hilltop vistas
- Rocky outcrops
- Vernal pools

3.3 Access Points and Connections

Primary trail system access points in the Middlesex Fells include:

Sheepfold: This is the most popular access point to the Fells. Off Route 28 on the eastern side of the western Fells, the Sheepfold offers two large parking areas, the large open Sheepfold meadow that is a popular place for dog-owners to bring their pets, and access to several trails including the Mountain Bike Loop,

Reservoir Trail and Skyline Trail. At popular times, this parking area becomes over crowded. This is also an area where individuals come to meet for illicit sexual experiences in the park.

Bellevue Pond: On South Border Road on the south side of the western Fells, Bellevue Pond trailhead offers parking for about 8 cars, and easy access to Bellevue Pond, Wright's Tower, Panther Cave and the Skyline Trail.

South Border Road: Numerous minimally developed pull-offs, trailheads, and small parking areas along South Border Road provide access to various parts of the western Fells trail system including Lawrence Woods, the Skyline Trail, and the Reservoir Trail. These points also provide community access from neighborhoods near Governor's Avenue in Medford and Highland Avenue in Winchester.

Marjam Supply Company / Bear Hill

Parking: This parking area on the north side of the eastern Fells provides access to the Mountain Bike Loop, Bear Hill and the Dark Hollow Area.

Flynn Rink: Off Woodland Road south of Spot Pond, Flynn Rink provides parking, a fitness 'parcourse' and access to the Cross Fells Trail with connections to the Rock Circuit Trail and the Fells Reservoir. There is currently no good mountain biking trail connection from Flynn Rink to the western Fells.

Botume House: The Botume House Park Headquarters and Visitors Center has parking for about four cars, and provides access to Half Mile Road and Spot Pond, with possible connections to the Cross Fells Trail.

Greenwood Park: Offers parking off of Pond Street on the north side of the Fells, and access to playing fields, a playground and the Crystal Springs Trail.

Other Access Points: A variety of other smaller parking pullouts and trailheads provide access to certain parts of the trail system at Long Pond, Crystal Springs, Virginia Wood, and off of Fellsway East.

Connections

As mentioned in Section 2, the trail network in the Fells is extensive with many different access points and overlapping and redundant trails. As a result, there are often multiple routes connecting the many parking areas, community access points, features and destinations. However, there are also some connections that are problematic or difficult to make.

Connecting Eastern and Western Fells: Route I-93 bisects the Fells and this creates a significant barrier for trail connections between the eastern and western parts of the reservation. The only reasonable connection between the two is on Route 28 between gates 27 and 28 which is designated as part of the Cross Fells Trail.

Around Spot Pond: Although there is a desire, and some efforts to create one in the past, there is no trail connection completing a loop around Spot Pond.

Flynn Rink to Quarter Mile Pond: There is no current legal mountain biking trail connecting the Flynn Rink Parking area to Quarter Mile Pond and the fire road network.

Between the Winchester Reservoirs: Although there are heavily used existing trails and roads connecting the Fells trail system within the Winchester Watershed lands between the three reservoirs, these lands and trails are posted "No Public Access." These connections allow for a variety of loops within the western Fells, however, they are currently restricted.

3.4 Recreational Experiences and Expectations

The DCR desires to manage the Middlesex Fells in a way that provides a range of users with a range of recreational experiences. We seek to provide these experiences while simultaneously conserving the natural qualities of the Fells environment and protecting the sensitive resources that exist there.

In mirroring our goals, the experiences we wish to provide are:

- The opportunity to appreciate and interact with the beauty and wonder of nature
- The opportunity to engage in physical activities within a natural setting
- The opportunity to strengthen social bonds by sharing the above activities with family, friends, and neighbors
- The opportunity to share one's skills, knowledge and labor as a steward of the environment

More specifically, within the Fells, DCR has identified the following “managed experiences” (those we actively seek to provide and manage for). These include:

- Observing, exploring, discovering, and sharing nature from existing trails
- Experiencing diverse landscapes and views from the trails
- Walking, hiking, and snowshoeing on a variety of types and difficulties of trails and terrain
- Mountain biking on a variety of types and difficulties of trails and terrain
- Running on variety of types and difficulties of trails and terrain
- Cross-country skiing on a variety of types and difficulties of trails and terrain
- Finding solitude
- Engaging in the above experiences with a family dog, and exercising and socializing a family dog with other dogs

- Orienteering
- Engaging in these experiences as members of a family, especially parents with their children Stewarding and improving the Fells environment

Although they may not be “managed experiences” at this time, DCR also recognizes that there may be some demand for and a benefit to allowing additional experiences including:

- Horseback riding
- Fishing (where it is allowed)
- Rock climbing and bouldering

For a variety of safety, ecological, watershed protection and user conflict reasons, the DCR does not believe that the Middlesex Fells is an appropriate venue to experience the following:

- Campfires or camping
- Swimming
- Off-leash dog recreation on trails (unless specifically designated)
- Walking dogs as a part of a formal or informal business (unless specifically permitted)
- Off-highway vehicle recreation
- Off-trail recreation of any kind (unless specifically permitted)

Finally, there are some activities that occur within the Fells that are not only inappropriate, but illicit. These include:

- Partying, drinking or vandalism
- Intimate sexual experiences

The following section provides additional details, discussion and reasonable expectations regarding the above “managed experiences.”

Observing, Exploring, Discovering, and Sharing Nature

As noted in the previous section, perhaps the two greatest features of the Fells are its diverse woodlands, landscapes, and habitats; and its proximity to a highly urbanized metropolitan

region. As a result, the opportunity to observe the colors and songs of migrating warblers, explore the shapes and textures of lichens on a rock outcrop, discover a vernal pool echoing with a chorus of frogs, and share each of these through the eyes of your child, are priceless experiences that the Fells has to offer.

Although it can be argued that the best way to appreciate nature is at a slow speed with your senses attuned to the world around you, discovering the wonders of the natural world is a personal experience which, depending on the individual, may be appreciated in boots, from the seat of a bike, in a backpack over your mother's shoulder, on the run or even from the seat of an ATV. As long as it is consistent with our managed and allowed uses for a particular park, and our rules and regulations, it is not appropriate for DCR to proscribe how users should best observe, explore, discover or share nature.

The experiences of observing, exploring and discovering nature are often enhanced by quietness, solitude, bright colors and the opportunity to see plants and animals that seem uncommon to our daily experience. The opportunity to share what you are seeing and hearing with one or two close friends or family can magnify the experience even more.

Conversely, this experience can be diminished by noise, groups of other people or intrusion by the features of our urbanized lifestyles such as trash or vehicles. It is also diminished by the perceived scaring away, destruction or loss of that nature; be it by a dog romping through a vernal pool, a woodland flower trampled or a rare species extirpated from the park.

However, while the Fells is a wonderful place to observe, explore and discover nature, it is also a popular and well-used urban park. As such, users should expect to encounter other users,

and should expect some level of disturbance by others.

Finally, although experiencing nature might seem best engaged in "off the beaten path," in a well used park like the Fells, such off-trail explorations, be it following a fox or seeking out a calling bird, can negatively impact the very nature we are appreciating.

Experiencing diverse landscapes and views of from the trails

Although similar in many ways to observing nature, the opportunity to travel from hemlock grove, to pine-studded pond shore, to rocky hilltop in the Fells provides a special experience all its own. Within and between each woodland or habitat type, one can feel a change in the air, perceive beauty in the different qualities of light, and appreciate the textures of the earth at a landscape scale.

This diverse landscape experience is enhanced all the more by the longer-distance views that one can find in the Fells – of the sunlight sparkling off the water through the trees, or the Boston skyline from an open outcrop. It can also be enhanced by the number and mix of natural and cultural landscape features encountered, and so, to some extent, is also magnified by the distance traveled by the user.

This experience, as with many other trail experiences, can be negatively impacted by getting lost or feeling confused by the trail network and markings, and by encountering situations that make one feel uncomfortable or unsafe. These might include stumbling upon an intimate sexual act, being scared by the approach of a dog or another user, feeling unwelcomed by others or being physically or verbally threatened.

Obviously, the above two experiences (observing nature, and experiencing diverse landscapes) can be enjoyed through various

modes of travel from foot, to horseback, to bike, to ski, to snowmobile, to off-highway vehicle. The DCR believes that all users of the Fells using allowed modes of travel (thus not including motorized vehicles) should be able to engage in these experiences without that experience being negatively impacted by getting lost, or feeling unsafe.

The following descriptions further discuss some of the elements particular to the modes of travel appropriate for the Fells.

Walking, hiking and snowshoeing on a variety of types and difficulties of trails and terrain

Experiencing the trails on foot is the slowest mode of travel. One can stroll leisurely, observing the world around you or engaging in deep conversation with a friend; or one can hike at a strenuous pace, raising the heart rate, sweating on the hills and feeling the rush of both accomplishment and exercise.

Travel by foot is also the simplest, lowest cost and perhaps most versatile mode of trail use. The equipment required is little more than a good pair of shoes (perhaps snowshoes) and a water bottle. Some walkers will look for wide relatively flat loops of short to moderate distances that they can travel without too much thought and return to their trailhead without being lost or confused. Some hikers will want to find more challenging trails that offer sections perhaps both steep and rocky, and bring them to destinations with features or views.

The opportunity to find a trail experience that is at the right distance and level of challenge for the individual, and the diversity of trail types and terrains in the Fells adds greatly to the pedestrian experience here. Most pedestrian users will want an experience of 1 to 8 miles, often with a destination in the middle, and generally loops are most desirable.

This experience can be diminished by encountering damaged, eroded or wet trails, the presence of trash, and (as noted above) situations that make the user feel uncomfortable or unsafe. Some of the specific situations that may diminish the pedestrian experience in the Fells include being startled by another user, having to “jump out of the way” of a fast moving biker, being confused by trails that enter posted watershed lands, being approached by an unknown dog off-leash, encountering dog waste or bags of dog waste along the trail, and becoming lost.

