APPENDIX A:

BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World

Ashfield Report

BioMap2

CONSERVING THE BIODIVERSITY OF MASSACHUSETTS IN A CHANGING WORLD

Ashfield

Produced in 2012

This report and associated map provide information about important sites for biodiversity conservation in your area.

This information is intended for conservation planning, and is <u>not</u> intended for use in state regulations.

Commonwealth of Massachusetts Department of Fish & Game

Commonwealth of Massachusetts Division of Fisheries & Wildlife

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

The Nature Conservancy
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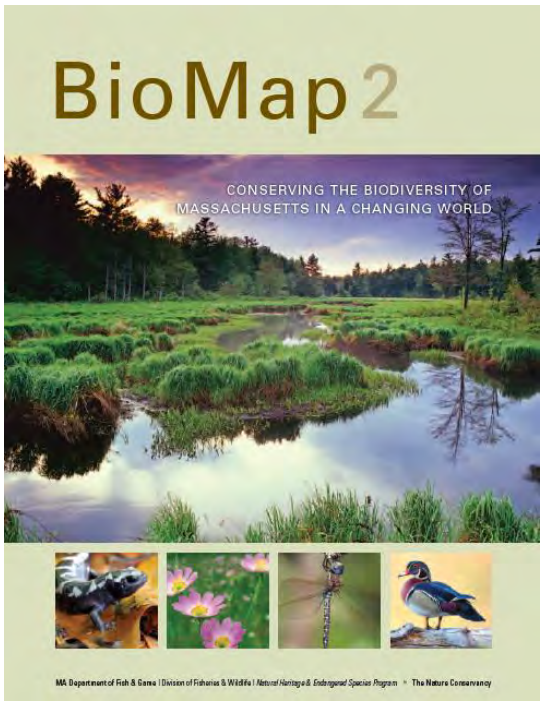
Introduction

The Massachusetts Department of Fish & Game, through the Division of Fisheries and Wildlife's Natural Heritage & Endangered Species Program (NHESP), and The Nature Conservancy's Massachusetts Program developed *BioMap2* to protect the state's biodiversity in the context of climate change.

BioMap2 combines NHESP's 30 years of rigorously documented rare species and natural community data with spatial data identifying wildlife species and habitats that were the focus of the Division of Fisheries and Wildlife's 2005 State Wildlife Action Plan (SWAP). *BioMap2* also integrates The Nature Conservancy's assessment of large, well-connected, and intact ecosystems and landscapes across the Commonwealth, incorporating concepts of ecosystem resilience to address anticipated climate change impacts.

Protection and stewardship of *BioMap2* Core Habitat and Critical Natural Landscape is essential to safeguard the diversity of species and their habitats, intact ecosystems, and resilient natural landscapes across Massachusetts.



Get your copy of the *BioMap2* report! Download from www.mass.gov/nhesp or contact Natural Heritage at 508-389-6360 or natural.heritage@state.ma.us.

What Does Status Mean?

The Division of Fisheries and Wildlife determines a status category for each rare species listed under the Massachusetts Endangered Species Act (MESA), M.G.L. c.131A, and its implementing regulations 321 CMR 10.00. Rare species are categorized as Endangered, Threatened or of Special Concern according to the following:

- Endangered species are in danger of extinction throughout all or a significant portion of their range or are in danger of extirpation from Massachusetts.
- Threatened species are likely to become Endangered in Massachusetts in the foreseeable future throughout all or a significant portion of their range.
- Special Concern species have suffered a decline that could threaten the species if allowed to continue unchecked or occur in such small numbers or with such restricted distribution or specialized habitat requirements that they could easily become Threatened in Massachusetts.

In addition NHESP maintains an unofficial watch list of plants that are tracked due to potential conservation interest or concern, but are not regulated under the Massachusetts Endangered Species Act or other laws or regulations. Likewise, described natural communities are not regulated by any law or regulations, but they can help to identify

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ecologically important areas that are worthy of protection. The status of natural communities reflects the documented number and acreages of each community type in the state:

- Critically Imperiled communities typically have 5 or fewer documented good sites or have very few remaining acres in the state.
- Imperiled communities typically have 6-20 good sites or few remaining acres in the state.
- Vulnerable communities typically have 21-100 good sites or limited acreage across the state.
- Secure communities typically have over 100 sites or abundant acreage across the state; however, excellent examples are identified as Core Habit to ensure continued protection.

In 2005 the Massachusetts Division of Fisheries and Wildlife completed a comprehensive State Wildlife Action Plan (SWAP) documenting the status of Massachusetts wildlife and providing recommendations to help guide wildlife conservation decision-making. SWAP includes all the wildlife species listed under the Massachusetts Endangered Species Act (MESA), as well as more than 80 species that need conservation attention but do not meet the requirements for inclusion under MESA. The SWAP document is organized around habitat types in need of conservation within the Commonwealth. While the original BioMap focused primarily on rare species protected under MESA, *BioMap2* also addresses other Species of Conservation Concern, their habitats, and the ecosystems that support them to create a spatial representation of most of the elements of SWAP.

BioMap2: One Plan, Two Components

B*ioMap2* identifies two complementary spatial layers, Core Habitat and Critical Natural Landscape.

Core Habitat identifies key areas that are critical for the long-term persistence of rare species and other Species of Conservation Concern, as well as a wide diversity of natural communities and intact ecosystems across the Commonwealth. Protection of Core Habitats will contribute to the conservation of specific elements of biodiversity.

Critical Natural Landscape identifies large natural Landscape Blocks that are minimally impacted by development. If protected, these areas will provide habitat for wide-ranging native species, support intact ecological processes, maintain connectivity among habitats, and enhance ecological resilience to natural and anthropogenic disturbances in a rapidly changing world. Areas delineated as Critical Natural Landscape also include buffering upland around wetland, coastal, and aquatic Core Habitats to help ensure their long-term integrity.

The long-term persistence of Massachusetts biological resources requires a determined commitment to land and water conservation. Protection and stewardship of both Critical Natural Landscapes and Core Habitats are needed to realize the biodiversity conservation vision of *BioMap2*.

Components of Core Habitat

Core Habitat identifies specific areas necessary to promote the long-term persistence of rare species, other Species of Conservation Concern, exemplary natural communities, and intact ecosystems.

Rare Species

There are 432 native plant and animal species listed as Endangered, Threatened or Special Concern under the Massachusetts Endangered Species Act (MESA) based on their rarity, population trends, and threats to survival. For

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Table 1. Species of Conservation Concern described in the State Wildlife Action Plan and/or included on the MESA List and for which habitat was mapped in *BioMap2*. Note that plants are not included in SWAP, and that marine species such as whales and sea turtles are not included in *BioMap2*.

Taxonomic Group	MESA-listed Species	Non-listed Species of Conservation Concern
Mammals	4	5
Birds	27	23
Reptiles	10	5
Amphibians	4	3
Fish	10	17
Invertebrates	102	9
Plants	256	0
Total	**413**	**62**

BioMap2, NHESP staff identified the highest quality habitat sites for each non-marine species based on size, condition, and landscape context.

Other Species of Conservation Concern

In addition to species on the MESA List described previously, the State Wildlife Action Plan (SWAP) identifies 257 wildlife species and 22 natural habitats most in need of conservation within the Commonwealth. *BioMap2* includes species-specific habitat areas for 45 of these species and habitat for 17 additional species which was mapped with other coarse-filter and fine-filter approaches.

Priority Natural Communities

Natural communities are assemblages of plant and animal species that share a common environment and occur together repeatedly on the landscape. *BioMap2* gives conservation priority to natural communities with limited distribution and to the best examples of more common types.

Vernal Pools

Vernal pools are small, seasonal wetlands that provide important wildlife habitat, especially for amphibians and invertebrate animals that use them to breed. *BioMap2* identifies the top 5 percent most interconnected clusters of Potential Vernal Pools in the state.

Forest Cores

In *BioMap2*, Core Habitat includes the best examples of large, intact forests that are least impacted by roads and development, providing critical habitat for numerous woodland species. For example, the interior forest habitat defined by Forest Cores supports many bird species sensitive to the impacts of roads and development, such as the Black-throated Green Warbler, and helps maintain ecological processes found only in unfragmented forest patches.

Wetland Cores

BioMap2 used an assessment of Ecological Integrity to identify the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Aquatic Cores

To delineate integrated and functional ecosystems for fish species and other aquatic

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Species of Conservation Concern, beyond the species and exemplary habitats described above, *BioMap2* identifies intact river corridors within which important physical and ecological processes of the river or stream occur.

Components of Critical Natural Landscape

Critical Natural Landscape identifies intact landscapes in Massachusetts that are better able to support ecological processes and disturbance regimes, and a wide array of species and habitats over long time frames.

Landscape Blocks

BioMap2 identifies the most intact large areas of predominately natural vegetation, consisting of contiguous forests, wetlands, rivers, lakes, and ponds, as well as coastal habitats such as barrier beaches and salt marshes.

Upland Buffers of Wetland and Aquatic Cores

A variety of analyses were used to identify protective upland buffers around wetlands and rivers.

Upland Habitat to Support Coastal Adaptation

BioMap2 identifies undeveloped lands adjacent to and up to one and a half meters above existing salt marshes as Critical Natural Landscapes with high potential to support inland migration of salt marsh and other coastal habitats over the coming century.

The conservation areas identified by *BioMap2* are based on breadth and depth of data, scientific expertise, and understanding of Massachusetts' biodiversity. The numerous sources of information and analyses used to create Core Habitat and Critical Natural Landscape are complementary, and outline a comprehensive conservation vision for Massachusetts, from rare species to intact landscapes. In total, these robust analyses define a suite of priority lands and waters that, if permanently protected, will support Massachusetts' natural systems for generations to come.

Legal Protection of Biodiversity

BioMap2 presents a powerful vision of what Massachusetts would look like with full protection of the land most important for supporting the Commonwealth's biodiversity. While *BioMap2* is a planning tool with *no regulatory function*, all state-listed species enjoy legal protection under the Massachusetts Endangered Species Act (M.G.L. c.131A) and its implementing regulations (321 CMR 10.00). Wetland habitat of state-listed wildlife is also protected under the Wetlands Protection Act Regulations (310 CMR 10.00). The *Natural Heritage Atlas* contains maps of Priority Habitats and Estimated Habitats, which are used, respectively, for regulation under the Massachusetts Endangered Species Act and the Wetlands Protection Act. For more information on rare species regulations, and to view Priority and Estimated Habitat maps, please see the Regulatory Review page at http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/.

***BioMap2* is a conservation planning tool that does not, in any way, supplant the Estimated and Priority Habitat Maps which have regulatory significance. Unless and until the *BioMap2* vision is fully realized, we must continue to protect our most imperiled species and their habitats.**

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Understanding Core Habitat Summaries

Following the Town Overview, there is a descriptive summary of each Core Habitat and Critical Natural Landscape that occurs in your city or town. These summaries highlight some of the outstanding characteristics of each Core Habitat and Critical Natural Landscape, and will help you learn more about your city or town's biodiversity. You can find out more information about many of these species and natural communities by looking at specific fact sheets at www.mass.gov/nhesp.

Additional Information

For copies of the full *BioMap2* report, the Technical Report, and an interactive mapping tool, visit the *BioMap2* website via the Land Protection and Planning tab at www.mass.gov/nhesp. If you have any questions about this report, or if you need help protecting land for biodiversity in your community, the Natural Heritage & Endangered Species Program staff looks forward to working with you.

Contact the Natural Heritage & Endangered Species Program

By phone	508-389-6360
By fax	508-389-7890
By email	natural.heritage@state.ma.us
By Mail	100 Hartwell Street, Suite 230 West Boylston, MA 01583

The GIS datalayers of *BioMap2* are available for download from MassGIS at www.mass.gov/mgis.

Town Overview

Ashfield lies on the border of the Berkshire Highlands/Southern Green Mountains, the Berkshire Transition, and the Vermont Piedmont Ecoregions. The Berkshire Highlands Ecoregion is an area drained by the Deerfield, upper Westfield, Hoosic, and Housatonic Rivers. Lakes and ponds are relatively abundant. This ecoregion has deep soils that support northern hardwoods and spruce-fir forests. The Berkshire Transition Ecoregion shares characteristics with the Berkshire ecoregions and the Connecticut River Valley Ecoregion. Forests are transition hardwoods and northern hardwoods. This area drains to the Westfield and Connecticut River basins. The Vermont Piedmont Ecoregion contains transition hardwood and northern hardwood forests. Hills are sometimes quite steep. Surface waters are highly alkaline. This area drains to the Deerfield and Connecticut River basins.

Ashfield at a Glance

- Total Area: 25,756 acres (40.2 square miles)
- Human Population in 2010: 1,737
- Open space protected in perpetuity: 4,288 acres, or 16.6% percent of total area*
- *BioMap2* Core Habitat: 4,643 acres
- *BioMap2* Core Habitat Protected: 800 acres or 17.2%
- Bi*oMap2* Critical Natural Landscape: 8,074 acres
- *BioMap2* Critical Natural Landscape Protected: 1,425 acres or 17.7%.

BioMap2 Components

Core Habitat

- 3 Exemplary or Priority Natural Community Cores
- 12 Wetland Cores
- 8 Aquatic Cores
- 14 Species of Conservation Concern Cores**
  - 1 bird, 2 reptiles, 2 amphibians, 1 fish, 1 insect, 3 plants

Critical Natural Landscape

- 3 Landscape Blocks
- 14 Wetland Core Buffers
- 7 Aquatic Core Buffers

* Calculated using MassGIS data layer "Protected and Recreational Open Space—March, 2012".

** See next pages for complete list of species, natural communities and other biodiversity elements.

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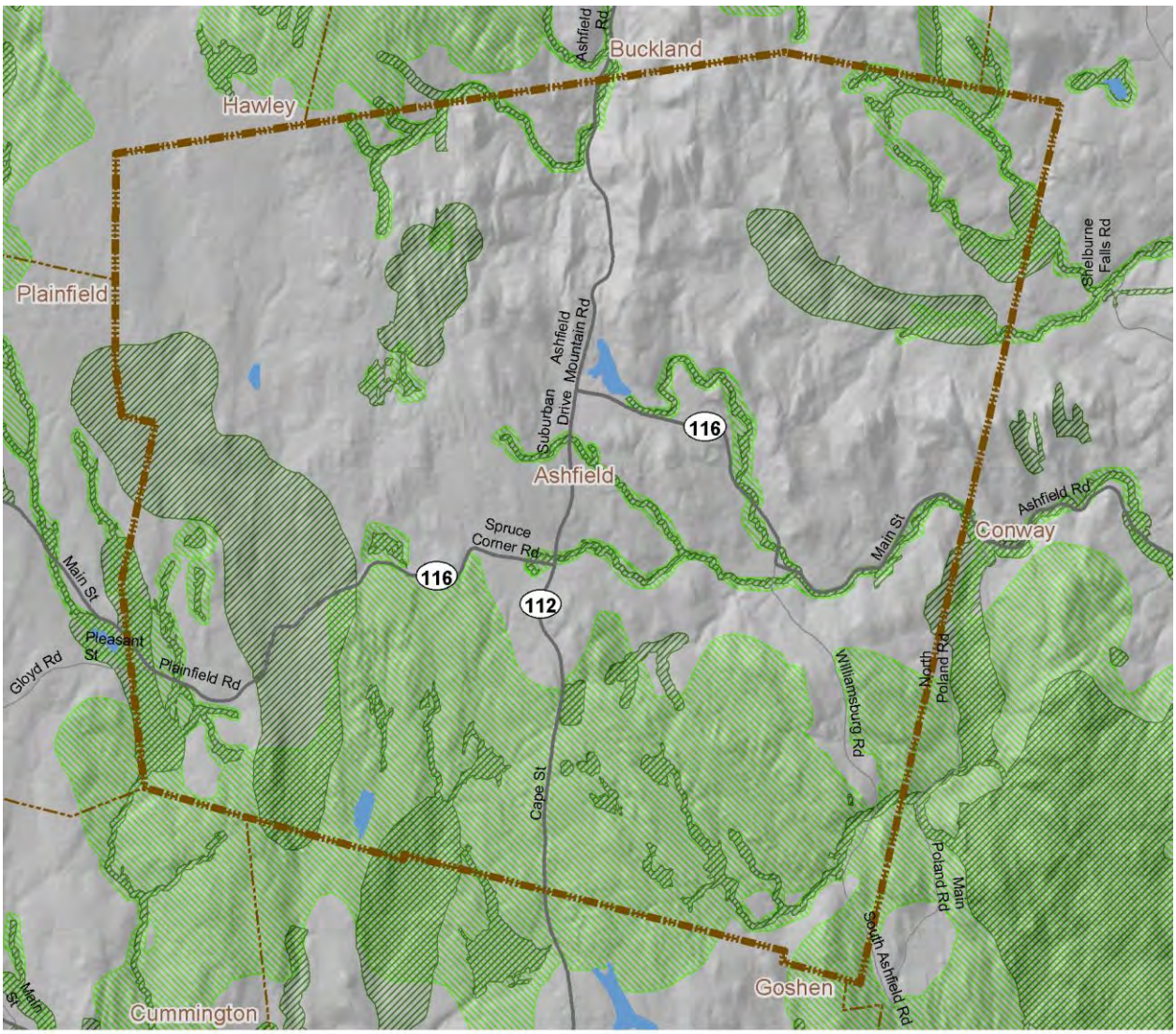
BioMap2 Core Habitat and Critical Natural Landscape in Ashfield



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Species of Conservation Concern, Priority and Exemplary Natural Communities, and Other Elements of Biodiversity in Ashfield

Insects

Dragonflies

Zebra Clubtail, (*Stylurus scudderi*), Non-listed SWAP species

Amphibians

Jefferson Salamander, (*Ambystoma jeffersonianum*), SC
Spring Salamander, (*Gyrinophilus porphyriticus*), Non-listed SWAP

Fishes

Longnose Sucker, (*Catostomus catostomus*), SC

Reptiles

Wood Turtle, (*Glyptemys insculpta*), SC
Smooth Green Snake, (*Opheodrys vernalis*), Non-listed SWAP

Birds

American Bittern, (*Botaurus lentiginosus*), E

Plants

Dwarf Mistletoe, (*Arceuthobium pusillum*), SC
Dwarf Scouring-rush, (*Equisetum scirpoides*), SC
Bristly Black Currant, (*Ribes lacustre*), SC

Priority Natural Communities

Acidic Graminoid Fen, S3
Rich, Mesic Forest Community, S3
Spruce-Fir Swamp, S3

Other *BioMap2* Components

Aquatic Core
Wetland Core
Landscape Block
Aquatic Core Buffer
Wetland Core Buffer

E = Endangered
T = Threatened
SC = Special Concern
S1 = Critically Imperiled communities, typically 5 or fewer documented sites or very few remaining acres in the state.
S2 = Imperiled communities, typically 6-20 sites or few remaining acres in the state.
S3 = Vulnerable communities, typically have 21-100 sites or limited acreage across the state.

