

MILL BROOK CONSERVATION AREA
(PROPOSED)

TOWN OF NORTHFIELD

PRELIMINARY NATURAL RESOURCE, ACQUISITION AND MANAGEMENT
ASSESSMENT



Prepared by:

Legacy
Partners, LLC
The Land is our Legacy

Legacy Partners, LLC
P.O. Box 202 ▪ Greenfield, MA 01302 ▪ Tel. 413-772-2146

TABLE OF CONTENTS

	Page
Background	3
Overview of NMH Land Holdings	4
Mill Brook Site Summary	5
Mill Brook Site Map	7
Mill Brook Tax Parcel Map	8
Overview of Mill Brook Parcels	9
Natural Communities	12
Historical Values	14
Recreation Values	18
Property Management Issues	20
Acquisition Process	22
Acquisition and Management Expenses	24
Sources of Funds	25
Miscellaneous.....	25
Appendix	26
A. Bird List	
B. Natural Community Descriptions	
C. Historical Images	
D. Public and Private Sources of Grant Funds	
E. List of Property Abutters	

Background

In January 2004, the Board of Trustees of the Northfield Mount Hermon School (NMH) announced plans to close the Northfield campus of the school and consolidate operations at the Mount Hermon campus in neighboring Gill, Mass. The Trustees also announced that they were actively pursuing alternative uses for the Northfield campus and surrounding property.

In response to the decision by the Board of Trustees, the Town of Northfield, acting through the Board of Selectman, established the Northfield Transition Committee to respond to issues generated by the closure and pending reuse of school property. This committee is comprised of local citizens and members of various Town Boards, including the Board of Selectman, Finance Committee, Planning Board, Conservation Commission, Open Space Committee and others.

In January 2006, the Transition Committee, acting through its sub-committee on Recreation and Conservation, hired Legacy Partners, LLC to conduct a preliminary natural resource and management assessment of property owned by NMH along Mill Brook in the center of Northfield. This assessment describes the ecological, historic, and recreational features of the site and makes recommendations for the possible acquisition and management of the land for conservation and recreation purposes. Potential funding sources for the acquisition and long-term management of the property are also identified.

This assessment is based on information provided by members of the Transition Committee, NMH staff and consultants, interviews with local residents and volunteers, and site visits. Other information was collected from published data sources, including the Northfield Assessor's records, Northfield Historical Society, the Massachusetts Natural Heritage Program and Mass GIS, the Commonwealth's geographic information clearing house.

Members of the sub-committee are: Nick Fleck, Chair, Sue Ross, Kathy Wright, Nathan Tufts, and Alex Stewart. Joan Deely provided technical assistance to the project.

Overview of NMH Property Holdings

Northfield Mount Hermon School owns approximately 2,028 acres of land in the Town of Northfield. These holdings can be summarized as follows:

- Core Campus – The core campus consists of about 250 acres. 30 buildings constitute approximately 578,178 gross square feet;
- Residences -- Twenty four off-campus residences in the town center of Northfield, consisting of 6 two-family residences and 18 single family residences;
- East Northfield Water Company – A reservoir and associated watershed lands totaling approximately 375 acres. The Water Company provides all the water to the campus and to 230 private households in the Town of Northfield;
- Open Space Property -- In addition to the watershed land, the school owns about 900 acres of forestland and 90 acres of agricultural land. These lands include significant timber stocks, important natural habitats, and an extensive foot and snowmobile trail network. Portions of the property are contiguous to the Northfield/Warwick State Forest.
- Golf Course – The school owns and operates a nine-hole golf course on about 60 acres in the town center of Northfield.

Mill Brook Site Summary



The area selected for this assessment consists of approximately 117 acres of land located in the center of Northfield along Mill Brook. Approximately, Twenty-three acres are located on the west side of Main Street off Mill Street adjacent to the Connecticut River, and ninety-four acres are located on the east side of Main Street, with frontage on Dickenson Road, School Street, Birnam Road and Holton Street. For discussion purposes the parcels are described as the Mill Brook “West” parcel, and the Mill Brook “East” parcel.

The Mill Brook west parcel is comprised of three tax parcels, including two small tracts of land adjacent to Mill Brook immediately down steam from the Main Street Bridge.

West Parcel:

Tax Parcel I.D. 17-A-23
Book 932, Page 48;

Assessed Value:

\$59,000

Tax Parcel I.D. 17-A-28
Book 932, Page 481;

\$6,700

17-A-27

\$5,900

No Deed Reference

The Mill Brook east parcel is comprised of two tax parcels.

East Parcel:

Tax Parcel I.D. 17-D-2
Book 763, Page 300

Assessed Value:

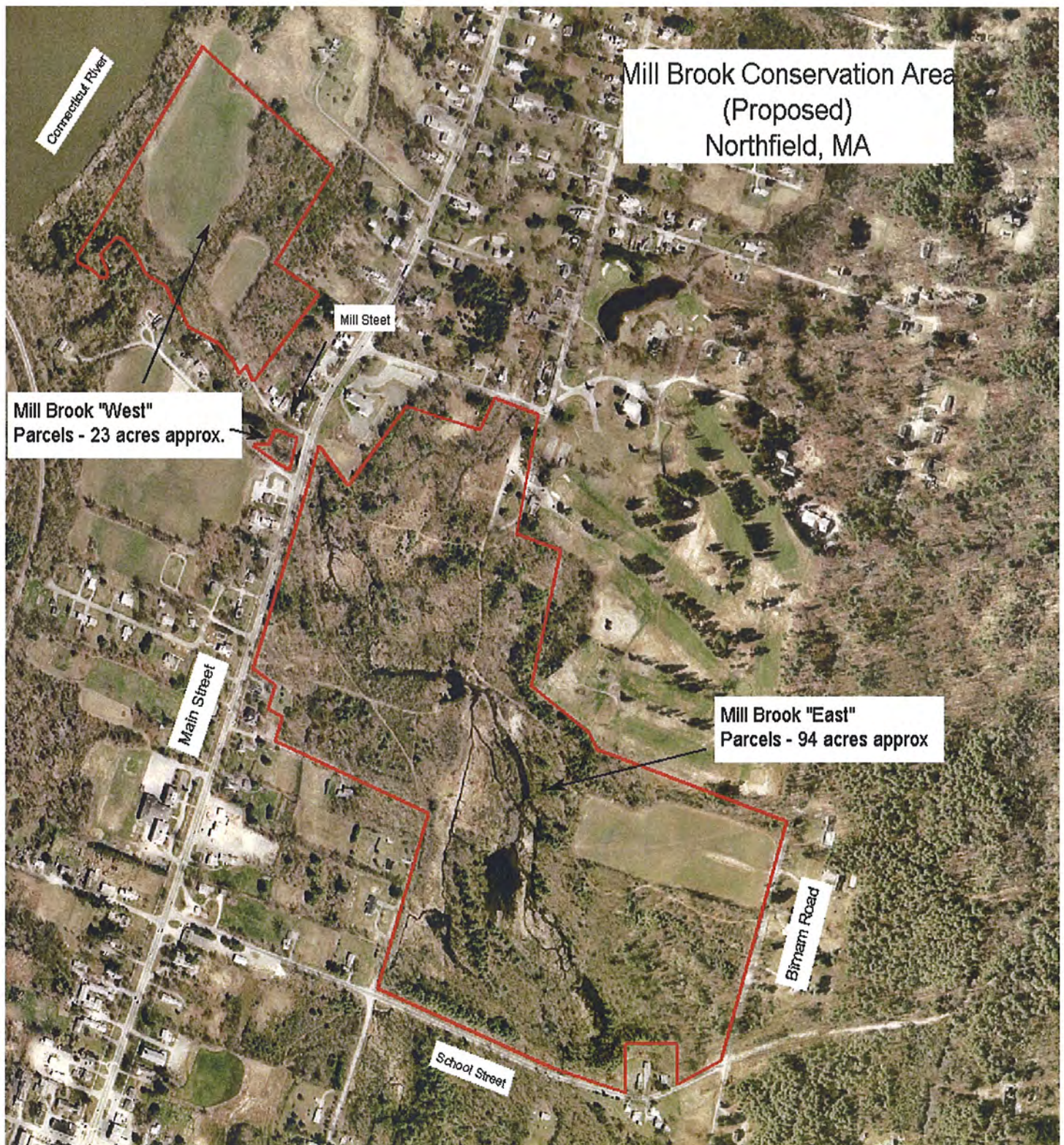
\$150,900

Tax Parcel I.D. 23-C-1
Book 763, Page 207

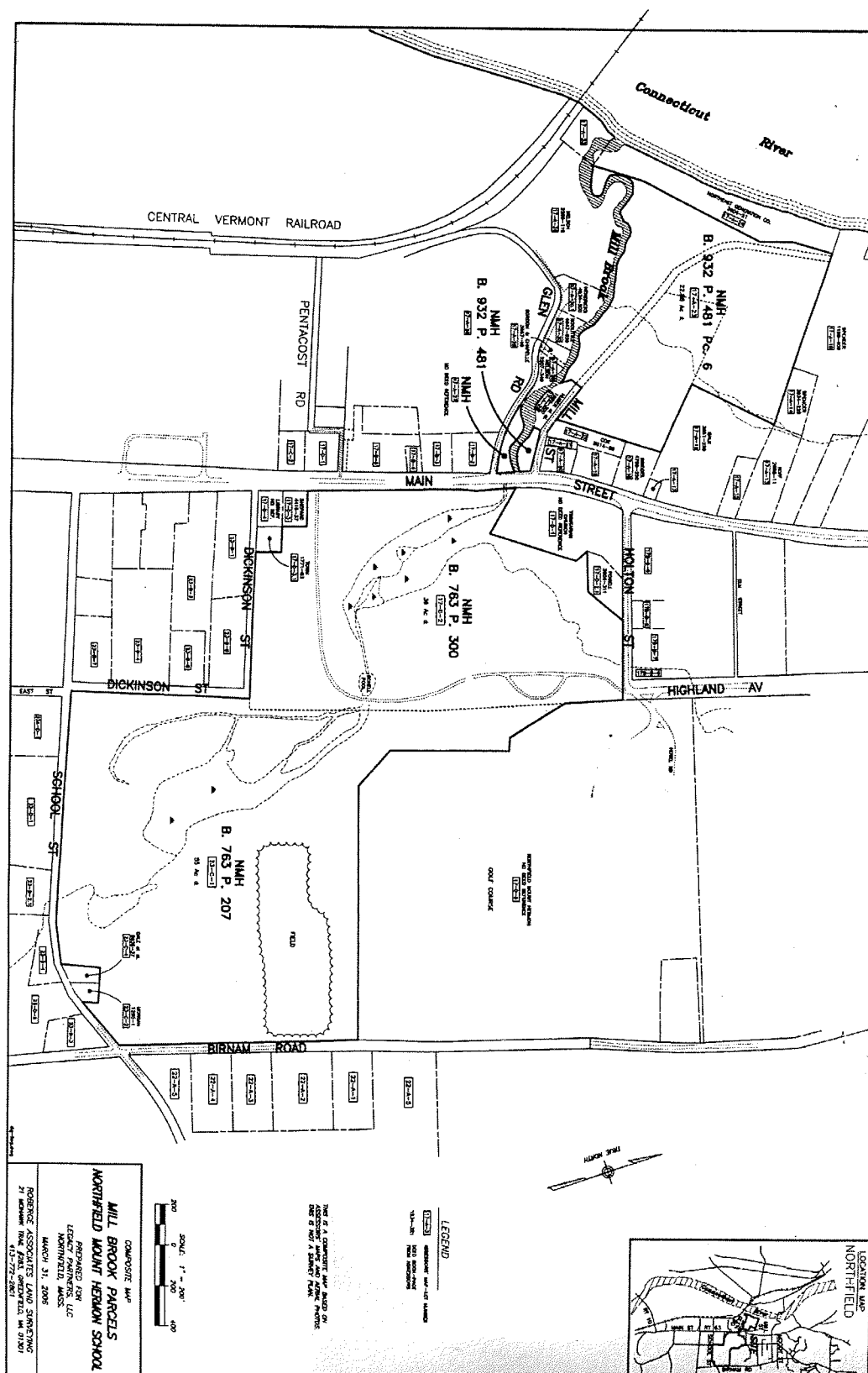
\$142,000

These tracts of land were identified for study by Transition Committee members because the sites are centrally located in the town, are readily accessible to local residents and are known to include meaningful historic, environmental and recreational values. In addition, the Committee determined that these tracts were potentially feasible for the Town to acquire and manage as a conservation area. Committee members felt that the Mill Brook parcels constitute a manageable project for the Town. However, the Committee believes that the remaining areas of NMH's open space land are also important resources to the Town and local residents.

Mill Brook Site Map



Tax Parcel Map



Overview of Mill Brook Parcels

Mill Brook rises in the hills in the Town of Warwick and flows in a westerly direction through Northfield, gathering tributaries along the way, until it cascades down a series of waterfalls and into the Connecticut River. The study area focuses on two segments of Mill Brook, one to the west of Main Street, and one to the east. This area is integral to the history of the Town and includes locations important to Native Americans, early settlers, travelers, farmers, transplants and present-day residents.

The entire property has a long history of repeated disturbances and intensive use. After initial clearing of pre-colonization forest, the land was used for agricultural purposes. A series of mills were constructed along the Mill Brook cascades on the west parcel. In the 18th century, Mill Street led to a ferry crossing on the Connecticut River; traces of the old road are still visible.

Around 1900, the east parcel was cleared of forest re-growth and maintained in a park-like state as part of the grounds of Birnam House, (known locally as The Chateau), the summer residence of Robert Francis Schell. The son of a wealthy New York diamond merchant, Schell became interested in the work of Dwight L. Moody, the founder of NMH. Two years were spent planning and building the ninety-six room residence with formal gardens and grounds. During this time Mill Brook was dammed to create a small lake.

