TRAIL SYSTEM / HABITAT MANAGMENT PLAN

DCR
Myles Standish State Forest

(Photo by Paul Jahnige)

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Myles Standish State Forest Bike Path

Section 1. Introduction

1.1. Introduction

This Trail System Plan for the Myles Standish State Forest is intended build upon the previous planning documents of the Myles Standish Planning Unit Resource Management Plan (RMP) by DCR (2011), Myles Standish State Forest Trails and Resource Management Plan by Epsilon Associates, Inc. (2001), and the Biodiversity of Myles Standish State Forest Report by the Natural Heritage and Endangered Species Program (2007).

As previous plans document the existing conditions and resources in the forest in some detail, this plan will not re-state that information, but may highlight particular aspects of those plans and their findings.

The plan is intended to provide short and medium term recommendations aimed at

- Enhancing recreational experiences for approved recreational uses
- Protecting the priority natural and cultural resources at the forest

- Ensuring access for desired purposes while limiting access for unauthorized purposes
- Providing opportunities for public and stakeholder stewardship of these recreational, natural and cultural resources

1.2. 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.*

1.3. 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.

Trails and trail networks can also provide vital emergency and management access pathways for public safety, search and rescue, fire control, wildlife management, research and forest management. Concurrently, they may provide undesirable access for unauthorized or illegal uses.

Trail Systems, as integrated networks, are 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, provide for public safety, discourage unwanted behaviors, and provide the desired range of high-quality recreational experiences to users.

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

1.4. The Planning Process

The development of the Myles Standish State Forest (MSSF) Trail System Plan will follow the basic process outlined in DCR's Trails Guidelines and Best Practices Manual (revised, 2008). This process includes the following steps:

1. Getting to Know the Trails

2. Identify Scenic, Recreational and Cultural Destinations, Features and Experiences

3. Identify Constraints, Issues and Problem Areas

4. Making Recommendations

As a part of this planning process, DCR is completing its Road and Trail Inventory for the MSSF. This inventory 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.

New Grassy Pond (Photo by Paul Jahnige)

Section 2. Existing Conditions

2.1 Natural Resource

The natural resource existing conditions for the MSSF are detailed in previous planning documents including the Myles Standish Planning Unit RMP Section 2.1. The RMP discusses climate, geology, soils, natural history, wildfire history, water resources, vegetation and wildlife.

The RMP notes that most of the soils of MSSF are sandy, excessively well drained with little organic matter. These soils are easily graded for roads and trails, and do not tend to hold water, but the uniform particle size and lack of organic matter means that soils can be highly erodible on slopes and under certain conditions leading to trail channelization.

The RMP specifically highlights several important habitats and natural communities within MSSF that deserve special attention and

protection, and that could be impacted by trail use, management and maintenance. These are:

- Globally Rare Pine Barrens
- Regionally Important "Frost Pockets"
- Coastal Plain Pond Shores
- Woodland Vernal Pools

The RMP documents 41 state-listed rare species present at the forest. In fact, MSSF is one of the most important areas in Massachusetts for the conservation of biodiversity. Many of these rare species can potentially be impacted by recreational use, trail system management and trail maintenance.

The pitch pine – scrub oak barrens within Myles Standish provide habitat for two tiger beetle species and three species of plants that could be negatively impacted by recreational use and trail maintenance.

Myles Standish's numerous kettle ponds and wetlands provide habitat for 12 state-listed species of plants, five state-listed dragonfly and damselfly species, two state-listed moth species, the endangered Northern Red-bellied Cooter and the Eastern Box Turtle. Trail use can impact the turtles and any activity that affects water quality including trail use, layout and maintenance can impact species that rely on the coastal plain ponds and pond shores.

2.2 Cultural Resources

The cultural resource existing conditions are detailed in the Myles Standish RMP Section 2.2. The RMP describes the pre-contact context, pre-contact archaeological sites, historic archaeological resources and historic resources.

The RMP highlights the fact that a high frequency of prehistoric archaeological sites in the Plymouth/Carver region indicates that this area was more or less continuously inhabited by Native Americans for over 10,000 years. The environmental setting and natural resources within MSSF are similar to those that exist around it. Thus, there is every reason to speculate that similar site densities exist within the State Forest. Because of the history protection and lack of soil disturbance, it is predicted that MSSF would have good potential for the survival of undisturbed prehistoric sites at strategically favorable locations such as in proximity to fresh water, and on relatively level well-drained soils. The RMP concludes that given the potential for below ground prehistoric sites at MSSF, it is incumbent upon the agency to take a cautious and conservative approach to project planning, design and implementation, including trail design, layout, management and maintenance that might disturb soils.

During the 1930s, MSSF was an important site for the Civilian Conservation Corps (CCC). The CCC created two camps within the forest from 1933 to 1935. CCC activities at Myles Standish included construction of over 70 miles of roads, 17 miles of hiking trails, and recreation areas at Charge, Fearing, and New Long Ponds.

Finally, the DCR Cultural Resource inventory identifies 11 "colonial" or "historic" roads and trails throughout MSSF, largely identified through documentary analysis of historic maps and atlases, not field survey. Because it is unknown whether any of these routes retain historic features or are archaeologically significant, they should be treated as potential cultural resources. In some cases additional fieldwork or archaeological testing may be required to determine whether below ground resources are present.

2.3 Recreational Resources

The RMP Section 2.3 documents the recreational resources and uses at MSSF. This section includes information on visitor use patterns and attitudes, demographic profile, local recreation demand, day use areas, camping areas, the private cottage program, fishing and hunting, and the current trail system.