The Fells is a popular, multi-use, urban park. On most trails, pedestrians should expect to encounter other users, including dogs and bikers, and hikers and walkers should be prepared for faster moving users to announce themselves from behind. However, DCR also believes that walkers, hikers, and snowshoers should be able to find some high-quality trail experiences in the Fells in which they do not have to worry about encountering fast-moving bikers or off-leash dogs.

Mountain biking on a variety of types and difficulties of trails and terrain

Mountain biking is a mode of travel that can add speed, distance, technical skill and physical challenge to the trail experience. In these ways, it can be similar to trail running and cross-country skiing. In general, most users on mountain bikes desire to connect with nature and experience diverse landscapes and destinations in the same way that other users do. However, the mountain biking experience also includes some elements such as fun and technical challenge. Experiencing a trail on wheels (and on skis to some extent) is somewhat different than on foot. The flow of the trail – its twists and turns, its ups and downs, its obstacles – all contribute to the mountain biking experience. The quality of the trail is integral to the quality of the experience.

As with pedestrian users, mountain bikers desire varying distances, levels of challenge and technical difficulty, and want to find the levels that are right for them. But they may also desire to increase their level of technical challenge as they develop. Mountain bikers may travel 5 to 15 miles during an outing, and an adequate trail system should provide approximately 40 miles of trails of varying types, levels of difficulty and terrain. Single-track trails and loop trails are important to the mountain bike experience, and loops of various difficulties are important to the different riders. There are currently approximately 32 miles of trails open to Mountain Biking, but only two miles of single track.

In the Fells, the mountain biking experience is diminished by the limited number of trails open to mountain biking, particularly single-track and more challenging trails, a lack of clear signage and marking, hidden obstacles, negative encounters with other users including off-leash dogs, and a feeling of not being welcome.

On most trails, mountain bikers should expect to encounter other users, including dogs and pedestrians. They should expect to ride in a manner that will not startle others. They should be prepared to slow down, and yield to walkers and hikers, especially on downhill segments. And they should expect to stay off of some trails.

While DCR believes that mountain biking is an appropriate trail use in the Fells and desires to provide an adequate trail experience including a variety of types of trails, difficulties and terrains; the Fells, as a well used urban park, is not an appropriate place for mountain bikers on all trails or for bikers to find the most advanced trail conditions. Mountain bikers in the Fells should expect to feel welcome, be respected by all users, and be able to find sufficient, single track trail mileage in the beginner and intermediate trail categories and maybe some

sections of advanced trail. But the Fells is not the appropriate place to find expert trails, man-made obstacles, off-trail opportunities, or extensive advance trail mileage.

Running on variety of types and difficulties of trails and terrain

Trail running is a pedestrian trail use, but the motivations of running are more likely to include physical exercise and traveling longer distances within the natural context. In terms of speed, distance and physical challenge, trail running is perhaps more akin to mountain biking than hiking, however, in terms of the variety, ruggedness and types of trails that are appropriate for running, it is more similar to hiking.

Within the Fells, runners include individuals, groups such as school cross-country teams and participants in organized events. The trail running experiences is enhanced by the natural context of the trails, and by the ability to traverse diverse landscapes, reach destinations such as views, and tackle varied terrain.

Runners generally cover three to seven miles in an outing, and do not necessarily want to stop to figure out which way to go.

The trail running experience can be diminished by damaged, eroded, wet trails, crowded conditions, dog waste, confusing markings and the approach of off-leash dogs.

Within the Fells, runners should be able to find a variety of well-marked running loops of three to six miles on easy to moderate trails, as well as some more challenging terrain.

Cross-country skiing on a variety of types and difficulties of trails and terrain

Cross-country skiing can only be experienced in the Fells a few times a year, but the experience of being able to strap on the skis after a storm, surround yourself in a white wonderland and feel like you are the only one in the woods can

be marvelous. While skiing is a pedestrian trail use, it is perhaps most similar to mountain biking in terms of the types of trails desired, the speed and distance traveled and the equipment and technical skill required.

The experience is enhanced by varied terrain and access to a variety of loop trails of different difficulties that allow the skier to choose a route appropriate for their level of skill. Although it is possible to ski on trails that have been tracked by other users, the skiing experience is often best on untracked trails or in undisturbed ski tracks.

The experience of cross-country skiing can be diminished by becoming lost or confused, rocky trail conditions, wet trails, obstacles and sudden steep down hills.

In the Fells, cross-country skiers should expect to find a variety of well-marked trails appropriate for skiing when conditions allow. They should not expect groomed conditions or trails specifically designed or designated for skiing. Nor, unfortunately, should skiers expected to be able to ski every year.

Finding solitude

The experience of finding a moment of solitude in the Fells is special – a moment to revel in the glory of nature, to reflect on one's own existence, to meditate or pray – these are moments to be savored and cherished. Such moments are enhanced by the diversity and beauty of the Fells landscape, and diminished by intrusions of the outside world.

However, the Fells is a popular and heavily used destination. It is not a wilderness area. While users may be able to find moments of solitude in the Fells at certain places, seasons or times of the day, users should not necessarily expect to find solitude in all instances, nor expect that moments of solitude might not be disturbed by other users.

Engaging in the above experiences with a family dog, and exercising and socializing a family dog with other dogs

Family pets, especially dogs, are an important part of today's society. For many owners, dogs are members of the family. Just like humans, dogs need to both exercise and socialize with other dogs to be healthy. As a result, many users to the Middlesex Fells desire to recreate with their dogs on trails and allow their dogs to socialize and recreate together, especially at the Sheepfold.

While some dog owners prefer to keep their dog on a leash to both control and protect the dog, most dog owners at the Fells desire to recreate and exercise their dogs off-leash. Current DCR regulations require that dogs at most state and urban parks, including the Fells, be on-leash. The reasoning for this is that some dogs can be aggressive, and even friendly dogs off-leash, particularly on trails, can startle or frighten other users or dogs as they approach. Dogs off-leash will also tend to run both on and off trail, contributing to off-trail impacts, and potentially disturbing wildlife.

For many dog owners, the experience of recreating with their dog is enhanced by the opportunity to do so in a beautiful, natural setting, and by the ability to allow their dogs to run and explore at their own pace. The experience of allowing dogs to socialize with each other is enhanced by wide open spaces that allow dogs to run, and the opportunity for human owners to socialize with each other.

The experience of recreating with a dog can be diminished by negative encounters with other users or other dogs.

Since off-leash dogs on trails can impact other users and potentially off-trail environmental resources, dog owners should expect to recreate with their dogs on leash on trail at the Fells.

Engaging in these experiences as members of a family, especially parents with their children

Exploring, experiencing and recreating in a natural setting can all strengthen social bonds. This is particularly valuable for families and especially valuable when those strengthened bonds are between a child and parent.

Exploring nature and recreating with a child can be an opportunity to teach, share and learn from each other. These interactions that occur in a natural setting can be more meaningful than those that might occur in front of the television, or even at the kitchen table.

Experiences with families can be enhanced by discovery, challenge, beautiful scenery and nice weather.

These experiences can be diminished by too much challenge, situations that feel unsafe and negative encounters with other users.

Stewarding and improving the Fells environment

The experience of being able to volunteer one's time and energy to improve the Fells trail system and environment is a valuable experience that many seek. Modern society often lacks opportunities to get outside and engage in physical labor, and volunteer stewardship on trails offers the opportunity to improve the environment, enhance recreational experiences and realize visible and tangible accomplishments. Such activities also strengthen participants' sense of connection to the environment and trail system, and provide opportunities for environmental education and skill development.

In addition, the Fells trail system clearly has significant need for ongoing maintenance, and volunteer stewardship will be a critical component of successful implementation of this trails plan.

The volunteer stewardship experience is enhanced by well-organized and clearly defined volunteer projects, opportunities to meet and socialize with others, and projects which have a clear, lasting and visible benefit.

The volunteer experience is diminished by a lack of organization, the exclusion of user groups and when the accomplishments of a project are un-done or appear to have little benefit.

Conclusion

The current trail network, user behaviors, conditions and policies existing in the Middlesex Fells and described in Section 2 of this plan, unfortunately do not create a trail system that fully provides for all the desired recreational experiences described above.

Through the recommendations of this plan, DCR seeks to enhance, in partnership with stakeholders, our ability to better provide for these desired trail experiences.



(Stone 'turnpike' over wet area. Photo by Paul Jahnige)

Section 4. Sensitive Natural and Cultural Resources

4.1 Ecological Impacts of Trail Activities

Environmental impacts of recreation are detailed and discussed in Section 4.2 of the Middlesex Fells RMP.

Of particular concern to DCR with respect to trails and trail-based recreation in the Middlesex Fells are areas where illegal uses, off-trail uses or existing trails intersect with and impact sensitive resources, including:

- Drinking water supplies
- Wetland resource areas
- Vernal pools
- Rare and endangered species habitats

- Priority natural vegetation communities
- Sensitive cultural sites

4.2 Water and Wetland Resources

The drinking water resources and associated infrastructure, and threats to these resources are described in the Middlesex Fells RMP Section 2.4.

Management resources and practices employed to protect these resources are described in Section 3.2 of the RMP.

Recommendations specifically designed to protect water resources are discussed in Section

5 of the RMP and also in Section 6 of this Trail Plan.

Trails can negatively impact wetland resources when they directly traverse wetlands without sustainable surfaces, and when they generate sedimentation through the displacement and erosion of soils that are carried into wetland resources. The primary contributor to wetland impacts from trails is poor trail layout and design, and off-trail uses.

In accordance with DCR's *Trails Guidelines and Best Practices Manual*, trail maintenance activities that have the potential to fill, remove, dredge or alter wetland resource areas will only be considered after a thorough review and permitting process by the local conservation commissions.

