Forest Stewardship Plan
for the
Brushwood Community Forest

A municipal forest for the town of West Fairlee made possible with significant funding from the federal Forest Legacy Program

West Fairlee and Fairlee
Orange County, Vermont

July 2011

Submitted by:
West Fairlee Conservation Commission
West Fairlee Town Office
870 RTE 113
West Fairlee, VT 05083

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3 Shipman Place
Montpelier, VT 05602

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Special Thanks to Orange County Forester David Paganelli &
West Fairlee's Conservation Commission & Select Board

Select Board
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Doug Sonsalla
Maurice "Chuck" Eaton

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Valree Rogers
Jim Totin - chair
Peggy Willey
Rebecca Wurdak

Lucy Yarian Fred Cook, Tree Warden

I. OWNERHSIP & CONTACT INFORMATION

Forest Legacy Program Conservation Easements

Easement Names: **Brushwood Community Forest Conservation Easement #1**
Brushwood Community Forest Conservation Easement #2 (for Parcel B only)
Brushwood Community Forest Conservation Easement #3 (For Phase 2)

Location: Fairlee and West Fairlee
Orange County, Vermont
Roads: Blood Brook Road, Brushwood Road, Kidderhood Road, & Millpond Road

Landowner At the Time of Conveyance: The Trust for Public Land (TPL)
Address: 3 Shipman Place
Montpelier, VT 05602
Phone: (802) 223-1373
Contact: Rodger Krussman, Project Manager
Email: Rodger.Krussman@tpl.org

Current Landowner: Town of West Fairlee
Address: West Fairlee Conservation Commission
West Fairlee Town Office
870 RTE 113
West Fairlee, VT 05083

Phone: (802) 333-9978
Contact: Peggy Willey, Conservation Commission Chair
Email: peggywilley@mytopsmail.com

Easement #1 Holder: State of Vermont, Dept. of Forests, Parks, and Recreation
Address: 103 South Main Street
Waterbury, VT 05671
Contact: Kate Willard, Lands Administration Section Chief
Phone: (802) 241-3697
Email: Kate.Willard@state.vt.us

Easement #2 Co-Holders: State of Vermont, Dept. of Forests, Parks, and Recreation (see above for contact information) and the Upper Valley Land Trust
Address: Upper Valley Land Trust
19 Buck Road
Hanover, NH 03755
Contact: Pete Helm, Vice President Stewardship
Phone: (603) 643-6626
Email: peter.helm@uvlt.org

Easement #3 Holder: State of Vermont, Dept. of Forests, Parks, and Recreation
Address: 103 South Main Street
Waterbury, VT 05671
Contact: Kate Willard, Lands Administration Section Chief
Phone: (802) 241-3697
Email: Kate.Willard@state.vt.us

II. PROJECT BACKGROUND

Introduction

This Forest Stewardship Plan for the Brushwood Community Forest is submitted on behalf of the Town of West Fairlee, Vermont. This new town forest is located within, and is named after, a ridge that marks the boundary between the towns of West Fairlee and Fairlee known locally as "Brushwood". In 2009, The Trust for Public Land and the State of Vermont Forest Legacy Program helped the Town of West Fairlee purchase and protect 470 acres as the Brushwood Community Forest. In 2011, The Trust for Public Land (TPL) and the State of Vermont Forest Legacy Program helped the Town of West Fairlee obtain an additional 580 acres of the previously known Bradford Town Forest. By adding this acreage the new community forest totals 1,050 acres of contiguous forest landscape with a significant wetland complex highlighting the conservation importance for West Fairlee and Fairlee, Vermont. This project was completed as part of the Trust for Public Land's Community Forest Program and the Vermont Town Forest Project. Funding was provided by the Forest Legacy Program, the Upper Connecticut River Mitigation Enhancement Fund of the New Hampshire Charitable Foundation – Upper Valley Region, the Aloha Foundation, and many other foundations and private individual donors. Conservation easements have been placed on all parcels to protect them from development, in keeping with the guidelines of the Forest Legacy Program. The State of Vermont Department of Forests, Parks, and Recreation (hereinafter the "State of Vermont") is the sole holder of the Forest Legacy conservation easement over Parcels A, C, D, and E (hereinafter "Conservation Easement #1"). The State of Vermont and the Upper Valley Land Trust (UVLT) co-hold the Forest Legacy conservation easement over Parcel B (hereinafter "Conservation Easement #2"). The State of Vermont will hold a Forest Legacy easement (hereinafter "Conservation Easements # 3") for the previous Bradford Town Forest. These Easements, as they are collectively referred to within this Forest Stewardship Plan, both permanently protect this Property from development. Only the portion of the Property situated in Fairlee may be subdivided from the existing Property at the discretion of the Town of West Fairlee in accordance with the terms of Conservation Easement #1. No other subdivision is permitted. Is this true for easement #3?

West Fairlee will manage the Property as a municipal forest for wildlife habitat, timber harvesting and management, public recreation and education purposes, and water quality protection. In addition to these multiple community benefits, permanent conservation of the Property also helps to defragment a portion of the Brushwood area by merging multiple parcels under one conserved ownership, and protects a working landscape through a sustainably

managed forest. The Property provides a larger forested block by being adjacent to the Fairlee Municipal Forest creating a 2,550-acre protected block of contiguous forest within approximately a mile and a half of Lake Morey and Lake Fairlee, and within 3 miles of the Connecticut River.

The purpose of this Forest Stewardship Plan is to identify known information relative to the Property, present the goals of the Town of West Fairlee, and put forth prescriptions for management and conservation activities for the next ten (10) years, which meet the requirements of the overlying Forest Legacy Easements as held by the State of Vermont and the Upper Valley Land Trust (Parcel B only). Completion of a Stewardship Plan is a requirement of the Forest Legacy Program. This plan shall be updated at least every ten years. The previous plan that was approved in 2009 is now superseded by the current 2011 Forest Stewardship Plan for an additional ten (10) year period.

History

The properties that make up the Brushwood Community Forest have been managed as timberland or recreation for approximately the last one hundred years. Like most of Vermont, Brushwood was largely deforested during the early and mid 1800s. Several hill farms were reportedly located here and most likely the land was used for diversified farming, pasturing cattle, horses and likely sheep. Numerous stonewalls are still visible today throughout the property, which exemplifies the land's agricultural past. Most of the land is now dominated by mid-successional forest of approximately 30 – 100 years old.

The properties that were combined to create the Brushwood Community Forest were all acquired from private owners and the town of Bradford? Bradford Water District? and all but Parcel C and Parcel E were enrolled in Vermont's Use Value Appraisal Program, otherwise known as Current Use. Current Use requires a forest management plan and allows uses such as timber management, wildlife habitat management, and recreation.

Local & Regional Significance

Master Plan of the Town of West Fairlee

The 2005 West Fairlee Master Plan outlines the threat West Fairlee faces from development due to its proximity to the Hanover/Lebanon/White River Junction region and its potential to become a bedroom community for these fast growing towns. It also clearly underscores the importance of remaining a rural town with large, undeveloped, forestland holdings that help maintain its rural character. The Master Plan also encourages conservation and recreational uses of the land, wildlife habitat protection, and preservation of natural, scenic, and historic resources. Protection of the Property supports all of these goals and helps direct development away from steep slopes, ridgelines, and some class 4 roads that traverse the Property, limiting the need for the town to provide services to these remote areas.

Residents have been exploring and supporting the idea of creating a community forest for decades. As early as 1971, the Orange County Natural Resources Technical Team proposed the

creation of a West Fairlee municipal forest located along the Fairlee-West Fairlee town line in order to "consolidate the three properties into a [single, expansive] tract in public ownership." More recently, 86% of respondents to West Fairlee's 2004 town-wide survey said that "the town should work with landowners and land trusts to conserve land." Finally, at Town Meeting on March 3, 2006, citizens voted unanimously for the Town to establish a Brushwood Community Forest by pursuing the purchase of privately owned forestland. In 2011, the addition of the previous Bradford Town Forest helped establish the 1,050 acre Brushwood Community Forest that enhances the expansive tract of public land ownership.

Regional Significance

The Brushwood Community Forest will have a significant and lasting impact on the towns of West Fairlee and Fairlee and this area of the Upper Valley region. The Property helps link the 1,500+/- acre Fairlee Municipal Forest to create over 2,500 acres of conserved, unfragmented forestland. With extensive road frontage on Blood Brook Road, Kidderhood Road, Millpond Road, and Brushwood Road, the Property is within easy commuting distance to the Hanover, Lebanon and White River Junction region (see Map A: Brushwood Community Forest Locus Map and Map C: Brushwood Community Forest Access Map).

The Brushwood Community Forest is located in a geographic area known locally as "Brushwood," which is part of a larger contiguous forest block of approximately 28,268 acres. The creation of a 125-acre ecological significant treatment area (STA) that meets the requirements of the UVA (Use Value Appraisal) program, supports the priority conservation strategy of increasing riparian habitat. Expansion of the community forest to include the former Bradford Town Forest helps protect the contiguous nature of the Brushwood Forest under one ownership and management strategy. Consolidating the fragmented landownership pattern is an important first step to protecting this larger regional forest. Several different organizations have identified this area as a high-priority for conservation making the creation and protection of the Brushwood Community Forest regionally significant.

Vermont State Wildlife Action Plan Priorities

Conservation of the Property will address multiple threats to Species of Greatest Conservation Need, as outlined in the Vermont Wildlife Action Plan (2005).

- *Habitat Loss:* The 1,050 acres of this Property will never be converted for development or other uses, and will remain as habitat for forest-dwelling species in perpetuity. As part of a larger 28,268-acre forest matrix block, it serves as a wildlife linkage and additional habitat to species that use the adjacent Fairlee Municipal Forest.

- *Impacts of Roads:* By conserving and consolidating ownership of 2 separately owned properties, further fragmentation and development of these parcels are prevented. Excluding temporary logging roads, no additional permanent roads will be created on the property.

- *Pollutants and Sedimentation*: The creation of a sustainable forestry plan for the Property and a special treatment area around the wetland complex, which will include appropriate buffers around streams and wetlands and mandates best management practices, will

protect water quality and decrease sedimentation in streams (see Special Management Areas within Section V. Timber Management). The restrictions put in place by these Easements will prevent, restrict, and/or control recreational off-road vehicle use on the property, which could cause erosion and sedimentation at stream crossings. Off-road vehicle use on the previous Bradford Town Forest parcel however, will not be restricted but trails that are abused are subject to closure

- *Global Warming*: Protection of this property links to the Fairlee Municipal Forest, providing for small-scale species migration north in latitude and a larger core forest for wildlife adaptation to climate change.

Conservation of the Property supports the following Conservation Strategies outlined in the Vermont Wildlife Action Plan:

Strategies for conserving Vermont's Birds of Greatest Conservation Need

- Slow the rate of fragmentation and development and maintain blocks of contiguous forest, grasslands, and early and late-successional habitats. (Chapter 4, page 14)
- (Encouraging) forestry practices that can enhance habitat suitability such as maintaining or increasing aspen stands or the retention of coarse woody debris and snags. (Chapter 4, page 14)
- Identify, prioritize and maintain existing contiguous forest blocks and associated linkages that allow for upward and northward movement in response to climate change (Chapter 4, page 14)

Strategies for conserving Vermont's Mammals of Greatest Conservation Need

- Maintain large blocks of undeveloped forests linked together by habitat corridors in order to provide a network of interconnected habitats throughout northeastern New England (Chapter 4, page 28)
- Maintain riparian buffers along streams (Chapter 4, page 28)
- Maintain and restore habitat connectivity and minimize fragmentation of forest blocks. (Chapter 4, page 28)

Strategies for conserving Vermont's Reptiles and Amphibians of Greatest Conservation Need

- Maintain habitat through appropriate management, direct habitat disturbance and site roadways away from sensitive sites such as breeding pools (Chapter 4, page 33)
- Work cooperatively with landowners, habitat management agencies, towns and communities to protect habitat and maintain connectivity. (Chapter 4, page 33)

Landscape Level Aquatic and Shoreline Conservation Strategies

- Increase in number of acres of riparian habitat restored and/or conserved (Chapter 4, page 70)
- Assistance to landowners and conservation groups on invasive exotic management and eradication (Chapter 4, page 70)

See Section VII of this Forest Stewardship Plan for a discussion of the individual species of Greatest Conservation Need that will benefit from protection of the Property.

U.S. Forest Service's Forests on the Edge Report
A portion of the larger Brushwood Forest just east of West Fairlee is within the Upper Connecticut-Mascoma Watershed, and has been identified by the U.S. Forest Service in their "Forests on the Edge" report as one of the top 10 most threatened watersheds in the country.

Vermont Town Forest Project
In 2004, the Northern Forest Alliance and a wide ranging team of twenty public and private partners, including the Vermont Department of Forests, Parks and Recreation, The Trust for Public Land, and the University of Vermont, launched the Vermont Town Forest Project designed to create new town forests and improve stewardship of existing town forests. The Brushwood Community Forest Initiative was selected by the Vermont Town Forest Project as a pilot project for creation of a new town forest due in large part to the opportunity for large-scale land conservation and connectivity through local control and ownership.

The Trust for Public Land's Connecticut River and Community Forest Programs
The mission of TPL's Connecticut River Program is to preserve New England's principal river and the quintessential New England working, scenic, and recreational landscapes along it. The Brushwood area is a part of the Connecticut River Watershed, and are an important priority for TPL's regional Connecticut River Program, not only because they protect part of this watershed, but also the natural and cultural character of New England. Additionally, the Brushwood Community Forest project is an important component of TPL's Community Forest Program, and could serve as a model for other "assemblage/defragmentation" projects that will become more and more important as large parcels of land become scarcer.

The Vermont Chapter of The Nature Conservancy
The Nature Conservancy has identified the greater Brushwood landscape, totaling over 28,000 acres, as a high priority for landscape conservation based on its forest block size, physical diversity, and the source habitat it provides for both common and uncommon species.

University of Vermont Spatial Analysis Lab
The University of Vermont's Spatial Analysis Lab recently identified this area as a "hot block" for bird habitat in a preliminary "Important Bird Area" landscape-level analysis (Buford, 2006, see Map I: Brushwood Community Forest Wildlife Habitat Map).

The Wildlands Project's Greater Northern Appalachians Wildlands Network Design
Similarly, The Wildlands Project has identified the Brushwood Forest as an area of high biological significance on the draft Vermont-Southern Lake Champlain Valley Wildlands Network maps.

Summary of Forest Legacy Conservation Easements

The entire Brushwood Community Forest is protected by three Forest Legacy Conservation Easements as described earlier in this Forest Stewardship Plan. The Easements seek to conserve managed forest, wildlife habitat and scenic beauty, protect water quality, encourage sustainable management of soil resources, as well as provide recreational opportunities to the public. This

protection will serve the natural communities of the forest, the forest industry, wildlife, and the people of Vermont.

A full summary of all Easements is provided in this section, though only the recorded Easements (attached to this plan in Appendix 1,2, and 3) should be relied upon if questions arise. The Easements are remarkably similar in their format, language, terms, and restrictions, however there are some distinct differences described as follows:

1. **Easement Holders:** Conservation Easement #1 covers Parcels A, C, D, & E only (referred to in the Summary of Conservation Easement #1 as the "Parcels") and is solely held by the State of Vermont, Department of Forests, Parks, and Recreation. Conservation Easement #2 covers Parcel B only and is co-held by the State of Vermont, Department of Forests, Parks, and Recreation and the UVLT. Conservation Easement #3 is held by the State of Vermont, Department of Forests, Parks, and Recreation.

2. **All-Terrain Vehicle (ATV) Use:** Conservation Easement #1 allows recreational ATV use on designated trails approved by the State of Vermont and only at the discretion of the Town of West Fairlee, provided such use is not inconsistent with the purposes of Conservation Easement #1. Conservation Easement #2 does not allow recreational ATV use. Conservation Easement #3 allows recreational ATV use on designated trails approved by the State of Vermont and only at the discretion of the Town of West Fairlee, provided such use is not inconsistent with the purposes of Conservation Easement #3. See the Recreation section of this Forest Stewardship Plan for further detail on recreational uses or see the Easement documents themselves for specific restriction language.

3. **Structures:** Both Easements allow the construction of structures within some specific guidelines (see the Easement documents for those guidelines). Conservation Easement #1 allows the construction of two such structures. Conservation Easement #2 allows the construction of one such structure. These are some of the main differences between these two Easements. Structures allowed in Easement #3?

4. **Subdivision:** Conservation Easement #1 allows subdivision by the Town of West Fairlee of only that portion of the Property situated in the town of Fairlee and only refers to the conveyance of that land to the town of Fairlee. Conservation Easement #2 cannot be subdivided and any future sale or conveyance of the Parcel B must be sold together with the rest of the Brushwood Community Forest property protected under Conservation Easement #1. Subdivision allowed in Easement #3?

Summary of Conservation Easement #1 ***(See Appendix A for full recorded copy of Conservation Easement #1)***

SPECIAL NOTE: Conservation Easement #1 covers Parcels A, C, D, & E, which are referred to in this summary as the "Parcels".

I. Purposes

a) To ensure that the protected Parcels are a managed forest and that their management be designed and implemented to minimize lasting adverse ecological impacts while assuring a continuing, renewable, and long-term source of forest products important to the economy of the State and region.
b) To allow dispersed non-commercial public recreational opportunities, to protect, maintain or enhance wildlife habitats, protect water quality, and to encourage sustainable management of soil resources.

Forest Management Objectives

a) Manage forest stands to maximize the opportunity for harvesting high quality large diameter sawlogs or veneer, sustained over time, while maintaining a healthy and biologically diverse forest. The Town of West Fairlee and the State of Vermont acknowledge that site limitations and biological factors may preclude the production of high quality sawlogs, and further that the production of a variety of forest products can be consistent with the goal of producing high quality sawlogs.
b) Conduct forest management and harvesting activities (including the establishment, maintenance and reclamation of log landings and skid roads) using the best available yet commercially feasible management practices in order to prevent soil erosion and to protect water quality.
c) Create a sustained yield of forest products and prevent liquidation harvest practices.