Based on a 2010 visitor survey, the RMP documents the percentage of visitors who engage in trail-related uses. These include:

- Hiking (29.3%)
- Walking/jogging (28.0%)
- Pavement biking (23.9%)
- Snowmobiling (13.0%)
- Mountain biking (8.3%)
- Nature study (7.6%)
- Horseback riding (5.0%)
- Hunting (2.4%)

The RMP also documents what visitors liked most and least about the trail-related experiences at MSSF. These included:

Liked Most (n)	**Liked Least** (n)
• Peace and quiet (70) • The ponds (53) • Being in nature (37) • Hiking trails (31) • Seclusion (23)	• Lack of maintenance (33) • Condition off-road trails (23) • Confusing trail markers (17) • Unclear Maps (14) • Condition paved bike trail (8)

The RMP goes on to describe and main trail-related uses and experiences at the forest of:

- Hiking
- Road Biking
- Cross-Country Running
- Horseback Riding
- In-line Skating
- Mountain Biking
- Snowmobiling
- Cross-Country Skiing
- Nature Observation

Finally the RMP discusses the significant issues related to illegal OHV riding at MSSF. It documented the problems observed and reported at MSSF relative to this prohibited use including:

- Creation of over 40 miles of unauthorized trails
- Pond shore, frost pocket and other natural and cultural resource damage
- Conflicts with other non-motorized trail users
- Damage to trails, such as trampling, erosion and deep gullies
- Damage to the unpaved forest road system, adversely affecting emergency access

The RMP recommends continuing the prohibition of OHV use at the forest, closing and restoring illegal trails, and enhancing enforcement.

2.4 Ownership and Management

MSSF is the largest State Park in Southeastern Massachusetts providing resource protection, forest management and public recreation on over 12,000 acres. The bulk of the State Forest is owned and managed by the DCR. However, there are some in-holdings, leases and joint management arrangements that add complexity to the ownership and management of MSSF. These include:

- 143 private cottages located on state land around five ponds
- Two Wildlife Management Area (WMA) encompassing a total of 2,000 acres, managed for pheasant and quail by the Massachusetts Department of Fish and Game (DFG)
- A Forestry Camp managed by the Massachusetts Department of Corrections at Bumps Pond
- East Head Reservoir and the land immediately surrounding it is an in-holding that provides water to irrigate cranberry bogs owned by A.D. Makepeace and Davison Partners
- Two utility easements, one gas and one electric, traverse the property
- Blueberry Hill Campground is an in-holding located on Curlew Pond

These add complexity to trail layout, management and maintenance issues.

2.5 The Current Trail System

The existing trail network is comprised of dirt roads, paved bike trails, forest management tracks and single track natural surface trails. A few trails are dedicated for specific uses, while the majority of official trails are considered multiple-use for a variety of authorized trail users.

Trail users also utilize other linear features in the landscape, particularly the electric and gas utility easements, and public or administrative paved roads.

The State Forest also has many miles of unauthorized, user-created, illegal trails. These provide access to the forest for illegal motorized vehicles and can be confusing to authorized trail users.

Unpaved Forest Roads

Due primarily to concern about forest fires, a grid system of management roads was developed between 1916 and 1937 to access most areas of the State Forest to control fire. These unpaved management roads also allow access for emergency personnel to evacuate users who have been trapped, injured or lost in the forest. They are narrow, gravel or natural surface roads suitable for travel only by high clearance and four-wheel drive vehicles. The only motor vehicles allowed on these roads are snowmobiles or authorized forest management, wildlife management, fire safety or other emergency vehicles. Today, these forest roads have become an important part of the MSSF trail network. Forest roads are used by many recreational users including hikers, equestrians and mountain bikers, as well as hunters, cross country skiers and snowmobilers in winter.

(Unpaved Forest Road, Photo by Paul Jahnige)

Bike Paths

Paved bike paths (6-8 feet wide) were constructed in the 1970's to enhance the biking experience by providing dedicated trails separate from the main automobile roads. These trails, totaling about 15 miles in length, are marked with bicycling symbols along their route to help guide bikers along the trail. Parking for bike path access is available at the forest headquarters, near Charge Pond and near the intersection of Three Cornered Pond Road and Upper College Pond Road.

The bike path network includes loop options in the area between the Forest Headquarters and

Fearing Pond. This layout facilitates safe biking between the State Forest Visitors Center and some of the forest's primary recreational areas. Two separate segments of the bike path branch out from this central network and run parallel to the roadways toward the northeast and northwest. These branches provide for longer bike riding opportunities.

Hiking Trails

Two designated hiking trails provide approximately 6 miles of pedestrian – only recreational opportunities. The East Head Trail starts at the forest headquarters and follows the shoreline of East Head Reservoir. This loop trail is approximately 2.4 miles in length. The Bentley Loop trail is approximately 3.5 miles and forms a loop between College Pond, Three Cornered Pond and New Long Pond, and can be accessed from a parking lot near the intersection of Three Cornered Pond Road and Upper College Pond Road.

(Hiking Trail, Photo by Paul Jahnige)

Although there are no other hiking specific trails in MSSF, the extensive network of forest roads, management tracks and paved pathways also provides various, although often confusing, hiking and walking opportunities.

Equestrian Trails

Equestrian uses are allowed on all forest roads. In addition, 28-miles of "equestrian loops" have been designated through the forest on both unpaved forest roads and single-track trails, connecting all areas of the forest.

Wildlife and Forest Management Tracks

Certain areas of the forest may have tracks that have been developed and maintained for wildlife or forest management, and are not necessarily official trails or components of the authorized trail network. These networks are particularly prevalent in the two Wildlife Management Areas. The photo below shows the open fields and forest tracks in the quail management area. These forest management tracks can add confusion and complexity for trail users.