The Northfield School, now known as NMH, acquired the property in 1930 following the death of Mr. Schell. The Chateau was annexed to the nearby Northfield Hotel, which was owned and operated by The Northfield School. In 1963, the Chateau was razed and later the bridge over Mill Brook was removed. In the 1970's, a flood washed out the dam for Schell Pond.

Today, the east parcel has reverted to naturalized upland woods and wetlands.



Evidence of past human activity is largely obscured. A series of nature trails on the property provide a pleasant walk through the area, and a snowmobile trail traverses one section of the property.



In recent years expanding beaver populations have constructed a series of dams along the brook. Water levels in the impounded areas have fluctuated significantly through a combination of beaver activity, high water events and beaver dam removal.



The area is currently used by local residences for walking, fishing, bird watching, dog walking, snowmobiling, nature education and general enjoyment. The property

contributes to the character of Northfield as a classic New England village. It includes some of the most significant historical attributes of the town (as described later.)

Natural Communities

One of the compelling features of the entire Mill Brook property is its wide range of natural communities. The site is located in the Connecticut Valley eco-region, as defined by the Massachusetts Natural Heritage and Endangered Species Program, Division of Fisheries and Wildlife. Because the area is integrated into the Village of Northfield, it has not been mapped as Core Habitat by the State, but as a tributary of the Connecticut River the Mill Brook parcels have locally significant natural attributes. Specific features include:

- **Cultural Grasslands/Prime Agricultural Land:** The property includes approximately twenty-five acres of open field that is currently used for hay production by local farmers. The soils for the Mill Brook “West” fields are comprised of Agawam fine sandy loam, a deep, well drained productive soil rated as a Class I soil for agricultural use by the USDA, Natural Resource Conservation Service. The soils for the Mill Brook “East” fields, located off Birnam Road, are comprised of Merrimac sandy loam, a well drained, productive soil rated as a Class II soil for agricultural uses. In addition to supporting local farms, these fields provide attractive views and provide habitat for many species of birds and wildlife that favor open land and edge habitat
- **Red Oak-Sugar Maple Transition Forest:** Historically, most of the upland within the study area was cleared, open land. Much of the upland area in the Mill Brook “East” parcel is comprised of a highly variable transition forest, including sugar and red maple, black cherry, hemlock, white pine, birch and oak tree species. A nearly pure stand of sugar maple along Main Street is managed as a sugar bush by the NMH farm program. Portions of the Mill Brook “East” site consist of mid-successional former pasture and open areas dominated by white pine, gray birch, oak species and aspen. This forest type supports a variety of neo-tropical migrants. These sites are heavily infested with Asiatic bittersweet, Japanese honeysuckle, Multiflora rose and Japanese barberry.
- **Forest Seep Community:** This small distinct natural community type is found on the Mill Brook “West” parcel along a ravine in the deep alluvial terrace adjacent to the Connecticut River. The upper portions of this ravine are dominated by northern hardwoods, including sugar maple and beech. The open forest floor affords views of Mill Brook as it cascades down the ledges along the old mill sites.
- **Major River Flood Plain Forest:** A small area located near the confluence of Mill Brook and the Connecticut River on the Mill Brook “West” parcel consists of flood plain forest, which extends onto adjoining property. These are species-rich areas for birds, insects, amphibians and small mammals.
- **Shrub Swamp:** Portions of the area formerly impounded by the Schell Pond dam, and more recently by beaver, is characterized by shrub-dominated wetlands. This is a highly variable area and offers excellent cover for amphibians and bird species, including waterfowl and herons.

- Shallow Emergent Marsh: Much of the former Schell Pond is characterized by shallow marsh areas that are flooded during periods of high water and beaver activity. This area, along with areas of open water, is attractive to great blue heron, waterfowl, and shore birds. Beaver, mink, raccoon, and otter all use this area. The existing nature trails adjacent to the marsh provide excellent opportunities for viewing wildlife.
- Mill Brook: The brook is a classic high quality cold water stream with resident populations of native brook trout. It is also stocked by the State for recreational anglers.

Please refer to the Appendix for summaries of different natural communities published by the Natural Heritage Program.

Please refer to the Appendix for a list of bird species observed on the property by Northfield resident Nick Fleck.

Due in large part to its history of intensive land use over the past century, the Mill Brook “East” parcel, in particular, has become infested by invasive plant species. In several areas, they constitute the dominant species. The trunks of some specimens of bittersweet are six inches in diameter. Species present include Asiatic bittersweet (*Celastrus orbiculatus*), Japanese barberry (*Berberis thunbergii*), honeysuckle (*Lonicera* spp) multiflora rose (*Rosa multiflora*) and glossy buckthorn (*Rhamnus frangula*).

Historical Values

The Mill Brook area is closely tied to the history of the Town of Northfield. From the pre-colonial settlement period to the present, this area is integral to the historical fabric of the community, as well as the Northfield Mount Hermon School. Transition Committee volunteers spent many hours researching the history of the Mill Brook area. These historical attributes are best summarized by a timeline compiled by Sue Ross, which is outlined below.

Please refer to the Appendix for archival photographs of the property.

1600-1669

Squakheag Indians from Coassock village settle along Mill Brook. Wigwams are situated near water falls in the picturesque glen. Wigwams are seen all the way down to the first terrace of the Connecticut River. The settlement serves as a camp for salmon fishing/smoking; adjacent meadows are used for farming.

1669

Following hostilities with the Mohawks, Squakheag Indians abandon the settlement.

1671

Squakheag Indians sell land to English settlers from Northampton.

August 16, 1673

First English settlement of Squakheag. Central Street is laid out “between the brooks”— Millers Brook constitutes the southern end and Mill Brook is the northern terminus.

September 3, 1675

During the King Phillips War, Indians attack Captain Beers and defenders of the Squakheag English settlement. Many are killed and the decision is made to abandon the settlement. Indians quickly move in and level the settlement.

1682

Second English settlement of Squakheag

1686

Miller John Clary of Hadley establishes a home and grist mill on the brook. The stream is formally named Mill Brook. A fort is built within sight of Clary’s mill.

1687

Town meeting votes to build a bridge over Mill Brook. John Clary is in charge.

August 16, 1688

John Clary, his daughter Sarah and four other settlers are killed in an attack by Indians allied with the French. The victims are buried just outside the fort. In

November, the decision is made to abandon Squakheag for the second time, leaving Deerfield exposed to attack.

1714

The Massachusetts General Court grants permission for a third settlement. Name of settlement is changed to Northfield

Summer 1717

Brothers Steven Belding and Jonathan Belding build a grist mill and a saw mill on the Clary site. "The Mill Brook, crossing the street in the middle of the village and falling in rapids to the big river, was the obvious site." (Parsons, Herbert C. A Puritan's Outpost, 1937. Pg. 99). The bridge is re-built and a dam constructed to create a mill pond to the east of the bridge.

1719-1723

A large log fort with watch towers is built on the John Clary lot on top of the bank above Mill Brook. The General Court regards Northfield as greatly threatened by the French and Indians and provides tax abatements, garrison soldiers and aid for fortifying houses. A cider press is set up on Mill Brook.

1723

Town of Northfield is incorporated as part of the Province of Massachusetts

1728

Jonathan Belding buys out his brother's interest the grist mill. Both mills remain in the family until 1812.

1748

Aaron Belding, age 22, is shot and scalped by an Indian whom he knows as he climbs over the ledge of rocks just above Mill Brook

1790's

Jabez Whiting of Warwick establishes a bark mill and tannery on Mill Brook. Jabez Parsons of Enfield, Connecticut establishes another tannery upstream. A distillery is established on the Boston Pike (now Warwick Rd.) by diverting the course of the Mill Brook and creating a pond to supply power for Strobridge's mill.

Early 1800's

Throughout the 1700's small parties of Indians appear around the Mill Brook during the summer. The last of the Squakheag tribes are seen in the early nineteenth century.

1830's

James White from Heath builds a great house on Mill Brook near his fulling mill.

1848

A railroad bridge is built over the Connecticut River just south of Mill Brook. Later a covered toll bridge is built below the railroad bed.

1874

George Long builds a saw mill on Mill Brook, west of Main St. on Glen Rd. The saw mill is at brook level, just downstream from the Henry W. Webster gristmill and is powered by a waterwheel with its own dam.

1875

Noted evangelist, founder of the Northfield School for Girls and Northfield native Dwight L. Moody returns. Arriving at the South Vernon station, he is driven across the river, up the hill (on what is now Glen Rd) to the Street, over the Mill Brook bridge and up the hill to his home.

1887

Hotel Northfield, with acreage adjacent to the Mill Brook area, opens.

1890

Francis B Schell, New York capitalist and his wife begin to summer in Northfield.

1891

Dickinson Library is built near site of Dickenson Fort, adjacent to the Mill Brook area.

1903

Francis B. Schell creates grand estate and constructs the chateau-like Birnam House, with spectacular view of the Connecticut Valley. His frontage on Main Street is blockaded by a high red fence, several ancestral homes are removed and the Mill Brook ponds on the east and west sides of Main Street are destroyed. Birnam House and the estate embrace a long stretch of the Mill Brook and are described by one writer as "a conspicuous but costly misfit in a New England town's architecture." Parsons, Pg. 401

1903 - 1928

Schell's estate eventually encompasses 125 acres. He creates a sunken garden in the Italian style just below the Chateau, and dams Mill Brook to create a small lake three-quarters of a mile long for the boating pleasures of his guests.

1930

The widowed Mrs. Schell transfers the Chateau to the Northfield Hotel Corporation (a subsidiary of The Northfield School).

1934-5

Chateau becomes the first Youth Hostel in America and serves as a guest house of the hotel during the summer months.

October 1963

Chateau is demolished. The carriage paths and Schell Pond continue to be used by The Northfield Inn guests until the mid- 1970's.

April 1977

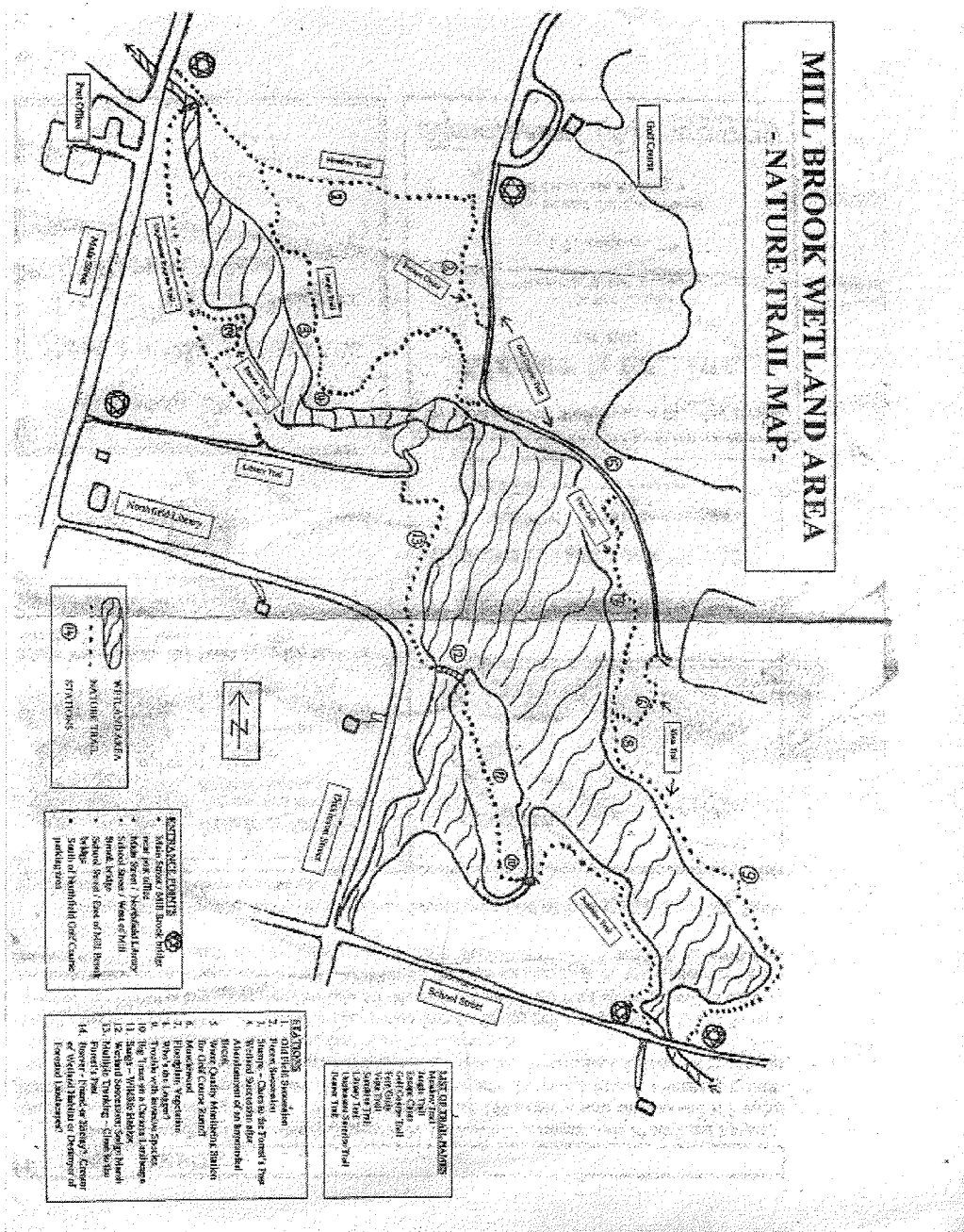
Northfield Inn (formerly Hotel Northfield) is demolished.

Recreational Values

An extensive system of walking trails traverse the Mill Brook “East” parcel, with boardwalks constructed over some wet areas. These trails are used for walking, bird watching, dog walking, and cross country skiing. Students from NMH and from Northfield Elementary School have used the site for environmental studies. The Northfield Snow Mobile Club maintains a snowmobile trail along the northern edge of the Mill Brook “East” parcel that connects with a region-wide network of snowmobile trails. Every spring, the Kiwanis Club sponsors a fishing derby for children in Schell Pond. The pond is stocked with trout; dozens of young people and their families enjoy a cookout and day of fishing.