II. Restricted Uses

1. The Parcels shall be used for forestry, educational, non-commercial, recreational and open space purposes only. No residential, commercial, industrial or mining activities shall be permitted and no structure or improvement shall be constructed or placed on the Parcels except as permitted under Permitted Uses;
2. Except as specifically permitted, no rights-of-way, easements of ingress or egress, driveways, roads, or utility lines or easements shall be constructed, developed or maintained into, on, over, under, or across the Parcels without prior written permission of the State of Vermont;
3. No additional easements or restrictions shall be placed on the Parcels without the prior written permission of the State of Vermont;
4. No outdoor advertising structures such as signs and billboards shall be displayed on the Parcels except reasonable signs indicating the name of the Parcels and its ownership, boundary markers, directional signs, memorial plaques, informational and interpretive signs, for sale signs, and signs limiting access or use;
5. No placement, collection or storage of trash, human waste, or any unsightly or offensive material without the prior written permission of the State of Vermont, except the storage of trash in receptacles for periodic off-site disposal;
6. No disturbance of the surface, including filling, excavation, and removal of topsoil, sand, gravel, rocks or minerals, or change of the topography of the land in any manner, nor any surface mining of subsurface oil, gas, or other minerals except as reasonably necessary to carry out the uses permitted on the Parcels;
7. No manipulation of natural watercourses, marshes, or other water bodies, nor activities conducted on the Parcels which would be detrimental to water purity, or which could

alter natural water level or flow except as reasonably necessary to carry out the uses permitted on the Parcels;

8. The Parcels shall not be subdivided without prior written permission of the State of Vermont, however the Town of West Fairlee may convey to the Town of Fairlee any and all portions of the Brushwood Community Forest located within the municipal boundaries of the Town of Fairlee without the permission of the State of Vermont upon thirty days prior written notice to the State of Vermont; and
9. No use or activity shall be allowed that is inconsistent with the Purposes of Conservation Easement #1.

III. Permitted Uses

Forest Management Activities

The town of West Fairlee has the right to conduct the following activities provided they are in accordance with the Forest Stewardship Plan and supervised by a professional forester:

1. Forest management activities, including harvesting timber and firewood, other wood products and non-timber forest products and conduct maple-sugaring operations.
2. During any road construction or harvesting and skidding of wood products, the town of West Fairlee shall employ the applicable practices in the publication "Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont" (1987) (also referred to as "AMPs").
3. Town of West Fairlee shall provide the State of Vermont with written notice at least fifteen days before any timber harvesting activity, except non-commercial thinning and any other harvesting involving fewer than 10 acres, or yielding fewer than 8,000 board feet of sawlogs or 25 cords of firewood.

Structures & Improvements

The Town of West Fairlee has the right to:

1. Maintain, repair, and replace existing forest management roads and associated bridges, culverts and gates to control motorized access, and construct new forest management roads and associated improvements if consistent with Conservation Easement #1 and additional road improvements are necessary to provide reasonable forest management access to the Property and the system of existing roads are not adequate.
2. Construct and maintain temporary saw mills, wood processing facilities, and similar temporary forestry structures, with necessary temporary access drives and utilities, provided that such temporary structures, access and utilities are used exclusively in functional support of forestry conducted on the Parcels, and that such construction has been approved in writing in advance by the State of Vermont.
3. Use motorized equipment for forest management activities.
4. Construct and maintain sugar houses, or similar forestry structures, with necessary access drives and utilities, on the Parcels, provided that such structures are used exclusively in functional support of forestry conducted on the Parcels, and such construction has been approved in writing in advance by the State of Vermont.
5. Construct, occupy, use, repair, maintain, and improve two structures on the Parcels, with prior written permission of the State of Vermont and provided the structures are not improved by providing electrical, water, sewage or an improved access drive, nor used for year-round occupancy, nor exceed 800 square feet of space. Any such structures shall

be located in a manner to minimize the loss of conservation values outlined in the Purposes section above.

Water Resources

The Town of West Fairlee has the right to:
Utilize, maintain, establish, construct, and improve water sources, courses, and bodies, provided that the Town of West Fairlee does not unnecessarily disturb the natural course of the surface water drainage and runoff flowing over the Parcels. Subject to the State of Vermont's written approval, the Town of West Fairlee may construct ponds or reservoirs.

Motorized and Mechanized Vehicles

The Town of West Fairlee has the right to:
Permit motorized and mechanized vehicles for recreational purposes, including but not limited to snowmobiles, ATV's and mountain bikes, and equestrian use on the Parcels in designated corridors shown in the Forest Stewardship Plan at the discretion of the Town of West Fairlee provided that such use is not inconsistent with the purposes of Conservation Easement #1.

Trails

The Town of West Fairlee has the right to:
Clear, construct and maintain trails for non-commercial walking, skiing, equestrian and other recreational activities on the Parcels, and to construct, fence, and maintain unpaved parking areas for up to ten parking spaces each at trailhead locations shown in the Forest Stewardship Plan.

Other Uses

The Town of West Fairlee has the right to:

1. Issue short-term permits to others to use the forest management roads to for forest management purposes on lands near the Parcels.
2. Extract sand and gravel from the Parcels exclusively for construction or improvement of forest management roads on the Parcels.
3. Engage in accessory uses of the Parcels if they are related to the principal forestry or recreational uses of the Parcels, and in the aggregate subordinate and customarily incidental to those principal uses, with prior written permission of the State of Vermont.

IV. Forestry Provisions

1) General Requirements

No roads shall be constructed or timber harvested until the Forest Stewardship Plan, prepared by a professional forester, is reviewed and approved by the Vermont State Forester. All updates, amendments or other changes to the Plan shall be submitted to the Vermont State Forester for approval.

2) Stewardship Plan Requirements

The Forest Stewardship Plan shall be based on the most current science and strive to improve stand quality and maintain important wildlife habitats consistent with current stand conditions and site quality. The Plan shall include forest management objectives, map of forest stands, streams, wetlands and major access routes, forest stand descriptions and

treatments, plant and wildlife considerations, recreational considerations and historic and cultural resource considerations. The Forest Stewardship plan shall be updated at least every ten years.

3) Harvesting Restrictions

a. Heavy cuts (meaning harvesting below the "C-Line" or minimum stocking level as determined in the USFS Silvicultural Guidelines for the Northeast) may be approved only if it is to: release a well-established understory, permit planting of different species of tree, for wildlife management purposes or to promote natural regeneration.

b. Harvesting within 50 feet of any wetland or the banks/shores of rivers, streams, and ponds (referred to as "Surface Water Buffer Zones") must be consistent with the Forest Stewardship Plan and take into account the effects of such activities on water quality and the plant and wildlife habitat associated with such areas. The number and width of stream crossings in the foregoing areas shall be kept to a minimum and shall include installation of all erosion control devices and follow all recommended practices described in the "Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont" publication (referred to as "AMPs") dated August 15, 1987, or successor standard approved by the State of Vermont.

V. Public Access

Public access is a conditioned right and will be provided as long as it does not interfere with forestry activities and is not otherwise inconsistent with the Purposes of the Conservation Easement #1. The Town of West Fairlee and the State of Vermont shall work to cooperatively resolve any issues with respect to public recreational access to the Parcels and to maintain public access to the Parcels.

The Parcels shall be available to the public for all types of non-commercial, non-motorized, non-mechanized, non-equestrian dispersed recreational purposes (including but not limited to bird watching, backcountry skiing, fishing, hunting, snowshoeing, and walking) consistent with the Purposes of Conservation Easement #1. Public access may be limited or restricted to assure compliance with Conservation Easement #1, to protect natural habitats, or to protect the public health or safety (including the right to permit, regulate or prohibit hunting or trapping).

VI. Enforcement of the Restrictions

The State of Vermont shall have reasonable access to the Parcels and make reasonable efforts to assure compliance by the Town of West Fairlee with the terms of Conservation Easement #1 by making periodic inspections. In the event that the State of Vermont becomes aware of an event or circumstance of non-compliance, the State of Vermont shall give notice to the Town of West Fairlee via Certified Mail, return receipt requested, and demand corrective action.

Summary of Conservation Easement #2 ***(See Appendix B for full recorded copy of Conservation Easement #2)***

SPECIAL NOTE: Conservation Easement #2 covers Parcel B only.

I. Purposes

a. To ensure that Parcel B is a managed forest and that its management be designed and implemented to minimize lasting adverse ecological impacts while assuring a continuing, renewable, and long-term source of forest products important to the economy of the State and region.
b. To allow dispersed non-commercial public recreational opportunities, to protect, maintain or enhance wildlife habitats, protect water quality, and to encourage sustainable management of soil resources.

Forest Management Objectives

a. Manage forest stands to maximize the opportunity for harvesting high quality large diameter sawlogs or veneer, sustained over time, while maintaining a healthy and biologically diverse forest. The Town of West Fairlee, the State of Vermont, and the UVLT acknowledge that site limitations and biological factors may preclude the production of high quality sawlogs, and further that the production of a variety of forest products can be consistent with the goal of producing high quality sawlogs.
b. Conduct forest management and harvesting activities (including the establishment, maintenance and reclamation of log landings and skid roads) using the best available yet commercially feasible management practices in order to prevent soil erosion and to protect water quality.
c. Create a sustained yield of forest products and prevent liquidation harvest practices.

II. Restricted Uses

1. Parcel B shall be used for forestry, educational, non-commercial, recreational and open space purposes only. No residential, commercial, industrial or mining activities shall be permitted and no structure or improvement shall be constructed or placed on Parcel B except as permitted under Permitted Uses;
2. Except as specifically permitted, no rights-of-way, easements of ingress or egress, driveways, roads, or utility lines or easements shall be constructed, developed or maintained into, on, over, under, or across Parcel B without prior written permission of the State of Vermont and the UVLT;
3. No additional easements or restrictions shall be placed on Parcel B without the prior written permission of the State of Vermont and the UVLT;
4. No outdoor advertising structures such as signs and billboards shall be displayed on Parcel B except reasonable signs indicating the name of Parcel B and its ownership, boundary markers, directional signs, memorial plaques, informational and interpretive signs, for sale signs, and signs limiting access or use;
5. No placement, collection or storage of trash, human waste, or any unsightly or offensive material without the prior written permission of the State of Vermont and the UVLT, except the storage of trash in receptacles for periodic off-site disposal;
6. No disturbance of the surface, including filling, excavation, and removal of topsoil, sand, gravel, rocks or minerals, or change of the topography of the land in any manner, nor any surface mining of subsurface oil, gas, or other minerals except as reasonably necessary to carry out the uses permitted on Parcel B;
7. No manipulation of natural watercourses, marshes, or other water bodies, nor activities conducted on Parcel B which would be detrimental to water purity, or which could alter

natural water level or flow except as reasonably necessary to carry out the uses permitted on Parcel B;

8. Parcel B shall not be subdivided without permission of Grantee. Further no portion of Parcel B shall be conveyed except as part of a conveyance of all of the Parcels encumbered by Conservation Easement #1; and
9. No use or activity is permitted which is or is likely to become inconsistent with the Purposes of Conservation Easement #2.

III. Permitted Uses

Forest Management Activities

The town of West Fairlee has the right to conduct the following activities provided they are in accordance with the Forest Stewardship Plan and supervised by a professional forester:

1. Forest management activities, including harvesting timber and firewood, other wood products and non-timber forest products and conduct maple-sugaring operations.
2. During any road construction or harvesting and skidding of wood products, the town of West Fairlee shall employ the applicable practices in the publication "Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont" (1987) (also referred to as "AMPs").
3. Town of West Fairlee shall provide the State of Vermont and the UVLT with written notice at least fifteen days before any timber harvesting activity, except non-commercial thinning and any other harvesting involving fewer than 10 acres, or yielding fewer than 8,000 board feet of sawlogs or 25 cords of firewood.

Structures & Improvements

The Town of West Fairlee has the right to:

1. Maintain, repair, and replace existing forest management roads and associated bridges, culverts and gates to control motorized access, and construct new forest management roads and associated improvements if consistent with Conservation Easement #2 and additional road improvements are necessary to provide reasonable forest management access to Parcel B and the system of existing roads are not adequate.
2. Construct and maintain temporary saw mills, wood processing facilities, and similar temporary forestry structures, with necessary temporary access drives and utilities, provided that such temporary structures, access and utilities are used exclusively in functional support of forestry conducted on Parcel B, and that such construction has been approved in writing in advance by the State of Vermont and the UVLT.
3. Use motorized equipment for forest management activities.
4. Construct and maintain sugar houses, or similar forestry structures, with necessary access drives and utilities, on Parcel B, provided that such structures are used exclusively in functional support of forestry conducted on Parcel B, and such construction has been approved in writing in advance by the State of Vermont and the UVLT.
5. Construct, occupy, use, repair, maintain, and improve one structure on Parcel B, with prior written permission of the State of Vermont and the UVLT and provided the structure is not improved by providing electrical, water, sewage or an improved access drive, nor used for year-round occupancy, nor exceeds 800 square feet of

space. Any such structure shall be located in a manner to minimize the loss of conservation values outlined in the Purposes section above.

Water Resources

The Town of West Fairlee has the right to:
Utilize, maintain, establish, construct, and improve water sources, courses, and bodies, provided that the Town of West Fairlee does not unnecessarily disturb the natural course of the surface water drainage and runoff flowing over Parcel B. Subject to the State of Vermont and UVLT's written approval, the Town of West Fairlee may construct ponds or reservoirs.

Motorized and Mechanized Vehicles

The Town of West Fairlee has the right to:
Use all-terrain vehicles on Parcel B for the limited purposes of forestry and trail maintenance. The Town of West Fairlee may not permit recreational use of all-terrain vehicles by the public. Operation of snowmobiles, mountain bikes, and equestrian use may be permitted on Parcel B in designated corridors shown in the Forest Stewardship Plan at the discretion of the Town of West Fairlee provided that such use is not inconsistent with the purposes of this Conservation Easement #2.

Trails

The Town of West Fairlee has the right to:
Clear, construct and maintain trails for non-commercial walking, skiing, equestrian and other recreational activities on Parcel B, and to construct, fence, and maintain one unpaved parking area for up to ten parking spaces at the trailhead location shown in the Forest Stewardship Plan (See Map C, Access and Recreation Map).

Other Uses

The Town of West Fairlee has the right to:

1. Issue short-term permits to others to use the forest management roads to for forest management purposes on lands near Parcel B.
2. Extract sand and gravel from Parcel B exclusively for construction or improvement of forest management roads on Parcel B.
3. Engage in accessory uses of Parcel B if they are related to the principal forestry or recreational uses of Parcel B, and in the aggregate subordinate and customarily incidental to those principal uses, with prior written permission of the State of Vermont and the UVLT.

IV. Forestry Provisions

1) General Requirements

No roads shall be constructed or timber harvested until the Forest Stewardship Plan, prepared by a professional forester, is reviewed and approved by the Vermont State Forester. All updates, amendments or other changes to the Plan shall be submitted to the Vermont State Forester for approval.

2) Stewardship Plan Requirements

The Forest Stewardship Plan shall be based on the most current science and strive to improve stand quality and maintain important wildlife habitats consistent with current stand

conditions and site quality. The Plan shall include forest management objectives, map of forest stands, streams, wetlands and major access routes, forest stand descriptions and treatments, plant and wildlife considerations, recreational considerations and historic and cultural resource considerations. The Forest Stewardship plan shall be updated at least every ten years.

3) Harvesting Restrictions

c. Heavy cuts (meaning harvesting below the "C-Line" or minimum stocking level as determined in the USFS Silvicultural Guidelines for the Northeast) may be approved only if it is to: release a well-established understory, permit planting of different species of tree, for wildlife management purposes or to promote natural regeneration.

d. Harvesting within 50 feet of any wetland or the banks/shores of rivers, streams, and ponds (referred to as "Surface Water Buffer Zones") must be consistent with the Forest Stewardship Plan and take into account the effects of such activities on water quality and the plant and wildlife habitat associated with such areas. The number and width of stream crossings in the foregoing areas shall be kept to a minimum and shall include installation of all erosion control devices and follow all recommended practices described in the "Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont" publication (referred to as "AMPs") dated August 15, 1987, or successor standard approved by the State of Vermont and the UVLT.

V. Public Access

Public access is a conditioned right and will be provided as long as it does not interfere with forestry activities and is not otherwise inconsistent with the Purposes of the Conservation Easement #2. The Town of West Fairlee, the State of Vermont, and the UVLT shall work to cooperatively resolve any issues with respect to public recreational access to Parcel B and to maintain public access to Parcel B.

Parcel B shall be available to the public for all types of non-commercial, non-motorized, non-mechanized, non-equestrian dispersed recreational purposes (including but not limited to bird watching, backcountry skiing, fishing, hunting, snowshoeing, and walking) consistent with the Purposes of Conservation Easement #2. Public access may be limited or restricted to assure compliance with Conservation Easement #2, to protect natural habitats, or to protect the public health or safety (including the right to permit, regulate or prohibit hunting or trapping).

VI. Enforcement of the Restrictions

The State of Vermont and the UVLT (UVLT) shall have reasonable access to Parcel B and make reasonable efforts to assure compliance by the Town of West Fairlee with the terms of Conservation Easement #2 by making periodic inspections. In the event that the State of Vermont and/or UVLT becomes aware of an event or circumstance of non-compliance, the State of Vermont and UVLT shall give notice to the Town of West Fairlee via Certified Mail, return receipt requested, and demand corrective action.

----- ADD CONSERVATION EASEMENT # 3 SUMMARY -----

III. TOWN OBJECTIVES

Since 1971 The Town of West Fairlee has sought to create a town forest in the Brushwood area of town. The creation of the Brushwood Community Forest is an effort by the Town to protect this land from development, put it into open public ownership, and manage it for timber, wildlife habitat, and public recreation and education. The Town of West Fairlee values the complex suite of both monetary and non-monetary benefits that forests provide including timber revenues, non-timber forest product revenues, tourism and recreation, water supply and water quality protection, carbon sequestration, open space protection, education, wildlife habitat protection, and a sense of community and increased civic pride.

