CONSERVATION MANAGEMENT PLAN

And

FOREST RESOURCE MANAGEMENT PLAN

CHASE BROOK PARCEL

TOWN OF FAYSTON
And
VERMONT LAND TRUST

In

Fayston, Washington County, Vermont

72 ACRES

March 2006

Hunger Mountain Forestry, Inc

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FOR VERMONT LAND TRUST DATE

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INTRODUCTION

The purpose of this management plan is to provide the framework and direction for management of the 72 acre Chase Brook parcel owned by the Town of Fayston and conserved by a Grant of Development Rights, Conservation Restrictions and Public Access Easement to the Vermont Land Trust, Inc.

The purpose of the granted rights to Vermont Land Trust, Inc. are:

1. To conserve non-motorized public recreation opportunities including the Catamount trail and Mill Brook Trails; public and environmental education and nature study opportunities; scenic resources; open space values; wildlife and deer wintering habitats; riparian values along chase Brook; and biological diversity associated with the Protected Property for present and future generations.
2. As secondary purpose, to conserve the sustainable forestry resources associated with the Protected Property for present and future generations.
3. These purposes will be advanced by conserving the Protected Property because it possesses the following attributes:

    a. 3200 feet of the catamount Trail, Mill Brook Trail and other side trails which provide the public with recreational and educational uses;
    b. is near the Fayston Town Elementary School;
    c. 305 feet of frontage on the German Flats Road.
    d. 3400 feet of frontage on Chase Brook;
    e. 34 acres of deer wintering habitat.

The Town of Fayston and the Vermont Land Trust, Inc. recognize the Purpose of this Grant and share the common goal of conserving these values of the Protected Property by the conveyance of conservation restrictions, and development rights, to prevent the use or development of the Protected Property for any purpose or in any manner which would conflict with the Purposes of this Grant. The Vermont Land Trust, Inc. accepts such conservation restrictions, development rights and public access easement in order to conserve these values for present and future generations.

The purpose of this management plan is to identify and evaluate the condition of the recreational resource, and inventory the vegetative and wildlife resource consisting of forest communities, wildlife habitat, natural communities, plant and aquatic communities.

The objective of this inventory and management plan is to prescribe management activities to maintain, improve and protect the recreational resources and critical wildlife habitat and special treatment areas and to incorporate silvicultural treatments for the forested land which will result in maximizing the long term productivity and sustainability of the forest land by setting management objectives which include consideration for the wildlife, soil and water, recreational and visual resources.

Responsibilities for Management

The Fayston Board of Selectmen has the primary responsibility for the implementation of this management plan and the management of the resources of this parcel. That responsibility is shared with the Vermont Land Trust as a Grantee of the rights identified above. The Fayston Board of Selectmen and the Vermont Land Trust have accepted this management plan.

Key Stakeholder individuals and organizations

The following list of Key Stakeholders includes all parties holding a legal interest in the Protected Property

1. Town of Fayston through the Board of Selectmen: Responsible for implementation of this management plan and the overall management of the property.
2. The Vermont Land Trust: Responsible for review of management plans and amendments and oversight and assurance of compliance of management activities with the Grant of Development Rights, Conservation Restrictions and Public Access Easement.
3. The Catamount Trail Association: Responsible for administration and management of the lands within the Trail Easement corridor in accordance with the rights deeded in the Grant of Conservation Restrictions and Trail Access Easement. (winter use for cross country skiing)

Interested and Affected Stakeholders

The following list of interested and affected stakeholders includes those individuals and parties who do not have a deeded right but who, through established uses and planned uses, have an interest in the management of the Protected Property

1. Mad River Path Association, Mill Brook Trail: Trails maintained for winter and summer use located on the property.
2. Town of Fayston Elementary School: Potential environmental education and awareness activities in close proximity to the Fayston Elementary School.
3. Mad River Riders (Local mountain bike group): Use of existing trails as part of trail network.
4. Adjacent landowners: (will be affected by activities on the Protected Property).

PROPERTY ACQUISITION

The property was acquired by the Town of Fayston in January 2005 from Snowridge Corporation. The deed of conveyance is recorded in Book 99 pages 645 – 647 of the Town of Fayston Land Records. The Town of Fayston has conveyed to Vermont Land Trust, Inc. a "GRANT OF DEVELOPMENT RIGHTS, CONSERVATION RESTRICTIONS, AND PUBLIC ACCESS EASEMENT" which is recorded in Book 99 pages 648 - 655 of the Town of Fayston Land Records. The conveyance of the rights to VLT includes the entire parcel. The predecessor in title, Snowridge Corporation, Inc. previously conveyed certain trail rights to Catamount Trail Association, recorded in Book 99 pages 637 to 642 of the Fayston Land Records. The Catamount Trail Easement consists of a 100 foot wide Recreation Trail Easement on a generally described location and is intended for winter use only, November 1 to April 30 annually with rights to conduct trail maintenance work in the summer months. The Mad River Path Association's Mill Brook Trail is located on this property and generally coincides with the Catamount Trail location. The Mad River Path Association trail is not covered by a formal trail easement or special use agreement.

MANAGEMENT PLANNING DEED REQUIREMENTS

The conveyance document to Vermont Land Trust contains various requirements among which is the development of Management Plans including a Forest Management Plan. This plan is prepared in fulfillment of the responsibility of the Grantor for the Management Plan and Forest Management Plan.

The **Management Plan** shall:

1. Provide for the use and management of the Protected Property in a fashion which is consistent with and advances the Purposes of the Grant;
2. Identify actions necessary to accomplish the following and shall appropriately balance all the resource attributes of the human uses for the Protected Property:

    a. identify and address the management needs of the recreational uses that may need special or more intensive management focus;
    b. provide for meaningful recreational links to private and public land;
    c. provide details of sustainable forest management activities
    d. provide a plan for road, sign, trail and sanitary facility use that has a minimal impact on water quality and plant, wildlife and aquatic habitat;
    e. provide for the identification and protection of natural communities, plant, wildlife and aquatic habitat and other ecologically sensitive or important areas; and
    f. be consistent with the Town plan.

    The **Forest Management Plan** shall:

    1. identify the Owner's forest management objective;
    2. provide an appropriately scaled, accurate map indicating such items as forest stands, streams, wetlands and major access routes and landings;
    3. provide forest stand descriptions including stocking levels, soils, topography, stand quality, site class, insect and disease occurrence, management history and prescribed silvicultural treatments;
    4. include plant and wildlife considerations;
    5. aesthetic and recreational considerations;
    6. historic and cultural resource considerations.

OVERVIEW OF PROPERTY

DESCRIPTION

Location: The property is located in the south Fayston area east of the German Flats Road (TH #2) and south of VT. RT #17 in the Harris Hill area. The westerly boundary of the property is generally the east bank of Chase Brook. The southwest corner of the property is an original lot line between L17R3 and L17R4 which corners southwest of Slide Brook and proceeds northeast crossing Slide Brook and Chase Brook cornering west of Chase Brook thence easterly 53 feet to the east bank of Chase Brook. The property has an estimated 3400 feet of frontage on Chase Brook and 305 feet of frontage on the German Flats Road in the northwesterly corner on the west side of Chase Brook. The property extends easterly from Chase Brook to the upland area generally referred to as Harris Hill. (See Figure 1 and Figure 2)

History of Ownership: Property of which this parcel is a part was acquired by Ward Lumber Company, Inc. in September 1941. Ward Lumber Company, Inc. was a large land owner in the Town of Fayston and other Mad River Valley Towns and owned and ran a lumber mill situated in the village of Moretown, VT.

