

State of Vermont
Agency of Natural Resources
Department of Forests, Parks and
Recreation

**Long-Range Management Plan
MT. MANSFIELD STATE FOREST**



Approved December 2, 2002

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Long Range Management Plan
Mt. Mansfield State Forest

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Section I Introduction

Mission Statements which have Guided the Development of this Plan

Vermont Agency of Natural Resources

The mission of the Agency of Natural Resources is "to protect, sustain, and enhance Vermont's natural resources, for the benefit of this and future generations." (Agency Strategic Plan, 2001-2005)

Four agency goals address the following:

- To promote the sustainable use of Vermont's natural resources;
- To protect and improve the health of Vermont's people and ecosystems;
- To promote sustainable outdoor recreation; and
- To operate efficiently and effectively to fulfill our mission.

Departments

Vermont Department of Environmental Conservation Mission Statement - 2001-2005

To preserve, enhance, restore, and conserve Vermont's natural resources, and protect human health, for the benefit of this and future generations.

Vermont Department of Fish and Wildlife Mission Statement - 2001-2005

The mission of the Vermont Fish and Wildlife Department is the conservation of all species of fish, wildlife, and plants and their habitats for the people of Vermont. To accomplish this mission, the integrity, diversity, and vitality of their natural systems must be protected.

Vermont Department of Forests, Parks and Recreation Mission Statement - 2001-2005

The mission of the Department of Forests, Parks, and Recreation is to practice and encourage high quality stewardship of Vermont's environment by monitoring and maintaining the health, integrity, and diversity of important species, natural communities, and ecological processes; managing forests for sustainable use; providing and promoting opportunities for compatible outdoor recreation; and furnishing related information, education, and services.

Overview of Lands Management by the Vermont Agency of Natural Resources

Purposes of Land Ownership

On behalf of the State of Vermont, the Agency of Natural Resources manages state-owned land for a variety of purposes, ranging from the protection of important natural resources to public uses of the land in appropriate places.

Natural resources include, but are not limited to, the following: biodiversity, wildlife habitat, natural communities, water bodies, wetlands, undeveloped land, scenery, and aesthetic values.

Public uses include, but are not limited to, the following: recreation, access to state lands or waters, environment-related businesses, flood control, education, research, and sustainable use of renewable resources such as hunting, fishing, trapping, and forest management.

Outcome of Long-Range Management Plans

The Vermont Agency of Natural Resources manages state lands in a sustainable manner by considering all aspects of the ecosystem and all uses of the natural resources. (Agency Strategic Plan 2001-2005)

The agency has a mandate to serve as the principal land steward for properties owned or managed by its three departments--Environmental Conservation; Fish and Wildlife; and Forests, Parks and Recreation.

The development of long-range management plans (LRMP) for agency lands represents a key step in providing responsible stewardship of these valued public assets. Each LRMP identifies areas where different uses are to be allowed and describes how these uses will be managed to ensure protection of natural resources. The following over-arching management standards further both agency and department missions and are applied to the development of long-range management plans for all ANR lands:

Biological Diversity: Agency lands are managed to both maintain and enhance the variety and abundance of plants, animals and other life forms at scales ranging from local to regional.

Ecosystem Health: Agency lands are managed to ensure ecosystem functions, health, and sustainability. Threats and stresses are monitored, evaluated, and reported regularly.

Legal Constraints: Agency lands are managed in accordance with the purposes for which they were acquired. Many agency lands were purchased with federal funds that require management to be directed for specific purposes. These requirements and other legal restrictions, such as conservation easements, are supported in all planning and management activities.

Natural Resource Science: The foundation for management decisions on agency land consists of comprehensive ecological assessments as developed and documented in long range management plans.

Wildlife Management: Wildlife management activities are directed at protecting and enhancing wildlife habitat for species needing to be conserved as well as those of public interest and utilization.

Recreational Uses and Needs: Agency lands are managed to create, maintain, and enhance sustainable recreational uses. Permitted or allowed activities are dependent upon site capabilities and public need. Wildlife management areas continue to give priority to wildlife dependent activities.

Sustainable Forestry: Agency lands are managed to ensure forest health and sustainability. Vegetation management and utilization strategies based on natural communities and appropriate silvicultural guidelines ensure that trees, forests, and forest ecosystems remain healthy.

Public Involvement: State lands are a public resource. The public is involved in all aspects of decision-making on state lands, including acquisition, policy development, management planning, and the implementation of policies, plans, and regulations. In developing long range plans, the agency considers interests outlined in local, regional, and state plans, including town plans, regional plans, watershed plans, and species recovery and management plans, and works to resolve conflicts between plans as may be appropriate or necessary.

Historical/Cultural and Scenic Values: Agency lands are managed to be sensitive to historical, cultural, and scenic values. Due to protection under state and federal regulations, sites of archaeological significance are equal in status to legal constraints applicable to the lands.

Best Management Practices: Lands under agency management serve as exemplary stewardship models for the public and private sectors in Vermont. Whenever possible, best management practices that are utilized are visible and easy to understand.

Regional Availability of Resources and Activities: Because every parcel of agency land cannot accommodate all the uses that the public might want, the agency works to ensure that the following uses are made available on a

regional basis: sustainable forest harvest; sustainable recreational activities; wildlife-oriented activities; protection of biodiversity and natural communities; and activities that reflect historical and cultural values.

August, 2001

PLAN STRUCTURE

This long-range management plan follows the agency's planning format. It is divided into several sections.

Section I is the *Introduction*, which includes the Agency and Department missions and an overview of lands management.

Section II is the *Parcel Description*. Found in this section is a summary of the parcel land use history, the history of acquisition, location and setting information, as well as locator maps and the parcel base map. Also included is a summary of the natural resources found on the property, as well as other special resources. How this plan relates to regional and town plans is also in the section.

Section III is a *Summary of Public Input* to this plan and management of the property.

Section IV covers *Management Strategies and Actions*. This section of the plan identifies areas where different uses are to be allowed and describes how these uses will be managed.

Section V is a compilation of a *Schedule of Activities*.

Section VI is the *Monitoring and Evaluation* portion of the plan, which will develop over time and provide a way of tracking accomplishments.

Section VII is the *Appendix*. Found in the appendix is a complete description of the public comment process and responsiveness summary as well as the full resource analyses, glossary, pertinent policies, legal constraints and additional maps.

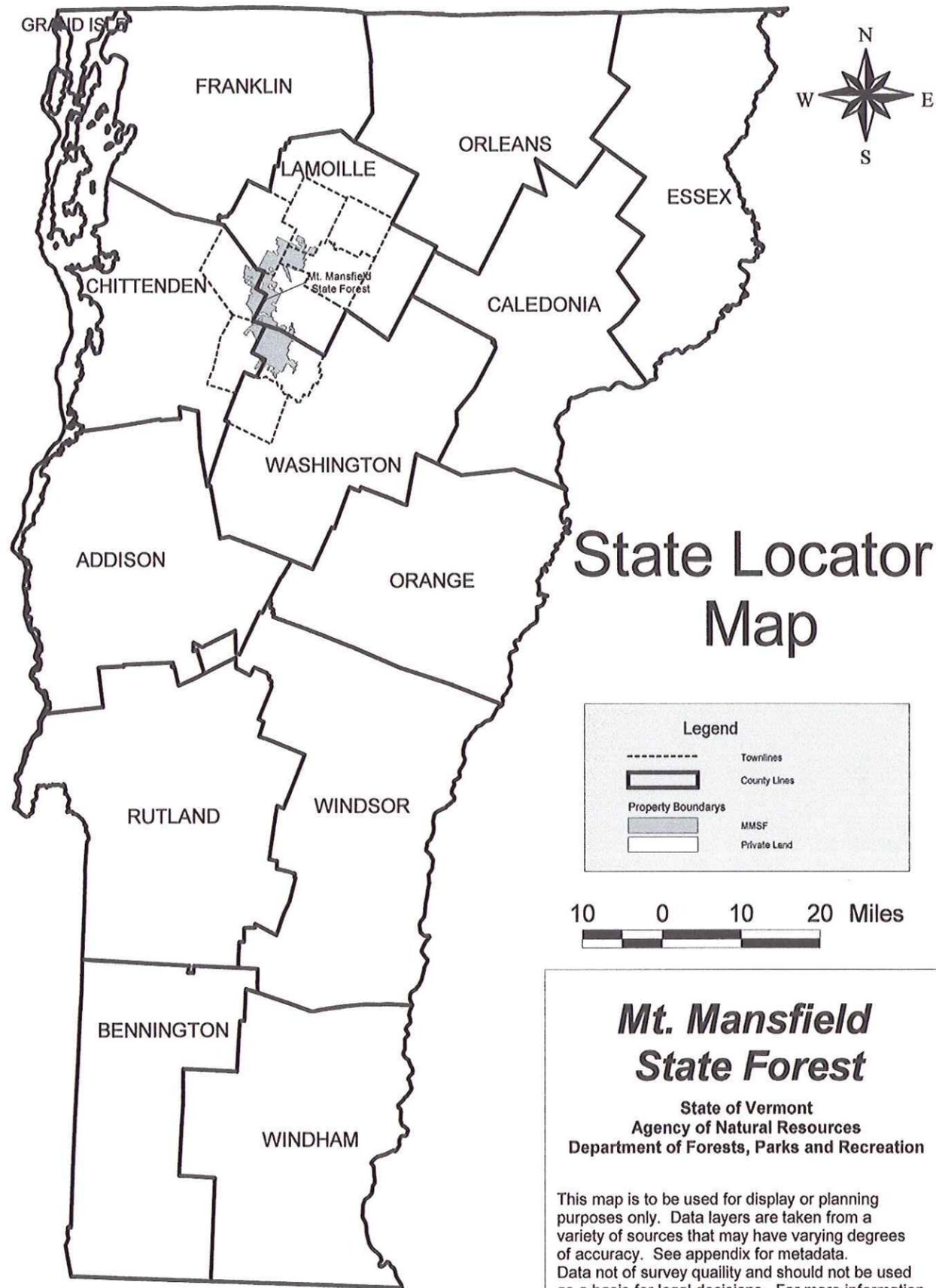
SECTION II Parcel Description

LOCATION INFORMATION

Mt. Mansfield State Forest is the largest contiguous landholding owned by the Vermont Department of Forests, Parks and Recreation and one of its most diverse. The forest consists of 39,837 acres and spreads into the counties of Chittenden, Lamoille and Washington (See State Locator Map). It is located in the towns of Bolton, Cambridge, Johnson, Morristown, Stowe, Underhill and Waterbury (See Town Locator Map and Base Map).

The forest is located north of U.S. Route 2 and U.S. Interstate 89, west of VT Route 100 and south of VT Route 15. Most of the land surrounding Mt. Mansfield State Forest can be characterized as small privately owned parcels. There are a few exceptions: to the southwest is Bolton Valley Ski Area; to the west is the Vermont Army National Guard firing range; and to the northwest are industrial forest lands owned by local sawmills.

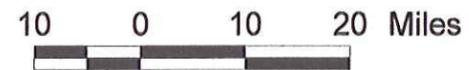
Vermont is divided into eight different biophysical regions, based on areas of similar climate, geology, topography, soils, and natural communities. Mt. Mansfield State Forest is found within the Northern Green Mountain biophysical region (See Biophysical Region Map). This region is characterized by high elevations, cool summer temperatures and acidic metamorphic rocks. Precipitation levels are greater than in the surrounding lower elevations.



State Locator Map

Legend

- Townlines
- County Lines
- Property Boundaries
- MMSF
- Private Land

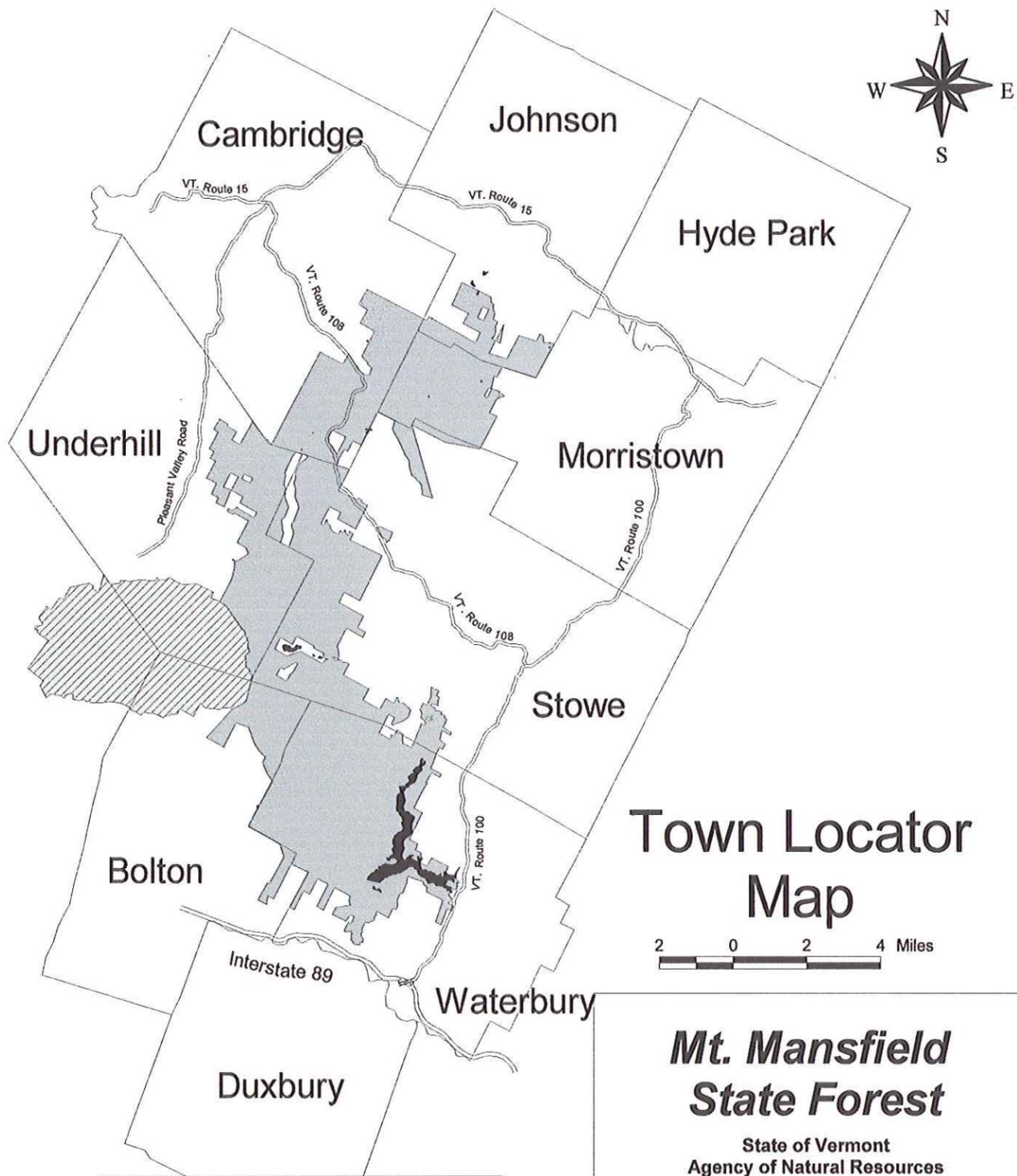


Mt. Mansfield State Forest

State of Vermont
 Agency of Natural Resources
 Department of Forests, Parks and Recreation

This map is to be used for display or planning purposes only. Data layers are taken from a variety of sources that may have varying degrees of accuracy. See appendix for metadata. Data not of survey quality and should not be used as a basis for legal decisions. For more information Contact Laura Cadmus, ANR Gis Coordinator.

Map Prepared by Dave Wilcox 5/1/02

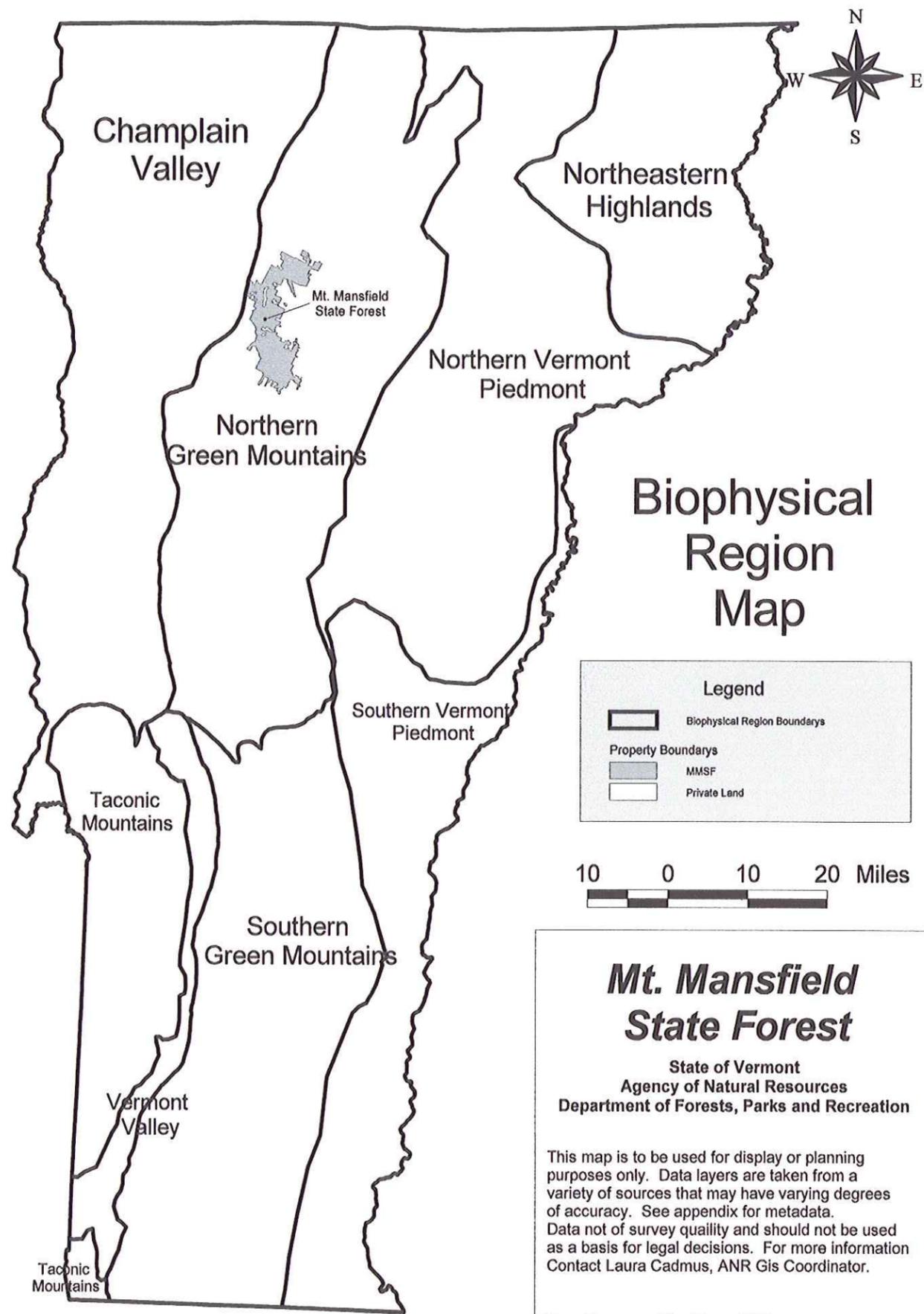


| Legend | |
|---------------------|--------------------------|
| | Townlines |
| | Roads |
| | Waterbodies |
| Property Boundaries | |
| | MMSF |
| | Private Land |
| | Ethan Allen Firing Range |

**Mt. Mansfield
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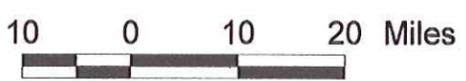
Map Prepared by Dave Wilcox 5/1/02



Biophysical Region Map

Legend

-  Biophysical Region Boundaries
-  Property Boundaries
-  MMSF
-  Private Land

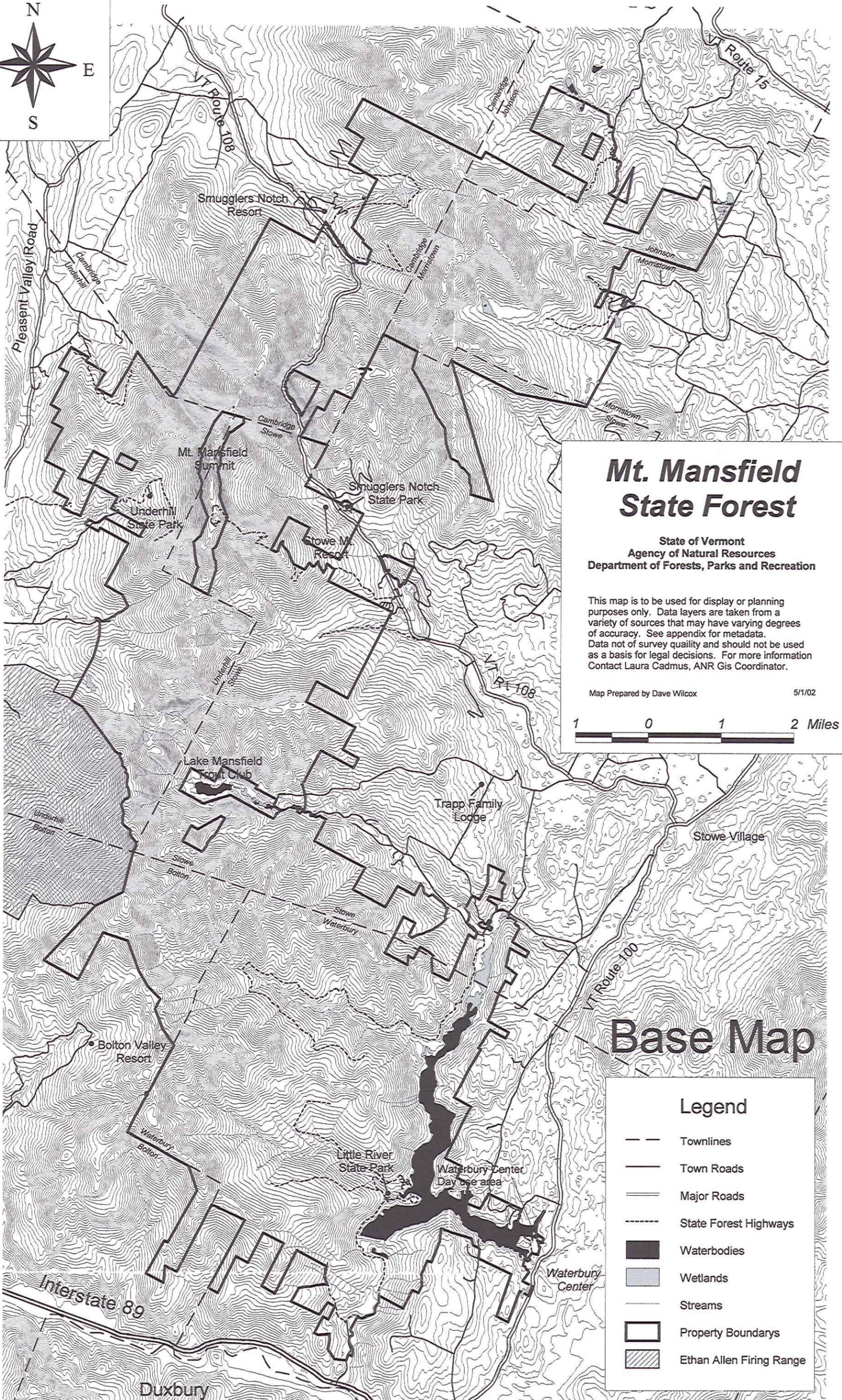
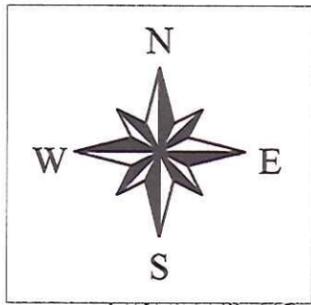


Mt. Mansfield State Forest

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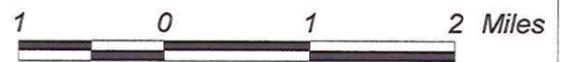


Mt. Mansfield State Forest

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Map Prepared by Dave Wilcox 5/1/02



Base Map

Legend

- Townlines
- Town Roads
- Major Roads
- State Forest Highways
- Waterbodies
- Wetlands
- Streams
- Property Boundaries
- Ethan Allen Firing Range

HISTORY OF ACQUISITION

State acquisition of Mt. Mansfield State Forest began on August 17, 1914 when the state purchased 3,155 acres from Ralph and Louise Case in the town of Mansfield, now a part of the Town of Underhill. During the next two years (1915 and 1916), C.E. and F.O. Burt sold the state about 2,000 acres in Stowe, which would become the site of Stowe Mountain Resort. There have been several major acquisition periods since.

In 1929 Champlain Realty sold the state 1,238 acres. In 1939 the Green Mountain Power Company transferred 10,000 acres around and including Waterbury Reservoir to the State. In 1940 the state purchased the Morse property, which included scenic Smugglers Notch, in the Town of Cambridge. The 1960s saw two more additions. The State exchanged 326 acres in Cambridge, the current site of the Village at Smugglers Notch, for 1,924 acres in Johnson. Later 8,000 acres in Stowe were acquired from the Laird and Burt families. In the 1990s, roughly 7,000 acres were acquired.

Since the 1960s almost all the lands acquired have had easements of some form attached to the purchase of the property. (See Purchase Constraints Map) A more detailed account of the legal constraints on Mt. Mansfield State Forest are found in Appendix A.

1. Land and Water Conservation Funds (LWCF) were used to purchase the Burt lands in Stowe and to build the Underhill, Smugglers Notch, Little River and Waterbury Center State Parks. The main restriction on these parcels is that they must remain open for recreational activities and the park facilities must be maintained and remain in use.

2. Vermont Housing and Conservation Board (VHCB) funds were used to purchase the Burling property in the Town of Morristown. This property is to be managed for passive outdoor recreation, forestry, open space and wildlife uses. The department cannot permit any infrastructure for alpine skiing, except for what existed at the time of purchase. VHCB funds were use also used in the purchase of the Sterling and Bingham Falls Tracts and the Kruse Block. VHCB is a co-holder of the easements with the Vermont Land Trust and Stowe Land Trust.

3. Green Mountain Club (GMC) purchased a number of parcels for the protection or relocation of the Long Trail. These deeds contain standard restrictions of two types. One allows for a variety of uses and the other is restricted to pedestrian recreational uses.

Buttolph Tract (Waterbury) can be used for all forms of non-motorized pedestrian recreational uses. However, snowmobile trails may cross the Long Trail with written approval. Timber harvesting is allowed outside

the trail protection corridor. GMC retains the right to relocate the Long Trail to this parcel and build a trail shelter if needed.

Lathrop and Bolton Valley Tracts (Bolton) have restrictions that allow for only non-motorized recreational uses, which include the relocation of the Long Trail and the construction of one rustic shelter. No commercial logging, use of motorized or mechanized vehicles, or use of horses and other pack animals is permitted on the property.

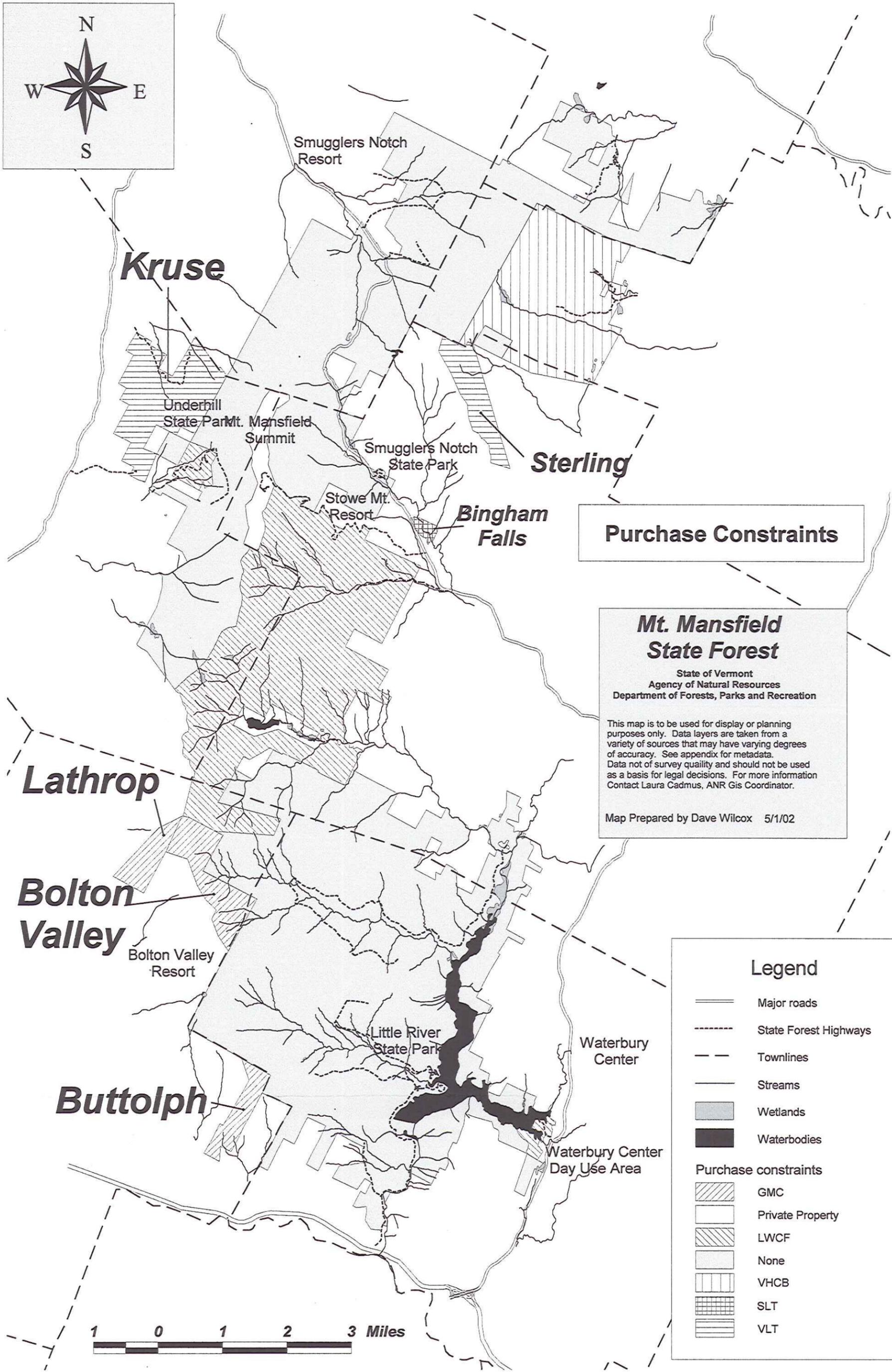
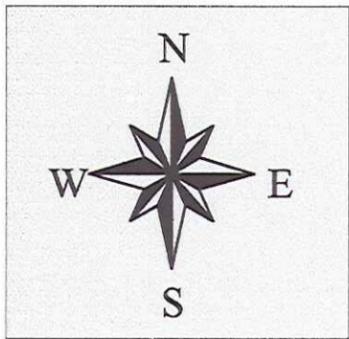
4. Vermont Land Trust (VLT) assisted with the purchase of two parcels, one in Stowe and the other in Underhill.

Sterling Tract is adjacent to the Beaver Meadow Block and is almost completely above 2,500 feet in elevation. Conservation restrictions allow the property to be used for wildlife habitat, forestry, education, non-commercial recreation, and open space purposes.

Kruse Block was purchased for the purposes of providing public access for recreation, to conserve wetland and wildlife habitat, scenic, cultural and open space values, and management of forest stands.

5. Stowe Land Trust (SLT) assisted with the purchase the Bingham Falls parcel in the Town of Stowe. The purpose of the easement is as follows:

1. As primary purposes, (a) to conserve and protect wildlife habitat, natural communities, native flora and fauna and waterfalls, gorges and cascades on the protected property; and (b) to foster pedestrian recreational use and utilization of the protected property.
2. As secondary purposes, (a) to provide for other non-commercial, non-motorized public recreational uses, including hiking, hunting, fishing, trapping, provided such uses are conducted in a manner that minimizes negative impacts on the primary purposes; and (b) to protect the protected property's undeveloped character, scenic and open space resources for present and future generations.



Purchase Constraints

Mt. Mansfield State Forest
 State of Vermont
 Agency of Natural Resources
 Department of Forests, Parks and Recreation

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Map Prepared by Dave Wilcox 5/1/02

Legend

- Major roads
- State Forest Highways
- Townlines
- Streams
- Wetlands
- Waterbodies

Purchase constraints

- GMC
- Private Property
- LWCF
- None
- VHCB
- SLT
- VLT

LAND USE HISTORY

Pre-State Ownership:

The Main Mountain and Notch¹- Development began on Mt. Mansfield in the late 1700s, when a trail was established to allow passage by horseback through Smugglers Notch. This trail was used to smuggle goods to and from Canada during the Revolutionary War and prohibition. It was later used as part of the under ground railroad smuggling slaves out of the south. In 1830, another horse trail was constructed on the Underhill side of the mountain. A guest house, known as the Halfway House, was built in 1850 part way up the trail. In 1857, the Tip Top House, later known as the Summit House, was constructed at the present site of the Octagon (a warming hut at Stowe Mountain Resort) on the Stowe side. It was reached by a horse trail. In 1858 the Summit House was moved to a new location on the ridgeline below the nose. Eventually the Town of Stowe was persuaded to construct the Toll Road part way up to the Summit House to allow visitors passage by carriage.

In the early 1860s the Notch House was constructed near Big Spring in Smugglers Notch. The original structure was abandoned in 1869, and then rebuilt in 1896. The town of Stowe later upgraded the horse trail through the Notch for passage by carriage to Big Spring. At the same time, work began to extend the Toll Road to the Summit House. This project was completed in 1870 and offered visitors an easier way to the summit of Mt. Mansfield.

The entire Notch Road was completed as a carriage road in 1894. In 1917, the State Legislature appropriated \$20,000 to make the Notch Road passable by cars. This was followed by major reconstruction of the Toll Road. At a cost of \$80,000 the Toll Road was upgraded to accommodate automobiles. In return for maintenance of the road, the Town of Stowe gave the Toll Road to the Mt. Mansfield Hotel Co., now Stowe Mountain Resort.

In 1910, the Green Mountain Club, organized by James P. Taylor, started construction of the Long Trail from Camel's Hump to Mt. Mansfield, although hiking trails had been established on the mountain as early as 1847. Taft Lodge, the first shelter on the Long Trail, was built in 1924 to accommodate over night hikers.

¹ At detailed history of Mt. Mansfield called "Mansfield" was written by Robert L. Hagerman, 1975 and published by Phoenix Publishing, Canaan, New Hampshire, Courier Printing C.

Little River Region² - To the south of Mt. Mansfield, in the Town of Waterbury, is the Little River Region. This area was first settled in the late 1700s along the Little River. As a road was established along the river valley to Moscow, people began to carve out their homesteads on higher ground. Settlement continued into the 1800s.

Logging played a major part in the lives of residents in the region. Remains of old logging camps and remnants of the Last Block Sawmill in the Ricker Block provides evidence of the early logging activities that took place. Records indicate that the Last Block Sawmill operated from 1917 to 1922. The land was logged to clear sites for homes, fields and pastures for farming. Logging provided a source of fuelwood for cooking and heating and lumber for construction. It was also a way for many farmers to earn extra money during winter months. The Little River was harnessed and provided the main source of power to operate a number of sawmills in the region.

Farming was not easy or very profitable because the hillside soils were extremely rocky and shallow. By 1900 many families had abandoned their farms and left the region. In the 1920s, Green Mountain Power Company began buying land in the area for a hydropower project. These plans were put on hold after the devastating Flood of 1927. Following the flood, the U.S. Engineering Department surveyed the region and proposed plans for flood control and power generating projects on several rivers in Vermont, including the Little River. Development of the dam on the Little River did not begin until the Civilian Conservation Corps (CCC) was formed in 1933. Before construction on the dam began, Camp Smith was built, eventually housing 2,500 men in tents and barracks. Construction began on the dam in June 1935 and was completed in 1938. After completion of the dam, the surrounding 10,000 acres were transferred to the State of Vermont and became part of Mt. Mansfield State Forest in 1939.

Post-State Ownership

Ski Area Development - Ski area development began in 1933 in the Town of Stowe with the clearing of the Bruce Trail near Ranch Camp. In 1934 the CCC cleared the Nose Dive and Chin Clip Trails and built the Vermont Ski Dorm. On February 7, 1937, Roland Palmedo, J. Hegley Cook and Lowell Thomas sought to obtain a lease from the State of Vermont to build a chair lift from the base of the mountain to the original site of the Summit House, the current site of the Octagon. A lease was eventually signed between the state and the Mt. Mansfield Lift Company. The company has been through a number of name

² A detailed history of the Little River Region has been compiled and published by W. Patrick Yaeger, "That Beautiful Vale Above the Falls", 1995. Pp 157.

changes and is now known as Stowe Mountain Resort.

The original lease was for a strip of land 100 feet wide by 6,300 feet long. On December 9, 1940 the first chair lift in Vermont and the longest in the nation opened on Mt. Mansfield. That same year the CCC built the Octagon. The Base Lodge was constructed in 1941 and has been expanded over the years. In the 1960s Mt. Mansfield experienced a second wave of development. This included an expanded trail system, increased parking capacity at the Base Lodge, construction of the gondola and the installation of snowmaking equipment. Lifts have been updated over the years and in 1992 night skiing began.

Through the 1930s and early 1940s the CCC began to clear downhill ski trails on the Underhill side of the mountain. At the time, it was envisioned that the Underhill area would be developed into a downhill ski area, similar to Stowe. About three miles of trails were completed when work stopped due to World War II. The idea was never rekindled in the post-war era.

Ski area development in Cambridge began in 1956 when the Smugglers Notch Ski Ways, now called Smugglers Notch Resort, started developing the area east of VT Route 108 from the base to the summit of Sterling Mountain. The original development consisted of two poma lifts, six trails, a state constructed shelter at the base and a warming hut at the top. The ski area went through an expansion surge in the 1960s with the addition of double chair lifts, more trails, construction of a new base lodge and snowmaking on Morse Mountain. A beginner ski area was added in 1999.

State Park Development - Development of the State Park system on Mt. Mansfield State Forest began in 1936 when the CCC constructed a picnic area in Smugglers Notch. This was followed by the Smugglers Notch State Park Campground, which consisted of four remote lean-tos and a bath house. It was later expanded in the 1960s.

At the same time the CCC crews were constructing ski trails in Underhill, they also started development of Underhill State Park, including a ranger's house.

On the Waterbury Reservoir, Little River State Park was developed in the 1960s as well, and later expanded in the 1970s. In 1981, development of a day use area was started with the installation of a concrete boat launch and vault toilet. The beach was developed in 1986, followed by construction of the entrance contact station. The summer of 1987 marked the official opening of the Waterbury Center State Park.

Vegetative Management - Prior to state ownership, much of Mt. Mansfield State Forest had been subject to various timber harvesting activities. The only harvesting records for the early acquisitions are the mention of logging operations in many of the original deeds. The Burt Nebraska and Burt Ranch Blocks were purchased from the Burt Family who managed their lands intensively for wood products. Timber management has been practiced on these lands since their acquisition. Timber sale records have been kept since 1956.

Since 1956, a total of 18.5 million board feet of timber have been harvested from various areas of Mt. Mansfield State Forest. Timber sales have ranged in size from 1,520 acres harvesting 1.5 million board feet of logs to three acres removing 28 cords of softwood pulp. Starting in the 1970s many cords of hardwood firewood have been harvested in five-cord firewood lots, which were sold to and cut by private individuals.

Another important management activity on Mt. Mansfield State Forest has been to maintain old apple orchards and fields as permanent openings for a variety of wildlife species. These areas have been either burned or mowed on a three-year schedule.

SUMMARY OF RESOURCES

Mt. Mansfield State Forest is largely mountainous terrain covering approximately 18 miles of the summits of the northern Green Mountain Range. Elevations range from 600 feet above sea level, at Waterbury Reservoir, to over 4,300 feet on Mt. Mansfield. This range in elevation creates a wide diversity of vegetative types and natural communities, which include: early successional forests; northern hardwood and spruce-fir forests; sub-alpine forests; cliffs; rock outcrops; and wetlands.

The most common natural communities found on Mt. Mansfield State Forest are the northern hardwood forests in the lower elevations and the montane spruce-fir and spruce-yellow birch forests in the upper elevations. There are also a number of natural communities that occur on very limited sites and which are considered state significant because of their quality. The Smugglers Notch area has many of these communities, including open talus slopes, boreal acidic and calcareous cliffs, and subalpine Krummholz communities. There are a number of rare, threatened and endangered plant species associated with these communities. The Cotton Brook in Waterbury also supports two unusual natural communities: an erosional river bluff; and a river sand or gravel shores. (See Appendix B).

Of the manageable timber land on the forest, the most common timber type is northern hardwood, consisting of sugar maple, yellow birch, beech and

a variety of associated species. The stands of early successional species such as white birch, red maple and aspen are a result of abandonment of farm fields and pastures. There are a number of small pine plantations on the forest that were established in the 1930s by the CCC. The native softwood stands consist of hemlock or red spruce and a variety of hardwood species. Management of state lands for timber products is free of many of the economic pressures that influence management of private forestlands. This lack of economic pressures allows state lands to provide a reliable and strategically important supply of timber, since timber sales are planned based on biological needs and not markets. As a result, it is possible to manage state forests to provide large diameter, high quality hardwood timber. (See Appendix D).

Mt. Mansfield, at an elevation of 4,393 feet above sea level, is the highest peak in Vermont. While the department owns the majority of the mountain, 400 acres on the summit ridge is owned by the University of Vermont and 20 acres by the Stowe Mountain Resort. The mountain's ridgeline resembles the profile of a man's face, and the names given to the prominent features reflect this: forehead, nose, upper lip, lower lip, chin and Adam's apple. The bedrock of Mt. Mansfield is sericite schists, gneisses and quartzites. Glacial deposits of gravel are common along stream courses at the lower elevations.

Mt. Mansfield State Forest is completely within the Lake Champlain watershed basin. It contains many of the headwaters for the Lamoille and Winooski River watersheds. There are a few high elevation natural ponds located on the forest, namely Goose Pond, Sterling Pond, Bear Pond and Lake-of-the-Clouds. It almost completely surrounds the largest body of water in Central Vermont, Waterbury Reservoir at 806 acres. Most of the low elevation wetlands are influenced by human or beaver activity.

There is an abundance of wildlife on the forest including black bear, moose, white-tailed deer, ruffed grouse, wild turkey, a variety of furbearers, the state threatened peregrine falcon and many species of songbirds. Mt. Mansfield State Forest not only provides general habitat for these species it also contains some critical habitats. The hemlock stands around the Waterbury Reservoir are part of a larger mapped deer wintering area. Throughout the forest are concentrated beech stands that are important mast stands for black bear and other animals. Four bear travel corridors have been identified along Route 108, which facilitate movement between the northern and southern portions of the forest. Since 1988, peregrine falcons have nested in Smugglers Notch. In recent years, peregrine falcons also nested in Nebraska Notch. The montane spruce-fir forest above 3,000 feet in elevation is summer nesting habitat for Bicknell's thrush. While Bicknell's thrush is not on the state's endangered species list it does warrant special consideration because of its very specific habitat requirements and the limited amount of habitat in the northeastern United States. (See Appendix B).

Located on Mt. Mansfield State Forest is evidence of the past farming communities. The Little River basin had a large settlement. The only thing remaining of these homesteads are the cellar holes, barn foundations, stonewalls, cemeteries and old roads. Within the basin, the Goodell House is the only structure remaining from the early settlement. There are a few old mill sites on the forest as well. The Waterbury Reservoir flooded a portion of the settlements in the Little River basin but these homesteads and roads can still be seen during times when the reservoir is drained. The cultural history of this area can be experienced by taking the self-guided History Hike from Little River State Park. There are other cultural sites around the forest, including CCC development in Underhill and scattered homesteads on the northern end of the forest. In 1932 Craig Burt, Sr. transformed his old logging camp in Ranch Valley into cross-country ski accommodations. The hostel was called Ranch Camp. The only things remaining of the camp are the building foundations.

Public recreational use of Mt. Mansfield State Forest is as diverse and varied as its size and geographic distribution would indicate. Most of the forest is just over an hour's drive from the Burlington area, Vermont's most populated region. It is also less than a three-hour drive from Montreal, Quebec (2 million people) and a day's drive for more than 30 million people in southern New England and the mid Atlantic states. While hiking, hunting, fishing and trapping have long been traditional uses of this land there are also opportunities for other recreational pursuits.

Three state park campgrounds are conveniently located within the forest. A day use area is located on Waterbury Reservoir along with two concrete boat launches and a separate launch for canoes and kayaks. Currently the reservoir has been drained so that repairs can be made to the earthen dam. Work is expected to be completed in 2005.

Developed winter recreation is offered at the Stowe Mountain Resort in Stowe and Smugglers Notch Resort in Cambridge. Both resorts are known for their exceptional downhill and nordic skiing facilities. The Vermont Association of Snow Travelers (VAST), the Green Mountain Club (GMC) and the Catamount Trail Association (CTA) all maintain trails on Mt. Mansfield State Forest. Trails range from the very difficult, climbing Mt. Mansfield, to the easy, the Nature Trail at Little River State Park. There are backcountry shelters and tenting areas. Smugglers Notch is also known for its winter ice climbing and mountaineering experiences. (See Appendix C).

RELATIONSHIP TO THE REGIONAL CONTEXT AND OTHER PLANNING EFFORTS

The Mt. Mansfield State Forest long-range management plan dovetails nicely into the regional context. The property is managed to maintain natural communities and water quality, to provide high quality wildlife habitat and forest products, and at the same time provide a wide variety of recreational experiences, from those involving contact with many people and developed facilities to those in remote settings with little human contact.

Regional Plans

Mt. Mansfield State Forest is located in the counties of Chittenden, Lamoille, and Washington. Each county has a regional planning commission and is required to prepare a regional plan every five years by soliciting input from member municipalities, regional organizations and the general public. The regional plans reflect growth trends and address issues of concern at the local and regional level; support the individual goals and issues of each of their respective communities as expressed in municipal plans; and provide a collective voice for the region in state and/or federal regulatory proceedings and in state agency planning efforts. The Central Vermont Regional Plan was adopted in 1998, the Chittenden County and Lamoille County regional plans were adopted in 2001. Consideration to these documents was given when planning for Mt. Mansfield State Forest.

From 1980 to 1995, population growth in Lamoille County was the fastest in the state. Chittenden County was the fourth fastest growing during this same period. This trend is expected to continue. As lands bordering Mt. Mansfield State Forest continue to experience development pressure the forest will come under pressure to provide increased opportunities for recreational activities, as well as provide high quality wildlife habitat and forest products.

Each of the regional plans recognizes the value of the forest land for providing habitats for numerous game and non-game wildlife; forest products; jobs to enhance regional economies; clean water resources; outdoor recreational opportunities; and contrast upon the landscape. This all contributes to a high quality of life.

Watershed Context

Mt. Mansfield State Forest is located in both the Lamoille River and Winooski River watershed. These watersheds represent two of the 17 basins throughout the state for which plans are being written by the Agency of Natural Resources (ANR) under the leadership of the Department of Environmental

Conservation, Water Quality Division.

The purpose of the basin plans is to look at overall water quality of each watershed by identifying issues related to water quality and water-related resources and by providing strategies and actions for improving these as well as conserving high quality water resources. It is ANR's intention to implement these activities in collaboration with interested organizations and individuals and within other agencies and departments.

The Lamoille basin plan is currently underway. The management of Mt. Mansfield State Forest will be conducted in cooperation with the efforts of this basin planning process and with efforts for the Winooski basin when it occurs.

From a watershed standpoint, state lands function as forested buffer zones that play an important role in maintaining water quality and modifying flood potential. To better understand the role of Mt. Mansfield State Forest, a broader viewpoint is needed.

A biophysical region assessment of the Northern Green Mountain biophysical region done in 1998 looked at the percentage of forested lands by elevation zones as well as the percentage of forested land in conservation status (state and federal ownership and private lands with conservation easements).

Northern Green Mountain Biophysical Region

| Elevation Range (feet) | Total Area (acres) | Forested Area (acres) | Percent Forested | Percentage of Total Conservation Land |
|---------------------------|-----------------------|--------------------------|---------------------|--|
| 0-600 | 26,816 | 16,252 | 61% | 20% |
| 600-2000 | 927,544 | 824,844 | 89% | 51% |
| 2000-3000 | 180,947 | 179,865 | 99% | 68% |
| >3000 | 18,177 | 17,920 | 99% | 69% |

Approximately seventy percent of all the land over 2000-foot elevation in the northern green mountain biophysical region is in public ownership.

SECTION III

Public Input Summary

Public involvement, or citizen participation, is a broad term for a variety of methods through which the citizens of Vermont have input into public land management decisions. The Department of Forests, Parks and Recreation is committed to seeking that input. Expressions of citizen interest come in many forms. These include letters, personal comments, telephone calls, and more formal methods, such as public meetings.

Formal public involvement for this planning effort on Mt. Mansfield State Forest started in 1989, when the Department of Forests, Parks and Recreation, the Central Vermont Regional Planning Commission and the Lamoille County Planning Commission co-sponsored a public forum to receive input regarding management of the forest. Attendees at this meeting broke into groups addressing their issues in six topic areas: Local Officials/Town Planning, Timber Management, Waterbury Reservoir, Summer Recreation, Winter Recreation, and General Uses.

During the past ten years, formal public meetings were used to address specific issues such as: a land swap between the Department of Forests, Parks and Recreation and Stowe Mountain Resort, relocation of the Smugglers Notch Campground, and the Smugglers Notch Scenic Highway. A planning advisory group was developed in 1995 to assist with the development of the long-range management plan. Since the department was in the early stages of using the geographic information system (GIS) technology, the planning advisory group asked that existing data layers be developed in GIS format before management decisions were made. There was also a need for more comprehensive resource data.

Three public meetings were held to review the final draft of this plan. These were held in a town in each of the forest's three counties: Morrisville, Lamoille County on June 18, 2002; Waterbury, Washington County on June 20, 2002; and Underhill, Chittenden County on June 25, 2002. Public comments were received at the meetings and during a formal comment period of 36 days after the last meeting. The comments received and responses to them are found in Appendix F – Responsiveness Summary.

All of this public input has been considered in the writing of the Mt. Mansfield State Forest Long-Range Management Plan and will continue to be considered as management of the forest moves forward. There will be future opportunities for the public to stay involved. Public comments will be needed for amendments and other planning efforts on Mt. Mansfield State Forest. Also, the Annual Stewardship Plan is available for review by July 1 of each year. Future opportunities will be announced on the department's website and local media.

SECTION IV Management Strategies and Actions

Vision Statement

Mt. Mansfield State Forest is revered as Vermont's finest example of a multi-use forest: in which the appropriate uses of timber management, wildlife habitat, recreation, research, historic sites, scenic corridors and vistas, all of which contribute significantly to the local and regional economies, are delicately balanced with the protection of environmentally sensitive areas, maintenance of the forest's wild character, and protection of critical headwaters in the Lake Champlain basin.

Management Goals of Mt. Mansfield State Forest

Within the broad bounds of the overall vision and management theme stated above, the following goals and objectives provide more specific direction for the management of Mt. Mansfield State Forest as a whole.

Management Goals and Objectives:

1. To protect biodiversity.

- S Protect species which are rare or exemplary
- S Maintain or enhance critical wildlife habitats and aquatic ecosystems
- S Use a coarse filter and fine filter approach to maintain and enhance natural communities.

2. To provide opportunities for the continuation of recreational activities that have taken place historically (e.g., hunting, fishing, trapping, hiking, alpine and nordic skiing, snowmobiling, camping, etc.) and for other compatible recreational activities.

- Work with trail organizations to maintain trail systems
- Maintain campgrounds and other recreation facilities

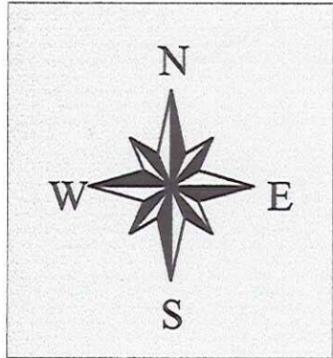
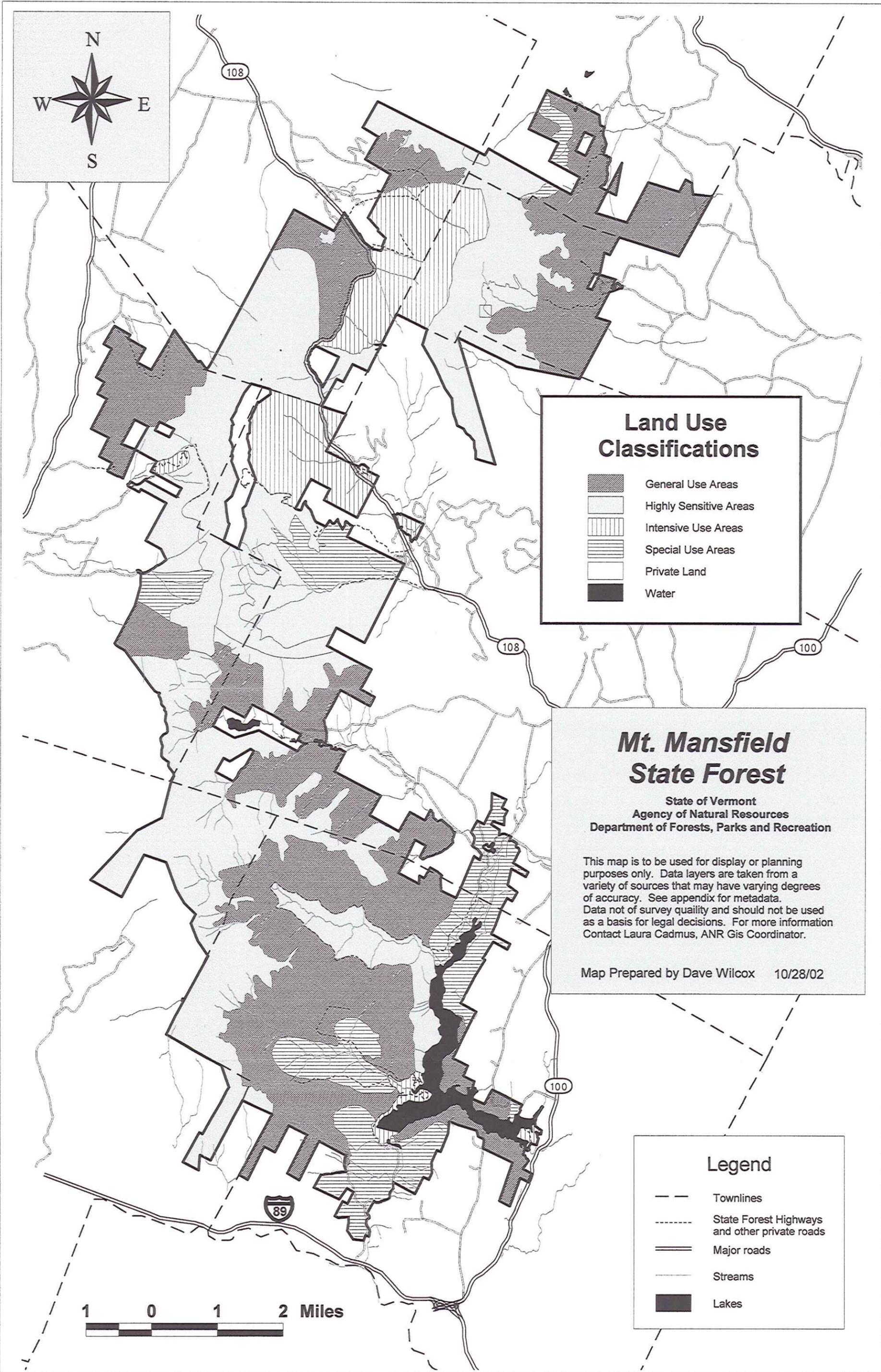
3. To maintain the contribution this forest makes to the local and regional economies.