(Wildlife Management Area, Google Earth)

Unauthorized Trails

Many parts of the State Forest are also riddled with unauthorized, user-created, illegal trails. Many of these trails were created by illegal motorized riding. They tend to go on and off the State Forest property, and many specifically impact sensitive resources such as frost pockets. These are particularly prevalent in the western and northwestern sections of the forest.

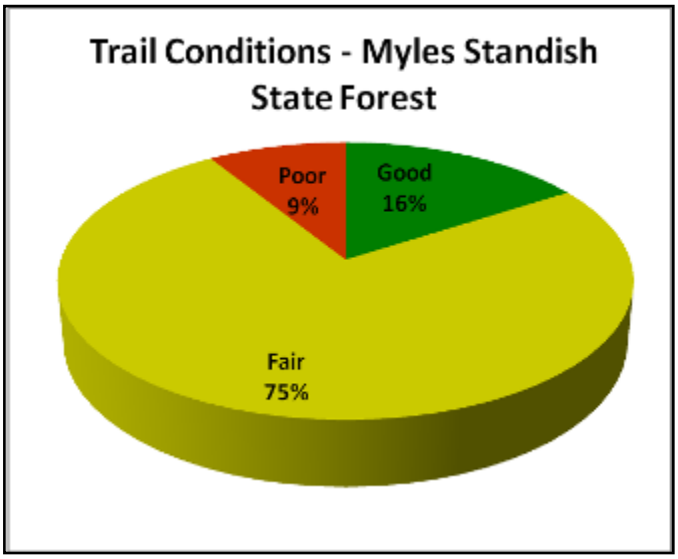
2.6 Trail Conditions

In 2013, the DCR completed it Road and Trail GPS/GIS Inventory for MSSF. This inventory logged a total of 205 miles of forest road and trail at forest, including

- 102 miles of unpaved forest roads and management tracks
- 14 miles of paved bike paths
- 43 miles of single track trails
- 46 miles of illegal, user-created trails

The inventory also records data on trail width, condition, and surface; and on trail structures, features, and road and trail damage.

In general, nearly 75% of the forest roads and trails at Myles Standish are rated as "Fair," and only 16% are rated as "Good." Compared with DCR trail conditions state-wide, the overall conditions at MSSF are somewhat sub-standard. The bike path system is now over 30 years old, and in addition to show signs of general deterioration, there are many locations of root damage and frost heaves causing dangerous conditions. Trail damage caused by illegal OHV riding is well documented in the Myles Standish State Forest Trails and Resource Management Plan (2001).



Finally, in addition to the lack of DCR trail maintenance capacity and the historic nature of many of the forest roads and trails, the characteristics of the soils and vegetation at MSSF may contribute to their condition.

2.9 Recreational Conflict

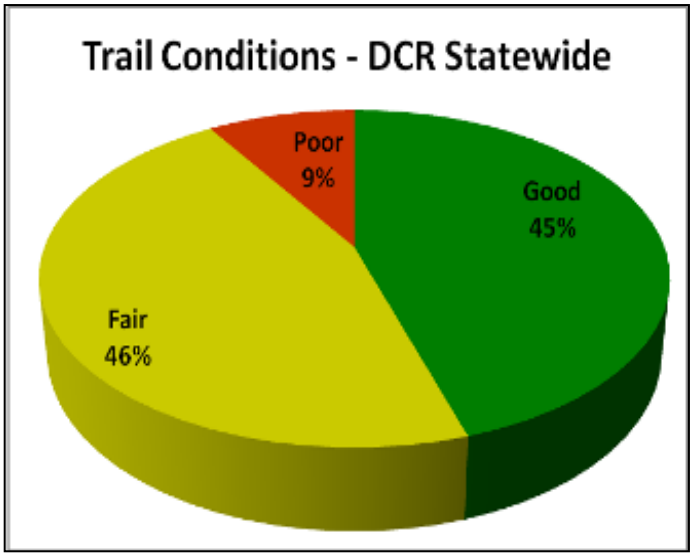
The Myles Standish State Forest Trails and Resource Management Plan (2001) documents reported and potential trail-related conflict at the forest. While the plan notes little or no evidence of direct incidents, the plan highlights the potential for conflict between certain recreational users and abutting land owners. Specifically, it notes potential conflict between:

- Mountain Bikers and Hikers / Equestrians
- OHV riders and other trail uses
- Trail users and abutting land owners

These conflicts seem to be related to:

- Startling or disturbing another user or their sense of solitude
- Trail alternations or damage caused by motorized use
- Disturbance caused by noise

Appendix A provides an overview of strategies for addressing user conflict on recreational trails.



Hiking at Myles Standish (Photo, DCR Files)

Section 3. Management Goals, Features, Experiences and Expectations

3.1 Trail System Management Goals

The trail system at the Myles Standish, ideally, should be managed to help DCR achieve four broad goals:

- Provide the public with opportunities to experience, appreciate and interact with the park's amazing natural and cultural resources
- Provide the public with opportunities for a range of recreational 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 all users and stakeholders to connect through the stewardship of the park's special natural, cultural and recreational resources.

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

- Highlight natural, scenic, and cultural features within the forest
- Provide a variety of desired recreational experiences to users
- Provide for forest and fire management access
- Connect important features, destinations, access points, and regional trail networks

It should achieve these while simultaneously:

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

3.2 Features, Access Points and Connections

The most important features of MSSF are the diverse and often rare natural habitats including the globally rare pine barrens, regionally rare frost pockets, white pine forests, open grasslands, and kettle ponds. These habitats are interesting to users in that they are uncommon in Massachusetts, quite bio-diverse and also relatively open providing many opportunities for interesting views.