When one examines an overview map of the NMH land holdings in Northfield, it becomes readily apparent that the Mill Brook parcels are the key link in the development of a potential Town-wide trail system connecting the Schell Bridge over the Connecticut River, through the Mill Brook parcels, to the existing trail network on the NMH property on Strobridge Hill. The Mill Brook parcels are the most direct link through the town center of Northfield for creating a trail corridor from the Connecticut River to the Northfield/Warwick State Forests and the Metacomet Monadnock Trail to New Hampshire and southern New England.

A beautiful trail network, established by NMH students and faculty, traverses the Mill Brook "East" parcel. Below is the trail map.



Property Management Issues

In the event the Town of Northfield acquires the Mill Brook property as a conservation area, clear lines of responsibility for management of the property will need to be developed. Either the Board of Selectmen or the Town Conservation Commission could be the lead town entity. The Conservation Commission has specific legal authority under the Massachusetts General Laws to manage town conservation land.

Given that the Town of Northfield does not have significant resources available to manage land, one model that has worked well in other communities is for the Town to enter into a management agreement with a private, non-profit organization to manage the property. Both the Mount Grace Land Conservation Trust and the Greater Northfield Watershed Association have expressed a willingness to consider this role, or a separate entity could be established for this purpose. Under this arrangement, the Town is the owner of the land, but the care and management of the property is the responsibility of the non-profit organization. This organization will organize a committee of local volunteers to support the general care and upkeep of the property. Volunteers could be drawn from the local snowmobile club, Kiwanis Club, Boy Scouts, neighbors and residents who already use and enjoy the property.

Based on an analysis of the existing condition of the property, and its anticipated use as passive recreation conservation land, it is estimated to cost about \$1,600 a year to care for the property utilizing the services of a non-profit organization and a committee of volunteers. In order to support the annual maintenance costs, an endowment would be established as part of the acquisition costs associated with the property. As the owner of the land, it is recommended that the Town hold the endowment as a special Town fund. A specific amount would be budgeted each year and provided to the non-profit organization for the upkeep of the property. A \$40,000 endowment, with a spending rate of .04% would yield an income stream of \$1,600. A specific break down of the annual expenses is provided on page 24.

A property management plan will also need to be prepared. The plan need not be complicated, but it should specify overall goals for the property, delineate lines of responsibility among the Town Boards and the non-profit organization, and establish local regulations such as hours of operation and restrictions on use (i.e. camping, alcohol consumption, fires, etc.). It is recommended that an ad hoc Committee of local residents, together with the non-profit organization, be convened to draft the management plan. As part of the initial acquisition expense, \$10,000 is budgeted for a project coordinator to work with the Town to develop the management plan. The project coordinator could either by an independent consultant or the non-profit organization could be hired for that purpose.

As passive recreation and conservation land, management considerations for the Mill Brook property would include the following activities:

1. Access Area – It is recommended that one location be selected as the major access point for public use. This one location would direct the access in a way to avoid conflicts with neighboring properties, and with appropriate signage establish the “identity” of the area as conservation land. Any rules and regulations would be

posted on the site. Two possible areas for the access area: a) adjacent to Main Street off the former driveway to Schell Pond (opposite the Pentacost Road), and b) adjacent to the intersection of Birnam Road and School Street. A one-time fixed expense of \$7,500 for site preparation is included in the acquisition budget on page 24, under the assumption that the Northfield Highway Department would prepare a parking area for 6-8 vehicles on a firm gravel surface.

2. Signs and Markers – The property should be identified with a sign, to be located in the parking area. Trail markers and signs indicating the property boundaries are recommended in order to avoid encroachment by neighbors. This is a fixed expense; however, it would require periodic maintenance by volunteers. The initial cost for the signs and markers is budgeted at \$5,000.
3. Trail maintenance – Periodic trail clearing and maintenance of the existing bridges and boardwalks would be necessary. This work would be done by volunteers, with an annual budget of \$500 for any materials needed. An annual “field day” for this purpose and general clean up would be a simple way to stay abreast of any general property issues.
4. Invasive Plant Control – It would be desirable, but not necessary, to control invasive species on the property. Such an undertaking would be very labor intensive. Work parties could be organized to work on areas along the trails and in the sugar maple stand with a focus on cutting and hand removal.
5. Agricultural land – Keeping the land open and available for farming is clearly a community objective. In accordance with state law, the Town is allowed to offer use of land for agriculture, provided such agreements are characterized as either use licenses or permits. If the goal is to encourage active farm use and sound land stewardship, it is recommended that at a minimum, five-year terms are provided to the farmer. This will encourage them to make the necessary investments in lime, fertilizer and take proper care of the land.
6. Beaver control – It may be necessary to control beaver activity in the event School Street is threatened with flooding. A policy on beaver control that complies with appropriate state regulations would need to be established as part of the management plan.
7. Forest Management – No specific forest management concerns were noted for this property. In the event the town acquires the property, decisions can be made concerning maple production and other forest management choices.

Acquisition Process

NMH's official policy is that no decision regarding the School's land holdings will be made until the disposition of the core campus is determined. The disposition and reuse of the core campus remains NMH's first priority.

Given NMH's extensive real estate holdings in the Town of Northfield, it is vitally important that the Town convey to NMH its sense of what is important to the community. Based on the deliberations of the Town's Transition Committee, Open Space Committee and Board of Selectmen, the conservation of the Mill Brook area has been determined to be of vital importance to the Town. In spite of that determination, however, the Town of Northfield does not have money for land purchases and maintenance. Accordingly, the following approach was developed to address both the needs of NMH and the Town of Northfield.

As the findings of the sub-committee clearly demonstrate, this 117-acre area is integral to the character of the Town of Northfield, and offers a wonderful recreation and conservation resource to Town residents. As NMH prepares to divest itself of its Northfield properties, one of its lasting legacies to the community would be a gift of conservation land to the Town. Comprised largely of wetlands, prime agricultural land, and other sensitive habitats, the property does not lend itself well to intensive development uses, nor does it add significant monetary value to NMH's real estate holdings. In fact, one could argue that as conservation land, the area would enhance the value NMH's remaining property.

One of the greatest challenges to managing the acquisition process, however, is the uncertainty as to if and when NMH might agree to donate the land to the Town. It is very hard to organize and sustain the energy necessary to put a property management agreement in place, and raise the necessary funds, if the outcome is uncertain. Therefore, it was determined that the most feasible way to proceed, was to ask NMH for a gift of the 117-acres, contingent upon the Town raising \$87,000 to cover acquisition and property stewardship costs, and establish a framework for the ongoing care and management of the property. Once it became certain to the townspeople that a gift of land could be realized, then an energized and empowered citizenry could go to work raising the funds and organizing the management structure for the property. No more than three years should be dedicated to the effort, and at the end of that time period the property be granted to the Town upon successful completion of the fundraising and organizing.

The budget outlined below includes the cost of a Phase I Environmental Site Assessment, and Title Examination. In the event NMH and the Town reach agreement, funds would be required for these activities, prior to the Town accepting title to the property. It should be noted that in at least three locations on, or adjacent, to the Mill Brook West parcel, dump sites were noted. These dump sites are in ravines along Mill Brook and on the banks of the Connecticut River. One local resident noted that it was the past practice of employees of the Northfield Hotel to use these sites as dumping grounds for the Hotel. It is recommended that these sites be investigated by a qualified environmental site inspector to determine if any threat to the public or environment exists.

It should also be noted that the legal title for the small tracts of land located immediately west of Main Street bridge may be ambiguous. The assessor's map indicates one of the parcels is owned by NMH, but no deed reference is available. A boundary survey and title examination is recommended for the entire site in order to sort out any specific ownership issues.

Neither of these technical problems should be obstacles for the Town and NMH completing the project, however. We are noting them here, so it will be possible to address them up-front in the acquisition process.

Acquisition and Management Expenses

One-time Acquisition and Transaction Expenses

Phase I Environmental Site Assessment	\$5,000
Title Examination and Legal fees	\$4,250
Boundary Survey	\$15,000
Closing fees and Misc. Expenses	\$250
Signs/Map and Trail Markers	\$5,000
Site work for parking area	\$7,500
Project Coordinator/Management Plan	\$10,000
Total	\$47,000

Annual Operating Expenses

Sign and trail marker maintenance	\$250	materials
Board walk maintenance	\$250	materials
Trail and Board walk Maintenance	Volunteers	
Invasive Plant control	Volunteers	
Liability Insurance	\$500	
Non profit management fee	\$600	
Total	\$1,600	

Endowment Fund

\$40,000	@	0.04	spending rate	\$1,600	Annual Income
----------	---	------	---------------	---------	---------------

Fund Raising Goal	\$87,000
--------------------------	-----------------

Sources of Funds

A list of twenty-two private foundations that have an ongoing interest in the protection of open space land and community development is included in the Appendix. This list was developed based on our past experience with some of these foundations and their criteria as listed in the Foundation Directory. See www.foundationcenter.org

In addition, public funding is available through the Commonwealth of Massachusetts for projects such as this; relevant programs are included in the Appendix. The Self-Help Program, administered by the Division of Conservation Services at the Executive Office of Environmental Affairs, is best suited for this project.

Miscellaneous

In order to assist with Town-wide mailings and other outreach efforts, a list of all the property abutters is also provided in the Appendix.

Appendix A Bird List

Bird List for the Mill Brook area - 2006*

W = winter '05-'06 (October-March)

Canada Goose	<i>Branta canadensis</i>	W
Mallard	<i>Anas platyrhynchos</i>	W
American Black Duck	<i>Anas rubripes</i>	W
Wood Duck	<i>Aix sponsa</i>	W
Hooded Merganser	<i>Lophodytes cucullatus</i>	W
Turkey Vulture	<i>Cathartes aura</i>	
Bald Eagle	<i>Haliaeetus leucocephalus</i>	W
Northern Goshawk	<i>Accipiter gentilis</i>	
Broad-winged Hawk	<i>Buteo platypterus</i>	
Ruffed Grouse	<i>Bonasa umbellus</i>	
Rock Dove	<i>Columba livia</i>	W
Mourning Dove	<i>Zenaidura macroura</i>	W
Barred Owl	<i>Strix varia</i>	W
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	W
Northern Flicker	<i>Colaptes auratus</i>	
Downy Woodpecker	<i>Picoides pubescens</i>	W
Hairy Woodpecker	<i>Picoides villosus</i>	W
Pileated Woodpecker	<i>Dryocopus pileatus</i>	W
Eastern Kingbird	<i>Tyrannus tyrannus</i>	
Eastern Phoebe	<i>Sayornis phoebe</i>	
Blue Jay	<i>Cyanocitta cristata</i>	W
American Crow	<i>Corvus brachyrhynchos</i>	W
Tufted Titmouse	<i>Parus bicolor</i>	W
Black-capped Chickadee	<i>Parus atricapillus</i>	W
Brown Creeper	<i>Certhia americana</i>	W
White-breasted Nuthatch	<i>Sitta carolinensis</i>	W
Red-breasted Nuthatch	<i>Sitta canadensis</i>	W
Golden-crowned Kinglet	<i>Regulus satrapa</i>	W
Ruby-crowned Kinglet	<i>Regulus calendula</i>	
Eastern Bluebird	<i>Sialia sialis</i>	
Hermit Thrush	<i>Catharus guttatus</i>	
American Robin	<i>Turdus migratorius</i>	W
Cedar Waxwing	<i>Bombus cedrorum</i>	W
European Starling	<i>Sturnus vulgaris</i>	W
Solitary Vireo	<i>Vireo solitarius</i>	
Black-and-white Warbler	<i>Mniotilta varia</i>	
Pine Warbler	<i>Dendroica pinus</i>	
Yellow Warbler	<i>Dendroica petechia</i>	
Northern Cardinal	<i>Cardinalis cardinalis</i>	
Song Sparrow	<i>Melospiza melodia</i>	
American Tree Sparrow	<i>Spizella arborea</i>	W
Chipping Sparrow	<i>Spizella passerina</i>	
Dark-eyed Junco	<i>Junco hyemalis</i>	W

White-throated Sparrow	<i>Zonotrichia albicollis</i>
Swamp Sparrow	<i>Melospiza georgiana</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
American Goldfinch	<i>Carduelis tristis</i>

*Species list follows National Geographic Society Field Guide Protocol

Birds Observed in the Mill Brook area*

June 24, 2005

Green heron	<i>Butorides virescens</i>
Rock Dove	<i>Columba livia</i>
Mourning Dove	<i>Zenaida macroura</i>
Northern Flicker	<i>Colaptes auratus</i>
Great Crested Flycatcher	<i>Myriarchus crinitus</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>
Red-eyed Vireo	<i>Vireo olivaceus</i>
Blue Jay	<i>Cyanocitta cristata</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Bank Swallow	<i>Riparia riparia</i>
Black-capped Chickadee	<i>Poecile atricapillus</i>
White-breasted Nuthatch	<i>Sitta carolinensis</i>
Veery	<i>Catharus fuscescens</i>
Wood Thrush	<i>Hylocichla mustelina</i>
American Robin	<i>Turdus migratorius</i>
Grey Catbird	<i>Dumetella carolinensis</i>
Yellow Warbler	<i>Dendroica petechia</i>
Black-and-white Warbler	<i>Mniotilta varia</i>
Ovenbird	<i>Seiurus aurocapillus</i>
Common Yellowthroat	<i>Geothlypis trichas</i>
Scarlet tanager	<i>Piranga olivacea</i>
Chipping Sparrow	<i>Spizella passerine</i>
Song Sparrow	<i>Melospiza melodia</i>
Swamp Sparrow	<i>Melospiza georgiana</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Common Grackle	<i>Quiscalus quiscula</i>
Baltimore Oriole	<i>Icterus galbula</i>
Purple Finch	<i>Carpodacus purpureus</i>
American Goldfinch	<i>Carduelis tristis</i>

*Species list follows American Ornithologists' Union protocol

Appendix B

Natural Community Descriptions

Classification of Natural Communities – Terrestrial

Community Name: CULTURAL GRASSLAND

Community Code: CT2B2A1000

SRANK: -

This distribution map focussed on cultural grasslands occurring on sandplains.