- Manage for a sustainable flow of high quality forest products.
- Manage to provide high quality habitat for target wildlife species.
- Manage to provide a wide range of recreational opportunities.

Land Use Categories (Classification)

This section of the plan identifies areas where different uses are to be allowed and describes generally how these uses will be managed. The four land use categories for lands managed by the ANR determine where certain activities or uses will be emphasized. Other activities may be allowed within these areas as long as they are compatible with and do not detract from the emphasized activity. The four categories are: (1) Highly Sensitive, (2) Special Use, (3) General Use, and (4) Intensive Use.

As part of the planning process, the lands, resources and facilities held by the Agency of Natural Resources are evaluated and assigned to the appropriate land use category. Assignment of the land use areas for Mt. Mansfield State Forest is based on a thorough understanding of the resources available and application of the over-arching land management standards presented in the introduction section of the plan. The resources include natural communities, plants, and wildlife as well as recreational, historic, timber and water resources. The 11 land management standards, as well as implementing legal constraints, such as easements held, wherever they are applicable.



Land Use Classifications

- General Use Areas
- Highly Sensitive Areas
- Intensive Use Areas
- Special Use Areas
- Private Land
- Water

Mt. Mansfield State Forest

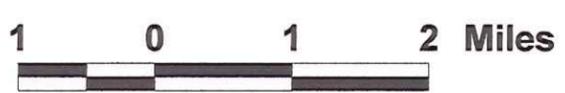
State of Vermont
Agency of Natural Resources
Department of Forests, Parks and Recreation

This map is to be used for display or planning purposes only. Data layers are taken from a variety of sources that may have varying degrees of accuracy. See appendix for metadata. Data not of survey quality and should not be used as a basis for legal decisions. For more information Contact Laura Cadmus, ANR Gis Coordinator.

Map Prepared by Dave Wilcox 10/28/02

Legend

- Townlines
- State Forest Highways and other private roads
- Major roads
- Streams
- Lakes



Highly Sensitive Areas (HSA):

Highly Sensitive Areas have uncommon or outstanding biological, ecological, geological, scenic, cultural or historical significance where these values are preserved and protected. Human activities/uses should be minimal and managed to protect these exceptional features. However, within many of these areas, trails already exist. There are only three roads found in or adjacent to the Highly Sensitive Areas, Route 108 through Smugglers Notch, the access road beyond Underhill State Park and the Toll Road, which is the boundary between two use areas. While it will not be possible to eliminate the uses already in existence, negative impacts may be mitigated. Logging will not occur in Highly Sensitive Areas, however, protection of the natural communities in these areas may involve some vegetative management.

On Mt. Mansfield State Forest the Highly Sensitive Areas represent 16,819 acres or 42% of the forest. Of these acres, 3,461 were designated as a Natural Area by the Governor in 1968. An additional 100 acres was designated as a Natural Area in 1995. About ten thousand acres occur on steep slopes with shallow soils that are not suitable for logging. The remaining 3,200 acres are low elevation lands that are either part of the Vermont Monitoring Cooperative's minimal management areas or protect the steep, highly erodible slopes to Waterbury Reservoir and Cotton Brook. Most of this land has not been logged since state ownership. Hunting, fishing and many recreational activities are allowed throughout these areas.

Management Goals:

- (1) Protect rare, threatened and endangered plants, animals and natural communities.
- (2) Protect examples of exemplary natural communities.
- (3) Protect high elevation areas with steep slopes and fragile soils.
- (4) Protect Class A1 waters (those above 2,500 feet elevation) to maintain their natural condition. Manage Class B1 waters to maintain an almost natural condition showing minimal changes from reference conditions for aquatic macroinvertebrates and fish assemblages.
- (5) Protect significant and unique wildlife habitats.
- (6) Maintain areas of remoteness, which provide a semi-primitive opportunity for recreation.
- (7) Continue to provide dispersed recreational opportunities where appropriate and compatible with other goals.

Management Objectives:

HSA #

- 1 Protect the Hemlock-Northern Hardwood natural community along the Cotton Brook and the west shore of the reservoir between the Cotton Brook and Little River State Park.** This is an exemplary example of this natural community. Also within this area are Erosional River Bluff natural communities. These sites are unique in that they occur on clay soils. This characteristic, along with the landscape context of being within a relatively large forested community, make it a state significant site. Over the years many sites along Waterbury Reservoir have been used by boaters for camping.

Implementation:

- a. Within this area there exists a multi-use trail. This trail will be maintained for hiking, mountain biking and snowmobiling.
- b. No new trails will be established.
- c. Due to the unstable nature of the Erosional River Bluffs, they will be protected from any form of human activity.
- d. Assess existing remote camping sites along the shores of the reservoir for compatibility with the resources. Manage the remote sites to control use and environmental impacts. Close sites as necessary.

- 2 Protect the high elevation Montane Spruce-Fir and the Montane Yellow Birch-Red Spruce natural communities.** Mt. Mansfield State Forest contains some of the most extensive, undisturbed examples of these natural communities in the state. They typically occur on steep slopes to the summit of the ridgeline and have shallow soils that are susceptible to severe erosion. These natural communities also serve many other functions.

The Montane Spruce-Fir natural community provides Bicknell's thrush habitat, which is limited throughout its breeding range. From a landscape scale, the ridgeline is a highly visible scenic resource. Within this area are a number of cliff communities including Boreal Calcareous Cliffs, Boreal Acidic Cliffs and Boreal Outcrops. The cliffs in Nebraska Notch provide nesting for a pair of peregrine falcons. Just south of Bolton Mountain summit there is a site containing two rare alpine plants. The Long Trail is currently found within this area.

Implementation:

- a. Human activity in this area is limited to pedestrian uses.
- b. When the location of a new crossing of the Winooski River is determined, the Long Trail will be rerouted for part of its length. The two Long Trail shelters located within this area will be maintained. There is also an access trail to the Long Trail from Lake

- Mansfield to Taylor Lodge. This trail will be maintained.
- c. A backcountry ski trail exists from Cotton Brook to Bolton Mountain Ski Area and down to the Little River. Part of this trail is on the proposed relocation of the Long Trail. The two trails will co-exist. Work on this trail consists of brushing only.
 - d. Any activity will consider the impact on the Bicknell's thrush nesting habitat. Trail relocations, improvements and new trails will be designed to eliminate further loss or degradation of this habitat.
 - e. The peregrine falcon nesting site will be protected. During the nesting season it may be necessary to restrict access to this area.

3 Protect the high elevation Montane Spruce-Fir and the Montane Yellow Birch-Red Spruce natural communities. This area is similar to HSA 2. It is part of this extensive natural community with a few differences. Within this area are a number of boreal outcrop communities. The ridgeline is highly visible making it an important scenic resource.

Implementation:

- a. Human activity in this area is limited to dispersed, pedestrian uses. Currently no trails exist within HSA 3. No new trails are planned for this area.

4 Protect the Northern Hardwood natural community as part of the Vermont Monitoring Cooperative's (VMC) research area with minimal disturbance. While the northern hardwood forests found on Mt. Mansfield State Forest are not rare they are considered exemplary for this natural community. Within HSA 4 there is an extensive, high quality beech stand that provides excellent fall feeding opportunities for black bear. Given the size of the area and amount of bear use in these beech stands, they are considered regionally significant for wildlife values.

Implementation:

- a. This area is designated for ecosystem research through a memorandum of understanding with the Vermont Monitoring Cooperative (VMC). It is designated as minimal disturbance, so research activities must have minimal negative impacts on the resource. All research activities must be reviewed and approved following VMC's established process.
- b. A portion of the trail system for the Mt. Mansfield Ski Touring Center is located within this area. Existing trails will be maintained. Maintenance on most trails consists of only brushing but some trails require drainage and excavating work. Given the high density of existing trails in this area, all proposals for new trails will come under intense scrutiny.

5 Protect the high elevation Montane Spruce-Fir and the Montane Yellow Birch-Red Spruce natural communities. This is the same natural community found in HSA 2 & 3. The difference in this area is that it is designated as part of the Vermont Monitoring Cooperative's research area. Portions of this area also provide Bicknell's thrush nesting habitat.

Implementation:

- a. Ecosystem research will be allowed through the VMC review process. It is designated as minimal disturbance so research activities must have minimal negative impacts on the resource.
- b. Some of the backcountry trails for the Mt. Mansfield Ski Touring Center are located in this unit. The trails will be maintained by brushing them to keep the trails open. Because use of these trails is limited to winter use, the ground has not been disturbed and erosion tends not to be a problem.
- c. Any activity will consider impact on the Bicknell's thrush habitat. No further loss or degradation of this habitat will occur.

6 Protect the high elevation Montane Spruce-Fir and the Montane Yellow Birch-Red Spruce natural communities. This area was designated a Natural Area by the Vermont Legislature in 1968. It also contains a number of other small natural communities, including Boreal Calcareous Cliffs, Boreal Outcrops, Open Talus, and Subalpine Krummholz. The largest expanse of Bicknell's thrush nesting habitat on Mt. Mansfield State Forest is found within this area, along with active peregrine falcon nesting sites. Smugglers Notch proper is found within the boundaries of the Natural Area. VT Route 108, which travels through the notch, is designated as a scenic highway³. This road is a popular commuting route during the summer and brings many visitors to the area each year. The notch is also a popular area during the winter and has been identified as a premier ice climbing area. There is also one cleared alpine ski trail in the Natural Area (Snuffy's Run). Snuffy's Run connects Smugglers Notch Resort in Cambridge with Spruce Peak in Stowe. The Long Trail, three shelters, a tenting area, and a number of side and access trails are located in this area. Sterling Pond is found within the Natural Area. Existing ski development encroaches on the shoreline of Sterling Pond. The area in the Town of Underhill is designated as part of the Vermont Monitoring Cooperative research area. Vermont State Parks operates an information booth in the notch proper as part of the Smugglers Notch State Park.

³ The Smugglers Notch Scenic Highway went through extensive public involvement. A Corridor Plan was adopted in 1995 and the implementation process is underway. The northern and southern gateways are currently under construction. A copy of The Smugglers Notch Scenic Highway Corridor Plan can be reviewed at the Barre District Office or the office of the Lamoille County Planning Commission.

Implementation:

- a. Human activity in this unit is limited to pedestrian uses, with two exceptions: Vermont Route 108 brings vehicles through Smugglers Notch and will remain in use; and the alpine ski trails are maintained during the ski season with groomers. The groomers are not allowed on Sterling Pond.
- b. The Smugglers Notch Scenic Highway will be managed according to the management plan. Activities planned for the Scenic Highway will require State permits.
- c. Maintain a department staff presence in the notch proper. This may involve continuing to operate and maintain the information booth. The department will reassess this need when the northern and southern gateways on the scenic highway are fully functional. Construct a new composting toilet to replace the existing outhouse facility.
- d. The Long Trail and associated shelters will be maintained. The trail system will be monitored to determine if trail closings or relocations are necessary. The Long Trail north of VT Route 108 will be moved to the Elephants Head Trail to eliminate the VT Route 108 walk for through hikers.
- e. The peregrine falcon nesting sites will be protected. During the nesting season it may be necessary to restrict access to the nesting habitat by closing trails and limiting rock climbing.
- f. Any activity will consider the impact on the Bicknell's thrush nesting habitat. No activity that will cause further loss or degradation to this habitat will occur.
- g. Within the research area, activities must be coordinated with the VMC. Only non-destructive research will occur in this area.
- h. A plan will be developed with the goal of restoring the riparian zone of Sterling Pond. Thousands of hikers, including anglers, visit this fragile high elevation pond annually and have caused considerable damage. The area will be monitored and evaluated to determine impacts on the resource, including the practice of stocking fish and ski area development.
- i. Rock climbing and bouldering are popular activities in the Notch. These activities will be monitored and action taken to mitigate negative impacts.
- j. A major problem within this area is winter snowboarding and skiing. Many illegal trails already exist. This activity will be monitored to determine its impact on the resource and actions taken to mitigate any negative impact.

7 Protect the Northern Hardwood natural community as part of the Vermont Monitoring Cooperative's (VMC) research area with minimal disturbance. The natural community is similar to that found in HSA 4. It contains a number of access trails to the Long Trail. There is an existing state forest highway in this area that was used for timber management. It currently provides access to the area for research.

Implementation:

- a. This area is designated for ecosystem research through a memorandum of understanding with the VMC. It is designated as minimal disturbance, so research activities must have minimal negative impacts on the resource. All research activities must be reviewed and approved following VMC's established process.
- b. Human activities will be limited to pedestrian uses.
- c. Access trails to the Long Trail will be maintained. Some trails may be considered for closure or major relocation in accordance with the Long Trail Management Plan as prepared by the Green Mountain Club.
- d. Evaluate the state forest highway to determine if the road should be maintained or closed permanently.

8 Protect the high elevation Montane Spruce-Fir and the Montane Yellow Birch-Red Spruce natural communities. This area is the northern most area of these natural communities on Mt. Mansfield State Forest. Within this area are a number of Boreal Acidic Cliff natural communities and an extensive Sedge Meadow natural community. The Long Trail and the access trails are located within this area. Whiteface shelter is directly on the Long Trail. Within the Beaver Meadow basin there are two other shelters. Beaver Meadow Lodge is maintained by the Green Mountain Club, while Burling Camp, which was built by the previous owner, is maintained by the Department of Forests, Parks and Recreation.

Implementation:

- a. Most activity in this area will be limited to pedestrian uses. The trail to Burling Camp was constructed for use by vehicles. While this trail will be closed to vehicle use it may be maintained using mechanical equipment.
- b. Any activity within this area will consider the impact on the Bicknell's thrush nesting habitat. No further loss or degradation of this habitat will occur.
- c. The Long Trail will be maintained as will Whiteface Shelter. The access trails to the Long Trail through Beaver Meadow Block will also be maintained. These trails are also used as a loop for day hiking in the basin.

- d. There are two lodges near the Sedge Meadow. They are used year round for over night use, since they are two of only a handful that still have wood stoves in them. This may create problems with providing a firewood supply and waste management. Both the Beaver Meadow Lodge and Burling Camp have privies that will need attention in the future. These two sites will continue to be monitored and specific solutions will be discussed.

9 Protect the old growth stand within the Montane Yellow Birch-Red Spruce natural community. This area was designated as the Daniel's Notch Natural Area in 1996. It is a significant example of an old growth forest. A foot trail goes from the Morse Block, through Daniel's Notch and into French Hill.

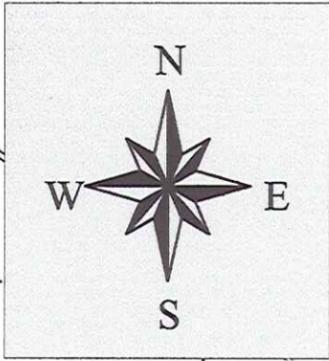
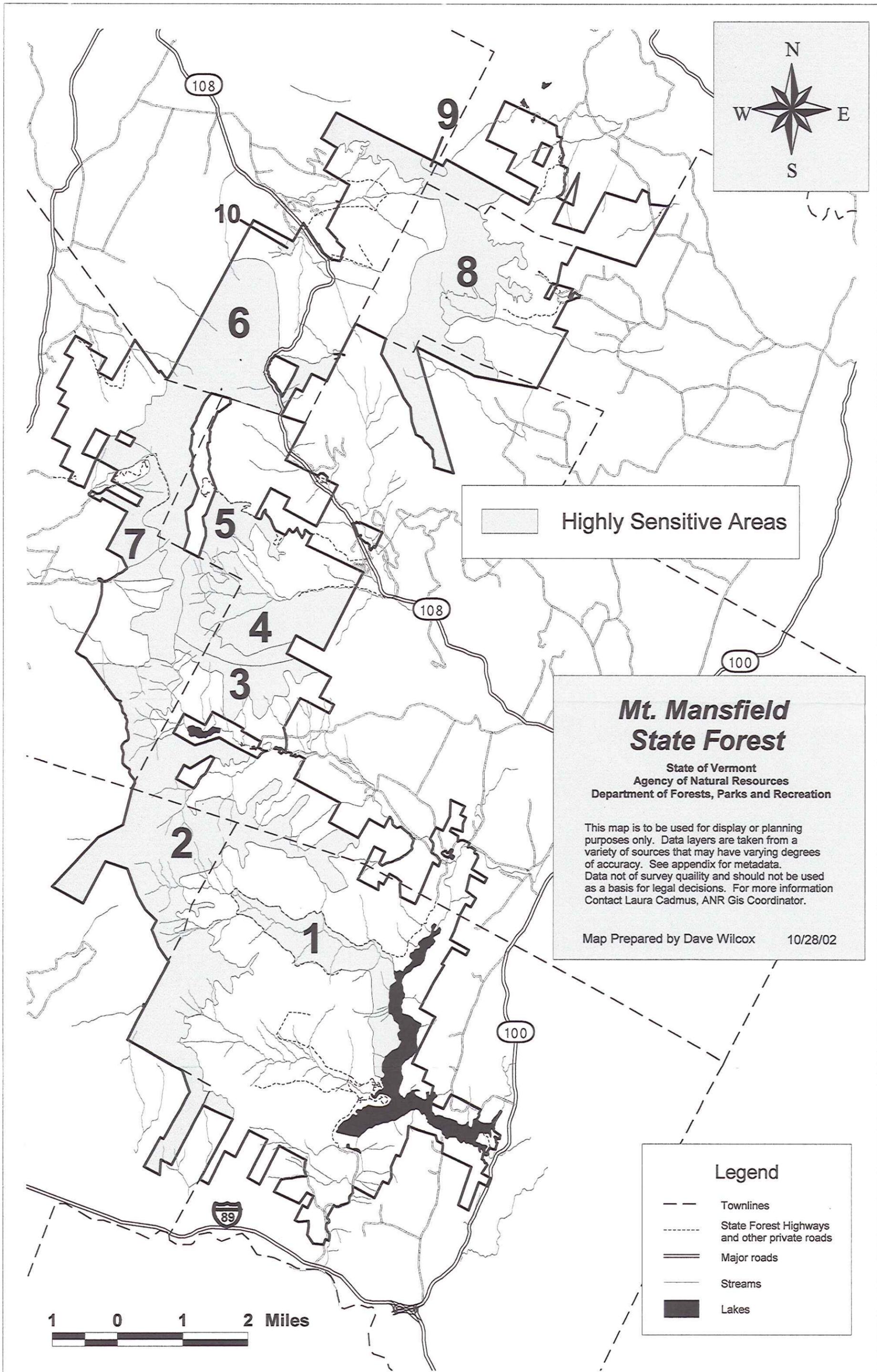
Implementation:

- a. Human activity within this area will be limited to pedestrian uses. The biggest management challenge that needs to be addressed is the use of all-terrain vehicles on the trail through Daniel's Notch.

10 Protect the Red Spruce-Hardwood Swamp natural community. This natural community exists on the side of a slight slope and is the result of seepage from the slope above coupled with a dense hardpan. It is state significant because of its quality and size. Old access roads exist in this area.

Implementation:

- a. Harvesting activity will not occur within the area.
- b. The old access road may be used to skid wood products out from adjacent stands, under frozen conditions only.



Highly Sensitive Areas

**Mt. Mansfield
State Forest**
 State of Vermont
 Agency of Natural Resources
 Department of Forests, Parks and Recreation

This map is to be used for display or planning purposes only. Data layers are taken from a variety of sources that may have varying degrees of accuracy. See appendix for metadata. Data not of survey quality and should not be used as a basis for legal decisions. For more information Contact Laura Cadmus, ANR Gis Coordinator.

Map Prepared by Dave Wilcox 10/28/02

Legend

- Townlines
- State Forest Highways and other private roads
- Major roads
- Streams
- Lakes

1 0 1 2 Miles

Special Use Areas (SUA):

Special Use Areas have unique or special resources where management objectives emphasize protection and/or enhancement of those resources. Where appropriate, compatible activities may occur, such as timber harvesting, wildlife management, road maintenance and construction and recreational activities. However, only those activities that are compatible with and do not detract from the primary objective of protection and/or enhancement of the unique or special resource will be considered.

On Mt. Mansfield State Forest the Special Use Areas represent 4,254 acres or 11% of the forest.

Management Goals:

- (1) Provide high quality habitat for target wildlife species.
- (2) Provide opportunities for dispersed recreational pursuits.
- (3) Manage Class B1 waters to maintain an almost natural condition showing minimal changes from reference conditions for aquatic macroinvertebrates and fish assemblages.
- (4) Manage existing agricultural fields using the Accepted Agricultural Practices developed by the Vermont Department of Agriculture, Food and Markets.
- (5) Produce high quality timber where compatible with the “special” resource.

Management Objectives:

SUA #

1, 2, Deer Wintering Areas. These areas have been mapped by the Vermont Department of Fish and Wildlife as deer wintering areas. Winter habitat is considered to be a critical element for white-tailed deer survival in Vermont. The wintering areas consist of Hemlock-Hardwood natural communities. All activities within these areas will be designed to improve the function of the hemlock and other softwood species as winter cover, as well as produce high quality accessible browse. A VAST corridor trail is located in SUAs 1 and 2. There are also trailhead parking areas in SUA 1 and 11. Over the past 10 years, sections of the trail have been relocated to keep the trail near existing roads and closer to the edge of the wintering areas rather than running through the middle of them. This reduces the recreational use impacts on the wintering deer. The old trail is still available for summer hiking use, but closed during the winter. In SUA 6 the major truck road is used as the VAST trail. The trail then goes through SUA 11 where it is located very close to the boundary line. SUA 4 contains remote camping sites along the reservoir. Primary access to these sites is by boat. The canoe access to the reservoir is in SUA 6. The Little River below Waterbury Dam is Class B3 due to water level fluctuations.

Implementation:

- a. Manage the Hemlock-Hardwood natural community under an unevenaged system. Every effort will be made to regenerate hemlock, enhance the ability of the stand to provide superior cover and provide browse. (Treatment will occur every 15 to 20 years).
- b. Evaluate recreation trails in the area to minimize the effects of use on the wintering deer. Close or relocate trails as needed. Maintain the parking areas at Cotton Brook and Little River. New trails through the deer wintering area will not be allowed.
- c. Assess existing remote camping sites along the shoreline of the reservoir for compatibility with the resources. Manage the remote sites to control use and reduce environmental impacts. Close sites as necessary.
- d. Maintain the canoe access area.

5 Floodplain Forest, Wetland Natural Communities, and Canoe Access

Area. This area occurs at the north end of the Waterbury Reservoir along the Little River. It is a mixture of natural communities that are water influenced. The natural communities include: Alder Swamps, Alluvial Shrub Swamps, River Sand or Gravel Shore, and Successional Floodplain Forest. Most of these natural communities have been disturbed by past agricultural practices. Since the construction of the Waterbury Dam and consequent flooding, the agricultural practices that disturbed the original natural communities have been discontinued. Natural floodplain communities have redeveloped in the absence of the agricultural practices in the remaining areas not inundated by the reservoir. The canoe access area to the reservoir is located within this area. While the water level has been lowered to facilitate repairs to the dam, there is a designated mountain bike trail from the canoe access to the mouth of the Cotton Brook where it ties into the established trail. When the dam is repaired and the water is returned to normal level, this trail will no longer exist. Japanese knotweed is an invasive, exotic plant that is found along the Little River in this area. The presence of this plant species could make it hard to establish desirable tree species along the river.

Implementation:

- a. Maintain a vegetated buffer along the Little River. This may require working cooperatively with other agencies on stream bank stabilization projects.
- b. Monitor and attempt to control the spread of invasive, exotic plants.
- c. Maintain the canoe access area for launching small crafts that must be carried to the water's edge.

3, 7, 8, 9, 10 & 16 Agricultural Fields. There are 91 acres of fields within the forest on which local farmers have agricultural licenses for producing farm crops or grazing livestock. These are the last remaining agricultural areas on the forest. Most of these fields are on the rich bottom lands along the Little River. The fields will be managed using the Accepted Agricultural Practices developed by the Vermont Department of Agriculture, Food and Markets.

Implementation:

- a. No pesticides will be applied to the licensed fields, per the Department of Forests, Parks and Recreation policy on pesticide use.
- b. Fertilizer will be applied at rates determined after soil tests.
- c. Buffer strips will be maintained between cropland and adjoining waters. Currently there are two fields that need to have buffer strips re-established because of natural stream bank erosion. The department, in conjunction with Department of Fish and Wildlife biologists, will cooperate with the licensee and the Natural Resources Conservation District to reestablish the buffers along the Little River and Miller Brook.

12 & 13 Vermont Monitoring Cooperative Research Area (VMC). These areas have been set aside for long-term monitoring and research on forest ecosystems by the VMC. The research in these areas will be designed to study the effects of active management on the ecosystem. A portion of the Mt. Mansfield Ski Touring Center's trail system is found in SUA 13. Also, within SUA13 is a high quality beech stand that provides excellent fall feeding opportunities for black bear.

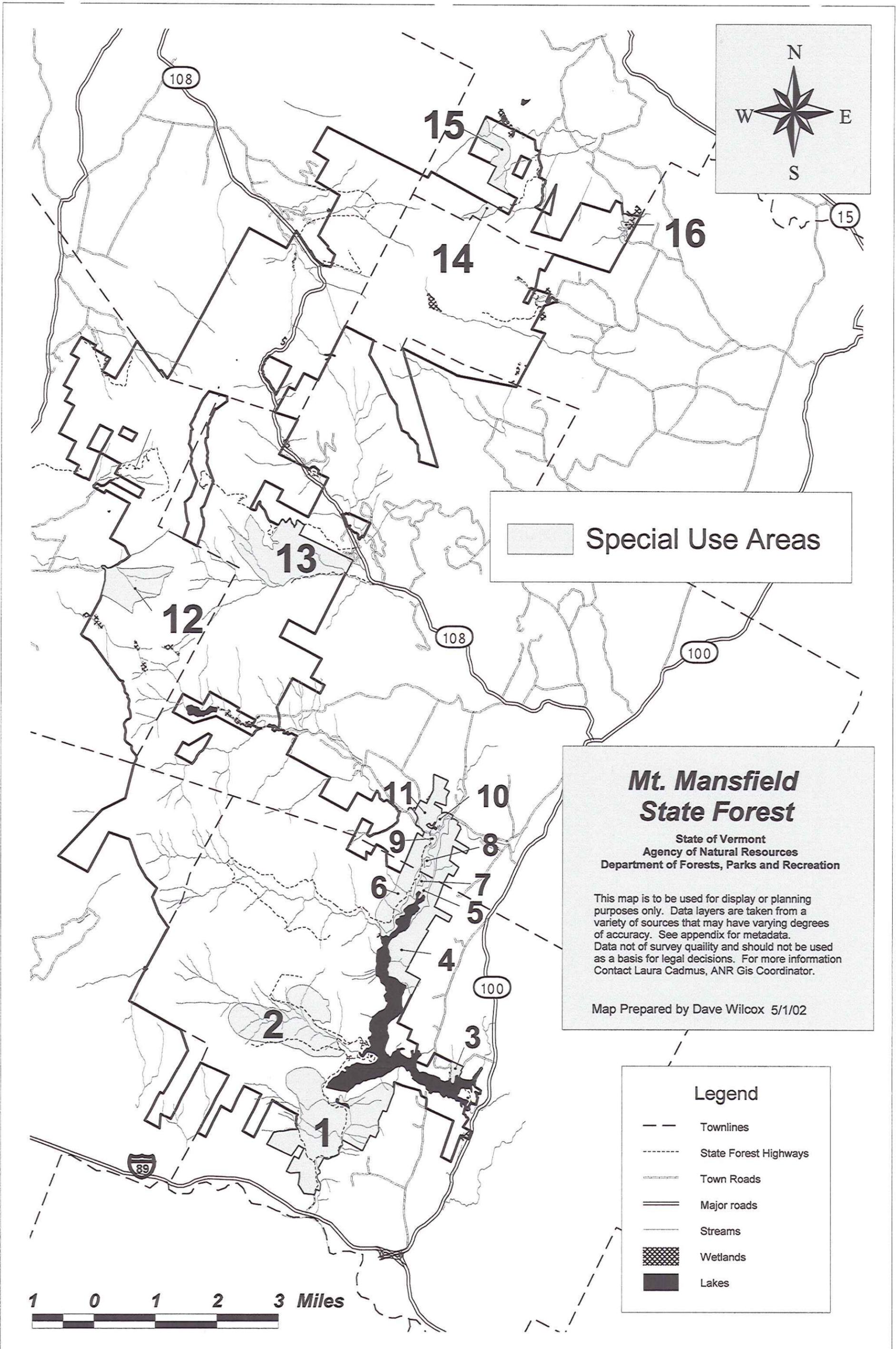
Implementation:

- a. Ecosystem research will be allowed through the VMC review process.
- b. Work with Stowe Mountain Resort to maintain the cross-country ski trail network. Maintenance work will include brushing, installing or replacing culverts, and installing waterbars, ditches or other structures to control erosion problems.
- c. Given the density of trails within SUA 13, all proposals for new trails will come under intense scrutiny and may not be allowed.

14 & 15 Long Trail Corridor. The Long Trail will be maintained according to the Memorandum of Agreement between the Department of Forests, Parks and Recreation and the Green Mountain Club. Within this corridor there is a Long Trail shelter that will be maintained by the Green Mountain Club. A number of parcels have recently been acquired north of the forest along what is known as Dry Ridge, for relocation the Long Trail. When all parcels have been acquired, the new route will be flagged and all necessary permits obtained before construction begins. The corridor will change to correspond with the relocated trail.

Implementation:

- a. Maintain a 200-foot buffer area on both sides of the Long Trail where no logging will be allowed. Manage an additional 300-foot buffer on both sides of the Trail under single tree selection.
- b. Maintain the Long Trail and Bear Hollow Shelter.



General Use Areas (GUA):

General Use Areas are where multiple land uses occur. The dominant use may be sustainable timber harvesting, wildlife habitat management, dispersed recreation or other general land uses. Where other uses dominate, vegetative management will be conducted to enhance the dominant use and will not permanently impair the land for that use.

On Mt. Mansfield State Forest the General Use Areas represent 14,171 acres or 36% of the forest.

Management Goals:

- (1) Provide a sustainable flow of high quality forest products.
- (2) Provide high quality habitat for target and general wildlife species.
- (3) Provide opportunities for a wide variety of dispersed recreational pursuits: hiking/walking, running, mountain biking, snowmobiling, hunting, fishing, trapping, cross-country skiing, remote camping on the reservoir, and primitive camping.
- (4) Maintain clean, high quality water resources and aquatic habitats. Restore quality of water resources where necessary.
- (5) Promote healthy natural communities.

Management Objectives:

GUA #

- 1 Extensive Northern Hardwood Forest.** This area consists of a northern hardwood forest that has been exposed to a wide variety of uses. The Little River area was first settled in the late 1700s. There was extensive settlement of the area that resulted in most of the land being cleared for farming or harvested to supply the local sawmills. By the turn of the 20th century many of the farms had already been abandoned. The remaining farms were purchased in the early 1900s, and in the 1930s the Waterbury Reservoir dam was constructed. The many cellar holes, stonewalls, cemeteries and apple orchards in this area are all evidence of this settlement. The existing northern hardwood forest is a result of the activities that have taken place. The areas abandoned in the 1930s are comprised of early successional tree species. Within this area there are approximately 17 acres of permanent grassy openings. These consist of old fields, apple orchards and log landings.

The remaining area consists primarily of sugar maple, yellow birch, white ash and other associated species. There are inclusions within this area that are comprised of red spruce, red maple and white birch or hemlock and yellow birch. The red spruce sites tend to be fairly wet, while the hemlock sites tend to be on rock outcrops. This area has been intensively managed for high quality timber products since state

ownership. Truck roads may double as VAST corridor trails during the winter and are used in the summer as multiple use trails. An alternate trail exists for times when the roads are plowed for timber harvesting activities.

Implementation:

- a. Manage the northern hardwoods emphasizing an unevenaged silvicultural system. Some stands will continue to be managed under an evenaged system. Stands will be treated on a 15- to 20-year cutting cycle.
- b. Manage early successional forest stands using an evenaged silvicultural system to maintain the vegetative diversity and to provide habitat for wildlife species requiring openings, edge and shrub-scrub habitat.
- c. Manage softwood inclusions using an evenaged silvicultural system. Treatments will result in thinnings every 10 to 15 years to maintain growth rates and establish regeneration.
- d. Maintain 10 percent of the basal area in hard mast producing species as a wildlife food source. Manage beech stands to promote tree health and conserve their wildlife functions and values.
- e. Maintain existing grassy openings to provide wildlife feeding areas and add to the diversity of the unit.
- f. Protect historic and cultural features from damage. Continue to provide self-guided tours of the Little River cultural area.
- g. Protect water quality and aquatic ecosystems from degradation.
- h. Provide the opportunity for diverse recreational pursuits that are compatible with the resources. This includes primitive camping and maintenance of existing trails and possible expansion of trails and trail uses. Consideration will be given to the recreational experience available and desired when addressing expansion of trails or uses.
- i. Maintain the existing truck road system. The truck roads in this area are gated to control vehicle access.

2,3 & 4 Mixed Hemlock Forest. These areas are predominantly hemlock with a mixture of other species including red spruce, white pine and a variety of hardwood species. These stands are located around the east arm of the reservoir. They are important for controlling erosion along the shores of the reservoir and maintaining the views from the water. A VAST corridor trail is located in GUA 2 and connects with the trail in GUA 1. The areas adjacent to these GUAs are mapped as deer wintering areas. These areas contain remote camping sites along Waterbury Reservoir. Primary access to the sites is by boat. Manage to produce high quality timber products, wildlife habitat and dispersed recreational opportunities.

These areas include cultural sites that were part of the Little River area. Currently most of the sites are located under water as a result of the reservoir. When the reservoir is drained the old roads can still be found.

Implementation:

- a. Manage the hemlock using an unevenaged silvicultural system. Stand will be treated on a 15- to 20-year cutting cycle.
- b. Manage the white pine stands using an evenaged silvicultural system. Over time these stands will regenerate to a mixed hemlock-hardwood natural community. Thin every 10 to 15 years.
- c. Protect any historic and cultural features that are found from damage.
- d. Protect water quality and aquatic ecosystems from degradation.
- e. Assess existing remote camping sites along the shoreline of the reservoir for compatibility with the resources. Manage the remote sites to control use and environmental impacts. Close sites as necessary.
- f. Provide the opportunity for diverse recreational pursuits that are compatible with the resources. This includes maintenance of existing trails and possible expansion of trails and trail uses. Consideration will be given to the recreational experience available and desired when addressing expansion of trails and uses.

5 & 6 Northern Hardwood Forest. These areas were designated in the Fragile Areas Registry, adopted in January 1982 as the Miller Brook Cirque. As such, any activities that affect the geologic features of the designated area are discouraged. These areas consist primarily of sugar maple, yellow birch, beech, and other species associated with a northern hardwood natural community. Within GUA 5 is an extensive beech stand that is used heavily by black bears and other wildlife during years of good nut production. The Catamount Trail is also located on the north western boundary of GUA 5. The Lake Mansfield Trail to Taylor Lodge and the Long Trail runs through GUA 6.

Implementation:

- a. Manage the northern hardwoods using an unevenaged silvicultural system to maintain and improve tree health and stand structure, to maintain a continuous canopy cover and a sustainable flow of timber products. Stands will be treated on a 15- to 20-year cutting cycle.
- b. Manage softwood inclusions using an evenaged silvicultural system. Treatments will result in thinnings every 10- to 15-years to maintain growth rates and establish regeneration.
- c. Maintain 10 percent of the basal area in hard mast producing species for wildlife food. Manage beech stands to promote tree health

- and conserve their wildlife functions and values.
- d. Provide the opportunity for diverse recreational activities that are compatible with the resources.
- e. Protect any historic and cultural features that are found from damage.
- f. Protect water quality and aquatic ecosystems from degradation

7 Northern Hardwood Forest. This area is primarily northern hardwood consisting of sugar maple, yellow birch and beech. Within the area are inclusions of hemlock, red spruce and a variety of hardwoods. Along Clay Brook a series of active and inactive beaver ponds exists. These wetlands provide vegetative diversity and habitat for water dependant wildlife.

Implementation:

- a. Manage the northern hardwoods using an unevenaged silvicultural system. Stands will be treated on a 15- to 20-year cutting cycle.
- b. Manage softwood inclusions using an evenaged silvicultural system. Treatments will result in thinnings every 10- to 15-years.
- c. Maintain 10 percent of the basal area in hard mast producing species for wildlife food. Manage beech stands to promote tree health and conserve their wildlife functions and values.
- d. Protect water quality and aquatic ecosystems from degradation. Maintain the wetlands along Clay Brook as high quality wildlife habitat.
- e. Provide the opportunity for diverse recreational activities that are compatible with the resources.
- f. Protect any historic and cultural features that are found from damage.

8 Northern Hardwood Forest. This area is primarily northern hardwood consisting of sugar maple, yellow birch and beech. Within the area are inclusions of hemlock, red spruce and a variety of hardwoods. There are 10 acres of permanent grassy openings. The area has been intensively managed for timber products.

Implementation:

- a. Manage the northern hardwoods using an unevenaged silvicultural system. Stands will be treated on a 15- to 20-year cutting cycle.
- b. Manage softwood inclusions using an evenaged silvicultural system. Treatments will result in thinnings every 10- to 15-years.
- c. Maintain 10 percent of the basal area in hard mast producing species for wildlife food. Manage the beech stands to promote tree health and conserve their wildlife functions and values.
- d. Provide the opportunity for diverse recreational activities that are compatible with the resources. Activities include hiking,

snowshoeing, cross-country skiing, hunting, etc. Consideration will be given to the recreation experience available and desired when addressing expansion of trails or uses.

- e. Protect any historic and cultural features that are found from damage.
- f. Protect water quality and aquatic ecosystems from degradation.
- g. Maintain existing grassy openings to provide wildlife feeding areas and add to the diversity of the unit. The openings consist of apple orchards, old fields and log landings.

9 & 10 Northern Hardwood Forest. These areas are primarily northern hardwood consisting of sugar maple, yellow birch and beech. Within these areas there are inclusions of mixed hemlock and hardwoods, located along the brooks. In these areas there are a number of small beech stands that provide excellent fall feeding opportunities for black bear. Two black bear travel corridors have been documented along Route 108. The corridors provide linkages for movement within their range. Located at the top of the Brewster River are a series of beaver ponds. These ponds are considered significant as bear spring feeding areas as well as important habitat for other wetland dependant wildlife. In GUA 9 there is evidence of past settlement. There are a couple of cellar holes and a mill site. GUA 10 is located within the wellhead protection area for the Village at Smugglers Notch's water source. The main truck road in this area is used as part of the Smugglers Notch Resort's cross-country ski trails.

Implementation:

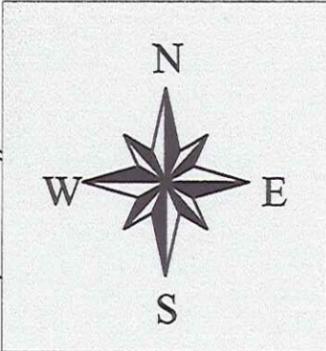
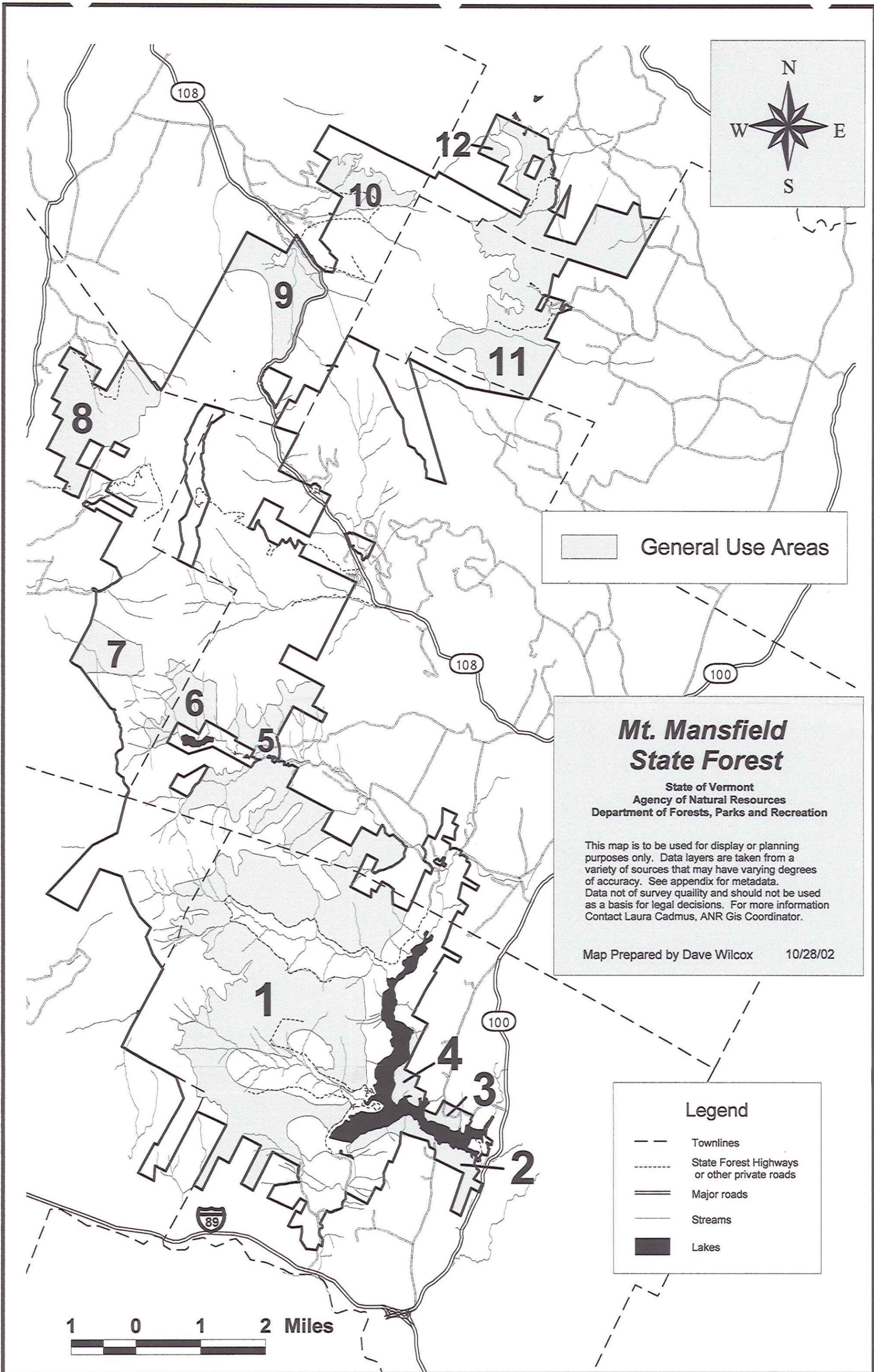
- a. Manage the northern hardwoods using an unevenaged silvicultural. Stands will be treated on a 15- to 20-year cutting cycle.
- b. Manage the softwood stands to promote the hemlock using an unevenaged silvicultural system. Stands will be treated on a 15- to 20-year cutting cycle.
- c. Maintain 10 percent of the basal area in hard mast producing species for wildlife food. Manage beech stands to promote tree health and conserve their wildlife functions and values.
- d. Protect water quality and aquatic ecosystems from degradation. Maintain the wetlands at the headwaters to the Brewster River as high quality wildlife habitat.
- e. Protect the bear travel corridors.
- f. Protect any historic and cultural features that are found from damage.
- g. Provide the opportunity for diverse recreational activities that are compatible with the resources.
- h. Maintain the existing truck road system. The truck roads in this Unit are gated to control vehicle access.
- i. Work with Smugglers Notch Resort to maintain the cross-country

ski trail network.

- 11 & Northern Hardwood Forest.** These areas are predominantly a Northern
12 Hardwood natural community. Small areas of Lowland Spruce and Hemlock natural communities exist in both GUAs. In GUA 11 are 5 acres of permanent grassy openings in the form of old fields and apple orchards. A VAST corridor trail is located in GUA 11. The Catamount Trail also passes through this area for a short distance.

Implementation:

- a. Manage the northern hardwoods using an unevenaged silvicultural system. Stands will be treated on a 15- to 20-year cutting cycle.
- b. Manage the hemlock using an unevenaged silvicultural system. Stand will be treated on a 15- to 20-year cutting cycle.
- c. Manage softwood inclusions using an evenaged silvicultural system. Treatments will result in thinnings every 10- to 15-years.
- d. Maintain 10 percent of the basal area in hard mast producing species for wildlife food. Manage beech stands to promote tree health and conserve their wildlife functions and values.
- e. Maintain existing grassy openings to provide wildlife feeding areas and add to the diversity of the unit.
- f. Protect water quality and aquatic ecosystems from degradation.
- g. Maintain the existing truck road system. The truck roads in this area are gated to control vehicle access.
- h. Provide the opportunity for diverse recreational pursuits that are compatible with the resources. This includes maintenance of existing trails and possible expansion of trails and trail uses. Consideration will be given to the recreational experience available and desired when addressing expansion of trails or uses.
- i. Protect any historic and cultural features that are found from damage.



General Use Areas

Mt. Mansfield State Forest

State of Vermont
 Agency of Natural Resources
 Department of Forests, Parks and Recreation

This map is to be used for display or planning purposes only. Data layers are taken from a variety of sources that may have varying degrees of accuracy. See appendix for metadata. Data not of survey quality and should not be used as a basis for legal decisions. For more information Contact Laura Cadmus, ANR Gis Coordinator.

Map Prepared by Dave Wilcox 10/28/02

Legend

- Townlines
- State Forest Highways or other private roads
- ==== Major roads
- Streams
- Lakes

1 0 1 2 Miles

Intensive Use Areas (IUA):

Intensive Use Areas are easily accessible and characterized by a high level of human activity and/or high intensity development on or adjacent to state land. Vegetative management will be directed towards aesthetic and safety considerations while lessening impacts on natural resource values. Other resources may be managed but in a compatible way with the dominant use.

On Mt. Mansfield State Forest the Intensive Use Areas represent 3,786 acres or 9% of the forest.

STATE PARKS

Management Goals:

- (1) Protect the natural and historic resources while providing high quality recreational opportunities and experiences, includes both terrestrial and aquatic resources.
- (2) Provide safe recreational facilities.
- (3) Provide recreational facilities to meet current and future needs.
- (4) Provide educational facilities and opportunities.

Management Objectives:

IUA #

- 1 Little River State Park** was built in the 1960s and consists of two areas (A and B), with loops through a mixed hardwood and softwood forest. They are located on the edge of Waterbury Reservoir and separated by Stevenson Brook. There are a total of 81 tent/trailer sites and 20 lean-tos. Three of the four toilet buildings have hot showers. The toilet building in loop B has been modified to be handicap accessible. A sanitary dump station is available, however the sites are not equipped with RV hookups. There are two swimming beaches for campers, along with a boat launch and boat rentals. There are many miles of roads and trails available for hiking in Mt. Mansfield State Forest. Some of the trails have been designated for mountain biking. Little River State Park receives on average 28,500 camper days per year with an additional 3,400 day-use visitors per year.

Within this area is a boat launch located at the Waterbury Dam, which is open to the public. There is no fee for use of this boat launch and it is open for use even if the park is closed.

The Little River area was first settled in the late 1700s. There was extensive settlement of the area that resulted in most of the land being cleared for farming or harvested to supply the local sawmills. By 1900 many of the farms had already been abandoned. The remaining farms

were purchased in the early 1900s. The Waterbury Dam was constructed in the 1930s, by the Civilian Conservation Corps. The reservoir was drained from 1981 to 1985 so repairs could be made to the earthen dam. It was drained again in 2000 for additional repairs. This work should be completed in 2005.

Implementation:

- a. Improve and update existing facilities to meet current regulatory codes and public demands. However, RV hook-ups are not considered compatible with the goals of Vermont State Parks.
- b. Convert some sites into cabins or lean-tos if demand warrants it.
- c. Protect historical and cultural features within the park.
- d. Maintain the existing park roads and trails. Consider expansion of trail uses, such as designated mountain bike trails. Possible user conflicts will be considered before new uses are designated. The park entrance road is gated to control vehicle access during the non-operational period.
- e. Maintain and improve the boat launch facility at the dam (maintained by the Department of Environmental Conservation).
- f. Manage the hemlock-hardwood forest to promote tree health and provide understory vegetation for screening between campsites.
- g. Develop and manage remote campsites on the Reservoir to control use and environmental impacts. Close sites as necessary.
- h. Develop additional educational and interpretative materials and information on the natural and cultural history of the area.
- i. Participate in the hydroelectric relicensing process to provide high quality recreational opportunities on or near the reservoir.

2 Waterbury Center State Park is located on the eastern arm of the Reservoir and sits on a 90-acre peninsula. It is one of the newest facilities within Mt. Mansfield State Forest. The park provides day recreation activities with a swimming beach, concrete boat launch, and a picnic area with charcoal grills and picnic tables. The park also offers a self-guided nature trail and boat rentals. The park receives about 20,000 visits per year.

Implementation:

- a. Improve and update existing facilities to meet current regulatory codes.
- b. Protect historical and cultural features within the park.
- c. Maintain the existing park road, parking lots and trails. The park entrance road is gated to control vehicle access during the non-operational period.
- d. Maintain the day use beach area with separation from the boat launch.

e. Maintain and improve the boat launch facility.

3 Smugglers Notch State Park is the oldest park in Mt. Mansfield State Forest. Historically, Smugglers Notch State Park consisted of a 35-site campground situated across Route 108 from the former entrance to the Stowe Mountain Resort Ski Area. The park has recently been expanded to include the state campground, the designated Scenic Highway, the Vermont State Ski Dorm, the proposed southern and northern gateways and the various recreational, geological, historical and ecological attractions (to include the Long Trail and side trails, Big Spring, Elephant's Head Scenic Vista, Sterling Pond, Smugglers Notch proper, and the picnic area). Within the park are accesses to the Long Trail and a number of side trails to the summit of Mt. Mansfield and Sterling Pond. The 72-acre Bingham Falls parcel was acquired in 2001 and is part of Smugglers Notch State Park.

Smugglers Notch State Park campground receives about 8,400 campers per year. The four campsites constructed by the CCC, in the 1930s, are listed on the National and Stat Register of Historic Places for their architectural significance relating to the CCC. The State Ski Dorm is also listed on the State Register of Historic Places.

Since there is no controlled access to the notch proper, it is hard to determine how many people travel through the notch during a season. Use of the hiking trails can be an indication of the number of people there. The Long Trail to Sterling Pond averages 12,800 hikers per year and the Long Trail to Taft Lodge averages 8,400 hikers per year. A black bear travel corridor has been documented along VT Route 108 within the Smugglers Notch State Park. The corridor provides linkage for movement within their range.

The Vermont State Ski Dorm was the longest operating ski hostel in the area. It closed to overnight guests in 1998 because it did not meet fire safety codes. The Stone Hut, located near the Octagon, is used by GMC Ranger Naturalists during the summer and available for overnight accommodations during the winter.

On May 2, 1996 the Vermont State Legislature authorized the Commissioner of the Department of Forests, Parks and Recreation "to enter into an exchange of land, whereby the state would convey a portion of its land holdings in the Town of Stowe, not to exceed 25 acres in size, which are currently part of Mt. Mansfield State Forest, and upon which the Smugglers' Notch State Park (SNSP) campground facilities are situated at present, to Mt. Mansfield Company, Inc., doing business as Stowe Mountain Resort (SMR), in exchange for a number of parcels of land SMR

owns in the Towns of Stowe and Cambridge, consisting of 1,092 acres, which have an appraised value equal to or greater than the state-owned parcel being conveyed.” At this time, a new campground across from Bingham Falls is being constructed to replace the existing SNSP. When the new campground is ready to operate the exchange will be transacted. For more information on the various exchange parcels see Appendix E.

Implementation:

- a. Improve and update existing facilities to meet current regulatory codes and public demands, to include the campground facilities, Stone Hut, Ski Dorm and parking in the notch. (Work with Stowe Mountain Resort during construction of the new campground).
- b. Protect historical and cultural features within the park. As part of the land exchange, the CCC structures in the existing campground must be relocated to the new campground.
- c. Protect black bear travel corridors.
- d. Maintain the existing park roads, excluding VT Route 108, which is a State highway and maintained by the Agency of Transportation (AOT).
- e. Maintain the Long Trail and associated side trails. The trail system will be monitored to determine if trail closings or relocations are necessary. The Long Trail north from Route 108 may be moved to the Elephant’s Head Trail to eliminate the road walk for through hikers. This relocation may require extensive work on the Elephant’s Head Trail to make it an easier hike for backpackers.
- f. Maintain the Bingham Falls parcel in an undeveloped state. No buildings will be constructed. Trails will be evaluated to determine the need for stabilization or closing. Formalize and develop trails to Bingham Falls to protect resources and for public safety.
- g. Manage the northern hardwood forest to promote tree health and provide understory vegetation for screening between campsites.
- h. Continue to be a partner in management of the Scenic Highway Corridor. Management will follow the Smugglers Notch Scenic Highway Plan, which includes development of the southern and northern gateways, and parking issues in the notch proper and at trailheads.
- i. Develop educational and interpretative materials and public information for Mt. Mansfield State Forest and its natural and cultural history.
- k. Monitor winter use of the notch and develop management strategies as appropriate.

4 Underhill State Park is located on the west slope of Mt. Mansfield near the headwaters of the Brown’s River. Facility development was initiated by the Civilian Conservation Corp in the 1930s and is cited in the National

Registry of Historic Places. There is an upper camping area, generally reserved for organized group use, and a lower camping area. Vehicle access to the upper area is restricted by a locked gate. Facilities in the upper area include nine lean-tos, a vault privy, and water supply standpipes. The park's water supply (deep well, solar array for pump power, and water storage/pumphouse control building) is located above the upper camping area, beside the CCC Road.

In the lower camping area are 11 tent sites, 6 lean-tos, a ranger station/residence, group picnic shelter, parking areas and toilet building. The toilet building has cold water and flush toilets, but no showers. The campground is not recommended for use by campers with RVs or camper trailers, in part because of the steep three-mile access road, but also because the sites are walk-in from the parking area. Most of Underhill's approximately 10,000 annual visitors (2,500 camper, 7,500 day-use) come to hike. Four trails from the park access the Mt. Mansfield summit ridge. The trails are part of the Long Trail system, and a number of loops are possible.

Implementation:

- a. Improve and update existing facilities to meet current regulatory codes and public demand.
- b. Protect historical and cultural features within the park. Management activities will follow guidelines established by the National Registry of Historic Places.
- c. Maintain the existing park roads.
- d. Maintain the trail system. The trail system will be monitored to determine if trail closings or relocations are necessary.
- e. Manage the northern hardwood forest to promote tree health and provide understory vegetation for screening between camp sites.
- f. Develop educational and interpretative materials and public information for the natural and cultural resources of the park and region.

SKI AREAS

Management Goals:

- (1) Protect the natural and historic resources while providing high quality winter and summer recreational opportunities.
- (2) Prevent soil erosion in the cleared ski trails and access roads.
- (3) Maintain high quality water resources.

It is important to note that all activities within the ski area are subject to Act 250 review.

Management Objectives:

IUA #

5 **Stowe Mountain Resort Ski Area** (SMR) is located on the east slope of Mt. Mansfield in the Town of Stowe. The original lease was developed in 1938 with the Mt. Mansfield Lift Company. The current lease runs until the year 2057. Currently the ski area encompasses 480 acres, and contains 11 lifts, 48 trails and 39 miles of skiing. Stowe Mountain Resort owns and operates the Cliff House and Octagon. They also own and operate the Toll Road, which is open from Memorial Day through October. The Toll Road allows approximately 18,000 people to access the summit of Mt. Mansfield each year. The Montane Spruce-Fir natural community is mapped as Bicknell's thrush habitat. While Bicknell's thrush is not on the state's endangered species list it does warrant special consideration because of its very specific habitat requirements and the limited amount of habitat in the northeast region.