Camping, hunting, access to the ponds, historic sites and buildings, and the recreational experiences provided by the road and trail system itself are also important features of the forest.

Specific access points, camping locations, day use areas and features include:

- Forest Headquarters
- Charge Pond
- Fearing Pond
- East Head Reservoir
- CCC Amphitheater
- Barrett Pond
- Paved Bike Paths
- Fire Tower
- Bentley Loop
- East Entrance
- College Pond
- Curlew and Rocky Ponds
- New Long Pond CCC Camp S-56
- Pine Barrens, Frost Pockets and Heathlands
- Selected Vernal Pools
- Cranberry Bogs

Trail Connections

Within MSSF, although there are over 160 miles of roads and trails, there remain many opportunities for new officially designated and maintained trail connections, especially for hikers. These include sustainable and enjoyable hiking connections between Charge Pond, Fearing Pond, Forest Headquarters, Barrett Pond and the Bentley Loop. There is also potential for hiking loops from the East Entrance and from Curlew and Widgeon Pond.

MSSF is a regional hub for many trail users from equestrian to hiking to bicycling. The Berkshires to Cape Cod Bridle Trail crosses MSSF. Due to its large size, central location and position in a chain of protected lands, MSSF has been identified as a hub for other multi-use trails being developed in Plymouth, Carver and Wareham. The Buzzards Bay Greenway would run north up the Wankinco River, through the middle of a large Makepeace landholding and enter MSSF via the Frog Foot Connector west of Charge Pond. A second path would connect the Cape Cod Canal, Bourne Road and Agawam Road Connector trails through Camp Cachalot to MSSF at Fearing Pond Road. The West Plymouth Greenway would run from Sampson Pond in Carver northwest into MSSF north of Federal Pond and would connect with the Kingston Link and Kings Pond Entrance trails at Curlew Pond. The Pine Hills, Ell River and Town Brook trails would connect at Snake Hill Road. These

greenways would support non-motorized recreational trail users such as walkers, hikers, bikers, equestrians and cross-country skiers.

3.3 Recreational Experiences and Expectations

The DCR desires to manage the MSSF in a way that provides a range of users with a range of allowed recreational experiences. We seek to provide these experiences while simultaneously protecting the sensitive natural and cultural resources of the forest.

Specifically at MSSF, we have identified the following trail-based "managed experiences" (those approved uses that we actively seek to manage for). These include:

- Hiking, walking, cross-country skiing and snowshoeing on a variety of types of trails at varying distances.
- Horseback riding on a variety of types of trails at varying distances.
- Biking (road and mountain) on a variety of types of trails at varying distances.
- Snowmobiling on a variety of types of trails.
- Being able to experience, discover and learn about the rich diversity of landscapes, habitats and views from existing official trails.
- Stewarding and improving the trails and environment of MSSF.

Non-trail-based "managed experiences" at the forest include:

- Camping in designated areas
- Swimming / boating
- Picnicking / day uses areas
- Hunting in Wildlife Management Areas

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:

- Recreating with dogs
- Fishing

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

- Off-leash dog recreation
- Off-highway vehicle recreation
- *Off-trail recreation (except hunting) unless specifically permitted*

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

Walking, hiking, cross-country skiing and snowshoeing on a variety of types of trails at varying distances:
Experiencing the natural environment on foot is the slowest and perhaps simplest mode of travel. One can stroll leisurely, observing the world around you or engaging in deep conversation with a friend; families can take the time for discovery as the hike; or one can hike, run or ski at a strenuous pace, raising the heart rate, sweating on the hills and feeling the rush of both accomplishment and exercise.

(Photo, crudanalyiz.com, The Pilgrim)

Some pedestrian trail users desire wide, relatively short to moderate distances (1 to 4 miles) that they can travel without too much

challenge. Some users will also desire a fully or mostly accessible trail surface that is firm and stable without obstructions. On the other hand, some pedestrian users desire challenging trails that offer variable terrain, provide access to more remote areas, are longer (up o 8-10 miles), and might even require some way finding skills.

The pedestrian trail experience at MSSF will be ***enhanced by*** trails that:

- Are the right distance, accessibility and level of challenge for the individual
- Bring the user through a diversity landscapes and habitats
- Connect access points, features and destinations in the forest
- Are well marked and signed
- Provide various loops options

The pedestrian trail experience at MSSF can be ***diminished by***:

- Encountering damaged, illegal or eroded trails
- The presence of trash or dumping
- Encountering illegal motorized vehicles or aggressive off-leash dogs
- Situations that are confusing
- Getting lost

Horseback riding on a variety of types of trails at varying distances:
Exploring MSSF on horseback is a prized experience. Equestrians can move further and faster than pedestrian users, and also get to experience the forest and landscape from an elevated perspective. The horse and rider also share a special bound that can both enhance and be enhanced by the recreational trail experience. Trail riding requires some specialized knowledge, skills and experience, and, of course, a horse.

Some equestrian trail users desire wide open dirt roads or wide trails that are well connected to access points, horse camp grounds and destinations in the park. Other equestrians may desire a greater variety of types of trails, distances and loops.

The equestrian experience at MSSF is ***enhanced by*** some of the same factors described for pedestrian trails, but also by:

- Trails that are maintained with vegetation clearances appropriate for equestrians
- Access to water for horses
- Connections to trailer accessible parking and camping areas

(Photo, EveryTrail.com)

The equestrian trail experience is ***diminished by*** the above noted items in addition to:

- Inadequate vegetation clearance or trail tread maintenance
- Encounters with other users that might frighten horse, including motorized vehicles, aggressive off-leash dogs and non-yielding mountain bikes

Biking (road and mountain) on a variety of types of trails at varying distances:
Road and mountain biking at MSSF are two rather different experiences. Although the act of riding a bike and the desire to do so in a natural setting is similar, these two trail uses differ in the types of trails desired, the level of skill required and overall experience sought.