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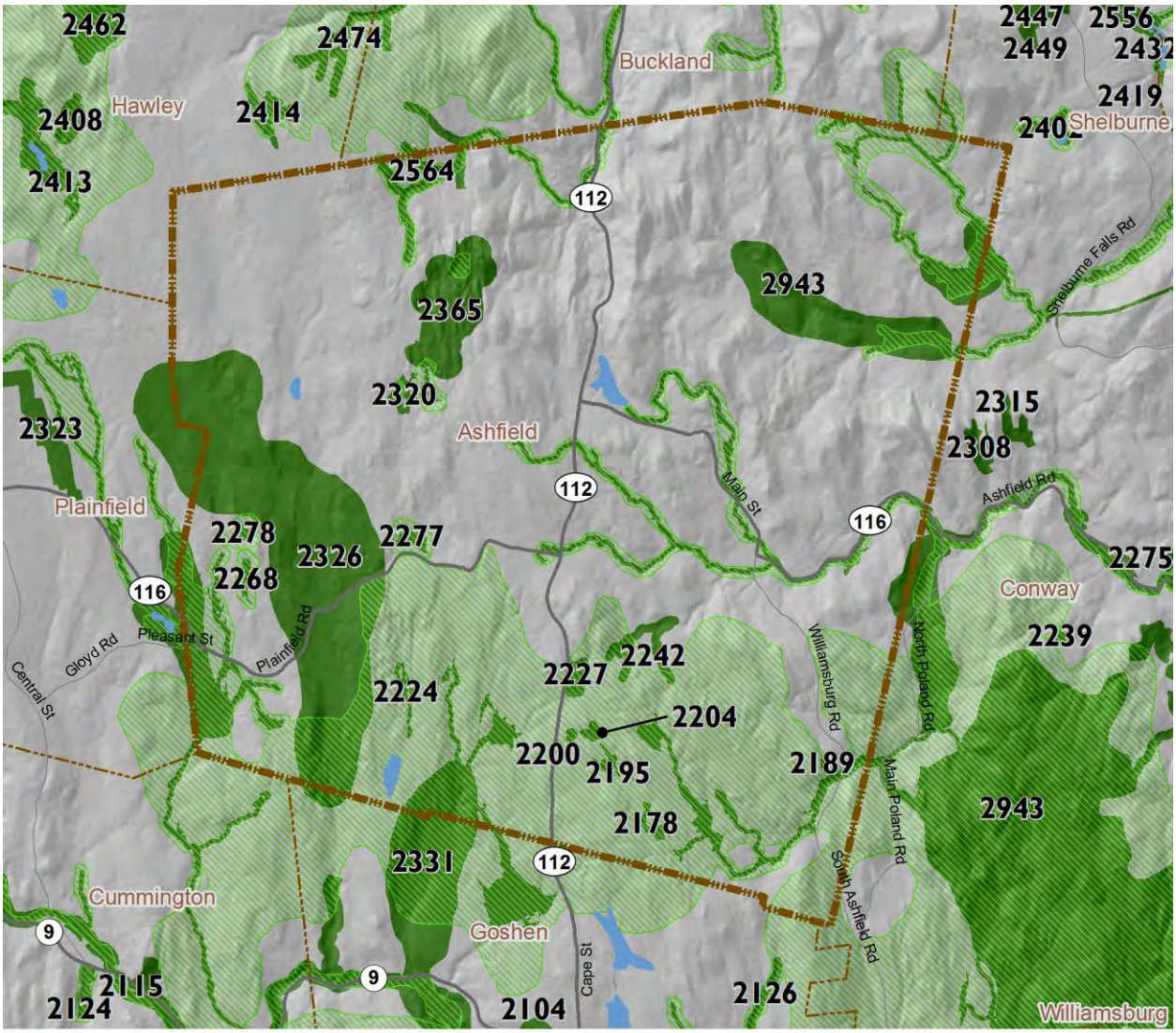
BioMap2 Core Habitat in Ashfield

Core IDs correspond with the following element lists and summaries.



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Elements of *BioMap2* Cores

This section lists all elements of *BioMap2* Cores that fall *entirely or partially* within Ashfield. The elements listed here may not occur within the bounds of Ashfield.

Core 2178

Wetland Core

Core 2189

Priority & Exemplary Natural Communities

Rich, Mesic Forest Community		S3

Core 2195

Wetland Core

Core 2200

Aquatic Core
Species of Conservation Concern

American Bittern	*Botaurus lentiginosus*	E

Core 2204

Aquatic Core
Species of Conservation Concern

American Bittern	*Botaurus lentiginosus*	E

Core 2224

Wetland Core

Core 2227

Aquatic Core
Species of Conservation Concern

American Bittern	*Botaurus lentiginosus*	E

Core 2242

Species of Conservation Concern

Spring Salamander	*Gyrinophilus porphyriticus*	Non-listed SWAP

Core 2268

Wetland Core

Core 2277

Wetland Core

Core 2278

Wetland Core

Core 2320

Priority & Exemplary Natural Communities		
Spruce-Fir Swamp		S3
Species of Conservation Concern		
Dwarf Mistletoe	*Arceuthobium pusillum*	SC

Core 2326

Species of Conservation Concern		
Smooth Green Snake	*Opheodrys vernalis*	Non-listed SWAP
Wood Turtle	*Glyptemys insculpta*	SC

Core 2331

Forest Core		
Wetland Core		
Aquatic Core		
Priority & Exemplary Natural Communities		
Forest Seep Community		
Hemlock Ravine Community		
Hickory - Hop Hornbeam Forest/Woodland		S2
High-energy Riverbank		S3
High-terrace Floodplain Forest		S2
Rich, Mesic Forest Community		S3
Species of Conservation Concern		
Barren Strawberry	*Geum fragarioides*	SC
Dwarf Scouring-rush	*Equisetum scirpoides*	SC
Foxtail Sedge	*Carex alopecoidea*	T
Hitchcock's Sedge	*Carex hitchcockiana*	SC
Muskflower	*Mimulus moschatus*	E
Purple Giant Hyssop	*Agastache scrophulariifolia*	E
Wild Senna	*Senna hebecarpa*	E
Woodland Millet	*Milium effusum*	T
Appalachian Coronet	*Hadena ectypa*	Non-listed SWAP
Ostrich Fern Borer Moth	*Papaipema* sp. 2 nr. *pterisii*	SC
Twelve-spotted Tiger Beetle	*Cicindela duodecimguttata*	SC
Harpoon Clubtail	*Gomphus descriptus*	E
Ocellated Darner	*Boyeria grafiana*	SC

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Riffle Snaketail	*Ophiogomphus carolus*	T
Ski-tipped Emerald	*Somatochlora elongata*	SC
Zebra Clubtail	*Stylurus scudderi*	Non-listed SWAP
Four-toed Salamander	*Hemidactylium scutatum*	Non-listed SWAP
Spring Salamander	*Gyrinophilus porphyriticus*	Non-listed SWAP
Smooth Green Snake	*Opheodrys vernalis*	Non-listed SWAP
Wood Turtle	*Glyptemys insculpta*	SC
Bridle Shiner	*Notropis bifrenatus*	SC
Lake Chub	*Couesius plumbeus*	E
Longnose Sucker	*Catostomus catostomus*	SC
Water Shrew	*Sorex palustris*	SC

Core 2365

Wetland Core		
Priority & Exemplary Natural Communities		
Acidic Graminoid Fen		S3
Species of Conservation Concern		
Bristly Black Currant	*Ribes lacustre*	SC
Jefferson Salamander	*Ambystoma jeffersonianum*	SC

Core 2564

Aquatic Core		
Species of Conservation Concern		
Early Hairstreak	*Erora laeta*	T
Ocellated Darner	*Boyeria grafiana*	SC
Jefferson Salamander	*Ambystoma jeffersonianum*	SC
Spring Salamander	*Gyrinophilus porphyriticus*	Non-listed SWAP
Longnose Sucker	*Catostomus catostomus*	SC

Core 2943F

Forest Core		
Wetland Core		
Aquatic Core		
Priority & Exemplary Natural Communities		
High-energy Riverbank		S3
Major-river Floodplain Forest		S2
Rich, Mesic Forest Community		S3
Riverside Rock Outcrop Community		S3
Species of Conservation Concern		
Broad Waterleaf	*Hydrophyllum canadense*	E
Dwarf Scouring-rush	*Equisetum scirpoides*	SC
Giant St. John's-wort	*Hypericum ascyron*	E
Green Dragon	*Arisaema dracontium*	T

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Hitchcock's Sedge	*Carex hitchcockiana*	SC
Mountain Alder	*Alnus viridis* ssp. *crispa*	T
Purple Clematis	*Clematis occidentalis*	SC
Shore Sedge	*Carex lenticularis*	T
Spiked False Oats	*Trisetum spicatum*	E
Tradescant's Aster	*Symphyotrichum tradescantii*	T
Arrow Clubtail	*Stylurus spiniceps*	Non-listed SWAP
Cobra Clubtail	*Gomphus vastus*	SC
Ocellated Darner	*Boyeria grafiana*	SC
Riffle Snaketail	*Ophiogomphus carolus*	T
Riverine Clubtail	*Stylurus amnicola*	E
Stygian Shadowdragon	*Neurocordulia yamaskanensis*	SC
Zebra Clubtail	*Stylurus scudderi*	Non-listed SWAP
Jefferson Salamander	*Ambystoma jeffersonianum*	SC
Spring Salamander	*Gyrinophilus porphyriticus*	Non-listed SWAP
Wood Turtle	*Glyptemys insculpta*	SC
Longnose Sucker	*Catostomus catostomus*	SC
Shortnose Sturgeon	*Acipenser brevirostrum*	E
Bald Eagle	*Haliaeetus leucocephalus*	T
Vesper Sparrow	*Pooecetes gramineus*	T

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Core Habitat Summaries

Core 2178

A 20-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

The Wetland Core occurs on mid elevation Slate, one of the least common ecological settings for Wetland Cores in the state.

Core 2189

A 2-acre Core Habitat featuring a Priority Natural Community.

Rich, Mesic Forests are a variant of northern hardwood forests, dominated by sugar maple with a diverse herbaceous layer that includes many spring wild flowers, in a moist, nutrient-rich environment. This small patch of Rich, Mesic Forest is a regional variant lacking the full species diversity of this community type. However it is in very good condition, with no exotic species, and is found within a very large naturally vegetated area.

Core 2195

An 18-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Core 2200

A 6-acre Core Habitat featuring Aquatic Core and a Species of Conservation Concern.

Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

American Bitterns are heron-like birds that nest primarily in large cattail, tussock or shrub marshes and are very sensitive to disturbance.

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Core 2204

A 13-acre Core Habitat featuring Aquatic Core and a Species of Conservation Concern.

Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

American Bitterns are heron-like birds that nest primarily in large cattail, tussock or shrub marshes and are very sensitive to disturbance.

Core 2224

A 24-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

The Wetland Core occurs on mid elevation Slate, one of the least common ecological settings for Wetland Cores in the state.

Core 2227

A 35-acre Core Habitat featuring Aquatic Core and a Species of Conservation Concern.

Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

American Bitterns are heron-like birds that nest primarily in large cattail, tussock or shrub marshes and are very sensitive to disturbance.

Core 2242

An 87-acre Core Habitat featuring a Species of Conservation Concern.

Spring Salamander adults inhabit clean, cold, high-gradient brooks and headwater seeps in forest habitat, usually at elevation >100 m. Larvae are entirely aquatic and largely nocturnal, spending daylight hours buried below the streambed or hidden under stones. Adults are semi-aquatic and spend most of their time under cover objects along the margins of brooks, springs, and seeps; however, they will venture into upland forest during rainy weather.

Core 2268

A 13-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

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Core 2277

A 21-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

The Wetland Core occurs on mid elevation Slate, one of the least common ecological settings for Wetland Cores in the state.

Core 2278

A 11-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Core 2320

A 34-acre Core Habitat featuring a Priority Natural Community and a Species of Conservation Concern.

Spruce-Fir Boreal Swamps are forested wetlands dominated by red spruce and balsam fir. These swamps are typically found at stream headwaters or in poorly drained basins in the higher, western and north-central parts of the state. This example of Spruce-Fir Swamp, though quite small, is a mature uneven-aged forest with good species diversity and little signs of human disturbance. It is located within a larger wetland complex in a large roadless area.

A member of the Christmas Mistletoe family, Dwarf Mistletoe is a very small fleshy shrub, usually no more than 0.8 inch tall, that parasitizes conifer trees. In Massachusetts, Dwarf Mistletoe occurs in peatlands varying from kettlehole peat bogs to spruce-fir-birch headwater swamps, generally on the branches of black spruce (*Picea mariana*).

Core 2326

A 2,275-acre Core Habitat featuring Species of Conservation Concern.

A small to medium-sized snake, adult Smooth Green Snakes are 14-20 inches long with a uniform light green back and yellow to white venter. The Smooth Green Snake is found in moist open or lightly forested habitat where grasses and shrubs are abundant (edges of marshes, wet meadows, fields, and forest edges or open forests, grasslands, blueberry barrens, pine barrens) and prefers to forage on the ground with activity in the daytime. Smooth Green Snake overwinter in rodent burrows, ant mounds and rock crevices, either singly or communally.

Wood Turtle habitat is streams and rivers, preferably with long corridors of undeveloped, connected uplands. They also use fields and early succesional habitat extending up to 500 meters on both sides of the waterways. Mowing and roads are the primary causes of mortality. Collection is also a conservation concern.

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Core 2331

A 12,656-acre Core Habitat featuring Forest Core, Wetland Core, Aquatic Core, Priority Natural Communities, and Species of Conservation Concern.

The East Branch of the Westfield River, a National Wild and Scenic River, runs southeastward through Cummington and then turns southward at the confluence with the Swift River and flows through the dramatic and narrow Chesterfield Gorge. This free-flowing river and its tributaries support 22 rare and uncommon species, including the Endangered Lake Chub and Harpoon Clubtail dragonfly.

Forest Seeps are in areas on wet slopes in hardwood forests where groundwater seeps out of the earth. The overstory is similar to that of the surrounding forest, but many typical wetland ferns, herbs, and shrubs occur as well. This example of Forest Seep runs parallel to the Westfield River, and is home to healthy population of a very unusual plant species. It is in good condition, and is relatively inaccessible.

Hemlock Ravine Communities are evergreen forests made up primarily of hemlocks, with dense, nearly closed canopies that cast deep shade so that very few plants grow below. They occur on moist, north-facing slopes, or along north-facing ravines. This small Hemlock Ravine is in good condition, with good size and age structure, although it has hiking trails and a small population of volunteer Norway Spruce is present.

Hickory-Hop Hornbeam Forests are open, hardwood forests dominated by various hickory species with significant hop hornbeam in the subcanopy. This community is characterized by a sparse shrub layer, and a nearly continuous cover of grasses and sedges. This mature example of Hickory-Hop Hornbeam Forest has high species diversity and little sign of anthropogenic disturbance. It is part of a larger mosaic of natural communities that provide it with a good buffer to human impacts.

High-Energy Riverbank communities are sparse, open graminoid communities found on cobble and sand deposits along fast-flowing rivers that experience severe flooding and ice scour. This example of High-Energy Riverbank is in excellent condition, with high species diversity, intact natural processes of flood and scour, and is well buffered by natural vegetation.

High-Terrace Floodplain Forests are deciduous hardwood forests that occur along riverbanks, above the zone of annual flooding. Although they do not flood annually, they flood often enough for the soil to be moderately enriched. This example of High-Terrace Floodplain Forest is small and in somewhat degraded condition, with two exotic invasive species present.

Rich, Mesic Forests are a variant of northern hardwood forests, dominated by sugar maple with a diverse herbaceous layer that includes many spring wild flowers, in a moist, nutrient-rich environment. Three examples of Rich, Mesic Forest incluiding a large one that has great structural and age diversity, with areas recovering from past disturbances. It is generally in good condition, largely buffered by naturally vegetated areas, and with few exotic invasive species.

Forest Cores are the best examples of large, intact forests that are least impacted by roads and development. Forest Cores support many bird species sensitive to the impacts of roads and development and help maintain ecological processes found only in unfragmented forest patches.

Wetlands Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are

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most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

Core 2365

A 397-acre Core Habitat featuring Wetland Core, a Priority Natural Community, and Species of Conservation Concern.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

The Wetland Core occurs on mid elevation Slate, one of the least common ecological settings for Wetland Cores in the state.

Acidic Graminoid Fens are sedge- and sphagnum-dominated acidic peatlands that experience some groundwater and/or surface water flow but no calcareous seepage. Standing water is often present throughout much of the growing season. This small, fairly diverse example of Acidic Graminoid Fen is found within a series of marsh and swamp habitats along the upper reach of Smith Brook, and is of moderate quality.

Bristly Black Currant is a low, bristly to spiny, straggling shrub measuring up to 3 feet in height. Bristly Black Currant is usually found in cool ravines and borders of swamps in upland regions of Massachusetts.

Adult and juvenile Jefferson Salamanders inhabit upland forests during most of the year, where they reside in small-mammal burrows and other subsurface retreats. Adults migrate during late winter or early spring to breed in vernal pools and fish-free areas of swamps, marshes, or similar wetlands. Larvae metamorphose in late summer or early fall, whereupon they disperse into upland forest.

Core 2564

A 1,007-acre Core Habitat featuring Aquatic Core and Species of Conservation Concern.

Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

The Early Hairstreak butterfly inhabits mature northern hardwood forest and associated openings. Larvae feed on the developing fruits and leaves of beech trees.

Ocellated Darners are dragonflies whose nymphs inhabit clear, shallow, rocky, swift-flowing streams and large, rocky, poorly vegetated lakes. Adults also inhabit nearby uplands, often forests with mixed coniferous and deciduous trees.

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Spring Salamander adults inhabit clean, cold, high-gradient brooks and headwater seeps in forest habitat, usually at elevation >100 m. Larvae are entirely aquatic and largely nocturnal, spending daylight hours buried below the streambed or hidden under stones. Adults are semi-aquatic and spend most of their time under cover objects along the margins of brooks, springs, and seeps; however, they will venture into upland forest during rainy weather.

In Massachusetts, the torpedo-shaped Longnose Sucker is found mainly in cool upper sections of streams and rivers with rocky to gravel substrates. These fish may swim miles to deposit their eggs on clean and well-oxygenated gravel substrates.

Core 2943F

A 4,980-acre section of a larger 93,990-acre Core Habitat featuring Forest Core, Wetland Core, Aquatic Core, Priority Natural Communities, and Species of Conservation Concern.

The lower Deerfield River and many of its tributaries are part of the extensive Connecticut River Core Habitat. This part of the Core supports 30 rare and uncommon species, from Longnose Suckers in Poland Brook to the Green Dragon (a relative of Jack-in-the-pulpit) in the wetland near the Deerfield's mouth. Many rare plants cling to the banks of the Deerfield in its steeper stretches, including Mountain Alder, Purple Clematis, and Tradescant's Aster.

High-Energy Riverbank communities are sparse, open graminoid communities found on cobble and sand deposits along fast-flowing rivers that experience severe flooding and ice scour. This example of High-Energy Riverbank is in good condition, but is threatened by upstream manipulations of water flow.

Major-River Floodplain Forests are dominated by silver maple. This community is found along the floodplains of large rivers. The soils here are enriched with nutrients brought by annual floods, resulting in a diversity of plants and insects. This Core has six examples of Major-river Floodplain Forest occurring in patches along the Deerfield River. At least one of these patches is very large, of high-quality, and is free of exotic species and human disturbances.

Rich, Mesic Forests are a variant of northern hardwood forests, dominated by sugar maple with a diverse herbaceous layer that includes many spring wild flowers, in a moist, nutrient-rich environment. This mature example of Rich, Mesic Forest is a regional variant lacking the full species diversity of its community type. It is structurally and topographically diverse, despite past logging, and exotic invasive species are established.

Riverside Rock Outcrop communities are sparsely vegetated areas in crevices on riverside rock outcrops where soil accumulates. The community occurs on flood-scoured bedrock along rivers. This example of Riverside Rock Outcrop occurs in conjunction with other important riverine communities along the Deerfield. The presence of several such communities near each other enhances the habitat value of each.

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Forest Cores are the best examples of large, intact forests that are least impacted by roads and development. Forest Cores support many bird species sensitive to the impacts of roads and development and help maintain ecological processes found only in unfragmented forest patches.

Wetlands Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

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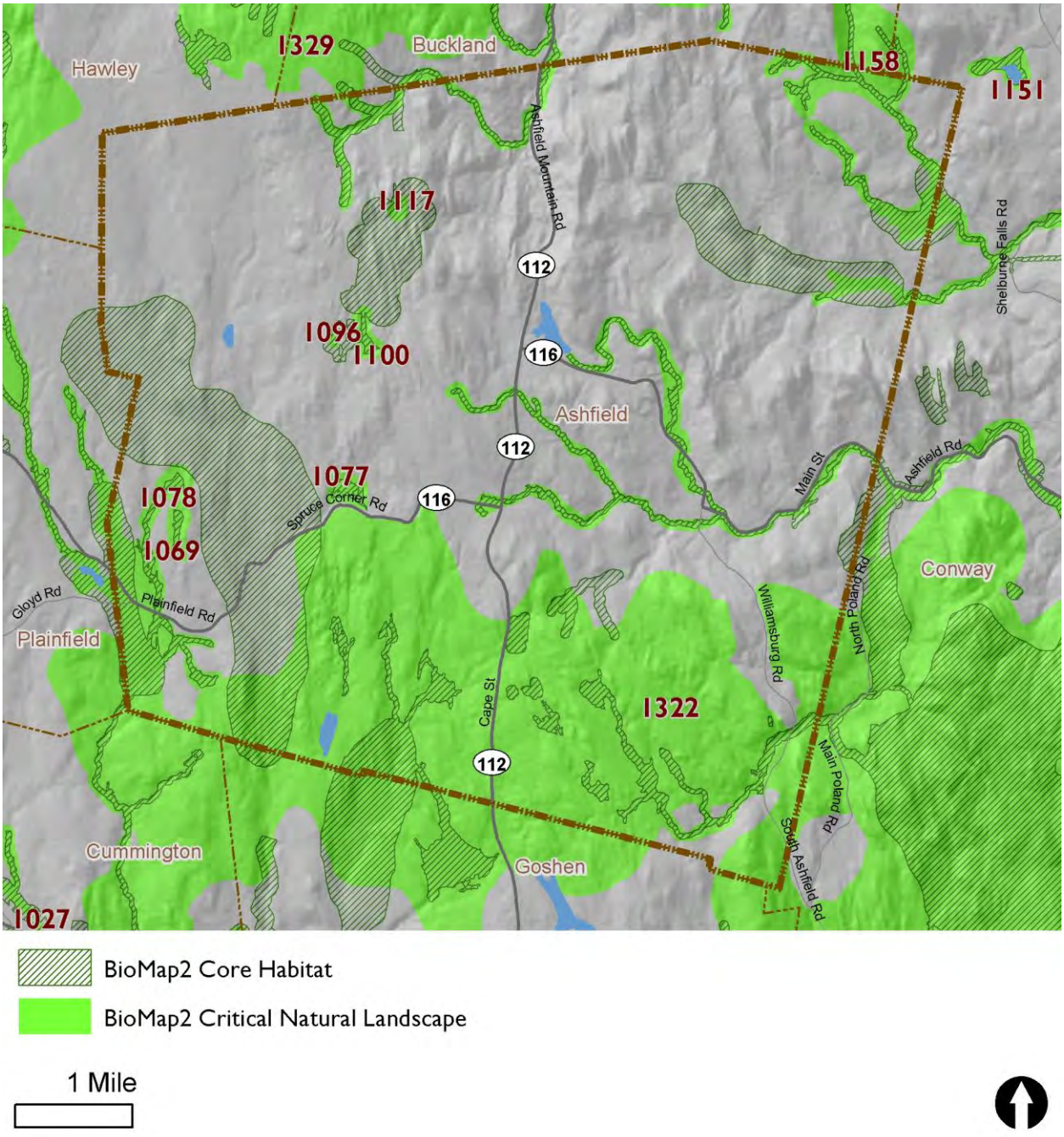
BioMap2 Critical Natural Landscape in Ashfield

Critical Natural Landscape IDs correspond with the following element lists and summaries.