Administration of the Brushwood Community Forest

The West Fairlee Conservation Commission will take the lead role in managing the Property and the implementation of the goals established by this Forest Stewardship Plan. The West Fairlee Select Board will have ultimate decision-making authority over the Property with concurrence of the Conservation Commission. The West Fairlee Conservation Commission will handle all day-to-day management decisions, legal responsibilities, and financial details (both income and expenses) and will submit annual action plans and budgets to the Select Board for approval. Orange County Forester David Paganelli (or successor Orange County Forester), who prepared the Timber Management section of this document, will provide assistance and advice pertaining to forest treatments. Overall management will be done in accordance with the Easements and this Forest Stewardship Plan approved by the State of Vermont.

<u>General Management Objectives</u>

- Maintain a "healthy forest" defined as: "resilient forest ecosystems that possess the long-term capacity for self-renewal of their ecological productivity, diversity, and complexity;" (Sustainable Forestry Task Force, Field Staff Report, October 2007)
- Educate the citizens of West Fairlee and the Upper Valley Region, particularly children, about natural communities, biodiversity, the working forest, and good stewardship practices;
- Manage recreation, wildlife and plant habitat protection, and timber management and forest health on this town forest in coordination with other towns (especially Fairlee and Bradford), organizations, state agencies, and neighboring landowners;
- Protect unique wildlife habitat, natural communities, and other natural resource values
- Protect the ecosystem services and significant habitat and aquatic values of the large wetland complex through special restrictions as a Special Treatment Area
- Preserve open space and maintain the traditional landscape; and
- Preserve and conserve the quality and quantity of the groundwater and surface water resources.

<u>Recreation Goals</u>

- Promote and encourage traditional forest uses including sustainable forest management and low impact outdoor recreation for residents and visitors;
- Maintain the tradition of open access for non-motorized low impact recreation;

- Over time, improve access for dispersed public recreation. Seek the cooperation of local stakeholders to monitor and maintain those access points;
- Maintain public access for hiking, hunting, and fishing subject to the terms, conditions and limitations set forth in the Easements; and
- Maintain a level of forest quality and public access that provides for quiet enjoyment at certain times of year.

Wildlife Habitat Goals

- Maintain and protect native biodiversity;
- Conserve rare and exemplary natural communities, forested and non-forested wetlands, vernal pools, and riparian areas;
- Protect and enhance a variety of habitats for native species through uneven-aged management and retention of downed woody debris, snag trees, cavity trees, very large or old trees, and early successional habitats;
- Provide a healthy mix of natural communities throughout the Property (recognizing the value of neighboring landscapes);
- Protect existing and potential habitat for wildlife such as deer wintering areas and other habitats that benefit both game and non-game species; and
- To the extent possible, prevent the introduction or spread of invasive plant and animal species

Timber Management Goals

- Manage the timber resource in a sustainable manner with an emphasis on harvesting timber at its maturity in consultation with the Orange County Forester;
- Create the conditions to encourage regeneration of desirable timber species;
- Encourage desirable advanced regeneration that is already on site;
- Identify and protect special natural areas for their intrinsic values;
- Limit impact on sensitive riparian areas, wetlands, and sites with steep topography and protection and/or enhancement of water quality;
- Manage timber in such a way that it is revenue-producing and compatible with wildlife conservation, recreation and education;
- Augment, modify and renew wildlife habitat to encourage specific wildlife species; and
- Support the region's rural economy.

IV. INFRASTRUCTURE

(see also Baseline Documentation Report)

General Topographic Description

The overall project area consists of hilly to moderate terrain with some areas of ledge and steep slopes and several ravines. Elevation ranges from 800 to 1700 feet. The majority of the Property is forested save for some early successional habitats on a small 10+/- acre portion of Parcel A, the former French property, and a 1-acre section of Parcel D (see Map K: Forest Bird Habitat Assessment Map). Several small streams, seasonal streams, and vernal pools are found throughout the Brushwood Community Forest. A considerably large wetland complex (36-acres, class 2) located within the Brushwood Community Forest in Fairlee on the northern section of the current Brushwood Forest and the southern section of the new addition. This wetland

complex is the subject of a Special Treatment Area for conservation. Another class 2 wetland complex is found on the southern portion of Parcel D in Fairlee and a portion of it extends into the adjacent Fairlee Municipal Forest (see Map D: Brushwood Community Forest Timber Stands & Aquatic Resources).

Scenic Values

The Brushwood Community Forest project area lies in close proximity to the Interstate 91 corridor providing terrific fall foliage views for visitors and residents alike. Route 5, which parallels I-91 in this area, has been designated as part of the Connecticut River Scenic Byway. Significant landscape views of the Connecticut River Valley are also available from higher portions of the land, especially in winter. Conservation of this Property will contribute to the preservation of the scenic quality of this part of the Connecticut River Valley, whether viewed from the highway or by taking a quiet ride along back roads such as Blood Brook or Kidderhood roads.

Roads

To manage 1,050 acres of land requires the development and maintenance of roads and trails. This section briefly presents an inventory of roads, trails and boundary lines. There are a limited number of forest roads and overgrown logging and skidder roads on the Property (see Map C: Access & Recreation Map and Appendix D: Survey).

Physical access to the Property can be gained through frontage along the following town roads: Blood Brook Road (two lane dirt road, partially paved), Brushwood Road (primarily single lane 4x4 class 4 dirt road), Kidderhood Road (primarily single lane 4x4 class 4 dirt road), and Millpond Road (primarily single lane 4x4 class 4 dirt road). Brushwood Road traverses the Property, through a parcel that connects the Brushwood Community Forest to the Fairlee Municipal Forest. Blood Brook Road runs along the western boundary of two portions of the Property, Kidderhood Road bisects the northern part of the Property, terminating at Brushwood Road, while Millpond Road runs the northeastern boundary; connecting with Brushwood Road. In addition Knobloch Road is a short town that gives access to the Knobloch property.

Two access points/parking areas are planned along Blood Brook Road. See the Proposed Action Schedule section and Map C: Access & Recreation Map for potential parking and access areas.

Road maintenance objectives for the interior forest roads include:

- ensuring safe conditions for a variety of uses including logging and passive recreation;
- minimizing erosion and runoff;
- preventing illegal trespass by ATVs;
- preventing the spread of invasive plants along trails and roads;
- minimizing increased avian predation and nest parasitism by minimizing the width, number and extent of new access and skid roads; and
- minimizing disruption of wildlife habitat and recreation trails.

For information pertaining to trails, please see the Recreation Section of this Forest Stewardship Plan.

Boundary Lines

Town roads bound a significant portion of the Brushwood Community Forest. Blood Brook Raod and Kinderhood Road help establish the western boundaries of the Property. In addition, Millpond Road helps delineate part of the eastern boundary of the Property before terminating at Brushwood Road (see Map B: Topographic and Parcel Map). The Brushwood Community Forest's boundaries have not yet been marked, though a survey of parcel A, B, C, D, and E has been completed (see Appendix D) with monuments (rebar with plastic marker caps) set at the corners. A survey is planned for the Bradford Town Forest. Some boundaries are marked by stonewalls (as shown on the Survey, Appendix D). North of Brushwood Road, the property is loosely marked by red painted blaze on trees that follow stone walls and old wire fence. See the Proposed Action Schedule section for boundary marking plans. See the Baseline Documentation Report for a full list of abutting landowners.

V. GEOLOGY AND SOILS

Bedrock Geology

The bedrock and surficial geology help determine the location of aquifers, wetlands, and forests. Bedrock constituents have the potential to impact water quality, types and depth of soils, topography, vegetation, and potential for various uses. The materials that comprise bedrock vary in density and permeability. Water "pools" in some areas, while running quickly through other areas, creating aquifers (water-saturated areas underground) and wetlands. Fractures in the bedrock also provide sources for water supplies.

The Property lies in the Vermont piedmont region, which is predominantly made up of limestone, schist and granite. Glaciers left many areas littered with gravelly soils containing stones and boulders, common throughout the property. There are no mapped sand and gravel deposits on the Property, but as shown in Map E (Geology Map), they can be found nearby, especially around Lake Morey. If gravel deposits are found, the Town of West Fairlee in accordance with the terms of the Easements shall have the right to extract sand and gravel from the Property, provided such materials are used exclusively for the construction, maintenance or improvement of forest management roads and/or log landings situated on the Property provided any extraction is done in accordance with the terms of the Easements and this Forest Stewardship Plan or successor Forest Stewardship Plan approved by the State of Vermont.

According to the Centennial Geologic Map of Vermont by Charles G. Dell, State Geologist, Vermont Geological Survey, the underlying bedrock of the Property is Gile Mountain Formation, which is made up of Devonian phyllite and mica schist. More specifically, the bedrock is composed of gray quartz-muscovite phyllite or schist, interbedded and intergradational with gray micaceous quartzite, calcareous mica schist, and, locally, quartzose and micaceous crystalline limestone. These rocks are somewhat rich in carbonate, which yield high-fertility soils by weathering easily and providing calcium, magnesium and other elements necessary for plant growth. Because they are alkaline in reaction, they also buffer acidity and create favorable conditions for nutrient uptake.

Soils

Soil types are important in managing timber due to differences in productivity and management limitations. Some soils are more fertile than others and thus, more productive. Productivity standards define which species will compete best on any given soil type, and are useful when developing silvicultural prescriptions for specific stands. Also, certain soil types have management limitations that must be considered. Limitations are typically defined by a soil's characteristics such as wetness and erodibility. For instance, an area with wet soils should be harvested in the winter when the ground is frozen to avoid damage. Conversely, drier soils can usually be safely harvested in the summer without negative disturbances. These considerations are also important in defining management and silvicultural decisions.

For typical forestland in the region, soil types are mapped in approximately fifty-acre minimum units (Order III mapping) by the Natural Resource Conservation Service. In managing conservation land, a more useful tool is to combine the soil types into "Important Forest Soil Groups." The soils are grouped together by common characteristics such as drainage patterns, stoniness, and expected forest successional trends. They can be used to compare the potential profitability of woodland production on different soils.

Important forest soils are those soil map units with a relative value of 74 or higher according to the Soil Potential Study and Forest Land Value Groups for Vermont Soils. These forest soils consist of map units in Forest Value Groups 1, 2 and 3 (out of a total of 7). Statewide, soils in Forest Value Groups 1, 2 and 3 cover approximately 40% of Vermont's total land Area.

Soil types of the Brushwood Community Forest are shown in Map F: Brushwood Community Forest Soils. The most common soil type found is Tunbridge-Woodstock-Rock outcrop complex (TrD and TwE). These soil types are a mix of two soils: Tunbridge, which are productive, extremely stony, and have good permeability. Woodstock soils are less productive, classified as having medium natural fertility, and are more likely to dry out. Although the table below shows Tunbridge-Woodstock as a category 5 Forest Soils Group, these soils can be quite productive depending upon which soil type is dominant. Colrain very stony fine sandy loam (CsD) and Colrain stony loam (CoC) are also present, which are productive soils with good permeability. Other less common soil types include Cabot soils (CbB) and Muck soils (Mu).

Table 1. Soil Types of the Brushwood Community Forest

Map Symbol	Map Unit Name	Forest Soils Group	Prime Agricultural Soil	Area (acres)
CoC	Colrain stony fine sandy loam, 8-15% slopes	1	Statewide	28.05
CoD	Colrain stony fine sandy loam, 15-25% slopes	2	~	2.06
BuB	Buckland stony loam, 3-8% slopes	3	Prime	2.12
BuC	Buckland stony loam, 8-15% slopes		Statewide	0.63
CsE	Colrain very ston fine sandy loam, 25 t o 5- percent slopes		NPSL	0.32
CsD	Colrain very stony fine sandy loam, 8-25% slopes		~	187.45
BvC	Buckland very stony loam, 8-25% slopes	4	~	101.3
CaC	Cabot stony silt loam, 8-15% slopes		Statewide (b)	22.9
BwE	Buckland soils, 25 to 50 percent slopes		NPSL	3.36
CbB	Cabot very stony silt loam, 3-15% slopes		~	29.65
TrD	Tunbridge-Woodstock very rocky fine sandy loams, 8-25% slopes	5	~	456.02
TwE	Tunbridge-Woodstock complex, 25-50% slopes		~	203.69
Mu	Muck	7	~	16.61
Pc	Peacham soils		~	2.69

VI. TIMBER MANAGEMENT

Forest History

The properties that make up the Brushwood Community Forest have been managed as timberland and used for recreation for approximately the last one hundred years. The Brushwood area was largely deforested along with most of Vermont during the early and mid 1800s. Several hill farms were reportedly located here and the land was probably used for diversified farming and pasturing cattle, horses and sheep. Most of the land is now dominated by mid-successional forest of approximately 30 – 100 years old.

The majority of the Property is maturing Northern Hardwood Forest or Hemlock-Northern Hardwood Forest and contains significant patches of hemlock and white pine. Most of the forest is two-aged or uneven-aged, though there are some even-aged early successional stands on the southern most parcel. The Property is generally well to fully stocked, with only a few stands being under stocked. Overall the Property has been managed for saw logs using uneven-aged selection harvests approximately every 15-25 years.

Forest types include Northern Hardwood, Hemlock/Hardwood/Pine, Red Maple/White Pine, Spruce, Mixed Hardwood, White Pine, Red Oak/Mixed Wood, Regenerating White Pine, and Hemlock. Hardwood and softwood tree species include sugar and red maple, paper and yellow birch, white ash, beech, white and red oak, hickory, eastern hop hornbeam, red and white pine, hemlock, and red and white spruce. Parcel B was recently home to the largest white spruce in the State until it was blown over in a 2006 storm. The magnificent tree formerly stood 103 feet high, with a DBH of 36 inches, and had a 42-foot crown.

The Property has remained wooded and undeveloped with some timber management, and some public recreational uses (both passive and active such as ATV). There are established conservation lands adjacent to the property. A homestead is located on a 20-acre in-holding, that straddles the West Fairlee and Fairlee Town line, in the northern section of the Property.

Around 1960, the Bradford Water Commission purchased the land that now constitutes the Property to establish a permanent future source of water for the village of Bradford. At that time the Property was pulled together from several smaller parcels, though 455 acres known as the Curtis parcel was the majority of the area purchased. In the years between 1960 and the mid-1980s no management occurred on the property, however in the late 1980s some timber harvesting occurred.

Silvicultural Management Goals

The overarching goal of West Fairlee's Conservation Commission is to manage the Brushwood Community Forest as "healthy forest", which is defined as "resilient forest ecosystems that possess the long-term capacity for self-renewal of their ecological productivity, diversity, and complexity" (Sustainable Forestry Task Force, Field Staff Report, October 2007). Management activities will promote a forest that reflects a diversity of stand ages and naturally occurring forest types in the majority of the forest. Special attention will be given to the conservation of rare and exemplary natural communities, and the conservation and enhancement of native plant and animal species and their habitats, including, but not limited to, the establishment and

retention of a range of sizes and types of downed woody debris, snag trees, cavity trees, occasional very large/old trees, and a small amount of early successional habitats.

In order to improve and manage wildlife habitat, at least 80% of the landscape will be maintained as mid-late successional forest, while also promoting early-successional (scrub/shrub and/or regenerating forest) conditions where opportunities exist. Combined, these areas of early successional habitat should comprise approximately 5% of the overall property acreage at any given time. At least one portion of Parcel A will be cleared and maintained as a log landing area. These openings will provide browse, dense cover, edge, and the quickly-changing stand dynamics of young forest that benefit and encourage some species of wildlife. Clearing will be conducted between September and November, once the majority of migrant birds have departed and the fruiting season has ended. Large clumps of mature residual trees will be left to serve as perch sites.

In general, uneven-aged silvicultural methods will be used, through single-tree and group selections of less than 5 acres. Harvesting during frozen ground conditions is preferred, but if summer harvesting is required, it will be scheduled before the start of the bird breeding season or after the second week of July. As a general rule, all dead snags and current "biological legacies" (old pasture trees, so-called wolf pines, old growth trees that have been spared in the past) will be retained for the benefit of wildlife and stand diversity, as well as for their educational and aesthetic value. The recommended goal will be to retain a minimum of six snags per acre, with one exceeding 18-inch dbh and three exceeding 16-inch dbh, with a priority of retaining hardwood snags. New "biological legacies" will also be encouraged by setting aside four trees per acre that are representative of the stand. This will add to the structural complexity of the stand and will also eventually create larger pieces of coarse woody material, providing shelter and food for numerous wildlife species. Where possible, slash will also be left on site to contribute to vertical structure and protect seedlings from being browsed by deer.

All activities on the Property shall be performed in accordance with then current, generally accepted best management practices for the sites, soils and terrain of the Property as described in "Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont", a Vermont Department of Forests, Parks and Recreation publication dated August 15, 1987 (hereafter "AMP's") and successor documents. Timber harvests will be focused in areas that can be managed easily, with simple access and few impediments due to site or topography. Areas with steep slopes, difficult access and/or ecological sensitivity such as extensive riparian and/or wetland ecosystems will be managed in order to protect their ecological qualities and to limit any and all environmental impacts from timber harvesting. To accommodate market and climatic (and related soil) conditions, changes may be necessary over the lifetime of this Forest Stewardship Plan. Any changes to this Timber Management section of the Brushwood Community Forest Stewardship Plan will occur in accordance with the Easements and in consultation with the Orange County Forester.

Avoiding Conflicts with Recreation

If timber management is to take place anywhere near hiking trails, care will be taken to avoid affecting or blocking the trail. In situations where impeding the trail is unavoidable, trails will be temporarily closed or rerouted. The location of the rerouted trails will be at the discretion of the

Town of West Fairlee, reflecting relevant site conditions at the time of harvest, and will be routed to avoid impacts on wetlands, springs, riparian areas, and other sensitive natural or cultural features.