Most road bikers at MSSF desire smooth, relatively flat, paved trails that meander through the forest and connect campgrounds, day use areas, habitats and entrances.

Mountain bikers will desire a variety of difficulties, distances and terrains. Most mountain bikers prefer narrower "single track" trails that meander through the forest and provide 10-20 miles of different loops.

The road biking experience at Myles Standish is enhanced by trails that:

- Are well maintained, smooth and paved
- Connect key campgrounds and destinations
- Provide sufficient mileage

The mountain biking experience is enhanced by trails that:

- Provide a variety of difficulties, distances and terrains
- Offer loop opportunities
- Provide sufficient mileage

The biking experiences at the forest can be diminished by:

- Poorly maintained or damaged trails
- Lack of signage / confusing trail networks

Snowmobiling on available trails:
Snowmobiling offers an opportunity to experience the forest and the landscape in winter on a motorized recreational vehicle. With current climatic conditions, snowmobiling in southeastern Massachusetts is a rare, but prized activity.

Most snowmobilers desire open, groomed trails with safe wetland crossings that connect various access points, parking areas and destinations. Snowmobilers also desire trails that are connected to a broader regional snowmobile network. Mostly, snowmobilers desire snow.

Being able to experience, discover and learn about the rich diversity of landscapes, habitats and views from existing official trails:
Experiencing, discovering and learning about the natural world can be accomplished through the various forms of trail-based recreation discussed about, however, it is perhaps best appreciated on foot. Stopping to investigate some small plant or insect, standing still and soaking up the sights, smells and sounds of a particular woodland, search for the perfect photo opportunity – these are activities most easily engaged in when the pace is slow and reflective.

The pine barrens, frost pockets, vernal pools and kettle ponds of Myles Standish offer marvelous natural wonders for visitors to explore and experience that are unlike most other places in the Northeast. Discovering and learning about the natural habitats from official, existing trails helps protect the various resources that visitors most enjoy.

Engaging in these experiences is enhanced by:

- Access to a variety of diverse habitats
- A sense of solitude
- Well-maintained trails
- Clear trail signage and maps

This experience can be diminished by:

- Disturbance from other users
- Damage to natural habitats
- Poorly maintained or confusing trails

Stewarding and improving the trails and environment of MSSF:
The experience of being able to volunteer one's time and energy to improve an area or trail system that you enjoy 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 MSSF trail system has some significant ongoing maintenance needs, and volunteer stewardship has been and can be a critical component of successful trail system management.

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, bureaucratic red-tape, and when the accomplishments do not appear to last of have tangible benefits.

(Volunteers Blazing Trails, Photo, WickedLocal.com)

Frost Pocket (Photo, salicicola.com)

Section 4. Sensitive Natural and Cultural Resources

4.1 Sensitive Species, Habitats and Resources

As identified in Section 2, MSSF hosts several sensitive and rare resources that may be sensitive to trail-based recreational use and trail management and maintenance.

Coastal Plain Pond Shores are a very sensitive habitat found along the shores of several kettle ponds in MSSF. The vegetation that comprises the pond shore community is low growing, herbaceous, graminoids and wildflowers that are fragile and easily damaged by trampling. Given the rarity of some of the plants in the pond shore community (some species are globally rare), damage in a few locations could destroy the habitat forever. Water quality in the ponds may also be impaired by trail-related erosion and sedimentation.

Pine Barrens: There is little vegetation that is directly impacted by recreationists on trail. As with other habitats, the primary impact occurs when the initial trail is cut or from off-trail use.

Frost Pockets and Heathlands: Frost pockets and heathlands are characterized by low

growing herbaceous vegetation that is sensitive to alteration from recreational activities. Frost pockets are particularly fragile because of the short and intense growing season produced by their microclimate, which harbors cold temperatures well into the early summer. And because these vegetation communities are underlain by sandy soils, temporary disturbance to the root structure of dominant vegetation can lead to unstable soils and can produce erosion that removes the substrate necessary for re-growth.

Tiger Beetles: Inhabit the southern section of the forest. Trails can actually provide some habitat for these rare beetles, but this means that beetles or their larva can be trampled by trail use and their habitat can be disturbed by trail management.

Turtles: The Northern Red-bellied Cooter and Eastern Box turtle may have negative responses to human activity and may be negatively impacted by some forms of trail maintenance. Water quality in the ponds or wetlands may also be impaired by trail-related erosion and sedimentation.

Below Ground Cultural Resources: Can be destroyed or damaged by improper soil disturbance, including trail maintenance activities that penetrate below the organic soil layer.

4.2 Ecological Impacts of Trail Activities

All trail – related uses, management and maintenance have the potential to negatively impact a variety of sensitive natural and cultural resources at MSSF.