Trail maintenance that has the potential to reduce existing erosion and sedimentation should be prioritized, and trails that currently traverse and impact wetland resources will be evaluated for closure.

It is important to note that mud holes or wet trail segments are not necessarily wetland resource areas, and are not likely to produce impacts to wetland resources through sedimentation. The primary impact of wet trail areas is the trail widening and vegetation trampling that occurs when users try to avoid getting their feet wet.

4.3 Vernal Pools

Vernal pools at the Middlesex Fells, their extent, and threats are described in Section 2.4 of the Middlesex Fells RMP. Recommendations designed to protect vernal pools, both certified and potential, are discussed in Section 5 of the RMP and Section 6 of this Trail Plan.



(Vernal pool with evidence of recreational impacts. Photo by Paul Iahnige)

4.4 Rare and Endangered Species Habitats

The rare species at the Middlesex Fells, and their needs, habitats, threats, and specific recommendations for protection are detailed in Appendix M of the Middlesex Fells RMP; Habitat Management Plan.

In addition, in accordance with DCR's *Trails Guidelines and Best Practices Manual*, all trail construction and maintenance activities (including basic maintenance) within Priority Habitat, whether completed by DCR staff or in cooperation with partners, must be reviewed and approved by the NHESP in accordance with the Massachusetts Endangered Species Act (MESA) unless it is covered by an exemption.

4.5 Priority Natural Communities

Although natural communities, such as bogs, grasslands or floodplain forests, are not legally protected under the MESA, they do deserve special consideration by DCR in the planning of trail maintenance and development because they harbor important components of biodiversity.

The NHESP ranks each type of natural community with a state rank (S1 – S5) that reflects the rarity and threat to that community in Massachusetts. S1 through S3 community-types are designated as Priority Natural Communities (PNCs). Exemplary natural communities are any occurrence (no matter what the rank) which is particularly good in terms of biodiversity, size, landscape context and potential for natural processes.

The PNCs, their extent, needs, and threats are all described in Section 2.4 of the Middlesex Fells RMP. Recommendations for protecting these communities are discussed in Section 5 of the RMP and in Section 6 of this Trail Plan.

In particular, there are some examples of Hickory Hophornbeam community (S2), Ridgetop Pitch Pine-Scrub Oak community (S2) and Circumneutral Rocky Summit/Rock Outcrops community (S2/S3) at the Fells. Both of these ridge top communities are susceptible to damage by trail usage because the soils are thin and can be easily worn. Unfortunately, ridge top locations also often include exposed bedrock and offer views, so users will tend to wander off trail in search of views and pleasant spots. This off-trail use can create additional impacts and fragment the natural community.

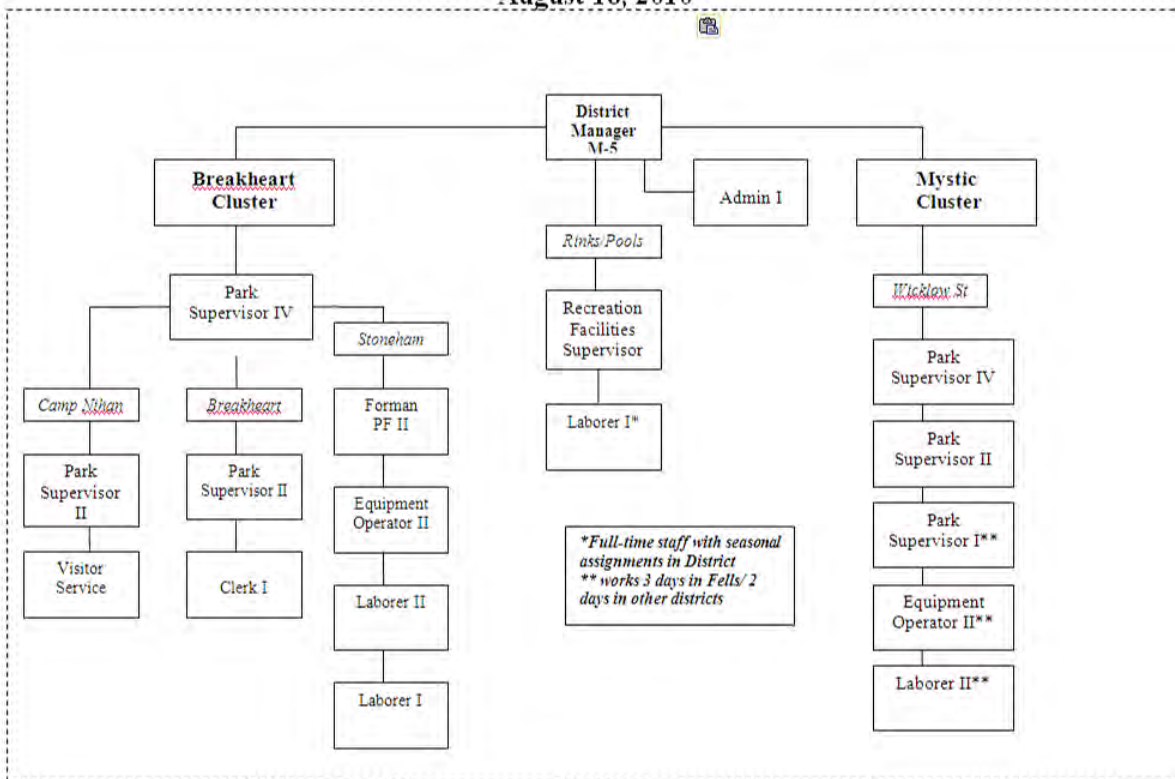
DCR has consulted with the NHESP Natural Community Ecologist to develop a set of recommendations to help better protect these potentially sensitive resources.

4.6 Cultural Resources

The Middlesex Fells' cultural resources, their locations, conditions, integrity, and threats are all detailed in Section 2.5 and Appendix R of the Middlesex Fells RMP. Recommendations for protecting these resources are discussed in Section 5 of the RMP.

In accordance with DCR's Trails Guidelines and Best Practices Manual, any trail project that includes excavation – including tree planting, sign installation and invasive removals – whether by DCR or volunteers, requires review by DCR's Office of Cultural Resources and potentially the Massachusetts Historic Commission (MHC; <http://www.sec.state.ma.us/mhc/>). If the project is not in an area with archeological and/or cultural resource sensitivity, the MHC may not require anything further. If the project is in such an area, or in an area that meets the criteria for a site that might have archeological resources, the MHC may request additional information or an archaeological survey.

DCR DUPR North Region Fells District Organizational Chart August 18, 2010



Section 5. Staffing and Stewardship Partners

5.1 DCR Staffing

DCR staffing resources are described in Section 3 of the Middlesex Fells RMP.

5.2 Friends of the Middlesex Fells Reservation

The mission of the Friends of the Middlesex Fells Reservation (FOF) is to protect and preserve the natural and historic resources of the Fells through public outreach and support. In addition to advocacy and information in support of this mission, the FOF partners with DCR and

others to organize a number of different educational and recreational programs including lectures, hikes, nature exploration and clean-ups.

In addition, the FOF has organized trail adoption and maintenance projects, within the Fells trail system (www.fells.org/getinv/adopt.cfm). They have received grants to maintain trails and install signs and have committed volunteer time to organizing these efforts.

5.3 New England Mountain Biking Association

The New England Mountain Biking Association (NEMBA) is a recreational trail advocacy organization with 17 local chapters dedicated to taking care of the places where members ride, preserving open space and educating the mountain bike community about the importance of responsible riding. The Greater Boston chapter (GB NEMBA) has a mission of promoting and preserving mountain bike access to the trails in the Greater Boston area by hosting riding events, helping to maintain the trails, training new riders and acting as advocates for the mountain bike community with local land managers and government authorities.

Within the Fells, NEMBA has organized trail riding events, trail maintenance days and a volunteer trail patrol (www.gbnemba.org/mtb-patrol.html), and has also advocated for expanded mountain biking access within the reservation.

5.4 Appalachian Mountain Club

The Appalachian Mountain Club (AMC) promotes the protection, enjoyment, and understanding of the mountains, forests, waters and trails of the Appalachian region. The AMC encourages people to experience, learn about and appreciate the natural world.

The Boston Chapter of the AMC hosts a variety of events within the metropolitan region including lectures, hikes, paddles, climbs and volunteer events. Within the Fells, the AMC has partnered with various groups to organize both hikes and volunteer events.

In addition, AMC's professional trail crew has worked with DCR to complete trail maintenance and repair projects.

5.5 Student Conservation Association

Each year, DCR partners with the Student Conservation Association's (SCA) MassParks AmeriCorps program to sponsor SCA youth crews to perform a variety of trail stewardship projects in parks, forests and reservations around the state.

Within the Fells, the SCA crews have performed a variety of trail maintenance and repair projects in recent years.

5.5 Other Stewardship Partners

In addition to the partners listed above, DCR collaborates and seeks to collaborate with a variety of other partners who may bring financial, organizational, human or other resources to assist DCR in forwarding its mission and goals within the Fells. These may include local user organizations such as FellsDog or state-wide organizations such as the Sierra Club.

DCR seeks to expand the number and breadth of stewardship partners collaborating with us in the Fells, particularly around the issues of trail maintenance, stewardship, and education.



Section 6. Recommendations

The DCR planning team considered the existing natural and cultural resources and their conditions and needs; existing recreation uses and impacts; user behaviors and demands; public, stakeholder and staff input; and

management resources and practices all detailed within this document and the Resource Management Plan for the Middlesex Fells. Based on this evaluation, DCR has developed

trail system recommendations designed to equally:

- Protect the Fells environment by reducing impacts from trail system and trail uses, and
- Enhance the recreational experiences for all appropriate trail users

Because this Trail System Plan is both a component of the Resource Management Plan and will also serve as a stand only management document, many, but not all, recommendations will appear in both documents.

Recommendations in the Resource Management Plan (described in Section 5) are organized by the Management Goals identified for the reservation.