- Trails will be adequately marked and signed to assist both loggers and trail users in locating the affected path.
- Where practical, a 150-foot buffer zone of partially cut or uncut forest will be left along trails.
- Forest harvesting machinery use should be minimized on and near existing trails. This would include limiting the number of skid road crossings and keeping them at right angles to the trail whenever possible.
- It is recommended that any accumulation of woody debris and slash on existing trails should be minimized.

When actively logging, the town of West Fairlee will post affected trails within the immediate vicinity of logging activity with a sign prohibiting pedestrian access for safety reasons. The prohibition will end at the conclusion of logging activity, and the landowner will remove these signs.

Special Management Areas

Certain sections of the Property such as riparian areas (rivers or streams), vernal pools, and wetland ecosystems have been designated as "Special Management Areas" (SMAs) within this Forest Stewardship Plan and are shown on Map I, Special Management Areas Map. These areas will receive special treatment during any activities that disturb the natural environment such as logging or road and trail building.

The Special Management Areas as depicted on Map I: Special Management Areas Map, were developed using the widths shown in Table 2. below. These widths or "Buffer Zones" around wetlands, ponds, and streams are measured from the wetland/upland boundary of wetlands, and from the mean high water line of streams and ponds. The width of the Buffer Zone will be the greater of 100 feet, or the width dictated by the AMPs or applicable wetland regulations.

Table 2: Widths used to develop the SMAs in this Plan.

Water Body Type	**SMA Width**
1st and 2nd Order Streams	100 feet
3rd Order Streams	300 feet
Non-Forested Wetlands <10 acres	100 feet
Non-Forested Wetlands >10 acres	300 feet

Management of Special Management Areas

The principal goal for management of the SMAs is the establishment and maintenance of a high quality buffer that provides an array of ecological benefits including but not limited to:

i. buffering aquatic and wetland plants and animals from human disturbance;
ii. preventing wetland and water-quality degradation;
iii. providing important plant and animal habitat;

iv. providing adequate corridors for species that require such areas for their seasonal, annual, or dispersal movements/migrations; and
v. providing organic matter, nutrients, and structure to aquatic systems.

Within the Special Management Areas, harvesting will only be done by singletree selection or small group cuts, with the long term objective to develop older, uneven-aged stands with at least 70% crown closure. Tree species that take up excess nutrients, such as oak and red maple, will be retained. Erosion will be monitored before, during and after harvesting, and no pesticides will be used within these Riparian Management Zones. Harvesting will be done in winter to minimize disturbance to the forest floor and understory vegetation and to avoid conflicts with breeding wildlife. No log yards, landings, and or staging areas will be constructed within SMAs unless absolutely necessary to allow the harvesting of a specific stand. Any such construction will be in compliance with "Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont" or successor documents. The number and width of crossings through SMAs shall be kept to a minimum and will include the installation of all erosion control devices and employ all recommended practices described in the AMPs.

The widths of and management guidelines for SMAs may be modified as appropriate, by the State of Vermont (and UVLT as applies to Parcel B) and the Town of West Fairlee, based upon the specific conditions of the site, including but not limited to, flooding zones, slopes, erodible soils, riparian vegetation communities, and roads. In no event shall an adjustment reduce the wetland or riparian Special Management Areas' buffers below fifty (50) feet in width.

These forested buffers filter surface and subsurface water, trapping sediment, nutrients, chemicals and other pollutants. Forested buffers also improve habitat for trout and other fish, by providing shade and woody debris. Large trees within riparian areas also provide perching and potential nesting sites for eagles, ospreys, herons, kingfishers, and other aquatic birds. Riparian forests provide breeding habitat for a number of bird species, including the red-shouldered hawk (*Buteo lineatus*), veery (*Catharus fuscescns*), American redstart (*Setophaga ruticilla*), warbling vireo (*Vireo gilvus*), and Baltimore oriole (*Icterus galbula*). Mammals such as beaver, muskrat, mink and otter use these habitats, as well as many amphibians and reptiles. Canada warblers and chestnut-sided warblers will make use of streamside thickets and shrubby, younger portions of riparian buffers.

Addition of STA language and goals of management – either included in the SMA section or will be considered as its own different management

A special treatment area over the significant wetland complex will help maintain the ecological services and integrity of the wetlands.

Vernal Pools

The upland forest surrounding vernal pools support amphibians the majority of the year. Some salamanders and wood frogs are especially sensitive to desiccation and temperature extremes so they need areas of uncompacted, deep litter, coarse woody debris, and patches of canopy shade. Best Management Practices for timber harvesting near vernal pools include:

- No disturbance of the vernal pool depression;

- Maintain or encourage a closed canopy stand in a pole- or greater size class that will provide shade, deep litter, and woody debris in a 100-foot zone around the pool;
- Limit harvesting to uniformly distributed, light, partial cutting while leaving a minimum of 70-80% canopy cover in the 100 foot zone around the pool;
- Harvesting operations will occur only when ground is frozen, when juveniles and adults are inactive; and
- Maintain a shaded moist forest floor in the 100-500 foot buffer around vernal pools by leaving at least 50-60% canopy cover, and using single-tree or group selection harvesting.

(For a full description of BMPs for harvesting near vernal pools, see Calhoun 2000).

Forest Management Areas – Prepared by David Paganelli, Orange County Forester

Needs to be amended – in process

The town of West Fairlee, with the help of The Trust For Public Land is in the process of assembling a municipal forest from several parcels of previously private land. This forest management plan describes five of those parcels: A (formerly French), B (formerly Crawford), C (formerly Ducharme), D (formerly Wallstrom), and E (formerly Cook). Parcel A consists of approximately 151.4 acres and has frontage on Blood Brook Road in West Fairlee. It is not contiguous with Parcels B (154 acres), C (16.7 acres), D (115.9 acres), or E (36.8 acres), F (580 acres) which are contiguous to each other. Map D: Timber Stands & Aquatic Resources Map shows the approximate boundaries of these parcels with forest stand designations.

Sampling and Data Collection

Parcel B property was visited on 10/25/08 by David Paganelli, the Orange County Forester who has been on this property in various locations, several times over the last three years. There is a management plan in place for this property, which was completed in 2002, but still accurately depicts conditions here. It was originally prepared by Redstart Forestry, with updated prescriptions and map done by Jeff Smith in 2005. The data in the present plan, with some minor adjustments for growth, is deemed to be sufficiently accurate for the purposes of this larger Forest Stewardship Plan. Stand 1 on Parcel B is similar enough with the small section of stand 2 on Parcel D (D-2) in the southwest corner that they should be combined in the next update of this Forest Stewardship Plan.

Parcel D was visited by Orange County Forester, David Paganelli on 9/18/08. The entire property was examined, and notes were taken, but no new data was collected as this property has a Current Use forest management plan in place that was done by Redstart Forestry in June of 2003. Since this plan is only five growing seasons old it was determined to be sufficiently accurate for the purposes of this larger Forest Stewardship Plan.

New data was collected on 9/18/08 on both Parcels E and C. Seven 10-factor prism points were sampled on Parcel E and four on Parcel C. Both of these properties were sufficiently uniform to be considered single stands and both were quite similar to adjacent stands on Parcel D. At each sample point a tally of trees was taken by species, diameter and stem quality. From this data the total basal area of each stand was calculated along with the portion that has potential to produce sawtimber. Mean stand diameter and the number of trees per acre were calculated. The

combination of this data allows access to U.S. Forest Service silvicultural guides and stocking charts to determine overall stocking and recommended treatments.

Parcel A was visited by Orange County Forester, David Paganelli on 9/22/08 and 9/24/08 to collect data for this Forest Stewardship Plan. A total of twenty-four sample points and two observation points (where no data was collected) were established. From this data the property was divided into five primary forest stands. The previous forest management plan divided the property into ten separate areas, but some of these areas are now determined to be similar enough that they can be combined.

PARCEL A (Former French Property)

STAND: A-1

This stand is at the entrance to the property and is split by the Cross-Rivendell trail. Any logging on the property would need to allow truck access on the trail for the entire length of this stand in order to reach the landing area.

Forest Type: White Pine

Natural Community: Northern Hardwood Forest

Acres: 4 (approximate)

Species Composition: White pine (100%). There may be other species present, but none fell in the two sample points. Regeneration is established as seedlings, saplings and poles of red maple, sugar maple, white ash, black cherry, red oak, eastern hophornbeam, American beech and hawthorn. The invasive, exotic woody shrub common buckthorn is well established here and needs to be controlled to maintain the integrity of the natural community into the future.

Total Basal Area: 170 sq.ft./acre

Acceptable Growing Stock Basal Area: 70 sq.ft./acre

Number of Trees/Acre: 139

Mean Stand Diameter: 15.0 inches

Stocking: Just above the “unmanaged” B-line. Well above the “managed” B-line.

Soil Mapping Unit: Cabot soils (CbB) are formed over a restrictive layer in the soil called a fragipan. They have high natural fertility but tend to be stony, and often have poor drainage.

Stand Structure: Two-aged, overstory pines and the understory hardwoods.

Stand History: This area is shown as open pasture in a November 1939 aerial photo. It was likely abandoned as agricultural land shortly afterward.

Wildlife: Deer browse noted on young hardwoods.

Insects, Disease and Invasive Plants: Common buckthorn is well-established here, but only at moderate levels. White pine blister rust has killed some trees and white pine weevil has caused extensive degradation of stem quality. At least two trees immediately adjacent to the trail have blown over in the recent past.

Longterm Objective: Continue to grow the white pine overstory as long as it is healthy, but move to convert the stand to a more natural mix of hardwoods and pine.

Scheduled Treatment: 2009-2010 Control common buckthorn. 2010-2015 Shelterwood thinning to release established regeneration and to allow for new regeneration. This cutting should be done in winter to protect established hardwood regeneration and should be done immediately following a good pine seed crop. Harvest the roughest white pine in small linear groups. Retain a residual basal area of 80-100 sq.ft./acre consisting of the best quality trees. Care must be taken to avoid skidding directly on the Cross Rivendell trail as much as possible and to follow the cutting with proper cleanup, grading and drainage structures by the following summer.

STAND: A-2

This highly variable stand is a combination of what was previously mapped as open land and saplings but is now well established with saplings and poles of a wide variety of species. This area contains the likely landing area for future logging and the Cross-Rivendell trail bisects the area.

Forest Type: Regenerating Pasture

Natural Community: Northern Hardwood Forest

Acres: 12 (approximate)

Species Composition: White pine, sugar maple, red maple, black cherry, American beech, elm, red oak, white ash, paper birch, basswood, aspen, balsam fir, white spruce and the invasive, exotic woody shrub common buckthorn.

Total Basal Area: Not measured. Highly variable, but generally fully stocked.

Acceptable Growing Stock Basal Area: Not measured, but many stems of good potential are present.

Number of Trees/Acre: Not measured

Mean Stand Diameter: Less than 4 inches

Stocking: Not measured but observation indicates stocking is near B-line.

Soil Mapping Unit: Cabot soils (CbB) are formed over a restrictive layer in the soil called a fragipan. They have high natural fertility but tend to be stony, and often have poor drainage.

Stand Structure: Even-aged. There are a few large, former pasture trees present but the vast majority of trees here are less than 25 years old.

Stand History: This area was once used as pasture and was still partially open as recent as 1998.

Wildlife: None noted.

Insects, Disease and Invasive Plants: Common buckthorn is established here, but at reasonably low levels and mostly near the main trail. White pine weevil has caused minor damage. Overall, all species appear to be healthy and vigorous.

Longterm Objective: Development of a healthy forest of native tree species. The area of the future landing should be cleared during logging and then kept open by annual, late season mowing.

Scheduled Treatment: 2009-2010 Control common buckthorn. 2010-2015 Clear 0.5-1.0 acre for a landing area. This area should be cleaned, graded, limed, fertilized and seeded at the close of operations, and mowed annually thereafter in late summer. The Cross-Rivendell trail below the landing will likely be used for a small amount of skidding and as the access road for logging trucks during logging scheduled in other areas for 2010-2015. A segment of the Cross-Rivendell trail in this stand that is immediately beyond the landing and will need to serve as the main skid trail. It is very important to minimize damage to trailside trees, to cut damaged trees and to properly cleanup, grade and drain the trail immediately after use.

STAND: A-3

This stand is north of stand 2, and appears to have been forested in the November 1939 aerial photo. The forest at that time appears to me made up of mostly hardwoods, with some softwoods, and this remains the case today. Much of this stand is found on a steep west facing slope, which would be difficult to access in places with commercial logging equipment.

Forest Type: Hardwood/Hemlock

Natural Community: Northern Hardwood Forest

Acres: 20 (approximate)

Species Composition: Sugar maple (34%), eastern hemlock (19%), white pine (15%), American beech (10%), paper birch (8%), red maple (6%), red oak (6%) and eastern hophornbeam (2%).

Regeneration is poorly established as seedlings and saplings of striped maple, American beech and eastern hophornbeam.

Total Basal Area: 130 sq.ft./acre

Acceptable Growing Stock Basal Area: 73 sq.ft./acre

Number of Trees/Acre: 167

Mean Stand Diameter: 12.0 inches

Stocking: A+ on the Northern Hardwood stocking chart, or mid B-A on the mixedwood stocking chart. Since it is estimated that target stocking of softwoods will be below 25%, the Northern Hardwood stocking chart is preferred.

Soil Mapping Unit: Colrain soils (CsD) are formed on convex slopes. Often steep, they are well drained and of medium natural fertility.

Stand Structure: Uneven-aged. Sampled trees varied in diameter from 6 inches to 26 inches.

Stand History: This area is shown as forest in the November 1939 aerial photo. It was likely wooded pasture, but some of the slopes are so steep that they would have largely been avoided by livestock. There are stumps throughout this stand that indicate a significant logging entry in approximately 1980.

Wildlife: Cavity trees—dead or dying, partly hollowed trees—are common along with many trees 20-26 inches in diameter that may have potential as legacy trees (old trees that have been spared during harvest or have survived stand-replacing natural disturbances).

Insects, Disease and Invasive Plants: Most of the white pines are of low to moderate vigor. Five to 10% of trees have significant stem damage from the previous logging entry that has led to rot in their lower trunks.

Longterm Objective: Maintain a stand of mixed hardwoods and softwood using uneven-aged management techniques. Use a cutting cycle of 20-25 years with diameter objectives of 18 inches for sugar maple, white pine and hemlock, and 24 inches for red oak.

Scheduled Treatment: 2010-2015 Individual tree and small group selection to release the best trees present and to establish regeneration. Leave some large trees of all species as legacy trees and wildlife trees. Residual basal area should be approximately 80-100 sq.ft./acre. The Cross-Rivendell trail is located along the southern and eastern edges of this stand, so care should be taken not to damage the trail.

STAND: A-4

This stand is a combination of two stands and a portion of a third from the forest management plan done for the previous owner by Jeff Smith of East Thetford. This stand is highly variable but transitions gradually from dense white pine over hardwood regeneration, to a mix of white pine and hardwoods over hardwood regeneration to patches of hardwood regeneration with white pine in the vicinity. What is constant is the presence of white pine in the overstory in most areas, and the presence of a mix of hardwood species in the understory. Ultimately, this entire area will develop into a northern hardwood stand and its present structural diversity is more a function of past agricultural abandonment and logging history than of real differences in site.

Forest Type: White Pine/Hardwood

Natural Community: Northern Hardwood Forest

Acres: 84 (approximate)

Species Composition: White pine (65%), red maple (16%), red oak and white ash (5% each), with smaller amounts of eastern hemlock, American beech, sugar maple, eastern hophornbeam and paper birch. Regeneration is well established as seedlings, saplings and poles of red maple, American beech, eastern hophornbeam, striped maple, pin cherry, white ash, red oak, white pine and hawthorn. At one sample point Japanese barberry and common buckthorn were present.

Total Basal Area: 129 sq.ft./acre

Acceptable Growing Stock Basal Area: 70 sq.ft./acre

Number of Trees/Acre: 285

Mean Stand Diameter: 9.1 inches

Stocking: Just above the "unmanaged" B-line. Well above the "managed" B-line for White Pine.

Soil Mapping Unit: Tunbridge-Woodstock soils (TwE) are formed over ledge at depths varying from 10-40 inches. This soil has moderately low available water capacity and medium natural fertility.

Stand Structure: Multi-aged. Very large open-grown pasture remnants, over large white pines that make up the rest of the overstory, and understory hardwoods. In ten sample points, over 10% of the trees tallied for measurement had diameters greater than 30 inches.

Stand History: This area is shown as open pasture in a November 1939 aerial photo with many scattered open-grown trees. It was likely abandoned as agricultural land shortly afterward and grew in to mostly White Pine. Stumps are common, indicating a significant harvest in the early 1980s. This is likely when most of the young hardwoods in the understory became established.

Wildlife: Structural diversity lends itself to a wide variety of habitat opportunities.

Insects, Disease and Invasive Plants: Japanese barberry and common buckthorn are well-established in places. White pine blister rust has killed some trees and white pine weevil has caused extensive degradation of stem quality. Recent wind damage was evident in several areas with some trees broken and others tipped over.

Longterm Objective: Continue to grow the white pine overstory as long as it is healthy, but move to convert the stand to a more natural mix of hardwoods and pine using uneven-aged management techniques. For white pine use vigor and quality as a guide for when to harvest, more than a firm diameter objective. Cutting cycle should be 20-25 years.

Scheduled Treatment: 2009-2010 Control Japanese barberry and common buckthorn. 2010-2015 Harvest low-quality or at-risk trees using individual tree and small group selection with the objective to release established regeneration and establish new regeneration, while releasing trees of good quality. Leave individual trees of large diameter throughout, along with trees of good quality in the 20-26 inch diameter classes to maintain a complex stand structure. Residual basal area should will be highly variable, but should average near 80 sq.ft./acre.

Care must be taken to avoid felling trees onto, or skidding across the Cross-Rivendell trail. A modest low-impact buffer should be left along the trail and where-ever possible trees should be skidded away from the trail rather than across it. There are existing logging access trails that make it feasible to log in this area without significantly damaging the Cross-Rivendell trail.