Concept: A human created and maintained open community dominated by grasses, normally maintained by mowing; primarily of conservation interest for the grassland bird community.

Environmental Setting: A grassland community that generally occurs on sand or other droughty, low nutrient soils. Surroundings, in many areas include Pitch pine / Scrub oak communities. Many small airports with surrounding grasslands were built on sand plains. Pastures and hayfields occur in all areas, and surroundings reflect the regional variations.

Vegetation Description: Airports, cemeteries, pastures, and hayfields provide different habitats, and support different species of plants and animals. Grasslands at many smaller airports are dominated by graminoids, usually little blue stem grass (*Schizachyrium scoparium*), Pennsylvania sedge (*Carex pensylvanica*), and poverty grass (*Danthonia spicata*), and many non-native species. Some cultural grasslands do have some mix of herbaceous species, such as goldenrods (*Solidago* and *Euthamia* spp.) and milk weeds including butterfly weed (*Asclepias* spp. and *A. tuberosa*).

Associations: Grasslands at airports tend to have more native grasses than do fields that are, or were recently, cultivated. Cemeteries are variable, some older ones have more native species than do more actively managed, newer cemeteries. Most cultural grasslands are mowed at least annually to maintain the grassland stage. Hayfields have fewest native species, but do support grassland birds.

Habitat Values for Distance to the coast and size of the grassland strongly affect the species that use a grassland. Many

Associated Fauna: species of birds that use grasslands are more common in the midwestern prairies and agricultural fields. Airports currently support Massachusetts' largest populations of Upland Sandpipers (*Bartramia longicauda*), Grasshopper Sparrows (*Ammodramus savannarum*), and Savannah Sparrow (*Passerculus sandwichensis*). Other grassland birds are found in different habitats - such as Bobolinks (*Dolichonyx oryzivorus*) in hayfield length taller grass, Eastern Meadowlarks (*Sturnella magna*) in pasture length short grass. Other grassland birds include Killdeer (*Charadrius vociferus*), Northern Meadowlarks (*Sturnella magna*), and Horned Larks (*Eremophila alpestris*). Meadow voles (*Microtus pennsylvanicus*), meadow jumping mouse (*Zapus hudsonius*), and the northern short-tailed shrew (*Blarina brevicauda*) would be expected in most grasslands. They would be hunted by garter snakes (*Thamnophis sirtalis*), long-tailed weasels (*Mustela frenata*), Kestrels (*Falco sparverius*), and wintering Northern Harriers (*Circus cyaneus*), Snowy Owls (*Nyctea scandiaca*), and Short-eared Owls (*Asio flammeus*).

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

Associated Rare Plants:

ASCLEPIAS TUBEROSA BUTTERFLY-WEED - WL

LUPINUS PERENNIS WILD LUPINE - WL

Associated Rare Animals:

AMMODRAMUS SAVANNARUM GRASSHOPPER SPARROW T

BARTRAMIA LONGICAUDA UPLAND SANDPIPER E

CYCINIA INOPINATUS UNEPECTED CYCNIA SC

CICINDELA PURPUREA PURPLE TIGER BEETLE SC

FARONIA RUBIPENNIS THE PINK STREAK T

POOECETES GRAMINEUS VESPER SPARROW T

Examples with Access is limited at airports. Massachusetts Military Reservation, Bourne and Sandwich;

Public Access: Orange Airport, Orange; Turner's Falls Airport, Turner's Falls; Logan Airport, Boston.

Threats: Exotics - especially cool season grasses that form mats. Common non-native species include sheep fescue (*Festuca ovina*), sweet vernal grass (*Anthoxanthum odorata*), velvet-grass (*Holcus lanatus*), bluegrass (*Poa pratensis*), timothy (*Phleum pratense*), and others.

Management Needs: Fire management plans should be produced and followed to introduce prescribed fire to the best examples. Reduce exotics where possible.

Synonyms

USNVC/TNC: Related to: Schizachyrium scoparium - Sorghastrum nutans - Herbaceous Alliance -- Schizachyrium scoparium - Sorghastrum nutans - Hypoxis hirsuta - Baptisia tinctoria Herbaceous Vegetation [CEGL006187]; Schizachyrium scoparium ssp. littorale shrub herbaceous Alliance [sparse woody Grassland] -- Myrica pensylvanica / Schizachyrium scoparium ssp. littorale - Danthonia spicata Shrub Herbaceous Vegetation [CEGL006067]; Danthonia spicata Herbaceous Alliance [possible, no association defined].

MA (old name): SANDPLAIN GRASSLAND - CULTURAL COMMUNITY

ME:

NH:

VT:

NY: Successional old field, Mowed lawn, Mowed lawn with trees.

CT:

RI:

Weatherbee:

Author: P. Swain **Date:** 7/1/99

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural

Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA.

Community Name: FOREST SEEP COMMUNITY

Community Code: CT1C2B1000

SRANK: S4

Concept: Hardwood forests on slopes, with small springs and seeps on mucky soils. Canopy is from or similar to, the surrounding forest, but shrub and herbaceous layers species are typical of wetlands or mesic areas.

Environmental Setting: Seeps may be near stream headwaters, or may be isolated with the water absorbed into the surroundings. They occur where the top of the ground water table intersects the surface, and the water emerges.

Vegetation Description: Canopy is usually northern hardwood species such as sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), red maple (*Acer rubrum*), yellow birch (*Betula alleghaniensis*), and white birch (*B. papyrifera*). Other sites have hemlock (*Tsuga canadensis*) spruce (*Picea rubens*), and scattered white pines (*Pinus strobus*) among the hardwoods. Ferns are typical: cinnamon fern (*Osmunda cinnamomea*), ostrich fern (*Matteuccia struthiopteris*), silvery spleenwort (*Deparia acrostichoides*), rattlesnake fern (*Botrychium virginianum*), and Christmas fern (*Polystichum acrostichoides*). Golden saxifrage (*Chrysoplegium americanum*) primarily occurs in seeps. Scouring rush (*Equisetum hyemale*), false hellebore (*Veratrum viride*), water avens (*Geum rivale*), an assortment of sedges are among the other plants found at seeps.

Associations: Presented as distinct from palustrine seeps, but may be just a small version.

Habitat Values for These small communities provide parts of the habitats of the species of surrounding communities.

Associated Fauna: Most tree dwelling species would not be affected by the presence of small seeps below. Star-nosed moles (*Condylura cristata*) would be expected in seeps of any kind. If the water from the seeps stays in topographic low areas those may function as vernal pools, and support vernal pool breeding species. Where even small amounts of sphagnum moss build up, four-toed salamanders (*Hemidactylium scutatum*) may be found, and in larger patches, Southern bog lemmings (*Synaptomys cooperi*) may be present.

Associated Rare Plants:

EQUISETUM SCIRPOIDES DWARF SCOURING-RUSH SC

PLATANThERA DILATATA LEAFY WHITE ORCHIS T

SPHENOPHOLIS PENNSYLVANICA SWAMP OATS T

SPIRANTHES ROMANZOFFIANA HOODED LADIES'-TRESSES E

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

Associated Rare Animals:

HEMIDACTYLIUM SCUTATUM FOUR-TOED SALAMANDER SC

POLYCELIS REMOTA SUNDERLAND SPRING PLANARIAN E

SOREX DISPAR LONG-TAILED SHREW SC

SYNAPTOMYS COOPERI SOUTHERN BOG LEMMING SC

Examples with Savoy Mountain State Forest, Savoy; Sunderland Fish Hatchery, Sunderland.

Public Access:

Threats: Exotic species: water-cress (*Rorippa nasturtium-aquaticum*), forget-me-not (*Myosotis scirpoides*), Yellow Iris (*Iris pseudacorus*), and Japanese barberry (*Berberis thunbergii*) can be abundant. Water flow needs to be maintained, large wells can impact small wetlands. Several locations have had natural mud or rock slides.

Management Needs: Exotic removals in sites where practical.

Synonyms

USNVC/TNC:

MA (old name): part of SNE SEEPAGE FOREST

ME: Not described.

NH: 1994: Northern Hardwood Seepage Forest

VT: Possibly a small type of Woodland Seep/Spring run community.

NY: Not described.

CT: Not described.

RI: Not described.

Weatherbee: Calcareous variant is part of Calcareous Seep Community.

Author: P. Swain **Date:** 8/4/99

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA.

Community Name: NORTHERN HARDWOODS - HEMLOCK – WHITE PINE FOREST

Community Code: CT1C000000

SRANK: S5

Concept: Closed canopy forest dominated by a mix of evergreen and deciduous trees, with sparse shrub and herbaceous layers.

Environmental Setting: Widespread in dry to mesic, moderately acidic conditions with moderate levels of nutrients. North facing slopes and ravines, and northern areas.

Vegetation Description: The community type ranges from Hemlock in pure stands to a deciduous forest with scattered hemlocks. There are variable combinations of hemlock (*Tsuga canadensis*), sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), yellow birch (*Betula alleghaniensis*), black cherry (*Prunus serotina*), and red oak (*Quercus rubra*), and white pine (*Pinus strobus*). Beech (*Fagus grandifolia*) occur on southeast facing slopes. There are often scattered paper birch (*Betula papyrifera*), aspen (*Populus tremuloides*), and red maple (*Acer rubrum*). The shrub layer is usually open, but, often containing scattered clumps of hobblebush (*Viburnum lantanoides*), red-berried elderberry (*Sambucus racemosa* ssp. *pubens*), fly-honeysuckle (*Lonicera canadensis*), and striped maple (*Acer pensylvanicum*). The herbaceous layer is sparse, but fairly diverse, with intermediate woodfern (*Dryopteris intermedia*), Christmas fern (*Polystichum acrostichoides*), clubmosses (*Lycopodium* spp.), Canada mayflower (*Maianthemum canadense*), white wood aster (*Aster divaricatus*), and wild sarsaparilla (*Aralia nudicaulis*). Occasional spring herbaceous species include painted trillium (*Trillium undulatum*), early yellow violet (*Viola rotundifolia*), broad-leaved spring beauty (*Claytonia caroliniana*), and trout-lily (*Erythronium americanum*).

Associations:

Habitat Values for Many animal species use parts of this type of forest, but geographical variation, structure, size, and

Associated Fauna: local conditions will affect which actual species are present. Many species of neo-tropical migrant songbirds nest in large numbers in larger occurrences, including a variety of warblers. Blackburnian warblers (*Dendroica fusca*) are particularly closely associated with hemlock stands. Northern Goshawk (*Accipiter gentilis*), Barred Owl (*Strix varia*), and Pileated Woodpeckers (*Dryocopus pileatus*) are also to be expected. Mammals include red squirrels (*Tamiasciurus hudsonicus*), gray squirrel (*Sciurus carolinensis*), chipmunks (*Tamias striatus*), redbacked vole (*Clethrionomys gapperi*), short-tailed shrew (*Blarina brevicauda*), masked and smoky shrews (*Sorex cinereus* and *S. fumeus*), and white-footed mouse (*Peromyscus leucopus*). At elevation, deer mouse (*P. maniculatus*) and woodland jumping mouse (*Napaeozapus insignis*) also occur in the forest type. Amphibians include redbacked salamanders (*Plethodon cinereus*) and wood frogs (*Rana sylvatica*); and expected reptiles include redbelly snakes (*Storeria o. occipitomaculata*).

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

Associated Rare Plants:

SOLIDAGO GLUTINOSA SSP RANDII RAND'S GOLDENROD E

Associated Rare Animals:

SOREX PALUSTRIS WATER SHREW SC

Examples with Mohawk Trail S.F., Charlemont; Jug End WMA, Egremont; Holyoke

Public Access: Range State Park, Amherst; Carlisle State Forest, Carlisle; Mt. Toby, Sunderland.

Threats: Exotics do well in the community. 1999- Hemlock hosts the non-native Woolly Adelgid, which usually kills a hemlock tree after it is fully infested.

Management Needs: Exotic control.

Synonyms

USNVC/TNC: Acer saccharum - Betula alleghaniensis -(Fagus grandifolia) Forest Alliance -- Acer saccharum - Betula alleghaniensis - Fagus grandifolia /Viburnum lantanoides Forest [CEGL006252];

Tsuga canadensis - Betula alleghaniensis Forest Alliance --Tsuga canadensis - Fagus grandifolia Forest [CEGL006088]; and Tsuga canadensis - Betula alleghaniensis Lower New England, Northern Piedmont Forest [CEGL006109]; Pinus strobus - Tsuga canadensis Forest Alliance -- Pinus strobus - Tsuga canadensis Lower New England, Northern Piedmont Forest [CEGL006328].

MA (old name): Part of: CNE MESIC CONIFER [Transition] FOREST ON ACIDIC BEDROCK/TILL and CNE DRY TRANSITIONAL FOREST ON SANDY / GRAVELLY SOILS [CT2E1B0000].

ME: Mixed hardwood - conifer forest; Hemlock slope community.

NH: Part of: Hemlock - beech -oak- pine forest; AND Semi - rich mesic sugar maple - beech forest; Includes: Hemlock forest; 1994 - Beech forest, Beech - Birch - Maple forest, and Semi - rich Mesic Forest.

VT: Mesic northern Hardwood forest [Beech - Birch - Maple forest] AND White Pine - Northern Hardwood forest; Part of Hemlock forest.

NY: Hemlock - northern hardwood forest AND Pine - northern hardwood forest.