Ward Lumber Company Inc., then located in Waterbury, VT, sold their interest in all real estate it owned in December 1968 to Laird Properties New England Land Syndicate which by change of name became New England Land Associates.

New England Land Associates conveyed the subject property to Snowridge, Inc. in December, 1988. Snowridge, Inc. conveyed the subject property to the Town of Fayston in January, 2005.

Throughout the 65 years of ownership from 1941 to the present, the subject property has been managed as forest land with the production of forest products being the primary objective of the various owners. Ownership prior to 1941 indicates the subject property was part of a farming unit.

Topography and Elevations: The topography is best described as gentle to moderately steep terrain sloping downward to the northwest. The property is moderately to steeply sloping with steepest areas occurring in the northerly part of the parcel. Slopes range from 5% to 30% with steeper areas easterly of and adjacent to the Chase Brook stream frontage.

Elevations range from a low of approximately 960 feet above Mean Sea Level at the intersection of the northeast boundary line on Chase Brook to a high elevation of 1340 feet at the southeast corner of the property.

The easterly part of the parcel contains relatively flat areas which contain class III wetlands created by the ground form and bedrock creating a perched water table.

Access: Access for roads from the German Flats Road frontage is less than suitable and not recommended. Stream banks on Chase Brook and steep slopes on sensitive soils easterly of Chase Brook do not offer a suitable access opportunity. No other unencumbered access to a public highway presently exists for the property.

Trail access is afforded by a footpath from German Flats Road to a pedestrian bridge constructed and maintained by Catamount Trail Association and the Mad River Path Association.

Access within the property is afforded by old logging roads and user developed and permitted recreation trails.

Access for future management of the vegetative resource will have to be obtained through temporary use rights of way with adjacent land owners unless adjacent land is acquired with frontage on a public highway.

Public access for non-motorized recreational use trails has been conveyed by deed to the Catamount Trail Association.

Existing Developments:

The following trails exist on the property. (See Figure 3)

Catamount Trail Association – A 100 foot wide corridor for use by the general public from November 1 to April 30 as a non-motorized cross country ski trail that enters the south side of the parcel at an elevation of 1240 feet from adjacent land now or formerly owned by Thorvald Tenny. The easement heads north-northeast and slightly downhill for a distance of approximately 1330 feet to an elevation of approximately 1160 feet, where it joins the Mad River Path Association's Mill Brook Trail. The easement turns west and then northwest, descending steeply for a distance of approximately 1050 feet to cross Chase Brook at an elevation of approximately 1040 feet. Chase Brook forms the boundary with adjacent property now or formerly owned by Marc Angelillo. An undeveloped spur trail location running approximately 700 feet south-southwest along the east bank of Chase Brook is also included in this easement. The approximate total length of the Trail easement is 0.6 miles. The Catamount Trail Association maintains a foot bridge across Chase Brook as well as a sign-in register on the east side of Chase Brook.

Rights of the Grantee (CTA) identified in the easement are:
1. The right to maintain the easement area including the right to cut, fell, trim and remove trees and underbrush and other vegetation and obstacles
2. The right to construct bridges and erosion control structures

Rights of the Grantor (Town of Fayston) identified in the easement are:
1. Right to maintain, repair, improve and replace existing trails within the easement area.
2. Right to relocate trails to another portion of the property with proper notification to CTA.
3. Right to use the Easement area for the removal of forest products with provisions for temporary alternative trail location agreed to by the CTA as well as other provisions.

Mad River Path Association Mill Brook Trail

The Mad River Path Association, Mill Brook Trail enters the property on the east boundary approximately 150 feet northeasterly of the iron pipe corner at the south end of the N471/2^0 E, 791 foot line and approximately 50 feet southwest of the end of the stone wall which identifies a part of that boundary line. The trail extends southwesterly on the property approximately 200 feet to its intersection with the Catamount Trail Association trail thence follows the Catamount Trail Association trail westerly down hill to the footbridge crossing Chase Brook near the German Flats Road.

The Mad River Path Association, Mill Brook Trail is not covered by any formal agreement such as an easement deed or special use permit.

User Developed Trails

User developed and historical access trails are located in the easterly part of the ownership. These paths occur as unmarked spur trails to the Catamount Trail location and appear to be used for hiking. Maintenance of these trails and paths is less than adequate and should be improved or closed to protect soils and trail beds. Some type of formal permitting agreement with the users should be considered by the landowner.

Visual Resources: The entire property has moderate to high visual resource values. The property is visible from the German Flats Road. The German Flats Road is one of the primary access roads to Sugarbush ski areas and the high volume of traffic results in a high exposure for this parcel as well as others on the German Flats Road. Development in the Hiddenwoods area, west of the property, also generates a high visual resource exposure for this property.

All planned management activities including harvesting will be designed and carried out in a manner which seeks to maintain, improve and enhance the aesthetic qualities of the visual resource on the parcel. Management activities adjacent to roads and trails will incorporate buffer zones to reduce the impact on foreground, middle ground and background aesthetics.

A Travel Influence Zone (TIZ) of 100 feet in width either side of legal trails will be established in which management will be modified to protect the foreground visual resource. The TIZ includes the trail easement area and extends 50 feet beyond the trail easement area. (See figure 3)

Visual resources within the property are characterized as a natural undisturbed foreground of mixed northern hardwoods and Eastern hemlock with dense Eastern hemlock forest in the north and west part of the property. Within the dense Hemlock stands areas of young Yellow birch sapling and pole stands attest to the success of past management activities. The general visual nature of the entire parcel is one of a healthy forest with little evidence of disease. Mature trees interspersed with young, healthy, vigorous growing trees of all species offer a variety of visual aspects and wildlife habitat.

Wildlife: The wildlife resource description is based on general observations in the field and are not the result of a specific and structured wildlife inventory. General observations include evidence of White-tailed deer, based on browsing of woody vegetation, and the indications associated with song and game birds such as direct sightings, obvious feed area use and audible recognition of bird songs and calls.

Approximately 35 acres of this property is mapped winter deer range. The mapped deer range is part of a much larger mapped deer winter range area located on the Mill Brook drainage. The mapped deer wintering area is located in the north part of the parcel and includes the area along Chase Brook. The mapped deer wintering area appears to have a high percentage of functional winter cover. Nearly all of the mapped area can be considered core range. (See Figure 4)

Black bear feeding area use was noted in areas of dense beech particularly in the southeast corner of the property. Use appears to be periodic depending on the availability of hard mast. (See Figure 4)

Common songbirds are well represented within the ownership and past activities have created habitats that encourage nesting and feeding by a variety of bird species. Upland birds and mammals such as ruffed grouse and varying hare are well represented and should be considered in all management activities.