Implementation:

- a. Review annual work plans prior to construction season.
- e. Inspect and monitor construction work to prevent erosion problems.
- f. When SMR proposes repair, replacement, or expansion of existing facilities, ANR will work closely with them to assure that the projects are consistent with the resort's master plan, that existing cultural and natural resource impacts are mitigated whenever possible and that additional impacts are avoided or minimized.
- d. Maintain high quality Bicknell's thrush habitat. This will mean no net loss of understory vegetation in this area. Clearing of new trails and glades will not be allowed in Bicknell's thrush habitat.
- e. Manage around the mapped beech stands to promote their wildlife function and values.

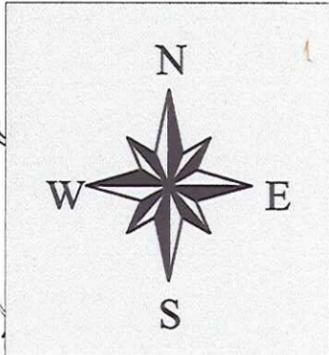
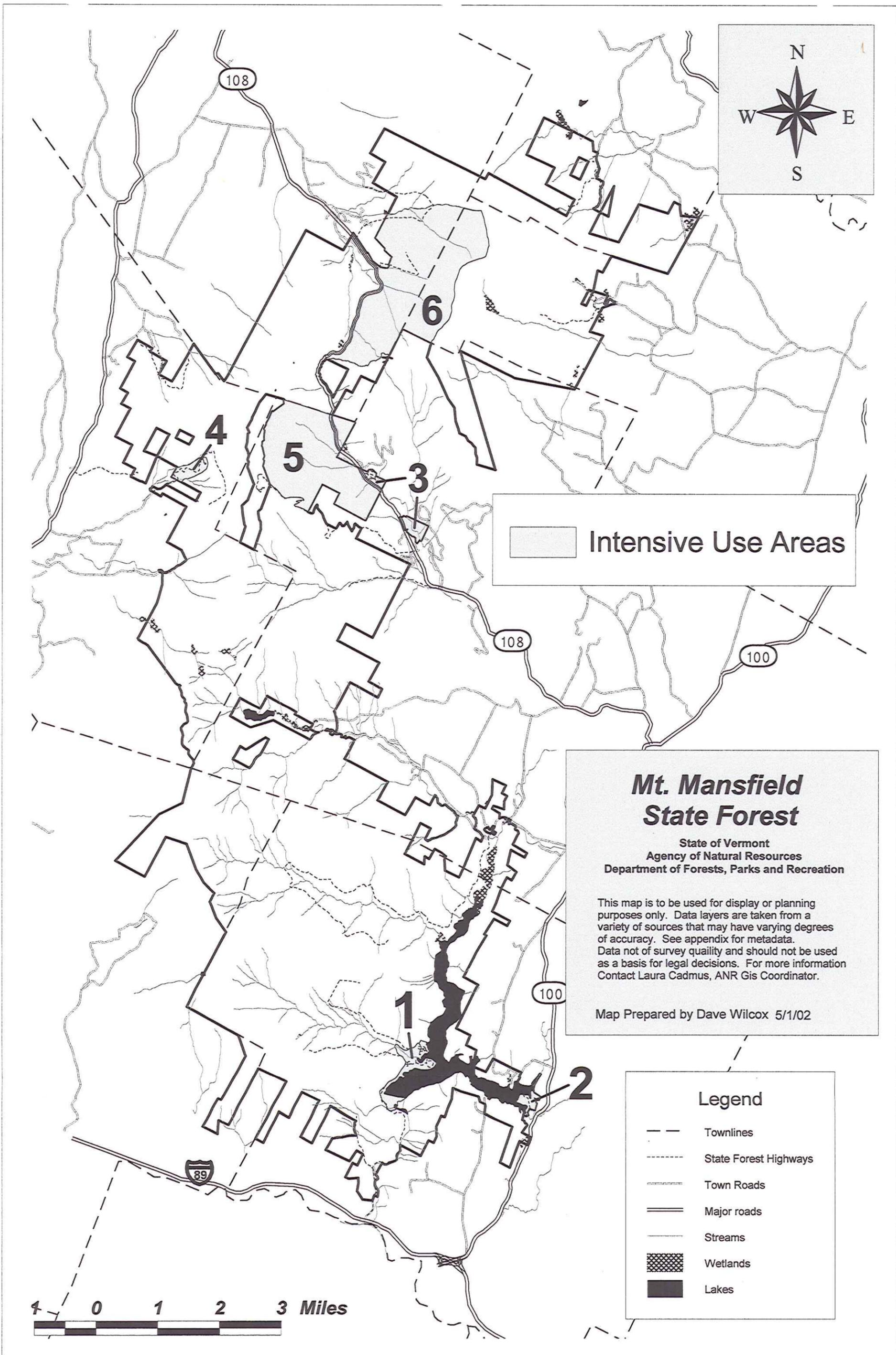
6 **Smugglers Notch Resort Ski Area** (SNR) is located on the west side of Mt. Mansfield State Forest and is north of the notch proper. The original lease started in 1956 with the Smugglers Notch Ski-Ways Corp. The current lease runs until 2058. The resort consists of 1,000 acres of terrain with 70 trails and 76 miles of skiing. The three mountains; Madonna, Sterling and Morse are all interconnected by lifts and trails. The Montane Spruce-Fir natural community is mapped as Bicknell's thrush habitat. Within this area are a number of small beech stands that are used by black bears and other wildlife species.

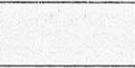
Implementation:

- a. Review annual work plans prior to construction season.
- b. Inspect and monitor construction work to prevent erosion problems.
- c. When SNR proposes repair, replacement, or expansion of existing facilities, ANR will work closely with them to assure that the projects

are consistent with the resort's master plan, that existing cultural and natural resource impacts are mitigated whenever possible and that additional impacts are avoided or minimized.

- d. Maintain high quality Bicknell's thrush habitat. This will mean no net loss of understory vegetation in this area. Clearing of new trails and glades will not be allowed in Bicknell's thrush habitat.
- e. Manage around the mapped beech stands to promote their wildlife function and values.



 Intensive Use Areas

**Mt. Mansfield
State Forest**

State of Vermont
Agency of Natural Resources
Department of Forests, Parks and Recreation

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Map Prepared by Dave Wilcox 5/1/02

Legend

-  Townlines
-  State Forest Highways
-  Town Roads
-  Major roads
-  Streams
-  Wetlands
-  Lakes

4 0 1 2 3 Miles



Water Resources

The management of Mt. Mansfield State Forest by the Department of Forests, Parks and Recreation will, at minimum, maintain the quality of all surface waters associated with the land. It is understood that agricultural and silvicultural activities that follow Accepted Agricultural Practices and Acceptable Management Practices are presumed to conform with the rebuttable presumption of compliance with Vermont's Water Quality Standards.

Managers of ANR land holdings will cooperate with the ANR's Department of Environmental Conservation, Water Quality Division's watershed planning initiatives for the Lamoille River Basin and others as they are undertaken.

The watershed basin planning effort includes the determination of the water classification and water management type of all waters located within the basin(s). Through this process the assignment of a water classification and water management type for all waters will take into consideration the existing water quality, the desired water quality, and whether or not the desired quality is attainable.

By Vermont statute, all waters above 2,500 feet in elevation are classified as A1 (water management type) and are managed to maintain their natural condition.

The goal for the water management type of waters below 2,500 feet that flow through ANR lands is of a high level (potentially B1). B1 waters are managed to maintain an almost natural condition showing minimal changes from reference conditions for aquatic macroinvertebrates and fish assemblages. Possible exceptions to B1 typing include the following:

- where water level is fluctuated for ski area water withdrawal
- where water level fluctuates due to dam bypass area
- where agricultural lands are located adjacent to waters
- situations where B1 water quality is otherwise unattainable.

On Mt. Mansfield State Forest the West Branch of the Little River, below Stowe Mountain Resort, is listed as an impaired waterway. As a result, any construction draining into this waterway will receive intense scrutiny. Skiing, hiking and other recreational trail construction will be closely monitored and controlled.

Section V Schedule of Activities for the Next 20 Years

The long-range management plan outlines in a general way how the Mt. Mansfield State Forest will be managed for the foreseeable future. Management activities to be undertaken in a particular year are detailed in the annual stewardship plan prepared by the District Stewardship Team. These are available for public review for each fiscal year beginning in June for the following July through June.

This section of the plan offers more specific details about a variety of management activities and practices that will be implemented on the forest. Some of these are of an ongoing nature, such as maintenance projects. Exactly when such projects are to be implemented often depends upon the availability of funding, which varies from year to year.

Another management activity included here is the cutting schedule for timber harvests for the next 20 years. This activity is more predictable than other activities. However, due to a variety of circumstances described in the timber sale section, harvest operations may need to be shifted a few years one way or the other. Due to the long-term durability of forests, this will have little effect on the final outcome.

Other management activities may include upgrades to existing facilities, new facilities, additions to the forest, and new demands for uses, which are unknown at this time. As these arise, they will undergo resource analysis and public review. They will then be placed in the appropriate land use classification category and managed accordingly.

The Department of Forests, Parks & Recreation is part of the Mt. Mansfield Partnership Group that also consists of the University of Vermont, Stowe Mountain Resort and the Green Mountain Club. Their goal is to work jointly to manage and protect the entire mountain including the privately owned summit ridgeline.

For management purposes, the forest is divided into smaller units called blocks, usually determined by natural features. Mt. Mansfield State Forest consists of 12 blocks. Management responsibilities are divided between District III in Essex and District IV in Barre (the Underhill and Kruse Blocks are managed by District III).

Roads

On Mt. Mansfield State Forest 42 percent of the forest is classified in the Highly Sensitive Area. The only roads in these areas are Route 108, a road into one of the VMC monitoring areas adjacent to Underhill State Park, and the Toll Road that is on a use class boundary. Any skid roads in these areas will continue to be left to grow over.

There are no plans for constructing new truck roads in any of the remaining land use classes. Maintaining the existing truck roads is an on-going process. Each year the culvert headers are cleared of leaves and other debris. Periodically the ditches are cleaned and re-established using an excavator. Culverts are repaired or replaced and the road surface is graded and graveled as needed. There are a number of bridges on various roads. The bridges will be maintained, repaired and replaced as needed. The roadsides are mowed to keep woody vegetation from growing up and closing in the roads.

There are numerous skid roads in the General and Special Use Areas that are used periodically for timber harvesting operations. When they are not in use they are closed down by waterbarring, removal of temporary water crossings, and blocking access.

Wildlife Habitat

Scattered throughout Mt. Mansfield State Forest are old fields and apple orchards. These grassy openings serve important wildlife functions for a variety of birds, mammals and reptiles. Maintaining the openings requires constant attention. These areas are mowed on a three-year schedule. Mowing occurs after August 15th to protect ground nesting birds. They may also be maintained with the use of controlled burning. The burning season in Vermont is very short and occurs before nesting begins.

The most current guidelines will be used to address management of riparian habitats, bear travel corridors, beech stands used as fall feeding areas, and other wildlife habitats. Den and snag trees will be maintained to provide habitat for cavity nesting birds and mammals.

Most of the deer wintering areas on Mt. Mansfield State Forest are mixed hemlock-hardwood stands. They are managed to promote the health of the softwood trees which enhances their ability to function as winter cover and provide hardwood browse in close proximity to the winter cover. This reduces the energy that deer will need to use in the search for food. These treatments will be accomplished as part of larger commercial timber sales included in the Timber Sale section.

| Fiscal Year | Block | Sale # | Treatment |
|------------------------|---------------|---------------|---------------------|
| 2004 | Ricker | 1 | Deer Wintering Area |
| 2009 | Blush Hill | 2 | Deer Wintering Area |
| 2013 | Blush Hill | 3 | Deer Wintering Area |
| 2013 | Woodward Hill | 4 | Deer Wintering Area |
| 2016 | Ricker | 6 | Deer Wintering Area |
| 2021 | Blush Hill | 4 | Deer Wintering Area |
| 2021 | Cotton Brook | 7 | Deer Wintering Area |

Timber Sale Schedule

The timber management goals for Mt. Mansfield State Forest include: manage on a sustainable basis; improve tree quality, vigor and species composition; improve wildlife habitat where opportunities present; maintain high standards for water quality; practice demonstration quality silviculture; maintain the high scenic quality of the Mt. Mansfield range; work with the natural community classifications to assure appropriate species composition on each site; and accommodate recreational uses where possible.

A detailed sale prescription will be prepared for each project at the time it appears in the Annual Stewardship Plan. Each block will be re-inventoried on a 10- to 20-year schedule. This timber sale schedule covers all treatments in the General and Special Use Areas. Management of wetlands, vernal pools, riparian areas, den and snag trees, bear corridors, and mast stands are implemented in each sale based on Agency of Natural Resource guidelines.

This Timber Sale Schedule is subject to change, depending on the results of more current inventories, improved silvicultural or habitat guidelines, insect and disease outbreaks, floods, wind and ice storms, exceptionally wet or snowy years, access problems, district workloads, markets, and the identification of new sensitive sites. Recognized U.S. Forest Service silvicultural guides will be used when developing stand prescriptions for timber harvests. Because forest management is a long-term proposition, shifting harvesting operations a couple years one way or the other has little effect on the final outcome. Unevenaged silvicultural practices will be the primary guide to manage the northern hardwood forest. Evenaged silvicultural practices will be used to manage the softwood plantations and maintain areas of early successional species.

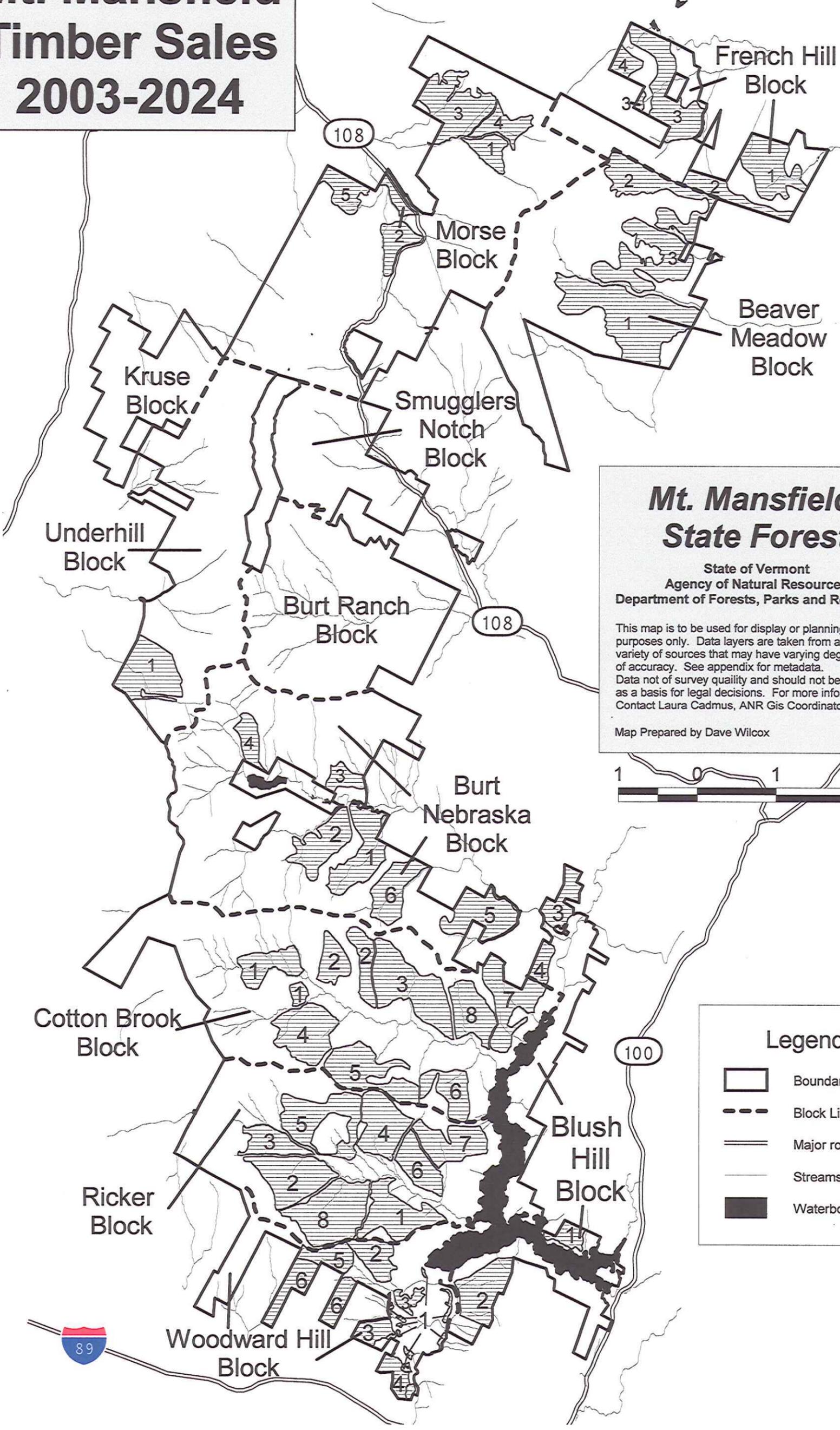
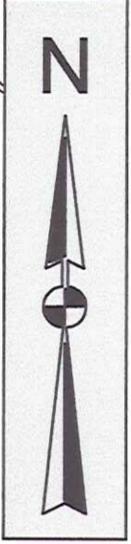
The following schedule of timber sales on Mt. Mansfield State Forest has been developed for the time period Fiscal Year 2004 through 2024.

| Fiscal Year | Block | Sale # | Treatment |
|--------------------|---------------|---------------|---|
| 2004 | Ricker | 1 | Selection |
| | Woodward Hill | 1 | Thinning |
| 2005 | Cotton Brook | 1 | Overstory Removal/Selection |
| 2006 | Burt Nebraska | 1 | Selection/Group Selection |
| | Blush Hill | 1 | Thinning/Selection |
| 2007 | Morse | 1 | Selection/Group Selection |
| | Ricker | 2 | Selection |
| | Woodward Hill | 2 | Selection/Thinning/Patch Cuts |
| 2008 | Cotton Brook | 2 | Selection/ Overstory Removal/Patch Cut |
| | Morse | 2 | Selection |
| 2009 | French Hill | 1 | Selection/Shelterwood/Patch Cuts |
| 2010 | Morse | 3 | Selection. Overstory Removal |
| | Ricker | 3 | Selection |
| | Woodward Hill | 3 | Selection/Group Selection/Overstory Removal |
| 2011 | Burt Nebraska | 2 | Selection/Group Selection |
| | Cotton Brook | 3 | Selection |
| 2012 | Morse | 4 | Selection |
| | Ricker | 4 | Patch Cuts/Thinning |
| | Beaver Meadow | 1 | Selection/Group Selection |
| 2013 | Woodward Hill | 4 | Selection |
| 2014 | Cotton Brook | 4 | Selection |
| | Ricker | 5 | Selection/Patch Cuts |
| | Underhill | 1 | Selection/Group Selection |
| 2015 | French Hill | 2 | Selection |
| | Morse | 5 | Selection |
| | Woodward Hill | 5 | Selection |
| | Beaver Meadow | 2 | Selection/Patch Cuts/Thinning |
| 2016 | Burt Nebraska | 3 | Selection |
| | Ricker | 6 | Selection/Group Selection |
| 2017 | Cotton Brook | 5 | Selection |
| | Woodward Hill | 6 | Selection |
| 2018 | Ricker | 7 | Selection/Patch Cuts |
| | Beaver Meadow | 3 | Selection |
| 2019 | Burt Nebraska | 4 | Selection |
| | Cotton Brook | 6 | Selection |
| | Woodward Hill | 7 | Thinning (Sale area 1 retreated) |
| 2020 | French Hill | 3 | Selection/Group Selection |
| | Ricker | 8 | Selection |
| 2021 | Cotton Brook | 7 | Selection |
| 2022 | Burt Nebraska | 5 | Selection |

| | | | |
|------|---------------|---|-----------------------------------|
| 2023 | Cotton Brook | 8 | Selection |
| | Ricker | 9 | Selection (Sale area 1 retreated) |
| 2024 | Burt Nebraska | 6 | Selection |

Other Operations: In addition to the above projected timber harvesting operations, stands adjacent to driveable roads may be subject to improvement thinning through the Department's Roadside Fuelwood Program at any time during the span of the management plan. Harvesting operations may also be done as part of training workshops, demonstration projects, salvage of storm or insect and disease damaged trees, removal of hazard trees in Intensive Use Areas, research studies, and maintenance and development in the ski areas. Access to state land is a problem in some areas. Therefore, some timber sales may be operated when adjacent landowners are conducting timber sales.

Mt. Mansfield Timber Sales 2003-2024

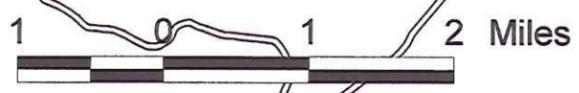


**Mt. Mansfield
State Forest**

State of Vermont
Agency of Natural Resources
Department of Forests, Parks and Recreation

This map is to be used for display or planning purposes only. Data layers are taken from a variety of sources that may have varying degrees of accuracy. See appendix for metadata. Data not of survey quality and should not be used as a basis for legal decisions. For more information Contact Laura Cadmus, ANR Gis Coordinator.

Map Prepared by Dave Wilcox 5/1/02



Legend

- Boundary Lines
- Block Lines
- Major roads
- Streams
- Waterbodies

Recreation

Management Responsibilities - Management responsibilities for recreation on Mt. Mansfield State Forest are divided between the Forestry and Parks Divisions. The Parks Division manages campgrounds, picnic areas, day use areas, buildings and other intensively use sites. The Forestry Division manages the extensive recreational opportunities such as hiking, snowmobiling, cross-country skiing, mountain biking, and primitive camping. The ski areas are the responsibility of the Department Lands Administration Section with field assistance provided by district forestry and parks staff.

There are a variety of maintenance projects that take place each year from work on trails, to the facilities in the campgrounds. It is an ongoing process. Most of the trail work on Mt. Mansfield State Forest is funded through the Vermont Recreation Trails Fund, a fund set up using gas tax receipts from non-highway sales of gasoline. There exists a huge network of trails on the forest. They include, but are not limited to, snowmobile trails, hiking trails, mountain bike trails, cross-country ski trails and combinations of these. Projects within the campgrounds and day use area include maintenance of buildings, beaches, boat launches and other associated facilities and upgrades to systems (water, sewer, electrical) that support use of the areas.

Hiking:

Work with the Green Mountain Club (GMC) to maintain the Long Trail system, reduce environmental impacts in the highly sensitive areas and around trail shelters.

Maintain other trails that are not part of the Long Trail system, ie. Trails at Little River State Park, Bingham Falls.

Monitor levels of use to identify future needs and problem areas.

Address the issue of winter parking at trailheads.

Snowmobiling:

Work with the Vermont Association of Snow Travelers (VAST) to maintain the trail network, reduce environmental and user group conflicts and provide a high quality experience.

Monitor snowmobile trail use to identify future needs and problem areas.

Address the growing demand for commercial snowmobile tour use of state lands.

Hunting, Fishing & Trapping:

Manage wildlife habitats to enhance the carrying capacity of the resource.

Open the state park campgrounds during the November deer season for

camping with self-contained RVs and campers.

Cross-country Skiing:

Work with the Catamount Trail Association (CTA) and other cross-country skiing groups to maintain the back-country trails, address issues of environmental impacts and safety.

Address the issue of winter parking at trailheads.

Mountain Biking:

Work with the Vermont Mountain Bike Advocates (VMBA) and other mountain bike organizations to address issues of trail maintenance, environmental impacts, signage, policing use, and designating new trails.

Keep mountain bike activity out of the upper elevations and other sensitive areas.

Monitor levels of mountain bike activity to identify future needs and problem areas.

Rock and Ice Climbing, Bouldering:

Monitor levels of use to identify future needs and problem areas.

Camping:

Remove hazard trees within the developed campgrounds.

Maintain buildings and facilities.

Convert tent sites to lean-tos as appropriate.

Provide areas for primitive camping.

Constructing New Trails and Recreational Facilities

Many things have changed from the time when most of the trails on Mt. Mansfield State Forest were constructed. Today construction projects for new trails must go through an extensive review process. The following are some of the issues that must be addressed before a new trail can be approved:

- § Does the parcel deed allow the activity?
- § Is the activity consistent with agency and department policies?
- § Is it compatible with the land use classification? Recreation Opportunity Spectrum (ROS) classification?
- § Are there significant resource issues? wildlife habitat; rare, threatened and endangered species; wetlands; cultural/historic, etc.
- § Are there other user group conflicts?
- § Is an Act 250 permit required? local permits required?
- § Is a storm water permit required? wetland permits?
- § Who will be responsible for construction, maintenance, signing, parking, enforcement, etc.?

A new project can take a significant commitment of time and energy from

conception to construction. Because of the district's small staff and many other responsibilities, the Department of Forests, Parks and Recreation will seldom propose a new trail or recreational facility unless it is to resolve an environmental issue, user conflict or to meet recreational needs and demands. Therefore, it will take a very committed organization or individual to get a new trail effort off the drawing board and onto the ground and take on responsibility for maintenance.

New/Unknown Recreational Uses of existing trails are always surfacing. Again they will have to go through a similar review process before use can occur.

Any organization interested in developing new trails or designating new uses for existing trails should start by contacting the State Lands Stewardship Forester in the Barre Office.

Research Activities Under the Vermont Monitoring Cooperative (VMC)

Underhill and Burt Ranch Blocks

The Vermont Monitoring Cooperative organization coordinates monitoring and research of forested ecosystems conducted by various scientists and organizations. Many studies are ongoing to monitor trends in the environment (i.e. weather, air quality, water quality, etc.) and in organisms within forests (i.e. birds, amphibians, trees, stream organisms, etc.). Other studies address specific research questions currently important to natural resource management and that can be accomplished given the natural resource features of Mount Mansfield. While the timing of implementing projects is subject to annual fluctuations in research funds, the following outlines the types of studies currently planned or implemented. Many are distributed throughout the VMC research area. Several are restricted to Underhill or Burt Ranch and are identified as such. Details are available through the VMC web site:

<http://vmc.snr.uvm.edu>

Underhill Block

This is the area currently used for the Forest Ecosystem Management Demonstration Project. Many scientists are collecting data on the forest ecosystem, economics, and social values associated with this forest. Silvicultural treatments will be conducted during the winter of 2002-2003 using both typical practices (single tree selection, group selection) and new silviculture whose goal is to accelerate development of old-growth characteristics. Results on ecological effects, silvicultural success, economic and social tradeoffs will be collected over the next five years. Tours are planned to demonstrate results to foresters, landowners and the public.

Burt Ranch and Smugglers Notch Blocks

This is the area currently used for the High Elevation Paired Watershed Study. Burt Ranch serves as the undeveloped forested watershed, and is compared to part of the Smugglers Notch Block (West Branch Watershed) where the Stowe Mountain Resort has developed ski trails, lodges, parking lots, and resort facilities. Cooperating with the Stowe Mountain Resort, permanently established stream gage stations on Ranch Brook and West Branch Brook provide a watershed framework for other VMC research on nutrient cycling, forest health, aquatic macroinvertebrates, stream water quality and sediment transport. Valuable data on the impacts of high elevation development are intended to further natural resource planning. Effects of snowmaking on hydrology and water quality should provide unique data for applications throughout the northeast.

Water Resources

In order to achieve the goals of 10 V.S.A. §1250 (Water Pollution Control) and 33 U.S.C. § et seq. (Clean Water Act), management practices on Agency of Natural Resources lands will, to the extent feasible, restore and maintain the quality of the state's waters and aquatic habitats. All management activities will conform with Vermont Water Quality Standards and Vermont Wetland Rules, and will follow guidance provided in the documents found in Appendix H.

Cooperate with the Department of Environmental Conservation, Water Quality Division on their watershed planning initiatives for the Lamoille and Winooski Rivers.

Manage waters according to their classification and typing.

Cultural Resources

Land management practices on Agency of Natural Resources lands will protect and maintain cultural and historic resources. Known cultural sites will be documented for future reference, as will new sites as they are found. As resources become available our knowledge of pre-European settlement will be improved.

Section VI

Monitoring and Evaluation

Each year the Long-Range Management Plan for Mt. Mansfield State Forest is in effect, monitoring will be conducted by the Agency of Natural Resources with the goal that state-owned resources are protected from insects and diseases, encroachments and unforeseen problems that may occur. Additionally, management activities will be evaluated to determine how closely the actual results match those projected within the plan. The Agency of Natural Resources may make recommendations for changes in planned activities to reflect the changed conditions or unanticipated results. Any major changes to the plan would be proposed as amendments and would be subject to public review and approval by the Agency's State Lands Stewardship Team and the appropriate department commissioner.

A. Forest Health

The health of the forest within Mt. Mansfield State Forest will be monitored annually by department personnel through a system of aerial observations and ground checking. Significant changes in forest conditions will be recorded and investigated by the forest protection staff. They will provide specific information on identified problems sufficient to make informed management decisions and will assist the state lands staff in formulating appropriate management strategies.

B. Natural Communities

The health of the natural communities within Mt. Mansfield State Forest will be monitored periodically. The state lands ecologist will assist in determining if changes to the natural community designation should be made. The monitoring will help determine recommendations for managing natural communities including rare, threatened and endangered species. Natural communities will also be monitored for the presence of invasive exotic plant and animal species. Recommendations will be made for possible control measures.

C. Vegetation Management

Timber harvests and wildlife management practices completed on Mt. Mansfield State Forest will be periodically monitored by the stewardship forester and district stewardship team to determine if the planned objectives are being met. If the monitoring results indicate that there is a significant difference between the outcomes predicted in the plan and the actual conditions, the Agency of Natural Resources may recommend changes.

D. Recreational Trails and Opportunities

Trails will be monitored for types and amounts of use they receive. They will be monitored for maintenance and repair needs. Work will be scheduled as needed.

E. Roads

All truck roads will be monitored to determine if erosion problems exist and when repairs to structures are needed. Recommendations will be made to make necessary repairs.

F. Water Resources and Aquatic Habitat

The water resources on Mt. Mansfield State Forest will be monitored to ensure that management objectives are attained. Monitoring will be conducted in the context of programs carried out by various departments of the Agency of Natural Resources. The Vermont Monitoring Cooperative will conduct research on a paired watershed on the east side of Mt. Mansfield to study nutrient cycling, forest health, aquatic macroinvertebrates, stream water quality and sediment transport.

Long-Range Management Plan
MT. MANSFIELD STATE FOREST

Appendix A

Special Constraints

Purchase Constraints

1. The “Burling” parcel of 2,983 acres was purchased with funds from the Vermont Housing and Conservation Board (VHCB). This parcel is to be used for agriculture, forestry, education, non-commercial recreation, open space and wildlife. No infrastructure for alpine skiing (beyond what is existing at signing) is permitted. Prior written notice of any construction consistent with permitted uses shall be provided to VHCB. These premises provide the benefit of a right-of-way for vehicular and pedestrian use. Use and location of hiking and cross-country ski trails shall be documented. There is a right-of-way across this parcel to a private lot and camp.

2. The “Sterling Valley” parcel of 500 acres was purchased with funds from the Vermont Land Trust (VLT). No right-of-ways, roads, or utility lines are permitted without permission of VLT. There shall be no disturbing of the soil or surface for gravel, sand, rocks, oil, etc. No snowmobiles or motorized vehicles are allowed, except that they may cross at marked trail crossings. Fields, orchards and pastures can be maintained along with the right to construct, maintain and repair roads for same.

Within the Sterling Valley parcel the state can use two specific areas for winter logging access upon 30 day written notice. If there is no other alternative, then the Catamount Trail easement can be utilized, however an alternate ski trail must be provided for and the easement trail restored to original condition. Also, the right to clear, construct and maintain trail crossings for walking, horseback riding, or other non-motorized activity is provided for. Prior approval is needed for timber harvesting, tent sites and rustic shelters. The Catamount Trail Association (CTA) has an easement for a 50-foot wide right-of-way across this parcel including future connecting spur and side trails. Upon mutual agreement between VLT and CTA the easement area may be relocated. CTA has the right to promote and manage the trail as a public cross country ski trail from November to April each year, and can control public access. CTA shall not restrict or limit Grantor and invitees to use trail as consistent with the purposed of the grant. CTA may locate, construct, alter, manage and maintain the trail including cutting of trees and brush within the trail corridor and for vistas. Motorized use is limited to emergency vehicles and maintenance equipment. Informational, directional, commemorative and warning signs are allowed.

3. The Kruse Block in Underhill was also purchased with VLT funds. This parcel is to be used for agriculture, forestry, education, non-commercial recreation, open space and wildlife. Prior written approval for any construction, consistent with permitted uses, is required from VLT. These premises provide the benefit of a right-of-way for vehicular and pedestrian use. There are several rights-of-way in common with others across it. Use and location hiking and cross-country ski trails shall be documented. Operation of motorized vehicles is

prohibited except for uses specifically reserved, such as maintenance, trail grooming, wildlife and forestry management.

4. The Burt Nebraska and Burt Ranch Blocks were purchased with Federal Land and Water Conservation funds (LWCF). As such the management objectives of this tract must be oriented towards recreation and all management activities shall assess the impact on recreational opportunities. Timber management activities may continue or be introduced as a secondary use if the practices are clearly described in management plans regarding specific locations.

5. The Underhill State Park camping areas were constructed using LWCF monies. As such the management objectives of this tract must be oriented towards recreation and all management activities shall assess the impact on recreational opportunities. Timber management activities may continue or be introduced as a secondary use if the practices are clearly described in management plans regarding specific locations.

6. The Alice Post parcel was also purchased with LWCF monies. As such the management objectives of this tract must be oriented towards recreation and all management activities shall assess the impact on recreational opportunities. It also included a right-of-way across the land of Walter Bennett. LWCF signs or plaques should be placed at these sites.

7. The Davison Parcel was purchased with LWCF monies. As such the management objectives of this tract must be oriented towards recreation and all management activities shall assess the impact on recreational opportunities.

8. The Lathrop parcel was deeded to the state by the Green Mountain Club (GMC). Timber harvesting is not allowed. Only low impact forestry to enhance biodiversity or old growth. Motorized vehicles, ATV's, snowmobiles, horses, etc. are not allowed on this parcel.

9. The Bolton Valley parcel was deeded to the state by the GMC. Timber harvesting is not allowed. Only low impact forestry to enhance biodiversity or old growth. Motorized vehicles, ATV's, snowmobiles, horses, etc. are not allowed on this parcel.

10. The Buttolph parcel was deeded to the state by the GMC. Timber may be cut but not within 200 feet either side of the Long Trail. Green Mountain Club permission is required for timber removal from the area between 200- to 500- feet either side of the trail. No Motorized vehicles are allowed within 500 feet of the trail. The only exception is for a snowmobile crossing of the Long Trail with GMC permission.

11. William J. Hooper swapped 102 acres of land with the state in exchange for a 10-acre parcel in 1992. Hooper excepted and reserved all mines and minerals lying on or under the land, and the liberty at all times to enter and search for mines; to carry away and take down surfaces; to dig pits and shafts; to erect buildings, construct roads, etc. He also reserved rights to all streams of water and the right to divert them.

12. The Bingham Falls parcel was deeded to the state by the Stowe Land Trust. There are no motorized vehicles, ATV's or snowmobiles allowed within this area.

Purchase Constraints Map

Other Constraints

1. The Green Mountain Club has a 99-year lease agreement and right to Beaver Meadow Lodge which expires in 2048.
2. A major constraint within a large portion of Mt. Mansfield State Forest are those rights reserved by the Green Mountain Power Corporation (GMP) as part of the transfer of land in accordance with Act 97 of 1939. Included in these are:
 - a. The exclusive right to utilize waterpower, water rights and privileges for generating power and/or water storage purposes;
 - b. The right to construct, operate and maintain a powerhouse substation or both;
 - c. The right to convert, adapt or change the dam and related structures;
 - d. The right to use any or all lands for work or construction related to the dam and related structures including the excavation of materials;
 - e. The right to use any structures for the generation of power and water storage provided that the reservoir capacity above elevation 592 feet shall be subservient to the rights of the State of Vermont to use for flood control;
 - f. The right to construct, maintain and repair lines towers, poles and related appurtenances;
 - g. The right to clear brush and/or trees as necessary which interfere with the reservoir and related structures.

Act 97 also states that GMP owns all buildings and materials placed on the property by them and is responsible for maintenance and taxes of these structures. All land above 633 feet in elevation with the Woodward Hill Block is excluded from any restrictions.

3. Paul Lyon of Waterbury, Vermont has a license for pasturing beef cattle on 25 acres of the “Ayers Place” along the Gregg Hill Road.
4. Phillip and Christine Kaiser of Stowe, Vermont have a license on six fields totaling 47 acres along the Cotton Brook and Nebraska Valley Roads for growing agricultural crops.
5. This area has been designated in the “Fragile Areas Registry”, adopted January 1, 1982 as the Miller Brook Cirque. It is the most complete geologic cirque east of the Mississippi River. No activity is allowed within this area that would affect the geologic features.

6. There is a “pent road” from the Nebraska Valley Road at Michigan Brook, through the southerly end of the Lake Mansfield Trout Club land and state land to a private inholding.
7. Marshall Faye of Stowe, Vermont has a license to pasture animals on five acres of open land.
8. This is a right-of-way (pent road) across private land to state owned land.
9. The Vermont Monitoring Cooperative has use of this area for many various research projects from 1993 to 2013. The purpose is to provide uninterrupted forest health and ecosystem monitoring and research to occur simultaneously on forested land under active and non-active management.
10. The Mount Mansfield Company has a license for the operation of a cross-country ski touring center and trail network.
11. Lyle Washer, Jr. has a license on four fields totaling 14.4 acres for the purpose of raising agricultural crops.
12. Henry and Alan Manchester of Johnson, Vermont have a deeded right-of-way to a hunting camp on private land northeast of Daniels Notch. The deed is not specific to location, but historic use has been from the “Boulley Place” along old existing roads.
13. There is a private lot located within the French Hill Block known as the “Sweet Lot” now owned by John Edwards. There is no deeded right-of-way across state land to this parcel.
14. Mark Cross of Shelburne, Vermont has a Memorandum of Understanding with the state regarding the proposed exchange of rights-of-way between his family and the state. The MOU provides for access across state land to his private land at this time.
15. Edward Lefevre of Hyde Park, Vermont has a license that provides temporary access to his private land over the same road as that of Mark Cross. The license stipulates that upon successful completion of negotiations with the state, the state will petition the Vermont Legislature for a permanent access.
16. The Long Trail traverses the entire length of Mt. Mansfield State Forest. Through a memorandum of understanding between the state and the Green Mountain Club a 500-foot buffer either side of the trail has been established. No logging is allowed within the first 200 feet either side of the trail. Between 200 and 500 feet harvesting can be done using a single tree selection method.

17. Smugglers Notch Food and Beverage Company, Incorporated, currently the Smugglers Notch Resort, has a lease for the operation of an alpine ski area through the year 2058. The lease is specific regarding use and function of the ski shelter and other facilities. Rental fees differ based on varying percentages of the gross receipts from ski area activities. Forestry related activities are allowed within the lease area so long as the activities do not interfere with ski area operations.

18. This area is designate as a well head protection area for the Village at Smugglers Notch water supply. Activities within this area must not be detrimental to the water source. Logging activities would follow the “Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont”.

19. Daniels Notch was designated as a Natural Area by the Vermont Legislature in 1996. It is a significant example of an old growth stand within the montane yellow birch-red spruce natural community.

20. This Natural Area was designated by the Vermont Legislature in 1968. This area is a montane spruce-fir and montane yellow birch-red spruce natural community. It contains many other small natural communities including boreal calcareous cliffs, boreal outcrops, open talus and sub-alpine Krummholz. Peregrine falcon nesting sites and the largest expanse of Bicknell’s thrush habitat are also found here.

21. Vermont Route 108 through Smugglers Notch proper is designated as a scenic highway corridor for 3.7 miles of its length. Activities are allowed within this area with consideration of maintaining the existing scenic, remote and pristine character of the corridor.

22. Federal Land and Water Conservation Funds (LWCF) were used to construct the many of the facilities at Little River State Park campground. This includes the caretaker’s quarters, new sewage system, campground expansion, and campground beaches, along with snowmobile trails and other trail development, and bank stabilization. General conditions of LWCF monies are:

- a. Primary use on purchased parcels must be for recreation.
- b. Structural improvements must be related to outdoor recreational use.
- c. Improvement must enhance outdoor recreation.
- d. Certain activities are prohibited on LWCF lands.
- e. Timber management practices may continue or be introduced as a secondary use if the practices are clearly described in management plans regarding specific locations.

23. LWCF monies were used in the construction of Smugglers Notch State Park campground, to include the campground trailer sanitary system and

campground water system, along with expansion of the ski shelter and parking area. General conditions are the same as listed in 22.

24. The Mount Mansfield Company, Incorporated, currently known as Stowe Mountain Resort, has a lease on 1,400 acres for the construction and operation of an alpine ski area through the year 2057. The lease refers to specific uses and functions of the state ski shelter and other facilities on state land. Rental fees differ, based on varying percentages of the gross receipts from lift tickets, restaurants, sport shops, warming shelter and state ski shelter. Other state activities with the lease area are permitted, however a sixty day notice is required if a project would impact ski area activities.

25. Smugglers Notch is designated as a National Natural Scenic Landmark, making protection to main objective in any management plan.

26. Underhill State Park was built by the Civilian Conservation Corps in the 1930s. Both camping areas are on the National Registry of Historic Places.

Other Special Constraints Map

Long-Range Management Plan
MT. MANSFIELD STATE FOREST

Appendix B

Ecological Assessment

A. Ecological Assessment

The Mount Mansfield State Forest ecological assessment was conducted using an updated version of the Department's Forest Examination protocol. It incorporates a methodology known as the coarse filter/fine filter assessment for protection of biodiversity as first developed by the Nature Conservancy. This approach first identifies examples of all natural community types at their natural scale of occurrence with the assumption that this will in turn protect most species. The life histories and distributions of many species are not known, especially for lower organisms such as fungi, bryophytes, and invertebrates. By conserving examples of natural communities that represent the full known biological variation of each community across the community's distribution range, it is hypothesized that the majority of the species for a region (both known and unknown) will be protected. This "coarse filter" approach must be implemented along with a "fine filter" that addresses specific populations of rare species, critical habitats, or other sites that are otherwise left unprotected through the coarse filter process.

1) Coarse Filter Assessment

Biophysical Region and Climate - Mt. Mansfield State Forest is located in the Northern Green Mountains biophysical region. This is a short section of the Appalachian Mountain system which extends from Alabama to the Gaspé Peninsula in Quebec. The climate in this biophysical region is influenced by the mountain themselves. Higher elevations are cooler. The summer temperatures along the ridgeline can be 20°F cooler than in the Champlain Valley to the west. The warmest temperature ever recorded at the summit of Mt. Mansfield is 80°F. The coldest winter temperatures are found on the north facing slopes.

The mountains also effect the precipitation in this biophysical region. The prevailing winds from the west are forced up over the mountains causing the air to cool. Since cooler air holds less moisture there is a higher amount of precipitation at the higher elevation. Moisture also comes in the form of clouds and fog. The average annual precipitation on the summit of Mt. Mansfield is 72 inches, which is the highest for the state.

Bedrock and Surficial Geology and Soils - Mt. Mansfield State Forest consists primarily of metamorphic rocks. The Hazens Notch Formation, a large portion of the upper elevations, is composed of graphitic rocks: phyllite and schist interbedded with dark colored quartzite and some pyrite content. The Fayston Formation is also common, consisting of schist and gneiss. These are generally acidic bedrock. However, there are some local areas which tend to be more calcareous. Talc and asbestos deposits have been reported on Woodward Mountain, as well as talc deposits near Sterling Pond.

During the last ice age, glaciers completely covered the area eroding the mountains to their current elevations. As the glaciers receded they deposited the rocks and soils. Mt. Mansfield and the adjoining mountain ridge were once an island in glacial Lake Vermont, which extended up the Winooski and Lamoille River valleys and connected in the Stowe area.

The high elevations are extensive areas of exposed bedrock, while the lower elevations are characterized by a layer of glacial till. There are areas of glacial lake sediments, primarily sand and gravel, deposited on the Forest. Much of the area around the Waterbury Reservoir consists of clay concretions that tend to be very unstable and highly prone to erosion. The Nebraska Valley, with Lake Mansfield at the headwaters, is the most complete glacial cirque on the east coast.

Hydrology/Streams/Rivers - Mt. Mansfield State Forest contains many of the headwater basins for the Lamoille and Winooski River watersheds. It is completely within the Lake Champlain Basin. There are a few natural ponds located on the Forest, namely Goose Pond, Sterling Pond, and Lake-of-the-Clouds. Most of the wetlands on the Forest are influenced by human or beaver activity.

Natural Community Types - A natural community is composed of an interacting assemblage of organisms, and the physical context—geology, hydrology, climate, natural disturbance regime, etc.— in which they occur. The 80 natural community types described in Vermont repeat across the landscape in patches of various sizes. When two or more unconnected patches occur near each other, they often function as a unit: elevation, hydrology, and geology are similar, organisms move back and forth between the patches, and natural disturbances affect them similarly. Natural community patches of this sort are considered to be a single occurrence of the natural community type. Thus, an occurrence of a natural community type may be composed of one to many patches or polygons.

Seven hundred thirty eight (738) occurrences of 35 natural community types (including variants of types) have been identified and mapped at Mount Mansfield State Forest (see Natural Community Map). A total of 513 upland natural community polygons and 225 water body polygons were mapped. Natural communities were identified through aerial photograph interpretation, systematic Forest Examination (FOREX) inventory, and collection of global positioning system (G.P.S.) data on the ground. Site visits were concentrated at forest stands for which there was no FOREX data, and for outcrop and wetland natural communities, which were unlikely to be described by FOREX. A Geographic Information System (G.I.S.) map of natural communities was produced using ArcView software. This digital natural community map is accompanied by an attribute table which describes the polygon's size, rarity of the community statewide, its quality, how the community was identified and

mapped, who made a site visit, whether a natural community assessment form was completed during a site visit, and other information.

Because some natural communities occur at very small scales (e.g., less than ¼ acre), this mapping effort is probably incomplete. Natural community mapping is an iterative process, and our knowledge improves with each mapping effort. Thus, the map presented here should not be viewed as a final statement on community distribution at Mount Mansfield State Forest; instead, it should be treated as a first attempt at describing natural communities in this area. Land managers should keep in mind that additional examples of small natural communities (e.g., Vernal Pools and outcrops) probably occur at Mount Mansfield State Forest. As subsequent inventories and site visits are conducted, this map will be improved.

Description of Natural Communities

What follows is a description of all natural community types identified at Mount Mansfield State Forest, arranged alphabetically. For most communities, the unique identifying numbers of all polygons on the map are given. If more than one polygon constitutes a natural community occurrence, this information is given. Polygon numbers are not provided for matrix (large-scale) communities, or for smaller community occurrences composed of many small polygons. A quality rank (A through D) was assigned to each natural community occurrence; these ranks are listed below only for state-significant examples of natural communities. Quality ranks are objectively assigned on the basis of occurrence size, quality, and landscape context. An A-ranked occurrence is of high quality in comparison with other occurrences of its natural community in the state, while a D-ranked example is of comparatively low quality. Detailed descriptions of these natural communities may be found in *Wetland, Woodland, Wildland: A guide to the Natural Communities of Vermont*, by Eric Sorenson and Elizabeth Thompson. Vermont's natural communities are also described by a national vegetation classification system and database maintained by Natureserve, which may be accessed at www.natureserveexplorer.org. Information may also be found in the glossary (Appendix??). A more specific report on the ecological features of Mount Mansfield State Forest prepared by contracting ecologist Michael Lew-Smith is available upon request.

Chapter 2 Alder Swamp

499,495,501,468,478,495,460

All but one of the Alder Swamps in the MMSF occur at the southern end of the property near Waterbury Reservoir or Little River in shallow depressions or in low areas adjacent to the water bodies. The canopy of tall shrubs is usually a mix of speckled alder (*Alnus incana*) and various willow species (*Salix* spp.) and can range in cover from 30-80%. Occasionally, there is a short (10m) canopy of American elm (*Ulmus americana*), black willow (*Salix nigra*) or balsam

popular (*Populus balsamifera*) over the shrub layer, but cover is sparse. The herbaceous cover is usually high, around 80-90%, and is dominated by sensitive fern (*Onoclea sensibilis*), sedges (*Carex* spp.), joe-pye weed (*Eupatorium maculatum*), and bluejoint grass (*Calamagrostis canadensis*). Moss cover is sparse or non-existent. The soils are a thin layer (½ inch) of organic peat over clay loam. The clay loam may be gleyed and usually contains many distinct mottles in the upper 6 inches. Depth of the clay loam is usually over 2 feet. In some cases the organic epipedon may be absent.

With the exception of one Alder Swamp in Smuggler's Notch (polygons 518) the Alder Swamps in MMSF are fairly disturbed, poor examples of a type that is widespread in the state. Some of them are adjacent to roads and have been impacted by them, others are adjacent to Waterbury Reservoir and are subject to altered hydrologies. Furthermore, all examples in the state forest are quite small compared to statewide occurrences. The alder swamp in Smuggler's Notch is small, but is in very good condition. It is located at the high end of the beaver flooding in a basin that includes Sedge Meadows and beaver ponds and on the upland edge is surrounded by Northern Hardwood Forest. Its position on the landscape and lack of disturbance have warranted a higher rank (B) than the other alder swamps in the forest.

Chapter 3 Alluvial Shrub Swamp

polygons 266, 269, 277, 276, 282

The Alluvial Shrub Swamps in MMSF mostly occur along the Little River north of Waterbury Reservoir. They are highly disturbed sites that have signs of past agricultural use. Some sites contain inclusions of drier areas that support a sparse tree cover of aspen (*Populus tremuloides*), white pine (*Pinus strobus*) and hawthorn (*Crataegus* sp.). The shrub swamp areas are dominated by speckled alder (*Alnus incana*) and various willow species (*Salix* spp.) with up to 50% cover. The dense herbaceous layer is typically dominated by reed canary grass (*Phalaris arundinacea*), sensitive fern (*Onoclea sensibilis*) and Joe-pye-weed (*Eupatorium maculatum*). Occasional vines of virgin's bower (*Clematis virginiana*) and river grape (*Vitis riparia*) may also be present. The soils are 2 ½ feet deep very fine sandy loams with mottles. Beneath this layer is a coarser sandy loam with gravel.

There is one example of an Alluvial Shrub Swamp at the mouth of Cotton Brook which is similar to those listed above but does not have any apparent agricultural history and shows no signs of human disturbance (polygons 522). The herbaceous layer is dominated by sedges (*Carex* spp.), sensitive fern (*Onoclea sensibilis*) and Canada goldenrod (*Solidago canadensis*). Other vegetation and soil characteristics are similar.

Chapter 4 Alpine Meadow

The Alpine Meadow is restricted to the high elevation summit of Mount Mansfield. Since most of the Alpine Meadow polygons are owned and managed by the University of Vermont and since much vegetative work has already been done in the alpine areas, no new vegetation plots were conducted during the course of this project.

The summit of Mount Mansfield contains the most extensive and diverse array of Alpine Meadow communities in the state. As mentioned below, there are some areas within polygons that are somewhat disturbed due to hiker traffic.

Because of the scale of mapping that was within the scope of this project, the polygons that are labeled Alpine Meadow on this map may also include bare bedrock outcrops and small areas of scree and talus. Any unvegetated surface and any surface that is shrub or herbaceous dominated on the summit of Mt. Mansfield above roughly 3300 feet was typed as Alpine Meadow. An effort was made to separate the Krummholz from the Alpine Meadow. In many cases, this was done successfully. In some cases, this proved impractical. There are some Alpine Meadow polygons, therefore, that contain inclusions of Krummholz communities.

Nearly all of the alpine polygons have hiking trails that run through them. As visitation to the summit increases, this disturbance is becoming less localized and more systemic. The long term damage that fragile alpine flora suffers from trampling has been well documented. Many of the trails are poorly delineated, leading to hikers often leaving the trail and trampling surrounding vegetation. Having trail stewards on the summit educating people has helped.

Chapter 5 Beaver Pond

197, 191, 203,328, 502,56, 95,96,97,99

Beaver Ponds are open water ponds associated with beaver flooding. They often contain standing dead trees from the flooding. Older ponds may harbor some aquatic vegetation such as bladderwort (*Utricularia vulgaris*) and pondweed (*Potamogeton* spp.). Most found in the forest, however, are too young or too small to support any aquatic vegetation. They are typically surrounded by Shallow Emergent Marshes and upland forest. They offer important wetland wildlife habitat within an upland matrix. See comments on the temporary nature of these communities under the Shallow Emergent Marsh description.

Chapter 6 Boreal Acidic Cliffs

Boreal Acidic Cliffs are found scattered throughout MMSF found mostly in the higher elevations of the Green Mountains. They differ from the Boreal Calcareous Cliffs not only in having more acidic substrate, but also a lower plant species diversity. The following description is taken from the cliffs in the

Nebraska Notch area (polygons 185-189). The vegetation on these cliffs is sparse. Plants are restricted to small ledges and cracks in the cliffs where a small amount of soil has collected. Common plants include: Virginia polypody (*Polypodium virginianum*), shining clubmoss (*Lycopodium lucidulum*), fragile fern (*Cystopteris fragilis*), harebell (*Campanula rotundifolia*), and hemlock parsley (*Conioselinum chinense*). Scattered calcareous lenses in the bedrock may give rise to small populations of calcium-loving plants (calciphiles) such as Steller's cliffbrake (*Cryptogramma stellari*) and green spleenwort (*Asplenium viride*).

There are many examples of this community in MMSF that were not visited. Since the underlying bedrock is predominantly acidic in nature, these sites were typed as Boreal Acidic Cliffs. If field visits to these sites reveals a significant component of calciphiles, the sites may be best placed in the Boreal Calcareous Cliff community.

Boreal Acidic Cliffs at the south-western end of Sunset Ridge, just south of Sunset Ridge and south west of the forehead of Mt. Mansfield.

EO# 007, 008, 009

A rank

Polygons 628, 638, 639 and 641, 577, 580, 581, 593, 594, 606, 608, 609, 612, 618, 619, 624, 625, 627, 632 and 707

These cliffs are fairly extensive, higher elevation cliffs that are unique in that some of them support alpine flora. Some of the cliffs (mostly the lower elevation examples) have yet to be explored. All are state significant sites.

Boreal Acidic Cliffs above Lake Mansfield.

EO# 013

A rank

polygons 235-238 and 240

These cliffs are typical acidic cliffs with a little sign of calcareous influence. The cliffs northwest of Lake Mansfield were surveyed for rare plants. Three clumps of *Huperzia appalachiana* were found. Aspect is northwest. See EO form for species list.

Boreal Acidic Cliffs in Nebraska Notch

EO# 011

A rank

polygons 185-189

These cliffs are good examples of the type and contain a small amount of calcareous rock. Some of them harbor populations of rare plants and a nesting site for Peregrine Falcons.

Boreal Acidic Cliffs at White Rocks above the Beaver Meadow in the Beaver Meadow Block of MMSF

EO# 010

A rank
polygons 61-63

Boreal Acidic Cliff north west of the Mansfield summit.

EO# 012

A rank
polygons 115

Chapter 7 Boreal Calcareous Cliffs

The Boreal Calcareous Cliffs in MMSF are found in Smuggler's Notch and near the summit of Mt. Mansfield. The cliffs in Smuggler's Notch are some of the best examples of this community found in Vermont. There has been extensive botanical and ecological work done on these areas. No further information, therefore, was gathered as part of this mapping project. For more information on these cliffs, contact the Nongame and Natural Heritage Program.