CT: Acer saccharum - Fagus grandifolia - Betula alleghaniensis forests -- Acer saccharum - Fagus grandifolia/ Viburnum alnifolia community AND Acer saccharum - Fagus grandifolia / Dryopteris intermedia community AND Acer saccharum - Fraxinus americana - Tilia americana forests - Acer saccharum Fraxinus / Asarum canadensis community AND Acer saccharum - Fraxinus americana / Osmunda claytoniana community AND Acer saccharum - Fraxinus americana / Dryopteris noveboracensis community; AND part of Tsuga canadensis Forests.

RI: Hemlock - Hardwood Forest.

Weatherbee: Mesic Northern Hardwood Forest Community.

Author: P. Swain **Date:** 8/27/99

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA.

Community Name: RED OAK - SUGAR MAPLE TRANSITION FOREST

Community Code: CT1B300000

SRANK: S4

Concept: Forests with species of northern hardwoods (maples) and central hardwoods (oaks) together. Has few of the extreme northern or southern indicators.

Environmental Setting: Mesic forests of mid slopes, moderate nutrient availability, and not very acidic. Some sites, especially with abundant white pine, are old field successional, and others have been managed as woodlots and were selectively cut in the past, or may continue to be logged to the present. The understory reflects the history of the sites.

Vegetation Description: Northern red oak (*Quercus rubra*), sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), and black birch (*Betula lenta*), with an admixture of white pine (*Pinus strobus*) and hemlock (*Tsuga canadensis*) dominate the canopy in variable proportions. White oak (*Quercus alba*), red maple (*Acer rubrum*), white ash (*Fraxinus americana*), and yellow birch (*B. alleghaniensis*) are regular associates. Striped maple (*Acer pensylvanicum*), maple-leaved viburnum (*Viburnum acerifolium*), hobblebush (*Viburnum lantanoides*), and witch hazel (*Hamamelis virginiana*) are typical shrubs of primary transition forests, and lowbush blueberry (*Vaccinium angustifolium*), is abundant in the more coniferous dominated sites. The herbaceous layer is neither dense nor sparse, often with patches of clonal species, includes wild sarsaparilla (*Aralia nudicaulis*), bracken fern (*Pteridium aquilinum*), hay scented fern (*Dennstaedtia punctilobula*), clubmosses (*Lycopodium clavatum* and *L. obscurum*), Indian cucumber (*Medeola virginiana*), Canada mayflower (*Maianthemum canadense*), whorled wood-aster (*Aster acuminatus*) and broad-leaved woodland-sedge (*Carex platyphylla*).

Associations:

Habitat Values for This widespread forest type provides habitat to many, particularly to opportunistic, animal species.

Associated Fauna: White-tailed deer (*Odocoileus virginianus*) are classic users of this forest type, although certainly not limited to it. Fisher (*Martes pennanti*) use larger, older examples. Many species move through the forest between other, specific habitats: frogs and salamanders breed in vernal pools and other wetlands and use the uplands in the rest of the year. Most of the widespread small mammals would be expected in larger occurrences of the community.

Associated Rare Plants:

NONE KNOWN

Associated Rare Animals:

NONE KNOWN

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

Examples with Harvard Forest, Petersham; Jug End WMA, Egremont; East facing slopes of Taconics, northern
Public Access: Berkshire County.

Threats:

Management Needs:

Synonyms

USNVC/TNC: *Quercus rubra* - *Acer saccharum* - (*Q. alba*) Forest Alliance -- *Acer saccharum* - *Quercus rubra* / *Hepatica nobilis* var. *obtusa* Forest [CEGL006046]; *Quercus rubra* - *Acer saccharum* - (*Q. alba*) Forest Alliance -- *Quercus rubra* - *Acer saccharum* / *Viburnum acerifolium* - *Corylus cornuta* Forest [CEGL006173]; *Quercus rubra* - *Betula alleghaniensis* / *Osmunda cinnamomea* Forest -- *Quercus rubra* - *Betula alleghaniensis* / *Osmunda cinnamomea* Forest [CEGL006000]; *Tsuga canadensis* - *Betula alleghaniensis* Forest Alliance - (associations under review) - *Tsuga canadensis* - *Betula alleghaniensis* Lower New England Northern Piedmont Forest [CEGL006109]; AND *Tsuga canadensis* - *Fagus grandifolia* forest [CEGL006088].

MA (old name): Part of: CNE MESIC HARDWOOD FOREST ON ACIDIC BEDROCK/TILL.

ME: Mixed hardwood - conifer forest community.

NH: Mesic Appalachian oak-sugar maple-beech-hemlock forest AND Sugar maple - beech - red oak till variant of semi rich mesic forests.

VT: Mesic Red Oak - Hardwood Forest.

NY: Part of: Appalachian oak-hickory forest.

CT: Quercus rubra / Viburnum acerifolium Forest; Quercus rubra - Betula alleghaniensis / Osmunda cinnamomea Forest.

RI: Part of: Beech - Maple Forest.

Weatherbee: Part of: Mesic Northern Hardwood Forest Community.

Author: P. Swain **Date:** 10/23/00

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA.

Community Name: WHITE PINE - OAK FOREST

Community Code: CT1A100000

SRANK: S5

Concept: A forest of mixed dominance with oaks and white pine in the canopy.

Environmental Setting: On moraine or till, often dry but not very dry. Grades into Pine - Northern Hardwood to the north. In southern areas occurs near pitch pine - oak forests, and grades into them. Often in a successional sequence from successional white pine forests. Also grades into mixed oak forests. In southeastern areas overlaps with Coastal Forest types: White pine - oak - holly and white pine - oak - beech forests.

Vegetation Description: White pine (*Pinus strobus*) and oak species (*Quercus rubra*, *Q. velutina*, *Q. alba*, *Q. coccinea*, and *Q. prinus*) dominate the canopy layer in a variety of proportions. Pitch pine (*Pinus rigida*), red maple (*Acer rubrum*), white birch (*Betula papyrifera*) and black birch (*B. lenta*), occur regularly but in low numbers. Southern areas also have pignut hickory (*Carya glabra*) and Sassafras (*Sassafras albidum*). Chestnut (*Castanea dentata*) is frequently present as a shrubby tree. Usually has a prominent heath shrub layer, with lowbush blueberries (*Vaccinium angustifolium* and *V. pallidum*), huckleberry (*Gaylussacia baccata*), mountain laurel (*Kalmia latifolia*), sheep laurel (*K. angustifolia*). Other shrubs include maple-leaved viburnum (*Viburnum acerifolium*). Characteristic species of the sparse herb layer include bracken fern (*Pteridium aquilinum*), wild sarsaparilla (*Aralia nudicaulis*), Canada mayflower (*Maianthemum canadense*), wintergreen (*Gaultheria procumbens*), partridge-berry (*Mitchella repens*), pink lady's slipper (*Cypripedium acaule*), cow-wheat (*Melampyrum lineare*), and whorled loosestrife (*Lysimachia quadrifolia*).

Associations: Part of a continuum of dry, acidic communities that contain a variety of tree oak and pine species. More work is needed to define types.

Habitat Values for There are no species known to be restricted to the White Pine -Oak forest types, most animals in the

Associated Fauna: forest are widespread generalists. Small mammals include white footed mice (*Peromyscus leucopus*), gray squirrels (*Sciurus carolinensis*) short-tailed shrew (*Blarina brevicauda*), red-backed vole (*Clethrionomys gapperi*), and chipmunks (*Tamias striatus*). Birds that nest in white pine -oak forests include Eastern Wood-Pewee (*Contopus virens*), Red-eyed Vireo (*Vireo olivaceus*), Brown Creeper (*Certhia americana*), Hermit Thrush (*Catharus guttatus*), and Red-tailed Hawks (*Buteo lineatus*). If a community occurrence contains vernal pools, newts and Spotted Salamanders (*Ambystoma maculatum*) will live in the humus of the forest floor for most of their adult lives.

Associated Rare Plants:

NONE KNOWN

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

Associated Rare Animals:

NONE KNOWN

Examples with Myles Standish State Forest, Plymouth, Carver; Freetown State Forest, Freetown, Quabbin

Public Access: Reservation, Belchertown. Wachusett Meadow WS (MAS), Princeton.

Threats:

Management Needs:

Synonyms

USNVC/TNC: *Pinus strobus* - *Quercus* (*rubra*, *velutina*) - *Fagus grandifolia* Forest [CEGL006293] AND *Quercus rubra* - *Q. prinus* - *Pinus strobus* / *Penstemon hirsutus* Woodland [CEGL006074].

MA (old name): Part of: SNE DRY OAK/PINE FORESTS ON ACIDIC BEDROCK OR TILL [CT2G2A1000]; and part of: SNE DRY CENTRAL HARDWOOD FOREST ON ACIDIC BEDROCK OR TILL; and Part of: SNE MESIC OAK/PINE FOREST ON SANDY/GRAVELLY SOIL [CT2E2A0000].

ME: Part of: Oak - Pine forest community.

NH: Includes: Dry red oak - white pine / heath / bracken fern community.

VT: Part of: Pine - Oak - Heath Sandplain forest ANDA northern variant is included in: Mesic pine-oak forest.

NY: Part of: Appalachian oak - pine forest or Pine – northern hardwood forest.

CT: Not described.

RI: Part of: Oak - pine forest.

Weatherbee: Dry Acidic Oak / conifer Forest community.

Author: P. Swain **Date:** 8/31/99

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA.

Classification of Natural Communities- Palustrine

Community Name: HIGH-TERRACE FLOODPLAIN FOREST

Community ELCODE: CP1A2B4000

SRANK: S2

Concept: Mesic, deciduous hardwood forests of high alluvial terraces above the zone of annual flooding. This community type also occurs along riverbanks of high-gradient, northern rivers.

Environmental setting: High-terrace floodplain forests occur on raised banks adjacent to rivers and streams, on steep banks bordering high-gradient rivers in the western parts of the state, on high alluvial terraces, and on raised areas within major-river and small-river floodplain forests. They are river-influenced and mesic, but they typically are not flooded annually as indicated by the presence of a distinct surface, soil organic layer. Soils are typically silt loams.

Vegetation Description: The canopy is a mixture of floodplain taxa, such as red and silver maple (*Acer rubrum* and *A. saccharinum*), and mesic, deciduous hardwoods including sugar maple (*A. saccharum*), shagbark hickory (*Carya ovata*), black cherry (*Prunus serotina*), American elm (*Ulmus americana*), and basswood (*Tilia americana*). Ironwood (*Carpinus caroliniana*) typically forms an open subcanopy and is a good indicator species of this community type. The shrub layer varies from sparse to well-developed with arrowwood (*Viburnum dentatum*), nannyberry (*Viburnum lentago*), and winterberry (*Ilex verticillata*) most common mixed with variable amounts of non-native shrubs, including Japanese barberry (*Berberis thunbergii*) and buckthorn (*Rhamnus frangula*, *R. cathartica*). The herbaceous layer is a mixture of the characteristic floodplain forest ferns--sensitive fern (*Onoclea sensibilis*) and ostrich fern (*Matteuccia struthiopteris*)--and rich upland herbs, such as Canada mayflower (*Maianthemum canadense*), lady fern (*Athyrium filix-femina*), zigzag goldenrod (*Solidago flexicaulis*), white snakeroot (*Eupatorium rugosum*), jack-in-the-pulpit (*Arisaema triphyllum*) and bellwort (*Uvularia sessilifolia*). Other characteristic herbaceous taxa include honewort (*Cryptotaenia canadensis*), bottlebrush grass (*Hystrix patula*), floodplain avens (*Geum laciniatum*), jumpseed (*Tovara virginianum*), Wiegand's wild rye (*Elymus wiegandii*), trilliums (*Trillium* spp.), trout-lily (*Erythronium americanum*), and enchanter's nightshade (*Circaea lutetiana* ssp. *canadensis*). Virginia creeper (*Parthenocissus quinquefolia*) and poison ivy (*Toxicodendron radicans*) can also be abundant.

Associations: One association was described in Kearsley (1998, 1999a): Type VI-Alluvial terrace forests (*Acer rubrum*-*Carya ovata*-*Prunus serotina* Association).

Habitat values for High-terrace floodplain forests can contain low wet depressions that function as vernal pools and

Associated Fauna: provide important amphibian breeding habitat.

Associated rare plants:

ACER NIGRUM BLACK MAPLE SC

CLAYTONIA VIRGINICA NARROW-LEAVED SPRING BEAUTY T

WALDSTEINIA FRAGARIOIDES BARREN STRAWBERRY SC

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

Associated rare animals:

AMBYSTOMA JEFFERSONIANUM JEFFERSON SALAMANDER SC

AMBYSTOMA LATERALE BLUE-SPOTTED SALAMANDER SC

CLEMMYS GUTTATA SPOTTED TURTLE SC

CLEMMYS INSCULPTA WOOD TURTLE SC

EMYDOIDEA BLANDINGII BLANDING'S TURTLE T

HEMIDACTYLIUM SCUTATUM FOUR-TOED SALAMANDER SC

Examples with Mill River, Northampton.

Public Access:

Threats: Most high terraces have been converted to agriculture. Remaining examples are typically small and disturbed by selective logging and trail clearing. The lack of natural vegetated buffers make these communities highly susceptible to non-native plant invasions. Most known examples have non-native plant species comprising a substantial percentage of overall plant cover. Because these communities fall outside of wetland boundaries, they are not subject to wetland regulations making them targets for selective logging and clearing for agriculture.

Management needs: Removal of non-native species.

Synonyms

USNVC/TNC: *Acer saccharum*/*Hydrophyllum virginianum*-*Tovara virginiana* Forest [CEGL006114].

MA [old name]: SNE Riverside/streamside mesic, deciduous forest [CT2F1A0000].

ME: Part of Hardwood floodplain forest community.

VT: Sugar maple-basswood-ostrich fern riverine floodplain forest.

NH: Sugar Maple-Silver Maple-White Ash Floodplain Forest.

NY: Part of Floodplain forest.