The management prescriptions contained in this report have been coordinated and modified in accordance with the **"MODEL HABITAT MANAGEMENT GUIDELINES for DEER, BEAR, HARE, GROUSE, TURKEY, WOODCOCK AND NON-GAME WILDLIFE"**, published by the Vermont Fish and Wildlife Department, Agency of Environmental Conservation, February 1986 and the **"MANAGEMENT GUIDE FOR DEER WINTERING AREAS IN VERMONT"**, published by the Vermont Departments of Fish and Wildlife and Forests, Parks and Recreation in September 1990.

Water Resources:
Chase Brook and an estimated 200 feet of Slide Brook represent the most significant water resources on and adjacent to the property. An estimated 800 feet of Chase Brook is situated within the property boundaries. Approximately 2180 feet of property boundary is located on the southeast bank of Chase Brook. A Riparian Buffer Zone (RBZ) consists of all land lying within 100 feet of the top of the southeasterly bank of Chase Brook and land on the northwesterly side of Chase Brook where Chase Brook lays within the property. The RBZ has been identified as a Special Treatment Area. (See Figure 5)

Management activities within the RBZ shall:

1. Preserve the natural values of the RBZ and maintain and improve the natural functions of the RBZ.

2. Address the planting, maintenance and cutting of vegetation.

3. Prohibit residential, commercial, industrial or mining activities and no building, structure or improvement shall be constructed, installed or moved into the RBZ.

4. Involve consultation with Fish and Wildlife professionals.

Three small Class III wetlands have been identified on the property. These areas are shown on the enclosed Water Resource map and are generally located near the northeasterly boundary and the southeasterly boundary. The actual extent of these wetlands has not been surveyed. The general location and estimated extent identified by field reconnaissance is shown on the Water Resource map. Each of the identified wetlands has associated outlet streams which are generally identified and considered part of the wetland. (See Figure 5)

Soils - The soil resources descriptions, symbols, names, and site classes were obtained from the United States Department of Agriculture, Soil Conservation Service, Soil Survey of Washington County, Vermont.

The soil associations found on the ownership are commonly gently sloping to steep, somewhat excessively drained to moderately well drained, shallow to deep, moderately coarse textured to fine textured soils that formed in glacial till on hilly uplands.

The soils mapped on the property are listed in the following table with the soil symbol shown first followed by the soil name. (See figure 6, Soils Map)

Soil Symbol	Soil Name
18B	Cabot Silt Loam, 0 to 8%
3A	Rumney Fine Sandy Loam, 0 to 2% slopes
39C	Colton Gravelly Loam Sand, 8 to 15% slopes
63C	Berkshire Fine Sandy Loam, 8 to 15% slopes
63D	Berkshire Fine Sandy Loam, 15 to 35% slopes
72D	Tunbridge-Lyman Complex, 15 to 35% slopes
78D	Peru Gravelly Fine Sandy Loam, 15 to 35% slopes

Slope Classes	Range in %
A	0% to 2%
B	2% to 8%
C	8% to 15%
D	15% to 35%

Description of Soil Associations

Cabot Silt Loam, 0 to 8% slope: This soil is very deep, nearly level to gently sloping and somewhat poorly drained and poorly drained. It is on toe slopes of knolls, on till plains and in drainage ways. Stones cover 1 to 3% of the surface. Slopes typically are concave.

Rumney Fine Sandy Loam, 0 to 3% slope: This soil is very deep, nearly level and poorly drained. It is on lower positions on flood plains that are frequently flooded by stream overflow for brief periods. Slopes are typically smooth.

Colton Gravelly Loam Sand, 8 to 15% slope: This soil is very deep, strongly sloping and excessively drained. It is on terraces and kames. Slopes are typically smooth.

Berkshire fine sand loam, 8 to 15% and 15 to 35% slope: This soil is very deep, strongly sloping to moderately steep and steep and well drained. It is on the backslopes of hills and knolls. Stones cover 1 to 3% of the surface. Slopes are typically convex.

Tunbridge-Lyman complex, 15 to 35% slope: This association consists of moderately steep and steep soils on hills and ridges. The moderately deep well drained Tunbridge soils are on shoulders and backslopes. The shallow, somewhat excessively drained lyman soils are on summits and shoulders. Stones cover 1 to 3% of the surface. Slopes typically are convex.

Peru Gravelly fine sandy loam and Chesuncook silt loam, 15 to 35% slope: This soil is very deep, moderately to steep and moderately drained. It is on backslopes of hills. Stones cover 1 to 3% of the surface. Slopes typically are concave.

History of Management: This property was actively managed for the production of forest products during the period of ownership by Ward Lumber Company, Inc. and successors in title up to the time of acquisition by Snowridge in 1988.

The most recent past harvesting appears to have occurred about 30 years ago at which time harvesting in the northerly part of the property occurred. No harvesting appears to have been done in the southerly part of the parcel at that time as no evidence of stumps exist from that approximate era.

No harvesting has been done since the mid 1970s.

Boundary Lines and Corners: Boundary lines on the parcel are not well defined. Close inspection is needed to identify boundary line blazes dating back to 1970, the time of survey by Keller and Lowe, Inc. Corners for most of the boundary have been located and as were identified in the 1970 survey.

Painting and maintenance of boundary lines is strongly recommended to facilitate future line location, possible signing needs and to prevent innocent trespass onto the property by adjacent owners.

Soils Testing by Snowridge: Evidence of soil testing for possible wastewater disposal was noted in the southwest corner of the property. The evidence consists of groundwater level observation tubes protruding from the ground surface within the tested area where holes were dug by a track mounted backhoe. The groundwater monitoring tubes are 2 inch to 4 inch white PVC extending 2 feet to 3 feet above ground surface level. These groundwater monitoring tubes should be removed and disposed of off the property at a certified land fill.

Encroachment by adjacent land owners An area of approximately ½ acre in the northeast corner shows evidence of tree cutting by adjacent land owners. The cutting appears to have been done about 10 years ago and was obviously done to improve views and solar lift for the adjacent ownership. Boundary line maintenance and signing would help to prevent this type of innocent trespass. Adjacent land owners have generally respected the boundary lines and no evidence of refuse dumping was noted.

Historic and Archeological Resources The only significant historical resource discovered on the property is a laid up dry wall foundation 150 feet east of the intersection of the Mill Brook Path and the Catamount Trail. The foundation appears to be an old sugaring set up and was probably what is known as a “Flat Pan” set up where maple sap was boiled down to produce maple sugar for domestic use. (See Figure 7)

The north part of the east boundary is identified as a stone wall which has withstood the test of time and the elements. Past landowners of the Protected Property and adjacent landowners have respected this wall and it generally is undisturbed.

Natural Communities [2]

"A Natural Community is an interacting assemblage of organisms, their physical environment and the natural processes that affect them. Whereas a natural community refers to an actual occurrence on the ground, a **natural community type** is a composite description summarizing the characteristics of all examples of that type " [2]

The Chase Brook property can be separated into distinct natural community types. Each of these natural community types is briefly summarized below. (See Figure 8)

Northern Hardwood Forest: A variable community, generally dominated by American beech, Sugar maple, and Yellow birch.