This community is very similar to the Boreal Acidic Cliff community and differs only in substrate and abundance of calcium loving plants (calciphiles). There are many cases where acidic bedrock may contain a small lenses of calcium rich rock and therefore support calciphiles in low abundance. At what point these situations are then labeled Boreal Calcareous Cliffs has yet to be determined. Much work still needs to be done in order to determine the ecology of the plants and the nature of the substrates in question.

For the purposes of this project, the Boreal Calcareous Cliff community was reserved for those sites that contained significant populations of calciphiles. Sites that contained only scattered populations of calciphiles (often in low abundance) were typed as Boreal Acidic Cliffs.

The vegetation in Calcareous Cliffs maintains a tenuous hold on to the cliffs in many areas. This and the fragile nature of the substrate make these areas susceptible to serious disturbance. The cliffs in Smuggler's Notch are especially vulnerable because they are the focus of a lot of tourist activity.

Boreal Calcareous Cliffs in Smuggler's Notch

EO# 001

A rank

Polygons 156, 111, 110, 532, 533, 109, 106, 103,102

Boreal Calcareous Cliffs at and near the summit of Mt. Mansfield

EO# 014

A rank

Polygons 644, 650, 662, 663, 670 and 149

Chapter 8 Boreal Outcrop

Boreal Outcrops are found throughout MMSF on mid-elevation knobs and high elevation summits. The most extensive information on this community was taken from the outcrop on Woodward Hill (polygons 372). See description below. This community is most abundant in MMSF in the area just below the lower elevational limits of the Alpine Meadow community. This occurs along sunset ridge and west of the forehead of Mt. Mansfield. No vegetation data was taken in these sites but from cursory observation, spruce and fir trees form a sparse canopy and the herbaceous vegetation is similar to other boreal outcrops but with the potential of an alpine element. The bedrock is generally acidic and the slopes are mostly south west. As with most boreal outcrops, the soils are fragile. This series of polygons contains hiking trails through them.

Three boreal outcrop communities in MMSF were not visited. Polygon #139 is quite large and deserves a site visit by an ecologist (EO# 008). Polygons 127 and 128 are probably similar to the outcrops near Sunset Ridge (EO# 009) as they exist just south west of there.

Boreal Outcrop in Woodward Hill.

EO# 006

A rank

polygons 372

This is an interesting site and somewhat unique in the forest. This EO consists of one polygon with south facing slopes on the side of Woodward hill at an elevation of about 1900-2100 feet. There is about 70% unvegetated surface with the vegetation restricted to the cracks and low areas in the bedrock where soil has accumulated. There is a sparse (5%) emergent tree layer of red spruce (*Picea rubens*) and white pine (*Pinus strobus*). Shorter trees (2-5m) make up what could be called a canopy with about 20% cover. Species include red oak (*Quercus rubra*), white birch (*Betula papyrifera*), mountain ash (*Sorbus americana*), and red maple (*Acer rubrum*). A tall shrub layer of 10% cover includes mountain ash, white birch and blackberry (*Rubus alleghaniensis*). Low blueberry shrubs (*Vaccinium angustifolium* and *V. myrtilloides*) are common short shrubs. The herbaceous layer is sparse (<10%) and is dominated by poverty grass (*Danthonia spicata*) and bracken fern (*Pteridium aquilinum*). The non-vascular layer has similar cover to the herbaceous layer and is dominated by reindeer lichen (*Cladina* spp.) and haircap moss (*Polytrichum juniperinum*). The soils are shallow, usually less than 5cm deep and restricted to cracks in the bedrock and flatter areas where soil is not easily washed away.

Boreal Outcrop in Smuggler's Notch

EO# 007

A rank

polygons 101

This is a unique and interesting outcrop site that was formed by the scouring of a small stream. At the time of visit in August of 1999, the stream was but a mere trickle but the bare rock all around attests to the size and strength of this drainage during spring runoff and storm events. The stream sits in a drainage north east of the cliffs of Smuggler's Notch and must receive a fair amount of runoff from the slopes above. The bedrock has cleaved in such a way that some areas look like giant stairs; small steep cliffs (10 feet tall) alternating with flatter outcrop areas. There are scattered clumps of white birch (*Betula papyrifera*) and mountain ash (*Sorbus americana*) trees that survive the scouring. Herbaceous vegetation is restricted to the cliff faces and small flatter areas where soil has accumulated. Common herbs include bluebell (*Campanula rotundifolia*) and poverty grass (*Danthonia spicata*). Bryophytes are found on the outcrop and along the stream and include *Grimmia* sp., *Bartramia pomiformis* and *Polytrichum strictum*. Overall moss cover is quite low, less than 5%.

The uniqueness of this site makes it somewhat difficult to type but it seems to fit best with the boreal outcrop community. Most of the area is actually outcrop type bedrock exposure and the flora seems to overlap with other outcrops. The disturbance regime is, however, quite different than normally seen on boreal outcrops and warrants a further in depth comparison.

Boreal Outcrop surrounded by Montane Spruce-Fir Forest northwest of the Chin.

EO# 008

polygons 139

This site was not visited, but from remote sensing looks to be in good condition and exists within as intact landscape.

Boreal Outcrop on the western end of Sunset Ridge on Mt. Mansfield.

EO# 009

A rank

Polygons 555-558, 564, 569, 572, 573, 579, 597-599, 602, 603, 605, 611, 614, 620, 633 and 643

This series of 20 polygons sit just below the elevational cutoff for the alpine meadow community. No vegetation data was taken in this EO. From cursory observation, spruce and fir trees form a sparse canopy and the herbaceous vegetation is similar to other boreal outcrops but with the potential of an alpine element. The bedrock is generally acidic and the slopes are mostly south west. As with most boreal outcrops, the soils are fragile. This series of polygons contains hiking trails through them. In order to prevent erosion and protect any fragile plant life, these trails should be well marked and hikers educated about the community and its sensitivity.

Boreal Outcrop just west of the forehead on Mt. Mansfield.

EO# 010

A rank

Polygons 135, 702, 709, 710, 712-725, 727-730 and 733-737.

This series of 27 polygons sit just below the elevational cutoff for the alpine meadow community. No vegetation data was taken in this EO. From cursory observation, spruce and fir trees form a sparse canopy and the herbaceous vegetation is similar to other boreal outcrops but with the potential of an alpine element. The bedrock is generally acidic and the slopes are mostly south west. As with most boreal outcrops, the soils are fragile. This series of polygons contains hiking trails through them.

Chapter 9 Cattail Marsh

polygons 477

There is only one occurrence of this type in the forest. It is a small 2 acre wetland adjacent to Route 100 and an old field. On the south end of the wetland the type grades into an Alder Swamp. This wetland seems fairly disturbed; it appears that it was created or otherwise effected by the construction of Rte 100.

Chapter 10 Erosional River Bluff

This series of six polygons exist on the steep slopes on either side of Cotton Brook. Unlike many Erosional River Bluffs in the state, this site has clay soils. There may also be a small amount of ground water influence in some areas. In some places, minor drainages have formed within the bluffs that drain into Cotton Brook. There are islands of treed vegetation within these polygons, but for the most part, the sites are herbaceous dominated with a fair amount of bare substrate (clay or gravel). The disturbance regime favors disturbance-loving plants such as mullein (*Verbascum thapsus*), goldenrods (*Solidago* spp.), creeping bentgrass (*Agrostis stolonifera*) and coltsfoot (*Tussilago farfara*). There are also some areas that are wetter and support hydrophytic vegetation such as Bailey's sedge (*Carex baileyi*) and wool-grass (*Scirpus cyperinus*). There are also a couple of small areas that seem almost fen-like in nature supporting such plants as sundew (*Drosera rotundifolia*), northern green orchid (*Platanthera hyperborea*), and *Aulacomnium palustre*, a moss.

These sites seem to be free of human disturbance and sit within a relatively large forested context that is unusual for the type. This landscape context, the uncommon substrate and the unique factors that are shaping this community make it significant site not only within Mt Mansfield State Forest, but within the state as a whole.

Erosional River Bluff along Cotton Brook.

EO# 001

A rank

polygons 340-342, 336-338

Chapter 11 Hemlock-Northern Hardwood Forest

Hemlock-Northern Hardwood Forests typically exist on the slopes (sometimes fairly steep) above streams and rivers where hemlock (*Tsuga canadensis*) thrives. In some cases, hemlock can exclude the hardwoods and this type can grade into the Hemlock-Red Spruce (*Picea rubens*) Forest. Canopy cover in the Hemlock-Northern Hardwood Forest is typically high, 80-95% with hemlock usually comprising the majority of the cover. Hardwoods in the canopy consist of yellow birch (*Betula alleghaniensis*), red maple (*Acer rubrum*) and beech (*Fagus grandifolia*). There is a subcanopy of the same species present in the canopy comprising anywhere from 15-40% cover. The shrub layers are likewise composed of the canopy tree species and can range from 5-30% cover. This evidence of regeneration is common with the hardwood : conifer ratio usually similar between the canopy and shrub layers. The dominant herbaceous species include intermediate fern (*Dryopteris intermedia*), hay-scented fern (*Dennstaedtia punctilobula*), and New York fern (*Thelypteris noveboracensis*). Herbaceous cover is typically quite low (<5% to 30%) underneath the sometimes dense tree canopy. Bryophyte cover is similar to herbaceous cover with common species including *Bazzania trilobata*, *Dicranum* spp., *Thuidium* spp., and *Hypnum* spp.. The soils are sandy loams or (rarely) clay loams 20-30cm deep over bedrock or loose rock (occasionally up to 70cm deep). A shallow A layer usually sits above a leached E horizon, and that above the B horizon to depth. The sites are usually moderately stony. Localized seepages are common within this community. These local wet areas support hydrophytic vegetation such as rough-stemmed sedge (*Carex scabrata*), foam flower (*Tiarella cordifolia*) and sensitive fern (*Onoclea sensibilis*).

It is common for any given polygon of this type to exhibit areas that lack hemlock and are dominated by hardwoods as well as areas that lack hardwoods. This mosaic pattern is best mapped as Hemlock-Northern Hardwood Forest because the pattern exists on a scale that is too small to accurately map.

These communities tend to have rather thin soils that may be susceptible to disturbance from large machinery.

Hemlock-Northern Hardwood Forest found around Waterbury Reservoir and Little River and in the Cotton Brook and Stevenson Brook drainages.

EO# 001

A rank

This is the largest group of polygons of this type in the forest. Most of the Hemlock-Northern Hardwood Forests in Mt Mansfield State Forest exist in this EO. Most of the information for the community description detailed above was taken from polygons in this EO.

The many polygons south of Waterbury Reservoir seem to be the most heavily disturbed of all the ones in this area. As the cover type map shows, many of the polygon in this area are not currently Hemlock-Northern

Hardwood Forest. Birch, aspen, and pioneer hardwood stands are common. The forests in the Greg Hill area (polygons 482, 481, 454, 458, 461, 464, 463, 462) and the area north of the reservoir (polygons 274,272,273,262,260) are similarly disturbed. Since these forests are currently not examples of the Hemlock-Northern Hardwood Forest, they were excluded from this EO.

The stands that surround the middle of Waterbury Reservoir are in good condition, though the best examples of this type are found along Cotton Brook and Stevenson Brook drainages. The Stevenson Brook stands include polygons 413, 410, 504, 503, 409, 407, 406, 385, 383 and 382. The Cotton Brook stands include polygons 289, 294, 293, 298, 296, 297, 301, 303, 304, 319, 318, 316, 317, 335, 343 and 346. Though these stands are not as large as the polygons along Waterbury Reservoir, they seem to be less disturbed and are in a more remote setting.

Hemlock-Northern Hardwood Forests in the French Hill area.

EO# 002

B rank

polygons 15, 28, 31,33 and 34.

This EO includes five polygons. The extent of these polygons extends beyond the state forest boundary into adjacent private land. Being near private land, some of the polygons in this EO (especially #34) are near agricultural fields and residential development. Of these five polygons, only number 34 was visited, though no vegetation data was taken.

Chapter 12 Hemlock Forests

There are relatively few Hemlock Forests in Mt. Mansfield State Forest, and the stands that are found here are typically rather small. These forests occur on steep slopes sometimes above streams and drainages where hardwoods in the canopy are few. The sites are dominated by hemlock (*Tsuga canadensis*), which can form a dense (90-95% cover) canopy. A sparse (5-20% cover) sub-canopy consisting of hemlock, yellow birch (*Betula alleghaniensis*), or beech (*Fagus grandifolia*) may also be present. The shrub layers show similarly sparse cover and include any of the tree species mentioned as well as moosewood (*Acer pensylvanicum*). The dense canopy layer usually keeps the herbaceous cover low, around 5-10%. Herbaceous diversity is likewise low, usually consisting of just a few species, intermediate fern (*Dryopteris intermedia*) and wood sorrel (*Oxalis acetosella*) being the most common species. The bryophyte layer is around 5% cover with *Bazzania trilobata* and *Hypnum* spp. dominating. The soils are sandy loams, 25-50 cm deep over loose rock or bedrock. A leached E horizon (Albic horizon) is common due to the acidity of the hemlock needles. When cover of hardwoods in the canopy increases, this type grades into the Hemlock-Northern Hardwood community.

These communities tend to have rather thin soils that may be susceptible to disturbance from large machinery.

Hemlock-Red Spruce Forest in the Blush Hill Area.

EO# 014

A rank

Polygons 425-427, 450, 470, 480 and 483

This EO contains two of the largest Hemlock-Red Spruce Forests in MMSF. It occupies the slope adjacent to Waterbury Reservoir. Bedrock outcrops are common in the steeper sections of these polygons. Small inclusions of Spruce-Fir Lowland forest are found in localized depressions.

Chapter 13 Lowland Spruce-Fir Forest

polygons 22 and 746

There are only two stands of Lowland Spruce-Fir Forest in Mt. Mansfield State Forest, one of which is considered state significant (polygons 22). Both of them occur in low elevation situations, slightly raised above an adjacent wetland, usually a conifer dominated swamp. Though vegetatively they may seem similar to the Red Spruce-Northern Hardwood Forest, their position on the landscape sets them apart. The canopy is dominated by red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*) with hemlock (*Tsuga canadensis*) appearing occasionally. Hardwoods in the canopy can be absent or present at low cover and usually consist of red maple (*Acer rubrum*) or white birch (*Betula papyrifera*). Canopy cover is typically fairly high, around 80%. A sparse sub-canopy consisting of any combination of the canopy trees is commonly present. Red spruce, hemlock, and moosewood (*Acer pensylvanicum*) make up the shrub layers which typically comprise 15-25% cover. The herbaceous layer is typically boreal in nature, being dominated by gold thread (*Coptis trifolia*), bunch berry (*Cornus canadensis*) and club mosses (*Lycopodium* spp.). These stands may contain areas where wetland vegetation like cinnamon fern (*Osmunda cinnamomea*) has colonized and become locally dominant. The soils are dark loams usually 10cm or more deep. A weakly developed hummock and hollow relief is occasionally present from tip-up mounds. These sites are typically very flat.

Lowland Spruce-Fir Forest adjacent to the Cranberry Bog near Belding Pond in the French Hill area.

EO# 004

B rank

Polygons 22

This polygon is the largest in Mt. Mansfield State Forest and the only significant example of it on this parcel of state land. It lies adjacent to the Cranberry Bog near Belding Pond and is a fairly flat site, raised slightly up from the level of the wetland. The canopy is dominated by red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*). An occasional red maple (*Acer rubrum*) or white birch (*Betula papyrifera*) is also present. Canopy cover is

fairly high, around 80%. A sparse sub-canopy consisting of the canopy trees is present. Red spruce and fir make up the shrub layers which typically comprise 15-25% cover, though in places, the fir can be denser. The herbaceous layer is boreal in nature, being dominated by gold thread (*Coptis trifolia*), bunch berry (*Cornus canadensis*) and club mosses (*Lycopodium* spp.). A weakly developed hummock and hollow relief is present from tip-up mounds. The hollows are occasionally much wetter than the rest of the forest and contain wetland herbaceous species that can become locally dominant.

There is an in holding of private property nearby, and the stand itself is only partial state owned. There is a two track road that cuts through parts of the stand, and some areas look rather young. Despite these disturbances, this site is in fairly good shape and is an interesting ecotone between the wetlands and uplands.

Chapter 14 Montane Spruce-Fir Forest

The Montane Spruce-Fir Forests in Mt. Mansfield State Forest occur along the spine of the Green Mountains. The examples of this community in MMSF are some of the most extensive, undisturbed examples found on state land in Vermont. All are considered state significant. They generally occupy elevations of 2500 ft to 4000 ft. The aspects are variable, as are the slopes which range from 5 to 30 degrees. Some areas may locally contain steeper slopes as well. The canopy is dominated by red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*), though at the higher elevations, red spruce may be replaced by black spruce (*Picea mariana*). Because of the extreme conditions in these communities, the only hardwoods present are white birch (*Betula papyrifera*), heart-leaved paper birch (*B. papyrifera* var. *cordifolia*) and mountain ash (*Sorbus americana*). Trees in the canopy range in height from 5 m to 25m depending on the site and the local growing conditions. Canopy cover is typically 70-80% though can be as low as 40%. A sub-canopy may be absent or present with up to 40% cover and consist of any of the species present in the canopy. The shrub cover is variable, ranging from 15% to 80%, though most commonly found in the lower part of that range. Species include any species present in the canopy as well as hobblebush (*Viburnum alnifolium*), mountain holly (*Nemopanthus mucronatus*) or mountain maple (*Acer spicatum*). The herbaceous layer comprises 5-30% cover and is boreal in nature, being dominated by mountain wood fern (*Dryopteris campyloptera*), bluebead lily (*Clintonia borealis*), goldthread (*Coptis trifolia*), and wood sorrel (*Oxalis acetosella*). Cover and diversity of bryophytes is very variable, ranging from 5-80% cover. In the stands with higher cover, diversity is quite high as well. Common species include *Bazzania trilobata*, *Dicranum ontariense*, *D. flagellare*, *Hypnum* spp., *Polytrichum* spp. and occasional *Sphagnum* spp.

The soils in these communities consist of a thin 1-5cm layer of organic debris over a dark A layer. Texture can be sandy loam, clay loam, or silt loam. A leached E horizon is common below the A layer from the acidic nature of the

leaf litter. A zone of accumulation (the B horizon) is usually found below the E layer. The soils are typically fairly shallow, 12-20 cm deep over bedrock or to a hardpan. Where water sits, redoximorphic features such as mottles may be present in the B horizon. Outcrops of bedrock are common in these communities, creating microhabitat for a wide range of flora and fauna not found where outcrops are absent.

Because of the slopes and the shallow soils, the soils in these communities are highly susceptible to erosion.

This community is considered one Element Occurrence because none of the polygons are separated by an ecologically significant fragmenting feature.

Montane Spruce-Fir Forest along spine of Green Mountains

EO# 010

A rank

Polygonss 6-11, 13, 71, 72, 74, 86, 105, 108, 153, 183, 195, 239, 207, 223, 345, 348-352, 358, 359, 364-367 and 369.

Chapter 15 Montane Yellow Birch- Red Spruce Forest

This community typically sits below the Montane Spruce-Fir Forest on the higher mountain slopes and on lower mountain peaks. . The examples of this community in MMSF are some of the most extensive, undisturbed examples found on state land in Vermont. All are considered state significant. The slopes are often steep, ranging 10-40 degrees and found at elevations of 1900-3100 feet. Damage from excessive winds and especially from ice is fairly common. This disturbance leads to widely varying vegetation structure depending on intensity of and time since the disturbance. In relatively undisturbed sites, the canopy cover is 75-90% and consists of yellow birch (*Betula alleghaniensis*), white birch (*B. papyrifera*), red spruce (*Picea rubens*), and an occasional balsam fir (*Abies balsamea*). White birch may be locally common, replacing yellow birch as a dominant canopy tree. In sites that have seen recent ice storm damage, the canopy species are the same, but canopy cover is much lower, usually around 30-60%. There is usually a sub-canopy comprising 10-20% cover and consisting of any of the canopy tree species. The shrub layers contain a significant amount of red spruce and balsam fir as well as smaller amounts of mountain maple (*Acer spicatum*), moosewood (*A. pensylvanicum*) and mountain ash (*Sorbus americana*). Blackberries (*Rubus alleghaniensis* s.l.) may be common short shrubs where significant ice damage has opened up the canopy. Shrub cover is typically 20-40%. The herbaceous strata is dominated by wood ferns (*Dryopteris* spp.), bunch berry (*Cornus canadensis*), whorled wood aster (*Aster acuminatus*), and bluebead lily (*Clintonia borealis*). Herbaceous cover is variable, ranging from 20-60%, but usually on the lower end of that range. The bryophyte cover is typically below

15% and consists of *Hypnum* spp., *Dicranum scoparium* and other *Dicranum* spp., *Leucobryum glaucum* and occasional *Sphagnum* spp., especially *S. girgensohnii*.

These sites are typically fairly stony, with outcropping of bedrock not uncommon. The soils are loams or sandy loams that reach 30cm in depth. A thin organic layer sits on top of a 5-6cm dark A layer. A leached E horizon is sometimes present below the A layer. The B horizon, or zone of accumulation, sits below the E (or below the A in the absence of the E layer) which reaches to the underlying rock.

Montane Yellow Birch- Red Spruce Forest

EO# 006

A rank

Polygons 87,157, 117, 118, 155, 168, 169, 182,184, 196, 225, 227, 253 and 353

Chapter 16

Chapter 17

Chapter 18

Chapter 19 Montane Yellow Birch-Sugar Maple-Red Spruce Forest

This community is a variant of the Montane Yellow Birch- Red Spruce Forest and can often be found adjacent to and grading into it. The Montane Yellow Birch-Sugar Maple- Red Spruce Forest is found at lower elevations than the Montane Yellow Birch- Red Spruce Forest where hardwoods such as sugar maple (*Acer saccharum*), red maple (*A. rubrum*) and beech (*Fagus grandifolia*) can grow. The elevation ranges of these two communities overlaps considerably depending on local environmental conditions. In some cases, these other hardwoods can colonize higher elevations if the slopes are more sheltered. The slopes that this community occupies are usually steep (15-30 degrees), though it can be found on higher elevation benches where slopes are slight. Damage from excessive winds and especially from ice is fairly common. This disturbance leads to widely varying vegetation structure depending on intensity of and time since the disturbance. In relatively undisturbed sites, the canopy cover is 75-90% and consists of yellow birch (*Betula alleghaniensis*), white birch (*B. papyrifera*), red spruce (*Picea rubens*), sugar maple (*Acer saccharum*), and beech (*Fagus grandifolia*). In sites that have seen recent ice storm damage, the canopy species are the same, but canopy cover is much lower, usually around 30-60%. There is usually a sub-canopy comprising 20-40% cover and consisting of any of the canopy tree species. The cover of shrubs ranges from 20-50%. Species composition of the shrub layer varies widely, with any of the following species sharing dominance: sugar maple, mountain maple (*A. spicatum*), moosewood (*A. pensylvanicum*), red spruce, hobblebush (*Viburnum alnifolium*), beech, balsam fir (*Abies balsamea*) and yellow birch. Blackberries (*Rubus alleghaniensis* s.l.) may be common short shrubs where

significant ice damage has opened up the canopy. The herbaceous layer ranges from 20-60% with 40% cover being common. Wood ferns (*Dryopteris* spp.), whorled wood aster (*Aster acuminatus*), bluebead lily (*Clintonia borealis*), and wood sorrel (*Oxalis acetosella*) are the most common dominants. The bryophyte layer is typically below 10% and consists of *Dicranum* spp., *Polytrichum* spp., *Hypnum* spp., and *Bazzania trilobata*. The soils consist of thin organic layer over 1-7 inches of a dark A horizon. The B horizon extends up to 24 inches deep over bedrock or loose rock. The texture can be a loam, a sandy loam or a silt loam.

The examples of this community in MMSF are some of the most extensive, undisturbed examples found on state land in Vermont. All are considered state significant.

Taken together with the Montane Yellow Birch- Red Spruce Forest, the Montane Yellow Birch-Sugar Maple- Red Spruce Forest forms a nearly continuous band at med to higher elevations along the Green Mountains. The polygons in this type are therefore all considered part of the same Element Occurrence.

Montane Yellow Birch-Sugar Maple-Red Spruce Forest

EO# 007

A rank

Polygons 2, 4, 5, 66, 70, 73, 76, 113, 136, 178, 180,181, 224, 226, 252, 255, 312, 356 and 360.

Chapter 20 Northern Hardwood Forest

The Northern Hardwood Forest is the most extensive community found in MMSF. It exists on a wide variety of soils, slopes and aspects. As such, there is great variation within the community. There are two variants that are mapped (White Pine-Northern Hardwood Forest and Yellow Birch Northern Hardwood Forest) and two that are present but are not mapped (Beech-Red Maple-Hemlock Northern Hardwood Forest and Sugar Maple-White Ash-Jack-in-the-pulpit Northern Hardwood Forest). The Northern Hardwood forest also shows variation relating to past management and land use history. There are many sites that are early successional and are dominated by early successional species.

The typical Northern Hardwood Forest (mid-late successional, not represented by any of the variants) is dominated by sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), yellow birch (*Betula alleghaniensis*) and white ash (*Fraxinus americana*). An occasional hemlock (*Tsuga canadensis*) or basswood (*Tilia americana*) can also be found in the canopy. Canopy cover is 65-90% and tree canopy height is 15-30 meters. A sub canopy of 15-50%

cover is present and composed of any of the canopy tree species as well as ironwood (*Ostrya virginiana*) or moosewood (*Acer pennsylvanica*). A tall (1-5 meters) shrub layer may be absent or present with up to 50% cover with cover in the 10-20% range most common. Typical species include hobblebush (*Viburnum alnifolium*), sugar maple, moosewood or any of the canopy species. A short shrub (<1 meter) layer is usually present at 5-20% cover and consists of any combination of the tree and tall shrub species. The herbaceous strata in the Northern Hardwood Forest ranges from 10-40% cover. Dominant species include wood aster (*Aster acuminatus*) and intermediate wood fern (*Dryopteris intermedia*). Bryophytes are sparse in this community and normally restricted to bases of trees, fallen logs and rocks. Cover is typically <5% with *Dicranum scoparium*, *Dicranum flagellare* and *Brachythecium sp.* being common. The soils are loams or sandy loams. There is typically a 1-2 inch duff layer over a dark A horizon that reaches 5 inches in depth. A reddish B horizon is sometimes present below the A horizon. In shallower soils, the B horizon may be absent. Soils are typically 4-18 inches deep though in some places may reach 2 feet in depth. Aspects are variable as are the slopes, which can range from 0-20+ degrees.

There are many sites, mainly in the Cotton Brook and Ricker Blocks that are early successional examples of the type. The canopy composition of these sites is variable. Some sites are dominated by early successional species such as trembling aspen (*Populus tremuloides*), white birch (*Betula papyrifera*) and yellow birch (*B. alleghaniensis*). Other sites are characterized by a canopy of young northern hardwood trees: sugar maple (*Acer saccharum*), red maple (*A. rubrum*), beech (*Fagus grandifolia*), or white ash (*Fraxinus americana*). In the later case, the canopy is usually dense (75%-95%) and the trees are small (5-10m tall). In the former case where early successional species are dominant, trees are taller (10-20m) and canopy is generally sparser (40-80%). There are also many sites where early successional species and northern hardwood species co-exist. A sub-canopy consisting of the canopy species can be absent or present at 20%-40% cover. The shrub layers are usually present at 5%-20% cover and are composed of sugar maple, mountain maple, hobble bush (*Viburnum alnifolium*), red spruce (*Picea rubens*), or beech. In some of the more disturbed early successional sites, species such as blackberries (*Rubus alleghaniensis*) and European bush honeysuckle (*Lonicera morrowii*) may also be present. The herbaceous layer is usually similar to the typical Northern Hardwood sites with intermediate fern, wood aster, New York fern (*Thelypteris noveboracensis*) and Canada goldenrod (*Solidago canadensis*). The soils are not different than those described above.

This community is considered one Element Occurrence because none of the polygons are separated by an ecologically significant fragmenting feature. The actual extent of this element is much larger with only the portion existing on state land currently inventoried and mapped.

Northern Hardwood Forest in MMSF

EO# 007

A rank

All Northern Hardwood Polygons.

White Pine-Northern Hardwood Forest

This variant of the Northern Hardwood Forest is found in three sites in MMSF (polygons 321, 455, 457). All appear to be similar to the Northern Hardwood forest but contain a significant amount of white pine in the canopy. All also appear to be succeeding from old agricultural land. No vegetation data was taken in these communities.

Yellow Birch Northern Hardwood Forest

There is only one mapped example of this Northern Hardwood variant in the forest (polygons 347). It sits at the headwaters of Cotton Brook and contains many small seepage areas (see description under Seep Community for more information). The canopy is mostly yellow birch (*Betula alleghaniensis*) with lesser amounts of sugar maple (*Acer saccharum*) and white birch (*B. papyrifera*). Other than canopy differences, the understory vegetation is similar to the Northern Hardwood forest.

Sugar Maple-White Ash-Jack-in-the-pulpit Northern Hardwood Forest

This variant of the Northern Hardwood Forest represents a slightly enriched condition leading to a different assemblage of species, especially herbs. These sites generally contain more white ash (*Fraxinus americana*) trees and show more vigorous tree growth compared to the standard Northern Hardwood sites. Other than usually containing more ash in the canopy, woody plant species and forest structure are similar to that of the standard Northern Hardwood Forest. The enriched condition usually expresses itself in the herbaceous layer with a greater species diversity and the presence of mineral rich indicators. In addition to the flora common in other Northern Hardwood sites, the following are present in the Sugar Maple-White Ash-Jack-in-the-pulpit Northern Hardwood Forest: maidenhair fern (*Adiantum pedatum*), blue cohosh (*Caulophyllum thalictroides*), yellow jewelweed (*Impatiens pallida*), white baneberry (*Actaea pachypoda*) and jack-in-the-pulpit (*Arisaema triphyllum*). While all of these species are common in the Rich Northern Hardwood Forest community, there were no sites found in MMSF that contained them in abundance enough to warrant including them in the “rich” type. In most cases, these herbaceous indicators were found only locally abundant, often restricted to steeper slopes or areas with more shallow bedrock. This is especially true in polygons 214 above Waterbury Reservoir just southeast of the log landing at the end of the Cotton Brook Road. This site was one of the richest found in MMSF but rich indicators were alternately

abundant and sparse within a short distance. While this site does produce some nice white ash (and even some large butternut), its overall characteristics resemble the Sugar Maple-White Ash-Jack-in-the-pulpit Northern Hardwood Forest.

Small examples of this slightly enriched Northern Hardwood forest can also be found at the base of steep slopes or between two small ridges. These areas receive runoff and nutrients from the slopes above them and may contain some indicators of mineral enrichment. Polygons 214 (see form R02) is an example of this condition in MMSF. This community may also occur on the slopes of mountains where there are localized areas of enrichment in the bedrock. The site above Waterbury Reservoir mentioned previously is one example of this situation in MMSF. Other examples include local areas within polygons 3 (see CA 82), polygons 515 (see CA 76) and polygons 214 (see CA 71). The Northern Hardwood Forest in Smuggler's Notch (polygons 3, in part) is slightly enriched from the bedrock and from colluvial forces from the slopes above. This is an interesting higher elevation example of this Northern Hardwood variant.

While none of these communities were mapped separately from the Northern Hardwood Forest in MMSF, these sites can be tracked; their presence within a particular Northern Hardwood polygon is included in the attribute table (in the comments field as "enriched inclusions"). The locations of these inclusions is listed on the Community Assessment (CA) form associated with that polygon. In addition, nearly all of the sites found were based on maps and personal knowledge of the land managers at FPR in Barre.

Beech-Red Maple-Hemlock Northern Hardwood Forest

This variant of the Northern Hardwood Forest is found in localized areas throughout MMSF. Due to the difficulty in mapping these sites, however, no sites were mapped. The canopy consists of red maple (*Acer rubrum*), beech (*Fagus grandifolia*), hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*) and white birch (*Betula papyrifera*). White ash and, in some cases, sugar maple are absent from the canopy. Herbaceous indicators of enrichment are also absent. Vegetation structure and species composition are otherwise similar to the standard Northern Hardwood Forest Community. Foresters know this variant as a Site 3 Northern Hardwood stand.

Chapter 21 Northern Hardwood Seepage Forest

polygons 752, 753, 751

The Northern Hardwood Seepage Forest usually exists within an upland Northern Hardwood forest matrix and shares many species with it. What sets the seepage forest apart is the locally wet conditions that lead to sparser tree canopy and hydrophytic herbaceous vegetation. In some cases, a slight rise or fall in topography (less than ½ foot) can be the border between these two communities. This results in the Seepage Forest being somewhat difficult to

map accurately. Many Seepage Forests have inclusions of Northern Hardwood Forests within them. In some cases, the Seepage Forests may exist only as thin bands surrounded by Northern Hardwood Forest. Also, many Northern Hardwood Forests contain small inclusions of Seepage Forests. In most cases, these Seepage Forests were not mapped because of their size and the difficulty in defining the boundaries. Very little is known about this community state-wide. The examples found in MMSF are some of the best examples of this community currently known on state land.

The canopy of the Seepage Forests is dominated by sugar maple (*Acer saccharum*) and white ash (*Fraxinus americana*) but is typically sparser than a Northern Hardwood Forest with only 50-60% cover. Tree height is typically 20 meters. In some cases, the majority of the canopy trees are found on slight hummocks (apparently old tip-up mounds). A sub-canopy of sugar maple, white ash, beech (*Fagus grandifolia*), moosewood (*Acer pensylvanicum*) and red spruce (*Picea rubens*) is also common at around 10-15% cover. A sparse shrub layer of 5-25% cover consisting of canopy tree species as well as moosewood (*Acer pensylvanicum*), hobblebush (*Viburnum alnifolium*), or elderberry (*Sambucus canadensis*) is usually present. The herbaceous flora shares some species in common with the Northern Hardwood forest, particularly on the drier hummocks. This drier flora includes lady fern (*Athyrium filix-femina*), intermediate wood fern (*Dryopteris intermedia*) and violets (*Viola sp.*) and is usually very low cover (<5-10%). Hydrophytic herbs typically dominate this strata with high species diversity and high percent cover. Cover is 80-100% and dominant species include: wood nettle (*Laportea canadensis*), silvery spleenwort (*Deparia acrostichoides*), jewel weed (*Impatiens capensis*), yellow jewel weed (*I. pallida*), nettles (*Urtica dioica*), blue joint grass (*Calamagrostis canadensis*), and rough-stemmed sedge (*Carex scabrata*). Some sites contain many mineral rich indicators and may have more in common with the Rich Northern Hardwood Forest than with the Northern Hardwood Forest community. Soils consist of a thin layer of peat over a silt loam or sand. Mottles indicating wet conditions are present. Soils can be shallow or reach >30cm in depth. Tip up mounds and fallen logs are a common site in this community because of the shallow or very wet soils. These sites are usually situated on slight (3-10 degrees) slopes.

Chapter 22

Chapter 23

Chapter 24

Chapter 25

Chapter 26 Open Talus

polygons 107, 104 and 642

There are three polygons of this community in Mount Mansfield State Forest. Two occur in Smuggler's Notch and one near the summit of Mt.

Mansfield. Most of the following vegetation description was taken from one of the sites (polygons 107) in Smuggler's Notch.

The overriding force in this community is the intermittent disturbance caused by rock slides from the cliffs above. Because of the disturbance regime, the site has not developed into a rocky Northern Hardwood Forest like that which surrounds it. Instead, it is shrub and herbaceous dominated. Tall shrubs such as balsam poplar (*Populus balsamifera*), green alder (*Alnus viridis*), and heart-leaved birch (*Betula cordifolia*) have colonized the local areas that have not seen more recent disturbance. This leads to a mosaic of shrub and herbaceous dominated areas within the same polygon. Within these areas tall shrub cover can reach nearly 100%, but overall at these sites the tall shrub cover is about 25%. Short shrubs are more common throughout the community as they tend to cling to the crevices in the rocks where soil has collected. The short shrub strata is dominated by yellow birch (*B. alleghaniensis*), raspberry (*Rubus idaeus*), meadowsweet (*Spiraea alba*), and bush honeysuckle (*Diervilla lonicera*) with cover ranging from 20% to 40%. The herbaceous cover ranges from 5% to 30% depending upon local disturbance conditions. Dominant species include: white snake-root (*Eupatorium rugosum*), Canada goldenrod (*Solidago canadensis*), harebell (*Campanula rotundifolia*), and heart-leaved aster (*Aster cordifolius*). Herbaceous diversity is fairly high with plants in the aster family and the grass family most abundant. The substrate is made up of boulders and talus sized rocks with some shallow soils collecting in the rock crevices. These soils are usually less than 1 cm thick and are coarse sands or sandy loams. The slopes are fairly steep (30-40 degrees) and aspects are variable. Because this community is maintained by disturbance, the boundary lines not only change over time but are also fairly indistinct spatially. If the areas that are dominated by tall shrubs experience another major disturbance, the site could revert back to an herbaceous dominated community. On the other hand, if the site remains free of major disturbance for a long period of time, the site could succeed to a Northern Hardwood Forest. Many areas in all states of succession can be found along the borders of these communities.

Open Talus communities below the cliffs in Smuggler's Notch.

EO# 006

A rank

Polygons 107

Open Talus communities below cliff on the east side of the summit of Mt.

Mansfield. EO# 007

A rank

Polygons 642

Chapter 27 Red Maple-Black Ash Swamp

polygons 743

This is a small but interesting swamp at the headwaters of a small stream in Mount Mansfield State Forest (polygons 743). It is not surrounded by very steep slopes and appears to receive most of the water input from ground water. There are a few indicators of groundwater input like golden saxifrage (*Chrysosplenium americanum*) but the site is otherwise lacking the indicators of enriched groundwater and the herbaceous flora is only moderately diverse. The canopy consists of red maple (*Acer rubrum*), yellow birch (*Betula alleghaniensis*) and some red spruce (*Picea rubens*) but cover is low (30-40%) and trees are relatively small. There is a sparse sub canopy of the same species that occupy the canopy. The tall shrub and short shrub layers are likewise sparse and consist mostly of red spruce. There is a nearly complete cover of herbs with cinnamon fern (*Osmunda cinnamomea*) dominating. Other abundant herbs include dwarf blackberry (*Rubus pubescens*), sensitive fern (*Onoclea sensibilis*), water horehound (*Lycopus uniflorus*), and jewel weed (*Impatiens capensis*). The bryophyte layer covers only about 30% but is surprisingly diverse, with about 20 different species found in the releve plot. The dominant mosses are *Rhizomnium magnifolium*, *Calliergon cordifolium*, and *Sphagnum girgensohnii*.

The edges of the swamp, especially on the downstream end are typically a little wetter than the rest of the swamp. Because of this they harbor a slightly different flora than the rest of the swamp. Standing water is common throughout the swamp in the hollows, which are wide and occupy most of the wetland. Cinnamon fern hummocks are also present and contain some of the drier herbaceous species. Overall, the swamp seems fairly wet and the hollows mucky. The peat is over 12 feet deep and contains woody and sedge fibers. The pH is 5.9 and the conductivity is 30 microsemens.

This is a very interesting, albeit small, headwater swamp. Being nestled in the heart of the Green Mountains and surrounded entirely by Mount Mansfield State Forest, its landscape context is excellent.

Red Maple Black-Ash Swamp at the headwaters of a tributary of Cotton Brook
EO# 052
C rank
polygons 743

Chapter 28 Red Spruce-Hardwood Swamp

polygons 757, 526, 92, 755, 37 and 745

There are three examples of intact Red Spruce-Hardwood Swamps in the forest (polygons 757,526,92) as well as three examples of successional Red Spruce-Hardwood Swamps (polygons 755, 37, 745). The latter three were Red Spruce-Hardwood Swamps that were flooded out by beaver and are now in

varying states of succession. Of the intact Red Spruce-Hardwood Swamps, polygon 92 is state significant. Polygon 526 and 757 are in very good condition but are rather small (<5 acres). The Red Spruce-Hardwood Swamps are dominated by a mixture of balsam fir (*Abies balsamea*), red spruce (*Picea rubens*) and red maple (*Acer rubrum*). Occasional hemlock (*Tsuga canadensis*), and birch (*Betula alleghaniensis* and *B. papyrifera*) trees may also be present. Canopy cover is 60-85%. A sparse (<20% cover) sub-canopy may also be present and contain any of the canopy tree species. The tall shrub strata is dominated by red spruce, hemlock, red maple or balsam fir and comprises 10-35% cover. Short shrubs may either be absent or present up to 60% cover, depending on the site. Where short shrubs are present, red spruce and yellow birch dominate. The herbaceous layer is typically fairly diverse with cinnamon fern (*Osmunda cinnamomea*), sensitive fern (*Onoclea sensibilis*), and sedges (especially *Carex crinita* and *C. scabrata*) dominating. The bryophyte strata is diverse and fairly abundant in this wetland community, with a 10-50% cover range. Peat moss (*Sphagnum centrale*, *S. girgensohnii*), *Thuidium* spp., *Hypnum* spp., and *Brotherlla recurvans* are common dominants.

There are two different ecological situations that result in the formation of this community in Mt. Mansfield State Forest. Polygons 526 and 757 both exist in low lying basins that are ground water influenced. Here, the soils are sapric peats (20inches) over clay or deep peats(> 3 feet). Hummock and hollow relief may be well developed and these sites may be lacustrine in origin. Polygon 92 exists on the side of a slight slope and is the result of seepage from the slope above coupled with a dense hardpan. The soils are 10 inches of sapric peat over the dense hardpan of coarse sandy loam. The different ecological conditions result in slightly different floras, mainly expressed in the herbaceous and bryophyte strata.

Red Spruce-Hardwood Swamp southwest of Morses Mill near sewage treatment plant.

EO# 016

C rank

Polygons 92

Red Spruce-Northern Hardwood Forest

The community occurs throughout the forest on mountain slopes and lower elevation peaks usually below 2200 feet. In some cases the stands reach up to 2500 feet but rarely higher. The aspects are variable and the slopes range from 3-30 degrees. The canopy is characterized by a mixture of hardwoods and conifers with typical canopy cover around 60-80%. Common canopy species include red spruce (*Picea rubens*), sugar maple (*Acer saccharum*), paper birch (*Betula papyrifera*), and yellow birch (*B. alleghaniensis*). White birch is a common species in these forests perhaps because disturbance, either from wind throw, ice storm damage or logging, is common. In the stands that have

experienced recent disturbance, canopy cover of 30-40% is typical. A sub-canopy comprising 15-40% cover and consisting of any of the canopy species as well as beech (*Fagus grandifolia*) and balsam fir (*Abies balsamea*) is usually present. Shrub cover is variable, ranging from 15-60% depending on the site, recent disturbance and canopy cover. Typical species include mountain maple (*A. spicatum*), moosewood (*A. pennsylvanicum*), red maple (*A. rubrum*), beech, hobblebush (*Viburnum alnifolium*) and red spruce. The herbaceous flora is usually species poor. Intermediate wood fern (*Dryopteris intermedia*), shining clubmoss (*Lycopodium lucidulum*), Canada may flower (*Maiathemum canadense*), hay-scented fern (*Dennstaedtia punctilobula*) and wild sarsaparilla (*Aralia nudicaulis*) typically make up the majority of the cover, which ranges from 15-30%. In one case, herbaceous cover was 70% (polygons 261) this may be related to the fact that this stand is much lower in elevation than most of the other stands sampled. The bryophyte strata is sparse with usually less than 5% cover.

The soils in this community consists of 1-2 inches of an organic layer over 2-6 inches of a dark loam. Depending on the site, the soils may be loams, silt loams, sandy loams or clay loams. A leached E layer is typically absent from these sites, though sometimes an incipient E horizon can be found. The B layer is a reddish loam. Depth of the soil ranges from 15 to 24 inches deep, These soils are usually well drained, though some sites that were visited were moderately well drained (polygons 153, 325, 370). These sites showed a clay loam hardpan around 16 inches deep and some exhibited mottles in the soil that are more typical in wetland soils. The flora in these sites are not noticeably different from those sites that are well drained.

The canopy flora in the Red Spruce-Northern Hardwood Forest is very similar to the montane forest types, especially the Montane Yellow Birch-Sugar Maple- Red Spruce Forest. The Red Spruce-Northern Hardwood Forest can be distinguished from the montane types by the landscape position (mainly elevation) and the understory flora. Where the elevations of these types overlap, the communities grade into one another.

Red Spruce-Northern Hardwood Forest on the northern end of Mount Mansfield State Forest in Morristown and Johnson.

A rank

EO# 001

polygonss 16,18-21,24,25, 48-52, 54, 55, 57-60, 64

This group of polygons contains the best examples of the Red Spruce-Northern Hardwood Forest in the state forest. Most of these stands are lower elevation sites that tend to be flatter and has a more diverse herbaceous layer than the sites at higher elevation. These stands seem to be more related to the Northern Hardwood Forests that surround them, whereas the higher elevation stands of Red Spruce-Northern Hardwood Forest are more closely related to the montane types. Of these sites, only polygons 54 was visited, though no vegetation data was taken.

Red Spruce-Northern Hardwood Forests on the slopes of Mt. Mansfield, Sterling Mountain and Madonna Mountain.

B rank

EO# 002

polygons 1, 80-83, 88-90

With the exception of polygons 1, these sites are good representations of the higher elevation variety of this type. They are situated on the western slope of the Green Mountains (Mt. Mansfield, Sterling and Madonna Mountains) at 2000'-2800'. The sites higher on the mountain (especially polygons 82) probably grades into the Montane Yellow Birch-Sugar Maple- Red Spruce Forest.

Red Spruce-Northern Hardwood Forest west of Sunset Ridge

B rank

EO# 003

polygons 123

This polygon sits on the bottom knob and slope of Sunset Ridge. It ranges from 1600-2300 in elevation and at 137 acres, it is one of the largest polygons of this type in the forest. This site was not visited during the field work of 1999-2000.

Red Spruce-Northern Hardwood Forest in the basin of Lake Mansfield and the surrounding slopes.

B rank

EO# 004

polygons 201, 204, 209, 213, 217, 220-223, 232, 241

None of these sites were visited so little is known on how they compare with the general description given below.

Red Spruce-Northern Hardwood Forest east of Mount Mayo in Mount Mansfield State Forest.

B rank

EO# 005

polygons 254, 256

These sites were pulled out as being different from the Montane Yellow Birch-Sugar Maple-Red Spruce Forest that surrounds them from the aerial photography and the orthophotos. However, I did not get a chance to visit them to determine if they are in fact different and for what reason. These sites should be visited by an ecologist in order to clarify the differences between these two types and hopefully gain insight into their relationship with one another. A general description of the Red Spruce-Northern Hardwood Forests found elsewhere in the Mount Mansfield State Forest is given below.

Red Spruce-Northern Hardwood Forest in the Stevenson Brook basin and Woodward Hill area.

B rank

EO# 006

polygons 325, 330, 331, 354, 355, 362, 370, 371, 374, 375, 380, 381, 386-388, 405, 411

This particular group of polygons occurs on slopes ranging in elevation from 1300-2300 feet. Polygons 325 is the site of a large wind throw disturbance with a very open canopy (20%) and a significant sub-canopy (40%). Polygons 330 and 331 are both successional sites, one of them (330) the site being managed with strip cuts. Polygons 370 just north of the Woodward Hill outcrop is dominated by white birch with significant amounts of red spruce and sugar maple in the sub-canopy and shrub layers.

River Sand or Gravel Shore

polygons 521

There is only one mapped example of this type in the forest, though many more smaller examples undoubtedly exist. It is a sparsely vegetated riverside community that sits along Cotton Brook near its entrance to Waterbury Reservoir (polygons 521). The substrate is a mixture of sand, gravel and cobble stones. The cobble stones (<10cm) dominate, making up 60% cover for this site. Larger rocks (>10cm) comprise 20% cover. Vegetation is sparse. There is a slight (3%) short shrub layer of balsam poplar (*Populus balsamifera*) and black willow (*Salix nigra*). Herbaceous cover is similarly sparse and comprised of species common in disturbed habitats including coltsfoot (*Tussilago farfara*), evening primrose (*Oenothera biennis*), horseweed (*Conyza canadensis*) and goldenrods (*Solidago* spp.). Ice scouring in the winter and high rains during spring runoff and storm events keep the community sparsely vegetated. Given the gravel and stone substrate, this site is well drained during low water periods.

River Sand or Gravel Shore along Cotton Brook near Waterbury Reservoir

EO# 002

B rank

Polygons 521

Sedge Meadow

polygons 65, 198, 469.

The Sedge Meadows found in MMSF are not necessarily typical examples of the type state wide. All examples of this community here occupy shallow basins where beaver have created wetlands in the past. Only sites that appear to be somewhat stable and have significant areas dominated by sedges were included in this type. This type can often be found with and can grade into the Shallow Emergent Marsh community. The Sedge Meadow type is dominated by

sedges, usually common tussock sedge (*Carex stricta*) or bladder sedge (*C. vesicaria*). Other graminoids such as bluejoint grass (*Calamagrostis canadensis*), hairgrass (*Agrostis hyemalis*), and hoary sedge (*C. canescens*) may also be present. In most cases, the sedges form a dense canopy and thatch layer which maintains a low cover of forbs. The few forbs found in these habitats include marsh St. John's-wort (*Triadenum fraseri*), spotted touch-me-not (*Impatiens capensis*) and sensitive fern (*Onoclea sensibilis*). A short shrub layer may be absent or present with low (<10%) cover and consist of meadowsweet (*Spiraea alba* or *S. tomentosa*) and birch (*Betula papyrifera* or *B. alleghaniensis*). The bryophyte layer is very variable depending upon the site; it can be <5% where the thick thatch layer inhibits colonization or nearly 90% in more open examples. In either instance, peat mosses are dominant and include *Sphagnum girgensohnii*, *S. russowii*, *S. squarrosum*, and *S. papillosum*. *Polytrichum strictum* and plants in the Mniaceae are also common. The substrate is deep sapric peat. In some cases a layer of fibric peat may exist over the sapric peat.

Any community associated with beaver influenced basins are subject to natural fluctuations in water level. These examples of Sedge Meadow may be successional to shrub swamps and eventually forested swamps or upland forests in the long term. On the other hand, more flooding by beavers could revert the site to a beaver pond.

While none of the example of Sedge Meadows in MMSF are state significant, two of them (Polygons 65 and 198, described below) are locally significant and should be managed accordingly.

The best example of this type in MMSF is the beaver meadow in the Beaver Meadow Block (polygons 65). This is a fairly extensive basin dominated almost entirely by tussock sedge. There is very little sign left of the beaver that initiated this wetland. Some areas within the basin are a little drier and colonized by hairgrass (*Agrostis sp.*) and along the northern edge, shrubs seem to be recolonizing the area.

Another interesting example of this type is in one of the wetland basins in the Nebraska Notch area (polygons 198). This site sits at one end of a basin that still contains an open beaver pond. The sedge dominant here (bladder sedge, *C. vesicaria*) tends not to form dense tussocks with thick thatch layers like tussock sedge. This coupled with the other environmental conditions present result in a dense carpet of peat moss and other mosses forming. This site is currently showing signs of succession: the Sedge Meadow is slowly colonizing the open water and the drier parts of the Sedge Meadow are being colonized by yellow birch seedlings.

The Sedge Meadow site on the south shore of Waterbury Reservoir (polygons 469) is the least impressive of the Sedge Meadows in MMSF. It is a small thin band that is influenced by the unnatural water level fluctuations of the reservoir.

Seep

polygons 744, 322 and 323

Only three examples of this type are mapped on the natural community map. None of them are very typical seeps, however, as they have previous land use histories that appear to have effected them. None of these three are therefore considered state significant. One of them (polygons 744) is located near an old foundation and has a old apple tree within it. There is a slight (10%) tall shrub layer of this old apple tree and Bebb's willow (*Salix bebbii*). Short shrubs occupy 25% cover and consist of meadow sweet (*Spiraea alba*) and red maple (*Acer rubrum*). Herbaceous cover is 90% and is dominated by sensitive fern (*Onoclea sensibilis*), wood horsetail (*Equisetum sylvaticum*) and purple stemmed aster (*Aster puniceus*). There is a sparse (5%) bryophyte layer with *Sphagnum* spp., *Thuidium* spp., and *Drepanocladus* spp.. The soils are 3-4 inches of peat over rock and gravel. This is an interesting and surprisingly floristically diverse site.

The other two polygons of this type (polygons 322, 323) have a dense (80%) cover of meadow sweet and blackberry (*Rubus alleghaniensis*) short shrubs. The herbaceous layer consists of 70% cover and is comprised of Canada goldenrod (*Solidago canadensis*), purple stemmed aster, long-hair sedge (*Carex crinita*) and grass-leaved goldenrod (*Euthamia graminifolia*). There is a low (10%) cover of bryophytes, mainly *Aulacomnium palustre*. The soils are 5 inches of organic soil mixed with gravel over a dense, gleyed basal till. While these are only three examples of this type, small localized seeps are found throughout MMSF. These seeps are herbaceous dominated with herb cover 50-70%. Common herbs include rough-stemmed sedge (*Carex scabrata*), slender manna grass (*Glyceria melicaria*), golden saxifrage (*Chrysosplenium americanum*) and jewel weed (*Impatiens capensis*). Bare soil, and many stones at the soil surface are common. There is typically a thin layer of organic soil over mineral soil or a dense hardpan.

The small size and inability to locate seepages remotely makes them difficult to map. Many of the seeps in MMSF are most likely state significant examples of this community. These sites are also important because they provide significant habitat for amphibians and, in some cases, a significant food source for bears in the spring. While locating these sites was not within the scope of this project, an effort should be made to map this community in MMSF. At the very least, this should entail foresters obtaining a GPS location when seeps are located during the process of conducting their ordinary work.

The fragile, wet soils of these sites make them susceptible to significant damage from heavy machinery.

Shallow Emergent Marsh

polygons 200,190, 741,47, 37,748,459,471,474, 202, 36, 467, 739, 740

There are fourteen polygons typed as Shallow Emergent Marsh scattered throughout the forest. All but one occur in localized depressions along stream courses and are the site of past or, in some cases present, beaver activity. This is a rather loosely defined type that is very variable depending on the local history of beavers in the basin, the topography, soils, surrounding vegetation and the type and energy of the stream that runs through it. The sites are invariably dominated by herbaceous vegetation, though there may be a sparse short shrub layer of yellow birch (*Betula alleghaniensis*), meadow sweet (*Spiraea alba*), steeple bush (*S. tomentosa*) and brambles (*Rubus* spp.). Cover of the shrub layer is dependent upon the state of succession that the particular site is in. Shrubs also tend to be more common near the edges of the basin. In some cases, trees may be creeping into the site from the surrounding uplands and any tree species from the surrounding forest may be present. The herbaceous layer usually exhibits high cover (80-100%) and a high degree of variability. It is usually dominated by graminoids such as sedges (*Carex* spp.), rushes (especially *Juncus effusus* and *J. brevicaudatus*), and grasses including bluejoint grass (*Calamagrostis canadensis*), manna grass (*Glyceria* spp.), and rice-cut grass (*Leersia oryzoides*). Forb cover is low to moderate and typically consists of sensitive fern (*Onoclea sensibilis*), goldenrods (*Solidago* spp.), spotted touch-me-not (*Impatiens capensis*), and water horehound (*Lycopus americanus*). Forb diversity is highly variable depending on the site. The soils may be either deep peat or peat over fine sand or clay. The depth and nature of the peat varies depending on the site. The subsoil is usually saturated or shows signs of a high water table.

There are a few Shallow Emergent Marshes in MMSF that are worthy of noting. Among those are the wetlands in the Nebraska Notch area (especially polygons 202 and 190). These sites are unique in hosting a wide variety of sedge species as well as a diverse array of peat mosses and other bryophytes. The floristic diversity in these wetlands is important as is their role in providing wetland wildlife habitat within an upland matrix.