Of particular concern to DCR with respect to recreational uses, trail system management and trail maintenance at MSSF are:

- Trampling, erosion, sedimentation and soil disturbance that negatively impacts:
  - Rare tiger beetles and rare plants
  - Coastal plain ponds and pond shores
  - Frost pockets
  - Vernal pools
  - Sensitive cultural sites

Some of the main causes of trampling, erosion, sedimentation and soil disturbance are:

- Illegal motorized trail use
- Creation and use of unauthorized trails by any users, including motorized users
- Off trail uses
- Poorly planned or executed trail maintenance

Trampling: Off-trail recreation, recreation on unauthorized trails, and recreational uses that widen trails, can trample plants and potentially rare beetles or their larva. Allowed recreation on authorized trails and existing trail tread does not further trample plants. Trampling is of most concern in MSSF where vegetative cover types are sensitive to recreational traffic. In particular, the herbaceous vegetation in coastal plain pond shores and frost pockets are particularly sensitive to human activity. Because of the short growing season in the frost pocket microclimate (see Section 2.7.1), it can take many years for the trampled vegetation to become reestablished.

Erosion and Sedimentation: Erosion occurs when wind or water (primarily water) carries soil from its existing location. The soils at MSSF, largely as a result of their relatively uniform size, are particularly erodible. Erosion can occur on trails particularly when water channelizes on a trail and carries soil with it. This is most likely to occur where trails are aligned along the “fall-line” of the slope (the most direct path up or down). As soils on trail erode, the trails become further “channelized” making it more difficult to get water off the trail. Trail layout and structures, such as

drainage dips, grade reversals and water bars, can be used to get water off of the trails. A "contour" alignment can help address this issue. Eroded soils eventually end up as deposited sedimentation, and can negatively impact water resource areas.

Erosion has been particularly problematic along the edges of ponds. In one location, horses have regularly entered a pond to drink, which has eroded the pond edge and caused a significant amount of sedimentation.

Soil Disturbance

Soil disturbance is a necessary part of trail construction and maintenance, but soil disturbance can also negatively impact below-ground archaeological resources. Soils can also be disturbed by illegal OHV use, and unauthorized trail building.

Example Areas of Existing Trail Damage

Erosion (Gully) Areas

- West of Barrett's Pond
- Southern Edge of 3-Corner Pond

Frost Pocket Damage

- Wing's hole
- Northwest portion of the forest

Illegal Trails

- Western portion of the forest

Section 5. Management, Staffing and Partners

5.1 Permitting Procedures

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.

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.

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.

5.1 DCR Staffing

DCR staffing resources are described in Section 3.2 of the MSSF RMP.

5.2 Friends of Myles Standish State Forest

The organization and work of the Friends of Myles Standish State Forest are described in section 3.8 of the MSSF RMP. In addition to other initiatives, individuals and user groups represented by the Friends have been very active in trail development and maintenance. For example, the Bentley Loop was developed and is maintained by volunteer Bob Bentley and the Equestrian Loop is maintained by local equestrian users active in the Friends.

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 Southeast MA Chapter may provide a valuable resources for trail maintenance and closure in MSSF.

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. AMC chapters and professional work crews can provide a source of volunteer labor and professional expertise for trail maintenance and closures. The Southeast Chapter has been active in trail maintenance at MSSF.

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.

5.5 Other Stewardship Partners

DCR seeks to expand the number and breadth of stewardship partners collaborating at MSSF, particularly around the issues of trail maintenance, stewardship, and education.

Section 6. Recommendations

6.1 Curtail Illegal Motorized Recreational Use of the Forest and Illegal Trail Creation

- Continue to exclude off-road vehicles from the property
- Engage rangers, Environmental Police and local police to enforce rules around motorized use and illegal trail creation to the full extent possible including fines and vehicle impoundment.
- Install signage to clearly communicate OHV restrictions.
- Install gates where appropriate to restrict vehicle access.

6.2 Close / Naturalize Unauthorized Trails that are Damaging to Sensitive Resources, in Poor Condition, Redundant, Confusing or Otherwise Not Desired by DCR.

- Finalize an MOU with DFG to establish procedures for DCR / DFG communication and cooperation and designate legal trails in the WMAs.
- Close / naturalize many trails in WMAs not needed for wildlife management and access.
- Close un-authorized trails, especially those in northwest and west of forest.
- Close trails impacting coastal plain pond shores or frost pockets.

- Simplify / close trails in the Bentley loop area to enhance this recreational loop opportunity.
- Reduce overall trail density.

6.3 Close trails using a multi-pronged trail closure approach.

Successful trail closures are difficult, especially in parks like MSSF. Appendix B, “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.
- Enforcement of trail closures.
- Monitoring for success and early correction of problems.

6.4 Establish New Loop Trail Opportunities around Main Campgrounds and Connecting Destinations

- Establish authorized single track loops around Charge Pond and linking Charge and Fearing Ponds.
- Established an authorized single track trail from Charge / Fearing to northeast entrance.

- Re-establish loop trail near northeast entrance.
- Assess the potential for a new paved path connection along north of forest to connect two existing paved paths and create a paved multi-use loop.

6.5 Repair and Enhance the Paved Bike Paths at the Forest

- Repair and resurface the paved bike paths within the state forest.

- Assess the potential for a new paved path connection along north of forest to connect two existing paved paths and create a paved multi-use loop.

6.6 Protect Sensitive Natural and Cultural Resources

- Restrict recreational trail use through Coastal Plan Pond Shore natural

communities. If a designated trail is located near such as community for educational purposes, signs should educate users about the community's highly sensitive nature.

- Restrict recreational access to frost pockets. Trails may be routed along the perimeter for appropriate observation and interpretation.

- Due to the potential for erosion, trail location should also, if practical, be located along contours rather than slope fall-lines.

- Permit all trail activities that disturb soils with DCR's archaeologist.

6.7 Improve MSSF Trail System Maps, Marking, Trailheads and Intersection Signage

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

- Develop and distribute new DCR trail maps to improve the experience for all users

- Improve trail signage and marking following DCR guidelines. 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.).

- Enhance trailhead signs and kiosks at main trailheads as resources allow.