The recommendations with this Trail System Plan are grouped into the following categories:

- Reduce the extent and confusion within the trail system
- Maintain, improve and close trails in cooperation with stewardship partners
- Improve trail system maps and signage
- Protect sensitive resources
- Enhance parking and access
- Enhance user education, information and self-enforcement
- Improve enforcement of trail rules and etiquette
- Enhance the pedestrian trail user experience
- Enhance the mountain biking trail user experience
- Provide legal, positive experience for dog-owners and their pets

6.1 Reduce the Extent and Confusion within the Trail System

As described in Section 2.5 of this plan, the trail system in the DCR Middlesex Fells Reservation is extensive and confusing. This negatively affects the recreational experience at the Fells and extending the recreational impacts to environmental resources. Trails targeted for closure are depicted in Sub-Appendix N.3.

6.1.1. Close targeted trails to reduce the number and miles of trails, reduce environmental impacts and enhance user experiences. Trails that are impacting sensitive natural and cultural resources, and those trail segments that contribute to user confusion should be closed. This will undoubtedly be a long-term effort and will require a combination of DCR and partner resources to implement. Ultimately, this recommendation may result in approximately a 20% - 25% reduction in trail mileage within the Fells.

DCR has prioritized trails for closure as follows. High Priority:

- Trail segments that go through or are eroding into vernal pools (RMP G1.5).
- Trail segments that impact wetland resource areas (RMP G1.6).
- Targeted forest roads and trails leading directly from DCR land on to Town of Winchester water supply lands (RMP G1.4).
- Targeted redundant, confusing, fall-line and poor-condition trails in Zone 1 areas as mapped in the RMP (RMP G2.1).

Medium Priority:

- Targeted redundant, confusing, fall-line and poor-condition trails in Zone 2 areas. Specifically, these include:
 - Confusing ‘spider-web’ trails north of the Sheepfold and Dark Hollow Pond.
 - Redundant trails in poor condition or with poor alignments in the Pine Hill area.
 - Redundant and confusing trail segments along the Rock Circuit Trail

6.1.2 Adopt a “no net gain” guideline at the Fells. For any new, rerouted or restored trail segment, at least an equal length of redundant, confusing, fall-line or poor-condition trails shall be closed. Preferably, trails should be closed in a 3:1 ratio (closures : new trails) for any new trail project.

6.1.3 Close trails using a multi-pronged trail closure approach. Successful trail closures are difficult, especially in a park like the Fells. Sub-Appendix L.2. “Closing and Restoring Trails” details a multi-pronged approach to trail closures that can be successful. It involves:

- User education that provides information through a variety of venues about why we are closing trails and the benefits of staying off those trails
- Trail tread restoration including tread aeration and transplanting of native vegetation to eliminate trail sight lines
- Signage at trailheads to indicate that trails are closed
- Physical barriers such as rocks, fences, logs or brush to indicate that the trail is closed and to eliminate sight lines
- Enforce prohibition on off-trail recreation (RMP G2.3).
- Monitoring of success and early correction of problems.

6.1.4 Reduce overlaps and intersections of main loop trails including the Skyline Trail, Reservoir Trail and Mountain Bike Loop through trail re-routes and re-designations (RMP G4.14). These main loop trails in the western Fells intersect 23 times and share 9 segments of tread. This contributes to user confusion and conflict. These intersections and overlaps can be significantly reduced with a few trail re-routes and re-designations.

6.1.5 Improve trail intersections. Many intersections in the Fells are confusing. Many trails do not intersect at right angles, two different intersections are sometimes within a

few feet of each other, and trails enter and leave at points offset from each other. These types of intersections create user confusion. Clear, simple intersections at a single point with right angles and a signpost are the most effective for keeping users on the right trail.

6.2 Maintain, Improve and Close Trails in Cooperation with Stewardship Partners

DCR has limited staff and financial resources to actively maintain, improve, or close trails. Fortunately, many stewardship partners are active in the Middlesex Fells. Most notably, these include:

- Appalachian Mountain Club (AMC), Boston Chapter
- Friends of the Fells, trail maintenance volunteers
- New England Mountain Biking Association, Greater Boston Chapter
- Student Conservation Association

6.2.1 Establish Memoranda of Understanding (MOU) and Stewardship Agreements with partners organizations at the Fells (RMP G7.1). These MOU’s and Stewardship Agreements outline roles, responsibilities, permitting requirements and expectations, and institute an annual process workplan for review and approval of activities.

6.2.2 Develop annual workplans with partners to identify specific projects for trail maintenance, improvement and closure within the Fells; and ensure proper permitting and oversight.

6.2.3 Ensure that all DCR or partner activities are appropriately reviewed, permitted and approved (RMP G2.6).

6.3 Improve Trail System Maps and Signage

Trail maps and signage are vital for public safety, interpretation, communication and setting appropriate expectations.

6.3.1 Develop and distribute new DCR trail maps to improve the experience for all users (RMP G4.16). DCR will develop an accurate trail map that we can post on kiosks, distribute at key locations and have available for download from the internet. The trail map should also include information on trail user expectations and etiquette and may include intersection numbering to be used in conjunction with signage.

6.3.2 Develop and distribute a mountain biking map. Current trail maps do not adequately show those trails that are both open and closed to mountain biking, and specific information on mountain bike etiquette.

6.3.3 Improve trail signage and marking following DCR guidelines (RMP G4.15). DCR, ideally in cooperation with stewardship partners, will implement the trail sign standards described within our *Trails Guidelines and Best Practices Manual* (and described in Sub-Appendix L.4.).



6.3.4 Enhance trailhead signs and kiosks at main trailheads as resources allow. Trailhead kiosks set appropriate user expectations, include emergency contact information, describe the trail experiences available from that location and list rules and user etiquette.

6.4 Protect Sensitive Resources

All recreational uses can impact sensitive resources, but trails can also direct and concentrate users, protecting these resources.

6.4.1 Protect Water Supplies and Wetland Resources.

- Work with MWRA to protect water resources and infrastructure under their jurisdiction from degradation (RMP G1.3).
- Add structures to trail segments that impact wetland resource areas (RMP G1.6).
- Work with the Town of Winchester Police and Water Departments to enforce no trespassing from DCR land to posted water supply lands (RMP G1.1).
- Implement and enforce a trail closure for mountain bikes during the month of March (or as conditions warrant), and encourage all users to avoid wet trails (RMP G1.9).
- Develop and implement an educational program to teach trail users about ecological impacts of trail use (RMP G1.8).
- Educate dog owners about the potential impact of dog waste on water supplies (RMP G1.10).
- Enforce dog-owners properly picking up and disposing of dog waste (RMP G1.11).
- Close trails as current conditions warrant with information posted on DCR's web site and at main trail access points.
- Also see 6.1.1.

6.4.2 Protect Certified and Potential Vernal Pools.

- Permit organizations such as the Vernal Pool Society to work with volunteers to certify potential vernal pools (RMP G.1.6).
- Implement the Guidelines for Protection of Vernal Pools and Associated Habitat on DCR Lands (Appendix D)
- Enforce leash regulations outside of official designated areas and circumstances (RMP G4.7).
- Also see 6.1.1.

6.4.3 Protect rare and endangered species and their habitats.

- Implement additional habitat management recommendations detailed in Appendix M, Habitat Management Plan, once approved by NHESP (RMP G2.8).
- Consult with the NHESP prior to all unapproved activities within Priority Habitat.

6.4.4 Minimize Impacts to Priority Natural Communities (PNC).

- Enforce prohibition on off-trail recreation (unless specifically permitted) (RMP G2.3).
- Add trail definition to official trails in proximity to sensitive plants and wildlife resource locations (RMP G2.7).
- Avoid introducing invasive plants with imported soil, rock or other material.
- Refrain from gathering materials for trail maintenance (rocks, logs, soil, etc.) from within the community.
- Also see 6.1.1.

6.4.5 Reduce Disturbance to Flora and Fauna.

- Enforce prohibition on off-trail recreation (unless specifically permitted) (RMP G2.3).
- Maintain large trail-free areas as trail free (RMP G2.2).
- Add trail definition to official trails in proximity to sensitive plants and wildlife resource locations (RMP G2.7).

- Develop and implement an educational program to teach trail users about ecological impacts of trail use (RMP G1.8).
- Enforce leash regulations outside of official designated areas and circumstances (RMP G4.7).
- Continue to allow after dark uses by special permit only.
- Also see 6.1.1.

6.4.6 Protect Sensitive Cultural Resources.

- During new trail planning, consult with DCR's Office of Cultural Resources and submit project proposals to the Massachusetts Historic Commission for review.

6.5 Enhance Parking and Access

6.5.1 Consider a “pay and display” day use fee at the Sheepfold (RMP G4.4). This will help to relieve trail use and parking pressure at the Sheepfold, and allow for better enforcement of inappropriate uses.

6.5.2 Develop all-persons accessible trail opportunities in both the western Fells and from Flynn Rink (RMP G2.1). Work in partnership with NEMBA to permit and complete the Flynn Rink connection project. Work with the Town of Winchester to design, permit and develop accessible trail opportunities in the western Fells.

6.5.3 Work in partnership neighboring land owners to formalize parking areas and trailheads at in the Bear Hill area and at the former Boston Regional Medical Center site.

6.5.4 Enhance parking at pullouts along South Border Road. These enhancements could include:

- Enhanced trailhead signage
- Demarcated parking spaces

6.6 Enhance User Education, Information and Self-Enforcement

6.6.1 Establish and educate users in appropriate trail etiquette (RMP G4.17).

Examples of basic trail etiquette are at <http://www.trailsandopenspaces.org/trail-etiquette.html>, <http://www.fomba.org/education.html> and http://callahandogs.com/?page_id=40.