The most significant and interesting Shallow Emergent Marsh in MMSF occurs in Smuggler's Notch. It is surrounded by Northern Hardwood Forest on the upland edges and interspersed with open water beaver ponds and small areas of Sedge Meadow within the basin. The a high diversity of herbs and bryophytes and its interesting landscape position make this site unique.

Being associated with the activity of beavers, these wetlands are dynamic in nature. If a particular site is without beavers for a long period of time, the site may succeed to a forested community only to be flooded out again when the beavers move back in. Given these natural fluctuations, these communities are somewhat ephemeral. One can therefore only draw tentative boundary lines around these communities. It may be enough to know that a particular basin is beaver influenced and could contain any number of

wetland plant communities depending on the nature of the site at that time. The particular boundary lines within the basin have less importance, at least in the long term.

Subalpine Krummholz

There are relatively extensive areas of Subalpine Krummholz in MMSF, all of them associated with the high elevations of Mt. Mansfield (elevations greater than 3000 ft.). This community seems to be more prevalent on the windward (west) side of the mountain than on the leeward side. Sites that contain krummholz on the leeward side often have very steep slope that could support only alpine meadow or krummholz communities. This assemblage of Krummholz polygons on Mt. Mansfield is one of the most extensive and significant found in the state. As mentioned in the Alpine Meadow community description, an effort was made to separate the krummholz from the alpine meadow polygons. In many cases, this was done successfully. In some cases, this proved impractical. There are some krummholz polygons, therefore, that contain inclusions of alpine meadow communities. Under the scope of this project, no new vegetation plots were conducted in the Subalpine Krummholz.

Subalpine Krummholz on the summit of Mt. Mansfield
EO# 001
A rank

Successional Floodplain Forest

polygons 265, 270, 271, 275 and 281

This is a series of five polygons that are currently leased as hayfields in the floodplain of Little River in Stowe.

Vernal Pool

polygons 749, 750 and 531

Three vernal pools were found in MMSF, all of them in the French Hill area. All of them were fairly small (50-200m²) and surrounded by Hemlock-Northern Hardwood Forest or Northern Hardwood Forest and all of them are considered state significant. The pools had a nearly complete cover of canopy trees from the surrounding forest. Vegetation in the pools is sparse (<10%) and consists of scattered plants of sensitive fern (*Onoclea sensibilis*), manna grass (*Glyceria melicaria*), spotted touch-me-not (*Impatiens capensis*) and lady fern (*Dryopteris intermedia*). Bryophytes are similarly sparse and restricted to fallen logs or stones within the vernal pool. Common bryophytes include *Thuidium* spp., *Calliergon cordifolium*, and *Rhizomnium magnifolium*. The soils consists of a 2-10 inch thick layer of organic peat over silt or clay loam. Like Seeps,

Vernal Pools are difficult to find because they cannot be detected very well remotely. All three examples found were discovered by chance and all three are considered to be state significant examples of this community.

Vernal Pool in French Hill Block east of the power lines near the state boundary
EO# 044
Polygon 749.

Vernal Pool in French Hill Block west of the road on the eastern slope of Caper Hill.
EO# 045
Polygon 750.

Vernal Pool along trail that leads to the pond at the head of Mud Brook, near shelter.
EO# 046
Polygon 531

NATURAL COMMUNITY MAP

2) Fine Filter Assessment

Rare, Threatened, and Endangered Species – Many of Vermont’s rare, threatened, and endangered species and natural communities have been documented on Mount Mansfield. Most of these records are from the state owned lands, but some are also from the portion of the summit owned by the University of Vermont.

Extremely rare natural communities (those ranked S1 by the Nongame and Natural Heritage Program, with five or fewer high quality occurrences known statewide) occurring here include Alpine Meadow, Alpine Peatland (found only on University of Vermont land adjacent to the state forest and natural area), and Subalpine Krummholz. Very rare communities (those ranked S2, occurring infrequently in Vermont, or covering a small area overall) include Boreal Calcareous Cliff, Erosional River Bluff, Open Talus. Rare to uncommon communities (those ranked S3, and having restricted distributions statewide) present are Montane Spruce-Fir Forest, Lowland Spruce-Fir Forest and Montane Yellow Birch-Red Spruce Forest.

At least four plant species that formerly occurred on Mount Mansfield have now disappeared from this station, and, in some cases, from the state altogether. At least 37 extremely rare plant species (ranked S1, and usually with five or fewer populations documented statewide) occur at Mount Mansfield State Forest. Ten rare plants (ranked S2, and generally known from six to 20 sites statewide) and one uncommon plant (ranked S3, and generally known from more than 20 sites statewide) have been documented here. Many of these rare elements thrive in the high elevation habitats that are well represented at Mount Mansfield, but are rare or absent throughout the rest of the state. Many rare animals also occur on the mountain. Of these, one is extremely rare, four are rare, and one is uncommon. A few of these animal species are discussed below.

Bicknells Thrush Nesting Habitat (Description/Significance): MMSF supports some of the largest nesting populations of Bicknells Thrush in the state. The habitat is characterized as high elevation spruce/fir krumholz habitat (above 1800 feet elevation). Some of this habitat has been degraded due to the development of ski trails and associated infrastructure on state lands leased to Stowe Mountain Resort and Smuggler’s Notch Resort. A comprehensive conservation plan may be needed to properly address the ecological needs of this and other species of high elevation nesting songbirds (e.g., boreal chickadee). Due to the dramatic decline in Bicknell’s Thrush populations, it is imperative to ensure the continued presence and integrity of existing nesting habitat for this species.

Peregrine Falcon Nesting Habitat (Description/Significance): Three (3) nest sites on ledge habitat exist on MMSF and are utilized by nesting

peregrine falcons. In recent years, nesting success at the Smuggler's Notch nest site has been good. These sites are identified on the wildlife habitat map as well as the necessary buffer zone to avoid disturbance to nesting peregrine falcons. These are considered critical habitats to the survival of this species in the State of Vermont and require vigilant protection from disturbance, both physically, and indirect disturbance from recreationists.

Critical Wildlife Habitats – A number of critical habitat elements were located and mapped on Mount Mansfield State Forest (see Wildlife Habitat Map). These features are discussed below.

Black Bear Habitat:

Black bears are an important component of the ecology of the Mount Mansfield range, and Mount Mansfield State Forest in particular. While the population of bears that utilize and rely on the lands of MMSF is not known, the character and quality of habitat for black bears indicates a high capacity for the local bear population. MMSF hosts two ski resorts, Stowe Mountain Resort and Smugglers Notch Resort. The growth and development associated with these commercial enterprises, combined with the relatively heavy pressure on the state forest from other recreationists and surrounding development poses significant risks for maintaining the long-term viability of the bear population in this area.

Black bears, among many other species of wildlife, provide great value to the users of MMSF. Some people are fortunate enough to observe a bear roaming in the forest, or crossing a road, while others receive great satisfaction by simply knowing that there are bears in the area. Bear hunting is a traditional activity enjoyed by some in the area. Bear hunting is highly regulated and controlled in such a way as to provide for this interest by allowing the public use of a renewable natural resource, as is done with deer, moose, and other species of hunted wildlife.

1. *Bear-scarred beech stands:* There are currently 27 different areas where concentrations of American beech trees are used on a regular basis by black bears as an important source of food and nutrition. Beech trees produce nuts that are high in fat and calories. They are a very important source of food and nutrition for bears, and directly affect bear survival and cub production. The beech stands currently identified and inventoried range in size from 2 acres to 150 acres. There are likely other areas of beech stands used by bears that are not yet mapped. These areas will be identified over time, mapped and recorded in the database for MMSF. All applicable conservation and management considerations for this habitat will be applied. It is important to

retain the viability of these beech stands and their remote character. Further, it is important to promote nectria resistant trees within a beech stand, and to encourage beech regeneration. Dense understory cover is also important to afford bears security to access the beech stands. Bears are susceptible to human disturbance, particularly during the fall when feeding in beech stands.

2. *Spring feeding habitat – Forested wetlands:* The Mount Mansfield range is not an area that is rich with wetlands. Rather, there are very few wetlands in this area, and those that have been identified tend to be relatively small, forested wetland habitat. Current information identifies 8 separate wetlands that provide suitable habitat for use by black bears as spring feeding areas. All of these are located on the north and west side of the range. The Agency's inventory of forested wetlands in this area is somewhat limited. There may be other wetlands that are not identified on the wildlife data layer for these lands. Future inventory efforts should work to expand the database on these habitats.
3. *Travel Corridors:* There are 4 primary, documented travel corridors used by black bears within the MMSF. These corridors are identified in the database as a ½ mile stretch along Route 108 and 1000 feet away from the road. This delineation is based on the Vermont Fish and Wildlife Department's Black Bear Habitat Evaluation and Mitigation Guidelines. These areas are used by bears on a regular basis to move within the forested range of Mount Mansfield. They tend to be areas with dense vegetative cover along a bend in the road, and are often associated with a stream drainage basin. These corridors are used repeatedly by bears (bears seem to demonstrate fidelity to these linkage habitats). They allow bears, and other animals, to move within the range, access important feeding habitats, allow the dispersal of subadults, and ensure genetic diversity by avoiding the isolation of populations.

Some of these corridors are not located on MMSF, but have been conserved through Act 250 proceedings with Stowe Mountain Resort and Smuggler's Notch Resort.

4. *Core remote forest habitat:* Black bears also require large blocks of relatively remote, undeveloped habitat to meet their life requisites. While MMSF provides very important core forest habitat for bears and other wildlife (wide-ranging carnivores, forest-interior nesting songbirds), parts of it are also rich with roads, trails, and a myriad of human activities. It will be critical in the future to ensure that existing unfragmented forest habitat in MMSF is not fragmented with trails, roads, etc.

Deer Wintering Habitat:

Description and Significance: White-tailed deer are at the northern extreme of their range in Vermont, and require deer winter habitat to survive. This is composed of softwood cover, typically with an East, South or West aspect. Deer winter habitat on MMSF is isolated in the southeast portion of the property. This habitat occurs in large patches around Waterbury Reservoir and its drainages. This habitat is absolutely critical for the survival of deer in this area and must be managed in accordance with Vermont Fish and Wildlife Department Guidelines. Parts of the deer winter habitat are also associated with significant natural communities, so conservation in those areas of overlap should take a hands-off approach.

Wetland Habitat:

Description and Significance: As mentioned above, MMSF and the surrounding area do not support a wealth of wetland habitats. Therefore, those wetlands that are on MMSF are of regional significance and may support unique wetland functions for the region. The largest and most diverse wetlands on MMSF are located at the north end of Waterbury Reservoir and on the northwest side of Smugglers Notch to the south of route 108. The Waterbury reservoir wetland provides habitat for waterfowl, wading birds, shorebirds, wetland dependant furbearers (e.g., beaver, mink, otter), moose, deer, a myriad of songbirds, amphibians and reptiles. The Smugglers Notch wetland also provides feeding habitat and summer thermal refuge for bears as well as other large mammals. These wetlands are uncommon on the MMSF landscape and should be afforded a very high degree of protection from disturbance.

Early Succession Habitat (including soft mast habitat):

Description and Significance: Most of MMSF is composed of mature forest cover and high elevation spruce/fir habitat. However, there are several types and stages of early succession habitat that are widely distributed within MMSF. These habitats consist of historic apple orchards, log landing areas from past timber harvest activities, fields in the lowlands around the north end of Waterbury Reservoir, and various stages of young, regenerating hardwood habitat. These habitats serve important wildlife functions and values including, but not limited to breeding, nesting, brood rearing, feeding, and migration habitat for American woodcock, chestnut sided warbler, ruffed grouse, and grass snake.

3) Other Quality of Habitat Concerns

Non-native Species - Exotic species can pose a threat to biodiversity and natural community health. They can also affect silviculture and other management considerations. Many non-native plant species have been documented here, but few pose significant risks to ecological integrity or other values on the state forest. One site visited, an old logging road in Smugglers Notch used by a commercial trail riding business, had significant populations of weedy, invasive plants. Most of these were transported to the site by horses, and some pose a threat to wetlands in the area.

Weedy plant infestations could become a problem anywhere human impacts are high. Therefore, land managers should be aware of the potential for weed problems on the summit of Mount Mansfield, where many rare and fragile species and communities are found.

Core Forest - MMSF provides several large blocks of remote, undeveloped forest habitat that serve a variety of important wildlife related functions. These functions include: (1) important habitat for wide-ranging carnivores such as black bears, bobcats, and fisher; and (2) important nesting habitat used by forest-interior songbirds. Due to the fact that MMSF is located within a rapidly developing landscape, is easily accessed by the state's largest population center (Chittenden County) these areas of remote, unfragmented, undeveloped forest habitats are highly significant for their ecological values, particularly related to wildlife. These areas can serve as source population habitats for some songbirds, raptors, and large mammals. They also provide refuge habitat from human disturbance as well as from highly adaptable mammalian predators such as raccoon and skunk that exploit highly fragmented habitats.

WILDLIFE HABITAT MAP

**Long Range Management Plan
MT. MANSFIELD STATE FOREST**

Appendix C

Recreation Assessment

Recreation Overview

The Mt. Mansfield State Forest is located in Chittenden, Lamoille and Washington Counties, the three fastest growing counties in Vermont. The parcel is within a 45-minute drive of Chittenden County, the most densely populated area in the state, less than three hours from the Montreal metropolitan area and within a day's drive for more than 30 million people in southern New England and the mid-Atlantic states. The accessibility of this parcel to so many people, the location of Vermont's highest point atop Mt. Mansfield in this parcel, and the many outstanding recreational opportunities available here contribute to the relatively high use of this state forest when compared with other state lands.

Mt. Mansfield is the historic center of the development of the outdoor recreation and tourism business that Vermont is so famous for. Being Vermont's tallest mountain, Mt. Mansfield has always attracted entrepreneurs who wanted to bring the breathtaking scenery and back-country experience to tourists and Vermont citizens. These entrepreneurs constructed a road to the summit of Mt. Mansfield, built major hotels both at the bottom and top of the Mountain, constructed a road through the difficult terrain in Smugglers Notch, cleared hiking trails that ran the ridge line and eventually connected from Massachusetts to Canada, built both cross-country and downhill ski areas. A primary contributor to the development of the recreation industry in Mt. Mansfield State Forest was the Civilian Conservation Corps (CCC). Beginning about 1933 the CCC built the dam at Little River creating the 800 acre Waterbury Reservoir. They constructed campgrounds at Underhill and Smugglers Notch, constructed the first ski trails in Vermont, as well as numerous buildings such as the Ski Dorm and Stone Hut. The importance of the CCC in early recreation related development cannot be overestimated.

Today the Mt. Mansfield State Forest hosts a wide variety of high quality recreational activities ranging from three State Parks (Little River, Smugglers Notch and Underhill), three boat launches, canoe access and a day use area on Waterbury Reservoir, two World class downhill ski areas (Stowe Mountain Resort and Smugglers Notch Resort), a cross-country ski center and miles of back-country trails. These trails include a section of the Catamount Trail, the historic Long Trail, one of the State's premier snowmobile trail networks, and mountain bike trails. In addition, the Forest features a National Scenic Highway through Smugglers Notch, a toll road to the summit of Mt. Mansfield, many hunting and fishing opportunities and a wide variety of surrounding tourist attractions and accommodations.

The Mt. Mansfield State Forest is also unique in its ability to provide a wide variety of outdoor recreational experiences. Within this single 40,000 acre parcel you can experience the social hustle and bustle of the ski resorts, the remote characteristics of Beaver Meadow, the historic charm of the Ricker Basin and the remote undeveloped shoreline at the north end of Waterbury Reservoir.

The Mt. Mansfield State Forest is also surrounded by many other important outdoor recreation based facilities. These include, the Bolton Valley Ski Area, the Trapp Family Lodge, the Lake Mansfield Trout Club and many inns, restaurants, lodges and hotels in Stowe and Cambridge.

Today it is estimated that Mt. Mansfield State Forest attracts over a million visitors a year who come to enjoy the wonderful scenery and partake in the many outdoor experiences available. With the increasing popularity of outdoor recreation come many challenges of balancing use with the capabilities of the natural resources. This analysis outlines in more detail the many recreational opportunities available and assesses the challenges and conflicts for future management.

History of Recreation Development

Over the past 20 years the Barre District has been compiling a history of recreational development on Mt. Mansfield State Forest covering the time period from 1700 to 2000. This document briefly summarizes significant events by year such as "1847 – Halfway House Trail constructed up Underhill side of Mt. Mansfield". This history outline is continually being updated and corrected as new information is discovered. Anyone wishing a copy should contact the District Office.

Recreation Overview Map

Recreation Opportunity Spectrum

Recreation Opportunity Spectrum (ROS) is an inventory and assessment process designed to focus on the character of experiences a recreational user can expect to find on a parcel of land. Developed by the US Forest Service in the western United States, this system has been adapted for use in the eastern United States. Use of the system will result in the public being given consistent messages on the types of recreation experiences to expect in various areas, regardless of being on State or Federal lands.

There are six ROS categories developed for New England. The categories range from the highly developed (urban) to the undeveloped (primitive). The characteristics used to map these ROS categories are based on 1. the physical setting – remoteness, size of the area and evidence of humans, 2. the social setting – the amount and type of contact between individuals and groups, and 3. the managerial setting – the amounts and kinds or restrictions placed on people's actions.

There are four ROS categories found on Mt. Mansfield State Forest.

- 1. Semi-primitive non-motorized areas** are characterized by a predominantly natural or natural-appearing environment of relatively medium to late size, at least 1,000 acres. Interactions between users is low, but there is often evidence of other users. There is a moderately high probability of experiencing isolation from human development, use and impact. The areas are at least ½ mile from maintained roads or trails designated for motorized or mechanized use. There may be unimproved roads and skid trails within the area. Timber harvesting and vegetation management may occur on a short-term basis. Road and trail density is low. On-site restrictions and controls are present but subtle. On Mt. Mansfield State Forest the semi-primitive non-motorized areas represent 14,718 acres or 37% of the Forest.
- 2. Semi-developed natural areas** are characterized by a natural appearing environment. Evidences of the sights and sounds of people are moderate. Interaction between users may be low to moderate, but evidence of other users is prevalent. Areas are within ½ mile of improved roads. Motorized and mechanized uses may be permitted. Many timber harvesting and vegetation management practices are compatible. Road and trail density is moderate. On-site restrictions and controls are noticeable but harmonize with the natural environment. On Mt. Mansfield State Forest the semi-developed natural areas represent 22,211 acres or 56% of the Forest.

- 3. Developed natural areas** are characterized by a substantially modified natural environment. Sights and sounds of people are readily evident. Interaction between users is often moderate to high. Road and trail density is moderate. Many timber harvesting and vegetation management practices are compatible. Motorized and mechanized uses may be permitted. Structures are readily apparent and may range from scattered to small clusters that could dominate the landscape. On-site restrictions and controls are obvious and may be numerous, though they are largely in harmony with the developed environment. On Mt. Mansfield State Forest the developed natural areas represent 2,669 acres or 7% of the Forest.
- 4. Highly developed areas** are characterized by a substantially developed environment. Social encounters are expected. Facilities are designed for large groups. Designed travel ways, including roads, paths, sidewalks, trails and highways are common. On-site restrictions and controls are obvious and may be numerous. On Mt. Mansfield State Forest the highly developed areas represent 239 acres or <1% of the forest.

A summer and winter ROS map was developed for Mt. Mansfield State Forest. The changes are subtle and occur in the northern portion of the Forest. The change is based on the fact that motorized uses in the winter are restricted because roads are not plowed.

Summer ROS Map

Winter ROS Map

Getting Approval For a New Recreation Project

Historically many of the recreation trails that were built on Mt. Mansfield State Forest before 1980 occurred with little environmental review and in some cases, even without landowner permission. Today there are many hoops a recreation project needs to go through before it can be implemented. The following is a checklist the District Staff considers when reviewing a trail proposal:

- Is the activity consistent with Agency and Department policy?
- Does the parcel deed allow the activity?
- Is the activity compatible with the land use classification map?
- Are there any significant animal, plant or water issues?
- Are any permits required? Act 250? Stormwater? Wetland?
- Are there cultural or historic issues?
- Are there other user group conflicts?
- Who will be responsible for construction, maintenance, signage, parking, enforcement, monitoring?

As is evident from this list, a recreation project can take a significant commitment of time and energy from conception to construction. Most trail work on Mt. Mansfield State Forest is now funded by the Vermont Recreation Trails Grant Program, a fund set up using gas tax receipts from non-highway sales of gasoline. Any trail organization or group can compete for this funding on an annual basis. However, all projects on State Lands need to be coordinated with the District Stewardship Forester. The following is a flow chart for a typical recreation project.

- Group approaches District with project.
- Stewardship Forester reviews project for obvious problems related to the deed, Agency/Department policies, and known environmental or cultural or historic issues. If issues are identified that need more review, the club or organization proposing the project needs to arrange for experts to do an assessment.
- If the project passes this test, it is reviewed by the District Stewardship Team.
- Once approved by the District Stewardship Team, the project is added to the Annual Stewardship Plan, which is submitted for Agency review on March 1st of each year.
- After the Annual Stewardship Plan approval is received, issues such as funding and permitting are worked out.

The time frame required to get approval for a new recreation project can range from 6 months to years depending on how complicated the issues are and when the project makes it into the planning cycle. Because of our small staff and many other responsibilities, The Department of Forests, Parks and Recreation seldom puts forward a new trail project unless it is to resolve an

environmental or user conflict. Therefore, it will take a very committed organization or individual to get a new recreation project off the drawing board and onto the ground.

Developed Recreation Areas

Campgrounds

There are three state campgrounds located on Mt. Mansfield State Forest and one state campground and four private campgrounds located a short distance from the Forest. The Vermont Campground Association publishes an annual guide to Vermont campground and maintains a website at: www.campvermont.com for a listing of current information.

State Campgrounds

- **Little River State Park**, 3444 Little River Road, Waterbury, VT 05676, phone: 802-244-7103 (summer), or 800-658-6934 (Jan. to May), open mid May to October 15. Base Rate: \$15 - \$22. The Park is located in the heart of central Vermont and the southern end of Mt. Mansfield State Forest on the west shore of Waterbury Reservoir. Hiking, fishing, wildlife watching and nature interpretation all occur at the Park. The Park naturalist offers hiking, interpretive and recreation programs, visiting stonewalls and foundations that formed a 6,000-acre farming community dating back to the 1700's. Little River has 81 tent/trailer sites and 20 lean-tos. To find Little River, go ½ mile west of Waterbury on US Route 2, then 3 ½ miles north on Little River Road.

- **Smugglers Notch State Park**, 7248 mountain Road, Stowe, VT 05672, phone: 802-253-4014 (summer) or 800-658-6934 (Jan. to May), open mid May to October 15. Base Rate: \$13 - \$20. The Park is located on the Stowe side of Smugglers Notch at the base of Vermont's highest peak, Mt. Mansfield. Smugglers Notch is one of the State's designated Natural Areas. This narrow pass has 1,000-foot cliffs along VT Route 108. Access to the Long Trail and interesting rock formation are located in the Notch. While in the Notch pay attention to the sky. The eerie sound keking, the rapid aerial acrobatic, exacting flight of the Peregrine Falcon can be heard and seen. This endangered species nests in the Notch. This campground was built by the CCC in the 1930's. Smugglers Notch has 21 tent/trailer sites and 14 lean-tos. Bingham Falls is now part of Smugglers Notch State Park. This beautiful but dangerous gorge has been a major local attraction for swimmers and hikers for many years. To locate the Park, travel 9.5 miles north on VT Route 108 from the Stowe Village.

- **Underhill State Park**, PO Box 249, Mountain Road, Underhill Center, VT 05490, phone: 802-899-3022 (summer) or 800-25202363 (Jan. to May), open: mid May to October 15, Base Rate: \$13 - \$20. A quiet mountain park, Underhill is nestled halfway up the western slope of Mt. Mansfield. Four hiking trails to the summit ridge connect with the Long Trail and make this Part a great hiking destination. Underhill has a group camping area $\frac{3}{4}$ mile above the ranger station with 9 lean-tos and accommodates groups up to 70 people with pit toilets. The lower camping area has 12 tent sites and 6 lean-tos. Sites are walk-in (100 yard maximum). No RV or trailer sites. Has flush toilets, running water but no showers. To locate the Park, turn off VT Route 15 in Underhill Flats onto Pleasant Valley Road for 4 miles through Underhill Center, to Mountain Road on the right. Three mile gravel entrance road is steep and narrow in spots and is not recommended for RV's or trailers.

- **Elmore State Park**, PO Box 92, Lake Elmore, VT 05657, phone: 802-888-2982 (summer) or 800-658-6934 (Jan. to May), open mid May – October 15. Base Rate: \$15 - \$22. Elmore State Park is nestled near the center of rural and picturesque Lake Elmore, VT. Elmore Mountain and Elmore Lake are two focal points of the Elmore experience. Take a 2-hour hike to the summit of Elmore Mountain. When you reach the top, climb 55-feet higher on one of Vermont's few remaining fire towers where you will witness a near 360 degree view of the surrounding area. Hike down the mountain and cool off in beautiful Lake Elmore. The Park was first developed by the CCC in the 1930's. The beach house and some of fireplaces are examples of the their work. There are 45 tent/trailer sites and 15 lean-tos. To locate the Park, travel 5 miles south of Morrisville on VT Route 12.

| Year | Little River | | Smugglers Notch | | Underhill | |
|------|--------------|---------|-----------------|---------|-----------|---------|
| | Day Use | Camping | Day Use | Camping | Day Use | Camping |
| 1938 | | | 0 | 57 | | |
| 1939 | | | 6,114 | 247 | 1,426 | 135 |
| 1940 | | | 8,985 | 417 | 3,688 | 237 |
| 1941 | | | 5,919 | 163 | 6,220 | 481 |
| 1942 | | | 794 | 4 | 0 | 0 |
| 1943 | | | 0 | 0 | 0 | 0 |
| 1944 | | | 1,422 | 233 | 0 | 0 |
| 1945 | | | 1,595 | 785 | 0 | 0 |
| 1946 | | | 6,883 | 284 | 2,491 | 203 |
| 1947 | | | 1,100 | 0 | 2,084 | 204 |
| 1948 | | | 0 | 740 | 2,613 | 249 |
| 1949 | | | 0 | 852 | 2,151 | 748 |
| 1950 | | | 0 | 969 | 3,080 | 688 |
| 1951 | | | 0 | 1,264 | 3,148 | 620 |
| 1952 | | | 5,085 | 1,767 | 3,946 | 667 |
| 1953 | | | 0 | 2,517 | 6,994 | 685 |
| 1954 | | | 0 | 2,655 | 3,716 | 1,177 |
| 1955 | | | 7,031 | 3,190 | 3,790 | 245 |
| 1956 | | | 6,057 | 3,455 | 0 | 0 |
| 1957 | | | 6,271 | 4,385 | 3,975 | 836 |
| 1958 | | | 6,599 | 4,754 | 4,453 | 1,548 |
| 1959 | | | 22,427 | 5,476 | 5,451 | 2,584 |
| 1960 | | | 6,123 | 8,074 | 4,958 | 2,216 |
| 1961 | | | 33,763 | 7,394 | 5,249 | 2,017 |
| 1962 | 0 | 3,280 | 7,488 | 6,334 | 4,923 | 2,110 |
| 1963 | 0 | 15,881 | 5,984 | 8,275 | 5,915 | 1,476 |
| 1964 | 471 | 15,646 | 7,305 | 7,258 | 4,874 | 1,436 |
| 1965 | 0 | 17,555 | 6,817 | 10,198 | 2,770 | 1,483 |
| 1966 | 0 | 21,016 | 8,020 | 10,874 | 2,758 | 1,669 |
| 1967 | 0 | 25,216 | 7,000 | 11,769 | 2,295 | 1,591 |
| 1968 | 0 | 24,226 | 0 | 9,643 | 4,301 | 1,269 |
| 1969 | 936 | 26,619 | 113 | 9,468 | 5,927 | 1,216 |
| 1970 | 1,472 | 19,573 | 135 | 10,982 | 6,883 | 2,003 |
| 1971 | 1,256 | 23,957 | 132 | 11,751 | 3,042 | 1,848 |
| 1972 | 1,329 | 26,091 | 42 | 9,388 | 4,441 | 1,252 |
| 1973 | 1,266 | 27,460 | 29,231 | 9,358 | 5,742 | 2,574 |
| 1974 | 1,304 | 26,213 | 74 | 9,064 | 4,964 | 2,446 |
| 1975 | 1,310 | 25,492 | 62 | 9,880 | 7,088 | 3,495 |
| 1976 | 834 | 26,902 | 46 | 8,535 | 7,783 | 3,301 |
| 1977 | 915 | 32,713 | 27 | 9,486 | 4,923 | 3,472 |

| Year | Little River | | Smugglers Notch | | Underhill | |
|------|--------------|---------|-----------------|---------|-----------|---------|
| | Day Use | Camping | Day Use | Camping | Day Use | Camping |
| 1978 | 1,328 | 32,130 | 25 | 8,211 | 5,750 | 3,048 |
| 1979 | 1,474 | 28,162 | 22 | 6,420 | 4,726 | 1,807 |
| 1980 | 2,179 | 26,858 | 67 | 7,504 | 4,747 | 2,150 |
| 1981 | 420 | 9,075 | 83 | 7,357 | 5,629 | 2,874 |
| 1982 | 725 | 10,365 | 168 | 7,463 | 6,081 | 2,681 |
| 1983 | 577 | 11,819 | 27 | 7,556 | 5,241 | 1,532 |
| 1984 | 695 | 9,243 | 19 | 6,413 | 5,896 | 2,485 |
| 1985 | 674 | 8,985 | 22 | 6,285 | 5,838 | 2,132 |
| 1986 | 1,643 | 15,094 | 28 | 5,406 | 5,767 | 2,284 |
| 1987 | 28,586 | 18,737 | 42 | 5,987 | 6,651 | 2,378 |
| 1988 | 31,120 | 22,293 | 7 | 6,574 | 8,023 | 2,486 |
| 1989 | 26,837 | 24,567 | 0 | 6,534 | 6,742 | 3,253 |
| 1990 | 3,351 | 27,965 | 7 | 7,088 | 6,712 | 3,075 |
| 1991 | 3,504 | 27,856 | 0 | 8,189 | 8,173 | 2,632 |
| 1992 | 2,937 | 27,691 | 2,593 | 8,759 | 9,159 | 3,483 |
| 1993 | 3,948 | 27,050 | 3,684 | 9,521 | 8,073 | 3,538 |
| 1994 | 3,339 | 27,294 | 6 | 7,022 | 8,386 | 3,715 |
| 1995 | 4,781 | 29,611 | 56 | 8,346 | 8,427 | 3,026 |
| 1996 | 3,173 | 28,959 | 12 | 8,760 | 7,394 | 2,930 |
| 1997 | 2,798 | 27,936 | 0 | 7,809 | 8,256 | 2,675 |
| 1998 | 2,898 | 33,920 | 0 | 10,876 | 8,381 | 2,288 |
| 1999 | 3,488 | 26,923 | 16 | 7,786 | 7,084 | 1,668 |
| 2000 | 1,590 | 20,542 | 5 | 7,528 | 7,256 | 1,891 |
| 2001 | 2,024 | 16,033 | 56 | 7,674 | 7,644 | 1,941 |

Private Campgrounds

- **Brewster River Campground**, 110 Campground Driver, Jeffersonville, V^ 05464, phone: 802-644-2126, open mid May to mid October. Base Rate \$20; lean-to \$30; Tipi \$30. E-mail: wmccone@sover.netwww.campvermont.com/brewster Looking for a quiet campground in a great location? We're the only private campground in VT that does not allow pets. This ensures that your camping experience here will be quieter, cleaner and safer. The area offers fishing, bicycling, canoeing and hiking, with easy access to Mt. Mansfield State Forest and the Long Trail. Our 20 sites are basically for tents, but some can accommodate small RV's and trailers. Most sites are shaded and right on the River. Modern bath house with free hot showers. Tour the local covered bridges and visit antique stores and quaint villages. Located at the northern gateway to Smugglers Notch scenic highway, 3 miles/5 km north of Jeffersonville on VT Route 108. Reservations encouraged for weekends.

- **Common Ground Park**, 1781 VT Route 100 Hyde Park, VT 05655, phone 802-888-5210, open: April 15 to October 15. Base Rate: Tents \$13; RV's \$20. E-mail: rjbjr@pshift.com. Common Ground offers 20 w/e sites and 7 tent sites. We have wooded or grassy sites that can accommodate larger units with slide-outs. Conveniently located near local tourist areas, but away from the crowds, in the beautiful mountains of Vermont. This family run campground has 24 hour access to free hot showers, LP gas, no charge dump station, new convenience store, in-ground pool, arcade, rec. hall, playground, go-karts, bumper boats and a challenging 18 hole mini golf course. Take VT Route 15 west from Morrisville. Turn right onto VT Route 100 North. Located 2 miles from the Route 15 and 100 intersection.

- **Gold Brook Campground**, PO Box 1028, RT 100, Stowe, VT 05672, phone: 802-253-7683, open All Year * Base Rate: \$18, Route 100, 7½ miles north from exit 10, I-89, 79 sites. Tents, WE 20, WES 30, & 50 amp hookups, cable vision & telephone connections available with prior arrangements. Free hot showers, DS, FP, wood, ice, major playground, shuffleboard, pool, rec. hall. Beautiful lawn on Gold Brook. Swimming, hunting, fishing, hiking, skiing and snowmobiling nearby. Brochure. Reservations suggested. Groups welcome. Base rate for 2 tenting or family of 4 with 2 children under 12.

- **Mountain View Campground & Cabins**, 3154 RT 15E, Morrisville, VT 05661, phone: 802-888-2178, open: May 6 - October 15 * Base Rate: \$22, three miles east of Morrisville, 12 miles from Stowe. On the Lamoille River. Heart of recreation in Vermont. 63 sites, 15 tent, 24 WE, 19 WES. Seasonal site available. Modern country colonial cottages, ideal for honeymooners. Fresh linens and hot showers included. Absolutely no pets in cabins. Flush toilets, hot showers, heated bathrooms, DS, laundry, ice, wood, PG, 2 pools (1 heated), pavilion, restaurant & snack bar, 9 hole mini golf, jacuzzi, excellent fishing, pets on leash. 25 shady sites on river. Nearby golf, alpine slide, gondola, train and glider rides.

Waterbury Reservoir – Water-based Activities

For a complete description of recreation around and on the Waterbury Reservoir see Pages E101 to E115 of Publication “Waterbury Hydroelectric Project” FERC No. 2090 on file at the Agency of Natural Resources Waterbury Office, Water Quality Division. This publication, printed August 1999, contains a very comprehensive description of recreational activities on and around the Waterbury Reservoir, as part of Green Mountain Power’s requirement for application to re-license its use of the Reservoir to generate power. Information contained in this report includes:

- A general description of recreation activities: camping, boating, fishing swimming hiking, biking waterskiing snowmobiling and cross-country skiing.
- Maps showing campsites, parks, access roads, boat launches and Reservoir zones.
- Information about shoreline recreation facilities.
- Discussion about existing and potential recreational uses.
- Estimates of current yearly recreation use.
- Projected 10 year trends in recreational use
- Description of Reservoir enhancements to be included in GMPP’s re-licensing agreement.

Waterbury Center State Park is located on a 90-acre peninsula with picnic sites, tables, hibachis, swimming beach, nature trail, boat ramp and restrooms. This Park started operation in 1990 and is an integral recreation resource in central Vermont. The Park operates from mid-May to September (Labor Day). To locate the Park, from I-89 (Exit #10) drive 2 ¾ miles north on VT Route 100, turn left onto Old River Road.

| Year | Day Use |
|-------------|----------------|
| 1990 | 18,259 |
| 1991 | 20,914 |
| 1992 | 18,361 |
| 1993 | 21,760 |
| 1994 | 22,138 |
| 1995 | 21,388 |
| 1996 | 20,843 |
| 1997 | 21,656 |
| 1998 | 15,975 |
| 1999 | 23,413 |
| 2000 | 5,821 |
| 2001 | 0 |

It should be noted that one month into the summer season of 2000 the Waterbury Reservoir was drained to start the process of making repairs to the dam.

Waterbury Reservoir Area Map

Smugglers Notch Area

A heavily used recreation corridor on Mt. Mansfield State Forest is located from the entrance to the Toll Road on Route 108 north through Smugglers Notch to the Base Lodge area of the Smugglers Notch Resort. Included in this corridor are the new proposed Smuggler's Notch State Park Campground, the Stowe Mountain Resort, the Toll Road, the trailheads to the Long Trail and side trails, the Smugglers Notch Scenic Highway, a State picnic area, a Park Contact Booth in the Notch, many scenic overlooks, historic structures, and the Smugglers Notch Resort. For administrative purposes this entire corridor is considered the Smugglers Notch State Park and day to day management is handled by the Parks Division of the Department of Forests, Parks and Recreation.

Route 108 is a popular commuting route during the summer and brings many visitors to the area each year. The high concentration of people results in periodic traffic congestion and people management issues. Many of these issues were addressed in the Smugglers Notch Scenic Highway Corridor Plan in 1995. A focus of the Plan was to reduce parking in the more sensitive sites and create attractive "gateways" at both end of the scenic highway corridor, where people could learn more about the area in an environmentally controlled situation. For a copy to the Plan contact the Lamoille County Planning Commission.

Smugglers Notch Area Map

General Recreation Trails

Mt. Mansfield State Forest has almost 200 miles of officially designated trails in addition, there are 40 miles of State Forest Highway that are open to many types of recreational uses. Designated uses range from hiking, snowshoeing, cross-country skiing, snowmobiling, mountain biking, and horseback riding. Some activities are restricted to specific areas by Agency policies.

The following is a summary of the officially designated trails on Mt. Mansfield State Forest:

- Long Trail 22 miles
- Other hiking trails 68 miles
- Cross-country ski trails 58 miles
- Snowmobile trails 36 miles
- Mountain bike trails 11 miles

There are several good guide books with maps available through various trail organizations and local book stores which provide a wealth of valuable information for the trail user.

Hiking Trails

Formal layout and clearing of trails started on Mt. Mansfield about 1847 with the construction of the Halfway House Trail on the Underhill side of the Mountain. The trail network, then on private land, expanded as more interest in hiking resulted in demand for more trails. Little thought was given to issues like parking areas, trail erosion or signage. The numbers of hikers and resulting impacts were minimal. As the system grew, so did the management problems. In 1986, the State of Vermont entered into an agreement with the Green Mountain Club (GMC) recognizing them as the designated maintainer of the Long Trail and its side trails.

The GMC in cooperation with the Department has taken a very active role in trying to address the many management issues that arise from the responsibility of maintaining a heavily used trail system in a very fragile environment. Some of the more important activities include:

- Creation of the Mt. Mansfield Partners Group, a group consisting of the GMC, the Department of Forests, Parks and Recreation, the University of Vermont, Stowe Mountain Resort and Smugglers Notch Resort. This group meets several times a year to discuss cooperative efforts to minimize impacts on the Summit.
- Creation of a Summit Caretaker Program funded cooperatively, with contributions from each organization. GMC supervises a Ranger presence on the summit during the summer and fall. The role of the Summit Caretaker is monitor activities by hikers and

educate people regarding the importance of a stewardship ethic to protect the fragile Alpine Zone.

- The GMC completed a Long Trail System Management Plan in 2001. This report inventories many of the more important features of the Long Trail in the Mt. Mansfield area and assesses trail conditions, use and management issues. For a copy contact the Green Mountain Club.
- The GMC is also currently working on a new Group Use Task Force aimed at increasing public education about hiking trails and trail issues. This Program will include mailings to groups, radio spots and eventually a website.
- Monitoring of hiking trail activity using sign-in boxes at Mt. Mansfield has been ongoing for over 10 years on some trails. This information has proven very valuable in identifying patterns of use and group sizes. It should be noted when looking at these number that study conducted several years ago indicates only about 50% of the people who hike the trails actually sign in.

Mt. Mansfield State Forest Hiking Summary

| Year | CCC Rd | Stevensville | Sterling Pond | LT to Taft | Elephants Head | Hazelton | Hell Brook |
|-------------|---------------|---------------------|----------------------|-------------------|-----------------------|-----------------|-------------------|
| 2001 | | | 13,256 | 8,469 | 1,030 | 1,071 | 1,827 |
| 2000 | 7,680 | 5,710 | 13,336 | 7,075 | 992 | 986 | 2,271 |
| 1999 | 9,130 | 5,486 | 10,541 | 7,366 | 1,169 | 1,200 | 1,636 |
| 1998 | 10,305 | 5,770 | 14,185 | 10,716 | 1,049 | 1,049 | 1,810 |
| 1997 | 10,261 | 5,626 | ND | ND | ND | ND | ND |
| 1996 | 8,565 | 5,662 | ND | ND | ND | ND | ND |
| 1995 | 7,275 | 4,657 | ND | ND | ND | ND | ND |
| 1994 | 7,979 | 3,332 | ND | ND | ND | ND | ND |
| 1993 | 6,582 | 3,844 | ND | ND | ND | ND | ND |
| 1992 | 6,977 | 4,343 | ND | ND | ND | ND | ND |
| 1991 | ND | 3,042 | ND | ND | ND | ND | ND |
| 1990 | ND | 2,587 | ND | ND | ND | ND | ND |
| 1989 | ND | 2,785 | ND | ND | ND | ND | ND |
| 1988 | ND | 1,956 | ND | ND | ND | ND | ND |
| Avg. | 8,306 | 4,215 | 12,830 | 8,406 | 1,071 | 1,076 | 1,886 |

Trail Issues:

Most major trail issues usually focus on parking problems and prevention of damage to fragile sites. Hiking trail use at Mt. Mansfield starts in early spring before the upper elevations have dried out. The trails are saturated with water and are susceptible to damage. The Department officially closes the high elevation trails to hiking until Memorial Day. Trail sign-in boxes indicate that the hiking ban is often ignored. It has proven very difficult to change

human behavior, so trail work focuses on hardening the trail surfaces for use during all seasons.

Parking problems occur primarily on good weather weekends in the summer and fall. While average parking demands are easily met with current parking spaces, peak demand times can overwhelm the facilities.

Damage to the fragile alpine zone at the summit of Mt. Mansfield comes from several sources. The primary source is the sheer number of people whose destination is the Summit. On a nice day in the fall foliage season over 600 people can be counted on the ridge. Because the summit is owned by the University of Vermont and Stowe Mountain Resort the primary responsibility for action does not belong to the Department. However, we are partners in solving this problem and will continue to participate in developing strategies to minimize human impacts.

Dogs have been identified as another major source of damage in the alpine zone, particularly dogs that are allowed to roam freely. A dog will often roam off trails and in short order can damage sizeable areas of fragile vegetation. For this reason a leash rule is in effect, but enforcing it has proven difficult.

Group use has also been identified as a source of significant problems. Unsupervised or under-supervised groups can be annoying to other trail users and hikers wandering off trails cause damage to the protected sites. The strategy to address this issue has been to require a Special Use Permit or License for organized groups. This permit helps assure that the groups receive a stewardship ethic message, that use does not occur when trails are closed, that the parking areas can accommodate the use, that group use does not overwhelm any given area or shelter and that large groups space out their hiker to avoid jamming up the trails.

Downhill Ski Areas

Beginning in 1939, the State of Vermont entered into a long term lease agreement with the Stowe Mountain Resort and later with Smuggler's Notch Resort, to construct ski areas on State Lands. The objective was to boost Vermont's standing as a high quality winter tourist destination. Both Stowe Mountain Resort and Smuggler's Notch Resort are world class facilities, with modern lifts and extensive snowmaking coverage. A sizeable tourist industry has built up around the two Resorts and the Towns of Stowe and Cambridge are very dependent on the resulting tourist trade.

Issues confronting both Resorts range from traffic, water withdrawal for snowmaking, sewage disposal, damage to fragile sites, water supply, storm water runoff, wildlife habitat conflicts, and electrical supply. Some of these issues (i.e., traffic) are not related directly to concerns of the Agency and are handled in the Act 250 and other regulatory processes. The four issues that are of special concern to the Agency are damage to fragile sites, wildlife habitat conflicts, water withdrawal for snowmaking and storm water runoff. As with traffic and other issues, these are addressed in some detail through the Act 250 and other regulatory processes. Agency experts in each of these fields are brought to the Act 250 process early on to help the District Commissions reach sound decisions. As landowner and co-applicant for any Act 250 applications, the role of the Department of Forests, Parks and Recreation, Lands Division, is to administer the terms of the lease for the State of Vermont, and make sure all Agency issues are addressed.

Annual Work Plans are required from the ski areas in April of each year. They are reviewed at the District level. Appropriate Agency experts are notified of any areas of special concern and the District Act 250 Coordinator determines what portions of the Work Plans will require permits. Recommendations are then made by the District staff concerning projects not requiring permits to the Director of Lands Administration for final determination. Once permits are acquired, the District Forestry and/or Parks Staff (with considerable input from other Agency experts) oversees the construction phase and conducts periodic inspections of the entire facilities.

The primary issue facing the Agency will be staffing to properly administer the ski area leases and fulfill our duty as stewards of the land. There is no funding source for "ski area administration," and Agency experts ranging from Water Quality, Wildlife, Heritage, Forestry and Parks, put in a considerable amount of time reviewing plans and overseeing construction. Our basic strategy for dealing with this is to put much of the burden of any required environmental review back on the ski area. Through the use of consultants, this can slow down permit approval and added to the cost of projects but has become a necessary way of doing business.

Cross-Country Ski Trails

Organized cross-country skiing started in the Mt. Mansfield Region with the development of Ranch Camp in 1932. Skiing in these early days was a combination of cross-country and downhill. Skiers would wrap animal fur around the base of their skis to get traction to go uphill, then remove the fur and ski down. When Ranch Camp closed in 1949, there was a long period of relative inactivity. This changed in 1972 when Bill Moulton, Johannes VonTrapp and Gardner Lane constructed a trail connecting the Trapp Family Lodge to Bolton Valley Ski Area. Both the Trapp Family Lodge and Bolton Ski Areas began promoting cross-country skiing and expanding their trail networks. A year or so later, the Stowe Mountain Resort and Smuggler's Notch Resort started developing cross-country ski trail operations to compliment their downhill operations. The primary motivator in the Stowe area was John Higgins who almost singlehandedly re-established the original extensive cross-country ski trail network in Ranch Valley. On the Underhill side of the Mountain, a network of official and unofficial cross-country ski trails has been opened by several local groups over the past 20 years. Because these were mostly unorganized volunteer efforts, the condition of the trails and signage has been a problem. As these trails got more popular, winter parking has also become a serious problem in the Underhill area.

Today, the State of Vermont has license agreements with the Trapp Family Lodge, Stowe Mountain Resort and Smuggler's Notch Resort for the use of the Mt. Mansfield State Forest for cross-country ski trails, as well as a Cooperative Agreement with the Catamount Trail Association for the development of the Catamount Trail. For a map and listing of cross-country ski trails, check the Forests, Parks and Recreation website or contact the District Office. There are also several good guidebooks and maps available at local bookstores.

Another popular, though unofficial, trail is, Route 108 through Smugglers Notch. This unplowed section of State Highway offers excellent scenery and dependable snow. Because Route 108 is a State Highway, it is also open to other trail users such as snowmobiles, so exercise caution.

Cross-country skiing at Mt. Mansfield has seen a steady growth in popularity over the past 20 years. As surrounding populations grow, we expect this to continue. Because the State of Vermont is not in the trail development and maintenance business, we are actively working with partner organizations such as the Catamount Trail Association, the GMC, surrounding private ski centers and volunteers, to construct and manage this trail network.

Issues that will need to be addressed include:

- S Winter parking
- S Signage
- S Back-country safety
- S User conflicts
- S Shelters

Snowmobiling

The first officially designated snowmobile trail on Vermont State Lands was built by Ben Hoffman and Bill Moulton and connected the Cotton Brook road to a series of abandoned old town roads in Ricker Basin. This 18 mile trail enabled a snowmobiler to travel from Moscow to Waterbury. The original trail was laid out in 1970 and took two summers to complete. The major obstacles encountered were the lack of bridges on brook crossings of the upper tributaries of Cotton Brook and Stevenson Brook. The original bridges constructed were badly undersized and built using hemlock stringers and untreated planking. They eventually failed or washed out and were gradually replaced with concrete and steel as part of the forest management road system.

In the early 1970's the Department of Forests, Parks and Recreation received a portion of the snowmobile registration funds for trail construction and ran a winter grooming program. The trail system in the Waterbury Reservoir area was continually upgraded and expanded. Winter parking areas were built at Moscow and Little river. In 1978 the Vermont Association of Snow Travelers (VAST) was delegated the responsibility for constructing and operating snowmobile trails on State lands.

Issues:

In the past 10 years, the snowmobile trail network has been systematically relocated off the truck roads to eliminate conflicts with log trucks. The Department requires winter logging in the Ricer Basin and some in the Cotton Brook Basin to avoid damage to wet sites and to eliminate user conflicts with the campground. The plowed roads and truck traffic resulting from scheduled timber harvests make the use of these roads unsafe for snowmobilers. In several key sections we have built parallel trails next to the roads.

Conflicts with wildlife, particularly winter deer habitat have been an ongoing concern. Several of the original trails were located in softwood stands and have since been relocated or closed. Others may be relocated if reasonable alternatives are found.

User group conflicts

Mountain Biking

The first officially designated mountain bike trail on Vermont State Lands was the Cotton Brook Road in 1986. The Department, at the request of District Trail Coordinator, Mike Green, established the trail as a way to study this new recreational activity and better understand the sport and its related management issues.

We soon learned that mountain bike activity would be difficult to manage as bikers wanted to explore and were constantly expanding their unofficial trail networks. This was promoted by the local bike shops who distributed trail maps that encouraged people to ride in areas we had not designated for this use. Mike Green worked closely with the local bike shops and in exchange for getting rid of the “unofficial” maps, he constructed several miles of specially designed trail in the Cotton Brook Area to offer mountain bikers more of a challenge. This effort has produced very mixed reviews and the current statewide mountain bike umbrella organization VMBA has indicated to us that these trails are too difficult for the average biker.

The primary difficulty we have had in addressing mountain biker’s needs is that, unlike the GMC, VAST and Catamount Trail organizations, mountain bikers have had problems getting organized on a statewide basis. Without a strong local organization to work with, it is difficult to provide for a well managed trail system. As an example, when Mike Green opened up the Cotton Brook Road for them, the local mountain bike club agreed to do the annual maintenance. The club has since disbanded and the Department has inherited the maintenance. Our hope is that VMBA will fill this void.

Department policy allows mountain bikes to ride on any gravel surfaced road or officially designated trail. When we first got involved with mountain bike activity at Mt. Mansfield, our major concern was damage to drainage structures on roads. While we have seen some damage, it hasn’t been a serious problem. This is probably due to the moderate level of activity and the fact that very few bikers ride in the upper elevations where most of the steep wet soils are located. The most serious environmental issue that has surfaced came during the Act 250 hearings on the possible relocation of the Smuggler’s Notch Campground into Ranch Valley. The District Wildlife Biologists expressed concern about the impact mountain bikers would have on identified black bear feeding areas located in several beech stands. From this hearing, came the recommendation that no mountain bike trails be located within a quarter mile of critical black bear feeding areas.

Hunting, Fishing and Trapping

Hunting, fishing and trapping are permitted on all State Lands, with the exception of areas around State Parks during the camping season. This activity is governed by rules and regulations developed by the VT Department of Fish and Wildlife.

While the Mt. Mansfield State Forest is not known for its high quality hunting or fishing, it does provide for some unique back country experiences where sportsmen and women can get away from it all.

Issues that come up periodically center mostly around improved vehicle access and more opportunities for backcountry camping. Parking areas are provided at all major access points.

Rock Climbing - Ice Climbing - Bouldering

Rock climbing, ice climbing and bouldering are activities that have a long history in Smugglers Notch. While the numbers of people who participate are relatively low, they are very committed to their sport.

Department policy allows for these activities when no significant environmental damage is evident. Our assessment of the environmental risks in Smugglers Notch has shown them to be low because of the unstable geologic nature of the Notch. Periodic rock slides cause far more disturbance than the relatively low level of recreational use. The one exception to this has been a requirement that rock climbers must suspend their activity in certain areas during the Peregrine Falcon nesting season. The climbers have been very cooperative and Peregrine nesting has been quite successful. Of greater concern than the organized rock and ice climbers are the thousands of casual tourists that park in the Notch and scramble over the rock slides. These impacts are very difficult to manage and far outweigh damage caused by organized groups.

As with other recreational user groups, commercial operations and organized groups need to obtain a Special Use Permit or license for their activity on State lands.

An issue that has surfaced recently is the increase in winter camping that is occurring in the Notch, reportedly by ice climbers. At this point in time little is known about the numbers and their impacts. There is also the question of whose jurisdiction is involved because Route 108 is a State Highway, and its winter use is a subject for the VT Agency of Transportation to

decide. The issue of the Notch being a dangerous place comes up periodically. In several cases, the Department has posted avalanche warnings when experts advised us that the danger was extremely high.

Guided Tours

As this tourist-based interest in the Mt. Mansfield State Forest and other State Lands grows, the Department has tried to get some control of it by putting in place requirements that any commercial groups (where a fee is charged) or any group over 10 people (i.e., schools) need to get a License or Special Use Permit. Our goals are threefold. First, to get a better handle on the numbers of people using the Mt. Mansfield State forest. Second, to impart a stewardship message to these groups. Third, to put conditions on the activities to reduce environmental damage or user group conflicts.

The Department has established a standardized fee structure for Special Use Permits. However, the guidelines will always be under constant review and revision. For the latest information, contact the District Stewardship Specialist.

Summer Recreation Map

Winter Recreation Map

Long Range Management Plan
MT. MANSFIELD STATE FOREST

Appendix D

Timber Resource Assessment

Timber Resource Assessment

In the 1910 Annual Report of State Forester Austin F. Hawes, the original purposes for the creation of state forests in Vermont were well defined.

“There are several reasons for advocating the creation of state forests in Vermont; reasons which must eventually result in large areas becoming either state or national forests.

In the first place, it has been proved in other states that private forestry practice is stimulated more by example than by any other method...

The ultimate object of the state, as well as national forests, must be either for the protection of water resources or the raising of timber.”¹

In 1914 State Forester Hawes convinced the Vermont Legislature to purchase 3,155 acres that would be the start of Mt. Mansfield State Forest. Mr. Hawes was concerned about the dwindling supply of timber from private lands and believed in the wisdom of the state owning and managing timberlands to ensure a future wood supply. From the very beginning of Mt. Mansfield State Forest timber management has been a major focus.

In 1997 the majority of timberland in Vermont (3.8 million acres or 85%) was privately owned. The state and federal governments owned 12% or 658,000 acres of the timberland. The remaining 3% was under industrial ownership. (Much of this land is now in state or federal government ownership.) This timberland contributes \$1.2 billion to the Vermont economy in the forest-based manufacturing industry and the forest-related tourism and recreation industry. These two industries employ almost 10,000 people. ²

Vermont's forested ecosystem provides the basis for biological diversity, natural communities, wildlife habitats, and scenic landscapes. The forests of Vermont also provide an important economic base for employment, tourism, and recreation, and support a diverse forest products industry.

In spite of the fact that the majority of Vermont's forest products are produced on privately owned timberland, timber from Vermont's state lands provides a strategic supply of resources for the forest products industry and a valuable means of demonstrating long-term

¹ Quote found in the *History of Forestry in Vermont* by Perry H. Merrill, 1959.

² Information in this paragraph is based on the publication *The Economic Importance of Vermont's Forests* prepared by the North East State Foresters Association, March 2001

forest management. Mt. Mansfield State Forest provides many demonstration sites where the forest has been under management and records have been kept on the various treatments for over 40 years.