Natural Heritage & Endangered Species Program

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Elements of *BioMap2* Critical Natural Landscapes

This section lists all elements of *BioMap2* Critical Natural Landscapes that fall *entirely or partially* within Ashfield. The elements listed here may not occur within the bounds of Ashfield.

CNL 1069
- Wetland Core Buffer

CNL 1077
- Wetland Core Buffer

CNL 1078
- Wetland Core Buffer

CNL 1096
- Wetland Core Buffer

CNL 1100
- Wetland Core Buffer

CNL 1117
- Wetland Core Buffer

CNL 1158
- Aquatic Core Buffer
- Wetland Core Buffer

CNL 1322
- Aquatic Core Buffer
- Landscape Block
- Wetland Core Buffer

CNL 1329
- Aquatic Core Buffer
- Landscape Block
- Wetland Core Buffer

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Critical Natural Landscape Summaries

CNL 1069

A 54-acre Critical Natural Landscape featuring Wetland Core Buffer.

A variety of analyses were used to identify protective upland buffers around wetlands and rivers. One, the variable width buffers methodology, included the most intact areas around each wetland and river, by extending deeper into surrounding unfragmented habitats than into developed areas adjacent to each wetland. Other upland buffers were identified through the rare species habitat analysis. In this way, the conservation of wetland buffers will support the habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.

CNL 1077

A 61-acre Critical Natural Landscape featuring Wetland Core Buffer.

A variety of analyses were used to identify protective upland buffers around wetlands and rivers. One, the variable width buffers methodology, included the most intact areas around each wetland and river, by extending deeper into surrounding unfragmented habitats than into developed areas adjacent to each wetland. Other upland buffers were identified through the rare species habitat analysis. In this way, the conservation of wetland buffers will support the habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.

CNL 1078

A 52-acre Critical Natural Landscape featuring Wetland Core Buffer.

A variety of analyses were used to identify protective upland buffers around wetlands and rivers. One, the variable width buffers methodology, included the most intact areas around each wetland and river, by extending deeper into surrounding unfragmented habitats than into developed areas adjacent to each wetland. Other upland buffers were identified through the rare species habitat analysis. In this way, the conservation of wetland buffers will support the habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.

CNL 1096

A 9-acre Critical Natural Landscape featuring Wetland Core Buffer.

A variety of analyses were used to identify protective upland buffers around wetlands and rivers. One, the variable width buffers methodology, included the most intact areas around each wetland and river, by extending deeper into surrounding unfragmented habitats than into developed areas adjacent to each wetland. Other upland buffers were identified through the rare species habitat analysis. In this way, the conservation of wetland buffers will support the habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.

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CNL 1100

A 52-acre Critical Natural Landscape featuring Wetland Core Buffer.

A variety of analyses were used to identify protective upland buffers around wetlands and rivers. One, the variable width buffers methodology, included the most intact areas around each wetland and river, by extending deeper into surrounding unfragmented habitats than into developed areas adjacent to each wetland. Other upland buffers were identified through the rare species habitat analysis. In this way, the conservation of wetland buffers will support the habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.

CNL 1117

A 20-acre Critical Natural Landscape featuring Wetland Core Buffer.

A variety of analyses were used to identify protective upland buffers around wetlands and rivers. One, the variable width buffers methodology, included the most intact areas around each wetland and river, by extending deeper into surrounding unfragmented habitats than into developed areas adjacent to each wetland. Other upland buffers were identified through the rare species habitat analysis. In this way, the conservation of wetland buffers will support the habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.

CNL 1158

A 1,099-acre Critical Natural Landscape featuring Aquatic Core Buffer and Wetland Core Buffer.

A variety of analyses were used to identify protective upland buffers around wetlands and rivers. One, the variable width buffers methodology, included the most intact areas around each wetland and river, by extending deeper into surrounding unfragmented habitats than into developed areas adjacent to each wetland. Other upland buffers were identified through the rare species habitat analysis. In this way, the conservation of wetland buffers will support the habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.

CNL 1322

A 288,370-acre Critical Natural Landscape featuring Aquatic Core Buffer, Wetland Core Buffer and Landscape Block.

A variety of analyses were used to identify protective upland buffers around wetlands and rivers. One, the variable width buffers methodology, included the most intact areas around each wetland and river, by extending deeper into surrounding unfragmented habitats than into developed areas adjacent to each wetland. Other upland buffers were identified through the rare species habitat analysis. In this way, the conservation of wetland buffers will support the habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.

Landscape Blocks, the primary component of Critical Natural Landscapes, are large areas of intact predominately natural vegetation, consisting of contiguous forests, wetlands, rivers, lakes, and ponds, as well as coastal habitats such as barrier beaches and salt marshes. Pastures and power-line rights-of-way, which are less intensively altered than most developed areas, were also included since they provide

habitat and connectivity for many species. Collectively, these natural cover types total 3.6 million acres across the state. An Ecological Integrity assessment was used to identify the most intact and least fragmented areas. These large Landscape Blocks are most likely to maintain dynamic ecological processes such as buffering, connectivity, natural disturbance, and hydrological regimes, all of which help to support wide-ranging wildlife species and many other elements of biodiversity.

In order to identify critical Landscape Blocks in each ecoregion, different Ecological Integrity thresholds were used to select the largest intact landscape patches in each ecoregion while avoiding altered habitat as much as possible. This ecoregional representation accomplishes a key goal of *BioMap2* to protect the ecological stages that support a broad suite of biodiversity in the context of climate change. Blocks were defined by major roads, and minimum size thresholds differed among ecoregions to ensure that *BioMap2* includes the best of the best in each ecoregion.

CNL 1329

A 111,531-acre Critical Natural Landscape featuring Aquatic Core Buffer, Wetland Core Buffer and Landscape Block.

A variety of analyses were used to identify protective upland buffers around wetlands and rivers. One, the variable width buffers methodology, included the most intact areas around each wetland and river, by extending deeper into surrounding unfragmented habitats than into developed areas adjacent to each wetland. Other upland buffers were identified through the rare species habitat analysis. In this way, the conservation of wetland buffers will support the habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.

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Help Save Endangered Wildlife!

Please contribute on your Massachusetts income tax form or directly to the

Natural Heritage & Endangered Species Fund

To learn more about the Natural Heritage & Endangered Species Program and the Commonwealth's rare species, visit our web site at www.mass.gov/nhesp.

APPENDIX B:
NHESP Letter Re Ashfield Open Space and Recreation Plan

MASSWILDLIFE

DIVISION OF
FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
MASS.GOV/MASSWILDLIFE

Jack Buckley, *Director*

September 12, 2016

Pat Smith
Franklin Regional Council of Governments
12 Olive St., Suite 2
Greenfield, MA 01301

RE: Ashfield Open Space and Recreation Plan

Dear Ms. Smith:

Thank you for contacting the Massachusetts Natural Heritage and Endangered Species Program (NHESP) regarding the Open Space and Recreation Plan for the Town of Ashfield. Enclosed is information on species listed under the Massachusetts Endangered Species Act (MESA), as well as on Priority Natural Communities, Certified and Potential Vernal Pools, Coldwater Fishery Resource streams and rivers, and other aspects of biodiversity documented in our database for the Town of Ashfield. The Town is encouraged to include this letter and associated materials in the Open Space and Recreation Plan.

MESA-listed Species

According to the NHESP database, the Town of Ashfield currently has habitat for the following rare species listed under MESA:

- American Bittern (*Botaurus lentiginosus*, Endangered)
- Lake Chub (*Couesius plumbeus*, Endangered)
- Jefferson Salamander (*Ambystoma jeffersonianum*, Special Concern)
- Dwarf Mistletoe (*Arceuthobium pusillum*, Special Concern)
- Ocellated Darner (*Boyeria grafiana*, Special Concern)
- Longnose Sucker (*Catostomus catostomus*, Special Concern)
- Dwarf Scouring-rush (*Equisetum scirpoides*, Special Concern)
- Wood Turtle (*Glyptemys insculpta*, Special Concern)
- Bristly Black Currant (*Ribes lacustre*, Special Concern)
- Name not released (NHESP does not release the names of species deemed particularly sensitive to collection)

Fact sheets on each of these species may be downloaded from our website at
http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/species-information-and-

conservation/mesa-list/list-of-rare-species-in-massachusetts.html. The Town is encouraged to include these fact sheets in its Plan.

Priority Natural Communities

There are 5 examples of Priority Natural Communities documented to NHESP from Ashfield:

- 1 Acidic Graminoid Fen
- 1 Rich Conifer Swamp
- 3 Rich Mesic Forests

Fact sheets on these communities may be downloaded from our website at http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/natural-communities/natural-community-fact-sheets.html. The Town is encouraged to include these fact sheets in its Plan.

Vernal Pools

As of this date, there are 10 Certified and 39 Potential Vernal Pools documented from Ashfield. Most of the Potential Vernal Pools are likely able to be certified; the Town is encouraged to certify vernal pools on its own properties and to require developers in town to certify pools on any property requiring permits from the town.

Coldwater Fishery Resources

There are 26 Coldwater Fisheries Resource streams in Ashfield: Bear River, Billings Brook, Bradford Brook, Chapel Brook, the Upper Branch of Clesson Brook, Drakes Brook, East Brook, Ford Brook, Sids Brook, Smith Brook, the South River, Stones Brook, the Swift River, including the North Branch, and13 small, unnamed tributaries to these brooks and rivers.

BioMap2

Seventeen areas within Ashfield are *BioMap2* Core Habitat. They include 8 Aquatic Cores, 12 Wetland Cores, 3 Priority Natural Community Cores, and areas for 11 Species of Conservation Concern (some of which have disappeared, been de-listed, or gone Historic since *BioMap2* was published in 2010). Some of these areas overlap.

Adjacent to some of these Core Habitats in Ashfield are 9 areas of *BioMap2* Critical Natural Landscape, including 7 Aquatic Buffers, 14 Wetland Buffers, and 3 Landscape Blocks, some of which overlap. For an explanation of *BioMap2* and the Core Habitats within Ashfield, please see the attached *BioMap2* Town Report.

Discussion

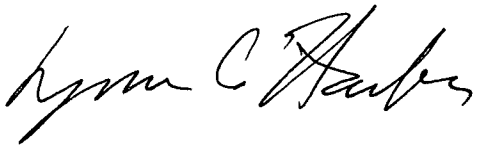
In a town like Ashfield, where much of the land is undeveloped and large areas of town are *BioMap2* areas and/or habitat for MESA-listed species, it can be hard to decide where the highest priorities for

land protection should be. The Town should consider carefully these suggestions for inclusion in its Open Space and Recreation Plan:

- Land Protection: The Town of Ashfield does not, apparently, own any parcels set aside for conservation (it does own property for recreation and water supply). Should the Town decide to conserve land itself, or if it wishes to partner with land trusts or encourage private landowners to conserve their land, we recommend making the Swift River and its watershed the highest priority
- Habitat Management: The Town should assess conservation, recreation, and water supply areas for the presence of invasive species. If invasives are present in substantial numbers or areas, consider removing them. (Note that the Division of Fisheries and Wildlife has offered grants to fund such activities in the past and is hoping to do so again in the future).
- Regulation: The Town should support and encourage its Conservation Commission to enforce the provisions of the Massachusetts Wetlands Act. While there is no local board or official charged with enforcing the provisions of the Massachusetts Endangered Species Act, the Town could consider having the Conservation Commission and the Building Inspector notify development applicants of the presence/absence of Priority Habitat of Rare Species on the applicant's property.
- Education and Outreach: Developing community support for conservation of biodiversity is essential for successful efforts at land protection, habitat management, and regulation. Offering field trips on Town conservation areas, writing articles on conservation for local websites and newspapers, and encouraging local students to conduct biological surveys and observations on conservation areas are a few of the low-cost ways to build support that will pay off in the future.

The Town of Ashfield is to be commended for undertaking production of an Open Space and Recreation Plan. Please do not hesitate to call me at 508-389-6351 if you have any further questions.

Sincerely,



Lynn C. Harper
Habitat Protection Specialist
Massachusetts Natural Heritage & Endangered Species Program

APPENDIX C:

Fact Sheets for Endangered, Threatened and Special Concern Species in Ashfield

Natural Heritage & Endangered Species Program

www.mass.gov/nhesp

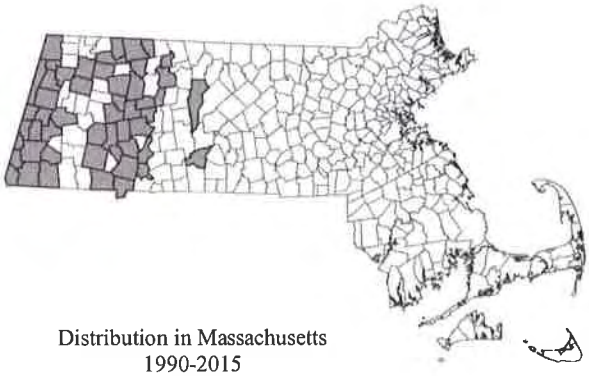
Massachusetts Division of Fisheries & Wildlife

Jefferson Salamander
Ambystoma jeffersonianum

State Status: **Special Concern**
Federal Status: **None**

DESCRIPTION: Jefferson Salamander is a large, gray to brownish-gray salamander with fine markings of light blue to silvery flecks on the limbs, lowers sides, and tail. Adults measure 4–7 inches (10–18 cm) in total length. The tail is laterally compressed (especially in sexually active males) and is approximately the length of the body. Jefferson Salamander is in the family of mole salamanders, and so it has distinctively long toes and a stockier build relative to other groups of salamanders in our region. Males tend to be smaller than females and have conspicuously swollen vents during the breeding season.

Larvae have bushy, external gills, a wide head, and a broad caudal fin that extends well onto the back. Young larvae are not easily distinguished from those of other *Ambystoma* species, but they do appear to have more prominent markings of golden yellow on the sides of the head, neck, and dorsum contrasting with a dark, olive-green to brownish base color. Older larvae can still be difficult to identify, but they are generally characterized as having grayish bodies, whitish/unpigmented undersides, and a heavily dark-mottled caudal fin.



Distribution in Massachusetts
1990-2015
Based on records in Natural Heritage Database
Map updated 2015

Jefferson Salamander
Photo by Bill Byrne

SIMILAR SPECIES: Jefferson Salamander is a member of an intricate group of salamanders known as the *Ambystoma jeffersonianum* complex. The complex consists of two bisexual species, Jefferson Salamander and Blue-spotted Salamander (*A. laterale*), and a group of unisexual *Ambystoma* of a hybrid lineage. Unisexual *Ambystoma* in this complex have variable nuclear genomes consisting of complements of both Jefferson Salamander and Blue-spotted Salamander, and a mitochondrial genome derived from Streamside Salamander (*A. barbouri*), a species currently occurring in Kentucky, Ohio, Indiana, Tennessee and West Virginia. The original species pairing that led to the hybrid unisexual lineage is not yet known, but recent studies suggest that today's unisexual *Ambystoma* and *A. barbouri* from western Kentucky share a maternal ancestor from ~5 million years ago. The unisexual *Ambystoma*, whose populations almost always consist entirely of females, co-occur with local populations of true Jefferson Salamanders and Blue-spotted Salamanders and are able to perpetuate through complicated reproductive mechanisms involving the use of sperm from males of the two species. The resulting offspring are unisexuals having varying ploidy levels (usually 3-4 sets of chromosomes, but occasionally 2 or

5) and varying complements of *A. jeffersonianum* vs. *A. laterale* nuclear genomes (depending on which of the species is present at a given site, and which reproductive mechanism plays out for a given egg).

The unisexual *Ambystoma* are very similar in appearance to Jefferson Salamander and Blue-spotted Salamander, forming a continuum from the grayish-brown coloration, diffuse blue flecks, and wide snout of Jefferson Salamander, to the black base color, prominent blue spots/blotches, and narrow snout of Blue-spotted Salamander. Unlike Blue-spotted Salamander, Jefferson Salamander cannot usually be distinguished from unisexual *Ambystoma* in the field by size and coloration.

A male Jefferson Salamander captured from the bottom of a vernal pool in Sunderland, Massachusetts during the breeding season.
Photo by Jacob E. Kubel

However, one can assume with high probability that any male specimen observed in most parts of the Jefferson Salamander range is, indeed, a Jefferson Salamander (rather than unisexual *Ambystoma*).

Some people confuse the lead/gray color phase of Eastern Red-backed Salamander (*Plethodon cinereus*) for Jefferson Salamander, as the two species have a grayish base color peppered with light-colored flecks along the lower sides. However, Eastern Red-backed Salamander is much smaller and leaner in overall appearance. Perhaps the easiest way to tell the two species apart is to examine the toes. They are very short and stubby in Eastern Red-backed Salamander, but long and fingerlike in Jefferson Salamander.

RANGE: Jefferson Salamander ranges from southern Ontario through New York and western New England south and west to northern Virginia, West Virginia, Kentucky, and eastern Illinois. Within Massachusetts, Jefferson Salamander is distributed throughout parts of Berkshire, Hampden, Hampshire, and Franklin counties. Several populations east of the Connecticut River have been confirmed, and approximately a dozen others are suspected. All populations of Jefferson Salamander in Massachusetts are presumed to contain unisexual *Ambystoma*.

The precise distribution of Jefferson Salamander between the Connecticut River and western Worcester County is not completely understood. Observation data from that region are based largely on egg masses and adult unisexuals, which cannot always be assigned reliably to a particular taxon within the *A. jeffersonianum* complex by appearance alone. Planned genetic investigations throughout the region will eventually confirm whether each previously observed population contains Jefferson Salamanders, Blue-spotted Salamanders, or both species.

HABITAT: Adult and juvenile Jefferson Salamanders inhabit relatively mature deciduous and mixed deciduous-coniferous forests and woodlands. Circumneutral to calcareous sites at higher elevations seem to be preferred, with many known populations being associated with rich hillsides and ridges. Jefferson Salamander is somewhat selective with its breeding habitat in Massachusetts, as the species breeds almost exclusively in isolated vernal pools and shrub swamps. Abandoned agricultural ponds and other man-made

impoundments are used in some situations, but Jefferson Salamanders tend to avoid other wetland types (e.g., red-maple swamps, floodplain marshes, beaver impoundments) used frequently by other mole salamander species. Vernal pools and shrub swamps nested between upland ridges ("saddle pools") are used often. The most productive breeding pools appear to be those that are relatively large (0.2–0.5 acres), are deep (3–5 ft), and have patches of multi-stemmed shrubs (e.g., *Cephalanthus occidentalis*, *Cornus* spp.) Abundant detritus and absence of predatory fish are additional characteristics of typical breeding habitat. Water clarity seems unimportant, as Jefferson Salamander does not exhibit a strong preference for pools with dark, tannic water as does Blue-spotted Salamander.