- Post, update and communicate through kiosks, signs, internet and personal contact reservation rules, regulations, appropriate behaviors and etiquette (RMP G5.1).
- Work with partners to encourage their members to comply with all reservation rules, regulations, permitting requirements, appropriate behaviors and etiquette (self-enforcement) (RMP G7.2).
- Establish, post and educate users on winter trail use etiquette, specifically that foot traffic avoid ski tracks, or pedestrian travelers stay on left/skiers on right.

6.6.2 Create a multi-user “Trail Ambassador” or “Trail Watch” program.

This program should be overseen by DCR and would train volunteers to welcome trail users, create a culture of user respect, and provide information and education upon request. The purpose of a “Trail Ambassadors” program is not to enforce park rules or guidelines, but rather to provide a welcoming environment for all users, offer information and education upon request, and provide a positive presence within the trail system.

6.6.3 Develop and implement an educational program to teach trail users about ecological impacts of trail use (RMP G1.8).

6.7 Enhance Enforcement of Trail Rules and Etiquette

6.7.1 Increase DCR Ranger presence at trailheads and on trails (RMP G5.2). Increase both the number of ranger hours available for the Fells and the number of hours on the trail system, especially at peak times. Strategies to accomplish this include:

- Fill Ranger II position for the Fells District (RMP G5.3).
- Continue to support two additional long-term seasonal rangers for the Fells District (RMP G5.4).
- Provide for occasional mounted patrols (RMP G5.5).
- Bring DCR Major Impact Team to conduct “sweeps” at the Fells (RMP G5.7).

6.7.2 Enforce park rules and regulations including:

- Prohibition on off-trail recreation (unless specifically permitted) (RMP G2.3).
- Leash regulations outside of official designated areas and circumstances and a 3-dog per person limit (RMP G4.7).
- No trespassing from DCR land to posted water supply lands (RMP G1.1).
- Dog-owners properly picking up and disposing of dog waste (RMP G1.11).
- No biking on / in pedestrian only trails and areas (RMP G4.12).
- Issuing citations for flagrant or persistent violations of regulations (RMP G5.6).

6.7.3 Coordinate with the State Police to provide support, periodic patrols and enforcement at specific sites (RMP G5.8).

6.7.4 Post, update and communicate through kiosks, signs, internet and personal contact reservation rules, regulations, appropriate behaviors and etiquette (RMP G5.1).

6.7.5 Establish a Park Watch program for the Fells (RMP G5.9).

6.8 Improve the Pedestrian Trail User Experience

6.8.1 Designate Virginia Wood (with the exception of one connecting trail) and the Long Pond area as pedestrian only areas with signage and on maps (RMP G4.8).

6.8.2 Enforce no biking on / in pedestrian only trails and areas (RMP G4.12).

6.8.3 Enforce leash regulations outside of official designated areas and circumstances and a 3-dog per person limit (RMP G4.7).

6.8.4 Institute and promote the “yield triangle” (bikes yield to hikers, everyone yields to horses) on multi-use trails within the Fells.

6.8.5 Work with partners to encourage their members to comply with all reservation rules, regulations, permitting requirements, appropriate behaviors and etiquette (self-enforcement) (RMP G7.2). This should include working specifically with NEMBA and other mountain bike organizations to encourage their members to stay off of trails designated for pedestrians only.

6.8.6 Reduce overlaps and intersections of main loop trails including the Skyline Trail, Reservoir Trail and Mountain Bike Loop through trail re-routes and re-designations (RMP G4.14). These main loop trails in the western Fells intersect 23 times and share 9 segments of tread. This contributes to user confusion and conflict. These intersections and overlaps can be significantly reduced with a few trail re-routes and re-designations.

6.9 Improve the Mountain Biking Trail User Experience

6.9.1 Designate the Reservoir Trail as a multi-use trail (RMP G4.9).

6.9.2 Designate the 1-3 official trails within the Dark Hollow area as multi-use use to provide enhanced mountain biking opportunities (RMP G4.10). This is also part of a strategy to provide a positive use to an area with unwanted activity (RMP G5.10).

6.9.3 Consider designating single-track trails and areas in the eastern Fells as multi-use, including appropriate portions of the Rock Circuit Trail, to provide more advanced mountain biking opportunities on sustainable surfaces and disperse biking from the western Fells (RMP G4.11).

6.8.5 Work with partners to encourage their members to comply with all reservation rules, regulations, permitting requirements, appropriate behaviors and etiquette (self-enforcement) (RMP G7.2). This should include working specifically with Friends of the Fells, AMC and Sierra Club to encourage their members to be respectful of all other users including mountain bikers in the Fells.

6.10 Provide Positive Experience for Dog-Owners and Their Pets

6.10.1 Manage a designated off-leash area at the Sheepfold as a pilot off-leash opportunity in partnership with and investment from dog-owner stakeholder groups (RMP G4.5).

6.10.2 Enforce leash regulations outside of official designated areas and circumstances, and enforce a 3-dog per person limit (RMP G4.7).

Trail System Plan
Sub-Appendix N.1.

Middlesex Fells Trail System Plan: Public / Trail User Input

We are inviting members of the public and users of the Middlesex Fells trail system to provide input into the trail system planning process. We invite each interested individual to submit an email or letter describing their comments, experiences, goals and concerns at this stage in the process. We will also invite additional comment on the draft plan, once developed. To help guide you in your thinking, we have included the set of questions below, but please do not feel constrained by these questions.

These questions are also available on-line at
<http://www.mass.gov/dcr/news/publicmeetings/greenwaysfellsuserssurvey.htm>

DCR's "Trail Guidelines and Best Practices" manual is available on-line at
http://www.mass.gov/dcr/stewardship/greenway/docs/DCR_guidelines.pdf

Thank you for your input!

Public / Trail User Guiding Questions

- How you (and your family) use the trails at the Middlesex Fells? (i.e. what parts of the Fells; how often; what kinds uses; what times of day, week and year; etc.)
- What would you describe as some of the highlights of the Fells trail system? (i.e. what scenic, natural or cultural resources and destinations are important to you?)
- What would you describe as some of the problems with the trail system at the Fells that affect your trail experience there?
- Can you describe the "recreational experience(s)" that you find most enjoyable at the Fells? (This might include the level of difficulty,

interaction with other users, length of the use, type of use, etc. Feel free to write about your best Fells experience.)

- If you could make three changes in the Fells trail system, what would they be?
- What other comments would you like us to consider as we develop our trail system plan for the Middlesex Fells?

Please mail or e-mail your input to:

Middlesex Fells Trail Plan

136 Damon Road

Northampton, MA 01060

Paul.jahnige@state.ma.us

Trail System Plan
Sub-Appendix N.2.



May / June 2010 No. 36

Closing and Restoring Trails

All trails impact the natural environment and require on-going maintenance. But some trails, usually as a result of poor layout and design, are more damaging than others, require excessive maintenance, and diminish the user's experience. Rather than try to maintain trouble trails over and over, in many cases, closing and restoring poor condition and redundant trails is the best solution for your trail system – environmentally, economically, and socially.



However, as anyone who has tried to close a trail knows, simply putting up a sign or piling brush at the trail entrance does not work. The compacted soils of the trail tread can resist naturalization for many years, and as long as open sight lines persist, users will continue to use the trail.

In most cases, successfully closing and restoring trails takes as much planning and effort as constructing new trails. The following Best Practices can help successfully close problem trails.

Provide a Better Option

The most important component of successfully closing a trail is to provide a more appealing alternative. This includes ensuring that the new route is well designed and marked, and *flows seamlessly* from existing trails. This may require redesigning trail intersections to take away open sight lines and create smooth transitions that keep users on the preferred route.



Educate Users

Users who do not understand why a trail is being closed may undo all your efforts. When closing trails it is important to let users know that you are closing trails, and more importantly, why. Post

information on trailheads, recruit volunteers to assist and encourage users to spread the word. ***Focus on the benefits*** of closing trails including habitat and water quality protection, along with a better trail experience.

Halt Ongoing Erosion

Some trails requiring closure will be fall-line trails that channelize water and experience continuing erosion. In order to close and naturalize these trails, active, on-going erosion must be stopped. ***Check dams and slash*** should be used to stem water flow and stabilize soils while naturalization occurs.



Close Sight Lines

Trails you can see are trails you will use. In the photos (top and left), even though barriers, signs and slash have been used to close the trail, the open sight lines still invite users to explore. The most effective way to close off sight lines is to ***transplant native vegetation*** in the trail corridor, especially any place a trail is visible from another trail. In other places along the closed trail, slash can be used to disguise the trail tread.

Consider Breaking Up Tread and Re-contouring the Land

Compacted trail tread will likely resist naturalization. Have you ever come across an old road in the woods that has not been used for years? Breaking up the soil with pulaskis and pick-mattocks, and scarifying the soil will allow natural regeneration to take hold. Re-contouring the land, particularly for eroded trails, will help remove evidence of old trails.

Block the Corridor

As a last resort, you can block the beginning and end of the trail with a fence and signs. The fence will look out of place, and could draw more attention to the closure. Be prepared to answer questions by posting signage explaining the closure on, or near, the fence. When the trail has been closed for a while the fence can be removed. This strategy may be needed especially at locations where users are looking for views and water access.

Don't Introduce or Spread Exotic Plants

Use local soils and plants in your trail reclamation project if possible. If outside materials are used, make sure they are certified weed-free and native. Clean tools and work boots before bringing them from other sites to ensure that invasive seeds are not transported.

Monitor Your Closure

Return periodically to monitor the success of your closure. Ascribe to the “broken window” theory of trail maintenance. If your closure is vandalized or damaged, fix it immediately.

Tips and Tools (Mattock and McLeod)

Closing and Reclaiming Damaged Trails webpage by IMBA is at
http://www.imba.com/resources/trail_building/reclaiming_trail.html

Naturalizing Abandoned Trail from the FHWA Trail Maintenance and Construction Notebook is at: <http://www.fhwa.dot.gov/environment/fspubs/00232839/page12.htm>

The Minnesota Department of Natural Resources “Trail Planning, Design and Development Guidelines” (http://www.dnr.state.mn.us/publications/trails_waterways/index.html) includes a section of decommissioning and restoring unsustainable trails.