Hemlock-Northern Hardwood Forest: Mixed forest of Eastern hemlock and northern hardwoods with hemlock occupying the majority of the canopy.

Forested Wetland: Seeps and Vernal Pools: These wetland communities are typically very small and occur in depressions or at the base of slopes in upland forests. Trees in the wetland may be scarce, but there is an overhanging canopy from the adjacent forest. Seeps have abundant groundwater discharging at their margins and usually a lush growth of herbs. Vernal pools are depressions that fill with water in the spring and fall and typically have little herbaceous cover.

[2] This information was adapted from Wetland, Woodland, Wildland, a Guide to the Natural Communities of Vermont, by Elizabeth H. Thompson and Eric R. Sorenson, 2000

SIGNIFICANT RESOURCES AND MANAGEMENT RECOMMENDATIONS

Ecologically Sensitive Areas:

Riparian Buffer Zone (RBZ)

The Riparian Buffer Zone (RBZ) includes all land lying within 100 feet of the top of bank of Chase Brook. Where the ownership boundary is the southeast bank of Chase Brook the RBZ consists of lands lying 100 feet southeasterly of the top of bank. Where the ownership lays northwesterly of Chase Brook as it does in the southwest corner and northwest corner the RBZ consists of all land northwesterly of the top of the northwest bank of Chase Brook to the northwesterly and southwesterly boundary.

The RBZ is subject to the following limitations which are outlined in the VLT deed.

1. The RBZ is significant in the protection of the health, stability and water quality of Chase Brook. A vegetative buffer along Chase Brook provides food and cover for aquatic and terrestrial species, maintains water temperature by providing shading and helps to prevent or mitigate erosion during periodic flood events.
2. Management of the RBZ will describe practices employed to preserve the natural values of the RBZ and to maintain and improve the natural functions of the RBZ.
3. The RBZ may be used for all types of non-commercial, non-motorized dispersed recreation purposes and management activities associated with forest management.

Management Recommendations for the RBZ

1. Arrange for an intensive inventory of the RBZ by the wetlands specialist of the State of Vermont Water Quality Division, Agency of Natural Resources. The intensive inventory should result in recommendations for improvement and protection of the RBZ.
2. Expand the RBZ southeasterly by delineation of a Water Influence Zone (WIZ) that extends from the southeasterly bound of the 100 foot RBZ to the top of the steep bank and delineate a WIZ of 50 feet either side of the top of bank of all perennial and intermittent streams flowing from the property into Chase Brook.
3. Prohibit the use of any motorized logging or recreation equipment within the RBZ and WIZ except for site specific projects such as bridge and trail construction and maintenance projects.
4. Actively seek assistance in developing educational material to be used for educational opportunities for the Environmental Learning for the Future (ELF) program for area elementary schools.
5. Repair, replacement, relocation or addition of stream crossing structures on Chase Brook and relocation or extension of the Catamount Trail and Mad River Path will incorporate recommendations of a fish and wildlife professional.
6. Recommendations of fish and wildlife professionals will be incorporated in this plan by amendment.
7. New trail locations authorized by existing or new agreements should be located out of the floodplain area adjacent to Chase Brook. Trails should be located on the slope area with provisions for cross drainage that mitigate the potential negative impacts of soil movement into the floodplain area of Chase Brook.

Class III wetlands
Field inventory work done to develop a data base for the forest management plan resulted in the discovery of three Class III (unmapped) wetlands, two of which are located near the northeast boundary and one located on the south east corner of the property east of the Catamount Trail. The location, extent and size of these wetlands is approximate on the attached water resource map. The total area is estimated to be approximately 3 acres. (See Figure 5)

Management Recommendations for Class III Wetlands

1. With assistance from the wetlands specialist of the State Water Quality Division, ANR delineate the perimeter of the identified wetlands.
2. Delineate a 100 foot wide buffer zone (WIZ) around each of the identified wetlands within which all use of motorized logging or recreational equipment will be prohibited except for site specific projects such as bridge and trail construction and maintenance projects.
3. Monitor health and condition of designated wetlands as part of the total oversight of the parcel.
4. Utilize wetlands as an instructional opportunity to educate area elementary students in wetlands ecology as a part of environmental education programs.
5. Pedestrian access trails may be located within the WIZ but not within the delineated area of the wetland.

Deer Winter Range - Deer Winter Range or "Yards" are areas of suitable forest type which provide cover, food and concealment during severe climactic conditions such as heavy snows in mid-winter. Mature softwood timber types with abundant understory regeneration are considered to provide the best winter range area. Deer winter range areas consist of "Core Range" (areas of concentration of softwoods with high crown closure of 70%+) and mixedwood adjacent to the core range which provide accessible browse.

The winter deer range in this parcel is characterized by dense hemlock on steep areas and relatively dense hemlock on steep areas adjacent to Chase Brook. Areas of deeper soils support a mixture of hardwoods and hemlock with the overstory dominated by hardwoods. Crown closure in the dense hemlock is approaching 80% while in the mixed hardwood-hemlock type it often is not more than 40%.

The goal for management of the winter deer range will be to:

1. Perpetuate functional shelter consisting of softwood overstory at least 35 feet tall with at least 70% crown closure of mature overstory softwoods.
2. Maintain mobility and access throughout the wintering area.
3. Provide accessible browse of preferred species within or adjacent to the functional shelter area.

Management Recommendations for Mapped Deer Winter Range

1. Monitor use of the mapped deer winter range through periodic inspection
2. Conduct no vegetative manipulation activities within the deer winter range until deemed necessary by apparent deterioration of the core range area.
3. All management activities in the deer winter range area will strive to enhance the functional cover by maintaining 70% or more crown closure of all overstory softwoods.
4. Seek professional assistance from the Vermont Department of Fish and Wildlife deer biologist in evaluating the condition of the deer wintering area with recommendations for management activities to improve the condition of the area.

Black Bear Feeding Area

Groups of American beech showing heavy feeding use by Black bear are located in the southeast upland area of the parcel. Bear claw climbing marks indicate historical use of the area by Black bear. No recent feeding use was noted however the habitat is present and should be protected and managed appropriately. Incidental use by Black bear of beech scattered throughout the south part of the property was also noted.

Management Recommendations for Black Bear Feeding Areas

1. Retain all beech concentrations showing evidence of Black Bear use.
2. Regenerate beech to assure future habitat exists where condition of beech stocking is high risk because of disease.
3. Locate trails away from concentrations of beech where proximity of trails to feeding areas might discourage use by Black Bear

Skiing, Hiking and Biking Trails

The Catamount Trail and Mad River Path are the only marked and identified trails on the property. Other unmarked trail locations identifiable by use and clearing were discovered during the field reconnaissance phase. Previously marked and cleared trails that are no longer being maintained or used were also discovered on the property.