A classic saddle pool used for breeding by Jefferson Salamander.
Photo by Jacob E. Kubel

In the terrestrial environment, thick leaf litter, abundant coarse woody debris, loose soils, predominantly closed-canopy tree cover, and abundant rodent tunnels are trademarks of good-quality microhabitat for adult and juvenile Jefferson Salamanders. Most adult individuals reside within several hundred meters of their breeding wetland. Research suggests that local salamander distribution around a breeding site may be influenced by habitat integrity, with salamanders residing closer to a wetland (on average) in intact forest, but occupying areas farther from the wetland when a forest patch is fragmented (e.g., by development). Of course, variability in the distribution of high-quality microhabitat around a breeding site is also likely to influence the distribution of individual salamanders around the wetland, as is the availability of other suitable wetlands within the patch of upland habitat.

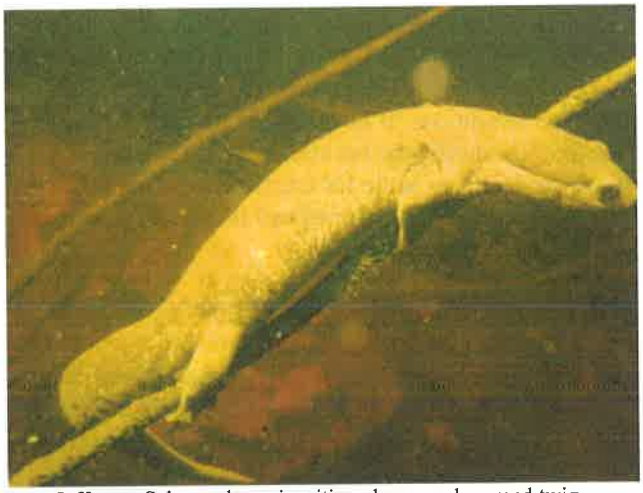
LIFE CYCLE/BEHAVIOR: As the family name "mole salamander" implies, adult and juvenile Jefferson Salamanders spend the majority of their time underground or hidden beneath rocks, logs, leaf litter, or other debris. During rainy or otherwise humid nights in the warmer months of the year, individuals may occur on the ground surface for purposes of foraging, dispersal, or migration to breeding sites. However, most hours of the year are spent under leaf litter, in rodent tunnels, or in other subsurface cavities. Winters are spent below the frost line, presumably in vertical rodent tunnels or root channels.

During March or early April (depending on the timing of winter thaw and warm rains), adult Jefferson Salamanders emerge from their underground retreats and migrate en masse to their breeding pools. Migrations are typically triggered by a steady rain with ambient air temperature holding above 40°F. Given those conditions, salamander movement may begin shortly after sunset and continue through the night, with peak activity occurring between an hour after sunset and midnight. Not all individuals can complete their journey in a single evening. Therefore, migrations may occur over the course of several nights to a couple of weeks, depending on the timing, duration, and frequency of suitable weather conditions. If nocturnal rains are slow to materialize during the normal migratory period, the salamanders may settle for drizzle or a low fog, or even migrate beneath the cover of leaf litter (still moist from snowmelt or ground thaw).

Once in their breeding pool, Jefferson Salamanders engage in an elaborate courtship similar to that of Blue-spotted Salamander. Various stages may be repeated or abandoned multiple times when a female is not receptive to a male, or when competing males disrupt or otherwise interfere with one another, but courtship generally proceeds as follows. The male Jefferson Salamander approaches a female, swims over her female, clasps her body behind her forelegs (with his own), and holds her for several minutes. During that time, the two salamanders may swim about as a clasped pair or just rest on the pool bottom. Eventually, the male (while clasping the female) begins rubbing his snout over her head, undulates his tail, and rubs his body and cloaca over her body in an increasingly vigorous manner. He

then releases the female, moves forward while undulating his tail, and deposits one to several spermatophores on the bottom substrate of the wetland. The female follows him and noses his cloaca, eventually moving over the spermatophores and picking up their seminal fluid with her cloacal lips, drawing it into her body.

In the pairing of male and female Jefferson Salamanders, reproduction then proceeds via normal fertilization of the eggs by sperm obtained from the spermatophore(s) (i.e., syngamy of haploid gametes). However, in the pairing of male Jefferson Salamanders with female unisexual *Ambystoma*, reproduction proceeds via any of several possible mechanisms (collectively termed kleptogenesis) that do not involve traditional syngamy. In the most common mechanism, the female produces unreduced, polyploid ova, and the male's sperm merely activates embryonic development in the eggs without contributing any genetic material, thereby resulting in offspring that are genetic clones of the unisexual mother. This is one reason why unisexual *Ambystoma* are believed to greatly outnumber true Jefferson Salamanders in most local populations.



Jefferson Salamander ovipositing along a submerged twig.
Photo by Jacob E. Kubel

After mating, a female Jefferson Salamander (or unisexual *Ambystoma*) deposits her eggs in one to several variably-sized clusters, each nested within a loose, clear, gelatinous matrix (egg mass). The egg masses typically contain 15–60 eggs each, but further research is needed to differentiate between egg masses of Jefferson Salamander and unisexual *Ambystoma* in Massachusetts. Egg masses of both groups are usually attached to the twigs of fallen tree branches or submerged shrubs, but grasses, forbs, or the pool bottom may be used when twigs are unavailable.

Hatching occurs in 3–4 weeks, whereupon the bushy-gilled, fully-aquatic larvae spend the next 2–3 months in the wetland. The salamander larvae feed voraciously on zooplankton, insect larvae (e.g., mosquitoes), and other aquatic organisms, increasing in body size and developing front and hind limbs as spring advances into summer. Metamorphosis then occurs in July or August, depending on when the wetland begins to dry, when food resources become limited, or on other factors. At this time, the larvae develop lungs, resorb their gills, and seek cover beneath stones, woody debris, leaf litter, or other detritus in moist or saturated portions of the wetland basin. There, the juvenile salamanders will wait for an opportunity to leave the basin and disperse into the surrounding forest (typically during an evening rain).

Jefferson Salamander egg mass attached to a submerged twig.
Photo by Jacob E. Kubel

Following dispersal from natal wetlands, juvenile salamanders will reside in the forest, feeding on snails, earthworms, beetles, and other small invertebrates. Upon reaching sexual maturity in approximately 3 years, most individuals will return to their natal wetland to breed, starting the cycle anew. Others will have sought out new ground, joining another segment of the local breeding population, or pioneering a new one of their own.

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Maximum life expectancy of Jefferson Salamander is unknown. Mark-recapture studies of other mole salamanders indicate that adult survivorship is relatively high, and individuals may live for several years or more with regularity. Accounts of salamanders held in captivity suggest a possible lifespan greater than 10 years.

POPULATION STATUS IN MASSACHUSETTS: Jefferson Salamander (including its unisexual associates) is legally protected and listed as Special Concern pursuant to the Massachusetts Endangered Species Act (M.G.L. c. 131A) and implementing regulations (321 CMR 10.00). As of January 2015, approximately 131 local populations have been documented among 51 towns since 1990. Primary threats to Jefferson Salamander in Massachusetts are habitat loss, habitat degradation, road mortality, and emerging infectious disease. The most common types of habitat loss are the clearing of forests and the filling (or draining) of vernal pools during residential, commercial, industrial, mining, or agricultural development.

Illegal clearing of forest and filling of vernal pools is an ongoing threat to pool-breeding salamanders in Massachusetts.
Photo by Jacob E. Kubel

Habitat degradation typically occurs when development fragments habitat (e.g., creates gaps between forest habitat and breeding wetlands), chemical applications (e.g., pesticides, deicing salts, fertilizers) pollute breeding wetlands, or commercial logging operations disrupt forest ecology (e.g., compact soils, reduce leaf litter, introduce or increase growth of non-native, invasive vegetation). High road densities and traffic volumes tend to result in increased levels of adult salamander mortality; in extreme cases, road mortality functions as a barrier between upland and breeding habitats. Known and potential impacts of several pathogens/emerging infectious diseases (e.g., ranavirus, *Batrachochytrium salamandrivorans*) are not completely understood, but outbreaks could result in severe and widespread salamander mortality.

MANAGEMENT RECOMMENDATIONS: At a local scale, sites of known occurrence of Jefferson Salamander should be managed to develop or maintain mature forest conditions within approximately 1,000 feet of confirmed and potential breeding wetlands. Such management should aim to minimize forest loss/fragmentation, road traffic, soil compaction, and introduction/growth of invasive, non-native vegetation. Forest type should be maintained as deciduous or mixed deciduous-coniferous. Fallen trees, branches, leaves, and other detritus should be allowed to accumulate on the forest floor. Hydrology of breeding wetlands should not be altered in ways that might reduce hydroperiod within the March through August time period. Breeding wetlands should be protected from chemical pollution, and basin structure should not be altered without special permits from the Massachusetts Division of Fisheries and Wildlife and/or the Department of Environmental Protection. Breeding wetlands should not be filled or used for dumping of yard waste or refuse.

At the landscape scale, area of mature upland forest between local populations of Jefferson Salamander should be maximized to maintain dispersal corridors and, therefore, genetic exchange between populations. Land acquisition/protection efforts for maintaining habitat connectivity should prioritize areas with low road densities and traffic volumes. A land-protection strategy may best serve long-term persistence of local populations where they occupy relatively large, connected areas containing abundant breeding habitats. However, lands supporting small, peripheral, or isolated populations are also worth protecting for maintenance of genetic diversity at the state level.

"Pure" populations of Jefferson Salamander that do not contain unisexual *Ambystoma* are not known to occur in Massachusetts nor anywhere else in New England. Long-term viability of populations with a low Jefferson Salamander to unisexual *Ambystoma* ratio is not well

understood. Therefore, identification and protection of populations with relatively high ratios of Jefferson Salamanders to unisexuals is considered an important precaution in a changing environment. Biological inventory, research, land acquisition, and environmental regulation are several actions that should be utilized to help meet that goal.

Stronger controls are necessary to guard against the introduction and spread of amphibian pathogens and infectious disease. For example, national policy and enforcement regarding importation of exotic wildlife in the global pet trade should be improved to reduce and minimize the volume of diseased animals entering the country. Within Massachusetts, field biologists, anglers, and other outdoor enthusiasts should adopt and promote appropriate equipment-sanitation procedures when outdoor activities span wide geographic areas. A statewide amphibian monitoring program that includes sampling for pathogens and disease outbreaks is needed.

Active management of Jefferson Salamanders and their habitats is a developing interest. For example, construction of vernal pools to enhance breeding opportunities at sites where wetland habitats are scarce is a continuing line of research. Citizens play an active role in conservation by helping adult salamanders cross roads safely during their breeding migrations, thereby increasing survivorship and reproductive output.

Citizens are encouraged to assist with conservation of Jefferson Salamanders in additional ways. For example, observations of Jefferson Salamanders (or associated unisexual *Ambystoma*) should be reported to the NHESP, as land-protection efforts for the species are dependent on knowing where local populations occur. Collection and submission of data for the certification of vernal pool habitat is another beneficial action, as it will afford certain legal protections to salamander habitats.

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Massachusetts Division of Fisheries & Wildlife
1 Rabbit Hill Road, Westborough, MA 01581
tel: (508) 389-6360, fax: (508) 389-7891
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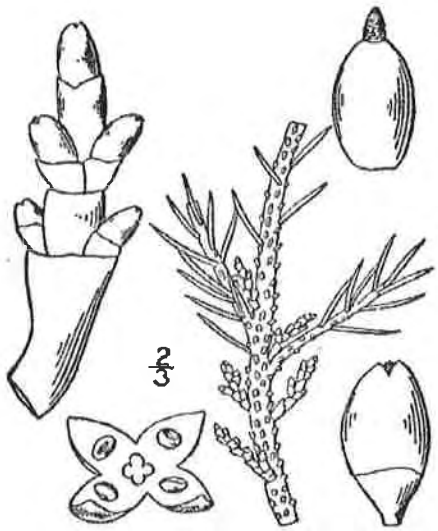
Dwarf Mistletoe

Arceuthobium pusillum Peck

State Status: Special Concern

Federal Status: None

Description: A member of the Christmas Mistletoe family (Viscaceae), dwarf mistletoe is a very small fleshy shrub, usually no more than 2 cm (0.8 in.) tall that parasitizes conifer trees. Its generic name reflects this parasitic habit, coming from the Greek words for juniper (*arkeuthos*) and life (*bios*). This simple or sparingly branched plant has greenish to chestnut-colored, or even purplish, stems that are circular when fresh and four-angled when dry. The opposite leaves are reduced to thin, connate, obtuse (blunt-tipped) scales with a width of only 1 mm (0.04 in.). Dwarf mistletoe spreads beneath the bark of its host by means of a haustoria, an organ used to obtain nutrients from the host. The formation of globose clumps of swollen, infected branches--or "witches' brooms"--saps the trees' strength, and, eventually, a tree covered with them may weaken and die. Dwarf mistletoe is a dioecious plant (a plant with unisexual flowers in which the individual plants are either male or female). Mistletoes reproduce by means of seeds expelled from explosive fruits. The sticky seeds cling to needles, eventually sliding down the needles to germinate on twigs. During the first year, the parasite penetrates the wood with a root-like structure and develops food and water transport systems. An aerial fruiting structure arises in the early spring of the second year. The structure is green and about as long as the spruce needles.. Male and female plants are located on separate branches or on separate trees. During the third year, pollen and flowers are produced. Male (pollen-producing) structures, which survive only a short time, are large and orange-yellow. Pollen is spread to the tiny flowers by wind, insects, and birds. Each flower then bears one barrel-shaped fruit. The fruit, which matures in the fall, is a hard seed covered with a sticky substance. The seed is shot out of the coat for a distance of up to 30 feet. The fruiting structure then withers and falls off, leaving only the cup-shaped base. Seeds may also be carried on the feathers of birds and the fur of mammals. Dwarf mistletoe will only germinate on live host branches.



Top: USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 1: 638.

Bottom: Black Spruce shoot with Eastern Dwarf Mistletoe. Photo by and courtesy of Thomas J. Rawinski.

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Range: Dwarf mistletoe, one of the most widespread of the New World species of *Arceuthobium*, is found throughout most of the range of its hosts. The documented range of dwarf mistletoe extends from Newfoundland and Quebec to Minnesota and Saskatchewan and south to northern New Jersey, Pennsylvania and Michigan.

Distribution in Massachusetts
1985 - 2010
Based on records in the
Natural Heritage Database

Habitat In Massachusetts: In Massachusetts, dwarf mistletoe occurs in peatlands varying from kettlehole peat bogs to spruce-fir-birch headwater swamps, generally on the branches of black spruce (*Picea mariana*). Elsewhere in its range, this plant occasionally occurs on red spruce (*Picea rubens*), white spruce (*Picea glauca*) and tamarack (*Larix laricina*). Throughout its range, it favors wetland communities dominated by conifer trees and influenced by acidic water. Specific habitats in Massachusetts include acidic conifer swamps, bog forests, and headwater swamps, including a headwater seepage swamp with both acidic and calciphilic plants. In addition to black spruce, associated species include larch (*Larix laricina*), balsam fir (*Abies balsamea*), yellow birch (*Betula alleghaniensis*), hemlock (*Tsuga canadensis*), red maple (*Acer rubrum*), bog laurel (*Kalmia polifolia*) and Labrador tea (*Ledum groenlandicum*).

Population Status in Massachusetts: Dwarf mistletoe is currently listed as a "Species of Special Concern" in Massachusetts. All listed species are protected from killing, collecting, possessing, or sale and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. There are 20 current stations (1985-2010) and 11 historical stations (unverified since 1978). The distribution of dwarf mistletoe is determined by the presence of its hosts, frequently spruces, which themselves are limited in distribution in Massachusetts. Due to its inconspicuous size, it is likely that some occurrences have as yet gone undiscovered. Dwarf mistletoe is also considered rare in Vermont, Rhode Island, Connecticut, New Jersey and Pennsylvania.

Management Recommendations: Various species of *Arceuthobium* are the only flowering plants that produce the phenomenon known as "witch's broom." Also caused by other parasites, such as fungi and mites, this deformity can eventually kill the affected branches and, later, the entire tree. While dwarf mistletoe is considered to be a serious threat by foresters--particularly in eastern Canada and the Lake states--it is not a problem in Massachusetts, where its rarity has resulted in its being placed on the state's rare species list. The vast majority of "witch's brooms" seen in Massachusetts are caused by other parasites.

The distribution of dwarf mistletoe is limited by that of its host species--in Massachusetts, primarily black spruce. Hence, in order to preserve a local population, it may become necessary to ensure that its host persists in the immediate vicinity. All active management of rare plant populations (including invasive species removal) is subject to review under the Massachusetts Endangered Species Act, and should be planned in close consultation with the Massachusetts Natural Heritage & Endangered Species Program.

For more information see:

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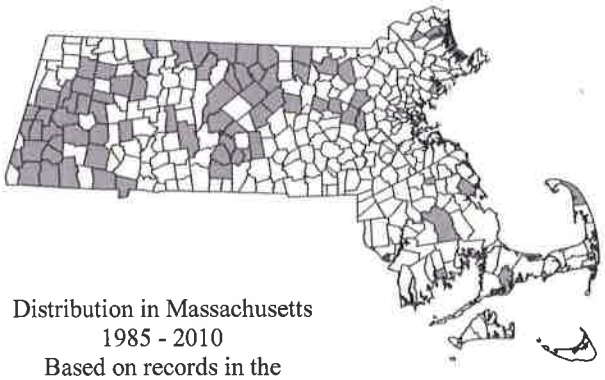
Massachusetts Division of Fisheries & Wildlife

American Bittern
Botaurus lentiginosus

State Status: **Endangered**
Federal Status: **None**

DESCRIPTION: The American Bittern is a medium-sized (23-34 inches [58-68 cm] long) brown, streaked, ground-dwelling heron that spends most of its time hidden among marshland vegetation. Its upper parts are mottled with brown and buff, while the under parts are streaked with brown and white. The short thick neck has a black stripe or patch on each side, and the throat is white with thick black streaks. The top of the head is usually darker than the body, or sometimes rusty. There is a buffy stripe over each of the yellow eyes. The bill, legs, and feet are pale yellow or yellowish-green. Wingspread is from 32 to 50 inches (80-106 cm) and the black wingtips are conspicuous in flight. The relatively short tail is rounded and mottled brown.

SIMILAR SPECIES: Immature Night Herons are grayer and more spotted than the American Bittern and frequently perch in trees. The Least Bittern is small with buffy wing patches.



Distribution in Massachusetts
1985 - 2010
Based on records in the
Natural Heritage Database

Photo: Bill Fournier

HABITAT IN MASSACHUSETTS: The American Bittern inhabits freshwater marshes, meadows, fens and bogs dominated by emergent vegetation such as cattails, bulrushes, sedges, and grasses. It may also occur in brackish wetlands.

BEHAVIOR: The American Bittern spends most of its time hidden among marshland vegetation. It walks slowly and stealthily. When startled, the bittern assumes what is perhaps it most characteristic stance: standing

frozen with the bill pointed skywards, in order to camouflage itself among the reeds, occasionally swaying from side to side with the vegetation as if blown by the wind. When flushed from a marsh, it gives "kok kok kok" call or a nasal "haink," its wings flap loosely, feet dangle, and it flies off slowly, but with rapid wing beats. The distinctive call is loud and guttural; the notes sound like an old-fashioned pump, usually in three syllables, the middle one sharply accented; "oonk-a-lunk" or "oong-ka-chook". Pumping calls are usually heard at dusk, or dawn in spring or early summer.

MATING/BREEDING HABITS: Courtship behavior is not well understood, but is known to include aerial and ground chases. Males slowly stalk females as they display a pair of white fanlike plumes raised over the back and shoulders. Usually, bitterns nest in marshes, but may also nest in grassy upland fields adjacent to wetlands. Males appear to be territorial throughout the breeding season, and remain in the nest-site vicinity. Males may be polygynous. The female builds the nest and cares for the young. The nest, about a foot (30 cm) in diameter, is located either on the ground in dense vegetation or on a platform about a foot above the water. Nest material includes dead reeds, cattails, grasses, and sedges. The 3 to 5 buff-brown to olive-brown eggs are laid at 1-day intervals with incubation beginning with the laying of the first egg. An egg hatches about 24 days after it was laid. Young are fed by regurgitation at the nest for about 2 weeks. The female continues to tend the young for an undetermined length of time after they leave the nest. There is one clutch per year.

FEEDING HABITS: Preferred foods include frogs, small snakes and eels, salamanders, crayfish, fish, and occasionally mice and grasshoppers caught on visits to open fields. The American Bittern feeds in marshes, meadows, and along edges of shallow ponds, standing motionless with neck outstretched and level bill, eyes focused down into the water, slowly aiming its bill before suddenly darting downward to seize the prey.