CT: *Acer saccharum*-*Fraxinus americana*/*Carex sprengelii* community.

RI: Not described.

Golet & Larson, 1974:

Other:

Author: J. Kearsley **Date:** 7/21/99

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA.

Community Name: MAJOR-RIVER FLOODPLAIN FOREST

Community ELCODE: CP1A2B1000

SRANK: S2

Concept: Silver maple-dominated forest community of alluvial floodplains of the Connecticut, Deerfield and Housatonic Rivers.

Environmental setting: Major-river floodplain forests are known to occur along mainstem sections of large rivers, such as the Connecticut, Housatonic, and Deerfield Rivers in Massachusetts. Soils are predominantly sandy loams without soil mottles and without a surface organic layer. Flooding at these sites occurs annually and is usually severe. An island variant of major-river floodplain forests [Type I in Kearsley, 1998, 1999a] occurs on elevated sections of riverine islands and riverbanks of major rivers where there are high levels of both natural and human disturbance.

Vegetation Description: Major-river floodplain forests have silver maple (*Acer saccharinum*) strongly dominant in the overstory, with over 60% cover, mixed with lesser amounts of cottonwood (*Populus deltoides*). American elm (*Ulmus americana*) and/or slippery elm (*U. rubra*) occur in the subcanopy. Shrubs are generally lacking. The herbaceous layer is usually dominated by a 3-6 ft. (1-2 m) tall, dense cover of wood-nettles (*Laportea canadensis*). Ostrich fern (*Matteuccia struthiopteris*) is sometimes abundant. Whitegrass (*Leersia virginica*) is consistently represented, but in low amounts, typically <5% cover. Other common associates are woodreed (*Cinna arundinacea*) and jack-in-the-pulpit (*Arisaema triphyllum*). An island variant of major-river floodplain forests [Type I in Kearsley, 1998] has similar species, but silver maple is not dominant in the overstory and the herbaceous layer is typically strongly dominated by ostrich fern. The overstory is an even mix of silver maple, cottonwood, sycamore (*Platanus occidentalis*), and American ash (*Fraxinus americana*), with box elder (*Acer negundo*) and hackberry (*Celtis occidentalis*; on the Housatonic River) common in the subcanopy. Species typical of disturbed areas, such as staghorn sumac (*Rhus typhina*) and bittersweet (*Celastrus orbiculata*), are also common in this variant, as are the vines, riverbank grape (*Vitis riparia*) and Virginia creeper (*Parthenocissus quinquefolia*).

Associations: Two associations were described in Kearsley (1999a). They are: Type I- Riverine island floodplain forests (*Acer saccharinum*-*Populus deltoides*-*Acer negundo*-*Matteuccia struthiopteris* Association), and Type II-Major-river floodplain forests (*A. saccharinum*-*P. deltoides*-*Laportea canadensis* Association).

Habitat values for Floodplain forests are insect-rich habitats that attract warblers, thrushes and other songbirds. In

Associated Fauna: particular yellow-throated and warbling vireos, which like to nest in the canopies of riverside trees, are frequently observed in floodplain forest communities. Raptors such as bald eagles and red-shouldered hawks also use riverbank trees as perch sites. In spring floods, wood ducks and hooded mergansers like the shady edges of floodplain forests and the interior meander scar pools. Eastern comma butterflies feed on elm and nettles, and the shady riverbanks are patrolled by several dragonfly species such as beaked and fawn darners. Interior meander scars and sloughs function as vernal pools providing breeding habitat for many frog species, such as leopard and pickerel frogs, American toads, and mole salamanders. Floodplain forests also provide sheltered, riverside corridors for deer and migratory songbirds.

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

Associated rare plants:

MENISPERMUM CANADENSE MOONSEED - WL

Associated rare animals:

CLEMMYS INSCULPTA WOOD TURTLE SC

DESMOCERUS PALLIATUS ELDERBERRY LONG-HORNED BEETLE SC

GOMPHUS FRATERNUS MIDLAND CLUBTAIL E

GOMPHUS VASTUS COBRA CLUBTAIL SC

GOMPHUS VENTRICOSUS SKILLET CLUBTAIL SC

HALIAEETUS LEUCOCEPHALUS BALD EAGLE E

NEUROCORDULIA OBSOLETA UMBER SHADOWDRAGON SC

OPHIOGOMPHUS ASPERSUS BROOK SNAKETAIL SC

OPHIOGOMPHUS CAROLUS RIFFLE SNAKETAIL T
 POMATIOPSIS LAPIDARIA RIVERBANK LOOPING SNAIL E
 SOMATOCHLORA CINGULATA LAKE EMERALD SC
 SOMATOCHLORA ELONGATA SKI-TAILED EMERALD SC
 SOMATOCHLORA GEORGIANA COPPERY EMERALD E
 SOMATOCHLORA KENNEDYI KENNEDY'S EMERALD E
 SOMATOCHLORA LINEARIS MOCHA EMERALD SC
 STYLURUS AMNICOLA RIVERINE CLUBTAIL E
 STYLURUS SCUDDERI ZEBRA CLUBTAIL E
 STYLURUS SPINICEPS A CLUBTAIL DRAGONFLY T

Examples with Fannie Stebbins, East Longmeadow; Rainbow Beach, Northampton.

Public Access:

Threats: Current threats include alteration of natural hydrology through damming, loss of vegetated buffer, disturbance by trail cutting and the subsequent invasion of non-native plant species. In a 1997 statewide floodplain forest community inventory, non-native plant species were observed at all floodplain forest sites surveyed, but they appeared to be localized to areas where the canopy was opened, the herbaceous layer was cleared, and the soil was disturbed. Non-native plant species were most abundant in the island variant of major-river floodplain forests that are heavily used by campers and boaters for recreation. Japanese knotweed (*Polygonum cuspidatum*) currently poses the greatest threat to major-river floodplain forests because of its ability to spread rapidly and shade out all other herbaceous plants.

Management needs: The natural hydrologic regime that created these special communities and their natural closed-canopy forest structure must be maintained. There are no truly effective ways to eradicate Japanese knotweed once it has established. The best way to avoid its spread is to prevent its establishment by avoiding all clearing and disturbance within floodplain forest areas, particularly on the sandier banks.

Synonyms

USNVC/TNC: *Acer saccharinum*-*Populus deltoides*/Matteuccia struthiopteris Forest [CEGL006147].

MA [old name]: Southern New England floodplain forest [CT2B1A0000].

ME: Hardwood floodplain forest community.

VT: Silver maple-ostrich fern riverine floodplain forest.

NH: Silver maple/wood nettle-ostrich fern floodplain forest.

NY: Floodplain forest.

CT: *Acer saccharinum*-*Populus deltoides* forests; *Acer saccharinum*/ *Eupatorium rugosum* community.

RI: Maple-sycamore floodplain forest.

Golet & Larson, 1974: Deciduous wooded swamp (WS-1).

Author: J. Kearsley **Date:** 7/21/99

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA.

Community Name: SHALLOW EMERGENT MARSH

Community ELCODE: CP2A0A1300

SRANK: S4

Concept: Grass, sedge, and /or rush-dominated wetlands on mucky mineral soils that are seasonally inundated and permanently saturated.

Environmental setting: Shallow emergent marshes occur in similar settings to deep emergent marshes, i.e., in broad, flat areas bordering low-energy rivers and streams, often in backwater sloughs, or along pond and lake margins. Unlike deep emergent marshes, shallow marshes commonly occur in abandoned beaver flowages, and in some states they are named "Abandoned beaver meadows" or "beaver flowage communities." The soils are a mixture of organic and mineral components. There is typically a layer of well-decomposed organic muck at the surface overlying mineral soil. There is standing or running water during the growing season and throughout much of the year, but water depth is less than deep emergent marshes and averages less than 6 in.

Vegetation Description: Vegetation composition is similar to deep emergent marshes except that shorter grasses, sedges and rushes dominate. Cat-tails, phragmites, and wool-grass, the dominants of deep emergent marshes, can occur but are never dominant. Tussock forming species, like tussock sedge (*Carex stricta*) and Canada bluejoint (*Calamagrostis canadensis* var. *canadensis*), often cover broad areas and form a hummock-hollow topography. Reed canary grass (*Phalaris arundinacea*) can also occur. It is common to see tussock sedge-dominated marshes in old beaver flowages mixed with scattered shrubs like alder and spiraea. The shallow water typically has a mixture of bur-reeds (*Sparganium* spp.), sedges (*Carex* spp.), and rice cut-grass (*Leersia oryzoides*). Floating leaved plants, like the water-lilies (*Nymphaea odorata* and *Nuphar* spp.), and submergents, like pondweeds (*Potamogeton* spp.), occur in open areas, and duckweed (*Lemna* spp.) is abundant in still water. Based on species composition alone, it can be difficult to differentiate shallow emergent marshes and wet meadows, but they occur in different physical settings and hydrologic regimes [see concept description for wet meadows. More community data are needed on these communities to determine the indicator species of each.]

Associations: No associations have been described in Massachusetts.

Habitat values for Shallow emergent marshes are excellent habitat for muskrats. As with deep emergent marshes

Associated Fauna: shallow emergent marshes provide important habitat for frogs and newts.

Associated rare plants:

ELEOCHARIS OBTUSA VAR OVATA OVATE SPIKE-SEDGE E

SAGITTARIA CUNEATA WAPATO E

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

Associated rare animals:

BOTAURUS LENTIGINOSUS AMERICAN BITTERN E

CIRCUS CYANEUS NORTHERN HARRIER T

CISTOTHORUS PALUSTRIS MARSH WREN - WL

CLEMMYS GUTTATA SPOTTED TURTLE SC

CLEMMYS INSCULPTA WOOD TURTLE SC

EMYDOIDEA BLANDINGII BLANDING'S TURTLE T

GALLINULA CHLOROPUS COMMON MOORHEN SC

IXOBRYCHUS EXILIS LEAST BITTERN E

PODILYMBUS PODICEPS PIED-BILLED GREBE E

RALLUS ELEGANS KING RAIL T

SOREX PALUSTRIS WATER SHREW SC

Examples with Nashua River marsh; Quaboag River WMA

Public Access:

Threats: Shallow emergent marshes are threatened by filling and dredging, impoundments that alter natural water-level fluctuations, and nutrient inputs from adjacent roads, fields, or septic systems. The invasion and spread of purple loosestrife (*Lythrum salicaria*) alters natural community structure and composition.

Management needs: Efforts are needed to control the spread of purple loosestrife.

Synonyms

USNVC/TNC: *Carex stricta* flooded herbaceous vegetation [CEGL004121]; maybe *Scirpus acutus*-*Carex lasiocarpa* herbaceous vegetation [CEGL006358].

MA [old name]: Southern New England nutrient-poor streamside/lakeside marsh [CP4A2A0000]; Southern New England nutrient-rich streamside/lakeside marsh [CP4A1A0000].

ME: Beaver flowage community; sedge meadow community?

VT: Shallow emergent marsh.

NH: Shallow emergent marsh [which they have subdivided into 5 subtypes: reed-grass meadow; tussock sedge meadow, medium sedge meadow, bulrush meadow, short graminoid-forb marsh].

NY: Shallow emergent marsh.

CT: Not described.

RI: Seasonally flooded (shallow) emergent marsh.

Golet & Larson, 1974: Robust shallow marsh (SM-1); narrow-leaved shallow marsh (SM-2); broad-leaved shallow marsh (SM-3).

Other: Acidic and circumneutral graminoid marshes [Weatherbee 1996]

Author: J. Kearsley **Date:** 7/21/99

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA.

Community Name: SHRUB SWAMP**Community ELCODE:** CP2A0C0000**SRANK:** S5**Concept:** Shrub-dominated wetlands occurring on mineral or mucky mineral soils that are seasonally or temporarily flooded.**Environmental setting:** Shrub swamps are common and widespread. They occur in basin depressions, at pond margins, and

along river and streamsides. They can be found in any flat area where the water table is at or above the soil surface for most of the year. Soils are generally well-decomposed organic mucks that are permanently saturated but only seasonally or temporarily inundated. Shrub swamps are often found in the transition zone between emergent marshes and swamp forests. More information is needed on their physical characteristics.

Vegetation Description: Shrub swamps are highly variable communities that probably can be divided into several types;

however, there is currently not enough information available to separate vegetation types. Shrub swamps typically have a mixture of the following shrub species: speckled alder (*Alnus incana* ssp. *rugosa*), smooth alder (*Alnus serrulata*), highbush blueberry (*Vaccinium corymbosum*), meadowsweet (*Spiraea alba* var. *latifolia*), buttonbush (*Cephalanthus occidentalis*), winterberry (*Ilex verticillata*), sweet gale (*Myrica gale*), swamp azalea (*Rhododendron viscosum*), silky dogwood (*Cornus amomum*), northern arrow-wood (*Viburnum dentatum* var. *lucidum*), maleberry (*Lyonia ligustrina*), and the nonnative shrub European alder-buckthorn (*Rhamnus frangula*). Scattered red maple (*Acer rubrum*) or gray birch (*Betula populifolia*) saplings also occur. Richer shrub swamps in areas with circumneutral water are often dominated by spicebush (*Lindera benzoin*). Some shrub swamps are dominated by a single species, such as black willow (*Salix nigra*) riverside thickets [which may best be included with floodplain forests], highbush blueberry thickets, or buttonbush swamps. Highbush blueberry thickets that occur on peat are described separately in the peatlands section; with more data, other types may also be split off and described as distinct community types. Since shrubs often form dense thickets, the herbaceous layer of shrub swamps is often sparse and species-poor. A mixture of the following species is typical: common arrowhead (*Sagittaria latifolia* var. *latifolia*), skunk cabbage (*Symplocarpus foetidus*), cinnamon fern (*Osmunda cinnamomea*), sensitive fern (*Onoclea sensibilis*), and royal fern (*Osmunda regalis*), sedges (*Carex* spp.), and Sphagnum spp. moss. More inventory work is needed.