To unsubscribe from this list, simply email paul.jahnige@state.ma.us with your email address and type “unsubscribe” in the subject or body.

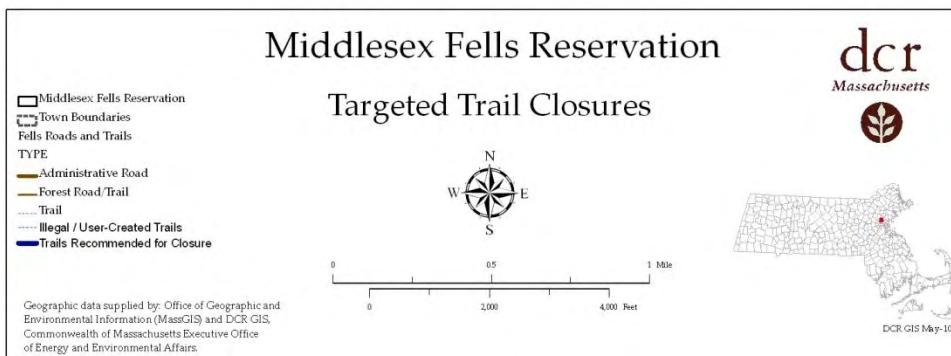
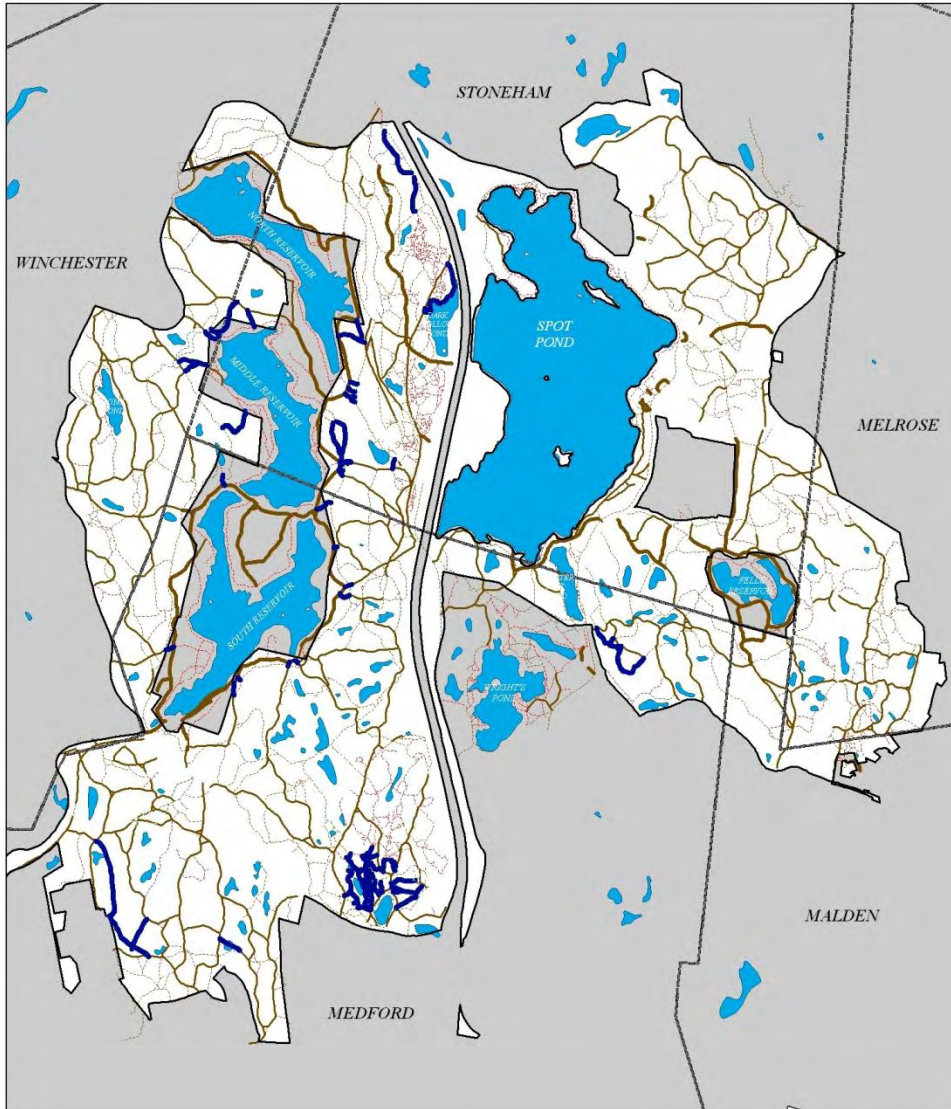
To subscribe, please email your contact information to paul.jahnige@state.ma.us.

Please forward to others who might be interested in Massachusetts Greenways and Trails.



Connections is the electronic newsletter from the Department of Conservation and Recreation’s Greenways and Trails Program,
Paul Jahnige, Director
136 Damon Road
Northampton, MA 01060
(413) 586-8706 ext. 20
paul.jahnige@state.ma.us
www.mass.gov/dcr/stewardship/greenway/index.htm

Trail System Plan
Sub-Appendix N.3.



Trail System Plan
Sub-Appendix N.4.

DCR Trails Guidelines and Best Practices Manual
(Section edited to provide guidance for the Middlesex Fells Trail Plan)

Trail Signage

"Signs are probably the quickest and easiest way to leave the trail user with a positive impression. If the signs are high quality, well maintained, and properly located, other trail problems are often over-looked. Consistent signs are the quickest way to increase the trail's identity and the public's support for the trail."
(National Park Service)

Current DCR Trail Marking

The Middlesex Fells currently employs a variety of different types of trail signs and marking systems including plastic blazes, painted blazes, plastic trail name signs, routed trail name and directional signs, interpretive signs, aluminum trail rules signs, and trailhead kiosks. These trail signage and marking standards will help improve trail management and user safety, and enhance the users' recreational experience. While achieving these standards may take years to realize, working toward them incrementally over time is an important goal.

Why Strive for Consistent Signage Standards?

Appropriate trail signs and markings provide information, enhance safety, and contribute to a positive user experience. Trail signage is perhaps our most important form of communication with our users, as signs are the messages that users see every time they visit. Consistent signage enhances safety, creates a positive trail identity, helps meet user expectations, and contributes to the public's support for trails.

The broad objectives of DCR's trail signage should be to:

1. Provide consistent positive exposure of the trail system to attract users
2. Educate the user about trails and trail uses
3. Reassure / ensure that the user is on the right trail and will not get lost
4. Control trail usage, reduce conflicts, and create safer, more enjoyable, and environmentally friendly recreational experiences

However, these objectives must be balanced with aesthetic considerations to avoid "sign pollution."

We accomplish these objectives through the consistent use of the following different kinds of trail marking:

- Trailhead signs and kiosks
- Intersection directional signs
- Reassurance markers and blazes
- Interpretive displays

It is important to consider the different purposes of each type of sign and use them appropriately. For example, using reassurance blazes to indicate allowed trail uses is probably inappropriate because it may require more blazing, and is very difficult to change if

the allowed uses change. On the other hand, using trailhead signage to designate allowed uses is simpler to implement, requires much less maintenance, and can be easily changed.

Implementation Priority

Implementing the below standards fully within the DCR system will take time. The priority for implementation should be as follows:

1. Fully implement the sign standards wherever new trails are developed or constructed.
2. Fully implement the standards when trails undergo significant restoration or repair.
3. Implement the appropriate standards as possible as trails are worked on through routine maintenance. For example, when a trail is maintained, re-blaze then, remove old plastic signage and install key intersection signs.
4. Implement the intersection signage standards park-wide.
5. Implement full signage standards park-wide.

General Trail Signage and Marking Standards

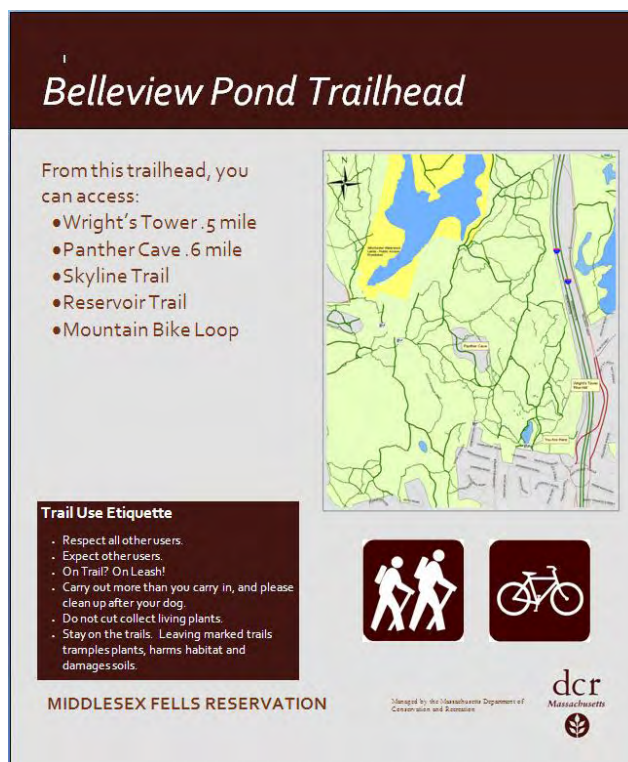
- Signage within Middlesex Fells should be consistent with respect to colors, materials, and look.
- Intersection directional signs and simple trailhead signs should be routed brown signs (wood or plastic composite material) with white lettering. Routed signs are aesthetically appealing and resistant to damage and vandalism.
- Trails should be blazed in painted 2x6 vertical blazes.
- Aluminum trail signs are **not** recommended.