RANGE: The breeding range of the American Bittern extends from Newfoundland west to Manitoba and British Columbia; south to Maryland and west through Oklahoma and Kansas to southern California. This bittern also breeds very rarely in the Gulf States. It winters from the Carolinas south to the Bahamas, Cuba, and Panama, and occasionally as far north as along the east coast of Massachusetts. American Bitterns return to Massachusetts marshes in April.

POPULATION STATUS: The American Bittern is listed as Endangered under the Massachusetts Endangered Species Act. All listed species are protected from killing, collecting, possessing, or sale and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. Population trends in Massachusetts are not known although the global population is thought to be declining.

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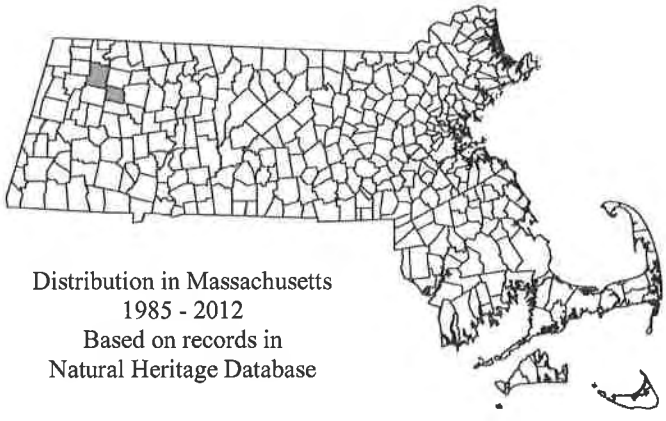
Massachusetts Division of Fisheries & Wildlife

Michaux's Sedge
Carex michauxiana
Boeckeler

State Status: **Endangered**
Federal Status: **None**

GENERAL DESCRIPTION: Michaux's Sedge is a perennial member of the Sedge family (Cyperaceae) that occurs in boggy areas. It has narrow (1.5–4 mm), yellowish green leaves that are shorter than the 15 to 70 cm (6–28 in.) flowering stems. It is named for the French botanist and explorer André Michaux (1746-1802).

AIDS TO IDENTIFICATION: To identify Michaux's Sedge and other members of the genus *Carex*, a technical manual should be consulted. Species in this genus have tiny, wind-pollinated flowers that are borne in spikes. Michaux's Sedge is one of only two members of *Carex* section *Rostrales* found in New England. Species in this section have long, slender perigynia (8–15 mm long and 1.5–3 mm wide) that gradually taper to a beak with two erect to spreading teeth. The perigynia are borne on two to five stalked, lateral spikes, with the staminate flowers in a small terminal spike. Of these two species, Michaux's Sedge can be recognized by its smaller size, generally erect spikes, shorter pistillate scales, and upper leaf sheaths that are concave at the mouth.



Distribution in Massachusetts
1985 - 2012
Based on records in
Natural Heritage Database

Michaux's Sedge is a wetland species that has long, slender perigynia that taper gradually to a toothed beak.
Photo by Russ Schipper.

SIMILAR SPECIES: The other member of *Carex* section *Rostrales* in New England is the common and widespread Long-culmed Sedge (*C. folliculata*), which can be found in similar wetland habitats. This species differs from Michaux's Sedge in its wider leaves (4–18 mm), taller stems (up to 1.75 m), and drooping lower spikes. Unusually small individuals of Long-culmed Sedge can be distinguished from Michaux's Sedge by the combination of pistillate scales that are more than two-thirds the length of the perigynia and upper leaf sheaths that are convex. Collins' Sedge (*C. collinsii*), which is rare in Connecticut and New York and has not been recorded from Massachusetts, also appears similar to Michaux's Sedge but has reflexed rather than spreading perigynia, with reflexed beak teeth.

HABITAT: The known sites for Michaux's Sedge in Massachusetts are boggy habitats with *Sphagnum*. One population occurs along the margins of a sluggish stream and the pond that it feeds, with Tawny Cotton-grass (*Eriophorum virginicum*), Threeway Sedge (*Dulichium arundinaceum*), and several orchid species. The other is a shrubby wet meadow with Shrubby Cinquefoil

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(*Dasiphora floribunda*) and Large Cranberry (*Vaccinium macrocarpon*).

RANGE: Michaux's Sedge occurs from Saskatchewan to Newfoundland, south to Minnesota and Maryland.

POPULATION STATUS IN MASSACHUSETTS: Michaux's Sedge is listed under the Massachusetts Endangered Species Act as Endangered. All listed species are protected from killing, collecting, possessing, or sale, and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. Michaux's Sedge occurs in Berkshire and Hampshire Counties, and was found historically in Franklin County.

MANAGEMENT RECOMMENDATIONS: As for many rare species, exact management requirements for Michaux's Sedge are not known. Caution is needed at sites with extant populations to prevent disturbance of hydrological conditions. Management may be required at some sites to prevent establishment of dense woody vegetation that may shade or compete with Michaux's Sedge. All active management of rare plant populations (including invasive species removal) is subject to review under the Massachusetts Endangered Species Act, and should be planned in close consultation with the Massachusetts Natural Heritage & Endangered Species Program.

MATURE PERIGYNIA PRESENT:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
						■	■	■			

REFERENCES:

Gleason, H. A., and A. Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada*, 2nd edition. The New York Botanical Garden, Bronx, NY.

Haines, A. 2011. *Flora Novae Angliae – a Manual for the Identification of Native and Naturalized Higher Vascular Plants of New England*. New England Wildflower Society, Yale Univ. Press, New Haven, CT.

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Few-flowered Sedge
Carex pauciflora
Lightf.

State Status: **Endangered**
Federal Status: **None**

GENERAL DESCRIPTION: Few-flowered Sedge is a perennial member of the Sedge family (Cyperaceae) found in sphagnum bogs. It has narrow leaves (1–2 mm) and single or loosely clustered flowering stems that are 10 to 40 cm (4–16 in.) tall. Both the common and scientific names of this species refer to its sparse inflorescence.

AIDS TO IDENTIFICATION: To identify Few-flowered Sedge and other members of the genus *Carex*, a technical manual should be consulted. Species in this genus have tiny, wind-pollinated flowers that are borne in spikes. Few-flowered Sedge is one of relatively few *Carex* species with just one spike at the top of each stem. The spike consists of a staminate portion above one to six slender, gradually tapering perigynia. The perigynia are 6 to 8 mm long and 1 to 1.5 mm wide, and are typically spreading or bent downward (deflexed).

Few-flowered Sedge has one to six slender, tapering perigynia that are spreading (left) or deflexed (right). Photos by Jennifer Garrett

Distribution in Massachusetts
1985 - 2012
Based on records in
Natural Heritage Database

SIMILAR SPECIES: Few-flowered Sedge is among the most easily recognized sedges. The perigynia of other species with single spikes in our area are not slender and tapering, are generally more numerous, and point upward rather than outward or downward. Perhaps the most similar species is Collins' Sedge (*C. collinsii*), which also has slender, spreading or reflexed, and fairly sparse perigynia. However, Collins' Sedge is a more robust plant, with wider leaves (2 to 4 mm) and longer perigynia (8 to 12 mm) that are borne in two to four separate, stalked spikes. Collins' Sedge is not known from Massachusetts and is rare in Connecticut and New York.

HABITAT: Few-flowered Sedge occurs in acidic sphagnum bogs, along with characteristic bog plants such as Leatherleaf (*Chamaedaphne calyculata*), Bog Laurel (*Kalmia polifolia*), Labrador Tea (*Rhododendron groenlandicum*), and Large Cranberry (*Vaccinium macrocarpon*). In New England, populations of Few-flowered Sedge typically occur on open bog mats where woody vegetation is short and sparse.

RANGE: Few-flowered Sedge occurs from Alaska and Washington east to Newfoundland and West Virginia. It also occurs in Eurasia. This species is listed as Endangered in Massachusetts and Pennsylvania, Special Concern in Connecticut, and Sensitive in Washington.

POPULATION STATUS IN MASSACHUSETTS: Few-flowered Sedge is listed under the Massachusetts Endangered Species Act as Endangered. All listed species are protected from killing, collecting, possessing, or sale, and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. Few-flowered Sedge is currently known from Franklin County, and it also occurred historically in Berkshire County.

THREATS AND MANAGEMENT RECOMMENDATIONS: As for many rare species, the exact management needs of Few-flowered Sedge are not known. Human or beaver activities that alter hydrological conditions may threaten existing populations. Populations may also be threatened by increased shading or competition from woody species. All active management of rare plant populations (including invasive species removal) is subject to review under the Massachusetts Endangered Species Act, and should be planned in close consultation with the Massachusetts Natural Heritage & Endangered Species Program.

MATURE PERIGYNIA PRESENT:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

REFERENCES:

Gleason, H.A., and A. Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada*, 2nd edition. The New York Botanical Garden, Bronx, NY.

Haines, A. 2011. *Flora Novae Angliae – a Manual for the Identification of Native and Naturalized Higher Vascular Plants of New England*. New England Wildflower Society, Yale Univ. Press, New Haven, CT.

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Massachusetts Division of Fisheries & Wildlife

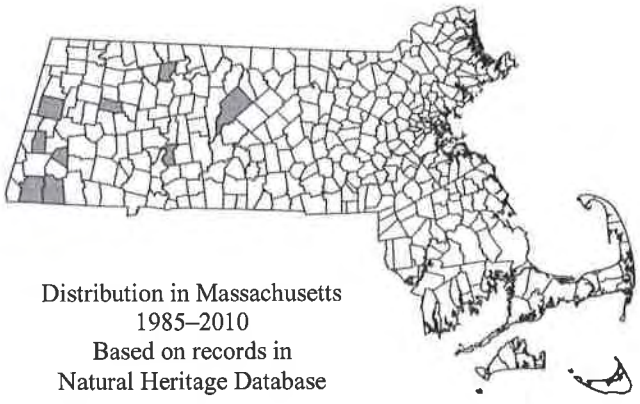
Tuckerman's Sedge
Carex tuckermanii
Dewey

State Status: **Endangered**
Federal Status: **None**

GENERAL DESCRIPTION: Tuckerman's Sedge (*Carex tuckermanii*) is a perennial wetland sedge (family Cyperaceae), named for American lichenologist and botanist Edward Tuckerman (1817–1886). It grows in loose clumps, with erect to arching stems and linear leaves up to a meter in height in habitats such as river and lake shores, swamps, and vernal pools. This species, a member of the *Carex* section Vesicariae, has particularly distinctive female flowering spikes; the clusters of pendulous, inflated teardrop-shaped perigynia (sing., perigynium) are its most recognizable feature.

Top photo: Norman Melvin @ USGS, downloaded from USDA-NRCS PLANTS Database.
Lower photos: Achene and perigynia of Tuckerman's Sedge Marybeth Hanley

AIDS TO IDENTIFICATION: Sedges of the genus *Carex* have small unisexual wind-pollinated flowers borne in spikes. The staminate (male, pollen-bearing) flowers are subtended by a single flat scale; the pistillate (female, ovule-bearing) flowers are subtended by one flat scale (the pistillate scale) and are enclosed by a second sac-like modified scale, the perigynium. Following flowering, the achene (a dry, indehiscent, one-seeded fruit) develops within the perigynium. The morphological characters of these reproductive structures are important in identifying plants of the genus *Carex* to species. A technical key is required to ensure correct identification. Tuckerman's Sedge is a clump-forming plant with short rhizomes and triangular culms (reproductive stems). The leaves are typically flat and slender, usually 2 to 5 mm; the basal sheaths are reddish purple. Like other sedges in *Carex* section Vesicariae, Tuckerman's Sedge has staminate and pistillate spikes borne on separate spikes of each culm;



Distribution in Massachusetts
1985–2010
Based on records in
Natural Heritage Database

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the staminate spikes in this species are terminal. The pistillate spikes comprise cylindrical rows of ascending perigynia that often droop from slender stalks in a pendulous fashion. The perigynia (mostly 4.5–7 mm wide), are broadly elliptic with prominent veins at the base, tapering to a double-toothed beak; and in flower are yellowish-green, later becoming straw-colored at maturity.

The pistillate scale is narrowly egg-shaped with a pointed tip and smooth margins. The achenes of this species are asymmetrical in shape with an indentation on one surface. The pistillate spike is subtended by a leaf-like bract (25–70 cm long) that significantly exceeds the inflorescence. Mature perigynia are present throughout much of the summer.

SIMILAR SPECIES: Blister Sedge (*Carex vesicaria*), another wetland species of section Vesicariae with ascending perigynia is similar to Tuckerman's Sedge but is more common; this species has smaller perigynia (shorter and narrower) than the rare species, and has a symmetrical achene, lacking an indentation. Several other species of *Carex* have inflated perigynia (including some of section Lupulinae and other species of section Vesicariae) and may superficially resemble Tuckerman's Sedge; thus numerous defining characters must be examined closely using a botanical key.

HABITAT: In Massachusetts, Tuckerman's Sedge inhabits the rich soils of lowland river floodplain habitats such as oxbows (C-shaped wetlands adjacent to river channels), low depressions, forests, meadows, swales, and vernal pools. Associated species include Fringed Sedge (*Carex crinita*), Hop-sedge (*Carex lupulina*), and Sensitive Fern (*Onoclea sensibilis*). The non-native plant Moneywort (*Lysimachia nummularia*), an invasive, is sometimes associated with Tuckerman's Sedge.

RANGE: Tuckerman's Sedge is known from eastern and central Canada (New Brunswick, Nova Scotia, Quebec, Ontario), most of the northeastern and mid-Atlantic states south to Maryland and West Virginia; and into the Midwest (primarily the Great Lakes region) as far as Minnesota. It has been possibly extirpated in Iowa.

POPULATION STATUS IN MASSACHUSETTS: Tuckerman's Sedge is listed under the Massachusetts Endangered Species Act (MESA) as Endangered. All listed species under MESA are protected from killing, collecting, possessing, or sale and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. This species is known from the western part of the state in Berkshire, Franklin, and Hampshire Counties, and in Worcester County in central Massachusetts.

MANAGEMENT RECOMMENDATIONS: The exact management needs of Tuckerman's Sedge are not known. As with all species, however, maintaining habitat quality is essential. The Massachusetts populations that have persisted over time are found in low depressions or swales within forested river floodplains; the species apparently thrives despite periodic inundation, and flooding is an important dispersal mechanism. Thus, changes to the hydrologic regime due to local land use change could threaten the viability of a Tuckerman's Sedge population. Further, water quality should be preserved; water quality degradation due to inputs of nutrients from fertilizers or animal waste could change the water and soil chemistry, and favor establishment of exotic or aggressive generalist species. Tuckerman's Sedge habitat should be monitored for exotic invasive species. Invasive plants can out-compete native plants for nutrients and light, excluding them over time. Some invasive plants, such as Garlic Mustard (*Alliaria petiolata*) are allelopathic, meaning they can change the soil chemistry to inhibit the viability of native plants. Exotic species of concern in flood plain communities include Common Reed (*Phragmites australis* ssp. *australis*), Garlic Mustard, Purple Loosestrife (*Lythrum salicaria*), Moneywort, and Reed Canary Grass (*Phalaris arundinacea*). If exotic plants are invading Tuckerman's Sedge habitat, a plan for control should be constructed. All active management within the habitat of a rare plant population (including invasive species removal) is subject to review under MESA, and should be planned in close consultation with the Massachusetts Natural Heritage & Endangered Species Program.

MATURE PERIGYNIA PRESENT:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
					■	■	■	■			

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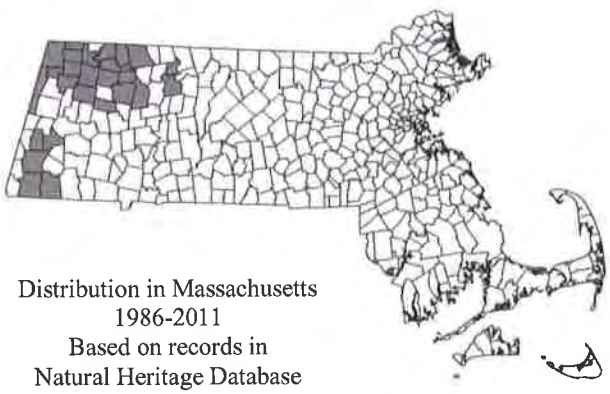
Massachusetts Division of Fisheries & Wildlife

Longnose Sucker
Catostomus catostomus

State Status: **Special Concern**
Federal Status: **None**

GENERAL DESCRIPTION: Longnose Suckers are torpedo-shaped fish with a snout that extends beyond the subterminal mouth. They can grow to over 500 mm (~20 in.); however in New England they are generally smaller. They are silvery-gray to yellowish in color and sometimes have darker blotches or saddles along their sides. During the breeding season they will have a red lateral stripe and tubercles (pimple-like bumps) on their head and fins.

SIMILAR SPECIES: Longnose Suckers and White Suckers (*Catostomus commersoni*) can be easily confused. Longnose Suckers have finer scales and have 85 lateral line scales, compared to 75 for White Suckers. The lateral line pores can sometimes be easily seen in the Longnose Sucker whereas in the White Sucker the pores are not visible. In the Longnose Sucker, the lower lips look like two square flaps, whereas in the White Sucker the lower lips are more tapered.



Distribution in Massachusetts
1986-2011
Based on records in
Natural Heritage Database

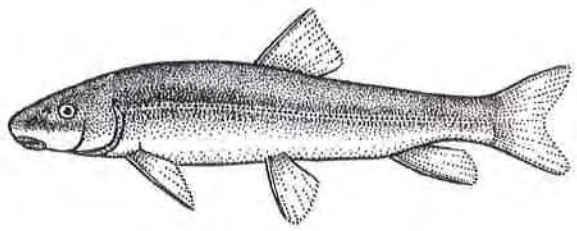


Illustration by Laszlo Meszoly, from Hartel et al. 2002.
Inland Fishes of Massachusetts.

HABITAT: In Massachusetts, Longnose Suckers are found mainly in cool upper sections of streams and rivers with rocky substrates. They are only found in the western part of the State, specifically in the Deerfield, Housatonic, Hoosic, and Westfield watersheds. In other parts of their range they are found in lakes and have been found as deep as 600 ft.

LIFE HISTORY: Longnose Suckers reach maturity at around 5 to 7 years of age, or 130-400 mm (~5 to ~16 in.) in length. They can live up to 20 years and can spawn multiple times during their life. Upstream spawning migrations occur from mid-April through July. They may migrate many kilometers to reach spawning grounds. Their peak spawning activity is relatively short lasting, between 5 and 10 days, and only occurs during daylight hours. Spawning occurs in areas that have moderate to fast stream currents and gravel substrates. Longnose Suckers do not build nests but release adhesive, sinking eggs and show no territoriality.

Young-of-the-year can be found in midwater feeding on plankton. Adult Longnose Suckers feed primarily on benthic invertebrates, specifically *Gammarus, Daphnia*, and a variety of insect larvae as well as algae. Longnose Suckers are vulnerable to predation during spawning by

a variety of animals, such as Northern Pike, Black Bears and other mammals, and Ospreys.

THREATS: Habitat alteration is a major threat especially through erosion and sedimentation, flow alterations, and increased water temperatures. This species relies on clean, well oxygenated gravel substrates for their eggs to develop and all of these threats can severely decrease their reproductive success. In addition, dams can prevent their migration to preferred spawning habitats.

BREEDING SEASON:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

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Massachusetts Division of Fisheries & Wildlife

Sedge Wren
Cistothorus platensis

State Status: **Endangered**
Federal Status: **None**

GENERAL DESCRIPTION: The Sedge Wren is a small, secretive passerine (Passeriformes) bird that inhabits shallow wetlands dominated by short grasses and sedges. Sedge wrens have both short tails and short bills and are approximately 4.5 inches (11.4 cm) long with a wingspan of 5.5 inches (14 cm) and a weight of 0.32 oz (7-10 g). Sexes are similar in appearance, though the male is slightly larger. They are generally buff colored (described variously as sandy buffy, cinnamon, or light brown) on the breast and sides, and can have a whitish belly and throat. The rump and upper tail-coverts are barred with black. The primaries are dark, slaty brown and the outer webs are irregularly marked with dark brown. The tail is plain brown-banded with black. The song starts with sharp, spaced *chips* followed by rapid *chaps,* also like a quick, descending chatter (Sibley 2000, Feith 2003, Forster 2003). The call is a short staccato *chadt* or *chep* along with a buzz *krrt* (Sibley 2000). Males will sing from a low bush or on a grass stalk and may sing throughout the day, but mostly in the morning and evening (Forster 2003).