Associations: No associations have been described in Massachusetts.**Habitat values for** Shrub swamps often function as vernal pool habitat in sections that have extended periods of ponding**Associated Fauna:** (2-3 months) and lack fish; these sections provide important amphibian breeding habitat.**Associated rare plants:**

BIDENS DISCOIDEA SMALL BEGGAR-TICKS - WL

SALIX PEDICELLARIS BOG-WILLOW - WL

From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version

1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA.

Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

Associated rare animals:

AMBYSTOMA JEFFERSONIANUM JEFFERSON SALAMANDER SC

AMBYSTOMA LATERALE BLUE-SPOTTED SALAMANDER SC

AMBYSTOMA OPACUM MARBLED SALAMANDER T

CLEMMYS GUTTATA SPOTTED TURTLE SC

CLEMMYS INSCULPTA WOOD TURTLE SC

DESMOCERUS PALLIATUS ELDERBERRY LONG-HORNED BEETLE SC

EMYDOIDEA BLANDINGII BLANDING'S TURTLE T

HEMIDACTYLUM SCUTATUM FOUR-TOED SALAMANDER SC

PAPAIPEMA SULPHURATA WATER-WILLOW STEM BORER T

SCAPHIOPUS HOLBROOKII EASTERN SPADEFOOT T

SYNURELLA CHAMBERLAINI COASTAL SWAMP AMPHIPOD SC

Examples with parts of 1000 Acre Swamp, Athol and Phillipston.**Public Access:****Threats:** Invasion by purple loosestrife (*Lythrum salicaria*).**Management needs:** More information is needed to assess the management needs of shrub swamps.**Synonyms****USNVC/TNC:** *Salix nigra* flooded shrubland [CEGL003901]; *Alnus incana* swamp shrubland [CEGL002381]; *Alnus serrulata* eastern shrubland [CEGL005082]; *Cephalanthus occidentalis* semipermanently flooded shrubland [CEGL003908]; *Decodon verticillatus* semipermanently flooded shrubland [CEGL005089].**MA [old name]:** Not described separately.**ME:** Shrub swamp community; Black willow-alder swamp community.**VT:** Alluvial shrub swamp/woodland ; shrub swamp; buttonbush swamp (*kettle basin shrub swamp*).

NH: Shrub swamps.

NY: Shrub swamp.

CT: *Salix nigra*/*Panicum dichotomiflorum* community; *Alnus rugosa*-*Salix* spp. Community; *Alnus rugosa*-*Cornus amomum*-*Ilex verticillata* community; *Cephalanthus occidentalis*-*Salix sericea* community; *Cephalanthus occidentalis*/*Glyceria canadensis* community; *Decodon verticillatus* shrubland s.

RI: Scrub/shrub wetland.

Golet & Larson, 1974: Sapling shrub swamp (SS-1); bushy shrub swamp (SS-2); compact shrub swamp (SS-3); aquatic shrub swamp (SS-4).

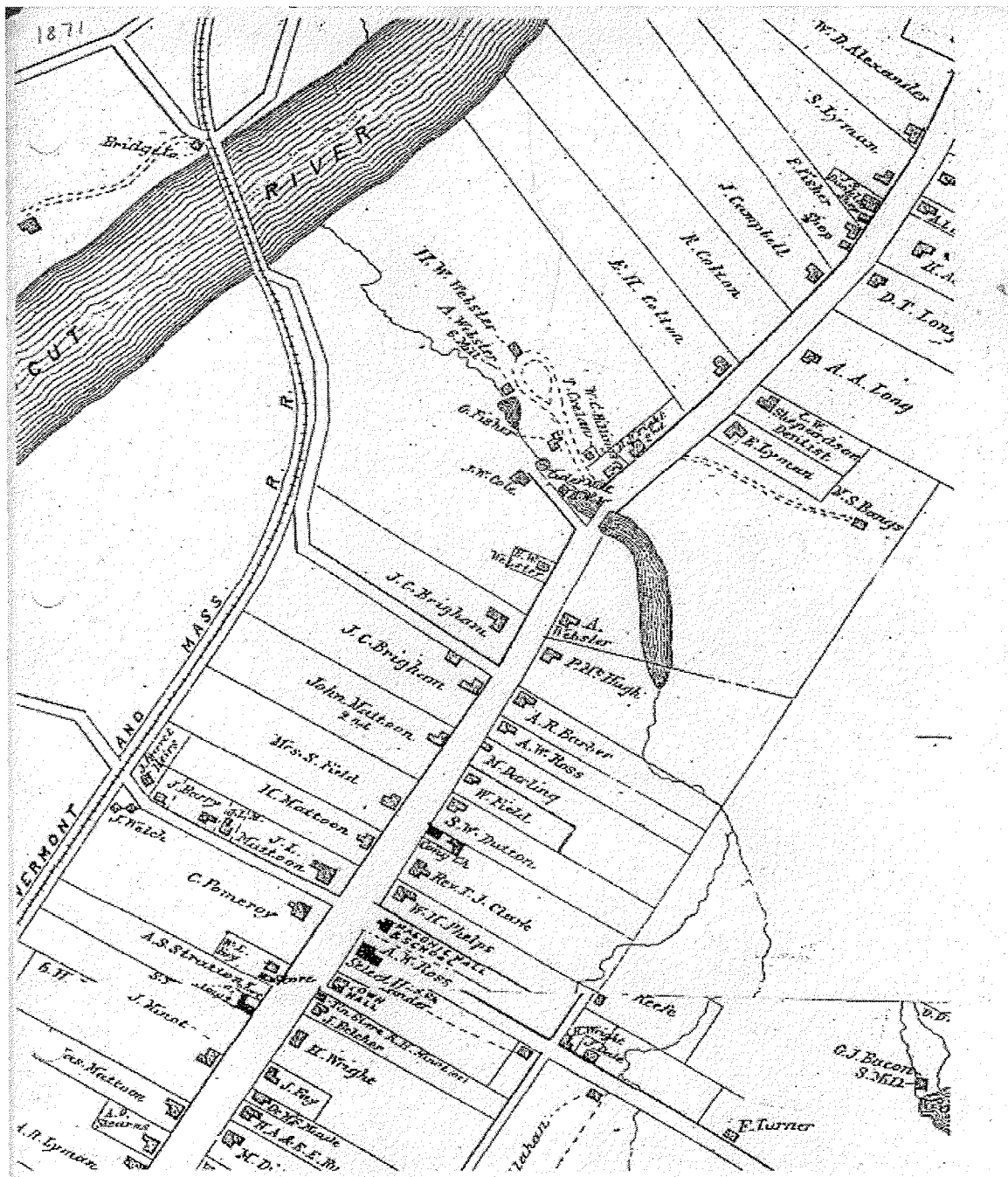
Other: Acidic and circumneutral shrub swamps differentiated by Weatherbee (1992) for Berkshire County.

Author: J. Kearsley **Date:** 7/21/99

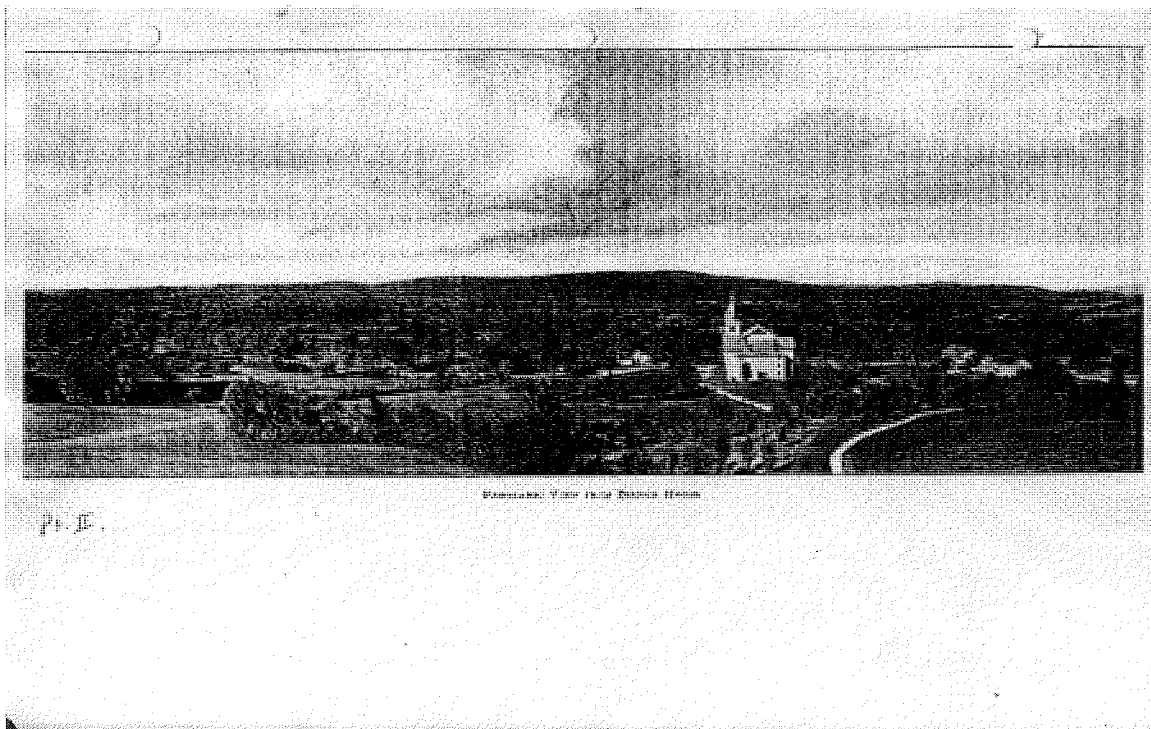
From: Swain, P.C. & J.B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version

1.3. Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife. Westborough, MA.

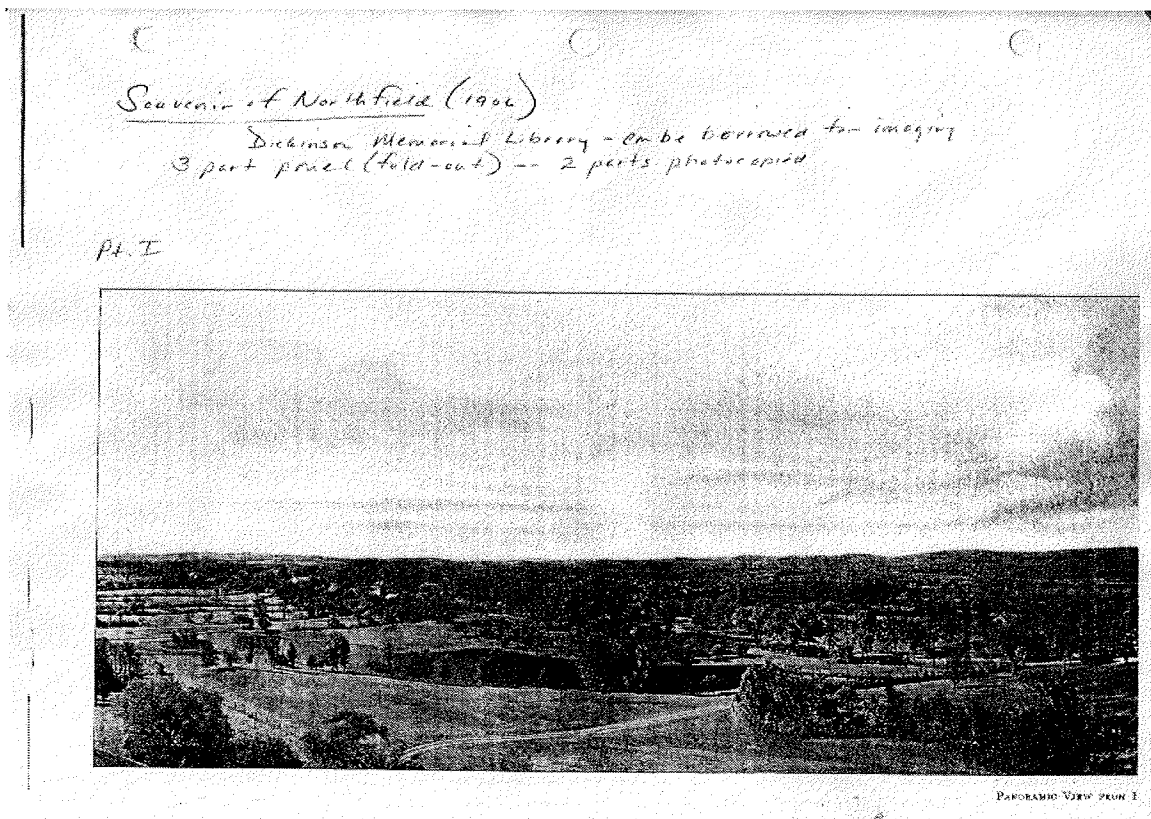
Historical Images



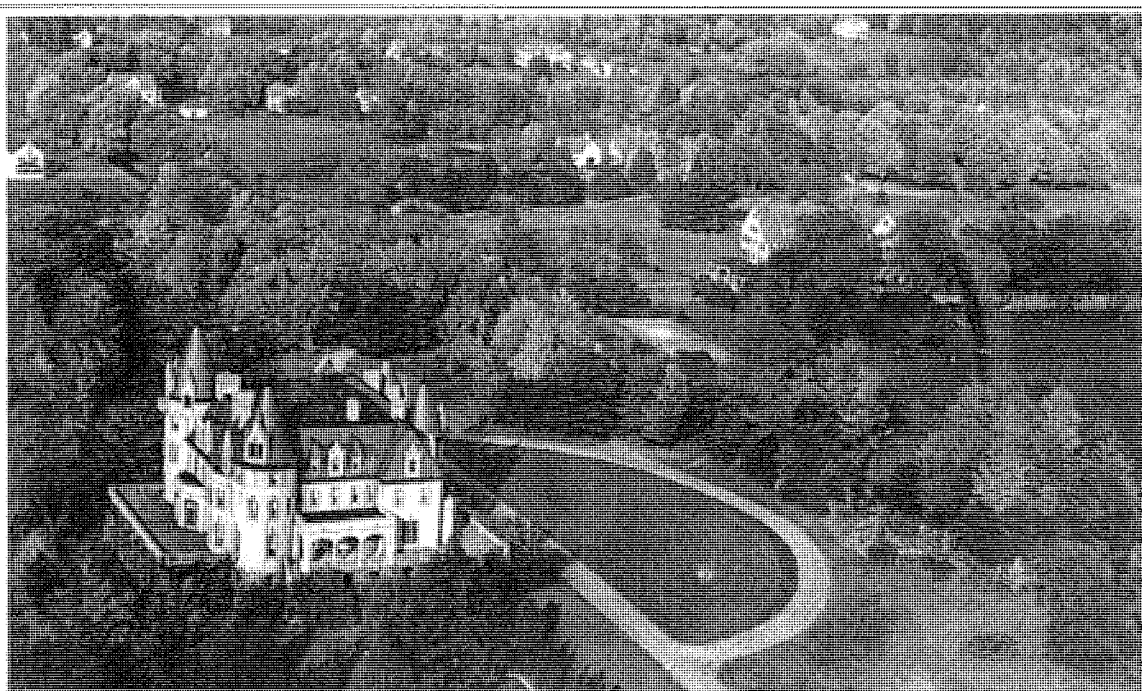
1871 map of Northfield. The cucumber-shaped mill pond occupied a portion of the Mill Brook East property. A second, smaller mill pond lies to the west of Main St. near the “Cascades” on the Mill Brook.