6.8 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 MSSF. Most notably, these include:

- Appalachian Mountain Club (AMC)
- Friends of Myles Standish State Forest
- New England Mountain Biking Association
- Student Conservation Association
- Others

- Establish Memoranda of Understanding (MOU) and Stewardship Agreements with partners organizations at MSSF. 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.

- Ensure that all DCR or partner activities are appropriately reviewed, permitted and approved.

6.8 Follow NHESP Management Recommendations for Biodiversity protection (see Appendix D for detail)

Pine Barrens Management Unit:

- Develop and implement a comprehensive fire reintroduction

program to improve and maintain habitat quality for pine barrens species.

- Remove tree plantations consisting of non-native species and thin tree plantations consisting of even-aged monocultures of native species.

- Avoid bulldozing, harrowing, or other soil scarification in habitat consisting of Scrub Oak, lowbush blueberries, and other native shrubs.

- Continue to exclude off-road vehicles from the property, and limit motorized vehicle traffic on unpaved forest service roads and power and gas line corridors.

- Do not pave or spread crushed stone on unpaved service roads.

- Develop a mowing plan that is more patchy and less frequent, to allow a more complex vegetation structure to develop within roadside firebreaks and game bird fields. Mowing should not occur during the growing season.

- Restrict mowing in specific locations identified by NHESP to before June 15 and after October 15.

- Survey and monitor for introduced invasive plant species, and eliminate or control these species to the best extent feasible.

- Long-term biodiversity surveys and monitoring to track the condition of, and the species inhabiting, the pine barrens and the various management subunits.

Pond Management Unit:

- Avoid development along pondshores that are currently undeveloped and undisturbed, including construction of new buildings and associated septic systems, new camping or swimming areas, or new boat launches.

- Survey and monitor for introduced invasive plant species, particularly aquatic species in ponds with boat access, and eliminate or control these species to the best extent feasible.

- Concentrate recreational activities in previously established beach, boat launch, and camping areas using educational signage and gates.

- Do not route trails along pondshores, including trails for bicycling, horse riding, or hiking. Any existing trails along pondshores should be re-routed.

- Properly maintain septic systems near the ponds in order to control nitrogen input.

- Do not allow new municipal wells to be installed on the property.

Rare Turtles:

- Install “Turtle Crossing” signs and speed bumps at known sites of routine crossing of paved roads by turtles.

- Continue to exclude off-road vehicles from the property.

- Follow NHESP Advisory Mowing Guidelines for Turtles when mowing fields and roadsides.

- Follow Forestry Conservation Management Practices (CMPs) for turtles to avoid turtle mortality during forestry activities.

- Create new turtle nesting areas according to the NHESP Turtle Nest Site Creation Advisory Guidelines.

- Create additional basking habitat for the Northern Red-bellied Cooter.

Appendix A
Understanding User Conflict on Recreational Trails

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/conf1.htm. Conflict in outdoor recreation settings (such as trails) can best be defined as goal interference attributed to another's behavior. It then identifies the following 12 principles for minimizing conflicts on multiple-use trails.

Adherence to these principles can 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 view 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.
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.
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.
12. **Monitor Progress:** Monitor the ongoing effectiveness of the decisions made and programs implemented.

Appendix B

connections

The newsletter of the Massachusetts Greenways and Trails Program

May / June 2010 No. 36

Closing and Restoring Trails

(Revised 2/26/14 for use at Myles Standish and other archeologically sensitive sites)

All trails impact the natural environment and require on-going maintenance. But some trails, usually as a result of poor layout and design or illegal usage, are more damaging than others, require excessive maintenance, and diminish the user's experience. At Myles Standish State Forest, illegal motorized use in particular are damaging soils and vegetation, and creating potentially dangerous trail situations.

Rather than try to maintain trouble trails over and over, in many cases, closing and restoring poor condition, redundant or illegal trails is the best solution for your trail system – environmentally, culturally, 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 make sure there is a more appealing and obvious 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.

For illegal trails, better marking legal trails will help keep users on appropriate trails.

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. This is particularly true of some trails at Myles Standish. 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.

Check dams should only be placed on fall-line slopes, should be laid within the trail tread and should involve a minimum of additional soils disturbance.

Close Sight Lines

Trails you can see are trails you will use. 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.

At Myles Standish, any material to be transplanted should be dug from locations on a slope greater than 5% to avoid potential impacts to below ground cultural resources, and digging depth should be limited to 12”.

At Myles Standish, dropping trees across the entrances and periodically along the trail may be the best way to close sight lines and discourage use.

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.

This technique should not be used at Myles Standish.

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.

Again, at Myles Standish, dropping trees across the illegal trails, is likely to be the best approach to blocking 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.

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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

Appendix C

DCR Trails Guidelines and Best Practices Manual (Section edited to provide guidance for the Myles Standish State Forest 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
DCR 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 meets 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:

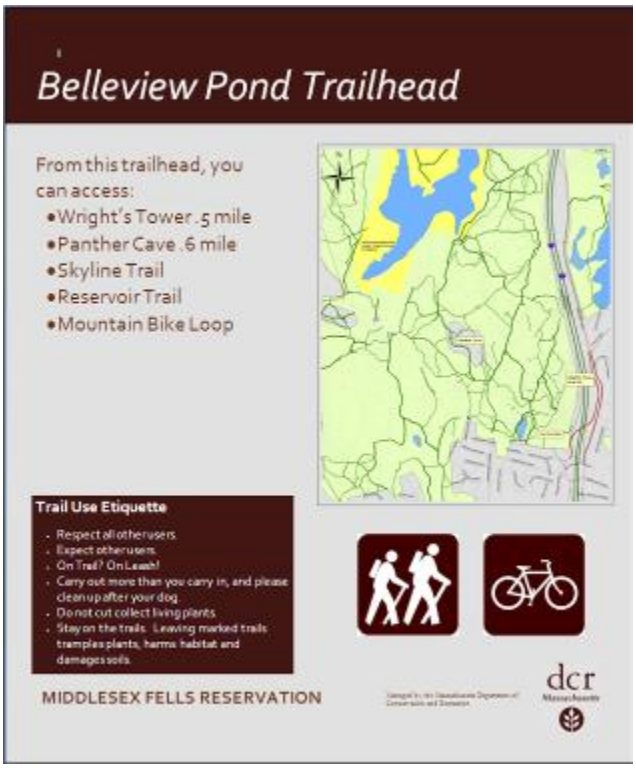
1. Fully implement the sign standards wherever new trails are developed or constructed.
2. Fully implement the standards when trails undergo significant restoration or repair.
3. Implement the appropriate standards as possible as trails are worked on through routine maintenance. For example, when a trail 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 MSSF 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 MSSF, 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

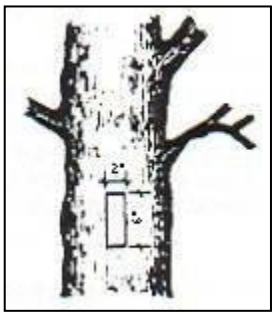
road main entrance, major summit, overnight shelter, etc.)

- 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, 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 of maintained. Painted blazes are more vandal resistant, do less damage than nail-on blazes, and are easier to alter.

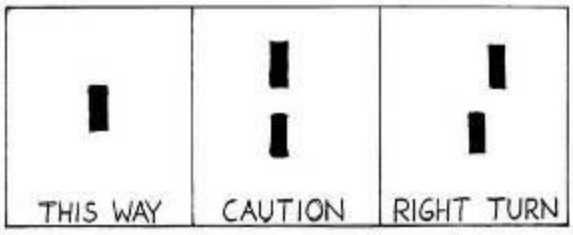
Blazes are placed on trees, slightly above eye level so that hikers, bikers or riders can see them easily when traveling in either direction. Blazes should be placed immediately beyond any trail junction or road crossing. Blazes along continuous trail segments need only be periodic, as tread is well 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.

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

Appendix D

Summary of NHESP Management Recommendations for Biodiversity Protection for Myles Standish State Forest

Pine Barrens Management Unit

Highest Priority Recommendations

- **Develop and implement a comprehensive fire reintroduction program**, to include a combination of mechanical fuel reduction and prescribed fire, in order to improve and maintain habitat quality for pine barrens species, as well as to reduce the potential for wildfire.
- **Remove tree plantations** consisting of non-native species and thin tree plantations consisting of even-aged monocultures of native species. Following cutting, controlled burning should be implemented to kill young pines and stimulate sprouting of native shrubs.
- **Avoid bulldozing, harrowing, or other soil scarification** in habitat consisting of Scrub Oak, lowbush blueberries, and other native shrubs.

Medium Priority Recommendations

- **Continue to exclude off-road vehicles from the property**, and limit motorized vehicle traffic on unpaved forest service roads and power and gas line corridors to minimal traffic for the purposes of maintenance, safety, and habitat management and monitoring.
- **Do not pave or spread crushed stone on unpaved service roads**
- **Develop a mowing plan that is more patchy and less frequent**, to allow a more complex vegetation structure to develop within roadside firebreaks and game bird fields. Mowing should not occur during the growing season.

Lower Priority Recommendations

- **Survey and monitor for introduced invasive plant species**, and eliminate or control these species to the best extent feasible.
- **Long-term biodiversity surveys and monitoring** to track the condition of, and the species inhabiting, the pine barrens and the various management subunits.

Pond Management Unit

Highest Priority Recommendations

- **Avoid development along pondshores that are currently undeveloped and undisturbed**, including construction of new buildings and associated septic systems, new camping or swimming areas, or new boat launches.
- **Continue to exclude off-road vehicles from the property**, particularly along pondshores.
- **Survey and monitor for introduced invasive plant species**, particularly aquatic species in ponds with boat access, and eliminate or control these species to the best extent feasible.

Medium Priority Recommendations

- **Concentrate recreational activities** in previously established beach, boat launch, and camping areas using educational signage and gates.

- **Do not route trails along pondshores**, including trails for bicycling, horse riding, or hiking. Any existing trails along pondshores should be re-routed.
- **Properly maintain septic systems near the ponds** in order to control nitrogen input.
- **Do not allow new municipal wells** to be installed on the property.

Lower Priority Recommendations

- **Long-term biodiversity surveys and monitoring** to track the condition of, and the species inhabiting, the coastal plain ponds and pondshores.
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Rare Turtles

Highest Priority Recommendations

- **Install "Turtle Crossing" signs and speed bumps** at known sites of routine crossing of paved roads by turtles.
- **Continue to exclude off-road vehicles from the property**.

Medium Priority Recommendations

- **Do not route trails along pondshores or through wetlands**, including trails for bicycling, horse riding, or hiking. Any existing trails along pondshores or through wetlands should be re-routed.
- **Follow NHESP Advisory Mowing Guidelines for Turtles** when mowing fields and roadsides.
- **Follow Forestry Conservation Management Practices (CMPs) for turtles** to avoid turtle mortality during forestry activities.

Lower Priority Recommendations

- **Create new turtle nesting areas** according to the NHESP Turtle Nest Site Creation Advisory Guidelines.
- **Create additional basking habitat** for the Northern Red-bellied Cooter.