Sedge Wren in wetland grasses. Photo by Chris Buelow, NHESP

SIMILAR SPECIES: Sedge Wrens have a striped crown and back that distinguishes them from other wrens, such as the House Wren, Winter Wren, and Carolina Wren. Marsh Wrens also occur in wetlands, but have a streaked crown, a white strip over the eye, paler coloration and a shorter bill (Kroodsma et al. 1997, Sibley 2000). They also tend to nest in wetlands or portions of wetlands with deeper waters than do Sedge Wren (Walton 2003). The Marsh Wren call has been described as both musical and mechanical or a dry, reedy rattle (Sibley 2000, Feith 2003). In addition, they may also vocalize while flying over the nest site (Walton 2003). Sedge Wrens spend most of their time on the ground and may flutter short distances when flushed (Forbush 1929).

Distribution in Massachusetts
1985 - 2010
Based on records in
Natural Heritage Database

HABITAT: Sedge Wrens inhabit wet meadows dominated by tall grasses and sedges, generally at the drier margins of wetlands and avoid flooded areas or areas of short, sparse, or open vegetation (DeGraaf and Yamaski 2001, Herkert et al. 2001). This habitat is found along the tidal marshes of the Middle Atlantic States, along the upland margins of freshwater ponds and

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marshes, and among the grasses in wet meadows and hayfields. Shrubs are generally sparse (Herkert et al. 2001). In New England, sedge wrens may colonize wet meadows early in the nesting season but, following summer drying, move to permanently wet, tussock marshland in July to raise a second brood. In the MANHESP records, wet hayfields or margins of wetlands with sedges and grasses are the most common habitat characteristics. Sedge Wrens are opportunistic in their use and occupation of preferred habitat and may nest in an area one year and not the next (Gibbs and Melvin 1992). Nesting sites must be moist, and are readily abandoned if flooding or drying occurs. Sedge Wren habitat is ephemeral because it is maintained by highly variable moisture regimes occurring in areas susceptible to drying or flooding due to annual and seasonal variation in rainfall. Vegetative succession and the effects of grazing, haying, planting, and other forms of disturbance also affect habitat structure and composition (Veit and Peterson 1993).

RANGE: Sedge Wrens breed from portions of Canada east of the Rocky Mountains to southern Quebec into the central St. Lawrence lowlands and the upper Mississippi Valley in the United States. They may also breed or spend portions of the summer from the Atlantic Coast of Canada south along the eastern US. Sedge Wrens are also known to breed in Central and South America. They winter along the Atlantic Coast from southern New Jersey south to Florida and then west to Alabama (Sibley 2000, Herkert et al. 2001).

LIFE CYCLE/BEHAVIOR: Sedge Wrens begin to migrate from their southern wintering areas in early April with most birds having left southern wintering areas by late April or early May. They arrive at nesting areas within a few weeks, generally in the third week in May and begin nesting within two weeks of arrival (Forster 2003). Eggs have been observed in nests in Massachusetts from May 25th to July 7th (Forbush 1929). MANHESP records indicate most observations in July and August, with some in June and just a few in May. In some cases, there may be a second wave of migrants arriving in June or July (Forster 2003). Late nesting at certain sites could represent renesting attempts by birds arriving from elsewhere. Alternatively, birds that arrived in May might delay nesting until appropriate conditions are available (Gibbs and Melvin 1992, Herkert et al. 2001).

Males choose nest locations in dense sedges and grasses and construct the outer structure. The material is woven together to form a round ball, 8-13 cm in diameter with a small (1.5-2.5 cm) side entrance. The nests are concealed within growing vegetation, 2-3 ft (0.6-0.9 m) above the water line (Harrison 1975). They may nest on tussocks in wetlands (Forster 2003). Females line the nests with grasses, sedges, feathers, and/or fur (Harrison 1975). Males may construct multiple nests to fool predators, but females line only those nests within which they lay eggs (Herkert et al. 2001). Territory sizes are highly variable approximately 1200 to 3500 m^2 (DeGraaf and Yamasaki 2001). In addition, males may shift territories. Clutch size ranges from two to eight. Only females incubate eggs, and incubation ranges from12-14 days (Forster 2003). Young fledge in 12-14 days. Females primarily take care of young, though males may occasionally help with feeding (Forster 2003). Two broods are typical and some nesting into late summer has been observed (Harrison 1975, Herkert et al. 2001). Sedge Wrens appear to migrate from mid-September to early October (Forster 2003).

LIMITING FACTORS: In Massachusetts, threats to Sedge Wren include loss of open, wet meadow habitat due to hydrologic changes, incompatible agricultural activities, and encroachment by invasive species. Preferred wetlands, such as sedge/grass meadows with moist or saturated soils, are the most easily drained and filled and are the wetland type most frequently lost to agriculture and urbanization. Local or regional reductions of the water table due to urbanization in the Northeast may reduce moisture in fields, which would otherwise create the preferred wet-meadow habitat (Herkert et al. 2001). Wetland loss often leads to drying processes on adjacent upland habitats, reducing the quality of nesting habitat in moist upland margins of wetland patches. The timing of hay cutting can degrade Sedge Wren habitats because of impacts on nests, young birds, and even possibly adults (Gibbs and Melvin 1992).

POPULATION STATUS IN MASSACHUSETTS: Sedge Wrens are extremely rare breeders in Massachusetts. They are listed as possible, probably or confirmed breeding in six breeding bird atlas blocks in the current (2007-2011) Massachusetts Breeding Bird Atlas project compared to three in the 1975-1979 atlas (MassAudubon 2003-2010, USGS 2011). The MANHESP has recorded 12 occurrences since 1989.

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Intermediate Spike-sedge

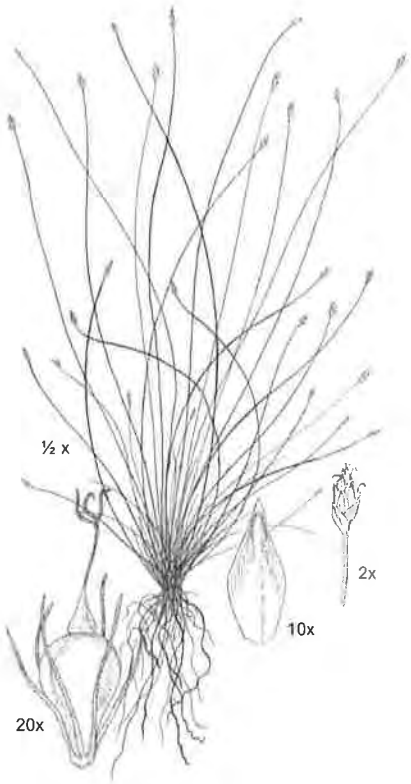
Eleocharis intermedia J.A. Schultes

State Status: **Threatened**
Federal Status: **None**

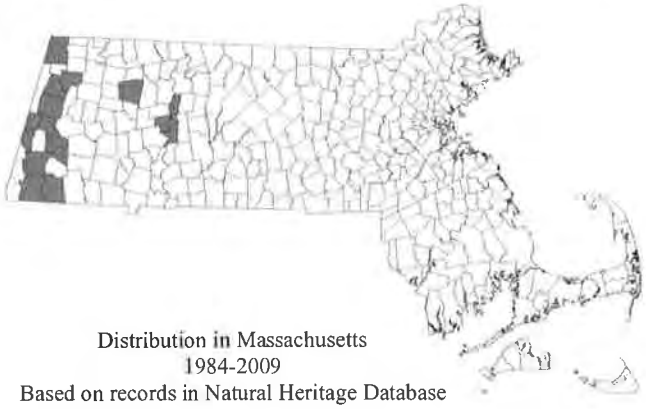
Description: The Intermediate Spike-sedge (*Eleocharis intermedia*) is a small (from about 2 to 10 inches tall or 5-25 cm), densely tufted, annual herb with thin, wiry stems. Although the Intermediate Spike-sedge and the other spike-sedges (also called spike-rushes) superficially resemble the group of plants called "rushes," they do not belong to the Rush Family, and are actually members of the Sedge Family. The spike-sedges have a single, tight cluster of inconspicuous flowers (a "spike") at the apex of each stem. The stems of spike-sedges appear leafless, and in fact these plants do not have leaf blades (the expanded part of the leaf), only leaf sheaths (the part which surrounds the stem). The Intermediate Spike-sedge has very slender, round stems with a groove running up them. The stems are usually all clumped together in somewhat of a mat, with some stems reclining horizontally and some standing erect. The stems within a mat are typically of different lengths.

Aids to Identification: To positively identify the Intermediate Spike-sedge and other spike-sedges (genus *Eleocharis*), a technical manual should be consulted. It is usually necessary to look at the tiny fruits of the plant under magnification to distinguish the species of spike-sedge. Members of this genus possess a type of fruit called an "achene," which is hard and nut-like and does not split open to release its single seed. Achenes in the spike-sedges are topped by a protuberance (called a "tubercle"), which varies in shape, size, and texture among species.

The tiny achene (only about 1 mm wide) of the Intermediate Spike-sedge matures in mid- to late summer, and is light brown to pale olive or yellow in color. It is three-sided, and appears smooth under a hand lens (slightly bumpy under a microscope). The tubercle is relatively narrow in this species and looks something like a small dunce's cap on top of the achene.



Holmgren, Noel H. *The Illustrated Companion to Gleason and Cronquist's Manual.* New York Botanical Garden.



Distribution in Massachusetts
1984-2009
Based on records in Natural Heritage Database

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Similar Species: There are many common spike-sedges or spike-rushes that could be confused with the Intermediate Spike-sedge. A common spike-sedge with very slender stems that forms mats or carpets is the Needle Spike-rush (*Eleocharis acicularis*). It is distinguished from the Intermediate Spike-sedge by having a long, gray achene that is roundish in cross-section, rather than strongly triangular. The Slender Spike-rush (*Elecoharis tenuis*) is thin-stemmed, but the stems are usually 4- to 8-angled (instead of round) and are scattered or only loosely clustered. The achenes of the Slender Spike-rush are rough or pitted in appearance when observed under a hand-lens. The Soft-stemmed Spike-rush (*Eleocharis obtusa*), a common associate, is another tufted annual that differs from the Intermediate Spike-sedge in having lens-shaped achenes (instead of triangular) and in its more robust appearance. Its stems are usually taller and thicker than the delicate, thread-like stems of the Intermediate Spike-sedge.

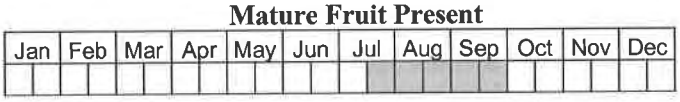
Range: The Intermediate Spike-sedge can be found from Quebec to Minnesota, south to West Virginia, Tennessee, and Iowa.

Habitat: The Intermediate Spike-sedge is typically found in marshes, fresh water mudflats, or in other wet areas with muddy substrates. In Massachusetts, this plant is found on muddy, alkaline river banks and pond shores, usually during periods of low water when mud is exposed. Plants found in association with the Intermediate Spike-sedge in Massachusetts include False Pimpernel (*Lindernia dubia*), Nodding Bur-marigold (*Bidens cernua*), Rice Cut-grass (*Leersia oryzoides*) and Soft-stemmed Spike-rush (*Eleocharis obtusa*).

Population Status in Massachusetts: The Intermediate Spike-sedge is listed under the Massachusetts Endangered Species Act as Threatened. All listed species are protected from killing, collecting, possessing, or sale and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. This species is reported from the western half of the State in Berkshire, Franklin, and Hampshire counties.

Management Recommendations: As for many rare species, exact needs for management of Intermediate Spike-sedge are not known. The following comments are based primarily on observations of populations in Massachusetts. Because this plant occurs in freshwater marsh mud-flats or muddy soils, proximity to a freshwater source such as a river, pond, or stream is necessary. Regular fluctuation in water level appears to benefit the species, which can be found on exposed mud during low-water years. Low-level disturbance provided by gentle wave action and/or regular flooding is important to maintain the relatively open, muddy conditions in which the Intermediate Spike-sedge thrives.

Mature Fruit Present



Updated 11 February 2009

Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries & Wildlife
1 Rabbit Hill Road, Westborough, MA 01581
tel: (508) 389-6360, fax: (508) 389-7891
www.nhesp.org

Dwarf Scouring-rush

Equisetum scirpoides Michx.

State Status: Special Concern

Federal Status: None

Description: This member of the Horsetail family is 4-8 inches (10-20 cm.) tall, evergreen and appears as a dark green tuft of wiry stems. Dwarf Scouring-rush has slender stems which may curve upward or lie flat along the ground and widely branching rhizomes. The stem has 3 to 4 broad and deeply concave ridges. Triangular sheaths surrounding the stems are less than an inch (3-4 mm.) long and have 3 or 4 teeth. Small (3-5mm), dark cones develop in late summer.

Habitat in Massachusetts: Dwarf Scouring-rush is found on moist banks and seepy wooded slopes and hillsides with springs and streams: they are often in ecotones between upland and wetland sites. Dwarf Scouring-rush is known to grow in subacidic and acid glacially derived soil. Associated species often include tree elements of the Northern Hardwoods forest including Red Maple (*Acer rubrum*), Sugar Maple (*A. saccharum*), White Ash (*Fraxinus americana*), Eastern Hemlock *(Tsuga canadensis*), and Yellow Birch (*Betula alleghaniensis*). The hemlock provides shade and a cool habitat. Shrubs may include Striped Maple (Acer pensylvanica), Spicebush (*Lindera benzoin*), and Low Raspberry (Rubus pubescens). The herbaceous layer may be sparse. However, a variety of species, including repeated occurrences of non-natives, have been reported in the area of Dwarf Scouring-rush populations: including Cinnamon Fern (*Osmunda cinnamomea*), Small Enchanter's Nightshade (*Circaea alpina*), Colt's-foot (*Tussilago farfara*), tree seedlings, other horsetails, and liverworts and mosses.

POPULATION STATUS: Dwarf Scouring-rush is listed under the Massachusetts Endangered Species Act as a Species of Special Concern. All listed species are protected from killing, collecting, possessing, or sale and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. Twenty-three current (1985-2010) occurrences have been reported and fourteen historical occurrences recorded. One reason for its rarity in Massachusetts is because it is

Dwarf Scouring-rush: The photo on top shows a typical mass of plant stems. Photo: Jennifer Garrett, NHESP.
Illustration: USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 1: 42.

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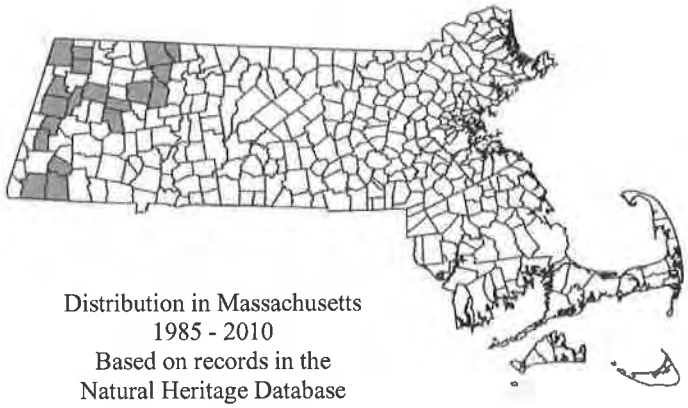
near the southern edge of its range. It is considered rare in most of the states on the southern edge of its distribution. Globally, Nature Serve ranks Dwarf Scouring-rush as G5, Secure.

RANGE: Dwarf Scouring-rush has a circumboreal distribution. In North America, it extends across Canada and south into Connecticut and west through Illinois, Iowa, South Dakota, and Wyoming and then into Washington.

For More Information See

NatureServe. 2010. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: December 10, 2010).

USDA, NRCS. 2010. The PLANTS Database (http://plants.usda.gov, 10 December 2010). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.



Distribution in Massachusetts
1985 - 2010
Based on records in the
Natural Heritage Database

Management and Threats: Most of the occurrences of Dwarf Scouring-rush have invasive species near the population. Competition from non-native invasive species can be a threat through shading and loss of space for the native species. Monitoring and removal of competing vegetation should be considered as a management strategy where appropriate. An additional likely problem in many populations is that the hemlock overstory may be damaged and thinned by Wooly Adelgids, another invasive species that infects and kills hemlock trees. All active management of rare plant populations (including invasive species removal) is subject to review under the Massachusetts Endangered Species Act, and should be planned in close consultation with the Massachusetts Natural Heritage & Endangered Species Program.

Several of the populations of Dwarf Scouring-rush are near roads: widening of roads and creation, formal and informal, of pull-off sites should be reviewed with regard to the effects on the Dwarf Scouring- rush.

1985
Updated: 2010

Natural Heritage & Endangered Species Program

www.mass.gov/nhesp

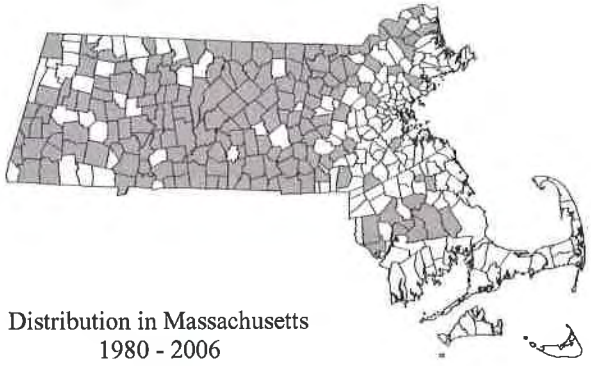
Massachusetts Division of Fisheries & Wildlife

Wood Turtle
Glyptemys insculpta

State Status: **Special Concern**
Federal Status: **None**

DESCRIPTION: The Wood Turtle is a medium-sized turtle (14-20 cm; 5.5-8 in) that can be recognized by its sculpted shell and orange coloration on the legs and neck. The carapace (upper shell) is rough and each scale (scute) rises upwards in an irregularly shaped pyramid of grooves and ridges. The carapace is tan, grayish-brown or brown, has a mid-line ridge (keel) and often has a pattern of black or yellow lines on the larger scutes. The plastron (lower shell) is yellow with oblong dark patches on the outer, posterior corner of each scute. The head is black, but may be speckled with faint yellow spots. The legs, neck, and chin can have orange to reddish coloration. Males have a concave plastron, thick tail, long front claws, and a wider and more robust head than females. Hatchlings have a dull-colored shell that is broad and low and a tail that is almost as long as their carapace, and they lack orange coloration on the neck and legs.

Photo by Mike Jones



Distribution in Massachusetts
1980 - 2006
Based on records in
Natural Heritage Database

SIMILAR SPECIES: The habitat of the Eastern Box Turtle (*Terrapene carolina*) and the Blanding's Turtle (*Emydoidea blandingii*) may overlap that of the Wood Turtle, but neither has the Wood Turtle's pyramidal shell segments. Unlike the Wood Turtle, the Box and Blanding's turtles have hinged plastrons into which they can withdraw or partially withdraw if threatened. The Northern Diamond-backed Terrapin (*Malaclemys terrapin*) has a shell similar to that of the Wood Turtle. However, its skin is grey and it lives only near brackish water, which the Wood Turtle avoids.

RANGE: The Wood Turtle can be found throughout New England, north to Nova Scotia, west to eastern Minnesota, and south to northern Virginia. The Wood Turtle appears to be widespread in Massachusetts. However, it should be kept in mind that little is known about the status of local populations associated with the majority of these sightings. Most of the towns have fewer than 5 known occurrences.

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Massachusetts Division of Fisheries & Wildlife

1 Rabbit Hill Rd., Westborough, MA; tel: 508-389-6300; fax: 508-389-7890; www.mass.gov/dfw

HABITAT IN MASSACHUSETTS: The preferred habitat of the Wood Turtle is riparian areas. Slower moving mid-sized streams are favored, with sandy bottoms and heavily vegetated stream banks. The stream bottom and muddy banks provide hibernating sites for overwintering, and open areas with sand or gravel substrate near the streams edge are used for nesting. Wood Turtles spend most of the spring and summer in mixed or deciduous forests, fields, hay fields, and riparian wetlands, including wet meadows, bogs, and beaver ponds. Then they return to the streams in late summer or early fall to their favored overwintering location.

LIFE CYCLE & BEHAVIOR: The Wood Turtle typically spends the winter in flowing rivers and perennial streams. Full-time submersion in the water begins in November, once freezing occurs regularly overnight, and continues until temperatures begin to increase in spring. It may hibernate alone or in large groups in community burrows in muddy banks, stream bottoms, deep pools, instream woody debris, and abandoned muskrat burrows. The Wood Turtle may make underwater movements in the stream during the winter; however, extended periods of activity and emergence from the water do not occur until mid-March or early April.