State lands are free from many of the short-term economic pressures that may influence the management of private timberland owners. As a result, many state forests are managed to provide large diameter, high quality timber suitable for use as veneer and high quality sawlogs. Mt. Mansfield State Forest has developed a well-earned reputation for providing a steady supply of high quality timber to the local markets.

Timber on state lands is managed for a number of reasons. On Mt. Mansfield State Forest, timber sales are conducted to maintain and improve forest health, to improve forest structure, to improve tree quality and vigor, to assure appropriate species composition based on the natural communities, and improve wildlife habitat. State lands timber sales are planned based on silvicultural needs and biological principles.

Forest Sustainability

Sustainable forest management is a top priority on Mt. Mansfield State Forest. The Agency defines sustainable forestry as “the production and use of resources to meet the needs of present generations without compromising the ability to meet the needs of future generations”. Sustainable forest management involves practicing a land stewardship ethic that encompasses ecological, economic and social values. The forest is managed to provide healthy populations of existing native plants and animals, enhance biodiversity, and maintain properly functioning ecosystems. Stresses need to be monitored and evaluated regularly.

On Mt. Mansfield State Forest a timber analysis for sustainability was accomplished. This analysis focused on three elements.

- 1) **Determining the actual acreage in long-term timber management.** Manageable timberland was determined by subtracting the high elevation land, natural areas, research areas, ski areas, campgrounds, special wildlife areas and other non-commercial lands from the total area. For Mt. Mansfield State Forest 14,171 acres (about 36%) of the total land area of 39,837 acres was determined to be managed timberland.

- 2) **Determining tree volume growth from the managed timberland.** Volume of growth was calculated to be about 200 board feet (bf) per acre per year or about 2,834,200 bf per acre per year.
- 3) **Compare the volume of growth to the actual harvests from these lands.** From 1958 to 2001 the total harvest was 18,421,200 bf. The annual harvest averages 428,400 bf per year. These numbers show that on Mt. Mansfield State Forest only 15% of the growth has been harvested annually.

History of Timber Management

Prior to state ownership the lands that now make up Mt. Mansfield State Forest were subject to repeated timber harvesting. Between 1800 and 1900 all land below 1500 feet was cleared for farming. Lands above 1500 feet were logged several times before state ownership.

In 1978, the Burt Nebraska and Burt Ranch Blocks, totaling approximately 8,000 acres, were purchased from Burt Forests, Inc. (See Block Map) Burt Forests, Inc. was founded in 1883 as the C.E. & F.O. Burt Company. The company eventually owned 11,000 acres of forestland in the town of Stowe and a number of sawmills. The sawmill operations were consolidated to the village mill in 1895. The Burt Co. mills annually handled a million feet of lumber and three fourths of a million clapboards. The company acquired large acreages of timberland looking to own enough so that the annual growth would match the cutting. Burt Forests, Co. was one of the largest landowners and employers in Stowe at the time. Since state-ownership, there have been a number of firewood sales and one large timber sale on these two blocks.

The Beaver Meadow and Kruse Blocks were also managed for timber production. These two blocks had harvesting operations just prior to state-ownership.

Timber management has been practiced extensively on areas of Mt. Mansfield State Forest since the first acquisitions. However timber sale records were not kept until 1958. There are accounts that the logs used to build the original base lodge at Stowe Mountain Resort were cut on the Underhill Block and then trucked around the mountain.

Block Map

Existing Conditions

Existing forest conditions are a direct reflection of the history of the Mt. Mansfield area. Twelve thousand (12,000) years ago a mile thick sheet of ice covered the area. As the glaciers receded, forests took over the land. When European settlers first came to the area, the landscape was characterized by hemlock stands in the lower outwash soils, northern hardwoods on the lower and middle mountain slopes, and spruce-fir-birch at the upper elevations. After a period of land clearing and later farm abandonment the forests on Mt. Mansfield State Forest have re-established themselves. One of the major differences between today's forest and that of 300 years ago is the tree species component of the northern hardwood zone. Three hundred (300) years ago American beech made up about 30% of the northern hardwood forest. Past management practices and beech scale disease have reduced this to below 10%, replaced primarily with sugar maple.

The Mt. Mansfield State Forest was inventoried using the 1980s version of the Forest Examination (FOREX) protocol. The Vermont Department of Forests, Parks & Recreation developed this system as a tool to inventory and evaluate Vermont State lands. The survey involves the statistical inventory and analysis of the timber resource.

Certain tree species in the forest grow in association with one another due to similar growing requirements and are referred to as forest cover types. Cover types are similar to natural communities and will often be the same. The main difference between them are that cover types designate what currently exists, while natural communities look at the potential of the site and what the climax forest would likely be. Therefore, in some instances the cover type and natural community do not correspond. On Mt. Mansfield State Forest one example of this are the pioneer forest cover types consisting of white birch, grey birch, and red maple. These stands are located within two different natural communities. One is the Northern Hardwood natural community and the other is the Hemlock natural community. With these stands the decision will need to be made whether to manage them in transition to the natural community or maintain them in pioneer species.

There are three general forest cover types found on Mt. Mansfield State Forest. Northern hardwoods are found in the lower elevations on the productive growing sites, red spruce in association with other species in the higher elevations on shallow soils, and hemlock associations along the low elevation waterways. (See Cover Type Map)

1) Northern hardwood makes up 50% of Mt. Mansfield State Forest. Located between 600 feet and 2200 feet in elevation, these stands consist primarily of sugar maple, yellow birch and American beech. Other species that appear in association with them are red maple, white ash, white birch, basswood, black cherry, aspen, white pine, hemlock, and red spruce. These stands are generally found on loamy soils with good moisture content and fertility. The forest productivity for the cover type ranges from Site I to Site III. Northern hardwood stands make up approximately 90% of the managed timberland.

2) Red spruce in association with yellow birch, white birch or balsam fir makes up 37% of the area. These stands are generally found in the upper elevations on steep slopes with shallow soils. The red spruce- yellow birch cover type is found at elevations where the northern hardwoods begin to transition out. Continuing up in elevation, yellow birch gives way to white birch and balsam fir becomes part of the mix. At about 3,000 feet in elevation the cover type consists of only red spruce and balsam fir. Forest productivity for these cover types range from Site III to Site IV.

3) Hemlock cover types make up 9% of the area. Hemlock in association with yellow birch is found at the lower elevations along the various waterways, especially around Waterbury Reservoir. This cover type is found on the clay soils deposited by the glaciers. Most of these stands are mapped as deer wintering area. Small, almost pure, hemlock stands are found scattered throughout portions of the northern hardwood cover type. They occur on micro sites that tend to be dry and shallow to bedrock . The forest productivity for the hemlock cover types range from Site I to Site II.

Site Productivity

Site productivity is based on the soils potential to grow timber and various limiting factors such as slope, surface features and soil depth. Four forest site categories, or classes, are used. Productivity can be expressed as the height a certain forest cover type will reach in 50 years, called site index. For example, using site index, if sugar maple is growing on a site at a rate that it will reach 60 feet tall when it is 50 years old, the site is classified as Site I. If it will be between 53 and 59 feet tall, it is Site II.

The site index and volume ranges for each class are:

| <u>Productivity Class</u> | <u>Potential Productivity (per acre per year)</u> | <u>Site Index</u> | |
|---------------------------|---|-------------------|--------|
| Site I | > 85 cubic feet | Spruce-fir | 50' |
| | | White pine | 70' |
| | | Northern hardwood | 60' |
| Site II | 50 to 84 cubic feet | Spruce-fir | 40-49' |
| | | White pine | 60-69' |
| | | Northern hardwood | 53-59' |
| Site III | 20 to 49 cubic feet | Spruce-fir | 30-39' |
| | | White pine | 50-59' |
| | | Northern hardwood | 45-52' |
| Site IV | < 20 cubic feet | Spruce-fir | 30' |
| | | White pine | 50' |
| | | Northern hardwood | 45' |

Cover Type Map

Mt. Mansfield State Forest

FOREX Inventory Summary

Block 01 - Burt Nebraska Block

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site | Timber Type | Species %BA |
|------|-------|-------|-----------------|----------------|---------------|-----------------|---------------|------|----------------|--------------------------------------|
| 1 | 1 | 15 | Open | | | | | II | | |
| | 2 | 35 | 15 | 107 | 47 | 23 | 37 | I | 24 | Hem 29% Ms 57% |
| | 3 | 231 | 13 | 79 | 30 | 16 | 33 | II | 25 | Ms 36% Be 31% |
| | 4 | 91 | 12 | 115 | 50 | 23 | 42 | III | 25 | Ms 45% Be 30% By 20% |
| | 5 | 64 | Protection | | | | | | IV | 35 |
| 2 | 1 | 232 | 11 | 98 | 42 | 14 | 42 | II | 25 | Be 41% Ms 40% |
| | 2 | 88 | 11 | 67 | 27 | 10 | 30 | II | 25 | Ms 46% Be 37% |
| | 3 | 100 | Protection | | | | | | III/IV | 35 |
| 3 | 1 | 4 | Open | | | | | II | | |
| | 2 | 255 | 12 | 82 | 33 | 17 | 32 | III | 25 | Be 44% Ms 39% |
| | 3 | 80 | 12 | 123 | 55 | 22 | 46 | III | 25 | Ms 44% Be 36% By 16% |
| | 4 | 30 | 9 | 120 | 48 | 25 | 47 | III | 25 | Ms 52% Be 21% By 15% |
| | 5 | 95 | Protection | | | | | | IV | 35 |
| 4 | 1 | 76 | 12 | 110 | 40 | 38 | 32 | III | 25 | Ms 68% Be 18% By 10% |
| | 2 | 254 | 12 | 73 | 16 | 18 | 39 | III | 25 | Ms 34% Be 38% By 11% |
| | 3 | 75 | 12 | 83 | 50 | 7 | 26 | IV | 30 | By 53% Mr 18% |
| | 4 | 175 | Protection | | | | | | IV | 35 |
| 5 | 1 | 41 | 14 | 100 | 35 | 20 | 45 | III | 25 | Ms 88% |
| | 2 | 228 | 13 | 79 | 29 | 21 | 29 | III | 25 | Ms 42% Be 29% By 14% |
| | 3 | 17 | 13 | 70 | 23 | 7 | 40 | II | 24 | Be 59% Ms 12% |
| | 4 | 83 | 11 | 76 | 30 | 12 | 34 | III | 30 | By 34% Ms 14% Bw 10% BE 10% |
| | 5 | 451 | Protection | | | | | | IV | 35 |
| 6 | 1 | 252 | 12 | 75 | 18 | 12 | 45 | III | 25 | Ms 45% Be 24% By 17% |
| | 2 | 532 | Protection | | | | | | IV | 35 |
| 7 | 1 | 2 | 10 | 245 | 215 | 10 | 15 | III | Sn plant. | Sn 83% Bw 17% |
| | 2 | 74 | 12 | 108 | 55 | 15 | 38 | III | | Ms 46% Be 20% By 20% |

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site | Timber Type | Species %BA |
|------|-------|-------|--------------|-------------|------------|--------------|------------|------|-------------|--------------------------------------|
| 7 | 3 | 117 | 13 | 65 | 25 | 18 | 22 | IV | 25 | Ms 45% Be 24% By 17% |
| | 4 | 311 | Protection | | | | | IV | 35 | |
| 8 | 1 | 307 | 11 | 63 | 26 | 21 | 16 | III | 25 | Ms 45% Be 22% BY 19% |
| | 2 | 274 | Protection | | | | | IV | 35 | |
| 9 | 1 | 10 | Open | | | | | II | | |
| | 2 | 340 | 12 | 100 | 38 | 13 | 49 | II | 25 | Ms 46% Be 20% Mr 17% |
| | 3 | 36 | 14 | 58 | 25 | 18 | 15 | III | 25 | Ms 44% Mr 33% |
| | 4 | 82 | 11 | 88 | 35 | 23 | 30 | IV | 11 | By 35% Bw 26% Mr 17% BE 17% |
| | 5 | 200 | Protection | | | | | IV | | |

Block 02 - Cotton Brook Block

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA |
|------|-------|-------|---------------------|-------------|------------|--------------|------------|---------------------------|-------------|-----------------------------|
| 1 | 1 | 471 | 12 | 109 | 58 | 25 | 26 | I=332 II=113 III=26 | 25 | Ms 52% Be 17% |
| | 2 | 115 | 13 | 124 | 78 | 30 | 16 | I=100 II=13 III=2 | 24 | Hem 46% By 14% Ms 10% |
| | 3 | 43 | 10 | 90 | 43 | 34 | 13 | I=37 II=6 | 108 | Bw 26% Mr 26% |
| | 4 | 50 | 14 | 100 | 54 | 14 | 32 | I | 24 | Hem 52% By 22% |
| | 5 | 6 | 13 | 100 | 80 | 3 | 17 | I | 21 | Pw 70% Mr 12% |
| | 6 | 54 | Protection | | | | | II=15 III=39 | 25 | |
| | 7 | 3 | Protection | | | | | II | 24 | |
| | 8 | 1 | | | | | | I | Pr | |
| | 9 | 20 | Alder Swamp | | | | | IV | | |
| | 10 | 6 | Open- old field | | | | | I | | |
| | 11 | 7 | Agricultural Fields | | | | | Tillable | | |
| | Roads | 10 | | | | | | IV | | |
| 2 | 1 | 221 | 10 | 67 | 28 | 17 | 22 | I=39 II=145 III=37 | 25 | Ms 48% Be 21% |
| | 2 | 158 | | | | | | I=112 II=46 | 25 | |
| | 3 | 87 | 10 | 86 | 25 | 24 | 37 | I=77 II=10 | 108 | Ms 29% Mr 27% Bw 17% |
| | 4 | 80 | 12 | 11 | 57 | 20 | 40 | I=33 II=47 | 25 | Ms 31% Be 21% Mr 13% |
| | 5 | 102 | 10 | 70 | 15 | 18 | 37 | II=10 III=92 | 25 | Ms 59% Be 29% |
| | 6 | 3 | Open- old field | | | | | I | | |
| | 7 | 3 | Apple Orchard | | | | | I | | |

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA | |
|------|-------|-------|---------------|-------------|------------|--------------|------------|------------------------------------|------------------|----------------------------|--|
| 2 | Roads | 6 | | | | | | IV | | | |
| 3 | 1 | 107 | 10 | 103 | 45 | 20 | 38 | I=30 II=77 | 25 | Ms 56% By 18% Aw 10% | |
| | 2 | 101 | 10 | 67 | 27 | 17 | 23 | I=27 II=74 | 25 | Ms 72% Be 15% | |
| | 3 | 27 | <4 | Regen. | | | | | | | |
| | 4 | 102 | 11 | 74 | 29 | 17 | 28 | II | 25 | Ms 61% Be 19% By 16% | |
| | 5 | 160 | 10 | 108 | 42 | 24 | 42 | I=40 II=120 | 108 | Mr 20% Bw 20% Sr 14% | |
| | 6 | 157 | Protection | | | | | | III=131 IV=26 | 35 | |
| | 7 | 63 | Protection | | | | | | II | 25 | |
| | 8 | 1 | Apple Orchard | | | | | | II | | |
| | Roads | 6 | | | | | | IV | | | |
| 4 | 1 | 133 | 10 | 88 | 28 | 12 | 43 | II=50 III=83 | 25 | Ms 54% By 20% Be 16% | |
| | 2 | 67 | 11 | 60 | 12 | 18 | 30 | III | 25 | Ms 32% Be 32% By 32% | |
| | 3 | 34 | 11 | 95 | 52 | 20 | 23 | III | 18 | Bw 41% By 36% | |
| | 4 | 25 | 10 | 93 | 33 | 20 | 43 | III | 30 | By 47% Bw 25% Mr 16% | |
| | 5 | 166 | 8 | 92 | 42 | 26 | 24 | II=5 III=161 | 35 | Bw 42% By 21% Mr 12% | |
| | 6 | 199 | Protection | | | | | | III=136 IV=36 | 33 | |
| 5 | 1 | 43 | 10 | 57 | 28 | 14 | 15 | II | 25 | Ms 71% Be 18% | |
| | 2 | 107 | <4 | Regen | | | | II | 25 | | |
| | 3 | 43 | | | | | | III | 30 | | |
| | 4 | 10 | Protection | | | | | | III | 30 | |
| | Roads | 2 | | | | | | IV | | | |
| 6 | 1 | 365 | 10 | 63 | 16 | 14 | 33 | I=130 II=145 III=74 IV=16 | 25 | Ms 45% By 24% Be 19% | |
| | 2 | 167 | 8 | 106 | 7 | 13 | 83 | IV | 35 | Bw 40% By 37% | |
| | 3 | 42 | 11 | 37 | 13 | 4 | 20 | III | 25 | By 30% Ms 20% Be 20% | |
| | Roads | 2 | | | | | | | | | |
| 7 | 1 | 259 | 10 | 72 | 33 | 14 | 25 | I=181 II=78 | 25 | Ms 54% Be 26% By 10% | |
| | 2 | 77 | 10 | 61 | 16 | 19 | 26 | I=63 II=14 | 25 | Ms 55% Be 19% | |
| | 3 | 122 | 12 | 84 | 30 | 14 | 40 | I | 25 | Ms 59% Be 22% By 12% | |
| | 4 | 35 | 10 | 50 | 33 | 0 | 17 | I | 35 | Sr 60% Bw 20% | |
| | 5 | 48 | 4 | 63 | 33 | 3 | 27 | I | 25 | Ms 53% Aw 21% Pw 16% | |

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA | |
|------|-------|-------|--------------|-------------|------------|--------------|------------|-------------------------|-------------|-----------------------------|--|
| 7 | 6 | 19 | 10 | 90 | 54 | 6 | 30 | I=17 II=2 | 35 | Bw 22% By 18% Mr 18% | |
| | 7 | 31 | Protection | | | | | | III | 25 | |
| | 8 | 125 | Protection | | | | | | III | 25 | |
| | Roads | 9 | | | | | | | IV | | |
| 8 | 1 | 175 | | | | | | I=72 II=55 III=48 | 25 | Ms 48% Be 22% Aw 17% | |
| | 2 | 143 | 14 | 109 | 46 | 25 | 38 | I=86 II=32 III=75 | 25 | Hem 36% Sr 36% Bw 18% | |
| | 3 | 20 | 10 | 133 | 100 | 0 | 33 | III | 23 | Hem 43% Mr 13% By 11% | |
| | 4 | 118 | 12 | 146 | 94 | 16 | 36 | I=78 II=20 III=20 | 24 | MS 24% Be 22% By 19% | |
| | 5 | 64 | 13 | 108 | 45 | 14 | 49 | I=2 II=37 III=25 | 25 | | |
| | 6 | 9 | Protection | | | | | | III | 23 | |
| | 7 | 23 | Protection | | | | | | I | 25 | |
| | Roads | 1 | | | | | | | IV | | |

Block 03 – French Hill Block

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA | |
|------|-------|-------|---------------------|-------------|------------|--------------|------------|---------------------------|--------------|-----------------------------|--|
| 1 | 1 | 32 | 6 | 83 | 35 | 15 | 33 | I=26 III=6 | 35 | Fb 35% Hem 22% Sr 19% | |
| | 2 | 67 | 9 | 108 | 54 | 29 | 25 | I=31 II=36 | 24 | Hem 28% Mr 24% By 17% | |
| | 3 | 53 | 9 | 73 | 20 | 28 | 25 | II=42 III=11 | 31 | Ms 35% Be 16% By 12% | |
| | 4 | 27 | 10 | 120 | 56 | 46 | 18 | I=8 II=19 | 18 | Bw 46% Ms 23% | |
| | 5 | 273 | 11 | 104 | 36 | 30 | 38 | I=1- II=263 | 25 | Ms 41% Be 29% By 14% | |
| | 6 | 211 | 11 | 109 | 54 | 28 | 27 | II=205 III=3 | 27 | Ms 85% | |
| | 7 | 17 | Agricultural Fields | | | | | | I=16 II=1 | | |
| 2 | 1 | 401 | 11 | 87 | 20 | 232 | 44 | I=77 II=135 III=160 | 25 | Ms 34% By 31% Be 18% | |
| | 2 | 45 | 10 | 87 | 30 | 22 | 35 | II=28 III=17 | 35 | Bw 43% Mr 21% Sr 13% | |
| | 3 | 259 | Protection | | | | | | III | 35 | |
| 3 | 1 | 359 | 10 | 94 | 45 | 20 | 29 | I=18 II=325 III=16 | | Ms 41% Be 18% By 15% | |
| | 2 | 27 | 9 | 107 | 40 | 40 | 27 | II | 25 | Mr 30% Hem 24% Be 12% | |
| | 3 | 109 | 11 | 92 | 55 | 11 | 26 | II | 24 | Mr 28% Ms 16% Sr 13% | |

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA |
|------|-------|-------|--------------|-------------|------------|--------------|------------|-----------------|-------------|------------------|
| 3 | 4 | 29 | 8 | 80 | 23 | 0 | 57 | II=16 III=23 | 30 | By 39% Bw 25% |
| | 5 | 5 | Open | | | | | II | 35 | |

Block 04 – Morse Block

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA |
|------|-------|-------|--------------------------------|-------------|------------|--------------|------------|-------------------------|-------------|--------------------------------------|
| 1 | 1 | 236 | Natural Area 184 ac >2500' | | | | | Iv | 35 | |
| | 2 | 20 | Natural Area | | | | | I=5 IV15 | 25 | |
| | 3 | 2 | N.A. - Lake of the Clouds | | | | | | | |
| 2 | 1 | 271 | Natural Area 159 ac >2500' | | | | | IV | 35 | |
| | 2 | 165 | Natural Area 37 ac. >2500' | | | | | I=72 II=72 III=28 | 25 | |
| | 3 | 1 | Natural Area - Bear Pond | | | | | | | |
| 3 | 1 | 43 | 14 | 61 | 24 | 16 | 21 | II | 25 | Be 46% Ms 42% |
| | 2 | 648 | Protection 190 ac. >2500' | | | | | IV | 35 | |
| | 3 | 44 | 14 | 61 | 24 | 16 | 21 | II | 25 | Be 46% Ms 42% Sr 2% |
| 4 | 1 | 195 | 11 | 99 | 67 | 19 | 13 | II | 25 | Ms 62% Be 19% |
| | 2 | 67 | 10 | 68 | 24 | 18 | 24 | II | 24 | Be 29% By 26% Hem 10% |
| 5 | 1 | 34 | Natural Area | | | | | | | |
| | 2 | 268 | Natural Area 212 ac. >2500' | | | | | | | |
| 6 | 1 | 245 | 11 | 99 | 43 | 31 | 25 | II | 25 | Ms 55% Be 20% By 16% |
| | 2 | 49 | 11 | 82 | 18 | 42 | 22 | III | 25 | Ms 42% Be 26% By 21% |
| | 3 | 23 | 10 | 75 | 40 | 15 | 20 | II | 24 | By 31% BE 24% Hem 21% |
| | 4 | 21 | 9 | 143 | 78 | 13 | 52 | II | 35 | Hem 33% Mr 22% Sr 18% |
| | 5 | 15 | 8 | 83 | 22 | 19 | 42 | II | 108 | Mr 50% By 16% |
| | 6 | 554 | Protection 140 ac. >2500' | | | | | IV | 35 | |
| 7 | 1 | 155 | 11 | 101 | 44 | 23 | 33 | II | 25 | Ms 64% Be 22% |
| | 2 | 706 | Protection 356 ac. >2500' | | | | | IV | 35 | |
| 8 | 1 | 88 | 12 | 108 | 54 | 34 | 20 | II | 25 | Ms 72% Be 13% By 11% |
| | 2 | 21 | 12 | 10 | 27 | 37 | 36 | II | 25 | My 41% Ms 19% Mr 19% BE 16% |

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA |
|------|-------|-------|------------------------------|-------------|------------|--------------|------------|--------------|-------------|--------------------------------------|
| 8 | 3 | 7 | 8 | 77 | 45 | 10 | 22 | II | 35 | Sr 38% Bw 26% By 12% Mr 12% |
| | 4 | 179 | Protection 15 ac. >2500' | | | | | IV | 35 | |
| 9 | 1 | 205 | 14 | 125 | 76 | 23 | 26 | II | 25 | Ms 71% By 16% |
| | 2 | 60 | 11 | 96 | 32 | 35 | 29 | III | 25 | Ms 71% BY 21% |
| | 3 | 33 | 12 | 113 | 52 | 26 | 35 | III | 35 | By 38% Be 36% |
| | 4 | 11 | | | | | | II | 24 | |
| | 5 | 692 | Protection 476 ac. >2500' | | | | | IV | 35 | |
| 10 | 1 | 219 | 10 | 89 | 52 | 17 | 20 | II | 25 | Ms 74% Be 14% |
| | 2 | 44 | 9 | 38 | 18 | 17 | 3 | II | 25 | Ms 77% Be 13% |
| | 3 | 22 | 13 | 103 | 63 | 30 | 10 | II | 23 | Hem 30% Bs 26% Be 19% |
| | 4 | 16 | 11 | 92 | 37 | 15 | 10 | III | 25 | Bs 44% Be 20% By 18% Sr 12% |
| | 5 | 1 | 10 | 105 | 90 | 10 | 5 | I | 19 | Bw 59% Mr 30% |
| | 6 | 21 | 11 | 90 | 53 | 27 | 10 | III | 25 | Ms 44% By 28% Be 16% |
| | 7 | 271 | Protection 62 ac. >2500 | | | | | | 35 | |

Block 05 - Ricker Block

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA |
|------|-------|-------|--------------|-------------|------------|--------------|------------|----------------|-------------|--------------------------------------|
| 1 | 1 | 252 | 12 | 92 | 53 | 14 | 25 | II | 25 | Ms 50% Aw 14% Be 10% |
| | 2 | 67 | 12 | 108 | 60 | 19 | 29 | II | 23 | Hem 14% Ms 16% By 14% |
| | 3 | 47 | 13 | 51 | 26 | 5 | 20 | II | 25 | Ms 38% Be 19% Aw 13% |
| | 4 | 12 | 10 | 96 | 56 | 10 | 30 | II | 18 | Bw 61% Ms 28% |
| | 5 | 23 | 12 | 80 | 60 | 0 | 20 | II | 35 | Sr 65% Be 15% By 10% Ms 10% |
| | 6 | 31 | Campground | | | | | II | 24 | |
| 2 | 1 | 358 | 13 | 85 | 46 | 13 | 26 | I=56 II=302 | 25 | Ms 62% Aw 11% |
| | 2 | 24 | 16 | 108 | 72 | 12 | 24 | II | 23 | Hem 49% Be 15% Ms 10% |
| | 3 | 3 | 12 | 80 | 60 | 0 | 20 | II | 35 | Sr 65% |
| | 4 | 116 | Protection | | | | | III | 35 | |

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA |
|------|-------|-------|--------------|--------------|------------|--------------|------------|-------------------------|-------------|--------------------------------------|
| 3 | 1 | 372 | 12 | 96 | 46 | 20 | 30 | I=129 II=243 | 25 | Ms 69% By 11% |
| | 2 | 127 | Protection | | | | | III | 35 | |
| 4 | 1 | 192 | 11 | 97 | 42 | 23 | 32 | I=18 II=169 III=5 | 25 | Ms 50% By 23% Be 12% |
| | 2 | 294 | Protection | | | | | III | 35 | |
| 5 | 1 | 19 | 12 | 56 | 34 | 10 | 12 | II | 25 | Ms 59% Be 10% |
| | 2 | 45 | 12 | 73 | 21 | 15 | 37 | II=40 III=5 | 25 | Ms 36% By 28% Be 28% |
| | 3 | 304 | Protection | | | | | III | 35 | |
| 6 | 1 | 192 | 12 | 101 | 41 | 24 | 36 | II=162 III=30 | 25 | Ms 56% Be 16% By 15% |
| | 2 | 35 | 8 | 90 | 33 | 27 | 30 | II=6 III=29 | 25 | By 41% Ms 34% Be 10% Mr 10% |
| | 3 | 165 | <4 | Regeneration | | | | II | 35 | |
| | 4 | 120 | 11 | 115 | 56 | 27 | 32 | II | 35 | Ms 30% Sr 24% Bw 18% |
| | 5 | 38 | 11 | 112 | 28 | 17 | 67 | II | 108 | Bw 49% Ms 28% Mr 22% |
| | 6 | 105 | Protection | | | | | III | 35 | |
| 7 | 1 | 209 | 10 | 95 | 32 | 20 | 43 | III | 108 | Mr 38% Bw 26% |
| | 2 | 167 | 12 | 106 | 45 | 10 | 51 | II | 25 | Ms 26% Be 14% By 14% Mr 13% |
| | 3 | 140 | 13 | 133 | 82 | 10 | 41 | II | 23 | Hem38% By 11% Mr 11% |
| | 4 | 7 | Old Orchard | | | | | II | | |
| 8 | 1 | 213 | 14 | 91 | 52 | 9 | 30 | I=59 II=154 | 25 | Ms 49% Be 10% Aw 10% |
| | 2 | 183 | 11 | 117 | 56 | 14 | 47 | I=26 III=157 | 108 | Bw 36% Mr 26% |
| | 3 | 28 | 11 | 125 | 100 | 8 | 17 | II | 23 | Hem50% Sr 16% |
| | 4 | 258 | Protection | | | | | II | 24 | |
| | 5 | 44 | Campground | | | | | II | 23 | |

Block 06 – Smugglers Notch Block

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA |
|------|-------|-------|-------------------------|-------------|------------|--------------|------------|---------------------------------|-------------|--------------------------------------|
| 2 | 1 | 102 | 11 | 100 | 22 | 52 | 26 | I=5 II=45 III=39 IV=13 | 25 | By 35% Be 25% Mr 17% Ms 11% |
| | 2 | 349 | Protection | | | | | III=8 IV=341 | 35 | By 66% Ms 16% Sr 8% |
| | 3 | 170 | Ski Trails & Lift Lines | | | | | | | |
| | 4 | 7 | Buildings & Parking | | | | | | | |
| 3 | 1 | 85 | 9 | 74 | 38 | 17 | 19 | II=59 III=2 IV=24 | 25 | Ms 45% Be 25% By 18% |
| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA |
| 3 | 2 | 53 | 9 | 95 | 23 | 45 | 27 | I=4 II=11 III=23 IV=15 | 25 | By 35% Be 25% Mr 17% Ms 11% |
| | 3 | 28 | Protection | | | | | II=5 IV=23 | | |
| | 4 | 78 | Ski Trails & Lift Lines | | | | | | | |
| | 5 | 3 | Buildings & Parking | | | | | | | |
| | 6 | 31 | Campground | | | | | | | |
| | 7 | 4 | | | | | | | | |
| 4 | 1 | 114 | 13 | 93 | 34 | 26 | 33 | II=87 III=23 IV=4 | 25 | Be 38% By 30% Ms 20% |
| | 2 | 116 | Protection | | | | | II=4 III=29 IV=83 | 35 | |
| | 3 | 57 | Ski Trails & Lift Lines | | | | | | | |
| | 4 | 7 | Buildings & Parking | | | | | | | |
| 5 | 1 | 73 | 12 | 102 | 56 | 23 | 23 | III=28 IV=45 | 25 | Ms 43% By 29% Be 27% |
| | 2 | 113 | Protection | | | | | IV | 25 | Ms 50% Be 24% By 14% |
| | 3 | 52 | Protection | | | | | IV | 35 | |
| | 4 | 1 | Picnic Area | | | | | | | |
| | 4 | 4 | Route 108 buffer | | | | | | | |

Block 08 – Woodward Hill Block

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA |
|------|-------|-------|--------------|-------------|------------|--------------|------------|--------------|-------------|----------------------------|
| 1 | 1 | 273 | 12 | 118 | 75 | 11 | 32 | II | 24 | Hem43% Mr 17% By 13% |
| | 2 | 176 | 13 | 108 | 44 | 19 | 45 | II | 25 | Ms 22% Be 20% By 14% |
| | 3 | 248 | 10 | 91 | 51 | 18 | 22 | II | 108 | Ms 18% Pw 17% Mr 16% |

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA |
|------|-------|-------|-------------------|----------------|---------------|-----------------|---------------|-----------------|----------------|-----------------------------|
| 1 | 4 | 11 | 12 | 93 | 73 | 10 | 10 | I | 18 | Bw 56% Mr 22% MS 12% |
| | 5 | 18 | 10 | 146 | 124 | 18 | 4 | I | Pr | Pr 70% Mr 13% |
| | 6 | 22 | 12 | 182 | 175 | 7 | 0 | I | Pw | Pw 84% Pr 11% |
| | 7 | 11 | 11 | 230 | 187 | 40 | 3 | II | Pw | Pw 88% Larch 10% |
| | 8 | 3 | 8 | 100 | 93 | 0 | 7 | I | Sn | Sn 61% Mr 14% |
| | 9 | 84 | Campground | | | | | | | |
| | Roads | 18 | | | | | | | | |
| 2 | 1 | 109 | 13 | 114 | 75 | 17 | 22 | II | 24 | Hem 44% Mr 13% Pw 12% |
| | 2 | 146 | 12 | 100 | 53 | 15 | 32 | II | 25 | Ms 45% Be 15% |
| | 3 | 100 | 13 | 71 | 39 | 17 | 15 | II | 25 | Ms 55% By 16% Be 13% |
| | 4 | 198 | 10 | 100 | 45 | 16 | 39 | II | 108 | Mr 33% Bw 16% Ms 13% |
| | 5 | 53 | 10 | 100 | 52 | 18 | 30 | II | 18 | Bw 52% Ms 23% |
| | 6 | 3 | 10 | 147 | 140 | 7 | 0 | I | Pr | Pr 50% Sn 22% Aw 10% |
| | 7 | 16 | 13 | 162 | 146 | 8 | 8 | I | Pw | Pw 88% |
| | 8 | 1 | | 240 | | | | I | Tamarack | |
| | 9 | .5 | Swamp | | | | | IV | | |
| | 10 | .5 | Mixed Plantation | | | | | II | | |
| | 11 | 2 | Open - Old Fields | | | | | II | | |
| | Roads | 2 | | | | | | | | |

Block 10 - Blush Hill Block

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA |
|------|-------|-------|---------------------|----------------|---------------|-----------------|---------------|-----------------|----------------|-----------------------------|
| 1 | 1 | 245 | 10 | 108 | 72 | 7 | 29 | II | 23 | Hem 34% Mr 24% Sr 16% |
| | 2 | 111 | 10 | 70 | 30 | 12 | 28 | I | 25 | Ms 37% Be 13% Aw 13% |
| | 3 | 10 | 10 | 178 | 151 | 7 | 20 | I | Pr | Pr 83% |
| | 4 | 309 | 12 | 104 | 35 | 24 | 45 | I | 24 | Mr 31% Hem 30% By 20% |
| | 5 | 9 | <4 | | | | | I | 108 | |
| 2 | 1 | 63 | Day Use Area | | | | | | | |
| | 2 | 15 | Open - old fields | | | | | | | |
| | 3 | 25 | Agricultural Fields | | | | | | | |
| | 4 | 18 | 12 | 98 | 84 | 8 | 6 | I | 22 | Pw 60% Hem 20% |

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA | |
|------|-------|-------|---------------------|-------------|------------|--------------|------------|--------------|-------------|--------------------------------------|--|
| | 5 | 21 | 10 | 102 | 47 | 13 | 42 | I | 25 | Mr 28% Hem16% Pw 13% Ms 12% | |
| | 6 | 178 | 12 | 144 | 99 | 21 | 24 | II | 24 | Hem59% Sr 11% Mr 11% | |
| 3 | 1 | 146 | 12 | 87 | 32 | 22 | 33 | II | 25 | Ms 31% Hem16% Be 19% | |
| | 2 | 281 | 11 | 112 | 55 | 21 | 36 | II | 24 | Hem31% Mr 28% By 13% | |
| | 3 | 29 | 14 | 97 | 52 | 17 | 27 | II | 32 | Sr 58% Hem19% | |
| 4 | 1 | 103 | 10 | 83 | 36 | 13 | 34 | II | 25 | Mr 22% Ms 18% Be 16% | |
| | 2 | 258 | 11 | 91 | 41 | 14 | 36 | II | 24 | Hem36% Ms 18% By 13% | |
| | 3 | 10 | 13 | 73 | 53 | 7 | 13 | I | 21 | Pw 70% | |
| | 4 | 7 | 11 | 130 | 99 | 17 | 14 | II | 32 | Sr 50% Mr 20% | |
| | 5 | 39 | Agricultural Fields | | | | | | | | |
| | 6 | 47 | Open – old fields | | | | | | | | |
| | 7 | 6 | Seed Orchard | | | | | | | | |

Block 11 – Beaver Meadow Block

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA |
|------|-------|-------|------------------------------|-------------|------------|--------------|------------|--------------|-------------|----------------------------|
| 1 | 1 | 232 | 12 | 92 | 42 | 9 | 41 | II | 25 | Ms 52% By 20% Be 17% |
| | 2 | 16 | 9 | 120 | 80 | 0 | 40 | II | 18 | Bw 86% Mr 14% |
| | 3 | 35 | 8 | 90 | 50 | 17 | 23 | II | 19 | Mr 51% Bw 27% |
| | 4 | 42 | Protection | | | | | III | 35 | |
| | 5 | 223 | Protection 78 ac. > 2500' | | | | | IV | 33 | |
| | 6 | 21 | 7 | 52 | 26 | 14 | 12 | II | 35 | Fb 35% Mr 23% Sr 15% |
| 2 | 1 | 115 | 9 | 65 | 30 | 10 | 25 | II | 35 | Mr 26% Ms 18% Fb 16% |
| | 2 | 312 | 11 | 81 | 43 | 7 | 31 | II | 25 | Ms 48% By 20% Be 19% |
| | 3 | 246 | Protection 128 ac. >2500' | | | | | IV | | |
| 3 | 1 | 21 | 10 | 90 | 27 | 17 | 46 | II | 25 | By 45% Ms 26% Be 23% |
| | 2 | 115 | Protection | | | | | III | 35 | |
| | 3 | 91 | Protection 82 ac. >2500' | | | | | IV | 33 | |
| 4 | 1 | 90 | Protection | | | | | | 35 | |
| | 2 | 318 | Protection 286 ac. >2500' | | | | | | 33 | |

| Comp | Stand | Acres | MSD (inches) | Total BA/Ac | Acc. BA/Ac | Unacc. BA/Ac | Cull BA/Ac | Site (acres) | Timber Type | Species %BA |
|------|-------|-------|------------------------------|----------------|---------------|-----------------|---------------|-----------------|----------------|----------------------------|
| 5 | 1 | 281 | 12 | 90 | 40 | 12 | 38 | II | 25 | Ms 44% Be 24% By 20% |
| | 2 | 19 | Protection | | | | | III | 35 | |
| 6 | 1 | 448 | 10 | 94 | 35 | 17 | 42 | II | 25 | Ms 39% Be 28% By 20% |
| | 2 | 55 | 6 | 55 | 30 | 3 | 22 | II | 30 | Mr 24% Fb 22% Sr 13% |
| | 3 | 6 | Protection | | | | | IV | 35 | |
| 7 | 1 | 452 | Protection 407 ac. >2500' | | | | | IV | 33 | |
| | 2 | 438 | Protection 368 ac. >2500 | | | | | IV | 35 | |

Tel: 802-241-3683
Email: eleary@fpr.anr.state.vt.us

MEMORANDUM

TO: Craig Whipple, Chief of Park Operations

FROM: Ed Leary, Director of State Lands

DATE: October 20, 1999

SUBJECT: **Land Exchange(s) between
State of Vermont and Mt. Mansfield Company, Inc.**

You asked me to provide you with detailed information pertaining to the two land exchanges between the State of Vermont and Mt. Mansfield Company, Inc., which have been authorized by acts of the Vermont General Assembly in 1996 and 1998.

J.R.H. 118, passed on May 2, 1996 authorized the Commissioner of the Department of Forests, Parks & Recreation “to enter into an exchange of land, whereby the state would convey a portion of its land holdings in the Town of Stowe, not to exceed 25 acres in size, which are currently part of Mt. Mansfield State Forest, and upon which the Smugglers’ Notch State Park (SNSP) campground facilities are situated at present, to Mt. Mansfield Company, Inc., doing business as Stowe Mountain Resort (SMR), in exchange for a number of parcels of land SMR owns in the Towns of Stowe and Cambridge, consisting of 1,092 acres, which have an appraised value equal to or greater that the state-owned parcel being conveyed.” I have attached a complete copy of J.R.H. 118 to this memo for your information.

Results of this particular exchange would allow SMR to expand its existing development at the base of Spruce Peak onto the land currently serving as the Smugglers’ Notch State Park campground. The State would gain 1187 acres of land, currently owned by SMR, which would become part of Mt. Mansfield State Forest. This land coming into state ownership would provide permanent protection to a section of the Long Trail, would put a significant portion of the shoreline of Sterling Pond that is privately owned into public ownership, and provide permanent protection of historic Peregrine falcon nesting habitat as well as the Elephant’s Head Trail in the area known as “Elephant’s Head”. A portion of the SMR lands, the 976 acre “Ridge Parcel”, for appraisal purposes, was assumed to have no development potential.

Craig Whipple
October 20, 1999
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According to the appraiser, "As part of this analysis, it is assumed that all development rights, associated with this parcel which benefit the current owner, Mount Mansfield Company, have been transferred to the adjacent Mt. Mansfield Company lands. Regardless, the parcel has no development potential due to its location above the 2,500 foot elevation". However, to provide absolute assurance as to the permanent protection of this ecologically, recreationally and aesthetically valuable piece of land, a permanent conservation easement will be held by the Vermont Land Trust.

Details pertaining to the 1996 exchange are as follows:

Lands to be traded:

From Mt. Mansfield Company, Inc.

- 1) Approximately 95 acres of land on the easterly side of Vermont Route 108 in Stowe, referred to as the "Elephant's Head" parcel.
- 2) Approximately 116 acres of land on the easterly side of Vermont Route 108, with 800 +/- feet of frontage, in Stowe and Cambridge, consisting of two parcels collectively referred to as the "Corridor" parcel.
- 3) Approximately 976 acres of land on the easterly side of Vermont Route 108 in Stowe, referred to as the "Ridge" parcel.

From State of Vermont

Approximately 25 acres of land on the easterly side of Vermont Route 108 in Stowe, with 2,200 +/- feet of road frontage, upon which is situated the Smugglers' Notch State Park campground facilities.

The lands authorized in 1996 to be exchanged have been determined through a standard appraisal process to be equal in value.

The most recent exchange, approved by the Governor on April 19, 1998, authorized the Commissioner of Forests, Parks & Recreation "to exchange lands with the company, by which the company shall convey to the state a parcel of approximately 35 acres, as a site for relocating the campground, including a 200-foot-wide permanent protective easement surrounding the parcel, as a buffer to enhance a wilderness experience at the campground, in return for which the state shall convey to the company a parcel of approximately 115 acres, with the following conditions:..." I am attaching a copy of the full text of this section, 35(a) of H.761, to this memo for your information.

This second exchange provided the Department of Forests, Parks & Recreation with an appropriate and suitable site upon which to relocate its Smugglers' Notch State Park campground facilities, while conveying to Mt. Mansfield Company land of equal value, some of which [the 58.8 acre Lot #1] would be restricted in terms of future development [see subsection (2)(B) of the legislative authorization].

Details pertaining to the 1998 exchange are as follows:

Lands to be traded:

From Mt. Mansfield Company, Inc.

- 1) Approximately 34.5 acres of land in Stowe, Vermont, situated on the south side of Vermont Route #108, as a site for relocating the Smugglers' Notch State Park campground, including a 200-foot-wide permanent protective easement surrounding the parcel, as a buffer to enhance a wilderness experience at the campground. The campground site, to be conveyed to the State in fee, is approximately 20 acres in size. The 200-foot-wide protective easement consists of approximately 14.5 additional acres. The State shall have the right to construct roads, campsites, trails and any other improvements associated with the new campground within the 200-foot-wide buffer. Mt. Mansfield Company, Inc. will only retain the right to maintain cross-country ski trails within the 200-foot-wide buffer.

From State of Vermont

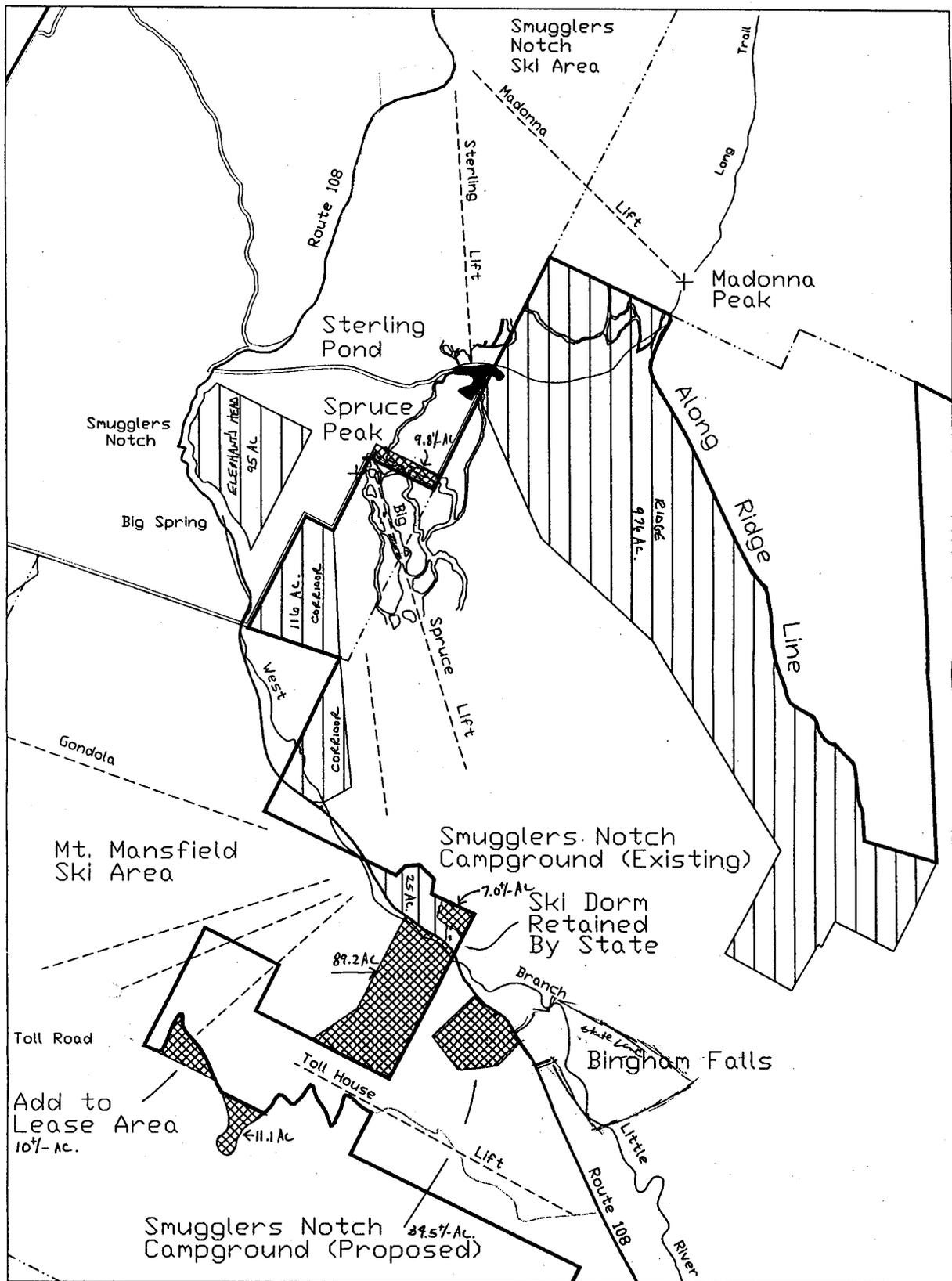
- 1) Approximately 9.8 acres of land in the town of Cambridge, situated northeasterly of the summit of Spruce Peak, upon which Mt. Mansfield Company, Inc. currently maintains down hill ski trails.
- 2) Approximately 7.0 acres of land in the town of Stowe, situated on the north side of Vermont Route #108, directly behind the Vermont State Ski Dorm.
- 3) Approximately 89.2 acres of land in the town of Stowe, situated on the south side of Vermont Route #108, directly across from the Vermont State Ski Dorm, that is currently leased by the State of Vermont to Mt. Mansfield Company, Inc. Any development of this acreage shall be prohibited, except for the construction of ski lifts, snow making equipment and ski trails. The Town of Stowe shall receive an easement to this parcel to enable construction of a municipal sewer line extension.
- 4) Approximately 11.1 acres of land in the town of Stowe, situated within Lot #39³ on the north side of the "Toll Road", through which Mt. Mansfield Company, Inc. currently maintains a down hill ski trail.

Craig Whipple
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The value of the land to be conveyed to the State of Vermont from Mt. Mansfield Company, Inc. was determined through an appraisal process to exceed the value of the land to be conveyed by the State of Vermont to Mt. Mansfield Company, Inc, by a sum of \$140,000. This exchange will provide the State of Vermont with a much more desirable site upon which to relocate the presently existing Smugglers' Notch State Park campground facilities, resulting in a camping experience quite similar to that which originally existed when the Civilian Conservation Corps built the current campground sixty years ago.

Please let me know if you need any additional information related to this very significant and quite complex pair of land transactions.

Attachments



Public Involvement

Mt. Mansfield State Forests Long Range Management Plan

History of the Planning Effort

The first public involvement started in 1989. the Vermont Department of Forests, Parks & Recreation, Central Vermont Regional Planning Commission and the Lamoille County Planning Commission co-sponsored a public forum to receive input regarding management on Mt. Mansfield State Forest on August 29, 1989. The meeting was held at the Stowe High School and had about 60 participants.

Public service announcements were sent to newspapers and radio and television stations. In addition, letters were sent to all adjacent landowners, resource organizations, loggers, legislators, regional planning commission members, town planning commission members, town select boards and town officers. At this time, the Underhill Block was not included in the planning process.

The meeting started with introductory remarks and a slide show. Participants broke into six smaller groups, each dealing with one aspect of management on Mt. Mansfield State Forest. The groups were: local officials/town planning; timber management; Waterbury Reservoir; summer recreation; winter recreation and general issues. The proceedings from this meeting are included later in this appendix.

William Moulton prepared an Overview Plan for Mt. Mansfield State Forest that dealt with concepts rather than specific activities. This plan went through a review and comment period and was signed by the Commissioner on June 19, 1992. Specific activities would be developed in individual Block Plans. It was decided to work with larger units because some of the management issues went over Block boundaries.

- Reservoir Unit- Woodward Hill, Ricker, Blush Hill, Cotton Brook and Burt Nebraska Blocks
- Main Mountain Unit- Smugglers Notch, Burt Ranch and Morse Blocks
- Sterling Unit - Beaver Meadow and French Hill Blocks.

Work started on the draft plan for the Main Mountain Unit in 1995. A planning advisory group was organized consisting of individuals and

organizations with an interest in Mt. Mansfield State Forest. Through this process a decision was made to include the Underhill Block.

On March 13, 1996 the first of two meetings was held in Morrisville to discuss a variety of issues including; a possible land swap between the department and Stowe Mountain Resort, long range plans for Stowe Mountain and Smugglers Notch Resorts, and the process for completing the long-range management plan for the Main Mountain Unit.

The second meeting was held on April 17, 1996. At this meeting, participants brainstormed issues that should be addressed in the plan. Also discussed was the future of the Smugglers Notch State Park campground. Issues raised at the meeting centered around the land swap. As a result, a separate committee was formed to deal with the issue of relocating the campground.

The planning advisory group met regularly until 1998, at which time the group charged the department with developing all existing data layers before decisions could be made. The group also encouraged the department to use geographic information system (GIS) technology. In February 1998 an Agency Team was created to develop the data layers and write a plan. Through this Team a list of needed data layers was created and assembling them began. Information on data layers was completed in 2001, along with a new long-range management plan format for all Agency of Natural Resources lands.

Using the new format a draft plan was created for Mt. Mansfield State Forest. A series of meetings was held in each of the counties that the forest is located in, for the express purpose of providing information and documenting comments on the draft plan. Comments were recorded at each of the meetings.

| | |
|---------------|-------------|
| June 18, 2002 | Morrisville |
| June 20, 2002 | Waterbury |
| June 25, 2002 | Underhill |

A 30-day comment period followed for written comments to be sent to the department.

During this entire process, there were other planning efforts focused on portions of Mt. Mansfield State Forest. In 1993 an advisory group was established to develop a plan for the Smugglers Notch Scenic Highway Corridor. This group met several times during the next 3 to 4 years. A plan was developed and implementation started.

The Vermont Agency of Natural Resources wishes to thank all the people who took the time to read the draft plan, attend public meetings, provide comments, and serve on the planning advisory groups. The management of Mt. Mansfield State Forest will be improved as a result of

the insightful comments that resulted in additions and corrections to the long-range management plan.

Draft Plan – Responsiveness Summary December 2002

Last winter there was a snowmobile tour group operating on the Stowe side of Smugglers Notch. Would like to see this operation stop. This has always been a great place to snowshoe where it is quiet and peaceful. There are plenty of snowmobile trails for their use.

The Department of Forests, Parks & Recreation did have a license with a snowmobile tour group that covered the east side of Smugglers Notch. This activity will not be approved for the 2002-2003 season. However, there is a question as to who has jurisdiction of this issue if the tour group operates totally within the road right-of-way. The Agency of Transportation may have jurisdiction over this. The department will follow up on this issue if the tour group operates from Stowe this winter.

At the open house in Underhill, I noticed what appears to be an error on the base map. The road directly north of the Mountain Road (off Pleasant Valley in Underhill) is Harvey Road. This is the southern access to the Kruse Block. You have marked it with a dotted line, which means State Forest Highway, according to your key. Harvey Road is not a State Forest Highway. It is a town road.

This change was made to the database and new maps show Harvey Road as a town road.

Why does the department close such a large area around the peregrine falcon nesting site in Smugglers Notch. In New York and New Hampshire they close down smaller areas around the nest sites.

At Smugglers Notch, the falcon closure area has been delineated by features that are easily recognizable on the ground (hiking trails, Route 108, ridgeline). The other factor used to determine the boundaries of the closure area is the ease in posting and patrolling the area.

The plan says on page 30 that the Beaver Meadow Lodge and Burling Camp receive considerable use for over night stays. I believe the use is low for winter camping. The log book doesn't show a lot of use.

Overnight use of Burling Camp and Beaver Meadow Lodge during the winter has been a growing concern for the department and the Green Mountain Club. However there has never been an accurate survey of winter use. The wording was changed in the Highly Sensitive Areas #8 to more accurately depict the concerns for this area. Monitoring use will provide the actual numbers.

In recent snowshoeing trips to the Beaver Meadow area, there has begun to be a problem with snowmobiles being used on the trail to Beaver Meadow Lodge. This area is a popular winter route for cross-country skiers and snowshoers who want to experience the quiet and solitude. Consider this an application for closure of the trail to Beaver Meadow Lodge and Burling Camp to snowmobiles.

This request fits with the current land use classification of the lodge sites into the Highly Sensitive Areas, where motorized recreational vehicles will not be allowed. This decision was made using the Recreational Opportunities Spectrum (see Appendix C – Recreation Assessment) that is designed to focus on the character of the experience a recreational user can expect to find. The lodge area was characterized as semi-primitive, non-motorized. Since only 37% of Mt. Mansfield State Forest is available for this type of experience the decision was made during the planning process to maintain those areas that currently fit this recreational experience. The department will post the trail to the lodges closed to snowmobiles during the winter.

Section II: How about add a paragraph identifying the constituent units, including the state parks? How do the boundaries of the parks correspond to the Blocks?

To avoid confusion, the references made to blocks and district responsibilities were moved to Section V. This section deals with actual management of the forest and has the maps showing block boundaries.

The administrative history might be interesting: as the Forest expanded, did FPR change is organization? When were the district offices created?

While the administrative history of the Department of Forests, Parks & Recreation may be interesting, it is not included as part if the individual management plans. This may be a good topic to have on the department's website.