STAND: A-5

This mixedwood stand is found along the southeast and eastern edge of the property and is dominated by hemlock. Much of the area is steep with shallow soils.

Forest Type: Mixedwood

Natural Community: Hemlock-Northern Hardwood Forest

Acres: 30 (approximate)

Species Composition: Eastern hemlock (43%), red maple (16%), paper birch (8%), white pine and sugar maple (6% each), white ash and eastern hophornbeam (5% each), along with lesser amounts of red oak, American beech, white spruce, red spruce, balsam fir, aspen and yellow birch. Regeneration is not well-established, but where present consists of mostly American beech, sugar maple, eastern hemlock, red oak, eastern hophornbeam, white ash, white pine and red spruce seedlings and saplings.

Total Basal Area: 164 sq.ft./acre

Acceptable Growing Stock Basal Area: 75 sq.ft./acre

Number of Trees/Acre: 292

Mean Stand Diameter: 10.1 inches

Stocking: Above the B-line for stands with greater than 30% hemlock.

Soil Mapping Unit: Tunbridge-Woodstock soils (TrD) are formed over ledge at depths varying from 10-40 inches. This soil has moderately low available water capacity and medium natural fertility. The Tunbridge soils are generally 20-40 inches deep to ledge, while the Woodstock soils are 10-20 inches deep.

Stand Structure: Uneven-aged

Stand History: This area is shown as wooded, with a similar species mix in a November 1939 aerial photo. There is evidence of past logging, stumps and stem damage, perhaps done in the early 1980s.

Wildlife: Cavity trees—dead or dying partly hollowed trees—were present as well as evidence of porcupine feeding on hemlocks.

Insects, Disease and Invasive Plants: Porcupine damage in some areas and widespread logging damage from the previous cutting 20-30 years ago.

Longterm Objective: Use uneven-age management to improve vigor and increase complexity of stand structure. Cutting cycle of 20-25 years with diameter objectives of 18-20 inches for sugar maple and 20-24 inches for the best red oak and white pine. Continue to grow the white pine overstory as long as it is healthy, but move to convert the stand to a more natural mix of hardwoods and pine.

Scheduled Treatment: 2010-2015 Harvest low-quality or at-risk trees using individual tree and small group selection with the objective to establish regeneration and release trees of good quality. Leave individual trees of large diameter throughout as legacy trees. Residual basal area should will be variable, but should average 80-100 sq.ft./acre.

PARCEL A

SUMMARY OF RECOMMENDED TREATMENTS

STAND	FOREST TYPE	RECOMMENDED TREATMENT	
A-1	White Pine	2009-2010	Control Invasive Plants
A-2	Regenerating	2009-2010	Control Invasive Plants
A-4	White Pine/Hardwood	2009-2010	Control Invasive Plants
A-1	White Pine	2010-2015	Shelterwood Thinning

A-2	Regenerating	2010-2015 Clear Landing Area
A-3	Hardwood/Hemlock	2010-2015 Individual Tree, Small Group Selection
A-4	White Pine/Hardwood	2010-2015 Individual Tree, Small Group Selection
A-5	Mixedwood	2010-2015 Individual Tree, Small Group Selection

All Blaze and paint all boundaries.

Be careful and respectful of the Cross-Rivendell trail. Work parallel to the trail, rather than on or across the trail, when possible.

During and after the planned activities in 2010-2015, clear, smooth and properly drain all trails needed for logging infrastructure. Smooth, lime, fertilize, seed and mulch landing area after use.

PARCEL B (Former Crawford Property)

STAND: B-1

This stand is at the northern edge of the property, south of Brushwood road and east of Blood Brook Road. Aspect varies but slopes generally face north or west. Small areas of steepness are present, but the entire area is easily accessible. Stand descriptive data is taken from the management plan done by Redstart Forestry for the previous owner in 2002. Basal area and mean stand diameter have been adjusted using moderate assumptions of growth for the seven growing seasons since sampling was done.

Forest Type: Northern Hardwood

Natural Community: Northern Hardwood Forest

Acres: 94 (approximate)

Species Composition: Sugar Maple (24%), red oak (18%), eastern hemlock (14%), paper birch (10%), American beech (8%), and smaller amounts of white pine, white ash, aspen, basswood, butternut, red maple and eastern hophornbeam. Regeneration is generally well established as seedlings, saplings and poles of white pine, yellow birch, striped maple, American beech, eastern hophornbeam, red maple, sugar maple and red oak.

Total Basal Area: 96 sq.ft./acre (adjusted for growth)

Acceptable Growing Stock Basal Area: 75 sq.ft./acre (adjusted for growth)

Number of Trees/Acre: 210

Mean Stand Diameter: 9.2 inches (adjusted for growth)

Stocking: Mid-way between the B-line and A-line of the Northern Hardwood stocking chart.

Soil Mapping Unit: Tunbridge-Woodstock soils (TwE) are formed over ledge at depths varying from 10-40 inches. This soil has moderately low available water capacity and medium natural fertility. The Tunbridge soils are generally 20-40 inches deep to ledge, while the Woodstock soils are 10-20 inches deep.

Stand Structure: Two-aged

Stand History: This stand has been forested for 75-100 years. Logging occurred in 1985 and 1986 and then again in 1997-98. The 1985-86 harvest removed 31 thousand board feet (mbf) of mostly white pine, 186 cords of firewood, and 340 cords of pulp. The 1997-98 harvest removed 95.940 mbf of hardwoods, 365 cords of firewood or hardwood pulp and 76.245 mbf of white pine sawtimber.

Wildlife: Deer and turkey activity has been noted here, along with the presence of at least two vernal pools. Vernal pools are small pools that typically dry up in summer but are important breeding areas for certain amphibians. Future timber harvesting will leave lightly cut buffers around these pools and will strive to retain significant large woody organic matter on the soil surface and in the forest canopy (for future recruitment) to provide travel and protective cover for migrating amphibians.

Insects, Disease and Invasive Plants: The paper birch is in decline. Beech bark disease has reduced the vigor of beech trees here and butternut canker has killed most of the butternut trees.

Longterm Objective: Continue management for the production of good quality northern hardwood, red oak, and white pine sawtimber. Technically, use uneven-age management with individual tree selection and small group selection harvests every 20-25 years. Maintain a complex forest structure with trees of all diameter classes and species represented. Average residual basal area of 80-100 sq.ft./acre (outside of groups) is expected after each harvest. Uneven-age management over time will create and perpetuate at least three distinct age classes of trees. Selection harvests are used to remove mature timber, poor quality or diseased trees, and to release or establish desired regeneration. In this stand the best quality, most healthy trees should be grown to specific diameter objectives. Use the following diameter objectives as a guide to maturity for trees of each species: 12-16 inches for paper birch; 14-18 inches for red maple and aspen; 18-22 inches for sugar maple, white ash and hemlock; 24-28 inches for red oak and white pine. Healthy butternut, and large, healthy American beech and basswood, should be retained regardless of diameter.

Scheduled Treatment: 2009-2010 Examine the stand to determine the presence of invasive exotic plants. Control as necessary. Re-examine this stand in ten years when this Forest Stewardship Plan is updated and schedule silvicultural activity at that time.

STAND: B-2

This stand is on moderately steep to steep terrain, which will limit active forest management in some areas. Stand descriptive data is taken from the management plan done by Redstart Forestry for the previous owner in 2002. Basal area and mean stand diameter have been adjusted using moderate assumptions of growth for the seven growing seasons since sampling was done.

Forest Type: Hemlock/Hardwood/White Pine

Natural Community: Hemlock-Northern Hardwood Forest

Acres: 33 (approximate)

Species Composition: Eastern Hemlock (22%), red oak (16%), American beech (15%), paper birch (13%), white pine (10%), sugar maple (9%), red maple (6%), and smaller amounts of aspen, white ash and eastern hophornbeam. The amount of regeneration varies. Where hemlock is dominant in the overstory, very little regeneration is present. Where hardwoods and white pine dominate the overstory, seedlings, saplings and poles of American beech, hemlock, eastern hophornbeam, white ash, sugar maple, red maple, white pine and red oak are found.

Total Basal Area: 126 sq.ft./acre (adjusted for growth)

Acceptable Growing Stock Basal Area: 96 sq.ft./acre (adjusted for growth)

Number of Trees/Acre: 206

Mean Stand Diameter: 10.6 inches (adjusted for growth)

Stocking: B+ on the Mixedwood stocking chart.

Soil Mapping Unit: Tunbridge-Woodstock soils (TwE) are formed over ledge at depths varying from 10-40 inches. This soil has moderately low available water capacity and medium natural fertility. The Tunbridge soils are generally 20-40 inches deep to ledge, while the Woodstock soils are 10-20 inches deep.

Stand Structure: Mostly two-aged.

Stand History: Portions of this stand were open less than 75 years ago, but the steeper land appears to have been wooded for at least the last century. A timber sale occurred in this stand and the abutting stand B-3 in 2000 and 2001. Total harvest volume was approximately 50 mbf of pine, pioneer hardwoods and hemlock, along with 152 cords of pulp, but it is unclear exactly how much of that came out of this stand.

Wildlife: No deer yard is mapped here by the Vermont Department of Fish & Wildlife, but areas of dense hemlock may be functioning as critical deer wintering areas.

Insects, Disease and Invasive Plants: Most of the paper birch is in decline. Beech bark disease is common.

Longterm Objective: Continue management for the production of good quality mixed hardwood and softwood sawtimber and wildlife habitat using uneven-age management with individual tree selection and small group selection harvests every 20-25 years. Maintain a complex forest structure with trees of all diameter classes and species represented. Average residual basal area of 80-100 sq.ft./acre (outside of groups) is expected after each harvest in hardwood areas. Target a residual basal area of 100-120 sq.ft./acre in areas dominated by hemlock. Uneven-age management over time will create and perpetuate at least three distinct age classes of trees. Selection harvests are used to remove mature timber, poor quality or diseased trees, and to release or establish desired regeneration. In this stand the best quality, most healthy trees should be grown to specific diameter objectives. Use the following diameter objectives as a guide to maturity for trees of each species: 12-16 inches for paper birch; 14-18 inches for red maple and aspen; 18-22 inches for sugar maple, white ash and hemlock; 24-28 inches for red oak and white pine. Healthy butternut, and large, healthy American beech and basswood, should be retained regardless of diameter.

Scheduled Treatment: No commercial activity is necessary in this stand at this time. Allow stand to naturally develop and re-examine in ten years.

STAND: B-3

This small stand is the northern end of a larger stand that extends south onto the abutting property. The terrain is variable and often steep. Stand descriptive data is taken from the management plan done by Redstart Forestry for the previous owner in 2002. Basal area and mean stand diameter have been adjusted using moderate assumptions of growth for the seven growing seasons since sampling was done.

Forest Type: White Pine/Red Maple

Natural Community: Hemlock-Northern Hardwood Forest

Acres: 5 (approximate)

Species Composition: Red maple (34%), white pine (31%), paper birch (12%), sugar maple (8%), eastern hemlock (6%) and smaller amounts of white ash, American beech, yellow birch, butternut, red oak and eastern hophornbeam. Regeneration is well established as saplings and poles of white pine, American beech, eastern hophornbeam, eastern hemlock, red maple, sugar maple, white ash and red oak.

Total Basal Area: 147 sq.ft./acre (adjusted for growth)

Acceptable Growing Stock Basal Area: 99 sq.ft./acre (adjusted for growth)

Number of Trees/Acre: 281

Mean Stand Diameter: 9.8 inches (adjusted for growth)

Stocking: Just above the "unmanaged" B-line for White Pine.

Soil Mapping Unit: Tunbridge-Woodstock soils (TwE) are formed over ledge at depths varying from 10-40 inches. This soil has moderately low available water capacity and medium natural fertility.

Stand Structure: Two aged to uneven-aged.

Stand History: A timber sale occurred in this stand and the abutting stand 2 in 2000 and 2001. Harvest volume was approximately 50 mbf of pine, pioneer hardwoods and hemlock, along with 152 cords of pulp, but it is unclear exactly how much of that came out of this stand.

Wildlife: Signs of deer and turkey were noted.

Insects, Disease and Invasive Plants: White pine blister rust has killed some trees and white pine weevil has caused degradation of stem quality. Beech bark disease and butternut canker disease are present.

Longterm Objective: Continue uneven-age management for the production of good quality white pine and mixed hardwood sawtimber using individual tree selection and small group selection harvests every 15-20 years. Maintain a complex forest structure with trees of all diameter classes and species represented. Due to the small size of this stand, work here will need to coincide with work in adjoining stands. Average residual basal area of 70-100 sq.ft./acre (outside of groups) is expected after each harvest. Uneven-age management over time will create and perpetuate at least three distinct age classes of trees. Selection harvests are used to remove mature timber, poor quality or diseased trees, and to release or establish desired regeneration. In this stand the best quality, most healthy trees should be grown to specific diameter objectives. Use the following diameter objectives as a guide to maturity for trees of each species: 12-16 inches for paper birch; 14-18 inches for red maple; 18-20 inches for sugar maple, white ash and hemlock; 24-28 inches for red oak and white pine. Healthy butternut or basswood, and large, healthy American beech, should be retained regardless of diameter.

Scheduled Treatment: No commercial activity is necessary in this stand at this time. Allow stand to naturally develop and re-examine in ten years. Work in this stand should be timed to coincide with work in stand 4.

STAND: B-4

This white pine stand was established on abandoned agricultural land approximately 65-75 years ago. Thinning has occurred here in the past, with good overall quality and long-term potential. The terrain here provides relatively good access. Stand descriptive data is taken from the management plan done by Redstart Forestry for the previous owner in 2002. Basal area and mean stand diameter have been adjusted using moderate assumptions of growth for the seven growing seasons since sampling was done.

Forest Type: White Pine

Natural Community: Northern Hardwood Forest

Acres: 23 (approximate)

Species Composition: White Pine (77%), eastern hemlock (10%), red maple (5%), and smaller amounts of aspen, sugar maple, American elm and white spruce. Regeneration is very well-established as saplings of red maple, elm, balsam fir, white ash, American beech, eastern hemlock and red oak.

Total Basal Area: 168 sq.ft./acre (adjusted for growth)

Acceptable Growing Stock Basal Area: 143 sq.ft./acre (adjusted for growth)

Number of Trees/Acre: 203

Mean Stand Diameter: 12.3 inches (adjusted for growth)

Stocking: Above the "managed" B-line for white pine stands.

Soil Mapping Unit: Colrain soils (CsD) are formed on convex slopes. Often they are well drained and have medium natural fertility.

Stand Structure: Two aged.

Stand History: This stand was established on abandoned agricultural land approximately 1935. It was thinned in approximately 1977.

Wildlife: Deer sign noted.

Insects, Disease and Invasive Plants: White pine weevil and white pine blister rust are present in this stand.

Longterm Objective: Use uneven-age management for the production of good quality white pine and mixed hardwood sawtimber using individual tree selection and small group selection harvests every 15-20 years. Develop and maintain a complex forest structure with trees of all diameter classes and multiple species represented. Average residual basal area of 100-120 sq.ft./acre (outside of groups) is expected after each harvest. Uneven-age management over time will create and perpetuate at least three distinct age classes of trees. Selection harvests are used to remove mature timber, poor quality or diseased trees, and to release or establish desired regeneration. In this stand the best quality, most healthy trees should be grown to specific diameter objectives. Use the following diameter objectives as a guide to maturity for trees of each species: 24-28 inches for white pine and red oak; 12-16 inches for paper birch; 14-18 inches for red maple; 18-20 inches for sugar maple, white ash and hemlock; Large, healthy American beech, should be retained regardless of diameter.

Scheduled Treatment: 2009-2010 Examine the stand to determine the presence of invasive exotic plants. Control as necessary. No commercial activity is necessary in this stand at this time. Allow stand to naturally develop and re-examine in ten years. It is expected that selection harvesting will be scheduled in the next Forest Stewardship Plan, and that work should be timed to coincide with work in stand 3.

PARCEL B
SUMMARY OF RECOMMENDED TREATMENTS

STAND	FOREST TYPE	RECOMMENDED TREATMENT
B-1 B-4	Northern Hardwoods White Pine	2009-2010 Examine for the presence of invasive exotic plants. If plants are found, control measures should be implemented.
All	Blaze and paint all boundaries.	

PARCELS C, D, & E
(C was formerly Ducharme, D was formerly Wallstrom, and E was formerly Cook)

STAND: D-1

This stand is in the eastern and southern portions of Parcel D. It is highly variable in species composition, quality and stocking. Stand descriptive data is taken from the management plan done by Redstart Forestry for the previous owner in 2003. Basal area and mean stand diameter have been adjusted using moderate assumptions of growth for the six growing seasons since sampling was done. This stand is similar to C-1 and the two should be folded together into a single stand when this Forest Stewardship Plan is updated in ten years.

Forest Type: Mixedwood

Natural Community: Hemlock-Northern Hardwood Forest

Acres: 12 (approximate)

Species Composition: Eastern hemlock (16%), yellow birch (14%), white ash (13%), white pine (12%), red maple (9%), paper birch (8%), and smaller amounts of American beech, eastern hophornbeam, red oak, striped maple, black cherry, basswood, sugar maple, red spruce and balsam fir. Regeneration is well-established as seedlings and saplings of striped maple, yellow birch, paper birch, spruce, fir, white ash, American beech and some white pine.

Total Basal Area: 112 sq.ft./acre (adjusted for growth)

Acceptable Growing Stock Basal Area: 81 sq.ft./acre (adjusted for growth)

Number of Trees/Acre: 260 (adjusted)

Mean Stand Diameter: 8.9 inches (adjusted for growth)

Stocking: Adequately stocked near the B-line for even-aged stands containing 25-65% softwood.