In spring, Wood Turtles are active during the day and are usually encountered within a few hundred meters from the stream banks. They have relatively linear home ranges that can be a half mile in length in Massachusetts (M. Jones, unpubl data). They will use emergent logs or grassy, sandy, and muddy banks to soak up the spring sun. During the summer months they feed in early successional fields, hayfields, and forests.

Wood Turtles are opportunistic omnivores; their diet consists of both plant and animal matter that is consumed on land and in the water. The Wood Turtle occasionally exhibits an unusual feeding behavior referred to as "stomping." In its search for food, this species will stomp on the ground alternating its front feet, creating vibrations in the ground resembling rainfall. Earthworms respond, rising to the ground's surface to keep from drowning. Instead of rain, the earthworm is met by the Wood Turtle, and is promptly devoured.

Although the peaks in mating activity occur in the spring and fall, Wood Turtles are known to mate opportunistically throughout their activity period. Males have been observed exhibiting aggressive behavior such as chasing, biting, and butting both during the mating season and at other times. A courtship ritual "dance" typically takes place at the edge of a stream or brook for several hours prior to mating. The dance involves the male and female approaching each other slowly with necks extended and their heads up. Before they actually touch noses, they lower their heads, and swing them from side to side. Copulation usually takes place in the water. Courting adults may produce a very subdued whistle that is rarely heard by observers. A female may mate with multiple individuals over the course of the active season.

In Massachusetts, most nesting occurs over a four-week period, primarily in June. Nesting sites may be a limited resource for Wood Turtles. Females are known to travel long distances in search of appropriate nesting habitat (average straight line distance of 244 m/800 ft). Once they have arrived at a suitable nesting area, there may be multiple nesting attempts or false nests that occur over the course of several days, prior to laying eggs. They abort attempts when disturbed (e.g., by human activities) early in the process or they hit a large rock while digging. Female Wood Turtles lay one clutch a year and often congregate in a good nesting area. Clutch size in Massachusetts averages 7 eggs (Jones, 2004, pers. comm.). Hatchling emergence occurs from August through September. The life span of the adult Wood Turtle is easily 46 years and may reach as much as 100 years.

THREATS: Hatchling and juvenile survival is very low and the time to sexual maturity is long. These characteristics are compensated by adults living a long time and reproducing for many years. Adult survivorship must be very high to sustain a viable population. These characteristics make Wood Turtles vulnerable to human disturbances. Population declines of Wood Turtles have likely been caused by hay-mowing operations, development of wooded stream banks, roadway casualties, incidental collection of specimens for pets, unnaturally inflated rates of predation in suburban and urban areas, forestry and agricultural activities, and pollution of streams.

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

MANAGEMENT RECOMMENDATIONS: Using a turtle habitat model developed by UMass and NHESP records, Wood Turtle habitat needs to be assessed and prioritized for protection based on the extent, quality, and juxtaposition of habitats and their predicted ability to support self-sustaining populations of Wood Turtles. Other considerations should include the size and lack of fragmentation of both riverine and upland habitats and proximity and connectivity to other relatively unfragmented habitats, especially within existing protected open space. This information will be used to direct land acquisition and to target areas for Conservation Restrictions (CRs), Agricultural Preservation Restrictions (APRs), and Landowner Incentive Program (LIP) projects.

Mowing and nest site creation guidelines developed by NHESP should be followed on properties managed for Wood Turtles. These practices will be most practical on state-owned conservation lands. However, these materials are also available to town land managers and private landowners.

Alternative wildlife corridor structures should be considered at strategic sites on existing roads. In particular, appropriate wildlife corridor structures should be considered for bridge and culvert upgrades and road-widening projects within or near Wood Turtle habitat. Efforts should be made to inform local regulatory agencies of key locations where these measures would be most effective for Wood Turtle conservation.

Educational materials are being developed and distributed to the public in reference to the detrimental effects of keeping our native Wood Turtles as pets (an illegal activity that reduces reproduction in the population), releasing pet store turtles (which could spread disease), leaving cats and dogs outdoors unattended (particularly during the nesting season), mowing of fields and shrubby areas, feeding suburban wildlife (which increases the number of natural predators on turtles), and driving ATVs in nesting areas from June-October. People should be encouraged, when safe to do so, to help Wood Turtles cross roads (always in the direction the animal was heading); however, turtles should never be transported to "better" locations. They will naturally want to return to their original location and likely need to traverse roads to do so.

Increased law enforcement is needed to protect our wild turtles, particularly during the nesting season when poaching is most frequent and ATV use is common and most damaging.

Forestry Conservation Management Practices should be applied on state and private lands to avoid direct turtle mortality. Seasonal timber harvesting restrictions apply to Wood Turtle habitat and to upland habitat that occurs up to 600 ft (183 m) beyond the stream edge. Motorized vehicle access to timber harvesting sites in Wood Turtle habitat is restricted to times when the Wood Turtle is overwintering. Bridges should be laid down across streams prior to any motorized equipment crossing the stream in order to maintain the structural integrity of overwintering sites.

Finally, a statewide monitoring program is needed to track long-term population trends in Wood Turtles.

ACTIVE PERIOD

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DeGraaf, R.M., and D.D. Rudis. 1983. *Amphibians and Reptiles of New England.* Amherst, Massachusetts: The University of Massachusetts.

Ernst, C.H., J.E. Lovich, and R.W. Barbour. 1994. *Turtles of the United States and Canada.* Smithsonian Institution Press, Washington and London.

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Updated 2015

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

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Giant St. John's-wort

Hypericum ascyron L.

State Status: Endangered
Federal Status: None

Giant St. John's-wort: close up flower and fruit, and growth form in habitat. Photos: Marybeth Hanley.

General description: Giant St. John's-wort (*Hypericum ascyron*) is a tall herbaceous perennial wildflower of the St. John's-wort family (Clusiaceae) that usually grows in alluvial soils within floodplain habitats. Plants are robust with multiple branches arising from stems that can grow up to 2 meters in height. The sessile leaves are arranged opposite one another on stems. The large, conspicuous yellow flowers and the large conical-shaped fruits are the plant's most recognizable features.

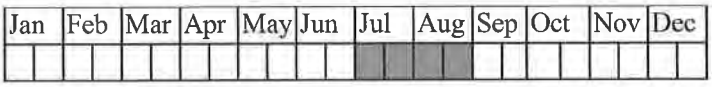
Aids to identification: Giant St. John's-wort emerges on stout stems give rise to compound branches. The sessile opposite leaves are lanceolate to elliptic in shape, 4 to10 cm (~ 1.5 to 4 in.) long, and clasping at the base. The leaves and stems are often glaucous (covered with a whitish waxy bloom). The showy yellow flowers are borne on long pedicels at the ends of branches, and have five large petals (25–30 mm long), five smaller sepals, and a dense cluster of stamens united into five basal sets. The flowers have five united, spreading styles at the apex of fruit. As the flower matures the petals curl lengthwise into one another. The fruit is a distinctive pyramid-shaped capsule (15–30 mm tall) with five chambers (locules). Giant St. John's-wort flowers in midsummer and fruits late summer into autumn.

Similar species: When Giant St. John's-wort is found in flower in the appropriate habitat, the likelihood of confusing this plant with another species in its genus is small. However, if the plant is vegetative it is possible that it could be confused with plants with similar. One possibility is Indian Hemp (*Apocynum cannabinum*), though the opposite leaves of this plant are short-stalked and mucronate (tipped with a short, sharp, abrupt point), and its stems and leaves contain a milky sap.

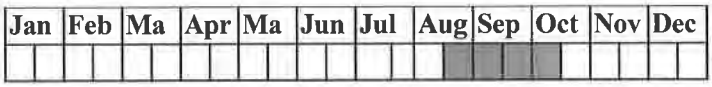
Habitat in Massachusetts: In Massachusetts, Giant St. John's-wort occupies habitats that are proximate to flowing water, including riverside ledges, cobble and gravel river shores, wet meadows, fields, moist thickets of streams and rivers, and power line rights-of-way. Populations tend to favor open areas. Associated species include a mix of herbaceous plants and vines such as Late Goldenrod (*Solidago gigantea*),

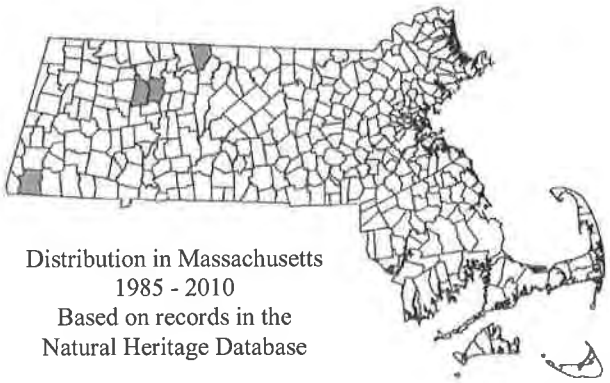
Rough-stemmed Goldenrod (*Solidago rugosa*), Stinging Nettle (*Urtica dioica*), Calico Aster (*Symphyotrichum lateriflorum*), Blue Heart-leaf Aster (*Symphyotrichum cordifolium*) and Wild Morning-glory (*Calystegia sepium*), Groundnut (*Apios americana*), and Wild Cucumber (*Echinocystis lobata*). Possible woody associates include Silver Maple (*Acer saccharinum*), Green Ash (*Fraxinus pennsylvanica*), and Silky Dogwood(*Swida amomum*). The non-native herbaceous grass Reed Canary Grass (*Phalaris arundinacea*), an invasive, is also sometimes associated with Giant St. John's-wort.

Flowering time in Massachusetts



Fruiting time in Massachusetts





Distribution in Massachusetts
1985 - 2010
Based on records in the
Natural Heritage Database

Range: Giant St. John's-wort is known from eastern-central Canada (Ontario and Quebec) and possibly Manitoba, most of the New England States, south to West Virginia and into the Midwest as far west as Nebraska and Kansas. This species is sporadic and rare in all New England states.

Population status in Massachusetts: Giant St. John's-wort is listed under the Massachusetts Endangered Species Act (MESA) as Endangered. All listed species under MESA are protected from killing, collecting, possessing, or sale and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. This species is currently known from Franklin and Berkshire County, and is historically known from Hampden and Hampshire Counties.

Management recommendations: The exact management needs of Giant St. John's-wort are not known. As with all species, however, maintaining habitat quality is essential. Changes in flooding regime due to anthropogenic land use could elicit changes in habitat quality (e.g., less flooding could allow colonization by competing and over-shading woody plants). Giant St. John's-wort habitat should be monitored for invasive exotic species. Invasive plants can out-compete native plants for nutrients and block light, excluding them over time. Exotic species of concern in flood plain communities include Common Reed (*Phragmites australis* ssp. *australis*), Garlic Mustard (*Alliaria petiolata*), Purple Loosestrife (*Lythrum salicaria*), Moneywort (*Lysimachia nummularia*), Reed Canary Grass (*Phalaris arundinacea*), and Japanese Knotweed (*Fallopia japonica*). If exotic plants are invading Giant St. John's-wort's habitat, a plan for control should be constructed. All active management within the habitat of a rare plant population (including invasive species removal) is subject to review under MESA, and should be planned in close consultation with the Massachusetts Natural Heritage & Endangered Species Program.

Updated 2010

Partially funded through the Natural Resource Damage Assessment and Restoration Programs of the MA Executive Office of Energy & Environmental Affairs and the U.S. Fish and Wildlife Service

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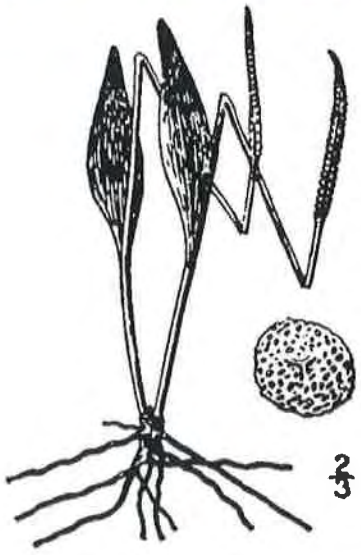
Adder's Tongue Fern

Ophioglossum pusillum Raf.
State Status: Threatened
Federal Status: None

Description: Adder's-tongue is a small terrestrial fern, up to 30 cm (12 in) high, consisting of a single fleshy green stalk (stipe) bearing a simple leaf and a fertile spike. The stipe arises from fleshy, cod-like rhizomes and roots. About midway up the stipe is the pale green leaf, approximately 15 cm (6 in), narrowly oval to oblong. In var. *pseudopodium* (false foot), the widespread form, the blade gradually tapers for about 1/3 to 2/3 of its length to a narrow, 1-2 cm base that continues to run down the lower stipe. There is a finely indented network of interconnecting veins. The stipe extends well beyond the leaf blade and is terminated by a short, pale green, narrow fertile spike from 1-4 cm long and up to 5 mm wide, which consists of 2 tightly packed rows of rounded sporangia (spore cases) on the margins of the spike axis. There can be a large variation in the size, shape, and position of the blade, as well as of the fertile spike; occurrences of two fronds (leaves) per rootstalk have been observed. The plant appears anytime after early June.

Similar Species: No other fern looks like the Adder's-tongue. Its closest relatives, the Grape Ferns (*Botrychium*) have dissected or lobed leaves. Several orchids and lilies may have similarly shaped fleshy basal leaves, such that non-flowering or juvenile individuals may at first glance be mistaken for Adder's-tongue Fern. However, all have parallel-veined leaves.

Habitat in Massachusetts: Boggy meadows, acidic fens (sphagnous areas with seeping groundwater), borders of marshes, wet fields, and moist woodland clearings provide suitable open and sunny habitat for Adder's-tongue Fern. Vegetation in these habitats is varied, composed predominantly of common grasses, bulrushes (*Scirpus*), sedges (*Carex*), and broadleaved herbs including Ragged, Small Purple Fringed, and White Fringed Orchis (*Platanthera lacera, P. psycodes, and P. blephariglottis*), and Swamp Milkweed (*Asclepias incarnata*). No common associate or indicator species particularly point to the presence of Adder's-tongue Fern.



Northern Adder's tongue: Photo: B. Legler, USDA Forest Service. Drawing: USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 1: 2.

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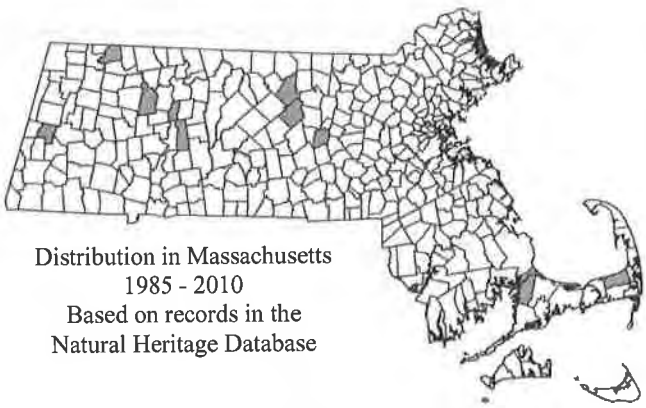
Range: Adder's-tongue Fern (var. pseudopodium) is a very widespread, primarily northern fern occurring across North America from Prince Edward Island and southern Quebec to Washington; south to Virginia and west to Indiana, Nebraska, Arizona and Mexico.



Distribution in Massachusetts
1985 - 2010
Based on records in the
Natural Heritage Database

Population Status: Adder's-tongue Fern s listed as Threatened under the Massachusetts Endangered Species Act. All listed species are protected from killing, collecting, possessing, or sale and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. It was once a widespread species in Massachusetts during the century of extensive agricultural clearing. Records prior to 1978 are from over 90 locations! At present there are only 8 known occurrences. This elusive and easily overlooked species makes it difficult to determine whether individual populations are in decline or stable. Possibly, undiscovered populations may still exist in Massachusetts, but the increasing rarity of appropriate open habitat appears to be a major factor in its decline in this state as well as most of its rangc. It is listed as rare in 20 states, including most of New England (except Vermont) and several provinces of Canada.. NatureServe ranks it as G5-Secure globally because of the widespread distribution.

Management Recommendations: Adder's-tongue Fern appears to need the increased light from canopy opening or forest clearing. Reports from most of the current sites mention threats from succession. Invasive species are impinging on several of the populations; removal of invasive plants would leave space and less shade for the fern.

Several of the sites are mowed fields, recommendations in those cases are for singly yearly mowings to take place in the spring to allow the plant to grow and produce spores. All active management of rare plant populations (including invasive species removal) is subject to review under the Massachusetts Endangered Species Act, and should be planned in close consultation with the Massachusetts Natural Heritage and Endangered Species Program.

For More Information See:

NatureServe. 2010. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: December 13, 2010).

USDA, NRCS. 2010. The PLANTS Database (http://plants.usda.gov, 13 December 2010). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

1990
Updated 2010

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Hairy Beardtongue

Penstemon hirsutus (L.) Willd.
State Status: Threatened
Federal Status: None

Description: Hairy Beardtongue is a light green, erect, herbaceous perennial in the Snapdragon or Figwort family (Scrophulariaceae). The stem is hairy or "hirsute" – hence, the species name *hirsutus*. Hairy Beardtongue's stem grows from 4 to 8 dm (1–3 ft.) high and is covered with long, whitish hairs. Its stem-borne leaves are 5 to12.5 cm (2-5 in.) long, oblong to lanceolate, opposite, stalkless, and finely toothed. A rosette of stalked leaves surrounds the base of the stem. The dull pink, purplish or violet flowers have petals that are partially fused into a narrow, five-lobed floral tube with two upper lobes and three lower lobes. The corolla is about 2.5 cm (1 in.) long and ends in white lips. Hairy Beardtongue's flowers occur in loose, stalked cluster. The fruit is an 8 to 9 mm long capsule (a dry fruit derived from a compound pistil that contains many seeds). At maturity, this capsule is more than half covered by the five-parted calyx. Like all members of the genus *Penstemon,* Hairy Beardtongue has five stamens one of which is sterile and topped by a tuft of hairs in place of an anther. Hairy Beardtongue blooms from Late May to early July.

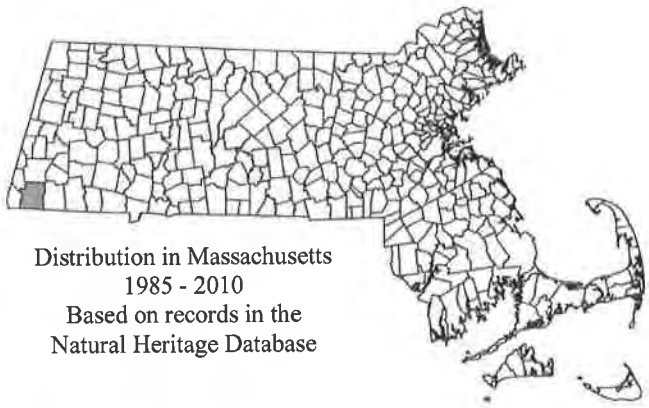
Similar Species: Several non-native species of *Penstemon* occur in Massachusetts and could be confused with Hairy Beardtongue. Foxglove Beardtongue (*P. digitalis*), unlike Hairy Beardtongue, has a smooth stem. Tube Beardtongue *(P. tubiflorus)* has both a smooth stem and white flowers. Pale Beardtongue (*P. pallidus*) has leaves that are hairy on both surfaces, while Hairy Beardtongue may have a few hairs only on the midvein on the leaf under-side.

HABITAT IN MASSACHUSETTS: Hairy Beardtongue is a plant of dry or rocky ground in woods, fields, and on hillsides. In Massachusetts, current habitats (1985-2010) include a dry, open but shaded area near limestone quarries; dry, dolomitic lower slopes and walls of two abandoned quarries; and a dolomitic limestone cobble rising abruptly from a river floodplain.

Top: Hairy Beardtongue's light purple flowers. Photo: Bruce Sorrie, NHESP. Bottom: Stem with opposite, stalkless leaves and hairy stem. Photo by and courtesy of Pamela Weatherbee.

Historical habitats in Massachusetts (unverified since 1978) include dry slopes, dry open woods, and dry roadside banks. Associated plant species include various junipers (*Juniperus* spp.), violets (*Viola* spp.) and dogwoods (*Cornus* spp.). Yellow Oak (*Quercus muehlenbergii*) and Narrow-leaved Vervain (*Verbena simplex*) are two rare Massachusetts species that have been found with Hairy Beardtongue.

Range: The range of Hairy Beardtongue extends throughout northeastern North America from Quebec and Maine to Wisconsin, and south to Virginia and Kentucky.