How about adding a paragraph about the way FPR manages the forest? I had to read the entire plan before realizing how difficult the organizational task is. For example, it appears from the plan that the ski areas are managed autonomously, as are the timber harvesting and campgrounds.

The ski areas are managed autonomously. They are managed according to the Master Plan developed by each ski resort. Each year a list of activities is prepared by the respective ski resort and submitted to the department for review. Most of the activities also require Act 250 approval.

In past years all activities in the campgrounds were managed separately from the land base. An annual work plan was developed by the forestry and parks divisions separate from each other. However, in recent years, an annual stewardship plan has been prepared that encompasses all activities on agency lands. The annual stewardship plan is prepared for each fiscal year, July 1 to June 30, by the district stewardship team and reviewed by the State Lands Team at the headquarters office in Waterbury. This effort is to provide feedback between and within departments of the Agency of Natural Resources and keeps lines of communication open.

Throughout, I wasn't prepared for the relative importance of the components of the forest. For example, the space devoted to the ski areas (1 page) and Bicknell's thrush (pervasive) probably don't correspond to their importance to the plan, Vermont's economy or FPRs workload. A few words might help me prepare for what is the most important item to attend to.

Mt. Mansfield State Forest is a large and very complex parcel of land. It is difficult to derive a balance between using the natural resources and protecting them. All aspects of the forest are important. The mission statements for the agency and departments, found in Section I, promote sustainable use of Vermont's natural resources for products and outdoor recreation, while protecting the integrity of the ecosystems. The land use classification for Mt. Mansfield State Forest tries to balance the importance of all of these issues.

The ski areas are important economically to the region and to the department. (The lease payments go to the parks revolving fund, which helps to operate the state park system.) Less attention was paid to the ski lease areas because what happens there is under the purview of the regulatory system. Although they have an impact on the use of the land, they have limited impact on how the long-range management plan was constructed. Each of the ski areas has developed a master plan.

Reference to Bicknell's thrush is also found throughout the Highly Sensitive Areas section because that is where the habitat exists.

Several sections repeated the same information about hemlock, spruce, mast, white pine, even- and uneven-aged stands. Perhaps a section spent organizing this information as an FPR policy would allow the reader to gain a better understanding of silviculture, ie: what is a cutting cycle, why sometimes 10-15 year intervals and other times 15-20 years? when to thin, clear-cut or selectively harvest? why sometimes even-aged and other times uneven-aged.

This information is all part of silvicultural management and is based on the growing requirements for individual tree species. "Cutting cycles" are part of an uneven-aged management system and refers to how often entries should be made into the stand, which differs by species being managed. The department started work on a brochure for state lands management that would explain these silvicultural terms for readers outside the forestry profession. The recommendation is made to complete this brochure and provide it both on the department's web page and as a handout at future public meetings.

Don't recall reading about the future of the ski dorm or the Stone Hut. Both provide a function and will consume resources for repair or tearing down.

This was an oversight. These buildings are now included in the implementation section for Smugglers Notch State Park found under Intensive Use Areas.

Act 250 is referenced (page 52) as if it pertains only to the ski areas. Structures as insubstantial as a leanto also require review. What projects require review and which do not? What is FPR's policy towards becoming a co-applicant? Is there a plan for sewage treatment?

The reference to Act 250 under ski area management was to alert readers that all activities within the ski areas require review. Act 250 review is needed for all development projects. An Annual Stewardship Plan is prepared and details specific activities that will take place in a given fiscal year. The District Environmental Commission reviews this document and gives a determination on which projects might need and Act250 permit.

Because the Department of Forests, Parks & Recreation is the owner of the land, the department must be a co-applicant on all ski area Act 250 permits. Sewage treatment at Stowe Mountain Resort is planned to tie into the town of Stowe's system.

How about including a few words about the contents of *Management Guide for Deer Wintering Areas in Vermont*? Since this is a web document, a URL would be appropriate. How are softwood cover and hardwood browse encouraged in the context of logging?

This is a publication developed jointly by the Vermont Department's of Forests, Parks & Recreation and Fish and Wildlife and contains standards for managing deer wintering cover of all softwood species. This guide is a supplement to existing silvicultural guides. The publication is available in print, but not on the website so a URL cannot be provided. A recommendation will be made to have this document available on the department website.

Trees in the wintering areas need to be managed to keep them growing vigorously. When tree growth slows down and stagnates the trees can become susceptible to attack by insects and diseases. The trees are thinned to reduce the competition for sunlight, water and nutrients, thereby allowing those remaining to grow faster. This work is accomplished through commercial timber sales. Hardwood browse is usually provided in a 200-foot buffer strip surrounding the wintering area. Small patch clearcuts are made to encourage growth of young trees that are within reach of a deer. Again, this work is accomplished through commercial timber sales.

Information on timber sales listed in deer wintering areas (page 56), timber sales (page 57) and the map (page 60) is inconsistent. Of the 7 items in the "wildlife" section, 4 do not appear in the timber sales table. I would like to see estimates of acreage and board feet. Would like to have some idea of the availability of "quality browse" (or something related to the survival of deer) over the next 20 years, and the effects, for example, if Sale N did not occur.

The timber sales listed in the Wildlife Habitat portion of Section V – Schedule of Activities for the Next 20 Years are management activities in the deer wintering areas. Some of these treatments will be accomplished as part of a larger timber sale as shown in the Timber Sale Schedule and some will be done as separate sales. This accounts for 4 sales not appearing in the Timber Sale Schedule.

Estimated acreages and board foot volumes will be provided in the Annual Stewardship Plan when each sale is scheduled. At this time, a detailed prescription will also be prepared.

The availability of high quality browse has not been monitored at this time. This will be a piece of information that will be collected over the life of this plan.

The guidelines paragraph in Wildlife section (page55) implies that FPR doesn't have a policy on riparian habitats. The wording did not inspire much confidence that guidelines would be developed any time soon.

There are various existing guidelines that the department follows when managing state lands. Some are formal guidelines that were developed through an interdepartmental process. For other areas recommendations have been made, but the formal guidelines have not been developed. The agency is in the process of developing the formal guidelines.

Buffers needed along streams is one issue. The acceptable management practices for water quality on logging jobs contain a minimum buffer, this recommendation is followed on all state timber sales. The question arises as to whether that is adequate.

No attention was given to the increases and decreases of use of the various resources. What data is available? For hiking, is overall usage increasing or decreasing? What is the relative use of easy hikes (Sterling Pond) versus difficult ones (Hell Brook)? My impression is that cross-country skiing and snowshoeing use is increasing. What about other uses like mountain biking, snow machines, water skiing, canoeing, fishing and primitive camping?

Records show that hiking use is fairly stable. The most heavily used trail on Mt. Mansfield State Forest is the Sterling Pond Trail, averaging almost 13,000 hikers per year. The summit of Mt. Mansfield sees 8,000 hikers each from the Sunset Ridge Trail and the Long Trail from Route 108 to Taft Lodge. The Stevensville Trails average 4,000 hikers per year. Hell Brook Trail averages 1,800 per year, while Elephants Head and Hazelton Trails average just over 1,000 hikers per year. These numbers help the department and Green Mountain Club determine which trails warrant the most attention. (See Appendix C – Recreation Assessment)

While there are no numbers regarding cross-country skiing and snowshoeing use, there are other indicators that use has increased over the past 10 years. The main indicator has been the need to provide winter parking in areas where only summer parking was provided in the past.

The numbers of hikers comes from trail register sign-in boxes. Other uses such as mountain biking and snowmobiling will require other methods of survey. These uses will need to be monitored during the course of this plan.

Is use of the state park campgrounds going up or down? Do campers prefer lean-tos or tent sites?

Camper-days at the three state park campgrounds have been relatively stable during the past 10 years. Little River State Park averages 28,000 camper-days per year when the Waterbury Reservoir is full. Numbers have been down since the reservoir was drained for dam repairs. Smugglers Notch campground averages 8,000 camper-days per year and Underhill State Park averages 3,000 camper-days per year. (See Appendix C – Recreation Assessment).

The parks division looks at a variety of surveys and trends to determine camper preferences. Most recent trends show a niche for rustic cabins within the parks. During the next few years, rustic cabins will be built in state park campground throughout the state.

What is the expected demand and prices for the timber which is proposed to be cut? It is my impression that lumber prices have increased significantly over the past several years. I don't know the mix of lumber, the markets it sells in, nor the volume cut. We are all aware of the questionable cost-benefit analyses conducted over the years by the US Interior Department. I think some mention of the complexities of the issue would be in order.

It is the department's experience that there will be a market for the timber cut off state land. However, it is hard to predict the price that will be paid for the trees. Stumpage prices increased during the early and mid 1990s, but have dropped some during the past couple of years. The stumpage prices, for most species is higher than it was in 1990.

Timber sales on state lands are planned based on silvicultural needs and biological principles, not market conditions. However, when conducting a timber sale the department attempts to receive the highest price possible for the wood sold. Timber sales are sold by competitive bids to the highest bidder.

Over the years, the department has studied the costs of conducting its timber sale program and found that revenues generated significantly exceed the costs of administering the program. They do not, however, cover the costs of managing the land for all of the other values such as, wildlife habitat, recreation, etc.

No information was provided about the revenues received from campsite fees and timber cutting and the area to which these revenues are applied.

Revenues received from campsite and day-use fees go directly to the Park Revolving Fund, which is used to operate the parks throughout the state. Other sources of income for the park revolving fund are timber sale receipts on

designated state park lands and payments from the various ski areas that operate on state owned land.

Until 2001, timber sale receipts from state forests went to the Vermont General Fund. To secure sustainable funding for management of public lands, the Legislature created Vermont's Land and Facilities Trust Fund. Timber sale receipts are now deposited in this trust fund. Once fully, established, the Fund will be able to cover certain costs, such as: repair and maintenance of state parks and conservation camps; maintenance of boundaries, roads, and trails; surveys and mapping; timber management; natural resource inventories; repairs to state-owned dams.

The “Monitoring and Evaluation” section (page 68) describes the staff skills required to perform some necessary tasks. Inasmuch as staff time is always limited, quantification of the magnitude of the effort would be desirable.

Many of the tasks in the Monitoring and Evaluation section are already in place. Aerial surveys are conducted each year to map and document insect and disease problems or outbreaks. Natural resource inventories are conducted as part of the Forest Examination (FOREX) system developed by the department. This system has been revised periodically since its start in 1971. Forex inventories are typically completed on a parcel of land every 10 years. Because of reduced staffing and an increase in the land base, this periodic inventory may happen every 15 to 20 years. The Lands and Facilities Trust Fund may help with funding these inventories.

Roads and trails are monitored to determine maintenance and emergency needs. Monitoring quality of the water resources and aquatic habitats require additional funding.

No mention was made of the volunteer effort, nor even the desirability of using volunteers.

The department has an Adopt-A-Trail program, where volunteers can take on maintenance responsibilities for specific trails. This has been used with great success on the Worcester Range trails. However, the success is a direct result of the fact that all the trail adopters have experience doing trail work. As a result department personnel do not need to spend a lot of time administering this program.

If this program were to be heavily promoted it would require a lot more administrative time. This would especially be the case when volunteers are inexperienced in doing trail work. At that point, the effectiveness of a volunteer program would be limited because the department does not have the personnel to supervise the volunteers.

The Park's division however has a successful volunteer program within the campground system. This works because the volunteers can be adequately supervised by the Park Rangers.

No mention was made of the size of the staff available nor the relative deployment towards the 4 "areas". The existence of contracted work was noted, but not the magnitude. No mention was made of the support required from the Agency of Natural Resources.

The state lands staff in the Barre District consists of five people who have management responsibilities for all state-owned land in this 3-county district. Mt. Mansfield State Forest is only one of those parcels. Most of these people also have program responsibilities not related to state lands management.

This means that the department does not have enough people to fully manage the land base. That is where the Lands and Facilities Trust Fund will come into play. There are many tasks that could be contracted out. This however is not a cure all. Like using volunteers, contracting work out will also require supervision by department personnel.

Development of long-range management plans requires participation from all departments within the Agency of Natural Resources. There are many data layers needed before a management plan is prepared. This requires staff time for various inventories. Again, state lands management is only a small portion of the job responsibilities for these people.

There is no mention of the net cost of implementing the plan. The plan doesn't provide any information to make a judgment that it is reasonable or beneficial.

This plan and others like it are not based on availability of staff or resources to implement them, but rather a statement of what we believe should be done over the next management period if and when resources are available to accomplish them. We will explore this issue as the management planning process evolves.

The plan leaves open the possibility for expansion and adjustment. Any parcel of 40,000 acres will have parcels which could wisely be sold or traded. What types of land is the forest deficient in? What areas are least essential to its purpose? What are its acquisition priorities?

Mt. Mansfield State Forest is part of a larger biophysical region. As such, deficiencies in types of land the state needs will be reviewed at the larger scale and not just Mt. Mansfield State Forest. The department has not identified specific parcels on the forest that could be sold or traded at this time, but

instead deals with individual proposals at the time they are made. Case in point is the impending land exchange with Stowe Mountain Resort. In 1999, the Agency of Natural Resources developed a Lands Conservation Plan. Through this plan, the agency has established a list of land acquisition priorities.

For Mt. Mansfield State Forest this will probably translate into acquiring lands such as: inholdings, those that enhance or facilitate public access, and lands that maintain or enhance the integrity of the existing forest.

The lack of attention given to FPR resources is critical because land acquisition undeniably increases the workload. The restrictions on the land, place an unknown, but perhaps significant demand upon FPR to monitor and correct deviations.

This is under constant discussion at all levels within the department and needs continuous monitoring. Unfortunately, in state government opportunities for high priority acquisitions and added responsibilities for management are occurring more by opportunity than by design. Added lands and added management responsibilities without added resources are a fact of life in state government.

Don't understand what drives timber sales. Guessing that it has something to do with selling trees before they die and fall over, and thus related to the production of the forest. Is the timber harvested from Mt. Mansfield State Forest (MMSF) a big part of the Vermont logging economy? Does MMSF have particularly good timber growth? Will there be more pressure for logging sites on state lands?

Timber on state lands is managed for a number of reasons, including: maintenance and improvement of forest health, providing wildlife habitat, assuring appropriate species composition based on the natural communities, providing healthy populations of existing native plants, animals and communities, improving forest structure, and improving tree quality and vigor. These decisions are based on silvicultural needs.

In the process of accomplishing many of these goals, trees will need to be cut. The department is committed to receiving the highest price possible for all wood products removed from state land.

State lands do not provide a large percentage of the timber for Vermont's logging economy. Only 6% of Vermont's land base is state-owned. However, timber on state lands is free from many of the short-term economic pressures that may influence management decisions on privately owned timberland. As a result, many state forests are managed to provide large diameter, high quality timber suitable for use as veneer and high quality sawlogs. Management on

state lands also provides a valuable means of demonstrating long-term forest management.

Mt. Mansfield State Forest has developed a reputation for providing a steady supply of high quality timber to local markets and many demonstration sites. In many cases there are management records for various treatments extending back over some 40 years.

When closing a site because of wildlife activity, FPR should have a clear policy or procedure to define who makes the decision, what powers that person has and who is to be notified. Example: Over the past few years the status of the spur trail to Elephants Head has been unclear. Signs appear on Route 108. The GMC and Elephants Head Trail adopter are not notified about the closure nor about opening the trail. Hiking opportunities have been lost because people assume that the trail is closed. Some have not found the spur trail because it was brushed in. It is more important to me that a decision is made and responsibility assigned, not the exact decision made.

The department has worked cooperatively with the Vermont Natural Heritage Program, the National Wildlife Federation (NWF) and the Green Mountain Club (GMC) on the peregrine falcon closure areas in the notch. Personnel from the NWF monitor the notch each spring to determine if the falcons are nesting and where. When this has been determined, the department takes the appropriate action to post the closure area.

When the falcons nested on Elephants Head, only the spur trail to Elephants Head was closed. At the time the department posted signs along the north side of Route 108, GMC was notified of the nesting. GMC personnel closed the spur trail by brushing the trail so that it was not visible to hikers. When the chicks had fledged, signs were removed and the trail was cleared. Since the falcons have been nesting on the Mt. Mansfield side of the notch no trails have been closed.

The point is well taken that communications is a must.

The maintenance responsibility for the Long Trail and side trails is in need of explication. It appears that responsibility is delegated to GMC which has its own adopter program. I happen to like FPR adopter guidelines: they are succinct yet complete.

The Green Mountain Club (GMC) is the protector and maintainer of the trails and facilities of the Long Trail system. GMC works cooperatively with the Department of Forests, Parks & Recreation when the trails and facilities are on state land. The state assists with providing funding for trail crews, managerial expertise, and staff support.

GMC maintains its own adopt-a-trail/shelter program and is not part of the departments program. This recommendation will be forwarded to the GMC Trail Management Committee for their consideration.

Is there a forest fire policy? Fire access roads?

The Department of Forests, Parks & Recreation will advise loggers and other forest users about hazard reduction, fire access roads and woods operation precautions during fire season, including the banning of open fires. All operations on Mt. Mansfield State Forest will be carried out in conformance with state regulations for slash disposal and department guidelines for preventing wildfires.

Wildfire detection is based on public reporting and air patrol during periods of high to extreme fire danger. Each town has a forest fire warden. This person is responsible for wildfire suppression on all fires in their town, including those on state land. The Forest Resource Protection Specialist will assist the town forest fire wardens with overhead fire responsibilities as well as provide guidance in determining compensation to the town for fire suppression costs. State personnel will actively assist the town in suppression efforts if requested.

All trucks roads on Mt. Mansfield State Forest are considered fire access roads. In many cases the local fire departments and rescue squads have access to gates that are kept closed.

The activities of the Vermont Monitoring Cooperative seem academic (in a positive sense). Yet there are many questions FPR should be asking. Some are mentioned on page 66. I encourage FPR to lean on VMC to do research relevant to the decisions that FPR will be called upon to make.

The department is one of the members of the Vermont Monitoring Cooperative (VMC), and therefore, is involved with the research on state land. The paired watershed study is one example of questions that have been asked and research designed to provide answers. VMC will continue to be the forum to accomplish needed research on ecosystem issues.

The section on timber raises questions. What is the objective for the cutting projected for the next 22 years.

The primary objective is to maintain healthy, high quality forest stands and provide forest products to the industry in a sustainable way.

The contrast between the first 56 pages and the detailed schedule of timber sales until 2024 was startling. I wonder why there is such

precision here and not elsewhere? Perhaps the 2002-2007 timber sale should be described in greater detail than the others.

Other than the fact that the timber sales are scheduled out, very little detail is provided for each sale. A detailed prescription will be prepared at the time the sale is included in the Annual Stewardship Plan. The main reason for including the schedule here is to provide people with the knowledge that timber management will take place along with where and when, instead of just saying that timber management will happen in the General Use Areas.

The information included in the timber sale section is an attempt to balance requests for detailed information with providing none of it in the plan.

Proceedings of the Public Forum August 23, 1989

On Wednesday, August 23, 1989 the Vermont Department of Forests, Parks & Recreation, Central Vermont Regional Planning Commission, and the Lamoille County Planning Commission co-sponsored a public forum to receive input regarding management of Mt. Mansfield State Forest. The meeting was held at the Stowe High School. There were about 60 participants present.

The meeting started with introductory remarks and why we need to plan. A slide-tape presentation was made illustrating the history and activities on Mt. Mansfield State Forest. The purpose of this presentation was to give people the whole picture, so that they approach the management process on the entire forest and not just their backyard.

From this the audience was broken into six smaller groups, each dealing with one aspect of management on the forest. The following is a report of the group discussions, areas of conflict, and recommended actions.

Group 1: Local Officials/Town Planners

Group Leader: Susan Sinclair, CVRPC

Recorder: Brad Greenough

Issues of Concern – Many issues arose during the discussion but a few were of major concern.

1. Purchase large tracts of land to preserve for the future
 - acquisition of 3,000 acres in Morristown
 - development/preservation concerns, set aside areas for future.

This issue was the highest priority of the group. Regarding the development occurring in the surrounding towns, it was felt there should be areas of land added to the forest for future generations to enjoy. The questions needing answers is whether the proposed purchases are intended to be wilderness or working forests.

2. Protect scenic/visual quality

- ski trails on Mt. Mansfield are getting too wide, not aesthetically pleasing.

All aspects of management on the forest need to address the issue of aesthetics, everything from proposed timber sales to ski trails. The department will need to review proposed ski area expansion on public lands for its effects on visual quality.

3. Need for accurate and timely information to plug into the planning process.

- joint ventures in planning process between state and town; need more interaction,
- lack of information to the towns; general, topographic maps, watersheds, deer yards, rare species,
- game plan for forest resources in planning; FLESA

Thoughts were there should be greater interaction between the towns and state when facing issues that will impact both parties or when an action by one will affect another.

Recommendations:

1. Jointly with the towns and department, officials should identify parcels of land that would be beneficial for the department to own.
 - This will be dependent on the Vermont legislative committee on land acquisition. Department will have to work from their recommendations.
2. Develop a visual resource plan as part of the Block Plans. Use this to critique individual projects on the forest.
3. Distribute the Vermont Agency of Natural Resources Bibliography to all towns, so that they will know what information is available and where to get it.
4. Provide towns with a list of activities that will be taking place annually on the forest. Towns are currently being sent portions of the Annual Work Project Plans that cover public lands in their town. This requires action by the town because we need information from them on any permits required by the towns, ect.

Group 2: Timber Management

Group Leader: Steven Sinclair

Recorder: Wes Guyette

Issues of Concern –

1. Education

- promote demonstration areas portraying state-of-the-art techniques.
- keep public informed of activities on the forest
- include economic benefits of logging in message to the public
- forests need to be shared, not exclusive use.

Education was seen as the key. The group felt the department should have an aggressive education program to show the benefits of timber harvesting and showing the forest as a renewable working resource.

2. Focus management on producing high quality timber.

- emphasize timber production on better sites
- more funds for TSI
- do more to reduce air pollution, acid rain, etc. The department should be more outspoken on these topics.

The overall concern was that historically timber management was a major use of Mt. Mansfield State Forest and over the recent years fewer sales are being offered.

3. Balances: timber management vs. other uses.

- roads and trails put in for timber management should not be taken over for exclusive use of recreationists
- wildlife concerns should not exclude growth and production of high quality timber
- aesthetics need to be considered
- management of trees within ski areas leases.

Many people have their livelihood tied to harvesting timber.

Conflicts –

There tends to be conflicts between timber management and other uses, especially recreation. Often the conflict does not arise because trees are harvested, instead, because two non-compatible uses are competing for the same space at the same time. This is illustrated by the closing of the Cotton Brook Road to operate a winter sale and cross-country skiers or snowmobilers trying to use a plowed road when they need the snow.

Recommendations –

1. Organize a working group composed of representatives from the various recreation groups. Sit down together and collaborate to find a workable solution to conflicts.
2. Efforts to educate the public regarding forest management have started with publication of the pamphlet *Trees for the Future* and development of the forest land supplement to the Town Planning Manual and the FLESA model. These efforts need to continue.
3. Visual Resource Management – see Group 1, recommendation 2.

Group 3: Waterbury Reservoir

Group Leader: Bruce Amsden

Issues of Concern –

1. Boating and swimming
 - separate boat launch from swimming area by moving the launch site
 - speeding on the reservoir
 - prevent spread of milfoil to the reservoir
 - waterskiing vs other boating activities

Boating and swimming conflicts have been a problem since the development of the day use area. These are two popular sports on the reservoir and have been the subject of previous public meetings.

2. Fish and wildlife
 - manage the fisheries resource
 - provide some boat access to the reservoir 24 hours a day, open all the time.

This group would like to see the fisheries resource actively managed and that access for fishing is included.

4. General issues
 - look at ways to control adjacent development around the reservoir
 - traffic problems regarding access to Route 100
 - continue management and control of resource use.

Recommendations –

1. Investigate a boat launch and fishing access off Gregg Hill.
2. Post speed restrictions at all access points.
3. Organized a milfoil watch program and set up milfoil inspection stations with hoses at boat access areas.
4. Designate a shoreline beach for water skiing, training area for taking off.
5. Investigate possibility of installing a fish ladder at Adam's Dam.
6. Develop a long-range fisheries plan for the reservoir.
7. Purchase areas surrounding the reservoir to control development, see Group 1, recommendation 1.
8. Work with town to develop a plan to mitigate traffic problems regarding access to Route 100.
9. Rope west end of swimming area for safety of swimmers when boats use the launch.
10. Do not allow motorized use of the winter reservoir ice.
11. Participate in upcoming Federal Energy Regulation Committee licensing renewal process with strong recreational concern regarding water level fluctuations.
12. Find areas of consensus between the towns of Waterbury and Stowe in management strategies for the reservoir.

Group 4: Summer Recreation –

Group Leader: Barbara Farr

Recorder: Gerry Spaulding

Issues of Concern –

1. Hang gliders
 - desire for launch site on Mt. Mansfield
 - liability

There were 14 members of the Vermont Hang Gliders Association present. The greatest concern of this group is to find a launch site in northern Vermont, with Mt. Mansfield being a logical choice since there is a road to the top of the mountain. There are a few stumbling blocks, however. One is liability concerning hang gliders and the ski lift towers. A second is the compatibility of a launch site within the Natural Area. The third is a landing site on private land.

2. Hikers
 - develop trails that are handicap accessible and scenic
 - develop short trails near Smugglers Cave, Refrigerator, etc.

The concern is that there are various hiking experiences on Mt. Mansfield State Forest, but except for the Toll Road and the summit area at the Nose, little is available for handicap persons wanting to enjoy the outdoors and view the scenery. Also at the Smuggler Notch parking lot, there is concern over safety and hikers taking random routes up boulders to various scenic spots. They felt some short trails should be developed in this area.

3. Mountain Bikers

This user group was interested in what the state policy is regarding use of mountain bikes on state lands and also would like maps showing areas that can be used.

Recommendations –

1. Officially meet with all impacted parties to determine feasibility of using Mt. Mansfield as a launch site for hang gliders. Must be concerned with use within the Natural Area and that a landing site is acceptable to local citizens since it will have to be on private land.
2. Recon areas around the reservoir for trails that could be handicap accessible. Develop trails where possible.
3. Determine need for short trails at Smugglers Notch and recon for best location of the trails. Work with the Green Mountain Club.

4. Develop a brochure for Mt. Mansfield which would show roads and trails open to the public and the type of use they are classified for, i.e., hiking, biking, horseback riding, snowmobiling, cross-country skiing, etc.

Group 5: Winter Recreation –

Group Leader: Mike Green

Recorder: Ray McIntyre

Issues of Concern –

1. Winter trails
 - signing: publicize trails, uniform sign color code, mark existing roads and trails, positive signing
 - access to ridgeline for cross-country skiers

It was felt there was a greater need for uniform color coding of signs which promote recreational activities and that the roads and trails need to be marked and mapped. This would allow people to know where they are and where the trail goes. Cross-country skiers also want to have access to the ridgeline. The Catamount Trail system will give that access when it is complete.

2. Conflicts with winter logging

The group felt that winter logging needed to be balanced with the other uses. When a truck road is plowed in the winter, it is no longer usable for cross-country skiing or snowmobiling.

Recommendations -

1. Publicize trails – see Group 4, recommendation 4.
2. Sign intersections of roads and trails with where the trails goes and distance.
3. Trail coordinators set color coding standards.
4. Conflict: winter recreation vs winter logging, see Group 2, recommendation 1.

Group 6 & 7: General –

Group Leader: Chris Walsh

Recorder: Joe Boingiovanni

Issues of Concern –

1. Preservation

- too much mix of nature and recreation activities
- increase resource protection in face of recreation activities
- preservation vs increased recreation diversity
- threat to alpine vegetation
- long term preservation vs short term recreation fads.

The overriding theme with this group was preservation of the resource in face of increasing demands on it. Most of the concern centered around increasing recreation demands faced on the state forest, especially intensive uses.

1. History

- history of the area not being presented
- vandalism, stolen signs, areas of historic significance.

The group felt the history of Mt. Mansfield is important and should be promoted. It is important for people to understand the history of the area, to fully appreciate what is available today, and what will take place in the future.

Recommendations –

1. Consider no management on large tracts of state forest. This option will require decisions on how many acres is large and whether it is necessary to have large tracts of Mt. Mansfield State Forest be areas of no management when large portions of C.C. Putnam State Forest (Worcester Range) is under that management system already.
2. Increase focus on history in areas of intensive use. Provide more public information in the form of brochures or displays about the history of the forest.
3. Provide public information regarding current activities on Mt. Mansfield State Forest.

Authorization to Plan and Manage

Statutory Authority

The Vermont General Assembly has authorized the Agency of Natural Resources and its Departments to acquire lands, hold interests in lands, and conduct land management activities. Authority is vested in several statutes that collectively empower the Agency, upon approval of the Governor or General Assembly, to acquire lands, accept donations of lands or interests in lands, exchange or sell lands or interests in lands for public benefit, and to manage those lands for a variety of public purposes.

Specific authorizing statutes are:

- **Title 3, Chapter 51, Section 2825:** The primary duties of the secretary are to coordinate the activities of the various departments and divisions of the agency for the proper development, management and preservation of Vermont's natural resources, to develop policies for the proper and beneficial development, management, and preservation of resources in harmony with the state comprehensive planning program and to promote the effective application of these policies by the departments and divisions affected.
- **Title 10, Chapter 83, Section 2601:** Establishes the general purposes and policies to acquire and manage state lands and authorizes the Department of Forests, Parks & Recreation to undertake such activities.
- **Title 10, Chapter 83, Section 2603:** Establishes the general powers and duties of the commissioner of the Department of Forests, Parks & Recreation to manage state lands.
- **Title 10, Chapter 103, Section 4144:** Authorizes the Department of Fish & Wildlife to acquire state lands.
- **Title 10, Chapter 103, Section 4147:** Authorizes the Department of Fish & Wildlife to exchange, sell, or lease lands.
- **Title 10, Chapter 37, Section 905b:** Authorizes the Department of Environmental Conservation to acquire and manage lands and the rights to protect the state's water resources.
- **Title 10, Chapter 155, Section 6301-5:** Authorizes acquisition of rights less than fee of real property.

Summary of Some Policies and Guidelines Used in the Management of Vermont Agency of Natural Resources Lands

Some of the highlights of the many policies and guidelines used in managing Vermont Agency of Natural Resources lands are listed below. In general, these were in effect at the start of this long range management plan. If more information is needed, refer to current policies and guidelines which can be made available upon request. The information is grouped into some general categories to make this document easier to use.

Acquisition of Land

Lands Conservation Plan: A Land Acquisition Strategy for the Agency of Natural Resources, October, 1999 - Standards and procedures for the Agency of Natural Resources to acquire lands.

Agriculture

Vermont Agriculture Nonpoint Source Pollution Reduction Program Law and Regulations, Title 6, CH. 215, 1995 and 1996 – Standards for managing agricultural lands.

Cultural and Archaeological Resources

State of Vermont laws applicable to archeological resources - Standards and operating procedures for state owned lands.

Stonewalls & Cellarholes: A Guide for Landowners on Historic Features and Landscapes in Vermont's Forests, Robert Sanford, 1994.

Fish and Wildlife

Vermont hunting, fishing, and trapping regulations.

Wildlife Management Areas Operational Procedures Manual, Vermont Department of Fish and Wildlife - Standards for management of wildlife management areas.

Management Guide for Deer Wintering Areas in Vermont, Fish and Wildlife, 1990 - Standards for managing for deer.

Landowner's Guide to Wildlife Habitat Management, Fish and Wildlife, Fish and Wildlife, 1995 - Standards for managing for a variety of wildlife species on state and private land.

Native Vegetation for Lakeshores, Streamsides and Wetland Buffers, Environmental Conservation, 1994, Standards for buffer strips along lakes, streams and wetlands in Vermont.

Rare and Endangered Species - Listing of species protected under state regulations.

Gravel Pits

Forests, Parks and Recreation Policy #3, 1991 - Standards for use of gravel pits on Forests, Parks and Recreation lands.

Land Use and Development

Act 250 - Law governing plans for land use and development in Vermont.

Mountain Top Communications Facilities

Siting, Use and Management of Electronic Communication Facilities on Properties Owned by the State of Vermont, Agency of Administration, 1998.

Natural Area Designation

Natural Areas Law and Forests, Parks and Recreation Policy #7 - Standards and guidelines for designation of Natural Areas on state forest and parks lands.

Pesticides Use

Forests, Parks and Recreation Policy #9 - Regulations on the use of pesticides on state forest and parks lands.

Prescribed Fire

Prescribed Burn Directive, Vermont Department of Forests, Parks and Recreation, 1989 - Procedures for planning and execution of prescribed burns.

Recreation

Uses of State Lands, Agency of Natural Resources Policy, 1999 - Criteria for appropriate uses and when permits and licenses are and are not required.

Forests, Parks and Recreation Policies and Procedures Manual, 1990-1999 - Procedures and standards for administering recreational activities on state forests and parks lands.

State Park Ranger's Manual, Forests, Parks and Recreation, 1999 - Operating procedures, rules, regulations, and standards for recreational activity on state forests and parks land.

Scientific Research

Forests, Parks and Recreation policy # 8 - Standards and guidelines for research on state lands.

Silviculture

Silvicultural References Manual, Forests, Parks and Recreation, 1997 - Guidelines for the Intent to Heavy Cut notification process.

Acceptable Management Practices (AMP) Guidelines, 1987 - Practices for maintaining water quality on logging jobs.

Wetlands Rules & Regulations, 1990 - Regulations that outline practices for logging around wetlands in Vermont.

Native Vegetation for Lakeshores, Streamsides and Wetland Buffers, Environmental Conservation, 1994 - Standards for buffer strips along lakes, streams and wetlands in Vermont.

Vermont Handbook for Soil Erosion and Sediment Control on Construction Sites, Vermont Department of Environmental Conservation, revised September, 1983.

Vermont Streambank Conservation Manual, Agency of Natural Resources, 1982 - Guidelines for construction around streams.

Stonewalls & Cellarholes: A Guide for Landowners on Historic Features and Landscapes in Vermont's Forests, Robert Sanford, 1994.

Ski Areas

Guidelines for the Design and Construction of Ski Lifts and Trails in Class A Watersheds in Vermont, Department of Environmental Conservation, 2000

Water Resources

Acceptable Management Practices (AMP) Guidelines, 1987 - Practices for maintaining water quality on logging jobs in Vermont.

Long Trail Construction and Maintenance Standards, Green Mountain Club, 1995 - Trail construction standards for public and private land.

Native Vegetation for Lakeshores, Streamsides and Wetland Buffers, Environmental Conservation, 1994 - Standards for buffer strips along lakes, streams and wetlands

Vermont Streambank Conservation Manual, Agency of Natural Resources, 1982 - Guidelines for construction around streams.

Vermont Water Quality Standards, Vermont Water Resources Board, 7/2/00.

Vermont Wetland Rules, Vermont Water Resources Board, 1/1/02

Glossary

The following is a series of key words and their definitions used in the development of Long Range Management Plans for Vermont Agency of Natural Resource lands.

Acceptable management practices (AMPs). In this plan, a series of erosion control measures for timber harvesting operations, as identified in state statutes. The AMPs are the proper method for the control and dispersal of water collecting on logging roads, skid trails, and log landings to minimize erosion and reduce sediment and temperature changes in streams.

All-aged (Uneven-aged) system. Timber management which produces a stand or forest composed of a variety of ages and sizes. Regeneration cutting methods in this system include single tree selection and group selection.

Basal area. A measure of the density of trees on an area. It is determined by estimating the total cross-sectional area of all trees measured at breast height (4.5 feet) expressed in square feet per acre.

Best management practices. A practice or combination of practices determined to be the most effective and practicable means of preventing negative impacts of silvicultural activities.

Biodiversity. The variety of plants and animals, their genetic variability, their interrelationships, and the biological and physical systems, communities, and landscapes in which they exist.

Biophysical region. A region with shared characteristics of climate, geology, soils, and natural vegetation. There are currently eight biophysical regions recognized in Vermont.

Block. A land management planning unit.

Browse. The part of leaf and twig growth of shrubs, vines, and trees available for animal consumption.

Buffer (Riparian Buffer Zone). The width of land adjacent to streams or lakes between the top of the bank or top of slope or mean water level and the edge of other land uses. Riparian buffer zones are typically undisturbed areas, consisting of trees, shrubs, groundcover plants, duff layer, and a naturally vegetated uneven ground surface, that protect the water body and the adjacent riparian corridor ecosystem from the impact of these land uses.

Canopy. The more or less continuous cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth.

Capability. The potential of an area to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends on current conditions and site conditions such as climate, slope, landform, soils, and geology as well as the application of management practices such as silvicultural protection from fire, insects, and disease.

Cleaning (Weeding). Regulating the composition of a young stand by eliminating some trees and encouraging others, and also freeing seedlings or saplings from competition with ground vegetation, vines, and shrubs.

Clearcutting. A cut which removes all trees from a designated area at one time, for the purpose of creating a new, even-aged stand.

Commercial forest land. Land declared suitable for producing timber crops and not withdrawn from timber production by statute or administrative regulation.

Conservation. The careful protection, planned management, and use of natural resources to prevent their depletion, destruction, or waste.

Conservation easement. Acquisition of some rights on a parcel of land designed to keep the property undeveloped in perpetuity.

Cover. Vegetation which provides concealment and protection to wild animals.

Cultural operation. The manipulation of vegetation to control stand composition or structure, such as site improvement, forest tree improvement, increased regeneration, increased growth, or measures to control insects or disease. Examples of methods used are timber stand improvement, cleaning or weeding, release, and site preparation.

DBH (diameter at breast height). The diameter of the stem of the tree measured at breast height (4.5 feet or 1.37 meters) from the ground.

Deer wintering area. Forest area with at least 70 percent conifer that provides suitable, stable habitat to meet deer needs during the winter.

Den tree. A live tree at least 15 inches DBH (diameter at breast height) containing a natural cavity used by wildlife for nesting, brood rearing, hibernating, daily or seasonal shelter, and escape from predators.

Developed (or intensive) recreation. Activities associated with man-made structures and facilities that result in concentrated use of an area. Examples are campgrounds and ski areas.

Diameter at breast height (DBH). The diameter of the stem of the tree measured at breast height (4.5 feet or 1.37 meters) from the ground.

Dispersed recreation. Outdoor recreation activities requiring few, if any, support facilities.

Ecological processes. The relationships between living organisms and their environment. Among these processes are natural disturbances such as periodic fire, flooding, or beaver activity; natural stresses such as disease or insects; catastrophic weather-related events such as severe storms or lightning strikes; or more subtle ongoing processes such as succession, hydrology, and nutrient cycling.

Ecological reserve. An area of land managed primarily for long-term conservation of biodiversity.

Ecosystem. A complex array of organisms, their natural environment, the interactions between them, the home of all living things, including humans, and the ecological processes that sustain the system.

Ecosystem management. The careful and skillful use of ecological, economic, social, and managerial principles in managing ecosystems to produce, restore, or sustain ecosystem integrity, uses, products, and services over the long-term.

Endangered species. A species listed on the current state or Federal endangered species list (VSA Title 10, chapter 123). Endangered species are those which are in danger of becoming extinct within the foreseeable future throughout all or a significant portion of their range.

Even-aged system. Timber management that produces a forest or stand composed of trees having relatively small differences in age. Regeneration cutting methods in this system include clearcutting, seed tree (seed cut) method, and shelterwood method.

Forest health. Condition in which forest ecosystems sustain their complexity, diversity, resiliency, and productivity.

Forest type. A natural group or association of different species of trees which commonly occur together over a large area. Forest types are defined and named after the one or more dominant species of trees, such as the spruce-fir and the birch-beech-maple types.

Forestry. The art and science of growing and managing forests and forest lands for the continuing use of their resources.

Fragmentation. Division of a large forested area into smaller patches separated by areas converted to a different land use.

Game species. Animals habitually hunted for food, particular products, sport, or trophies.

Geographic Information Systems. A computer-based means of mapping lands and resources and communicating values associated with them (GIS).

Green certification. A process, sponsored by several international organizations, that promotes sustainable forest management practices, providing a marketplace identify for forest products certified to have been grown and manufactured in a sustainable manner.

Group Selection. The removal of small groups of trees to meet a predetermined goal of size, distribution, and species.

Habitat. A place that provides seasonal or year round food, water, shelter, or other environmental conditions for an organism, community, or population of plants or animals.

Hardwood. A broad leaved, flowering tree, as distinguished from a conifer. Trees belonging to the botanical group of angiospermae.

Healthy ecosystem. An ecosystem in which structure and functions allow the maintenance of the desired conditions of biological diversity, biotic integrity, and ecological processes over time.

Heritage Sites. Sites identified by the Vermont Nongame and Natural Heritage Program of the Department of Fish and Wildlife, which have rare, threatened, or endangered species of plants or animals. Heritage sites are identified using a common

standards-based methodology, which provides a scientific and universally applicable set of procedures for identifying, inventorying, and mapping these species.

Intensive (or developed) recreation. Outdoor recreation activities requiring major structures and facilities.

Interior dependent species. Those wildlife species that depend on large unbroken tracts of forest land for breeding and long term survival. The term is also often used in conjunction with neotropical migratory bird species requiring large patches of fairly homogeneous habitat for population viability.

Intermediate treatment. Any treatment or tending designed to enhance growth, quality vigor, and composition of the stand after its establishment or regeneration and prior to the final harvest.

Land conservation. The acquisition or protection through easements of land for wildlife habitat, developed state parks, and working forests.

Landscape. A heterogeneous area of land containing groups of natural communities and clusters of interacting ecosystems. These can be of widely varying scales but normally include a range of elevations, bedrock, and soils.

Mast. The fruit (including nuts) of such plants as oaks, beech, hickories, dogwood, blueberry, and grape, used for food by certain wildlife species.

Motorized use. Land uses requiring or largely dependent on motor vehicles and roads.

Multiple-use forestry. Any practice of forestry fulfilling two or more objectives of management, more particularly in forest utilization (e.g. production of both wood products and deer browse).

Multiple-use management. An onsite management strategy that encourages a complementary mix of several uses on a parcel of land or water within a larger geographic area.

Native (species). A plant or animal indigenous to a particular locality.

Natural Area. Limited areas of land, designated by Vermont statute, which have retained their wilderness character, although not necessarily completely natural and undisturbed, or have rare or vanishing species of plant or animal life or similar features of interest which are worthy of preservation for the use of present and future residents of the state. They may include unique ecological, geological, scenic, and contemplative recreational areas on state lands.

Natural community. An assemblage of plants and animals that is found recurring across the landscape under similar environmental conditions, where natural processes, rather than human disturbances, prevail.

Nongame species. Animal species that are not hunted, fished, or trapped in this state. This classification is determined by the state legislature.

Northern hardwood. Primarily sugar maple, yellow birch, and beech. May include red maple, white ash, white birch, black cherry, red spruce, and hemlock.

Old growth forest. A forest stand in which natural processes and succession have occurred over a long period of time relatively undisturbed by human intervention.

Outdoor recreation. Leisure time activities that occur outdoors or utilize an outdoor area or facility.

Overstory. That portion of the trees, in a forest of more than one story, forming the upper or upper-most canopy layer.

Pole. A tree of a size between a sapling and a mature tree.

Pole timber. As used in timber survey, a size class definition; trees 5.0 to 8.9 inches (varies by species) at DBH. As used in logging operations, trees from which pole products are produced, such as telephone poles, pilings, etc.

Regeneration treatment (harvest cut). Trees are removed from the stand to create conditions that will allow the forest to renew or reproduce itself. This is accomplished under either an even-aged management system or an uneven-aged management system.

The four basic methods used to regenerate a forest are clearcutting, seed-tree, shelterwood, and selection (group selection or single tree selection).

Regeneration methods. Timber management practices employed to either regenerate a new stand (regeneration cutting) or to improve the composition and increase the growth of the existing forest (intermediate treatment).

Regulated Hunting/Fishing/Trapping. The harvest of wildlife under regulations stipulating setting of seasons, time frame of lawful harvest, open and closed zones, methods of take, bag limits, possession limits, and reporting or tagging of species.

Release (release operation). The freeing of well-established cover trees, usually large seedlings or saplings, from closely surrounding growth.

Removal cut. The final cut of the shelterwood system that removes the remaining mature trees, completely releasing the young stand. An even-aged stand results.

Salvage Cutting. The removal of dead, dying, and damaged trees after a natural disaster such as fire, insect or disease attack, or wind or ice storm to utilize the wood before it rots.

Sanitation cutting. The removal of dead, damaged, or susceptible trees to improve stand health by stopping or reducing the spread of insects or disease.

Sapling. As used in timber surveys, a size class definition. A usually young tree larger than seedling but smaller than pole, often 1.0 to 4.9 inches at DBH.

Seedling. A very young plant that grew from a seed.

Seed-Tree (Seed Cut) method. The removal of most of the trees in one cut, leaving a few scattered trees of desired species to serve as a seed source to reforest the area.

Shelterwood method. A series of two or three cuttings which open the stand and stimulate natural reproduction. A two cutting series has a seed cut and a removal cut, while a three cutting series has a preparatory cut, a seed cut, and a removal cut.

Silvicultural systems. A management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. Systems are classified according to the method of carrying out the fellings that remove the mature crop and provide for regeneration and according to the type of forest thereby produced.

Single tree selection method. Individual trees of all size classes are removed more or less uniformly throughout the stand to promote growth of remaining trees and to provide space for regeneration.

Site Preparation. Hand or mechanical manipulation of a site, designed to enhance the success of regeneration.

Snag. Includes standing dead or partially dead trees that are at least 6 inches in diameter at breast height (DBH) and 20 feet tall.

Softwood. A coniferous tree. Softwood trees belong to the botanical group gymnospermae, including balsam fir, red spruce, and hemlock.

Special use. Lands that are leased or designated for a specific purpose, usually beyond the scope of normal department operations.

Stand improvement. An intermediate treatment made to improve the composition, structure, condition, health, and growth of even or uneven-aged stands.

Stewardship. Caring for land and associated resources with consideration to future generations.

Sustainability. The production and use of resources to meet the needs of present generations without compromising the ability of future generations to meet their needs.

Sustained yield. The yield that a forest can produce continuously at a given intensity of management.

Thinning. Removing some of the trees in a dense immature stand primarily to improve the growth rate and form of the remaining trees and enhance forest health.

Threatened species. A species listed on the state or Federal threatened species list. Threatened species are those likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

Timber lands. Properties that are managed primarily for the maximum production of forest products.

Timber Stand Improvement. Activities conducted in young stands of timber to improve growth rate and form of the remaining trees.

Traditional uses. Those uses of the forest that have characterized the general area in the recent past and present, including an integrated mix of timber and forest products harvesting, outdoor recreation, and recreation camps or residences.

Uneven-aged (All-aged) system. Timber management which produces a stand or forest composed of a variety of ages and sizes. Regeneration cutting methods in this system include single tree selection and group selection.

Watershed. The geographic area within which water drains into a particular river, stream, or body of water. A watershed includes both the land and the body of water into which the land drains.

Weeding (cleaning). Regulating the composition of a young stand by eliminating some trees and encouraging others, and also freeing seedlings or saplings from competition with ground vegetation, vines, and shrubs.

Wilderness. Areas having pristine and natural characteristics, typically roadless and often with some limits on uses. (This is not the federal definition of wilderness.)

Wildlife habitat. Lands supplying a critical habitat need for any species of wildlife, especially that which requires specific treatment and is of limited acreage.

Working forest. Land primarily used for forestry purposes but also available for recreation, usually where both managed land and land not presently being managed is present.

Working landscape. A landscape dominated by land used for agricultural and/or forestry purposes.

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MEMORANDUM

TO: Craig Whipple, Chief of Park Operations

FROM: Ed Leary, Director of State Lands

DATE: October 20, 1999

SUBJECT: **Land Exchange(s) between
State of Vermont and Mt. Mansfield Company, Inc.**

You asked me to provide you with detailed information pertaining to the two land exchanges between the State of Vermont and Mt. Mansfield Company, Inc., which have been authorized by acts of the Vermont General Assembly in 1996 and 1998.

J.R.H. 118, passed on May 2, 1996 authorized the Commissioner of the Department of Forests, Parks & Recreation “to enter into an exchange of land, whereby the state would convey a portion of its land holdings in the Town of Stowe, not to exceed 25 acres in size, which are currently part of Mt. Mansfield State Forest, and upon which the Smugglers’ Notch State Park (SNSP) campground facilities are situated at present, to Mt. Mansfield Company, Inc., doing business as Stowe Mountain Resort (SMR), in exchange for a number of parcels of land SMR owns in the Towns of Stowe and Cambridge, consisting of 1,092 acres, which have an appraised value equal to or greater that the state-owned parcel being conveyed.” I have attached a complete copy of J.R.H. 118 to this memo for your information.

Results of this particular exchange would allow SMR to expand its existing development at the base of Spruce Peak onto the land currently serving as the Smugglers’ Notch State Park campground. The State would gain 1187 acres of land, currently owned by SMR, which would become part of Mt. Mansfield State Forest. This land coming into state ownership would provide permanent protection to a section of the Long Trail, would put a significant portion of the shoreline of Sterling Pond that is privately owned into public ownership, and provide permanent protection of historic Peregrine falcon nesting habitat as well as the Elephant’s Head Trail in the area known as “Elephant’s Head”. A portion of the SMR lands, the 976 acre “Ridge Parcel”, for appraisal purposes, was assumed to have no development potential.

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According to the appraiser, "As part of this analysis, it is assumed that all development rights, associated with this parcel which benefit the current owner, Mount Mansfield Company, have been transferred to the adjacent Mt. Mansfield Company lands. Regardless, the parcel has no development potential due to its location above the 2,500 foot elevation". However, to provide absolute assurance as to the permanent protection of this ecologically, recreationally and aesthetically valuable piece of land, a permanent conservation easement will be held by the Vermont Land Trust.

Details pertaining to the 1996 exchange are as follows:

Lands to be traded:

From Mt. Mansfield Company, Inc.

- 1) Approximately 95 acres of land on the easterly side of Vermont Route 108 in Stowe, referred to as the "Elephant's Head" parcel.
- 2) Approximately 116 acres of land on the easterly side of Vermont Route 108, with 800 +/- feet of frontage, in Stowe and Cambridge, consisting of two parcels collectively referred to as the "Corridor" parcel.
- 3) Approximately 976 acres of land on the easterly side of Vermont Route 108 in Stowe, referred to as the "Ridge" parcel.

From State of Vermont

Approximately 25 acres of land on the easterly side of Vermont Route 108 in Stowe, with 2,200 +/- feet of road frontage, upon which is situated the Smugglers' Notch State Park campground facilities.

The lands authorized in 1996 to be exchanged have been determined through a standard appraisal process to be equal in value.

The most recent exchange, approved by the Governor on April 19, 1998, authorized the Commissioner of Forests, Parks & Recreation "to exchange lands with the company, by which the company shall convey to the state a parcel of approximately 35 acres, as a site for relocating the campground, including a 200-foot-wide permanent protective easement surrounding the parcel, as a buffer to enhance a wilderness experience at the campground, in return for which the state shall convey to the company a parcel of approximately 115 acres, with the following conditions:..." I am attaching a copy of the full text of this section, 35(a) of H.761, to this memo for your information.

This second exchange provided the Department of Forests, Parks & Recreation with an appropriate and suitable site upon which to relocate its Smugglers' Notch State Park campground facilities, while conveying to Mt. Mansfield Company land of equal value, some of which [the 58.8 acre Lot #1] would be restricted in terms of future development [see subsection (2)(B) of the legislative authorization].

Details pertaining to the 1998 exchange are as follows:

Lands to be traded:

From Mt. Mansfield Company, Inc.

- 1) Approximately 34.5 acres of land in Stowe, Vermont, situated on the south side of Vermont Route #108, as a site for relocating the Smugglers' Notch State Park campground, including a 200-foot-wide permanent protective easement surrounding the parcel, as a buffer to enhance a wilderness experience at the campground. The campground site, to be conveyed to the State in fee, is approximately 20 acres in size. The 200-foot-wide protective easement consists of approximately 14.5 additional acres. The State shall have the right to construct roads, campsites, trails and any other improvements associated with the new campground within the 200-foot-wide buffer. Mt. Mansfield Company, Inc. will only retain the right to maintain cross-country ski trails within the 200-foot-wide buffer.

From State of Vermont

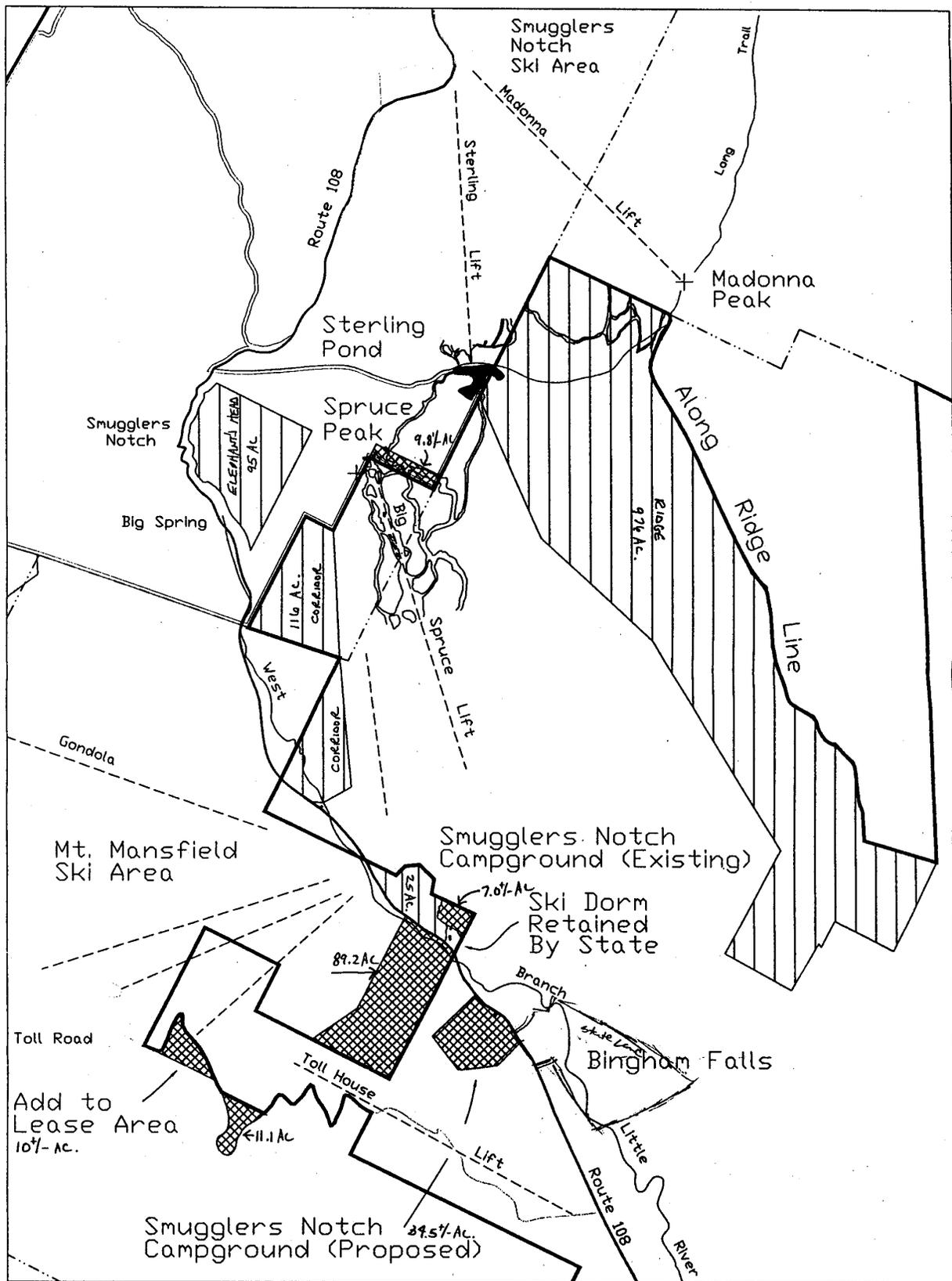
- 1) Approximately 9.8 acres of land in the town of Cambridge, situated northeasterly of the summit of Spruce Peak, upon which Mt. Mansfield Company, Inc. currently maintains down hill ski trails.
- 2) Approximately 7.0 acres of land in the town of Stowe, situated on the north side of Vermont Route #108, directly behind the Vermont State Ski Dorm.
- 3) Approximately 89.2 acres of land in the town of Stowe, situated on the south side of Vermont Route #108, directly across from the Vermont State Ski Dorm, that is currently leased by the State of Vermont to Mt. Mansfield Company, Inc. Any development of this acreage shall be prohibited, except for the construction of ski lifts, snow making equipment and ski trails. The Town of Stowe shall receive an easement to this parcel to enable construction of a municipal sewer line extension.
- 4) Approximately 11.1 acres of land in the town of Stowe, situated within Lot #39³ on the north side of the "Toll Road", through which Mt. Mansfield Company, Inc. currently maintains a down hill ski trail.