Trailhead Signs

Trailhead kiosks or signs may come in different forms depending on the setting, complexity, and information needs.

For more developed trailheads, popular trails or high profile trails, a designed and professionally fabricated trailhead sign is appropriate. The template (right) follows the general standards for “**Wayside Signage**” in the in the DCR Graphics Standards Manual. This template includes:

- A sign board of approximately 20” wide by 24” in height (5:6 portrait orientation).
- Trail name or Trailhead name in **Frutiger Italics** in a 4” (1/6) brown band at the top.
- Text message (in **sabon** font) with trail description and perhaps additional information placed in the upper left text box.
- A map showing features, destinations, distances and connections in the upper right.
- **Standard “Trail User Etiquette”** is in a brown box in the lower left.
- Allowed and prohibited use symbols are in the lower right.



- Allowed and prohibited use symbols may also be in 4" x 4" square signs mounted on the posts below the sign.
- Park name is in capitals, left justified at the bottom with the DCR logo in the lower right corner.
- The position of the map, text boxes and symbols may be flexible depending on the specific needs of each sign.
- This type of sign should be affixed with brackets to two 4x4 pressure treated wood posts planted 24" in the ground.

On roadsides or at lower profile trailheads, simpler routed wood signs may be used. These should be:

- A sign board of approximately 21" wide by 15" in height (5:7 ratio landscape orientation)
- Trail name in Frutiger italics at about .8" – 1"
- Key trail destinations and distances at about .5"
- State Park Name in caps at the bottom
- "dcr" in the lower right corner
- Information and symbols showing allowed and prohibited trail uses and trail difficulties. This information may be in 4"x4" square signs mounted on the post below the sign.
- Sign should be affixed with lag bolts to a single 4x4 pressure treated wood post planted 24" in the ground.



Intersection Directional Signs

Within the Fells, directional signs **should** be placed at main trail intersections, decision points, and spur junctions. Intersections signs should be mounted on wood posts. Post type should be consistent within the site. Trails names and arrows **may** also be placed vertically on wood posts.

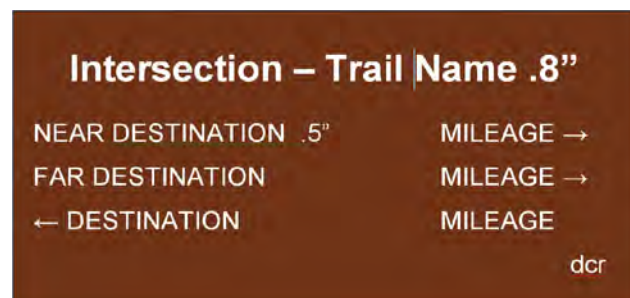
Intersection directional signs are the most important source of information for users, and can serve to enhance safety,

avoid bad user experiences, and increase use of under-used sections of the trail. If someone knows that there is a tower, waterfall or other attraction down the trail, they may be tempted to hike to it and thus become intrigued with the trail idea.



Intersection signs **should** include the following information:

- Trail name, if the trail is named
- The closest significant destination (such as a view, summit, waterfalls, etc.)
- The closest trailhead
- A farther major destination or point of reference (such as



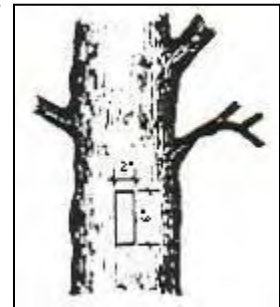
- road main entrance, major summit, overnight shelter, etc.)
- The distance to the destinations in miles and tenths
- The direction to these destinations indicated by arrows may be necessary
- "dcr" in the lower right corner
- markings for allowed or restricted uses
- intersection number in the lower left corner

In complex trail systems with numerous intersections such as the Fells, intersection numbering can be used and listed on an accompanying trail map. Numbers should not be used instead of directional signage, but can be used in conjunction and can be placed on the intersection directional sign in the lower left corner.

Reassurance Markers/Blazes

Trail blazes or reassurance markers are important trail elements that allow the user to stay on trails and provide a sense of reassurance. The recommended guidelines are consistent with best management practices for trail marking.

Official DCR trails **should** be blazed with vertical **painted blazes**. Plastic blazes should be avoided and replaced when trails are re-blazed, upgraded or maintained. Painted blazes are more vandal resistant, do less damage than nail-on blazes, and are easier to alter.



Blazes are placed on trees, slightly above eye level so that hikers, bikers or riders can see them easily when traveling in either direction. Blazes should be placed immediately beyond any trail junction or road crossing. Blazes along continuous trail segments within the Fells need only be periodic, as tread is well established. It is not desirable to have more than one blaze visible in either direction at any one time. One well placed blaze is better than several that are poorly placed, and it is important to strike a balance between "over-blazing" and "under-blazing."

Standard blazes should be 2" x 6" vertical rectangles. The 2" x 6" rectangular shape is large enough to be seen easily without being visually obtrusive and is the most universally accepted style of trail blazing. Edges and corners should be crisp and sharp. Dripping paint, blotches and over-sized blazes should be avoided. On rough barked trees, the tree will first need to be smoothed using a paint scraper, wire brush, or draw knife. A high quality, glossy, exterior acrylic paint such as Sherman Williams Metalatex or Nelson Boundary Paints should be used for long durability.

Within the Fells, the following colors are used to denote specific trails

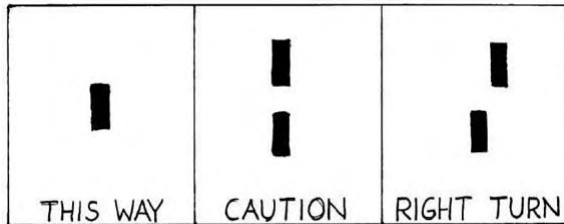
- Skyline Trail – White
- Reservoir Trail – Orange
- Mountain Bike Loop – Green
- Cross Fells Trail – Light Blue
- Rock Circuit Trail – White
- Crystal Springs Trail - Red

In the Fells, we recommend that official trails (other than those specifically designated routes above) should be blazed in dark blue for multi-use trails and white for hiking only trails.

Vegetation should be pruned from in front of the blazes to ensure visibility in all seasons.

In non-forested areas, blazes may be placed on wooden posts 4 feet above the ground or stone cairns may be used to mark the trail. Blazes can be painted on exposed rock, but will not be visible in the winter.

Directional Change Indicators



Double blazes should be used in places that require extra user alertness (e.g. important turns, junctions with other trails, and other confusing locations). They should be used sparingly so that they do not become meaningless or visually obtrusive. They are unnecessary at gradual turns and well-defined trail locations such as switchbacks.

A reassurance marker should be placed so that it can be seen from the direction indicator. Be sure to mark confusing areas to guide users coming from both (or all) directions. Avoid arrows.

Interpretive Displays

An interpretive sign must be part of a well thought out interpretive plan complete with goals, objectives, thematic statements and topics. The plan should be based on an audience and site analysis which will guide the selection of materials and interpretive approach. Contact the Interpretive Services section of the Bureau of Ranger Services if you are interested in developing an interpretive plan. Once you have completed your interpretive plan, you will need to confer with Interpretive Services and the DCR Graphics Team to develop specific displays. An outline of the wayside development process is available in the DCR Graphic Standards Manual.

Interpretive waysides are an important and effective way to provide information to visitors. There are two types of wayside: low profile and upright. Low profile exhibits are low, angled panels that provide an interpretive message related to a specific place or feature. They usually include one or more pictorial images and a brief interpretive text. Upright waysides typically provide general information, rather than site-specific interpretation; they are often located near a visitors center or trailhead to provide information about facilities, programs, and management policies.

The panels are fabricated from a high-pressure laminate material, which is both cost-effective and allows the use of color to create a more attractive presentation. They are generally guaranteed for 10 years by the fabricators, and are resistant to vandalism by spray paint or cutting. The Graphic Design team will coordinate fabrication through the state vendor program.

Sign Maintenance

Sign maintenance is critical to the operation of a quality trail system. Well maintained signs that are repaired promptly convey a sense of pride and reduce further vandalism. Signs are a highly visible representation of the quality of the trail. Their maintenance or lack of maintenance leaves the visitor with a positive or negative impression about the trail. Signs convey many kinds of information and it is critical that they be in good

shape. Special attention should be given to those that are damaged from shooting and other factors, those that are faded or brittle from long exposure, and those that are simply missing. All signs that are damaged or weathered no longer convey a good impression or serve the intended purpose, and should be repaired or replaced. Periodic painting and other maintenance is a necessity and will prolong the life of a sign.

Temporary Trail Signage and Blazing

Some uses such as seasonal snowmobiling or special events may require temporary trail blazes and signs. Temporary signs installed by DCR partners should be allowed under a Special Use Permit or MOA and should follow these guidelines.

- Temporary signs shall be approved by the facility supervisor
- They should be installed on posts rather than nailed to trees
- They shall not advertise specific vendors
- They shall be removed when the seasonal or temporary use is over
- Temporary signs shall not be inconsistent with these DCR standards

Trail System Plan
Sub-Appendix N.5.

**Evaluation of Mountain Biking and Hiking Recreation
Consistent with the Sierra Club's Policy on Off Road Use of Bicycles**

Excerpts of the Sierra Club Policy (Sierra Club 1994)

“I. POLICY

- a. Trails and areas on public lands should be closed to all vehicles unless
 - i. determined to be appropriate for their use through completion of an analysis, review, and implementation process, and
 - ii. officially posted with signs as being open.
- b. The process must include
 - i. application of objective criteria to assess whether or not environmental quality can be effectively maintained, and whether the safety and enjoyment of all users can be protected;
 - ii. a public review and comment procedure involving all interested parties; and
 - iii. promulgation of effective implementing regulations where impacts are sufficiently low that vehicle use is appropriate.
- c. Trails and areas designated for vehicular use must be monitored periodically to detect environmental damage or user interference inconsistent with the above criteria. Where this occurs, the trail or area must be closed to vehicles unless effective corrective regulations are enforced.