Soil Mapping Units: Tunbridge-Woodstock (TrD), Cabot (CbB) and Muck (Mu) are all found here. Tunbridge-Woodstock soils are formed over ledge at depths varying from 10-40 inches. This soil has moderately low available water capacity and medium f natural fertility. Cabot soils are deep, generally poorly drained and underlain by a fragipan layer. Muck soils are wetland soils with deep organic layers ranging from 18-inches deep to greater than 14-feet. Tunbridge-Woodstock soils are generally quite productive for tree growth. Cabot soils are productive, but since soils tend to be poorly drained there is often a danger of internal rot and stem breakage. Muck soils are not productive for tree growth.

Stand Structure: Uneven-aged.

Stand History: This area has been forested for at least 85 years, though most of the trees are younger than that. The entire stand was logged in the early 1990s. There is a small inholding parcel within this stand. It would be advisable to purchase this small inholding.

Wildlife: Beaver activity is evident near the wetlands. A vernal pool was found in the eastern portion of this stand in a small patch of dense hemlock.

Insects, Disease and Invasive Plants: Many of the white pines show evidence of white pine weevil damage and a small amount of white pine blister rust is present. Common buckthorn was found near the landing area.

Longterm Objective: Maintain a stand of mixed hardwoods and softwoods using uneven-age management techniques. Use a cutting cycle of 20 years with diameter objectives of 20-24 inches for white pine and red oak, 18-20 inches for sugar maple and eastern hemlock, 16-18 inches for yellow birch, white ash and black cherry, 14-16 inches for paper birch, spruce and fir.

Scheduled Treatment: 2009 Control invasive plants around the landing area. No commercial forest management activity is necessary here for the next ten years.

STAND: D-2

This stand is primarily in the northwestern portion of Parcel D. As with D-1, it is highly variable in species composition, quality and stocking. Stand descriptive data is taken from the management plan done by Redstart Forestry for the previous owner in 2003. Basal area and mean stand diameter have been adjusted using moderate assumptions of growth for the six growing seasons since sampling was done. This stand is similar to E-1 and the two should be folded together into a single stand when this Forest Stewardship Plan is updated in ten years.

The small section of this stand in the southwest corner likely should be folded into the larger B-1 in ten years.

Forest Type: Northern Hardwood

Natural Community: Northern Hardwood Forest

Acres: 7 (approximate)

Species Composition: Sugar maple (39%), yellow birch and white ash (12% each), eastern hemlock (8%), American beech (8%), and smaller amounts of eastern hophornbeam, white pine, red oak, black ash, red maple, paper birch, and balsam fir. Regeneration is well-established as seedlings and saplings of American beech, spruce, fir, sugar maple, striped maple and eastern hophornbeam.

Total Basal Area: 98 sq.ft./acre (adjusted for growth)

Acceptable Growing Stock Basal Area: 78 sq.ft./acre (adjusted for growth)

Number of Trees/Acre: 175 (adjusted)

Mean Stand Diameter: 10.1 inches (adjusted for growth)

Stocking: Adequately stocked above the B-line for even-aged northern hardwood stands.

Soil Mapping Units: Tunbridge-Woodstock (TrD) and Buckland (BvC). Tunbridge-Woodstock soils are formed over ledge at depths varying from 10-40 inches. This soil has moderately low available water capacity and medium f natural fertility. Buckland soils are generally moderately well-drained or well drained soils with a fragipan at 16-33 inches in depth. Both soils are productive for tree growth.

Stand Structure: Mostly two-aged.

Stand History: This area has been forested for at least 75 years and the entire stand was logged in the early 1990s

Wildlife: Large diameter, healthy beech trees were found here. These trees are valuable as a wildlife food source and should not be harvested in future activities.

Insects, Disease and Invasive Plants: Beech bark disease is common. Butternut canker has killed most of the butternut trees in this stand.

Longterm Objective: Manage this stand for the maintenance of a healthy northern hardwood forest using uneven-age management techniques. Maintain a minimum average basal area of 80 sq. ft./acre. Use diameter objectives of 20-24 inches for red oak, 18-20 inches for sugar maple, white ash and eastern hemlock and 14-18 inches for yellow birch and red maple.

Scheduled Treatment: No commercial forest management activity is recommended at present. Re-evaluate in ten years.

STAND: E-1

This stand is on a gentle to moderately steep side hill, above and west of Kidderhood Road. It is similar to stand D-2 on Parcel D, which is across the road.

Forest Type: Northern Hardwood

Natural Community: Northern Hardwood Forest

Acres: 36.8 (approximate)

Species Composition: Sugar maple (49%), American beech (14%), red maple (10%), paper birch (8%), white ash (6%) and smaller amounts of red oak, yellow birch, white pine, black cherry, eastern hemlock, eastern hophornbeam and aspen. Regeneration is not well-established. Where present it is dominated by shade tolerant species.

Total Basal Area: 104 sq.ft./acre

Acceptable Growing Stock Basal Area: 53 sq.ft./acre

Number of Trees/Acre: 162

Mean Stand Diameter: 10.8 inches

Stocking: Just below the A-line of the Northern Hardwood Stocking Guide.

Soil Mapping Unit: Tunbridge-Woodstock soils (TrD, TwE) are formed over ledge at depths varying from 10-40 inches. This soil has moderately low available water capacity and medium f natural fertility.

Stand Structure: Two-aged

Stand History: This area has been forested for some time and was logged approximately 15-20 years ago. It looks like firewood was the principal target of cutting.

Wildlife: Deer browse noted on young hardwoods.

Insects, Disease and Invasive Plants: Beech bark disease is common.

Longterm Objective: Promote a healthy mixed northern hardwood forest using uneven-age management. Expect a 20 year cutting cycle with diameter objectives of 20 inches for sugar

maple, white ash and red oak, and 16-18 inches for other species such as American beech and eastern hophornbeam.

Scheduled Treatment: None recommended at present. Re-evaluate in 10 years.

STAND: C-1

This stand is on rolling ledgy terrain between Brushwood Road and the southwestern boundary of Parcel D and is very similar to parts of stand D-1.

Forest Type: Mixedwood

Natural Community: Hemlock or Hemlock-Northern Hardwood Forest

Acres: 16.7 (approximate)

Species Composition: Sugar Maple (41%), Red Maple (29%), Hemlock (15%), White Pine (7%), American Beech and White Ash (4% each). Regeneration is not well-established. Where present it is dominated by Eastern Hophornbeam, American Beech, Striped Maple and ferns.

Total Basal Area: 68 sq.ft./acre

Acceptable Growing Stock Basal Area: 38 sq.ft./acre

Number of Trees/Acre: 139

Mean Stand Diameter: 9.5 inches

Stocking: B-line of the Northern Hardwood Stocking Guide.

Soil Mapping Unit: Tunbridge-Woodstock soils (TrD) are formed over ledge at depths varying from 10-40 inches. This soil has moderately low available water capacity and medium f natural fertility.

Stand Structure: Even-aged

Stand History: This area has been forested for some time and was logged approximately 15-20 years ago. It looks like hardwood pulp and hemlock were the principal targets of cutting. In addition an old camp exists on this stand at the intersection of Brushwood and Kidderhood Road. It is advisable to destroy and properly dispose of this old camp.

Wildlife: Deer browse noted on young hardwoods.

Insects, Disease and Invasive Plants: Beech Bark disease is common. Tipped over or broken trees indicate recent storm damage.

Longterm Objective: Promote a healthy mixed hemlock-northern hardwood forest using uneven-age management. Expect a 20 year cutting cycle with diameter objectives of 24 inches for white pine and red oak, 20 inches for sugar maple and white ash and 16-18 inches for other species.

Scheduled Treatment: None recommended at present. Re-evaluate in 10 years.

----- Insert Summary of Stands for Phase II Property ---

PARCELS C, D, & E
SUMMARY OF RECOMMENDED TREATMENTS

STAND	FOREST TYPE	RECOMMENDED TREATMENT
D-1	Mixedwood	2009 Control invasive, exotic plants. If possible, purchase small inholding. Mow landing annually.
D-2	Northern Hardwood	No activity. Re-evaluate in 2018.
E-1	Northern Hardwood	No activity. Re-evaluate in 2018.
C-1	Mixedwood	Destroy and properly dispose of old camp. Work to limit unwanted ATV access from Brushwood Road.
All		- Blaze and paint external property boundaries. - Protect old stone culvert on Brushwood Road at the main stream crossing. - Identify, map and maintain all internal trails that may be useful for recreation or future forest management activities.

Insert Management objectives and treatments for Bradford Parcel

VII. WILDLIFE

As described in section V, the Property is dominated by mid-successional forest (~30-100 years old), including northern hardwoods, softwoods (white pine and hemlock) and mixed hardwood/softwood. Early-successional forests characterized by high densities of seedlings, saplings, herbs and shrubs are present, but uncommon. They can be found in small patches where recent harvesting or natural disturbance has opened up the forest canopy. Vernal pools, stream systems and wetlands are a small but significant component of the Property, offering critical habitat for wildlife.

The area's residents include deer, moose, bear, snowshoe hare, beaver, amphibians, and a myriad of bird species including turkeys and migratory songbirds. The concentration of these animals is due largely to the abundance of mast-producing trees such as beech and red oak and the presence

of hemlock and pine wintering areas. Forested wetland complexes and vernal pools also provide key breeding, nesting, and feeding habitats for amphibians and birds.

There is also a 15-20 acre old growth northern hardwood forest (~185 years old) and a hemlock forest on the border between the Property and the Fairlee Town Forest. The northern hardwood forest includes a wet cove forest and a scrubbier hardwood forest on the ledges and boulders adjacent to the ridge tops. Additionally, some softwood swamps have just been identified for further study in the northern section of the property as part of a statewide inventory by VT Department of Fish and Wildlife. According to the Vermont Wildlife Action plan, softwood swamps provide habitat for 26 animal Species of Greatest Conservation Need and 33 plant Species of Greatest Conservation Need. The softwood swamp and wetland areas in the central portion of the Property are an area targeted as part of a 125-acre Special Treatment Area to protect both the habitat and the wildlife species that consistently use the wetland complex.

Moose and black bear populations benefit from the wetland complexes as well as regenerating hardwood forests. Both lowland and upland habitat is important to bear, moose, as well as bobcat. The Property's beechnuts and acorns could provide an important fall food source for bears. White tailed deer are also abundant on the Property, taking refuge in several dense hemlock stands that serve as important deer wintering areas. A 12.7-acre hemlock stand is considered to be a deer wintering area in the current use plan for the former French property. This is not recognized on the state deer wintering area maps, but is locally important. State-mapped deer wintering areas are found just east and south of the Property, as shown on Map J: Wildlife Habitat map.

There is an active beaver *(Castor canadensis)* population in the wetland complex in the central part of the Property as evidenced by numerous beaver-chewed trees and at least two well-maintained lodges. The dead, standing trees that line the Wallstrom Wetland are crucial habitat for flying squirrels (*Claucomys sabrinus*). Other mammals present include coyote *(Canis latrans var.)*, raccoon (*Procyon lotor)*, fisher (*Martes pennanti*) and porcupine (*Erethizon dorsatum)*.

The Property is in the direct path of the Connecticut River migration corridor cutting across Northern New England to the waters of Cape Cod Bay and Nantucket Sound. The Property is also recognized by University of Vermont Spatial Analysis Lab as a "hot block" for bird conservation in their "Important Bird Area" landscape-level analysis, due to its species richness and habitat area indices for roadless forest blocks. Their model predicted that this Property includes habitat for many migratory bird species that have been declining in New England-including yellow-bellied sap sucker (*Sphyrapicus varius*), Eastern wood pee-wee (*Contopus virens*), blue-headed vireo (*Vireo solitarius*), veery (*Catharus fuscescens*), wood thrush (*Hylocichla mustelina)*, black-throated blue warblers (*Dendroica caerulescens*), black-throated green warblers (*Dendroica virens*), Canada warblers (*Wilsonia canadensis*), blackburnian warblers (*Dendroica fusca*), and white-throated sparrows (*Zonotrichia albicollis*), four of which (veerys, wood thrush, black-throated blue warbler, and Canada warblers) are considered to be Species of Greatest Conservation Need by the recent Vermont Wildlife Action Plan.

Audubon Vermont has identified the landscape around the Brushwood Community Forest as the Orange Country Forest Bird Block, denoting its high importance to conserving bird species that

have a high proportion of its global breeding population in the Northern Forest region. The following is a summary from the Forest Bird Habitat Assessment and Management Recommendations, by Steve Hagenbuch at Audubon Vermont. Please see Appendix D for the full report.

The majority of the Property is most suitable to mature mixed-forest canopy and mid-story nesting and foraging bird species, including area sensitive species such as wood thrush, due in part to the dominance of pole and sawtimber sized trees, lack of habitat fragmentation, and contiguousness with similar habitat to the north, south, and east. High abundances of leaf litter also make this area of high quality for ground nesting species such as the ovenbird. Birds such as the black-throated blue warbler that nest in woody-stemmed understory vegetation may find suitable nesting and foraging sites however this forest layer is not a dominant feature. Blackburnian warblers, blue-headed vireos, and woodland raptors make use of the stands of white pine on the Crawford and French parcels. Keeping recreational trails, access roads and skid trails narrow will help to prevent nest predators and parasites into the forest interior.

Three patches of early-successional vegetation on the Property provide critical breeding habitat for declining bird species such as chestnut-sided warblers and white-throated sparrows, as well as feeding habitat by mature forest species such as scarlet tanager and wood thrush. Dense regeneration of seedlings and saplings of shade intolerant tree species and shrubs in new 1-acre group selections and patch cuts will provide nesting and foraging habitat for these birds. Early successsional birch stands are also used by American woodcock and ruffed grouse for cover, nesting and mating rituals. Damp areas in these stands can provide worms and other invertebrates for woodcock to feed upon, and throughout the winter, grouse will roost in these trees and feed heavily on unopened buds.

The Property's mixture of forest types and stand ages also support wild turkey *(Meleagris gallopavo)*, ruffed grouse (*Bonasa umbellus*), pileated woodpecker (*Dryocopus pileatus*), and many species of songbirds and raptors. The hardwood uplands and juxtaposition between forest and wetlands on the property provide an important nesting area for landbirds such as Canada Warbler (*Wilsonia Canadensis*) and Woodcock (*Scolopax minor*) and habitat for Wood Thrush (*Hylocichla mustelina*), Black-throated Blue Warbler (*Dendroica caerulescens*), Chestnut-sided Warbler, Eastern Wood Pewee (*Contopus virens*), Veery (*Catharus fuscescens*), Ovenbird (*Seiurus aurocapilla*), Wilson's Snipe (*Gallinago delicata*) and Yellow-bellied Sapsucker (*Sphyrapicus varius*).

In terms of regional context, Brushwood Community Forest sits on the edge of a large block of core habitat. It is regionally significant to wildlife as feeding, breeding, and nesting grounds. Contiguous forest habitat supports native plants and animals, including those species like bobcats and black bears that require large areas to survive. Such habitat, together with other important habitats such as wetlands, also supports natural ecological processes such as predator/prey interactions and natural disturbance. It also serves to buffer species against the negative consequences of fragmentation. For instance, many of Vermont 's native migratory songbirds, including the hermit thrush (Vermont 's state bird), generally require larger patches of relatively unfragmented forest habitat to ensure successful reproduction. In the absence of such habitat, these birds are greatly affected by increased rates of nest predation from raccoons, skunks,

squirrels, and chipmunks as well as nest parasitism from brown-headed cowbirds. Many of the native migratory songbird populations are now in decline due, in part, to the loss of contiguous forest habitat.

In addition to its importance as core habitat, the Brushwood Community Forest serves an important role in connecting habitat blocks in the region. Connecting lands, such as those bisected by roads or development can be more important than the comparatively lower quality habitat they contain may suggest because of the importance of this connectivity function. Movement of animals from one habitat patch to another is the most common function associated with connecting habitat. This function is particularly important for wide-ranging animals, such as bobcats and black bears, or for animals that require a great deal of space to meet their daily life needs, such as barred owls or otter. Although connecting habitat is often associated with wide-ranging mammals, it is equally important for animals with relatively small ranges. Spotted salamanders, for example, use connecting habitat in spring to move from their hibernation sites to breeding pools.

The value of connecting habitat is a function of both seasonal and spatial patterns of wildlife behavior. For example, connecting habitat may allow black bears to access important food resources during a specific time of year (seasonal), or it may prevent isolation of bear populations by allowing free exchange of breeding adults (spatial). Ultimately, connecting habitat can ensure that the habitat, movement, migration, and behavior requirements of most native plants and animals are conserved across a broad landscape.

The broader ecological value of connecting habitat is to join fragmented pieces of habitat, thereby reducing the deleterious effects of habitat fragmentation and population isolation. Linking small or otherwise isolated habitat patches may reduce the risk of local population extinctions by ensuring immigration, recolonization, reproduction, and exchange of genes for some plant and animal species.

General Wildlife Considerations

Overstory Inclusions

Overstory inclusions are small patches of forest cover that are distinct from the surrounding forest, but are too small to be treated as a separate stand. Examples include patches of softwood cover in hardwood stands, and/or patches of hardwood in softwood stands. Such inclusions increase the habitat diversity in an area, and provide feeding, nesting, and shelter opportunities that may not be available in stands of a single type. For example, coniferous overstory inclusions of spruce and fir can provide feeding, nesting, and winter shelter opportunities in deciduous stands that pure hardwood stands cannot provide. Likewise, deciduous overstory inclusions of beech and other hardwoods can provide mast and other foraging and nesting sites that pure coniferous stands cannot provide.