Panorama of the Schell property, looking west.

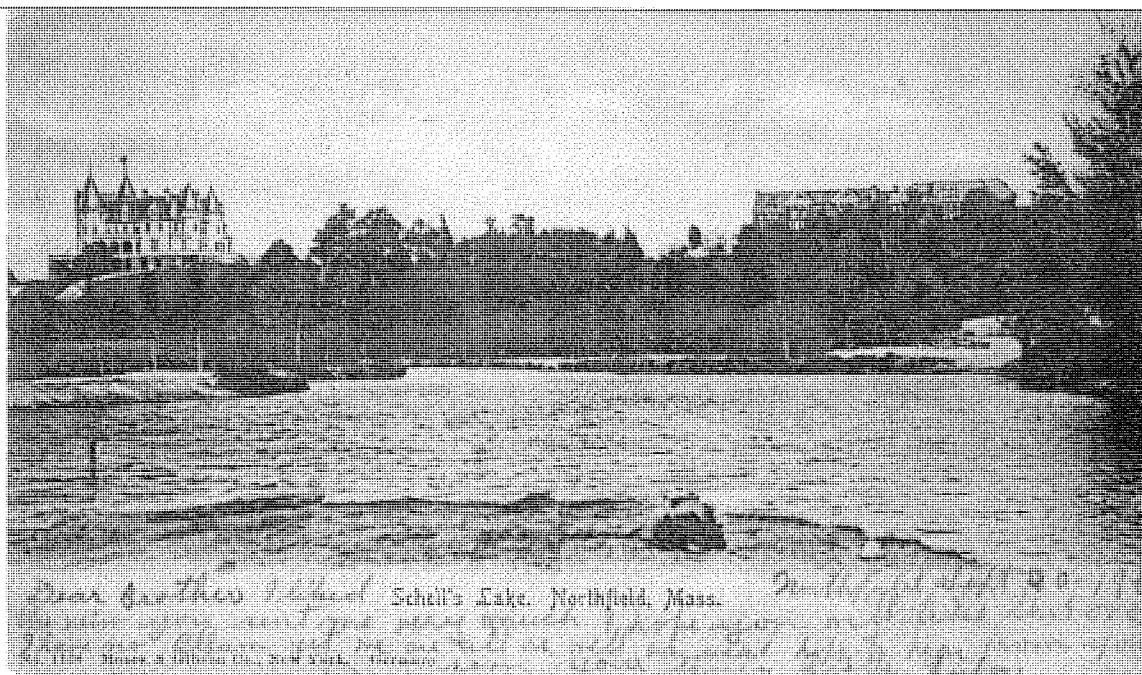


Panorama of the Schell property. Open land in the foreground is the site of Mill Brook East, and has reverted to wetlands and forest.



THE NORTHFIELD, EAST NORTHFIELD, MASS.

Aerial view of Birnham House and former grounds. Mill Brook East is out of the frame to the left.



Postcard depicting Schell's Lake created by ...Schell for the enjoyment of guests at Birnham House. The area covered by the lake comprises much of the current Mill Brook East property, which has since reverted to wet meadow, shrub swamp and woodlands.

Appendix D
Public and Private Sources of Grant Funds

Potential Grant Funding Sources – Public

1. Drinking Water Supply Protection Grant – EOEa

The purpose of this program is to protect key parcels of land believed critical to the protection of current and future water supplies.

Eligibility: Municipalities and water supply entities recognized by state law.

Contact: Christy Edwards
617-626-1151
Christy.edwards@state.ma.us

2. Self-Help Conservation Land Acquisition Program

Provides grant assistance to city and town conservation commissions for the acquisition of open space for conservation and passive recreation purposes.

Eligibility: Municipalities must have a current open space and recreation plan to apply, and the land must be open to the general public.

Contact: Jennifer Soper
617-626-1015
Jennifer.soper@state.ma.us

3. General Land and Water Conservation Fund

The Federal Land and Water Conservation Fund (P.L. 88-578) provides up to 50% of the total project cost for the acquisition, development and renovation of park, recreation or conservation areas. Nearly 4000 acres have been acquired and hundreds of parks renovated using the \$94.2 million that Massachusetts has received from the state side portion of the federal program since 1965.

Eligibility: Municipal Conservation commissions, park departments and certain agencies within EOEa.

Criteria: Access by the general public is required.

Contact: Jennifer Soper
617-626-1015
Jennifer.soper@state.ma.us

4. Recreational Trails Program

Provides funding for construction and improvement of publicly accessible recreational trails.

Eligibility: Municipalities, nonprofit groups and regional and state agencies

Contact: Jennifer Howard
413-586-8706 x18

Potential Grant Funding Sources – Private

Foundation Prospect	Location	Grant Range	Application Process	Application Deadline	Prospect Range	Comments
Abelard Foundation East	Lincoln, MA	\$10K	Proposal	3/15 and 9/15	L	
The Afognak Foundation	New York, NY	\$10-\$50K	Pre-Selected	Any time	L	
Archers Daniels Midland Foundation	Decatur, IL	\$1-\$50K	Letter of Inquiry	Any time	L	
The Agrosy Foundation	Boston, MA	\$1.5-\$10K	Pre-Selected	Any time	L	
Bafflin Foundation	Providence, RI	\$10-\$15K	Proposal	Any time	M	
Ben and Jerry's Foundation	S. Burlington, VT	\$5-\$15K	Letter of Inquiry	12/15,4/15,8/15	L	
Boston Foundation	Boston, MA	\$10-\$15K	Letter of Inquiry	3/15,6/15,9/15,12/1	M	
Cabot Family Charitable Trust	Boston, MA	\$5-\$35K	Proposal	2/2,9/1	M	
Jessie B. Cox Charitable Trust	Boston, MA	\$25-\$75K	Concept Paper	1/15,4/15,7/15,10/15	H	
Crickett Foundation	Boston, MA	\$5-\$10K	Proposal	Call	M	
The Duskey Foundation	Boston, MA	\$3-\$10K	Pre-Selected	Any time	L	
Fields Pond Foundation	Waltham, MA	\$2-\$10K	Concept Paper	Any time	H	Int'd in learning more
Agnes M. Lindsay Trust	Manchester, NH	\$1-\$15K	Proposal	Anytime	L	
Merck Family Fund	Milton, MA	\$10-\$25K	Letter of Inquiry	Any time	M	
New England Biolabs Foundation	Beverly, MA	\$.5-\$20K	Proposal	3/1,9/1,12/1	L	
Norcross Wildlife Foundation	New York, NY	\$5-\$7K	Proposal	Any time	H	
The Orchard Foundation	Boston, MA	\$5-\$10K	Proposal	3/1,9/1	M	
The Prospect Hill Foundation	New York, NY	\$10-\$50K	Proposal	Any time	L	
Red Acre Farm, Inc.	Stow, MA	\$5-\$15K	Letter of Inquiry	Any time	L	

Foundation Prospect	Location	Grant Range	Application Process	Application Deadline	Prospect Range	Comments
Elmina B. Sewall Foundation	New Haven, CT	\$5-\$15K	Pre-Selected	Any time	M	
The Sudbury Foundation (NE Grassroots Fund)	Sudbury, MA	\$2.5K	Concept Paper	Any time	H	
Community Foundation of Western Mass.	Springfield, MA	\$500-\$2.5K	Application	Annual	M	

Appendix E

List of Property Abutters

Location	Name		Mailing Address		Notes
81 Birnham Rd.	Atkinson, Ted and Ann J.		81 Birnham Rd.	Northfield, MA 01360	
100 School St.	Badyrka, Ruth Dale	Dale, John E.	10 Bordenshire Dr.	Bordentown, NJ 08505	Estate?
154 Main St.	Balk, Stewart	Balk, Linda M.	154 Main St.	Northfield, MA 01360	
154 Main St.	Balk, Stewart	Balk, Linda M.			
24 Dickinson St.	Banford, David R. Jr.	Banford, Wendy M.	24 Dickinson St.	Northfield, MA 01360	
106 School St.	Bickford, Rua J.		PO Box 133	Northfield, MA 01360	
146 Main St.	Bridges, Kathryn		146 Main St.	Northfield, MA 01360	
22 Holton St.	Champoux, George Jr.	Champoux, Nancy J.	22 Holton St.	Northfield, MA 01360	
7 Mill St.	Cox, Jennifer E.		605 Mariners Hill Dr.	Marshfield, MA 02050	
2 Highland Ave.	Denny, Jeffrey	Denny, Susan S.	2 Highland Ave.	Northfield, MA 01360	
99 School St.	Dimatteo, John Jr.	Jones, Billi J.	99 School St.	Northfield, MA 01360	
29 Glen Rd.	Doolittle, James E.		29 Glen Rd.	Northfield, MA 01360	
28 Holton St.	Eaton, Kathleen		28 Holton St.	Northfield, MA 01360	
111 Main St.	Eldridge, Pamela N.		111 Main St.	Northfield, MA 01360	
25 Glen Rd.	Gordon, David S.	Chappell, Ann	25 Glen Rd.	Northfield, MA 01360	
120 Main St.	Handren, Michelle		120 Main St.	Northfield, MA 01360	
111 Birnham Rd.	Hasanbasic, Rinfret	Akey, Patricia Anne	111 Birnham Rd.	Northfield, MA 01360	
37 Glen Rd.	Hendricks, Jeffrey T.	Hendricks, Amy L.	37 Glen Rd.	Northfield, MA 01360	
160 Main St.	Hoff, Kenneth E.	Hoff, Dolores E.	160 Main St.	Northfield, MA 01360	
97 East St.	Holden, Donald	Holden, Carolyn W.	97 East St.	Northfield, MA 01360	
38 School St.	Livernoise, Betsy		PO Box 492	Northfield, MA 01360	Estate
134 Main St.	McGowan, Jon G.	McGowan, Suzanne J.	134 Main St.	Northfield, MA 01360	
Glen Rd.	Nelson, George	Nelson, Shirley K.	18 Glen Rd.	Northfield, MA 01360	Life Estate
	NMH	c/o Carol Lebo	126 Pentacost Rd.	Northfield, MA 01360	
130 Main St.	NMH	c/o Carol Lebo	206 Main St.	Northfield, MA 01360	
Glen Rd.	NMH	c/o Carol Lebo	206 Main St.	Northfield, MA 01360	
Glen Rd.	NMH	c/o Carol Lebo	206 Main St.	Northfield, MA 01360	
31 Holton St.	NMH	c/o Carol Lebo	206 Main St.	Northfield, MA 01360	
Rear Mill St.	Northeast Generation Co.	c/o M. Curtin	PO Box 270	Hartford, CT 06141-0270	
Rear Glen Rd.	Northeast Generation Co.	c/o M. Curtin	PO Box 270	Hartford, CT 06141-0270	
147 Main St.	Northfield Trinitarian Church Congregation		147 Main St.	Northfield, MA 01360	
136 Main St.	Pilgrim Leasing Corp.		PO Box 1298	Hyannis, MA 02601	PO
91 Birnham Rd.	Rogers, Berton B.	Berton, Dorothy M.	91 Birnham Rd.	Northfield, MA 01360	
118 Main St.	Rogers, Timothy H.	Rogers, Tracey A.	118 Main St.	Northfield, MA 01360	
16 Dickinson St.	Seredynski, Stephen	Seredynski, Nona G.	PO Box 94	Northfield, MA 01360	
12 Mill St.	Shea, Ruth Alecia		PO Box 242	Suffield, CT 06078	
117 Main St.	Shepard, Christopher B.	Shepard, Bonita J.	117 Main St.	Northfield, MA 01360	
162 Main St.	Spencer, Rodman	Spencer, Joanne F.	162 Main St.	Northfield, MA 01360	
99 Birnham Rd.	Spencer, Ross L. Jr.	Spencer, Carolyn	99 Birnham Rd.	Northfield, MA 01360	
113 Main St.	Town of Northfield	Dickinson Memorial Library	113 Main St.	Northfield, MA 01360	
97 School St.	Verdery, Daniel F.	Verdery, Margaret A.	97 School St.	Northfield, MA 01360	
26 Dickinson St.	Whittaker, Marion	Whittaker, Lloyd Bennet	26 Dickinson St.	Northfield, MA 01360	Life Estate
79 School St.	Wright, Karen M.	c/o Marcia Waite	84 Warwick Rd.	Northfield, MA 01360	Life Estate