II. BACKGROUND

The Sierra Club is concerned about the effects of use of bicycles off-road. Concerns have been raised about effects such as soil erosion, impacts on plants and animals, displacement of other trail users, and impacts on other users' safety and enjoyment. These concerns argue for special regulation, with effective enforcement, of off-road bicycling.

Appendix C - Criteria

When a land management agency reviews suitability of a trail for bicycle use, bicycle use should not be allowed where it would cause the following measurable effects. This list is not all-inclusive.

- a. Significant soil erosion or significant damage to streams or fish habitat.
- b. Rutting, impairment of trail drainage, breakdown of trail shoulders, and other forms of damage not correctable using U.S. Forest Service trail maintenance standards and techniques.
- c. Significant disturbance of plants or animals or their habitat.
- d. Damage to archaeological, scientific, historical, or other significant resources, including rare natural features of interest for scientific study.

- e. Danger to the safety of bicyclists or other users because of bicycle speed, steep grades, steep terrain, sharp curves, slippery or unstable trail surfaces, or limited visibility. See Appendix D for design features that can improve safety.
- f. Significant displacement or annoyance of other non-motorized users.

Appendix F - Monitoring and Enforcement

If a trail is determined to be suitable for bicycles, the land management agency should develop and implement a monitoring plan:

1. Identify the impacts being monitored, including impacts to water quality, soils, wildlife, flora, and other users (accidents, injuries, enjoyment of the trail).
2. Establish quantitative and qualitative measurement scales for impacts.
3. Establish impact thresholds which, if reached, trigger correction or closure of the trail to bicycles.
4. Establish a schedule for monitoring activities.
5. Establish a written reporting system.
6. Train personnel to follow the monitoring program.
7. Reliable trained persons from user groups may be used to supplement monitoring by staff.
8. Specify baseline inventories to allow for monitoring of trends.
9. Secure the resources to carry out the monitoring plan.
10. The best enforcement of regulations will come from regular patrolling combined with effective education and an active monitoring program.”

Discussion of DCR’s Evaluation

Through this RMP, the DCR evaluated both pedestrian and mountain biking at the DCR Middlesex Fells Reservation and, consistent with the above Sierra Club policy, found that mountain biking is an appropriate recreational trail use at the Fells, though not necessary on all trails or in all areas. DCR notes that the above policy is not DCR policy, but rather that of a third party environmental advocacy organization devoted to protecting wild places, and not all aspects of the above policy are consistent with DCR’s mission and policies, or the management principle and goals of this RMP.

DCR is somewhat surprised that, given the research on environmental impacts, the Sierra Club does not have a similarly protective policy regarding evaluating, managing and monitoring pedestrian and camping uses, especially given the research on impacts in wild places.

DCR is also surprised that the above policy is based on a background statement that says “concerns have been raised.” Given the state of research on environmental impacts, it is incumbent upon on organizations like the Sierra Club to base policies on best available scientific information. If the available research is lacking, then it is incumbent upon that organization to collect, compile, complete or fund additional research.

That being said, DCR’s evaluation of mountain biking at the Fells is consistent with this policy as detailed below.

I.a)i. Through this RMP, DCR has completed an analysis, review and recommends implementation of mountain biking on specific trail and in specific areas at the Fells.

I.a)ii. DCR guidelines call for officially posting open and closed trails and areas on maps, at trailheads, and at specific trail intersections.

I.b)i. DCR evaluated specific objective criteria in Section 2.4, 2.5, 4.2 and 4.4 of the RMP to determine that environmental quality can be effectively maintained, and that the safety and enjoyment of all users can be protected (see additional discussion below).

I.b)ii. This RMP, including public meetings, workshops and extensive public comment periods, has provided significant opportunities for public review and comment by all parties.

I.b)iii. The RMP recommends the promulgation of rules, regulations and etiquette to ensure appropriate mountain biking and pedestrian uses, and identifies a multi-faceted management, enforcement and compliance strategy in Sections 4.6 and Section 5 of this RMP.

I.c) The RMP identifies and recommends the implementation of a monitoring protocol to ensure that the impacts and compliance of all users are monitored and corrective action can be taken if necessary.

Appendix C – Criteria:

In the RMP's review of mountain biking and pedestrian impacts to specific resources at the Fells we evaluated the impacts to the specific soils, vegetation, natural communities, rare species, wildlife, water quality, archaeological and historic resources, trail resources, public safety, other users' recreational experiences, and recreational conflict.

a) The RMP determines that recreational uses at the Fells, including mountain biking and hiking, contribute to measureable erosion on some trail segments and impacts to some wetland resources areas. The RMP recommends repairing areas of trail damage, closing specific trails impacting wetland resource areas, and re-routing some fall-line and poor condition trails. While both mountain biking and pedestrian uses may contribute to these impacts, they cannot be attributed to one use over another. The RMP documents that overall, the condition of trails, soils and streams at the Fells is in good condition. The RMP does not find that any recreational uses at the Fells are leading to "significant erosion" or "significant damage to streams or fish habitat."

b) Through the RMP, DCR's road and trail inventory documented all occurrences of trail damage (see Section 2.6), including rutting, exposed roots, washouts and mud holes. This inventory documents that the condition of the trails at the Fells are in comparatively good condition. The RMP recommends repairing, closing or re-routing sections of trail that are especially damaged or difficult to maintain. The specific locations of trail damage are attributable to all approved recreational uses at the Fells. The RMP finds that all trail damage areas are "correctable using U.S. Forest Service trail maintenance standards and techniques" and practices detailed in DCR's Trail Guidelines and Best Practices Manual.

c) The RMP documents that plant and animal habitats at the Fells are diverse, extensive, numerous and generally in good condition. The RMP determines that all recreational uses have the potential to disturb wildlife, and that off-trail uses trample plants and disturb wildlife significantly more than on-trail uses. Sections 4.2 and 4.4 describe the extent, impacts and characteristics of off-trail use at the Fells. Off-trail uses are primarily pedestrian. The RMP recommends that off-trail uses continue to be prohibited and recommends enhanced education and enforcement around this issue. The RMP finds that current uses at the Fells are not resulting in significant disturbance of plants or animals or their habitat.

d) The RMP documents the extent and condition of cultural resources at the Fells (Section 2.5). The RMP finds no evidence of impacts to these resources from existing recreational uses. The RMP also evaluates the potential impacts to rare species and priority natural communities at the Fells. It determines that some species and communities are susceptible to trampling from any off-trail uses. The RMP recommends that off-trail uses continue to be prohibited and recommends enhanced education and enforcement around this issue. The RMP recommends closing or re-routing some trails in proximity to

certain rare resources, and recommends adding trail definition to existing trails in other areas. The RMP does recommend that the Skyline Trail remain pedestrian only to best protect certain species. The RMP does not find that mountain biking is damaging any rare resources at the Fells.

e) The RMP evaluated the issues of safety, conflict and impacts to other users' recreational experiences at the Fells (Section 4.4). The RMP does not find that mountain biking at the Fells poses a significant public safety risk. The RMP does recommend that the Skyline Trail should remain pedestrian only because of its steep terrain, poor sight lines and fall line alignment. The RMP does find that some level of conflict exists between mountain bikers and other users. The RMP also finds that mountain biking can negatively impacts some pedestrians' recreational experiences, and that many pedestrians do not want to encounter a mountain bike, and do not want to be startled by the approach of a mountain bike. As a result, the RMP recommends that at the Fells a certain level of separation between users is appropriate. The RMP recommends establishing two pedestrian-only areas where one will hopefully not have to encounter a mountain bike, and recommends maintaining several pedestrian-only trails. Consistent with the Sierra Club Policy Section E, the RMP also recommends separating overlapping segments of heavily used mountain biking and pedestrian-only trails, and allowing mountain biking on some additional segments of existing trail to provide a "satisfying and safe bicycling experience that will minimize the desire of bicycle riders to enter closed areas" (Sierra Club 1994).

f) The RMP does find that mountain biking at the Fells, especially mountain biking on hiking only trails, does lead to the annoyance of some other users. The RMP recommends enhancing enforcement of no mountain biking on hiking-only trails. The RMP does not find that mountain biking has lead to "significant displacement of other users." However, it is important to note here that DCR must provide recreational opportunities to a variety of users, and while annoyance, displacement of and conflict between users is a concern, there is not moral hierarchy of recreational use. Here the above policy may be inconsistent with DCR's mission to "protect, promote and enhance our commonwealth of natural, cultural and recreational resources."

Appendix F – Monitoring and Enforcement

The RMP recommends the establishment of a multi-faceted management and compliance strategy to enhance compliance and reduce impacts by all users. The RMP identifies that, for most recommendations surrounding enforcement and compliance, the resources to implement these are currently available. The RMP also establishes monitoring protocol consistent with Sierra Club's Policy Appendix F. DCR does not make the specifics of this protocol available to the public for obvious reasons, however, we have:

- 1) Identified criteria to monitor including trail damage, resource damage, public safety and compliance with rules and regulations.
- 2) Established both qualitative and quantitative measures.
- 3-5) Our protocol establishes thresholds, monitoring locations, schedule and electronic record keeping and reporting. For example, the RMP identifies an appropriate level of rules compliance of 75%.
- 6-7) Following the approval of the RMP, we will institute staff training on the monitoring protocol for ranger services, operations and planning staff.
- 8) The RMP, Section 2, trail inventory, incident reporting and the initial compliance monitoring data, establish baselines to monitor and evaluate trends. For example, the trail inventory establishes a baseline of acceptable number and area of trail damage per trail mile on single track trails.
- 9) The RMP identifies that the resources our currently available in implement this protocol.
- 10) The RMP recommends a multi-faceted management and compliance strategy to enhance compliance and reduce impacts by all users including ranger presence, patrols and education.