Overstory inclusions may result from either small-scale site differences, or variations in the past disturbance history of the stand. They can vary significantly in size, from a group of stems to an acre or more. It has been shown that wildlife use of overstory inclusions increases with the tree size class; more species use the saw-timber size class than the regeneration size class. While larger inclusions may more significantly diversify available habitat, smaller inclusions are also

very important. The value of a small inclusion increases proportionately to how different it is from the surrounding forest. Even a single hardwood tree in a pure softwood stand can greatly increase the variety of habitats. Over a quarter of New England's bird species and a lesser number of mammals use overstory inclusions in one way or another. Therefore, the objective for forest management will be to maintain and regenerate inclusions of softwood cover in predominantly hardwood stands and inclusions of hardwood cover in predominantly softwood stands. (DeGraaf et al. 1992, NHDRED 1997)

Permanent Forest Openings

Permanent forest openings are areas that are usually less than 10% stocked with trees and are dominated by grasses, forbs, brambles, and fruiting shrubs. Although these areas represent only a small portion of Vermont's landscape, they may contribute a disproportionately high share of wildlife habitat to the overall forest environment. These areas provide necessary habitat for about 22% of New England's wildlife species, and are seasonally important habitat to nearly 70% of species. They are valuable to wildlife because with more light reaching the forest floor, the number of plant species available increases, thus diversifying the forest structure and providing seasonally important foods. Habitat components for many woodland species are also made available, and new habitats for open and edge-adapted species are provided. The value of these openings depends largely on the surrounding landscape. For example, such openings will be more beneficial in large expanses of continuous forest than in areas containing a mixture of forest and non-forested habitats.

Prior to European settlement, these non-forested habitats were found mostly in wet areas and in areas cleared by Native Americans. With the expansion of agriculture through the 1800s, these habitats increased greatly. However, for the last 150 years this type of habitat has been declining as forests returned on abandoned pastures. It has thus been suggested that 3-5% of forestland should be maintained in permanent forest openings to maintain this habitat. Topography, aspect, size of the opening, and distance to other openings will influence the use of new openings by wildlife and will be considered when planning cutting operations. The primary sources of permanent forest openings in a managed forest are remnant meadows and pastures, as well as log landings created during harvesting operations that are maintained afterward. In general, an opening of moderate size with a southern exposure will be most useful, especially when other openings are not already available within an otherwise mature forest. Overall, the objective in forest management should be to create or permanently maintain openings dominated by grasses, forbs, or shrubs within forest-dominated upland landscapes. (Oliveri 1988, NHDRED 1997)

Beaver-created Openings

Beaver are renowned for their manipulation of water, and the ecological changes associated with it. The activities of beaver in a forested landscape create a series of habitats: from newly flooded areas, to stagnant ponds, to open meadows. Initially, nutrients are released from the soil into the water, supporting a wide variety of plant and animal communities. Nutrients then accumulate in the bottom organic matter as water flow decreases. When beaver eventually abandon these flowages and water levels drop, the organic matter decomposes, allowing grasses and forbs to colonize the area. In time, shrubs and trees reoccupy these beaver meadows and the cycle continues.

Each of these successional stages provide habitat for a variety of wildlife species. Frogs, turtles, otter, mink, and other species thrive in the open water stage of beaver-created openings. Wood ducks, black ducks, and other waterfowl depend on beaver flowages for feeding, nesting, and brood-rearing habitat, as well as refuges during the autumn migration. Hooded mergansers, common golden eyes, owls, wood ducks, tree swallows, woodpeckers, and other cavity-nesters use the dead and dying trees created when the flooding occurs. Different species of swallows and flycatchers are attracted to these areas because of the abundant insect populations and perch sites. The diverse vegetation of the wetland edge attracts species such as yellow warblers and common yellowthroats. Herons, eagles and ospreys also use these habitats for feeding and nesting. Because of the early "green-up" along these wetland edges and at beaver meadows, species such as moose, deer, and bear are attracted to these areas as well.

Besides benefiting wildlife, beaver flowages also influence water quality. Their dams reduce erosion by trapping sediments, thereby recycling nutrients that would have been washed further downstream. Wetlands created by beavers can also slow spring run-off, decrease downstream flooding, and help in groundwater discharge. Therefore, beaver and their habitat should be recognized as essential components of a healthy diverse forest ecosystem. Specific plans to encourage beavers would have objectives such as maintaining hardwoods, especially aspen, along drain ways in places where beaver dam-building activity and subsequent wetland openings are desired, and where water levels can be controlled so that damage to roads and personal property is minimal. (Diefenbach et al. 1988, NHDRED 1997)

Beaver's ability to influence water bodies could potentially cause problems for forest roads, and potentially forest health and tree survival. The Town of West Fairlee in coordination with the State of Vermont (and UVLT for Parcel B only) and in accordance with the terms of the Easements can monitor beaver activity and its impacts on the Brushwood Community Forest.

Deer wintering areas

In Vermont, White-tailed deer live near the northern-most edge of their geographical range in the northeastern U.S. Because of the severe winter conditions experienced in this area, deer require special habitats called deer wintering areas, or deer yards, to help them survive. These areas are typically lowland softwood stands, usually associated with waterways and riparian habitat. Compared to more open areas, these softwood stands provide shelter from harsh winter weather by reducing snow accumulation and wind speeds, allowing for overhead thermal cover, and increasing nighttime temperatures and relative humidity. Because of the young hardwoods growing intermixed with the softwood, they also allow access to food supplies as well as escape from predators. These factors all serve to reduce heat loss and energy demands placed on the deer in winter when food availability and quality is reduced. Yard size varies from small yards of only a few dozen acres to thousands of acres, and the number of deer present in the yard varies with size. Overall, deer wintering areas compromise 9% of the land base in Vermont.

Two basic habitat elements need to be present in order for an area to be classified as a deer wintering area. These are: 1) a core area identified by concentrations of dense softwoods, and 2) mixed hardwoods and softwoods adjacent to or within the core area which provide accessible forage. The severity of the winter often determines whether a certain area is used as a wintering area in a given year. In mild winters, deer often use habitats further away from dense softwood

stands, which may be used during severe winters. Proper management planning for deer wintering areas should provide at least 50% of the entire area in functional shelter at all times - meaning softwood cover at least 35 feet tall with crown closures averaging 65 to 70%. The remainder of the wintering area should be in younger age classes that will provide hardwood browse and softwood regeneration that will provide shelter in the future. Also, because not all available browse is good quality for deer in winter, preferred foods such as red maple, sugar maple, mountain maple, striped maple, hobblebush, and birch should be retained whenever possible. In order to allow for deer mobility and access throughout the wintering area, it has been suggested to manage unbroken, dense lanes of softwood cover at least 200 feet wide as sheltered travel corridors, utilizing existing networks of softwood riparian habitat wherever possible.

Besides benefiting deer, managing existing deer wintering areas will ensure a continued yield of forest products and abundant regeneration. Also, diversifying the age and size classes of softwoods will provide quality habitat for a large variety of wildlife species. Therefore, a forest management objective should be to manage existing and potential deer wintering areas to provide shelter, travel lanes to access food, escape from predators, and access to preferred browse. (Wiley 1988, NHDRED 1997)

Mast

"Mast" is the nuts, seeds, and fruits of woody plants that provide food for wildlife, and are broken down into two categories. "Hard mast" refers to nuts and seeds, while "soft mast" refers to fruits and berries. Hard mast is a very nutritious food, containing high levels of fat and protein. This is important in contributing to fat stores critical for migration in species such as wood duck, or hibernation in species such as bears and raccoons. It is also important to the survival of newly fledged young such as cedar waxwings and robins. Birds and mammals depend heavily on mast during peak production periods either in late summer, early fall, or during the winter when sources may still be available on trees and shrubs, on the ground, or stored in caches.

While many trees and shrubs are mast producers, some are more important than others in terms of wildlife value and merit special attention. In terms of hard mast, beech trees provide an especially important autumn food for black bears in New England. Often these trees will be scarred with claw marks on the trunk or there will be clumps of broken branches in the crown where they sat and consumed beech nuts. Beech nuts are also important to a number of other wildlife species including raccoons, red squirrels, White-tailed deer, ruffed grouse, spruce grouse, wild turkey, and rose-breasted grosbeak. Birches are also important mast producers because of their abundance and the fact that they retain much of their seed crop above the snow through the winter. Many small birds and mammals rely on birch seeds, including redpolls and pine siskins. Softwood trees including white and red pine, white, red and black spruce, hemlock, tamarack, and balsam fir are important seed sources for wildlife, especially because of its availability in winter. Many birds and small mammals, including mourning doves, chickadees, crossbills, finches, grosbeaks, pine warblers, nuthatches, mice, voles, and red squirrels make use of softwood mast.

As with hard mast, there are a number of important soft mast species that are beneficial to wildlife. Black, pin, and choke cherry provide abundant fruit that are eaten by many birds and mammals. Wild apple trees are also extremely valuable as wildlife food. Wild apples are eaten by a wide variety of wildlife species, including deer, bear, fisher, grouse, and various songbirds. Many shrubs also produce valuable food for wildlife, including alder, mountain ash, beaked hazelnut, dogwood, blueberry, raspberry, viburnums, and elderberry. Because all of these sources of mast are critical to wildlife survival, it is important to manage mast producing trees for a continuous source of wildlife food and quality seed for regeneration. (Oliveri 1988, NHDRED 1997)

Cavity trees, dens, and snags

Cavity trees, den trees, and snags are terms used for dead or partially dead standing trees possibly with existing cavities, which are essential to the well being of many kinds of wildlife. Collectively, the term "wildlife tree" includes both snags and cavity/den trees. Snags can either be classified as hard snags, which often have some limbs remaining and fairly sound sapwood, or soft snags, which usually have no limbs and are in the advanced stages of decay. Dead or dying standing trees provide roosting, perching, foraging, and nesting sites for roughly 40 species of birds. 18 mammals use natural or excavated cavities in forested habitats for nesting, roosting, or denning. These species require a wide range of cavity-tree size classes in order to provide suitable shelter. Bats and brown creepers also use the spaces beneath the loose bark of dead or dying trees as resting sites. Large old trees that have been spared from harvesting and natural disaster events are often referred to as "legacy trees" and provide similar habitat benefits as wildlife trees by providing diversity age classes into a forest matrix.

Many of the species that use wildlife trees, especially cavity-nesting birds, are insectivorous. These birds help to decrease populations of insects that attack trees, buffer epidemic outbreaks, and increase the effectiveness of insects that parasitize those insects attacking the trees by chipping the bark off of infested trees. One benefit of this biological control is reduced economic loss in damaged trees. However, regardless of their role in insect control, these birds (and all other species that use wildlife trees) are part of the forest community, a fact that seems reason enough to justify preservation of suitable habitat.

The use of a wildlife tree by a certain species depends both on the characteristics of the tree (live/dead, DBH, height, type of decay), and of the surrounding vegetation (species composition, age, stand size). Larger trees with cavities are more valuable since they are known to accommodate more species - including providing resting sites for pine marten and fisher, as well as a place for them to raise their young. Also, the presence of heart-rot allows for easier excavation, and sound sapwood provides insulation from temperature extremes and protection from predators. Snags and wolf trees (very large, wide-spreading mature tree that likely grew alone in a field without competitors) that do not currently have cavities are also very important components of the habitat. They provide foraging sites and perches for insectivorous birds, kingfishers, and raptors. They also provide singing perches for many species of songbirds, and nest sites for species like great blue herons and ospreys. Therefore, a forest management objective would be to retain snags and den trees (a minimum of six per acre - one exceeding 18 inches DBH and three exceeding 12 inches DBH) in order to help maintain populations of cavity-nesting wildlife. (Elliott 1988, NHDRED 1997, Hagenbuch 2008)

Coarse Woody Debris

Coarse woody debris refers to dead trees or portions of trees lying on the forest floor, including logs, stumps, limbs, upturned tree roots, and slash. Such material may play several roles in forest ecology including soil moisture and nutrient cycling, providing a base for the growth of new trees ("nurse logs"), harboring fungi that aid in nutrient retention and cycling, and providing habitat for wildlife. Coarse woody debris is used as habitat by over 30% of the region's mammal species (mostly rodents, shrews, and carnivores), 45% of amphibians (primarily salamanders) and 50% of reptiles (mostly turtles and snakes). It is used as feeding sites by rodents, shrews, black bears, and woodpeckers, and provides shelter for many species of small mammals. Seventeen species of Vermont mammals also den in or around downed logs. Moist micro-habitats are created when downed logs cause the formation of pools and riffles in streams, which provide important fish habitat, as well as basking, and nesting locations for turtles, waterfowl, mink, and otter. Ground-nesting birds (including juncos and winter wrens) also nest within upturned tree roots. Dead and downed material provides habitat for lower organisms, which contributes to the food chain - including insects and other invertebrates, mosses, fungi, and lichens. It is also used as lookout sites, preening and drumming sites, and natural bridges across streams.

In general, larger (18+ inches) hollow or rotten logs and stumps have the highest value for wildlife. Softwood stands also seem to contain more and longer-lasting woody debris than hardwood stands. However, the amount of dead and down material is low in many of Vermont's forests. It has been viewed as fuel that creates fire hazards, as potential wood products that should be salvaged, and as physical barriers to forest operations and regeneration. As forests are maturing, the supply of dead and down material is naturally increasing due to the older trees dying and falling over. Factors that could reduce the supply of such material include greater utilization of cull material through chipping or whole tree harvesting, increasing the intensity of forest management, and the shortening of rotation lengths. Therefore, it is important to manage for dead and down woody debris in forests by retaining material that currently exists and allowing its accumulation where it is currently missing. (Elliott 1988, DeGraaf et al. 1992, NHDRED 1997)

Vernal pools

Vernal pools are small depressions in the ground that fill with water during the melting of snow in the spring, or during the accumulation of rain in autumn. They may also fill when the groundwater level rises above the level of the depression, and they have no inlet or outlet. Because vernal pools lack fish (due to the pool being temporary, too warm, too shallow, oxygen poor, or because they may freeze in winter), they provide a unique habitat for a number of aquatic organisms that would otherwise be prey for fish - including many species of amphibians. For example, wood frogs and mole salamanders only breed in vernal pools, and ten other species of reptiles and amphibians use these habitats for breeding or feeding.

Vernal pools exist throughout the Property. Such pools provide important breeding habitat for various amphibians including wood frog (*Rana sylvatica*), spring peeper (*Pseudacris crucifer*), spotted salamander (*Ambystoma maculatum*), Jefferson's salamander, blue-spotted salamander, northern Leopard frog (*Rana pipiens*) and red spotted newt (*Notophthalmus viridescens*). Deep

vernal pools, like the ones on the Property, provide the long-lasting habitat that is essential to amphibian reproduction. Adequate conservation of this resource would require maintenance of appropriate forested buffers. These will be taken into account as part of timber sale restrictions. Eventually, it may be possible to map some or all of the pools.

Insects and invertebrates, including tiny snails and clams, also live in vernal pools. While some may spend part of their life cycle in other habitats besides vernal pools, a number survive in the mud during dry periods. During these times, matted and discolored leaves in a small depression may be the only evidence that signifies this area as a vernal pool. So, while vernal pools are quite inconspicuous, they provide critical habitat for a number of species - and protection of these pools is especially important in maintaining local amphibian populations. Management of vernal pools for amphibian habitat would include maintaining trees surrounding the pools to avoid increases in temperature or siltation. Hiking trails should not be located adjacent to vernal pools. (NHDRED 1997)

Woodland raptor nest trees

In Vermont, many species of raptors - including red-tailed, red-shouldered, broad-winged, sharp-shinned, northern goshawk, and Cooper's hawks - build large stick nests in the major forks of mature hardwoods and on whorls of large branches of white pines. Many species often reuse the same nest year after year. Some may build a new nest nearby, while others may remodel a nest originally constructed by another species. However, suitable trees for supporting large stick nests are limited in present-day forests in Vermont. This is especially critical for those species of concern in Vermont, including the red-shouldered hawk, northern goshawk, and Cooper's hawk. Compounding this problem is the fact that these raptors can be sensitive to human disturbance as well as habitat changes in the vicinity of their nests. Excessive activity around their nests during the early weeks of the breeding season may cause a pair to abandon the nest. It may also cause the female to flush from the nest, leaving the eggs vulnerable to predation or fatal chilling. Therefore, it is important to manage for suitable nest trees for woodland-nesting raptors and avoid disturbance of nesting pairs. (NHDRED 1997)

Recommendations

Wildlife Management

Many features of these Easements and this Forest Stewardship Plan will have favorable impacts on wildlife using the Property. Foremost of these is the simple act of preserving the Property in a relatively undeveloped state and thus preserving valuable habitat, which would otherwise be lost.

Additional active steps already mentioned include:

- Creating Special Management Areas and buffers in areas of special ecological significance
- Taking steps to protect vernal pools during timber harvesting activities
- Creating areas of early successional forest growth through patch cutting
- Preserving micro-habitats through appropriate tree selection and use of "dead" wood
- Encouraging recreational use in areas of lower ecological significance and discouraging recreation in areas of greater ecological sensitivity

The Town of West Fairlee also wishes to prescribe forest management treatments that will benefit interior forest birds such as Canada Warbler, Wood Thrush, Veery and Olive-sided Flycatcher. Timber management can be used to improve forest structure including a diversity of age classes. Ensuring multiple age classes in trees and shrubs provides a variety of habitat types for a multitude of wildlife species.

Natural Resource Inventory

Identification and inventory of different ecological features of the Property could be an active and valuable element of a local educational program. This could include one or more of the following optional actions:

- Conducting a botanical survey that may identify rare species on the Property;
- Conducting a survey of resident, breeding and migratory birds that use the Property; and/or
- Identification and mapping of vernal pools in early spring when vernal pool amphibians are breeding (Calhoun 2000).

Wildlife monitoring

After baseline data on habitats has been established the Town of West Fairlee may consider creating a wildlife population monitoring program. With assistance from partner organizations such as VT Audubon, possible grant funding, and the recruitment of energetic volunteers, this annual collection of wildlife data can become a critical component of ongoing stewardship efforts, and can add an active and participatory element to an environmental education program.

The goal of wildlife monitoring is to collect population information to see how management (or lack of management) of specific habitats is affecting wildlife populations over time. Some examples of the types of monitoring projects appropriate for the region and these timber types are:

1) Woodcock singing ground surveys

   These surveys are conducted in order to look at woodcock populations and to determine how these populations fluctuate from year to year. Survey protocol should be consistent with the U.S. Fish and Wildlife Services North American Woodcock Singing Ground Survey.

2) Grouse drumming surveys

   These surveys are used to assess the current grouse populations and to track population changes over time.