The Catamount Trail easement authorizes use during the period of November 1 to April 30 annually with authorization for maintenance work during the period of May1 to November 1 annually. The Mad River Path Association trail does not appear to be covered by any formal trail easement and use appears to be on a year around basis. The local mountain bike club, Mad River Riders, may consider the trails on the subject property part of their trail network, however there does not appear to be any formal agreement in place.

The existing maintained trails are in relatively good condition. The section of the Catamount Trail from the south boundary to the intersection of the Mad River Path Association trail is located on an old logging road which has been graded and smoothed. Portions of the trail are located in a valley or land form depression with little opportunity for proper drainage to maintain a dry useable trail. Near the intersection of the Mad River Path Trail the Catamount Trail follows back and forth across the intermittent stream which is the outflow from the Class III wetland located in the southeast part of the property.

From the intersection of the Catamount Trail and Mad River Path Trail the combined location falls rather steeply to the pedestrian foot bridge on Chase Brook. The trail has some water diversion structures in the form of shallow waterbars and broad based dips to direct water off the trail into the surrounding undisturbed forest land. Portions of the trail location are wet, are on sensitive soils and may be somewhat unsafe.

Management Recommendations for Trails

1. Relocate the travel way of the south portion of the Catamount Trail that is located in the depression to the west side of the existing trail staying within the easement area. No significant removal of vegetation will be necessary.
2. Provide hand built water diversion structures such as broad based dips and low waterbars to direct water off the trail and across the trail at selected locations.
3. Develop special use agreements with responsible organizations for those trails not covered by formal agreements in order to control use and prevent conflicts between users.
4. Seek to provide adequate parking facilities for users of the trails in the German Flats Road area with informational signing to assist trail users and protect adjacent landowners.
5. Expand the trail side buffer zone from the outside limit of 50 feet either side of the trail to an outside limit of 100 feet either side of the trail. The additional zone width of 50 feet will provide for a 200 foot wide strip of restricted vegetative management that will have a primary objective of management for aesthetics with no vegetative manipulation other than high risk and hazard tree removal.

Education

The property is strategically located to provide outdoor class room opportunities to the Fayston Elementary School located adjacent to the German flats Road and directly across the road from this property. Use by other educational facilities such as Waitsfield Elementary School, Crossett Brook Middle School and Harwood Union High School could be easily accommodated by the provision for adequate parking on the east side of German Flats Road.

Management Recommendations for Educational Opportunities

1. Seek input from area educational institutions on needs for outdoor educational curriculum requirements.
2. Provide for use of the property as a laboratory for educational opportunities in the introduction to students to natural history, plant communities and ecology.
3. Seek input from the ELF program administrators on how best to accommodate educational opportunities for the ELF program.

Parking

There is presently no public parking facility near the trail heads for the property. Parking has been permitted on the west side of the German Flats Road at the entrance to the Hiddenwood development. Parking appears to have been permitted by the generosity of the landowners association of Hiddenwood. No parking area exists at the end of the Harris Hill Road (TH#24).

Management Recommendations for parking

1. Provide for suitable parking at or near the Chase Brook pedestrian crossing by entering into formal agreement with a landowner in that area.
2. Future parking on the east side of German Flats Road is preferable to accommodate use by area educational institutions to avoid school age children having to cross German Flats Road during high use periods. Possible acquisition of a suitable area to the south to accommodate parking on the east side of the German Flats Road is being considered by the Board of Selectmen.

Signing

Signing to control and direct use in the German Flats area is being addressed by CTA. CTA is working with the landowner on whose land the pedestrian crossing is located to prevent parking on the east side of the German Flats Road and to inform the public that the land is private land in an effort to inform the public and protect the privacy of the landowner.

Signing on the Catamount Trail is presently adequate however signing for the Mad River Path, Mill Brook Trail needs to be improved in order to direct use to the appropriate trail locations as well as inform users of permitted uses of the trail.

Management Recommendations for signs

1. CTA to continue to work with adjacent landowners to improve signing to assure landowner privacy is protected.
2. CTA to continue to work with adjacent landowners to provide for adequate public parking through formalized agreement. (Special Use Permit or easement deed)
3. Signing for mountain bikers of the right-of-way of pedestrian hikers.

Potential Conflict of Uses

The established use of existing trails on the property by mountain bikers could result in a conflict of uses between day hikers during the snow free months. Resolution of potential conflicts can be affected through alternate trail locations mutually agreed to by the organized mountain bike group and by signs that alert mountain bike riders to the presence and right-of-way of pedestrian hikers

Prohibited Uses

The following uses are prohibited on the property.

1. No snowmobiling, motorized “dirt bikes” or motorized recreational vehicles are permitted on the property.
2. No camping, camp fires or refuse disposal is permitted on the property.
3. No buildings will be erected on the property.
4. No signs will be erected other than those permitted for trail identification and use and boundary line signing to identify the bounds of the property.

Forest Resource

Management Plan

Town of Fayston
And
Vermont Land Trust

Chase Brook parcel

72 Acres

INTRODUCTION

The following Forest Resource Management Plan is provided to fulfill the obligation of the land owner to develop a Forest Management Plan as identified in section 1.B(2) of the Grant of Development Rights, Conservation Easements and Public Access Easement.

The purpose of this inventory and management plan is to assess the existing conditions resulting from past forest management activities and to provide sufficient information to make long term management prescriptions for the forested resource in accordance with the landowners objectives.

The objective of this management plan is to prescribe silvicultural treatments for the forested land which will result in maximizing the long term productivity for the forest land and set management objectives including consideration for the wildlife, recreation, soil, water and visual resources.

Resource Management Data Gathering Procedure

The descriptions of forest overstory and understory vegetative conditions are based on data collected using a systematic Variable Plot Cruise [Bitterlich Method] with a 10 factor prism to sample overstory vegetation and general point observations to sample understory vegetation. All measurable data was entered on field data collection forms for SILVAH, a computer program for analyzing and prescribing silvicultural treatments for hardwood stands in the Allegheny Plateau in northeastern Pennsylvania. The inventory program has been adapted to reflect conditions found in Vermont and the Northern Hardwood [beech / birch / maple] forest type.

A total of 23, 10 factor sample plots were taken in January 2006 in the commercial forest land area on this parcel, yielding a sample intensity of 1 plot per 3.1 acres. This sample intensity is sufficient for planning and stand prescription purposes but is not sufficient for forest product sale purposes.

The resource descriptions resulting from the analysis of the field data are intended to give the owner / manager a clear picture of the existing conditions and sufficient information to make a conclusive judgement regarding the best treatment to meet long term objectives of the individual stand areas and consequently the entire resource under management.

Definitions of Terms

The following definitions are of commonly used terms in describing forest stands and prescribing silvicultural treatments for the stands. This glossary is included at this point in the report for easy reference by the reader.

Basal Area [BA] - Basal Area is used to express the density of growing stock or number of trees per acre. Basal Area is the sum of the area of the cross section at 4.5 feet above the ground of all of the trees on an acre of land. Basal Area is expressed in sq.ft./acre

Acceptable Growing Stock [AGS] - Acceptable Growing Stock trees are those which are well formed trees of commercial species which will produce a high quality tree for sawlog purposes now or in the future.