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October 20, 1999
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The value of the land to be conveyed to the State of Vermont from Mt. Mansfield Company, Inc. was determined through an appraisal process to exceed the value of the land to be conveyed by the State of Vermont to Mt. Mansfield Company, Inc, by a sum of \$140,000. This exchange will provide the State of Vermont with a much more desirable site upon which to relocate the presently existing Smugglers' Notch State Park campground facilities, resulting in a camping experience quite similar to that which originally existed when the Civilian Conservation Corps built the current campground sixty years ago.

Please let me know if you need any additional information related to this very significant and quite complex pair of land transactions.

Attachments



Public Involvement

Mt. Mansfield State Forests Long Range Management Plan

History of the Planning Effort

The first public involvement started in 1989. the Vermont Department of Forests, Parks & Recreation, Central Vermont Regional Planning Commission and the Lamoille County Planning Commission co-sponsored a public forum to receive input regarding management on Mt. Mansfield State Forest on August 29, 1989. The meeting was held at the Stowe High School and had about 60 participants.

Public service announcements were sent to newspapers and radio and television stations. In addition, letters were sent to all adjacent landowners, resource organizations, loggers, legislators, regional planning commission members, town planning commission members, town select boards and town officers. At this time, the Underhill Block was not included in the planning process.

The meeting started with introductory remarks and a slide show. Participants broke into six smaller groups, each dealing with one aspect of management on Mt. Mansfield State Forest. The groups were: local officials/town planning; timber management; Waterbury Reservoir; summer recreation; winter recreation and general issues. The proceedings from this meeting are included later in this appendix.

William Moulton prepared an Overview Plan for Mt. Mansfield State Forest that dealt with concepts rather than specific activities. This plan went through a review and comment period and was signed by the Commissioner on June 19, 1992. Specific activities would be developed in individual Block Plans. It was decided to work with larger units because some of the management issues went over Block boundaries.

- Reservoir Unit- Woodward Hill, Ricker, Blush Hill, Cotton Brook and Burt Nebraska Blocks
- Main Mountain Unit- Smugglers Notch, Burt Ranch and Morse Blocks
- Sterling Unit - Beaver Meadow and French Hill Blocks.

Work started on the draft plan for the Main Mountain Unit in 1995. A planning advisory group was organized consisting of individuals and

organizations with an interest in Mt. Mansfield State Forest. Through this process a decision was made to include the Underhill Block.

On March 13, 1996 the first of two meetings was held in Morrisville to discuss a variety of issues including; a possible land swap between the department and Stowe Mountain Resort, long range plans for Stowe Mountain and Smugglers Notch Resorts, and the process for completing the long-range management plan for the Main Mountain Unit.

The second meeting was held on April 17, 1996. At this meeting, participants brainstormed issues that should be addressed in the plan. Also discussed was the future of the Smugglers Notch State Park campground. Issues raised at the meeting centered around the land swap. As a result, a separate committee was formed to deal with the issue of relocating the campground.

The planning advisory group met regularly until 1998, at which time the group charged the department with developing all existing data layers before decisions could be made. The group also encouraged the department to use geographic information system (GIS) technology. In February 1998 an Agency Team was created to develop the data layers and write a plan. Through this Team a list of needed data layers was created and assembling them began. Information on data layers was completed in 2001, along with a new long-range management plan format for all Agency of Natural Resources lands.

Using the new format a draft plan was created for Mt. Mansfield State Forest. A series of meetings was held in each of the counties that the forest is located in, for the express purpose of providing information and documenting comments on the draft plan. Comments were recorded at each of the meetings.

| | |
|---------------|-------------|
| June 18, 2002 | Morrisville |
| June 20, 2002 | Waterbury |
| June 25, 2002 | Underhill |

A 30-day comment period followed for written comments to be sent to the department.

During this entire process, there were other planning efforts focused on portions of Mt. Mansfield State Forest. In 1993 an advisory group was established to develop a plan for the Smugglers Notch Scenic Highway Corridor. This group met several times during the next 3 to 4 years. A plan was developed and implementation started.

The Vermont Agency of Natural Resources wishes to thank all the people who took the time to read the draft plan, attend public meetings, provide comments, and serve on the planning advisory groups. The management of Mt. Mansfield State Forest will be improved as a result of

the insightful comments that resulted in additions and corrections to the long-range management plan.

Draft Plan – Responsiveness Summary December 2002

Last winter there was a snowmobile tour group operating on the Stowe side of Smugglers Notch. Would like to see this operation stop. This has always been a great place to snowshoe where it is quiet and peaceful. There are plenty of snowmobile trails for their use.

The Department of Forests, Parks & Recreation did have a license with a snowmobile tour group that covered the east side of Smugglers Notch. This activity will not be approved for the 2002-2003 season. However, there is a question as to who has jurisdiction of this issue if the tour group operates totally within the road right-of-way. The Agency of Transportation may have jurisdiction over this. The department will follow up on this issue if the tour group operates from Stowe this winter.

At the open house in Underhill, I noticed what appears to be an error on the base map. The road directly north of the Mountain Road (off Pleasant Valley in Underhill) is Harvey Road. This is the southern access to the Kruse Block. You have marked it with a dotted line, which means State Forest Highway, according to your key. Harvey Road is not a State Forest Highway. It is a town road.

This change was made to the database and new maps show Harvey Road as a town road.

Why does the department close such a large area around the peregrine falcon nesting site in Smugglers Notch. In New York and New Hampshire they close down smaller areas around the nest sites.

At Smugglers Notch, the falcon closure area has been delineated by features that are easily recognizable on the ground (hiking trails, Route 108, ridgeline). The other factor used to determine the boundaries of the closure area is the ease in posting and patrolling the area.

The plan says on page 30 that the Beaver Meadow Lodge and Burling Camp receive considerable use for over night stays. I believe the use is low for winter camping. The log book doesn't show a lot of use.

Overnight use of Burling Camp and Beaver Meadow Lodge during the winter has been a growing concern for the department and the Green Mountain Club. However there has never been an accurate survey of winter use. The wording was changed in the Highly Sensitive Areas #8 to more accurately depict the concerns for this area. Monitoring use will provide the actual numbers.

In recent snowshoeing trips to the Beaver Meadow area, there has begun to be a problem with snowmobiles being used on the trail to Beaver Meadow Lodge. This area is a popular winter route for cross-country skiers and snowshoers who want to experience the quiet and solitude. Consider this an application for closure of the trail to Beaver Meadow Lodge and Burling Camp to snowmobiles.

This request fits with the current land use classification of the lodge sites into the Highly Sensitive Areas, where motorized recreational vehicles will not be allowed. This decision was made using the Recreational Opportunities Spectrum (see Appendix C – Recreation Assessment) that is designed to focus on the character of the experience a recreational user can expect to find. The lodge area was characterized as semi-primitive, non-motorized. Since only 37% of Mt. Mansfield State Forest is available for this type of experience the decision was made during the planning process to maintain those areas that currently fit this recreational experience. The department will post the trail to the lodges closed to snowmobiles during the winter.

Section II: How about add a paragraph identifying the constituent units, including the state parks? How do the boundaries of the parks correspond to the Blocks?

To avoid confusion, the references made to blocks and district responsibilities were moved to Section V. This section deals with actual management of the forest and has the maps showing block boundaries.

The administrative history might be interesting: as the Forest expanded, did FPR change is organization? When were the district offices created?

While the administrative history of the Department of Forests, Parks & Recreation may be interesting, it is not included as part if the individual management plans. This may be a good topic to have on the department's website.

How about adding a paragraph about the way FPR manages the forest? I had to read the entire plan before realizing how difficult the organizational task is. For example, it appears from the plan that the ski areas are managed autonomously, as are the timber harvesting and campgrounds.

The ski areas are managed autonomously. They are managed according to the Master Plan developed by each ski resort. Each year a list of activities is prepared by the respective ski resort and submitted to the department for review. Most of the activities also require Act 250 approval.

In past years all activities in the campgrounds were managed separately from the land base. An annual work plan was developed by the forestry and parks divisions separate from each other. However, in recent years, an annual stewardship plan has been prepared that encompasses all activities on agency lands. The annual stewardship plan is prepared for each fiscal year, July 1 to June 30, by the district stewardship team and reviewed by the State Lands Team at the headquarters office in Waterbury. This effort is to provide feedback between and within departments of the Agency of Natural Resources and keeps lines of communication open.

Throughout, I wasn't prepared for the relative importance of the components of the forest. For example, the space devoted to the ski areas (1 page) and Bicknell's thrush (pervasive) probably don't correspond to their importance to the plan, Vermont's economy or FPRs workload. A few words might help me prepare for what is the most important item to attend to.

Mt. Mansfield State Forest is a large and very complex parcel of land. It is difficult to derive a balance between using the natural resources and protecting them. All aspects of the forest are important. The mission statements for the agency and departments, found in Section I, promote sustainable use of Vermont's natural resources for products and outdoor recreation, while protecting the integrity of the ecosystems. The land use classification for Mt. Mansfield State Forest tries to balance the importance of all of these issues.

The ski areas are important economically to the region and to the department. (The lease payments go to the parks revolving fund, which helps to operate the state park system.) Less attention was paid to the ski lease areas because what happens there is under the purview of the regulatory system. Although they have an impact on the use of the land, they have limited impact on how the long-range management plan was constructed. Each of the ski areas has developed a master plan.

Reference to Bicknell's thrush is also found throughout the Highly Sensitive Areas section because that is where the habitat exists.

Several sections repeated the same information about hemlock, spruce, mast, white pine, even- and uneven-aged stands. Perhaps a section spent organizing this information as an FPR policy would allow the reader to gain a better understanding of silviculture, ie: what is a cutting cycle, why sometimes 10-15 year intervals and other times 15-20 years? when to thin, clear-cut or selectively harvest? why sometimes even-aged and other times uneven-aged.

This information is all part of silvicultural management and is based on the growing requirements for individual tree species. “Cutting cycles” are part of an uneven-aged management system and refers to how often entries should be made into the stand, which differs by species being managed. The department started work on a brochure for state lands management that would explain these silvicultural terms for readers outside the forestry profession. The recommendation is made to complete this brochure and provide it both on the department’s web page and as a handout at future public meetings.

Don’t recall reading about the future of the ski dorm or the Stone Hut. Both provide a function and will consume resources for repair or tearing down.

This was an oversight. These buildings are now included in the implementation section for Smugglers Notch State Park found under Intensive Use Areas.

Act 250 is referenced (page 52) as if it pertains only to the ski areas. Structures as insubstantial as a leanto also require review. What projects require review and which do not? What is FPR’s policy towards becoming a co-applicant? Is there a plan for sewage treatment?

The reference to Act 250 under ski area management was to alert readers that all activities within the ski areas require review. Act 250 review is needed for all development projects. An Annual Stewardship Plan is prepared and details specific activities that will take place in a given fiscal year. The District Environmental Commission reviews this document and gives a determination on which projects might need and Act250 permit.

Because the Department of Forests, Parks & Recreation is the owner of the land, the department must be a co-applicant on all ski area Act 250 permits. Sewage treatment at Stowe Mountain Resort is planned to tie into the town of Stowe’s system.

How about including a few words about the contents of *Management Guide for Deer Wintering Areas in Vermont*? Since this is a web document, a URL would be appropriate. How are softwood cover and hardwood browse encouraged in the context of logging?

This is a publication developed jointly by the Vermont Department's of Forests, Parks & Recreation and Fish and Wildlife and contains standards for managing deer wintering cover of all softwood species. This guide is a supplement to existing silvicultural guides. The publication is available in print, but not on the website so a URL cannot be provided. A recommendation will be made to have this document available on the department website.

Trees in the wintering areas need to be managed to keep them growing vigorously. When tree growth slows down and stagnates the trees can become susceptible to attack by insects and diseases. The trees are thinned to reduce the competition for sunlight, water and nutrients, thereby allowing those remaining to grow faster. This work is accomplished through commercial timber sales. Hardwood browse is usually provided in a 200-foot buffer strip surrounding the wintering area. Small patch clearcuts are made to encourage growth of young trees that are within reach of a deer. Again, this work is accomplished through commercial timber sales.

Information on timber sales listed in deer wintering areas (page 56), timber sales (page 57) and the map (page 60) is inconsistent. Of the 7 items in the "wildlife" section, 4 do not appear in the timber sales table. I would like to see estimates of acreage and board feet. Would like to have some idea of the availability of "quality browse" (or something related to the survival of deer) over the next 20 years, and the effects, for example, if Sale N did not occur.

The timber sales listed in the Wildlife Habitat portion of Section V – Schedule of Activities for the Next 20 Years are management activities in the deer wintering areas. Some of these treatments will be accomplished as part of a larger timber sale as shown in the Timber Sale Schedule and some will be done as separate sales. This accounts for 4 sales not appearing in the Timber Sale Schedule.

Estimated acreages and board foot volumes will be provided in the Annual Stewardship Plan when each sale is scheduled. At this time, a detailed prescription will also be prepared.

The availability of high quality browse has not been monitored at this time. This will be a piece of information that will be collected over the life of this plan.

The guidelines paragraph in Wildlife section (page55) implies that FPR doesn't have a policy on riparian habitats. The wording did not inspire much confidence that guidelines would be developed any time soon.

There are various existing guidelines that the department follows when managing state lands. Some are formal guidelines that were developed through an interdepartmental process. For other areas recommendations have been made, but the formal guidelines have not been developed. The agency is in the process of developing the formal guidelines.

Buffers needed along streams is one issue. The acceptable management practices for water quality on logging jobs contain a minimum buffer, this recommendation is followed on all state timber sales. The question arises as to whether that is adequate.

No attention was given to the increases and decreases of use of the various resources. What data is available? For hiking, is overall usage increasing or decreasing? What is the relative use of easy hikes (Sterling Pond) versus difficult ones (Hell Brook)? My impression is that cross-country skiing and snowshoeing use is increasing. What about other uses like mountain biking, snow machines, water skiing, canoeing, fishing and primitive camping?

Records show that hiking use is fairly stable. The most heavily used trail on Mt. Mansfield State Forest is the Sterling Pond Trail, averaging almost 13,000 hikers per year. The summit of Mt. Mansfield sees 8,000 hikers each from the Sunset Ridge Trail and the Long Trail from Route 108 to Taft Lodge. The Stevensville Trails average 4,000 hikers per year. Hell Brook Trail averages 1,800 per year, while Elephants Head and Hazelton Trails average just over 1,000 hikers per year. These numbers help the department and Green Mountain Club determine which trails warrant the most attention. (See Appendix C – Recreation Assessment)

While there are no numbers regarding cross-country skiing and snowshoeing use, there are other indicators that use has increased over the past 10 years. The main indicator has been the need to provide winter parking in areas where only summer parking was provided in the past.

The numbers of hikers comes from trail register sign-in boxes. Other uses such as mountain biking and snowmobiling will require other methods of survey. These uses will need to be monitored during the course of this plan.

Is use of the state park campgrounds going up or down? Do campers prefer lean-tos or tent sites?

Camper-days at the three state park campgrounds have been relatively stable during the past 10 years. Little River State Park averages 28,000 camper-days per year when the Waterbury Reservoir is full. Numbers have been down since the reservoir was drained for dam repairs. Smugglers Notch campground averages 8,000 camper-days per year and Underhill State Park averages 3,000 camper-days per year. (See Appendix C – Recreation Assessment).

The parks division looks at a variety of surveys and trends to determine camper preferences. Most recent trends show a niche for rustic cabins within the parks. During the next few years, rustic cabins will be built in state park campground throughout the state.

What is the expected demand and prices for the timber which is proposed to be cut? It is my impression that lumber prices have increased significantly over the past several years. I don't know the mix of lumber, the markets it sells in, nor the volume cut. We are all aware of the questionable cost-benefit analyses conducted over the years by the US Interior Department. I think some mention of the complexities of the issue would be in order.

It is the department's experience that there will be a market for the timber cut off state land. However, it is hard to predict the price that will be paid for the trees. Stumpage prices increased during the early and mid 1990s, but have dropped some during the past couple of years. The stumpage prices, for most species is higher than it was in 1990.

Timber sales on state lands are planned based on silvicultural needs and biological principles, not market conditions. However, when conducting a timber sale the department attempts to receive the highest price possible for the wood sold. Timber sales are sold by competitive bids to the highest bidder.

Over the years, the department has studied the costs of conducting its timber sale program and found that revenues generated significantly exceed the costs of administering the program. They do not, however, cover the costs of managing the land for all of the other values such as, wildlife habitat, recreation, etc.

No information was provided about the revenues received from campsite fees and timber cutting and the area to which these revenues are applied.

Revenues received from campsite and day-use fees go directly to the Park Revolving Fund, which is used to operate the parks throughout the state. Other sources of income for the park revolving fund are timber sale receipts on

designated state park lands and payments from the various ski areas that operate on state owned land.

Until 2001, timber sale receipts from state forests went to the Vermont General Fund. To secure sustainable funding for management of public lands, the Legislature created Vermont's Land and Facilities Trust Fund. Timber sale receipts are now deposited in this trust fund. Once fully, established, the Fund will be able to cover certain costs, such as: repair and maintenance of state parks and conservation camps; maintenance of boundaries, roads, and trails; surveys and mapping; timber management; natural resource inventories; repairs to state-owned dams.

The “Monitoring and Evaluation” section (page 68) describes the staff skills required to perform some necessary tasks. Inasmuch as staff time is always limited, quantification of the magnitude of the effort would be desirable.

Many of the tasks in the Monitoring and Evaluation section are already in place. Aerial surveys are conducted each year to map and document insect and disease problems or outbreaks. Natural resource inventories are conducted as part of the Forest Examination (FOREX) system developed by the department. This system has been revised periodically since its start in 1971. Forex inventories are typically completed on a parcel of land every 10 years. Because of reduced staffing and an increase in the land base, this periodic inventory may happen every 15 to 20 years. The Lands and Facilities Trust Fund may help with funding these inventories.

Roads and trails are monitored to determine maintenance and emergency needs. Monitoring quality of the water resources and aquatic habitats require additional funding.

No mention was made of the volunteer effort, nor even the desirability of using volunteers.

The department has an Adopt-A-Trail program, where volunteers can take on maintenance responsibilities for specific trails. This has been used with great success on the Worcester Range trails. However, the success is a direct result of the fact that all the trail adopters have experience doing trail work. As a result department personnel do not need to spend a lot of time administering this program.

If this program were to be heavily promoted it would require a lot more administrative time. This would especially be the case when volunteers are inexperienced in doing trail work. At that point, the effectiveness of a volunteer program would be limited because the department does not have the personnel to supervise the volunteers.

The Park's division however has a successful volunteer program within the campground system. This works because the volunteers can be adequately supervised by the Park Rangers.

No mention was made of the size of the staff available nor the relative deployment towards the 4 "areas". The existence of contracted work was noted, but not the magnitude. No mention was made of the support required from the Agency of Natural Resources.

The state lands staff in the Barre District consists of five people who have management responsibilities for all state-owned land in this 3-county district. Mt. Mansfield State Forest is only one of those parcels. Most of these people also have program responsibilities not related to state lands management.

This means that the department does not have enough people to fully manage the land base. That is where the Lands and Facilities Trust Fund will come into play. There are many tasks that could be contracted out. This however is not a cure all. Like using volunteers, contracting work out will also require supervision by department personnel.

Development of long-range management plans requires participation from all departments within the Agency of Natural Resources. There are many data layers needed before a management plan is prepared. This requires staff time for various inventories. Again, state lands management is only a small portion of the job responsibilities for these people.

There is no mention of the net cost of implementing the plan. The plan doesn't provide any information to make a judgment that it is reasonable or beneficial.

This plan and others like it are not based on availability of staff or resources to implement them, but rather a statement of what we believe should be done over the next management period if and when resources are available to accomplish them. We will explore this issue as the management planning process evolves.

The plan leaves open the possibility for expansion and adjustment. Any parcel of 40,000 acres will have parcels which could wisely be sold or traded. What types of land is the forest deficient in? What areas are least essential to its purpose? What are its acquisition priorities?

Mt. Mansfield State Forest is part of a larger biophysical region. As such, deficiencies in types of land the state needs will be reviewed at the larger scale and not just Mt. Mansfield State Forest. The department has not identified specific parcels on the forest that could be sold or traded at this time, but

instead deals with individual proposals at the time they are made. Case in point is the impending land exchange with Stowe Mountain Resort. In 1999, the Agency of Natural Resources developed a Lands Conservation Plan. Through this plan, the agency has established a list of land acquisition priorities.

For Mt. Mansfield State Forest this will probably translate into acquiring lands such as: inholdings, those that enhance or facilitate public access, and lands that maintain or enhance the integrity of the existing forest.

The lack of attention given to FPR resources is critical because land acquisition undeniably increases the workload. The restrictions on the land, place an unknown, but perhaps significant demand upon FPR to monitor and correct deviations.

This is under constant discussion at all levels within the department and needs continuous monitoring. Unfortunately, in state government opportunities for high priority acquisitions and added responsibilities for management are occurring more by opportunity than by design. Added lands and added management responsibilities without added resources are a fact of life in state government.

Don't understand what drives timber sales. Guessing that it has something to do with selling trees before they die and fall over, and thus related to the production of the forest. Is the timber harvested from Mt. Mansfield State Forest (MMSF) a big part of the Vermont logging economy? Does MMSF have particularly good timber growth? Will there be more pressure for logging sites on state lands?

Timber on state lands is managed for a number of reasons, including: maintenance and improvement of forest health, providing wildlife habitat, assuring appropriate species composition based on the natural communities, providing healthy populations of existing native plants, animals and communities, improving forest structure, and improving tree quality and vigor. These decisions are based on silvicultural needs.

In the process of accomplishing many of these goals, trees will need to be cut. The department is committed to receiving the highest price possible for all wood products removed from state land.

State lands do not provide a large percentage of the timber for Vermont's logging economy. Only 6% of Vermont's land base is state-owned. However, timber on state lands is free from many of the short-term economic pressures that may influence management decisions on privately owned timberland. As a result, many state forests are managed to provide large diameter, high quality timber suitable for use as veneer and high quality sawlogs. Management on

state lands also provides a valuable means of demonstrating long-term forest management.

Mt. Mansfield State Forest has developed a reputation for providing a steady supply of high quality timber to local markets and many demonstration sites. In many cases there are management records for various treatments extending back over some 40 years.

When closing a site because of wildlife activity, FPR should have a clear policy or procedure to define who makes the decision, what powers that person has and who is to be notified. Example: Over the past few years the status of the spur trail to Elephants Head has been unclear. Signs appear on Route 108. The GMC and Elephants Head Trail adopter are not notified about the closure nor about opening the trail. Hiking opportunities have been lost because people assume that the trail is closed. Some have not found the spur trail because it was brushed in. It is more important to me that a decision is made and responsibility assigned, not the exact decision made.

The department has worked cooperatively with the Vermont Natural Heritage Program, the National Wildlife Federation (NWF) and the Green Mountain Club (GMC) on the peregrine falcon closure areas in the notch. Personnel from the NWF monitor the notch each spring to determine if the falcons are nesting and where. When this has been determined, the department takes the appropriate action to post the closure area.

When the falcons nested on Elephants Head, only the spur trail to Elephants Head was closed. At the time the department posted signs along the north side of Route 108, GMC was notified of the nesting. GMC personnel closed the spur trail by brushing the trail so that it was not visible to hikers. When the chicks had fledged, signs were removed and the trail was cleared. Since the falcons have been nesting on the Mt. Mansfield side of the notch no trails have been closed.

The point is well taken that communications is a must.

The maintenance responsibility for the Long Trail and side trails is in need of explication. It appears that responsibility is delegated to GMC which has its own adopter program. I happen to like FPR adopter guidelines: they are succinct yet complete.

The Green Mountain Club (GMC) is the protector and maintainer of the trails and facilities of the Long Trail system. GMC works cooperatively with the Department of Forests, Parks & Recreation when the trails and facilities are on state land. The state assists with providing funding for trail crews, managerial expertise, and staff support.

GMC maintains its own adopt-a-trail/shelter program and is not part of the departments program. This recommendation will be forwarded to the GMC Trail Management Committee for their consideration.

Is there a forest fire policy? Fire access roads?

The Department of Forests, Parks & Recreation will advise loggers and other forest users about hazard reduction, fire access roads and woods operation precautions during fire season, including the banning of open fires. All operations on Mt. Mansfield State Forest will be carried out in conformance with state regulations for slash disposal and department guidelines for preventing wildfires.

Wildfire detection is based on public reporting and air patrol during periods of high to extreme fire danger. Each town has a forest fire warden. This person is responsible for wildfire suppression on all fires in their town, including those on state land. The Forest Resource Protection Specialist will assist the town forest fire wardens with overhead fire responsibilities as well as provide guidance in determining compensation to the town for fire suppression costs. State personnel will actively assist the town in suppression efforts if requested.

All trucks roads on Mt. Mansfield State Forest are considered fire access roads. In many cases the local fire departments and rescue squads have access to gates that are kept closed.

The activities of the Vermont Monitoring Cooperative seem academic (in a positive sense). Yet there are many questions FPR should be asking. Some are mentioned on page 66. I encourage FPR to lean on VMC to do research relevant to the decisions that FPR will be called upon to make.

The department is one of the members of the Vermont Monitoring Cooperative (VMC), and therefore, is involved with the research on state land. The paired watershed study is one example of questions that have been asked and research designed to provide answers. VMC will continue to be the forum to accomplish needed research on ecosystem issues.

The section on timber raises questions. What is the objective for the cutting projected for the next 22 years.

The primary objective is to maintain healthy, high quality forest stands and provide forest products to the industry in a sustainable way.

The contrast between the first 56 pages and the detailed schedule of timber sales until 2024 was startling. I wonder why there is such

precision here and not elsewhere? Perhaps the 2002-2007 timber sale should be described in greater detail than the others.

Other than the fact that the timber sales are scheduled out, very little detail is provided for each sale. A detailed prescription will be prepared at the time the sale is included in the Annual Stewardship Plan. The main reason for including the schedule here is to provide people with the knowledge that timber management will take place along with where and when, instead of just saying that timber management will happen in the General Use Areas.

The information included in the timber sale section is an attempt to balance requests for detailed information with providing none of it in the plan.

Proceedings of the Public Forum August 23, 1989

On Wednesday, August 23, 1989 the Vermont Department of Forests, Parks & Recreation, Central Vermont Regional Planning Commission, and the Lamoille County Planning Commission co-sponsored a public forum to receive input regarding management of Mt. Mansfield State Forest. The meeting was held at the Stowe High School. There were about 60 participants present.

The meeting started with introductory remarks and why we need to plan. A slide-tape presentation was made illustrating the history and activities on Mt. Mansfield State Forest. The purpose of this presentation was to give people the whole picture, so that they approach the management process on the entire forest and not just their backyard.

From this the audience was broken into six smaller groups, each dealing with one aspect of management on the forest. The following is a report of the group discussions, areas of conflict, and recommended actions.

Group 1: Local Officials/Town Planners

Group Leader: Susan Sinclair, CVRPC

Recorder: Brad Greenough

Issues of Concern – Many issues arose during the discussion but a few were of major concern.

1. Purchase large tracts of land to preserve for the future
 - acquisition of 3,000 acres in Morristown
 - development/preservation concerns, set aside areas for future.

This issue was the highest priority of the group. Regarding the development occurring in the surrounding towns, it was felt there should be areas of land added to the forest for future generations to enjoy. The questions needing answers is whether the proposed purchases are intended to be wilderness or working forests.

2. Protect scenic/visual quality

- ski trails on Mt. Mansfield are getting too wide, not aesthetically pleasing.

All aspects of management on the forest need to address the issue of aesthetics, everything from proposed timber sales to ski trails. The department will need to review proposed ski area expansion on public lands for its effects on visual quality.

3. Need for accurate and timely information to plug into the planning process.

- joint ventures in planning process between state and town; need more interaction,
- lack of information to the towns; general, topographic maps, watersheds, deer yards, rare species,
- game plan for forest resources in planning; FLESA

Thoughts were there should be greater interaction between the towns and state when facing issues that will impact both parties or when an action by one will affect another.

Recommendations:

1. Jointly with the towns and department, officials should identify parcels of land that would be beneficial for the department to own.
 - This will be dependent on the Vermont legislative committee on land acquisition. Department will have to work from their recommendations.
2. Develop a visual resource plan as part of the Block Plans. Use this to critique individual projects on the forest.
3. Distribute the Vermont Agency of Natural Resources Bibliography to all towns, so that they will know what information is available and where to get it.
4. Provide towns with a list of activities that will be taking place annually on the forest. Towns are currently being sent portions of the Annual Work Project Plans that cover public lands in their town. This requires action by the town because we need information from them on any permits required by the towns, ect.

Group 2: Timber Management

Group Leader: Steven Sinclair

Recorder: Wes Guyette

Issues of Concern –

1. Education

- promote demonstration areas portraying state-of-the-art techniques.
- keep public informed of activities on the forest
- include economic benefits of logging in message to the public
- forests need to be shared, not exclusive use.

Education was seen as the key. The group felt the department should have an aggressive education program to show the benefits of timber harvesting and showing the forest as a renewable working resource.

2. Focus management on producing high quality timber.

- emphasize timber production on better sites
- more funds for TSI
- do more to reduce air pollution, acid rain, etc. The department should be more outspoken on these topics.

The overall concern was that historically timber management was a major use of Mt. Mansfield State Forest and over the recent years fewer sales are being offered.

3. Balances: timber management vs. other uses.

- roads and trails put in for timber management should not be taken over for exclusive use of recreationists
- wildlife concerns should not exclude growth and production of high quality timber
- aesthetics need to be considered
- management of trees within ski areas leases.

Many people have their livelihood tied to harvesting timber.

Conflicts –

There tends to be conflicts between timber management and other uses, especially recreation. Often the conflict does not arise because trees are harvested, instead, because two non-compatible uses are competing for the same space at the same time. This is illustrated by the closing of the Cotton Brook Road to operate a winter sale and cross-country skiers or snowmobilers trying to use a plowed road when they need the snow.

Recommendations –

1. Organize a working group composed of representatives from the various recreation groups. Sit down together and collaborate to find a workable solution to conflicts.
2. Efforts to educate the public regarding forest management have started with publication of the pamphlet *Trees for the Future* and development of the forest land supplement to the Town Planning Manual and the FLESA model. These efforts need to continue.
3. Visual Resource Management – see Group 1, recommendation 2.

Group 3: Waterbury Reservoir

Group Leader: Bruce Amsden

Issues of Concern –

1. Boating and swimming
 - separate boat launch from swimming area by moving the launch site
 - speeding on the reservoir
 - prevent spread of milfoil to the reservoir
 - waterskiing vs other boating activities

Boating and swimming conflicts have been a problem since the development of the day use area. These are two popular sports on the reservoir and have been the subject of previous public meetings.

2. Fish and wildlife
 - manage the fisheries resource
 - provide some boat access to the reservoir 24 hours a day, open all the time.

This group would like to see the fisheries resource actively managed and that access for fishing is included.

4. General issues
 - look at ways to control adjacent development around the reservoir
 - traffic problems regarding access to Route 100
 - continue management and control of resource use.

Recommendations –

1. Investigate a boat launch and fishing access off Gregg Hill.
2. Post speed restrictions at all access points.
3. Organized a milfoil watch program and set up milfoil inspection stations with hoses at boat access areas.
4. Designate a shoreline beach for water skiing, training area for taking off.
5. Investigate possibility of installing a fish ladder at Adam's Dam.
6. Develop a long-range fisheries plan for the reservoir.
7. Purchase areas surrounding the reservoir to control development, see Group 1, recommendation 1.
8. Work with town to develop a plan to mitigate traffic problems regarding access to Route 100.
9. Rope west end of swimming area for safety of swimmers when boats use the launch.
10. Do not allow motorized use of the winter reservoir ice.
11. Participate in upcoming Federal Energy Regulation Committee licensing renewal process with strong recreational concern regarding water level fluctuations.
12. Find areas of consensus between the towns of Waterbury and Stowe in management strategies for the reservoir.

Group 4: Summer Recreation –

Group Leader: Barbara Farr

Recorder: Gerry Spaulding

Issues of Concern –

1. Hang gliders
 - desire for launch site on Mt. Mansfield
 - liability

There were 14 members of the Vermont Hang Gliders Association present. The greatest concern of this group is to find a launch site in northern Vermont, with Mt. Mansfield being a logical choice since there is a road to the top of the mountain. There are a few stumbling blocks, however. One is liability concerning hang gliders and the ski lift towers. A second is the compatibility of a launch site within the Natural Area. The third is a landing site on private land.

2. Hikers
 - develop trails that are handicap accessible and scenic
 - develop short trails near Smugglers Cave, Refrigerator, etc.

The concern is that there are various hiking experiences on Mt. Mansfield State Forest, but except for the Toll Road and the summit area at the Nose, little is available for handicap persons wanting to enjoy the outdoors and view the scenery. Also at the Smuggler Notch parking lot, there is concern over safety and hikers taking random routes up boulders to various scenic spots. They felt some short trails should be developed in this area.

3. Mountain Bikers

This user group was interested in what the state policy is regarding use of mountain bikes on state lands and also would like maps showing areas that can be used.

Recommendations –

1. Officially meet with all impacted parties to determine feasibility of using Mt. Mansfield as a launch site for hang gliders. Must be concerned with use within the Natural Area and that a landing site is acceptable to local citizens since it will have to be on private land.
2. Recon areas around the reservoir for trails that could be handicap accessible. Develop trails where possible.
3. Determine need for short trails at Smugglers Notch and recon for best location of the trails. Work with the Green Mountain Club.

4. Develop a brochure for Mt. Mansfield which would show roads and trails open to the public and the type of use they are classified for, i.e., hiking, biking, horseback riding, snowmobiling, cross-country skiing, etc.

Group 5: Winter Recreation –

Group Leader: Mike Green

Recorder: Ray McIntyre

Issues of Concern –

1. Winter trails
 - signing: publicize trails, uniform sign color code, mark existing roads and trails, positive signing
 - access to ridgeline for cross-country skiers

It was felt there was a greater need for uniform color coding of signs which promote recreational activities and that the roads and trails need to be marked and mapped. This would allow people to know where they are and where the trail goes. Cross-country skiers also want to have access to the ridgeline. The Catamount Trail system will give that access when it is complete.

2. Conflicts with winter logging

The group felt that winter logging needed to be balanced with the other uses. When a truck road is plowed in the winter, it is no longer usable for cross-country skiing or snowmobiling.

Recommendations -

1. Publicize trails – see Group 4, recommendation 4.
2. Sign intersections of roads and trails with where the trails goes and distance.
3. Trail coordinators set color coding standards.
4. Conflict: winter recreation vs winter logging, see Group 2, recommendation 1.

Group 6 & 7: General –

Group Leader: Chris Walsh

Recorder: Joe Boingiovanni

Issues of Concern –

1. Preservation

- too much mix of nature and recreation activities
- increase resource protection in face of recreation activities
- preservation vs increased recreation diversity
- threat to alpine vegetation
- long term preservation vs short term recreation fads.

The overriding theme with this group was preservation of the resource in face of increasing demands on it. Most of the concern centered around increasing recreation demands faced on the state forest, especially intensive uses.

1. History

- history of the area not being presented
- vandalism, stolen signs, areas of historic significance.

The group felt the history of Mt. Mansfield is important and should be promoted. It is important for people to understand the history of the area, to fully appreciate what is available today, and what will take place in the future.

Recommendations –

1. Consider no management on large tracts of state forest. This option will require decisions on how many acres is large and whether it is necessary to have large tracts of Mt. Mansfield State Forest be areas of no management when large portions of C.C. Putnam State Forest (Worcester Range) is under that management system already.
2. Increase focus on history in areas of intensive use. Provide more public information in the form of brochures or displays about the history of the forest.
3. Provide public information regarding current activities on Mt. Mansfield State Forest.

Authorization to Plan and Manage

Statutory Authority

The Vermont General Assembly has authorized the Agency of Natural Resources and its Departments to acquire lands, hold interests in lands, and conduct land management activities. Authority is vested in several statutes that collectively empower the Agency, upon approval of the Governor or General Assembly, to acquire lands, accept donations of lands or interests in lands, exchange or sell lands or interests in lands for public benefit, and to manage those lands for a variety of public purposes.

Specific authorizing statutes are:

- **Title 3, Chapter 51, Section 2825:** The primary duties of the secretary are to coordinate the activities of the various departments and divisions of the agency for the proper development, management and preservation of Vermont's natural resources, to develop policies for the proper and beneficial development, management, and preservation of resources in harmony with the state comprehensive planning program and to promote the effective application of these policies by the departments and divisions affected.
- **Title 10, Chapter 83, Section 2601:** Establishes the general purposes and policies to acquire and manage state lands and authorizes the Department of Forests, Parks & Recreation to undertake such activities.
- **Title 10, Chapter 83, Section 2603:** Establishes the general powers and duties of the commissioner of the Department of Forests, Parks & Recreation to manage state lands.
- **Title 10, Chapter 103, Section 4144:** Authorizes the Department of Fish & Wildlife to acquire state lands.
- **Title 10, Chapter 103, Section 4147:** Authorizes the Department of Fish & Wildlife to exchange, sell, or lease lands.
- **Title 10, Chapter 37, Section 905b:** Authorizes the Department of Environmental Conservation to acquire and manage lands and the rights to protect the state's water resources.
- **Title 10, Chapter 155, Section 6301-5:** Authorizes acquisition of rights less than fee of real property.

Summary of Some Policies and Guidelines Used in the Management of Vermont Agency of Natural Resources Lands

Some of the highlights of the many policies and guidelines used in managing Vermont Agency of Natural Resources lands are listed below. In general, these were in effect at the start of this long range management plan. If more information is needed, refer to current policies and guidelines which can be made available upon request. The information is grouped into some general categories to make this document easier to use.

Acquisition of Land

Lands Conservation Plan: A Land Acquisition Strategy for the Agency of Natural Resources, October, 1999 - Standards and procedures for the Agency of Natural Resources to acquire lands.

Agriculture

Vermont Agriculture Nonpoint Source Pollution Reduction Program Law and Regulations, Title 6, CH. 215, 1995 and 1996 – Standards for managing agricultural lands.

Cultural and Archaeological Resources

State of Vermont laws applicable to archeological resources - Standards and operating procedures for state owned lands.

Stonewalls & Cellarholes: A Guide for Landowners on Historic Features and Landscapes in Vermont's Forests, Robert Sanford, 1994.

Fish and Wildlife

Vermont hunting, fishing, and trapping regulations.

Wildlife Management Areas Operational Procedures Manual, Vermont Department of Fish and Wildlife - Standards for management of wildlife management areas.

Management Guide for Deer Wintering Areas in Vermont, Fish and Wildlife, 1990 - Standards for managing for deer.

Landowner's Guide to Wildlife Habitat Management, Fish and Wildlife, Fish and Wildlife, 1995 - Standards for managing for a variety of wildlife species on state and private land.

Native Vegetation for Lakeshores, Streamsides and Wetland Buffers, Environmental Conservation, 1994, Standards for buffer strips along lakes, streams and wetlands in Vermont.

Rare and Endangered Species - Listing of species protected under state regulations.

Gravel Pits

Forests, Parks and Recreation Policy #3, 1991 - Standards for use of gravel pits on Forests, Parks and Recreation lands.

Land Use and Development

Act 250 - Law governing plans for land use and development in Vermont.

Mountain Top Communications Facilities

Siting, Use and Management of Electronic Communication Facilities on Properties Owned by the State of Vermont, Agency of Administration, 1998.

Natural Area Designation

Natural Areas Law and Forests, Parks and Recreation Policy #7 - Standards and guidelines for designation of Natural Areas on state forest and parks lands.

Pesticides Use

Forests, Parks and Recreation Policy #9 - Regulations on the use of pesticides on state forest and parks lands.

Prescribed Fire

Prescribed Burn Directive, Vermont Department of Forests, Parks and Recreation, 1989 - Procedures for planning and execution of prescribed burns.

Recreation

Uses of State Lands, Agency of Natural Resources Policy, 1999 - Criteria for appropriate uses and when permits and licenses are and are not required.

Forests, Parks and Recreation Policies and Procedures Manual, 1990-1999 - Procedures and standards for administering recreational activities on state forests and parks lands.

State Park Ranger's Manual, Forests, Parks and Recreation, 1999 - Operating procedures, rules, regulations, and standards for recreational activity on state forests and parks land.

Scientific Research

Forests, Parks and Recreation policy # 8 - Standards and guidelines for research on state lands.

Silviculture

Silvicultural References Manual, Forests, Parks and Recreation, 1997 - Guidelines for the Intent to Heavy Cut notification process.

Acceptable Management Practices (AMP) Guidelines, 1987 - Practices for maintaining water quality on logging jobs.

Wetlands Rules & Regulations, 1990 - Regulations that outline practices for logging around wetlands in Vermont.

Native Vegetation for Lakeshores, Streamsides and Wetland Buffers, Environmental Conservation, 1994 - Standards for buffer strips along lakes, streams and wetlands in Vermont.

Vermont Handbook for Soil Erosion and Sediment Control on Construction Sites, Vermont Department of Environmental Conservation, revised September, 1983.

Vermont Streambank Conservation Manual, Agency of Natural Resources, 1982 - Guidelines for construction around streams.

Stonewalls & Cellarholes: A Guide for Landowners on Historic Features and Landscapes in Vermont's Forests, Robert Sanford, 1994.

Ski Areas

Guidelines for the Design and Construction of Ski Lifts and Trails in Class A Watersheds in Vermont, Department of Environmental Conservation, 2000

Water Resources

Acceptable Management Practices (AMP) Guidelines, 1987 - Practices for maintaining water quality on logging jobs in Vermont.

Long Trail Construction and Maintenance Standards, Green Mountain Club, 1995 - Trail construction standards for public and private land.

Native Vegetation for Lakeshores, Streamsides and Wetland Buffers, Environmental Conservation, 1994 - Standards for buffer strips along lakes, streams and wetlands

Vermont Streambank Conservation Manual, Agency of Natural Resources, 1982 - Guidelines for construction around streams.

Vermont Water Quality Standards, Vermont Water Resources Board, 7/2/00.

Vermont Wetland Rules, Vermont Water Resources Board, 1/1/02

Glossary

The following is a series of key words and their definitions used in the development of Long Range Management Plans for Vermont Agency of Natural Resource lands.

Acceptable management practices (AMPs). In this plan, a series of erosion control measures for timber harvesting operations, as identified in state statutes. The AMPs are the proper method for the control and dispersal of water collecting on logging roads, skid trails, and log landings to minimize erosion and reduce sediment and temperature changes in streams.

All-aged (Uneven-aged) system. Timber management which produces a stand or forest composed of a variety of ages and sizes. Regeneration cutting methods in this system include single tree selection and group selection.

Basal area. A measure of the density of trees on an area. It is determined by estimating the total cross-sectional area of all trees measured at breast height (4.5 feet) expressed in square feet per acre.

Best management practices. A practice or combination of practices determined to be the most effective and practicable means of preventing negative impacts of silvicultural activities.

Biodiversity. The variety of plants and animals, their genetic variability, their interrelationships, and the biological and physical systems, communities, and landscapes in which they exist.

Biophysical region. A region with shared characteristics of climate, geology, soils, and natural vegetation. There are currently eight biophysical regions recognized in Vermont.

Block. A land management planning unit.

Browse. The part of leaf and twig growth of shrubs, vines, and trees available for animal consumption.

Buffer (Riparian Buffer Zone). The width of land adjacent to streams or lakes between the top of the bank or top of slope or mean water level and the edge of other land uses. Riparian buffer zones are typically undisturbed areas, consisting of trees, shrubs, groundcover plants, duff layer, and a naturally vegetated uneven ground surface, that protect the water body and the adjacent riparian corridor ecosystem from the impact of these land uses.

Canopy. The more or less continuous cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth.

Capability. The potential of an area to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends on current conditions and site conditions such as climate, slope, landform, soils, and geology as well as the application of management practices such as silvicultural protection from fire, insects, and disease.

Cleaning (Weeding). Regulating the composition of a young stand by eliminating some trees and encouraging others, and also freeing seedlings or saplings from competition with ground vegetation, vines, and shrubs.

Clearcutting. A cut which removes all trees from a designated area at one time, for the purpose of creating a new, even-aged stand.

Commercial forest land. Land declared suitable for producing timber crops and not withdrawn from timber production by statute or administrative regulation.

Conservation. The careful protection, planned management, and use of natural resources to prevent their depletion, destruction, or waste.

Conservation easement. Acquisition of some rights on a parcel of land designed to keep the property undeveloped in perpetuity.

Cover. Vegetation which provides concealment and protection to wild animals.

Cultural operation. The manipulation of vegetation to control stand composition or structure, such as site improvement, forest tree improvement, increased regeneration, increased growth, or measures to control insects or disease. Examples of methods used are timber stand improvement, cleaning or weeding, release, and site preparation.

DBH (diameter at breast height). The diameter of the stem of the tree measured at breast height (4.5 feet or 1.37 meters) from the ground.

Deer wintering area. Forest area with at least 70 percent conifer that provides suitable, stable habitat to meet deer needs during the winter.

Den tree. A live tree at least 15 inches DBH (diameter at breast height) containing a natural cavity used by wildlife for nesting, brood rearing, hibernating, daily or seasonal shelter, and escape from predators.

Developed (or intensive) recreation. Activities associated with man-made structures and facilities that result in concentrated use of an area. Examples are campgrounds and ski areas.

Diameter at breast height (DBH). The diameter of the stem of the tree measured at breast height (4.5 feet or 1.37 meters) from the ground.

Dispersed recreation. Outdoor recreation activities requiring few, if any, support facilities.

Ecological processes. The relationships between living organisms and their environment. Among these processes are natural disturbances such as periodic fire, flooding, or beaver activity; natural stresses such as disease or insects; catastrophic weather-related events such as severe storms or lightning strikes; or more subtle ongoing processes such as succession, hydrology, and nutrient cycling.

Ecological reserve. An area of land managed primarily for long-term conservation of biodiversity.

Ecosystem. A complex array of organisms, their natural environment, the interactions between them, the home of all living things, including humans, and the ecological processes that sustain the system.

Ecosystem management. The careful and skillful use of ecological, economic, social, and managerial principles in managing ecosystems to produce, restore, or sustain ecosystem integrity, uses, products, and services over the long-term.

Endangered species. A species listed on the current state or Federal endangered species list (VSA Title 10, chapter 123). Endangered species are those which are in danger of becoming extinct within the foreseeable future throughout all or a significant portion of their range.

Even-aged system. Timber management that produces a forest or stand composed of trees having relatively small differences in age. Regeneration cutting methods in this system include clearcutting, seed tree (seed cut) method, and shelterwood method.

Forest health. Condition in which forest ecosystems sustain their complexity, diversity, resiliency, and productivity.

Forest type. A natural group or association of different species of trees which commonly occur together over a large area. Forest types are defined and named after the one or more dominant species of trees, such as the spruce-fir and the birch-beech-maple types.

Forestry. The art and science of growing and managing forests and forest lands for the continuing use of their resources.

Fragmentation. Division of a large forested area into smaller patches separated by areas converted to a different land use.

Game species. Animals habitually hunted for food, particular products, sport, or trophies.

Geographic Information Systems. A computer-based means of mapping lands and resources and communicating values associated with them (GIS).

Green certification. A process, sponsored by several international organizations, that promotes sustainable forest management practices, providing a marketplace identify for forest products certified to have been grown and manufactured in a sustainable manner.

Group Selection. The removal of small groups of trees to meet a predetermined goal of size, distribution, and species.

Habitat. A place that provides seasonal or year round food, water, shelter, or other environmental conditions for an organism, community, or population of plants or animals.

Hardwood. A broad leaved, flowering tree, as distinguished from a conifer. Trees belonging to the botanical group of angiospermae.

Healthy ecosystem. An ecosystem in which structure and functions allow the maintenance of the desired conditions of biological diversity, biotic integrity, and ecological processes over time.

Heritage Sites. Sites identified by the Vermont Nongame and Natural Heritage Program of the Department of Fish and Wildlife, which have rare, threatened, or endangered species of plants or animals. Heritage sites are identified using a common

standards-based methodology, which provides a scientific and universally applicable set of procedures for identifying, inventorying, and mapping these species.

Intensive (or developed) recreation. Outdoor recreation activities requiring major structures and facilities.

Interior dependent species. Those wildlife species that depend on large unbroken tracts of forest land for breeding and long term survival. The term is also often used in conjunction with neotropical migratory bird species requiring large patches of fairly homogeneous habitat for population viability.

Intermediate treatment. Any treatment or tending designed to enhance growth, quality vigor, and composition of the stand after its establishment or regeneration and prior to the final harvest.

Land conservation. The acquisition or protection through easements of land for wildlife habitat, developed state parks, and working forests.

Landscape. A heterogeneous area of land containing groups of natural communities and clusters of interacting ecosystems. These can be of widely varying scales but normally include a range of elevations, bedrock, and soils.

Mast. The fruit (including nuts) of such plants as oaks, beech, hickories, dogwood, blueberry, and grape, used for food by certain wildlife species.

Motorized use. Land uses requiring or largely dependent on motor vehicles and roads.

Multiple-use forestry. Any practice of forestry fulfilling two or more objectives of management, more particularly in forest utilization (e.g. production of both wood products and deer browse).

Multiple-use management. An onsite management strategy that encourages a complementary mix of several uses on a parcel of land or water within a larger geographic area.

Native (species). A plant or animal indigenous to a particular locality.

Natural Area. Limited areas of land, designated by Vermont statute, which have retained their wilderness character, although not necessarily completely natural and undisturbed, or have rare or vanishing species of plant or animal life or similar features of interest which are worthy of preservation for the use of present and future residents of the state. They may include unique ecological, geological, scenic, and contemplative recreational areas on state lands.

Natural community. An assemblage of plants and animals that is found recurring across the landscape under similar environmental conditions, where natural processes, rather than human disturbances, prevail.

Nongame species. Animal species that are not hunted, fished, or trapped in this state. This classification is determined by the state legislature.

Northern hardwood. Primarily sugar maple, yellow birch, and beech. May include red maple, white ash, white birch, black cherry, red spruce, and hemlock.

Old growth forest. A forest stand in which natural processes and succession have occurred over a long period of time relatively undisturbed by human intervention.

Outdoor recreation. Leisure time activities that occur outdoors or utilize an outdoor area or facility.

Overstory. That portion of the trees, in a forest of more than one story, forming the upper or upper-most canopy layer.

Pole. A tree of a size between a sapling and a mature tree.

Pole timber. As used in timber survey, a size class definition; trees 5.0 to 8.9 inches (varies by species) at DBH. As used in logging operations, trees from which pole products are produced, such as telephone poles, pilings, etc.

Regeneration treatment (harvest cut). Trees are removed from the stand to create conditions that will allow the forest to renew or reproduce itself. This is accomplished under either an even-aged management system or an uneven-aged management system.

The four basic methods used to regenerate a forest are clearcutting, seed-tree, shelterwood, and selection (group selection or single tree selection).

Regeneration methods. Timber management practices employed to either regenerate a new stand (regeneration cutting) or to improve the composition and increase the growth of the existing forest (intermediate treatment).

Regulated Hunting/Fishing/Trapping. The harvest of wildlife under regulations stipulating setting of seasons, time frame of lawful harvest, open and closed zones, methods of take, bag limits, possession limits, and reporting or tagging of species.

Release (release operation). The freeing of well-established cover trees, usually large seedlings or saplings, from closely surrounding growth.

Removal cut. The final cut of the shelterwood system that removes the remaining mature trees, completely releasing the young stand. An even-aged stand results.

Salvage Cutting. The removal of dead, dying, and damaged trees after a natural disaster such as fire, insect or disease attack, or wind or ice storm to utilize the wood before it rots.

Sanitation cutting. The removal of dead, damaged, or susceptible trees to improve stand health by stopping or reducing the spread of insects or disease.

Sapling. As used in timber surveys, a size class definition. A usually young tree larger than seedling but smaller than pole, often 1.0 to 4.9 inches at DBH.

Seedling. A very young plant that grew from a seed.

Seed-Tree (Seed Cut) method. The removal of most of the trees in one cut, leaving a few scattered trees of desired species to serve as a seed source to reforest the area.

Shelterwood method. A series of two or three cuttings which open the stand and stimulate natural reproduction. A two cutting series has a seed cut and a removal cut, while a three cutting series has a preparatory cut, a seed cut, and a removal cut.

Silvicultural systems. A management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. Systems are classified according to the method of carrying out the fellings that remove the mature crop and provide for regeneration and according to the type of forest thereby produced.

Single tree selection method. Individual trees of all size classes are removed more or less uniformly throughout the stand to promote growth of remaining trees and to provide space for regeneration.

Site Preparation. Hand or mechanical manipulation of a site, designed to enhance the success of regeneration.

Snag. Includes standing dead or partially dead trees that are at least 6 inches in diameter at breast height (DBH) and 20 feet tall.

Softwood. A coniferous tree. Softwood trees belong to the botanical group gymnospermae, including balsam fir, red spruce, and hemlock.

Special use. Lands that are leased or designated for a specific purpose, usually beyond the scope of normal department operations.

Stand improvement. An intermediate treatment made to improve the composition, structure, condition, health, and growth of even or uneven-aged stands.

Stewardship. Caring for land and associated resources with consideration to future generations.

Sustainability. The production and use of resources to meet the needs of present generations without compromising the ability of future generations to meet their needs.

Sustained yield. The yield that a forest can produce continuously at a given intensity of management.

Thinning. Removing some of the trees in a dense immature stand primarily to improve the growth rate and form of the remaining trees and enhance forest health.

Threatened species. A species listed on the state or Federal threatened species list. Threatened species are those likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

Timber lands. Properties that are managed primarily for the maximum production of forest products.

Timber Stand Improvement. Activities conducted in young stands of timber to improve growth rate and form of the remaining trees.

Traditional uses. Those uses of the forest that have characterized the general area in the recent past and present, including an integrated mix of timber and forest products harvesting, outdoor recreation, and recreation camps or residences.

Uneven-aged (All-aged) system. Timber management which produces a stand or forest composed of a variety of ages and sizes. Regeneration cutting methods in this system include single tree selection and group selection.

Watershed. The geographic area within which water drains into a particular river, stream, or body of water. A watershed includes both the land and the body of water into which the land drains.

Weeding (cleaning). Regulating the composition of a young stand by eliminating some trees and encouraging others, and also freeing seedlings or saplings from competition with ground vegetation, vines, and shrubs.

Wilderness. Areas having pristine and natural characteristics, typically roadless and often with some limits on uses. (This is not the federal definition of wilderness.)

Wildlife habitat. Lands supplying a critical habitat need for any species of wildlife, especially that which requires specific treatment and is of limited acreage.

Working forest. Land primarily used for forestry purposes but also available for recreation, usually where both managed land and land not presently being managed is present.

Working landscape. A landscape dominated by land used for agricultural and/or forestry purposes.