3) Breeding song bird surveys

   These surveys are usually conducted during late May through early July in the very early morning. Observers note species of birds heard, as well as the types and sizes of vegetation nearby.

4) Track surveys

   Track surveys could be used to look at animal activity in the winter throughout different areas and habitats throughout the Property.

VIII. RARE SPECIES & EXEMPLARY NATURAL COMMUNITIES

As maintenance and protection of biological diversity and integrity is a main stewardship goal for this Property, management activities will promote a forest that reflects a diversity of stand ages and naturally occurring forest types in a majority of the forest. Special attention will be given to the conservation of rare and exemplary natural communities, and the conservation and enhancement of native plant and animal species and their habitats, including, but not limited to, the establishment and retention of a range of sizes and types of downed woody debris, snag trees, cavity trees, occasional very large/old trees, and early successional habitats.

Although the Brushwood Community Forest property has no known occurrences of endangered or species of special concern, within a three-mile radius there are 18 natural heritage sites that would likely be affected on a landscape level if this land were converted to non-forest use. This cluster of species occurrences, has been designated as a Biodiversity Hotspot in Vermont by the Vermont Biodiversity Project (Marshall 2000, see Map H: Brushwood Forest Wildlife Habitat Map). These species include the Fairlee Bog Pond-four-toed salamander (*Hemidactylium scutatum*), a species of special concern in Vermont and several plant species including the state-threatened Ram's Head Lady's Slipper (*Cypripedium arietinum*), and two plants of Greatest Conservation Need: Guadalupe Naiad (*Najas guadalupensis*) and Vasey's Pondweed (*Potamogeton vaseyi*). In addition, several unique natural communities also occur nearby including a Dwarf Shrub Bog and a Poor Fen.

Further east on the Palisades above the Connecticut River, several other plant species can be found including one state-endangered species: Bentgrass (*Calamagrostis stricta* ssp. *inexpansa*, four state-threatened species: Slender Mountain-rice (Oryzopsis pungens, state-threatened), Harsh sunflower (*Helianthus strumosus*), Northern Wild Comfrey (*Cynoglossum virginianum var. boreale*), and Nodding Stickseed (*Hackelia deflexa* var. *americana*), two Species of Greatest Conservation Need: Smooth False-foxglove (*Aureolaria flava*), Drooping Bluegrass (*Poa saltuensis*), and two other rare plants: Fogg's goosefoot (*Chenopodium foggii),* and Downy Woodmint (*Blephilia cilata*). Peregrine falcons (*Falco peregrinus*) and state-endangered Timber Rattlesnakes (*Crotalus horridus*) and are also known to occur here.

On the western and southern side of the former Bradford parcel, there is approximately 17.5 acres of Hemlock-Balsam Fir-Black Ash Seepage Swamp within the wetland complex, an uncommon (S3) natural community type in Vermont. This is considered a state-significant example of this natural community type, due to its size, condition, and the condition of the landscape in which it occurs (a nearly 11,000 acre unfragmented habitat block). Seepage swamps such as this one develop under the influence of ground water discharge along the swamp margins. This seepage water discharge tends to be high in minerals (especially calcium) and this results in very characteristic plant species (black ash, swamp saxifrage, golden saxifrage, delicate-stemmed sedge, and many others) that define this and other types of seepage swamps (Sorenson, 2011).

IX. WATER RESOURCES

The Brushwood Community Forest is situated directly within the Brushwood Hills, the closest contiguous 10,000-acre forest block to the Connecticut River's main stem south of the Nulhegan/Victory/Kilkenny regions. From a broad perspective, the Brushwood Community Forest helps protect the ecological integrity and water quality of the Connecticut River, as well as Lake Fairlee and Lake Morey. In addition the Brushwood Community Forest indirectly protects Phase II?→(nearby drinking water sources such as the Bradford Water Commission land), which was purchased as a future drinking water source for the town, and numerous private wells that serve residents of West Fairlee and Fairlee.

Rivers and Streams

The Property contains 2.5 miles of first order streams, according to GIS analysis of the state hydrology data. The southern portion of the Property contains the headwaters of Blood Brook, which drains into Lake Fairlee, a 457-acre lake that provides recreation opportunities for the community, as well as habitat for cold water and warm water fish. The northern portion of the Property contains the headwater stream and wetlands of Millpond Brook, which is a tributary of the Waits River, which quickly joins with the Connecticut River.

Wetlands

There are approximately 85 acres of palustrine wetlands found on the Property based on GIS analysis of the National Wetlands Inventory data layer and Vermont Significant Wetlands Inventory. These are classified as evergreen forested wetlands that are seasonally flooded or semipermantly flooded. As is typical for beaver influenced wetlands, the presence and extent of open water fluctuates greatly depending upon the yearly beaver activity (Arrowwood 2005). These wetlands are a part of a larger 85-acre wetland complex that includes those found on the Fairlee Municipal Forest. Speckled alder, red maple, red spruce and balsam fir are found on the edges of the wetland, with ferns in the understory and high amounts of snags and coarse woody material. These areas serve important functions in providing habitat and maintaining, or improving, water quality. Wetlands are protected by the State of Vermont and all management activities will be designed to preserve their integrity. Riparian management zones have been identified in order to protect water and other natural resource values on the Property (See Map H, Special Management Areas Map).

The large 85-acre wetland, which straddles Brushwood Road, contains a large Emergent Marsh, dominated by blue joint-grass (*Calamagrostis canadensis*), tussock sedge (*Carex stricta*) and wool-grass (*Scirpus cyperinus*). There is a high water table in this area and numerous channels of water running through the meadow. To the west of the emergent marsh is a Spruce-Fir Tamarack Swamp that is also found on the Property. According to Arrowwood Environmental (2005), this is the largest and probably the most significant conifer swamp in the town. The majority of the swamp appears not to have been affected by beaver flooding. There is a scattered canopy of fir (*Abies balsamea*) and white pine (*Pinus strobus*) and a moderately dense shrub cover of speckled alder (*Alnus incana*). The herbaceous layer is dominated by cinnamon fern (*Osmunda cinnamomea*), lake sedge (*Carex lacustris*) and dewberry (*Rubus pubescens*). This swamp seems to be in very good condition with no signs of invasion by non-native plant species and little or no evidence of human disturbance (Arrowwood Environmental, 2005). It provides

conditions favorable to Canada warbler, a species suffering significant declines, as well as alder flycatcher and olive-sided flycatcher.

Special Treatment Area

The 85-acre wetland complex will be protected by an approximately 120 acre Special Treatment Area, the goal of the STA is to serve as an ecological reserve for the protection of the natural resources and biodiversity, through the inclusion of riparian and buffer areas. The area contains element occurrences of Hemlock-Balsam Fir-Black Ash Seepage Swamp, an uncommon (S3) natural community type. This is considered a state-significant example of this natural community type, due to its size, condition, and the condition of the landscape in which it occurs. Being part of the headwaters of the Mill Pond Brook, the wetland complex receives ground water discharge from seeps or springs. Therefore, the surface and near surface waters in these swamps have relatively high concentrations of dissolved minerals, leading to rich soils for unique plant species, such as the Swamp Fly Honeysuckle (Lonicera oblongifolia) a rare (S2) plant, also found within the STA.

X. RECREATION AND EDUCATION

The Property has been used for hiking, hunting, and recreating for generations. Through the terms of the Forest Legacy Easements passive non-commercial public access is granted to the Property provided it does not conflict with the other purposes of the Easements. Public access will create opportunities to connect trail networks on nearby Fairlee municipal forests, benefit the local and regional tourist economy, and provide health benefits for residents and visitors alike.

Passive Pedestrian Recreation

In accordance with the Easements, the Property shall be available to the public for all types of non-commercial, non-motorized, non-mechanized, non-equestrian dispersed recreational purposes including, but not limited to hiking, hunting, fishing, wildlife viewing, backcountry skiing, snowshoeing, and environmental education. Trails throughout the region connect people to the landscape and to each other by linking towns and providing a place for year-round recreation. The Lake Morey Trails Association currently maintains over ten miles of trails that connect the Lake with the Fairlee Municipal Forest. Multiple logging roads and trails already cross the Brushwood Community Forest and could be improved to create links between town forests (see Map C: Access & Recreation Map).

The most notable trail in existence for pedestrian use is the Cross Rivendell Trail. For the past five years, students at the Rivendell School have designed and constructed the Cross Rivendell hiking trail, spanning close to forty miles in four towns and two states. The trail begins in Chelsea, Vermont and terminates at the top of Mt Cube in Orford, New Hampshire, where it joins with the Appalachian Trail. One of the last remaining links in the trail crosses the Brushwood Community Forest on its way to Bald Top Mountain. This link was completed in 2007 and its permanent protection under the Vermont Forest Legacy program helps ensure the future of this trail system that has been so successful at connecting children with their local forests.

The Town of West Fairlee Conservation Commission plans on assessing the pedestrian trail needs during their first ten years of ownership. However two potential new hiking trails are proposed as follows:

1. Blood Brook Road to Bald Top Link – From the proposed Brushwood Community Forest Parking Area off Blood Brook Road to Bald Top Mountain, linking with the Cross Rivendell Trail.
2. Beaver Wetland Nature Trail – From Brushwood Road south to the beaver wetland that straddles the Brushwood Community Forest and Fairlee Municipal Forest. This trail will be constructed in accordance with the recommendations of the Vermont Audubon Forest Bird Habitat Assessment supplied with this Forest Stewardship Plan as Appendix D.

Trails will be monitored as needed by the Conservation Commission and they will be responsible for overseeing any repairs or improvements and coordinating with the State of Vermont (and UVLT regarding Parcel B) or other interest groups as necessary (current roads and trails are shown on Map B: Topographic and Parcel Map.) New trails will be routed to avoid any adverse

impact on wetlands, springs, riparian areas, and other sensitive natural features. To prevent increased predation of birds and nest parasitism, trails will be less than 25 feet in width and, if possible, a forest canopy closure of greater than 70% will be maintained. All new trails will be constructed and maintained in a manner to minimize environmental impact, be compatible with other uses in the forest, and be in accordance with the Easements and the "Best Management Practices for Erosion Control During Trail Maintenance and Construction" (State of New Hampshire, Department of Resources and Economic Development, Division of Parks and Recreation, Trails Bureau, 1996).

Equestrian, Mechanical, and Motorized Recreation

Recreational uses such as snowmobiling, mountain biking, horseback riding, and ATV use are permitted only on designated trails and only at the discretion of the Town of West Fairlee in accordance with the Easements. The current status of these forms of recreation are listed below.

Two snowmobile trails, operated by the Vermont Association of Snow Travelors (VAST), cross the Property (see map C: Access and Recreation Map). The trail that crosses Parcel A is a designated snowmobile trail approved by the West Fairlee Conservation Commission. The Conservation Commission will work with VAST and the State of Vermont (and UVLT regarding Parcel B) on any maintenece or management issues relating to this trail or future snowmobile trails. The second trail follows Brushwood and Kidderhood Roads and is under the jurisdiction of the towns of West Fairlee and Fairlee since these are class IV town roads. The Town of West Fairlee does not intend to create any new snowmobile trails at this time.

Currently there are no designated mountain biking or horsebackriding trails, however the West Fairlee Conservation Commission will consider any proposals for the creation of such trails at their regularly scheduled meetings and will coordinate with the State of Vermont (and UVLT regarding Parcel B) on the creation and location of any new designated trails for these uses.

Recreational ATV use is not permitted on any portion of the Brushwood Community Forest Phase I pursuant to the terms and restrictions of Conservation Easement #2, which applies to Parcel B only, and pursuant to the discretion of the Town of West Fairlee for all other parcels (Parcels A, C, D, and E). Conservation Easement #1 allows recreational use of ATVs only at the discretion of the Town and only in designated corridors. Class IV town roads are not part of the Property nor are they controlled by the terms of the Easements. However, the Brushwood Community Forest Phase II (previously Bradford Town Forest), is permitted for ATV use on designated trails. The Town of West Fairlee has approved the use ATVs on Class IV roads such as Brushwood Road and Kidderhood Road, as well as trails including, the Hemlock to Doe Orchard trail (which starts at the Knobloch property and runs to the mill), the Hemlock to Sand Landing, and the short trail that parallels the wetland complex known as the Thurston trail. However, the fourth trail, a spur loop off of Doe Orchard is not an a designated ATV trail due to steep topography and proximity to persistent wet areas of the trail. (See Map K: Brushwood Community Forest ATV Access Map for trail designation)

Camping

There are currently no campgrounds or camping areas located on the Property and camping is not allowed without permission from the Town of West Fairlee. The West Fairlee Conservation

Commission will consider any proposals for the creation of camping areas at their regularly scheduled meetings and will work with the State of Vermont (and UVLT regarding Parcel B) to ensure that this use is in accordance with the terms of the Easements.

Managing Public Access

The Town of West Fairlee and Vermont Department of Forest, Parks, and Recreation agree to cooperatively monitor public access to and use of areas that are ecologically fragile to ensure that the current ecological conditions and the purposes of the Easements are not diminished or degraded by the public. Access to the property may be closed or restricted by either the Town of West Fairlee or the of Vermont (or UVLT with regard to Parcel B) for public health and safety reasons or to protect the properties natural resources and ensure compliance with the terms of the Easements. Concentrated public use causing erosion or degradation of the landscape, hunting out of season, threat of fire, or danger from active timber harvesting operations are all examples of issues that may require either the Town of West Fairlee or the State of Vermont (or UVLT with regard to Parcel B) to restrict public access. Both the Town of West Fairlee and the State of Vermont (and UVLT with regard to Parcel B) will work in good faith to manage and maintain public access to the Property according to the terms of the Easements.

The Town of West Fairlee will notify and work with the State of Vermont and UVLT with regard to Parcel B, if restriction of public access is deemed necessary. The Town of West Fairlee will alert the public using temporary signs regarding any active timber harvesting operations on the Property. The Town of West Fairlee will exercise care during timber harvesting operations to avoid affecting or blocking public trails as much as possible.

Parking

Two parking areas are planned for the Brushwood Community Forest as follows:

1. Brushwood Community Forest Parking Area – Located at the log landing on Parcel B off of Blood Brook Road.
2. Cross Rivendell Trail Parking Area – Located at the intersection of the Cross Rivendell Trail and Blood Brook Road on Parcel A.

Potentially could have a parking area for a few cars near the Sand Landing?

The West Fairlee Conservation Commission will coordinate the creation of these parking areas with the State of Vermont, UVLT with regard to Parcel B, and the West Fairlee Select Board. The Conservation Commission will also be responsible for coordinating annual maintenance, mowing, plowing, or grading as necessary (see Map C: Access and Recreation Map).

XI. HISTORIC OR CULTURAL RESOURCES

Numerous stonewalls are located throughout the Property, delineating old pastures and old property boundaries. Some old stone foundations may still exist from the homesteads of these early settlers. The most notable historic and cultural resources are not located on Property however, but are adjacent to it. These include the Asa May House (also known as Blood Brook Farm), located on Blood Brook Road, which is listed on the National Register of Historic Places and the old Blood Brook Saw Mill (currently inactive) also on Blood Brook Road, which dates back to about 1800 and according to the West Fairlee Historical Society is considered the oldest existing saw mill in Vermont.

XII. PROPOSED ACTION SCHEDULE

Year 2009-2010: Listed in Order of Priority

1. Blaze and Paint All Boundaries
2. Control Invasive Plants: Parcel A, Stands A-1, A-2, A-4: Control invasive plants; Parcel B, Stands B-1 & B-4: Examine for the presence of invasive plants and implement control measures if plants are found; and Parcels C, D, and E, Stand D-1: Control invasive plants.
3. Parcels C, D, and E, Stand D-1: If possible, purchase small inholding. Mow landing annually.
4. Parcels C, D, and E, Stand C-1: Destroy and properly dispose of old camp. Work to limit unwanted ATV access from Brushwood Road.

Year 2010-2015

- Construct Parking Areas
  - Brushwood Community Forest Parking Area on Parcel B
  - Cross Rivendell Trail Parking Area on Parcel A (should be done as part of or post timber sale)
- Construct New Trails
  - Bald Top Trail Connection - Brushwood Community Forest Parking Area to CRT
  - Trail from Brushwood Road to southern Wetland on Parcel D.
- Create Trail Map
- Maintain Parking Areas, Trails, and Signs.
- Parcel A, Stand A-1: Shelterwood Thinning (following good pine seed crop)
- Parcel A, Stand A-2: Clear 0.5-1.0 acre Landing Area
- Parcel A, Stands A-3, A-4, A-5: Individual Tree, Small Group Selection

Year 2030

- Reevaluate Conditions & Management of Property
- Begin Forest Stewardship Plan Revision
- Consider Conducting Timber Cruise & Developing Timber Harvesting Plan

Year 2021

- Complete Forest Stewardship Plan Revision

Needs to be updated with what was accomplished in 2009-2010

XIII. LITERATURE CITED

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XIV. SIGNATURE PAGE & STATEMENT OF STEWARDSHIP ETHIC

Stewardship is an ethic recognizing that the land and its natural inhabitants have an inherent worth and that we have a responsibility to manage our actions as part of that. It guides us to manage our activities to the utmost of our abilities, to insure the future health, productivity, and well being of the land, its natural communities and species, and to allow our successors opportunities at least equal to ours to use the land and its resources.

The Vermont Stewardship Program encourages and assists non-industrial forest landowners to become good forest stewards and actively manage their forests and related resources to benefit both themselves and future generations. This Forest Stewardship Plan will help to guide the Town of West Fairlee in actively protecting and managing their forestland and related resources.

The signatures below indicate the approval and certification of this Forest Stewardship Plan by the following parties.

FEE OWNER
Town of West Fairlee
Select Board

_____
By: Patricia Ayres Crawford, Select Board Chair

_____
By: Maurice Eaton, Select Board Member

_____
By: Doug Sonsalla, Select Board Member

EASEMENT HOLDER
State of Vermont
Department of Forests, Parks, & Recreation

_____
David Paganelli
State Forester for Orange County