Unacceptable Growing Stock [UGS] - Unacceptable Growing Stock trees are those which are undesirable because of species or condition and which will not produce a high quality sawlog product now or in the future.

Diameter Breast High [DBH] - Diameter Breast High is the point 4 1/2 feet above the ground at which diameter and growth measurements are made on standing trees.

Stand - A Stand is an area of relatively homogeneous tree cover similar in age and species composition that can be managed as a separate entity from the surrounding area.

Matrix - A stand matrix is the entire combination of all the separate vegetative and soil communities that comprise the homogeneous stand area.

Inclusion - An inclusion is a relatively small area, which may differ in some way from the primary stand matrix. A small 1/4 acre area of Red spruce in a Sugar maple stand would be an inclusion.

Site Index [SI] -Site Index is a number that is used to express the productivity potential of a particular location or site for a particular tree species. Site Index is a function of the age and height of a tree. The higher the Site Index number the better the site capability.

Stocking Levels for Even-aged Management

"**A" Level Stocking** - Stands at "A" Level stocking are fully stocked.

"B" Level Stocking - Stands at "B" Level stocking have the minimum level or density of stocking to fully occupy the site.

"C" Level Stocking - Stands at "C" level stocking are expected to achieve "B" level within 10 years if allowed to grow undisturbed.

Vegetation Size Classes - **SEEDLINGS:** 2 feet to 5 feet+ in height and less than l inch in diameter.
SAPLING: 2 inches to 4 inches DBH.
POLES: 5 inches to 8 inches DBH.
SAWTIMBER: 10 inches + for softwood and 12 inches + for hardwood.

Deer Winter Range - Deer Winter Range or "Yards" are areas of suitable forest type which provide cover, food and concealment during severe climactic conditions such as heavy snows in mid-winter. Mature softwood timber types with abundant understory regeneration are considered to provide the best winter range area.

Deer Summer Range - Deer summer range are those which provide a high degree of diversity with grassy openings and meadows, regenerating hardwoods and softwood forest types as well as a mixture of immature sapling and pole size stands interspersed with mature timber type areas.

Mast - Divided into Hard and Soft mast, they are the whole family of nut and fruit bearing shrubs and trees which produce nuts and fruits palatable to various wildlife species.

> **Soft Mast** - These include species which produce soft fruits or berries such as pin cherries, blueberries, raspberries, etc. These species generally produce fruits in mid to late summer.
>
> **Hard Mast** - These include species that produce hard fruits or nuts and include beech, oak, butternut and related species. This group tends to produce fruit in late summer and fall.

Q-Factor – Q value refers to the average quotient or ratio between number of trees in successively smaller diameter classes. (See appendix for a description of Q-Factor and managing northern hardwoods by implementation of a flexible Q.) Q-Factor is used to assist the land manger in the management of forest stands under uneven-aged or all aged management systems.

Management Objectives

The management objective of the landowner is to manage the forest resource in a manner consistent with the primary focus of the parcel, that being to provide recreational and educational opportunities while protecting critical wildlife habitat and accommodating the needs of the public.

The objective of the Forest Management program is to provide a sustained yield of high quality forest products consistent with the soil and other resource values and to maximize the productivity of commercial forestland through the application of responsible silvicultural management practices.

The dominant silvicultural system to be applied will be uneven-aged management of all forest types with emphasis on the single tree selection method of removal. The desired management results are high quality sawlogs with pulpwood removed in early thinning operations or as an adjunct to the production of high quality sawlogs to improve stand quality.

Individual stand prescriptions have been carefully considered and will be periodically reviewed as more accurate information becomes available. Proposed treatments will encourage the development of thrifty stands of young trees that are most productively utilizing the potential of the existing site.

The objective in management for all uneven-aged stands is to strive for a Q-Factor of 1.5 and a maximum individual tree diameter at maturity of 20 inches. Reentry or the cutting cycle will be 15 to 20 years.

All prescriptions are based on the concept of identification of the **featured stand** with all prescribed treatments designed to bring the stand and individual trees to maturity within the time, diameter and site constraints.

Management Constraints

Management constraints are prohibited or controlled activities that are designed to protect the resource and to avoid the commitment of irretrievable or irreversible actions.

The Management Constraints for this ownership are:

1. Protect all stream courses from sedimentation and completely restore and revegetate all woods roads after use. Conduct all harvesting in accordance with the Acceptable Management Practices for Controlling Water Quality on Logging Jobs in Vermont [AMPs].

2. Lop and scatter all slash resulting from harvesting or stand tending to lay flush or within two (2) feet of the ground.

3. Modify harvesting in areas adjacent to trails and high visibility areas, to protect and enhance the visual resource.

4. Conduct thinnings in immature stands during non-growth periods whenever possible. [July through March]

5. Utilize existing road locations when feasible and improve through use with full restoration after use according to AMPs.

6. Conduct operations in wet areas and areas of shallow soils in winter during frozen ground conditions in order to mitigate impacts from equipment on sensitive sites.

7. Protect all stonewalls, stone foundations and other historical features from damage or alteration.

8. Provide undisturbed buffer zones on trails, riparian zones and classified wetlands. Restrict or prohibit management activities in buffer zones.

9. Provide alternative trail locations for existing permitted trails during periods of planned management activity projects to avoid conflicts between permitted uses and management activities.

History of forest management activities

This property has been managed for the production of high quality hardwood and softwood sawlogs by a succession of owners for the past 65 years, since 1941. Prior to 1941 the property was part of a farm unit and probably was managed to provide domestic firewood and building materials in support of the farm homestead.

The forest land on this property has been permitted to develop naturally for many years with very little harvesting activity. Areas which were open pasture 75 years ago are now productive forest stands. The property contains mature, undisturbed northern hardwood types, parts of which might be desirable to preserve. The affects of natural occurrences such as wind damage can be observed along the upper elevations of the property.

The most recent harvesting appears to have occurred in the mid to early 1970s. Harvesting evidence is still visible in the northerly part of the parcel while little evidence of harvesting was noted in the south part of the parcel.

The present condition of the forest land is characterized as one of a well stocked, thrifty growing trees with a high diversity of species and age classes throughout the property. Critical wildlife habitat, sensitive ecological areas and riparian zones have not been negatively impacted by past management activities.

Historical resources such as stone walls and sugar house foundations have been protected under past management activities.

Forest Stand Descriptions and Prescribed Treatments

For the purpose of description and management, the ownership has been separated into specific stand areas. Each stand area is different from the adjacent stand area and in most cases requires a different management prescription to meet the long term objective. For information regarding the location of the specific stand area and their relation to existing facilities such as access or developed sites, refer to the Map in the back of this report. [See Property of Town of Fayston, Chase Brook Parcel Map.]

Stand #1:

Stand #1 is an 18 acre area of Eastern hemlock with associated hardwoods. The stand area includes the Riparian Buffer Zone (RBZ) along Chase Brook which is measured 100 feet from the top of the southeasterly bank of Chase Brook and all land within the property boundary northwest of Chase Brook. The RBZ comprises an estimated 8.2 acres. In addition to the RBZ it is important that an additional area identified as a Water Influence Zone (WIZ) be identified which will include all lands southeast of the southeast boundary of the RBZ to the top of bank of the steeply sloping ground to the southeast. The WIZ will include all of the remainder of stand #1. Forest management activities may be conducted in the WIZ but not in the RBZ. All forest management in the WIZ will be done during winter months on frozen ground and will be conducted with low impact operations such as horse logging.

The northerly part of the stand is in the mapped winter deer range. Characteristics of the south part of the stand very closely approximate the deer winter range characteristics in the north part of the area. It is recommended that the deer winter range include all of stand #1 and management focus in the WIZ be influenced strongly by deer winter range management objectives.

The goal for management of the winter deer range will be to:

1. Perpetuate functional shelter consisting of softwood overstory at least 35 feet tall with at least 70% crown closure of mature overstory softwoods.
2. Maintain mobility and access throughout the wintering area.
3. Provide accessible browse of preferred species within or adjacent to the functional shelter area.

The present stand composition by percentage of species occurring is: Eastern hemlock – 67%; Red maple – 12%; Yellow birch – 6%; Red spruce 6%; Sugar maple – 5%; American beech, White ash and Quaking aspen – 1 % each.

The current stand structure and condition is:

Total Basal Area (BA) - - - - - - - - - - 156 sq.ft./acre
Acceptable Growing Stock (AGS) - - - - 148 sq.ft./acre
AGS BA Breakdown:
Saplings (2”-4”) - - - - - - - - - - 0 sq.ft./acre
Poles (6”-10”) - - - - - - - - - - - 47 sq.ft./acre
Small Sawtimber (12”-16”) - - 87 sq.ft./acre
Medium Sawtimber (18” – 22”) 14 sq.ft./acre

Unacceptable Growing Stock (UGS) - - - 8 sq.ft./acre (UGS is poor quality Rm, Yb and Qa)
Mean Stand Diameter (MSD) - - - - - - - - 12.3 inches
Quadratic Mean Stand Diameter (QMSD) – 10.5 inches
Q-Factor is 1.6
Estimated average age is 80 years
Age structure is all aged. Site Index (SI) for sugar maple is 62.

Prescription: This stand is presently somewhat overstocked by an estimated 50 sq.ft./acre. Natural mortality of aspen and yellow birch will reduce that stocking level by 10 sq.ft./acre over the next 10 years and will provide some large woody debris on the ground in the RBZ. Over story crown density is now at an estimated 75% which is near optimum for deer winter range. Vegetative manipulation in the RBZ is not needed as current species composition is good and growth on thrifty growing trees is optimum. Visual impacts from harvesting because of northwesterly aspect of the stand will be undesirable. Seek evaluation of condition of winter deer range by a deer biologist and incorporate winter deer range management recommendations as an addendum to this management plan. Allow stand to continue to develop naturally for this plan period and reexamine in 2015.

Stand #2

Stand #2 is a 32 acre area of northern hardwoods with scattered groups of Eastern hemlock and American beech. The relatively high density of hemlock results in this stand being classified as a mixedwood stand and the stocking guides for mixed softwood will govern management. Concentrations of beech occur in the southeast corner of the property. These groups of beech exhibit historical use by Black bear with nearly 100% of the larger stems showing bear claw marks. Beech regeneration is less than adequate, however the relatively poor condition of mature and over mature beech leads to the assumption that vegetative regeneration of beech will be common within 10 years. Beech scale nectria complex infections are common, however the disease appears to have run its' course.

The Catamount Trail enters the property on the south boundary line and traverses through the central part of this stand to its' intersection with the Mad River Path Association, Mill Brook Trail. The Mill Brook Trail enters the property along the easterly boundary and travels through the stand for a distance of approximately 200 feet to the intersection of the Catamount Trail.

A Travel Influence Zone (TIZ) of 100 feet either side of these trails will be established. The TIZ will be managed to protect the visual resource by restricting heavy equipment use for vegetative management activities within the zone.

The present stand composition by percentage of species occurring is: Sugar maple – 37%; Hemlock – 23%; Beech – 21%; Yellow birch – 10%; Red maple – 6%; White ash – 2%; Quaking aspen – 1% and Red spruce – 1%.

The current stand structure and condition is:

Total Basal Area (BA) - - - - - - - - - - 126 sq.ft./acre
Acceptable Growing Stock (AGS) - - - - 101 sq.ft./acre
AGS BA Breakdown:
Saplings (2"-4") - - - - - - - - - - 2 sq.ft./acre
Poles (6"-10") - - - - - - - - - - - 30 sq.ft./acre
Small Sawtimber (12"-16") - - 58 sq.ft./acre
Medium Sawtimber (18" – 22") 11 sq.ft./acre
Unacceptable Growing Stock (UGS) - - - 25 sq.ft./acre (UGS is primarily, beech and Yellow birch)
Mean Stand Diameter (MSD) - - - - - - - - 13.0 inches
Quadratic Mean Stand Diameter (QMSD) – 10.7 inches
Q-Factor is 1.45
Estimated average age is 85 years
Age structure is all aged
Site Index (SI) for sugar maple is 62.

Prescription: This mixedwood stand is now somewhat overstocked by about 20 sq.ft./acre. Stocking of saplings and UGS poles is not interfering with growth on AGS overstory trees. This stand should be permitted to develop naturally over this 10 year plan period. Reexamine in 2016.

Stand #3

Stand #3 is a 12 acre area of hemlock and Red maple with inclusions of densely stocked Yellow birch poles and saplings. The advanced regeneration of Yellow birch pole and saplings is natural regeneration resulting from the harvesting done about 1975. Small ¼ to ½ acre groups of hemlock were removed during the 1975 operation with Yellow birch regeneration occupying the site soon after harvesting occurred. Hemlock regeneration is common within the stand area, however browsing by deer appears to have eliminated much of the hemlock. This stand area is a highly significant component of the deer winter range area. Crown closure of overstory softwood is generally less than 50% in the north part of the stand and approximately 70% in the south part of the stand.

Intermittent streams and poorly drained soils within this stand result in a difficult access situation.

The combined Catamount Trail and Mill Brook Trail traverse the south part of this stand. The TIZ adjacent to the trail should extend through this stand. The WIZ of a 50 foot buffer around the Class III wetlands will impact a portion of this stand. (See Map)

The present stand composition by percentage of species occurring is: Hemlock – 52%; Red maple – 21%; beech – 8%; Sugar maple – 6%; Red spruce – 6%; Black cherry – 4% and Yellow birch – 2%.

The current stand structure and condition is:

Total Basal Area (BA) - - - - - - - - - - - - 120 sq.ft./acre
Acceptable Growing Stock (AGS) - - - - 105 sq.ft./acre
AGS BA Breakdown:
Saplings (2”-4”) - - - - - - - - - - - 2 sq.ft./acre
Poles (6”-10”) - - - - - - - - - - - - 40 sq.ft./acre
Small Sawtimber (12”-16”) - - 45 sq.ft./acre
Medium Sawtimber (18” – 22”) 18 sq.ft./acre
Large Sawtimber (24”+) -------- 0 sq. ft./acre
Unacceptable Growing Stock (UGS) - - - 15 sq.ft./acre (UGS is poor quality beech and Red maple)
Mean Stand Diameter (MSD) - - - - - - - - 13.3 inches
Quadratic Mean Stand Diameter (QMSD) –11.0 inches
Q-Factor is 1.4
Estimated average age is 85 years
Age structure is all aged
Site Index (SI) for red maple is 55.

Prescription: This stand is now slightly over stocked by an estimated 20 sq.ft./acre. Crown closure is less than optimum for managed deer winter range. Available browse is abundant on the edges of the yellow birch pole and sapling inclusions. Seek evaluation of condition of winter deer range by a deer biologist and incorporate winter deer range management recommendations as an addendum to this management plan. Permit stand to develop naturally during this 10 year plan period and reexamine in 2016.

Stand #4

Stand #4 is a 10 acre area of Red spruce, White pine, Red maple, hemlock and Balsam fir. The white pine component is large scattered trees in the overstory. The remainder of the stocking is in the understory and consists of naturally regenerated trees resulting from past management activities. Most of this stand is within the WIZ of the two Class III wetlands located near the east boundary of the property. All of this stand is within the mapped winter deer range. Soils are generally poorly drained throughout the stand.

The present stand composition by percentage of species occurring is: Red spruce – 37%; Red maple – 26%; Eastern hemlock – 17%; White pine – 14% and Balsam fir – 6%.

The current stand structure and condition is:

Total Basal Area (BA) - - - - - - - - - - 175 sq.ft./acre
Acceptable Growing Stock (AGS) - - - - 160 sq.ft./acre
AGS BA Breakdown:
Saplings (2"-4") - - - - - - - - - - 0 sq.ft./acre
Poles (6"-10") - - - - - - - - - - - 90 sq.ft./acre
Small Sawtimber (12"-16") - - 50 sq.ft./acre
Medium Sawtimber (18" – 22") 5 sq.ft./acre
Large Sawtimber (24"+) -------- 15 sq. ft./acre

Unacceptable Growing Stock (UGS) - - - 15 sq.ft./acre
Mean Stand Diameter (MSD) - - - - - - - - 11.1 inches
Quadratic Mean Stand Diameter (QMSD) – 8.6 inches
Q-Factor is 1.6 (Pole size stocking in the understory is influencing Q)
Estimated average age is 70 years
Age structure is all aged
Site Index (SI) for Red spruce is 50.

Prescription

In accordance with the natural areas protection objectives of the land owner, no vegetative manipulation activities should be done in this stand. The WIZ will adequately protect the class III wetlands and associated streams. Reexamine in 2016.

Management activities in the Water Influence Zone (WIZ): The WIZ is established to protect the water resources located on the parcel and to supplement protection of special areas such as the Riparian Buffer Zone (RBZ). No disturbance should be permitted in these areas. The objective of management is to encourage natural conditions to develop in and adjacent to the protected areas.

Management activities in the Travel Influence Zone (TIZ): The TIZ is established to protect the visual resources in an area adjacent to heavily traveled pedestrian trails and to maintain the user experience at as high a level as possible. No vegetative manipulation other than removal of high risk and hazard trees and trail clearing should be done within the TIZ. Removal of trees should be done without aid of mechanical equipment and in most instances will consist of cutting and hand removal to an area well away from the trail.

UNEVEN-AGED MANAGEMENT OF NORTHERN HARDWOODS IN THE NORTHEAST

In the application of uneven-aged management of the northern hardwood timber type, due consideration must be given to residual stocking, maximum tree size, regeneration, and diameter distribution all of which comprise stand structure.

It is known that growth of northern hardwood stands is essentially the same for a wide range of stocking. Growth peaks at 60 to 100 sq. ft. of basal area per acre. To concentrate growth on as few trees as possible without quality loss, a residual stocking of 70 sq.ft. of trees 5 inches and over is recommended.

Maximum tree size is the tree diameter considered mature by the forester. Often referred to as the diameter objective, maximum tree size can vary from 14 to 26 inches DBH, depending on site and the land owners objective. As financial maturity is at l8 to 22 inches, the diameter objective is usually set close to these diameters, or about 20 inches DBH.

Regeneration under uneven-aged management is obtained by two cutting methods—single tree selection and group selection. Single tree selection favors tolerant species such as American beech and Sugar maple. Large group selections of 2 acres or less favor the establishment of intermediate and intolerant species such as Yellow birch and White ash. Small group selection [the removal of 2 or 3 trees in a group] is usually employed to release advanced growth of desirable understory trees.

The establishment of an appropriate diameter distribution or structure goal for a stand is the most critical step in implementing uneven-aged management. These guidelines simplify the process, making uneven-aged management relatively simple to apply. The approach calls for employment of a flexible Q. The stand structure goal does not remain fixed throughout the stand development period or rotation, but management is directed toward increasing the proportion of sawtimber by progressively reducing the Q value.

Q value refers to the average quotient or ratio between number of trees in successively smaller diameter classes. Stand Q values range from 1.3 to 2.0. Second growth stands with a large number of small diameter trees, have a Q value of 1.6 to 2.0. Mature stands with a high proportion of sawtimber trees have a low Q value, of 1.3 to 1.4. As northern hardwood stands develop naturally, changes in stand structure vary from a high Q value initially to a lower Q value as they approach maturity. The best sites approach a lower Q value than medium or poor sites.

In order to establish a stand structure goal for an existing stand, it is necessary to determine its present structure or the Q value that best describes the stand. A “Rule of Thumb” has been developed that is sufficiently accurate for making this determination. As an example, a stand with 50% poles and 50% sawtimber has a Q value of about 1.6; therefore the appropriate stand structure goal or selected Q for this stand would be 1.6 or 1.5. If markets are not available for small trees, rather than consider noncommercial Timber Stand Improvement (TSI) which is an out-of-pocket expense, the best choice is to select a higher Q value to concentrate harvest cuts in sawtimber and to carry a higher inventory of poles.

Figure 1: Residual stand structure designed for 70 sq.ft. of residual basal area per acre, up through the 20-inch class.

DBH Class [Inches]	Q=1.3 BA	Q=1.4 BA	Q=1.5 BA	Q=1.6 BA	Q=1.7 BA	Q=1.8 BA	Q=1.9 BA	Q=2.0 BA
6 TO 10	21	25	30	34	38	41	44	47
12 TO 14	20	20	20	19	18	17	16	15
16 +	29	25	20	17	14	12	10	8
TOTAL	70	70	70	70	70	70	70	70

Figure 2: <u>"Rule of Thumb"</u> - To identify existing stand structure or Q value, determine the percentage of poles and sawtimber and pick the Q value that most closely approximates the stand.

Poles 6" to 10"	Sawtimber 12" +	Estimated Q Value
30%	70%	1.3
35%	65%	1.4
40%	60%	1.5
50%	50%	1.6
55%	45%	1.7
60%	40%	1.8
63%	37%	1.9
65%	35%	2.0

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