Distribution in Massachusetts
1985 - 2010
Based on records in the
Natural Heritage Database

Population Status: There are four current locations (1985-2010) in one town in Berkshire County and the species was known historically (unverified since 1978) from Franklin, Hampshire, and Worcester Counties. Three of the current stations have fewer than 15 plants; at the other site numbers vary from year to year but are usually in the tens to several hundred plants. Hairy Beardtongue is also considered rare in Vermont, Quebec, Wisconsin, and Virginia; it was present historically in Delaware. NatureServe ranks Hairy Beardtongue as globally Apparently Secure, G4.

Hairy Beardtongue is listed under the Massachusetts Endangered Species Act as Endangered. All listed species are protected from killing, collecting, possessing, or sale and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors.

Management and Threats: Threats include succession and lack of disturbance to rocky slopes and ledges. Two of the current sites are old disturbed areas with many shrubby and non-native invasive species. Populations should be monitored for invasions of exotic plants; if exotic plants are crowding and out-competing Hairy Beardtongue, a plan should be developed, in consultation with the Massachusetts Natural Heritage & Endangered Species Program, to remove the invaders.

All active management of rare plant populations (including invasive species removal) is subject to review under the Massachusetts Endangered Species Act, and should be planned in close consultation with the Massachusetts Natural Heritage & Endangered Species Program.

FOR MORE INFORMATION:

NatureServe. 2010. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: December 17, 2010).

USDA, NRCS. 2010. The PLANTS Database (http://plants.usda.gov, 17 December 2010). National Plant Data Center, Baton Rouge, LA

1992
Updated 2010

Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries & Wildlife
1 Rabbit Hill Road, Westborough, MA 01581
tel: (508) 389-6360, fax: (508) 389-7891
www.nhesp.org

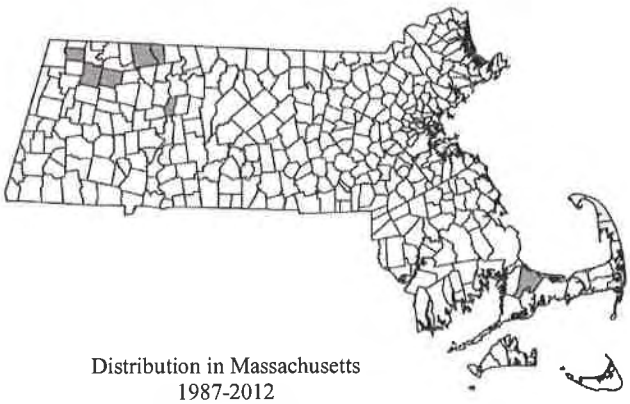
Leafy White Orchis

Platanthera dilatata (Pursh) Lindl. ex Beck

State Status: **Threatened**
Federal Status: **None**

Description: Leafy White Orchis, or Bog Candles, is a tall, leafy-stemmed, stout or slender perennial in the Orchid family (Orchidaceae) that rises from fleshy roots and ends in a slender spike of white flowers. It is erect, hairless, and reaches up to 1 m (3 1/3 ft.) in height. The lanceolate leaves number about twelve and become progressively smaller toward the top of the plant. Leafy White Orchis's small flowers are generally bright white and are arranged in a 1-3 dm (1/3 to 1 ft.) long spike. Their delightful fragrance has been likened to cloves. The 5-10 mm (0.2 - 0.4 in.) long lip, or lowermost petal, widens near the base and has five to seven prominent veins. The spur (a hollow extension of the flower) is about as long as the lip. Leafy White Orchis's fruit is a 12 x 6 mm (0.47 - 0.24 in.) ellipsoid capsule (a fruit that is formed from a compound pistil and that contains many seeds). In Massachusetts, the plant blooms from mid-June through July.

Range: The North American range of Leafy White Orchis has been documented as extending across Labrador to Alaska and south to New Jersey, Wisconsin, South Dakota, New Mexico, and California.



Distribution in Massachusetts
1987-2012
Based on records in Natural Heritage Database

Photo: Jennifer Garrett, NHESP

Similar Species: The White-fringed Orchis (*Platanthera blephariglottis*) and the Clubspur Orchis (*Platanthera clavellata*), two white to whitish-flowered orchids of somewhat similar habitats, could be confused with Leafy White Orchis. However, in our area, the lip of White-fringed Orchis is deeply fringed. The Clubspur Orchis is both shorter, 1-4 dm (1/3 to 1 1/3 ft.), than the Leafy White Orchis and, generally, has only one well-developed leaf on its stem. Finally, Northern Green Orchis (*Platanthera hyberborea*) is extremely hard to distinguish from Leafy White Orchis and often hybridizes with it. In contrast to Leafy White Orchis, it has green or greenish-white flowers. (Some authorities consider *Platanthera hyperborea* to be a green-flowered form of *Platanthera dilatata.*)

Please allow the Natural Heritage & Endangered Species Program to continue to conserve the biodiversity of Massachusetts with a contribution for 'endangered wildlife conservation' on your state income tax form as these donations comprise a significant portion of our operating budget.

Habitat in Massachusetts: Leafy White Orchis is a plant of sunny, wet areas, including bogs, seepage slopes and wet woods, especially where cold water surfaces to form springs. It prefers non-acid soil conditions. In Massachusetts, habitats include a cold, muddy and springy seep; a wet spot near a road; an area of sphagnum and rich muck, with springs and streamlets; a wet, sedgey open area; and an open, springy seep adjacent to a tributary. Plant species associated with Leafy White Orchis include sphagnum moss (*Sphagnum* spp.), various horsetails (*Equisetum* spp.), willows (*Salix* spp.), alders (*Alnus* spp.), Marsh Fern (*Thelypteris palustris*), Royal Fern (*Osmunda regalis*), and Yellow Sedge (*Carex flava*).

Population Status: Leafy White Orchis is currently listed as Threatened in Massachusetts. There are nine current stations (discovered or relocated since 1984) in seven towns and 15 historical stations (unverified since 1984) in 14 towns. Reasons for the plant's rarity in Massachusetts include loss of habitat, due both to development and forest succession, and scarcity of suitable habitat. Leafy White Orchis is also considered rare in Illinois, Indiana, New Mexico, Pennsylvania, and Wisconsin. It was present historically in Connecticut. The species is quite common in the far North, but becomes rare in the southern portions of its range.

Updated March 2012

Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

Bristly Black Currant
Ribes lacustre
(Pers.) Poir.

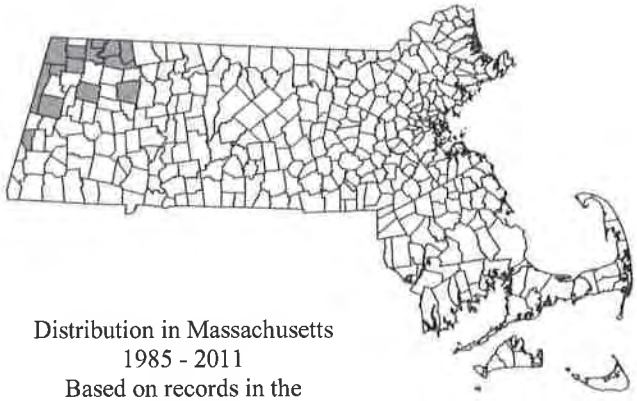
State Status: **Special Concern**
Federal Status: **None**

DESCRIPTION: Bristly Black Currant (*Ribes lacustre*) is a low, bristly to spiny, straggling shrub measuring up to 1 meter (3 feet) in height. Its leaves are alternate and are deeply cut with 3 to 5 lobes. Flowers are yellowish-green to pinkish, have fan-shaped to semicircular petal lobes, and are about 1/2 cm (less than 0.25 inches) in diameter. It is a northern plant of cool, moist forest slopes, usually in dappled shade.

AIDS TO IDENTIFICATION: The Bristly Black Currant is one of several members of the genus *Ribes* found in Massachusetts. A combination of characters must be used to distinguish it: 1) It has a "skunky" odor when the leaves, twigs, and fruits are crushed; 2) Its flowers and fruits are arranged in a raceme (which has a central stalk) which usually bears four or more flowers; 3) It has stipatate (stalked) glands on the ovaries of the flowers, and later on the (purple to black) fruits, giving them a "bristly" appearance; and 4) Its stems are armed with thin, bristly prickles, as its common name implies.

Ribes lacustre

Holmgren, N. 1998. *The Illustrated Companion to Gleason and Cronquist's Manual.* New York Botanical Garden.



Distribution in Massachusetts
1985 - 2011
Based on records in the
Natural Heritage Database

SIMILAR SPECIES: It can be difficult to distinguish between species in the genus *Ribes* in the vegetative state; flowers and fruits make identification much simpler. Swamp Red Currant (*R. triste*) co-occurs with the Bristly Black Currant at a few streamside locations; however, it has smooth, red fruits and unarmed stems. Smooth Gooseberry (*R. hirtellum*) is similar to Bristly Black Currant; however, the broken twigs and fruit do not have a foul odor, the fruits are not bristly, and leaves are never as deeply cut as those of *R. lacustre*. Skunk Currant (*R. glandulosum*) may grow in the same places as Bristly Black Currant, but has spineless stems.

RANGE: Bristly Black Currant is found from Labrador to Alaska, south to the mountains of Pennsylvania, West Virginia, Virginia, Minnesota, and California.

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Massachusetts Division of Fisheries & Wildlife

1 Rabbit Hill Rd., Westborough, MA; tel: 508-389-6300; fax: 508-389-7890; www.mass.gov/dfw

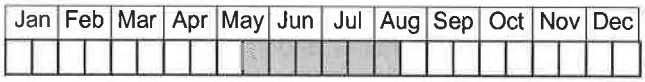
HABITAT: Bristly Black Currant is usually found in cool ravines and borders of swamps in upland regions of Massachusetts. It often occurs close to mountain streams, seepy ledges, or in steep rocky ravines, but it is also found in high-elevation swamps. The shrub prefers shaded to filtered light and wet soil, although one occurrence is in a mesic-dry region. It is found in association with northern hardwoods-hemlock forest. Surrounding vegetation may include Yellow Birch (*Betula alleghaniensis*), Red Spruce (*Picea rubens*), American Mountain-ash (*Sorbus americana*), Striped Maple (*Acer pensylanicum*), and Hobblebush (*Viburnum lantanoides*). Associated rare species are Braun's Holly Fern (*Polystichum braunii*) and Hemlock Parsley (*Conioselinum chinense*).

POPULATION STATUS IN MASSACHUSETTS: The Bristly Black Currant is a Species of Special Concern in Massachusetts. It is rare here in the Commonwealth because it is a cool-climate plant with limited appropriate areas of moist, montane habitat. There are 11 current populations, all concentrated in northwestern Massachusetts in areas of relatively high elevation or high latitude, or both. As with all species listed in Massachusetts, individuals of the species are protected from take (picking, collecting, killing) or sale under the Massachusetts Endangered Species Act.

THREATS: Drastic alterations to the habitat supporting the Bristly Black Currant could threaten populations. Large-scale logging, conversion of forest to developed land use, or alterations to stream or swamp hydrology could negatively impact habitat conditions for this species by altering its cool, moist, and shaded character. The invasive species Multiflora Rosa (*Rosa multiflora*) and barberry (*Berberis* spp.) have been documented at one station, and may out-compete the Bristly Black Currant. Direct impact to individual plants of Bristly Black Currant could occur from off-trail hiker trampling or trail-widening activities.

MANAGEMENT RECOMMENDATIONS: As with most rare plants, exact needs for management of Bristly Black Currant are not known. The following advice comes from observations of the populations in Massachusetts. Excessive off-trail foot traffic on steep, unstable slopes may cause erosion, or may damage populations through direct trampling; hikers should be strongly encouraged to stay on trails near populations of Bristly Black Currant. Any future trail construction should take into account locations of this rare species to avoid direct impacts. Forestry activities should be avoided or very carefully planned and executed in areas near Bristly Black Currant, since drastic canopy opening could alter the cool, moist nature of its habitat and open areas up to early successional competitors. Alterations to stream and swamp hydrology should be carefully avoided, since this species usually does not tolerate dry conditions. Stations for Bristly Black Currant should be monitored for invasive exotic species such as barberry (*Berberis* spp.) which can also thrive in cool, moist forest conditions; if found, invasive species should be controlled.

Flowers or Fruit Present



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Natural Heritage & Endangered Species Program

www.mass.gov/nhesp

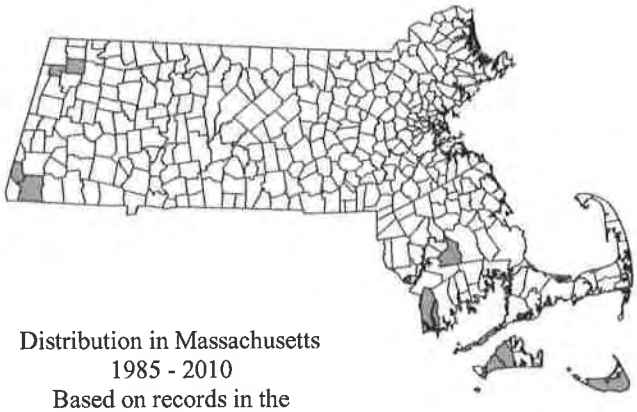
Massachusetts Division of Fisheries & Wildlife

Canadian Sanicle
Sanicula canadensis L.

State Status: **Threatened**
Federal Status: **None**

DESCRIPTION: Canadian Sanicle is a fibrous-rooted, herbaceous biennial in the Parsley family (Apiaceae). The plants grow up to 7.5 dm (29 in.) in height. Longer branches fork two to three times. The doubly serrate, palmately compound (with leaflets radiating out from a central point) leaves are three-parted, but may appear five-parted due to deep lobing on the two lateral leaflets. Inconspicuous greenish or whitish flowers are arranged in umbels (rather flat-topped groups of flowers in which all the flowers arise from a single point) with rays of differing lengths. The small, approximately globe-shaped fruits are borne in groups of three on 1-1.5 mm long pedicels. The styles (usually slender, stalk-like portions of the pistils) are shorter than the hooked bristles that cover the fruit, suggesting the plant's alternative common name of Short-styled Snakeroot. The plant's anthers (uppermost portions of the stamens) are white. Canadian Sanicle fruits from June through September.

Canadian Sanicle or Short-styled Snakeroot. Photo: B.A. Sorrie, NHESP. Illustration: USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 2: 624.



Distribution in Massachusetts
1985 - 2010
Based on records in the
Natural Heritage Database

SIMILAR SPECIES: Similar species include the other snakeroots that occur in our area: Black Snakeroot (*Sanicula marilandica*), Clustered Snakeroot (*S. odorata*), and Trefoil Sanicle (*S. trifoliata*). Clustered Snakeroot differs in its bright yellow anthers, yellowish-green flowers, and the fact that its style exceeds its fruit bristles in length. Black Snakeroot also has styles that are longer than the fruit bristles. The pistillate, or female, flowers of Trefoil Sanicle differ from those of Canadian Snakeroot in having no stalks. In addition, the sepals of Trefoil Sanicle form a conspicuous beak at the top of the fruit.

HABITAT IN MASSACHUSETTS: Canadian Sanicle is a plant of moist, open woods and openings in them such as trail edges and tree falls. Sites in Massachusetts are nutrient rich, somewhat wet areas; sites include low knolls and mesic slopes in and along paths through extensive red maple swamp, a seepy area wet in winter-

spring and mesic in summer to fall, and rich northern hardwood forests. The forests it grows in have canopies of northern and central hardwoods, often mixed, and usually mixed with successional species. The trees at the Canadian Sanicle sites include most hardwoods in the state, reflecting the wide distribution of the species and a predilection for second-growth forests in fairly moist, rich conditions: Sugar and Red Maple (*Acer saccharum* and *A. rubrum*), oaks (*Quercus* spp.), White Ash (*Fraxinus americana*), Tulip Tree (*Liriodendron tulipifera*), Sassafras (*Sassafras albidum*), various hickories (*Carya* spp.), Beech (*Fagus grandifolia*), White Pine (*Pinus strobus*) and birches (*Betula alleghaniensis* and *B. papyrifera*). A subcanopy of Hop-hornbeam (*Ostrya virginiana*), Hornbeam (*Carpinus caroliniana*) and/or Witch Hazel (*Hamamelis virginiana*) is common.

The shrub layer tends to be sparse although it may have dense patches of Spicebush (*Lindera benzoin*), Highbush Blueberry (*Vaccinium corymbosum*), Northern Arrow-wood (*Viburnum dentatum* var. *lucidum*), Winterberry (*Ilex* spp.), or elderberries (*Sambucus canadensis* and *S. racemosa* ssp.)

The herbaceous layer is rich and varied; many of the species are known to grow in nutrient-rich moist conditions in northern hardwoods forests and others are more widespread. Included at many sites are Wild Geranium (*Geranium maculatum),* Indian Cucumber Root (*Medeola virginiana*), White Avens (*Geum canadense*), Hog Peanut (*Amphicarpaea bracteata*), Jack-in-the-Pulpit (*Arisaema triphyllum*), Wild Sarsaparilla (*Aralia nudicaulis*), Wild Ginger (*Asarum canadense*), Virginia Waterleaf (*Hydrophyllum virginianum*), Christmas Fern (*Polystichum acrostichoides*), Elliptic Shinleaf (*Pyrola elliptica*), Poison Ivy (*Toxicodendron radicans*), Virginia Creeper (*Parthenocissus quinquefolia*), Dewberries (*Rubus* spp.), and many members of the Asteraceae.

RANGE: The range of Canadian Sanicle is from southern Ontario, New Hampshire and Massachusetts to southern Minnesota and South Dakota, and south to Florida and Texas. NatureServe ranks it as Globally Secure. Canadian Sanicle is considered rare in New Hampshire, Vermont, and Quebec.

POPULATION STATUS IN MASSACHUSETTS: Canadian Sanicle is listed under the Massachusetts Endangered Species Act as Threatened. All listed species are protected from killing, collecting, possessing, or sale and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. It is currently known from Berkshire, Dukes, Bristol, Nantucket and Plymouth Counties and is historically known from Franklin County, as well as Bristol, Plymouth, Nantucket and Dukes Counties. There are eleven current sites in ten towns and nine historical locations (unverified since 1985) in the Commonwealth.

MANAGEMENT AND THREATS: Several of the populations occur with non-native invasive associates including Common Buckthorn (*Rhamnus cathartica*), Multiflora Rose (*Rosa multiflora*), Asian Bittersweet (*Celastrus orbiculata*), Japanese Barberry (*Berberis thunbergii*) and shrub honeysuckles (*Lonicera* spp.). Sites should be monitored for invasions of exotic plants; if exotic plants are crowding and out-competing this species, a plan should be developed, in consultation with the Massachusetts Natural Heritage & Endangered Species Program, to remove the invaders. All active management of rare plant populations (including invasive species removal) is subject to review under the Massachusetts Endangered Species Act, and should be planned in close consultation with the Massachusetts Natural Heritage & Endangered Species Program.

REFERENCES:

NatureServe. 2010. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: January 27, 2011).

USDA, NRCS. 2011. The PLANTS Database (http://plants.usda.gov, 27 January 2011). National Plant Data Center, Baton Rouge, LA 70874-4490 USA. http://plants.usda.gov/java/profile?symbol=SACA15&photoID=saca15_001_avd.tif

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Natural Heritage & Endangered Species Program

www.mass.gov/nhesp

Massachusetts Division of Fisheries & Wildlife

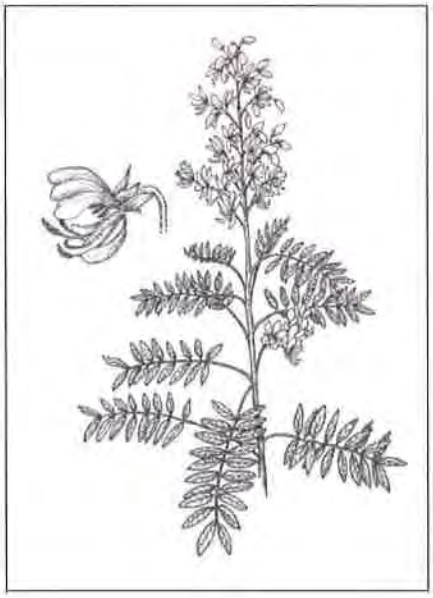
Wild Senna
Senna hebecarpa
(Fern.) Irwin & Barneby

State Status: **Endangered**
Federal Status: **None**

DESCRIPTION: Wild Senna is a robust, herbaceous perennial in the Pea family (Fabaceae), growing 0.9 to 2 m (3–6.5 ft.) tall. The compound leaves have 6 to 10 pairs of simple (*i.e.*, without lobes or teeth) leaflets. Racemes of showy, five-petaled, yellow flowers about 2 cm across are present from late July through August and occasionally into mid-September. The fruits are flattened, pea-like pods, 7 to 12 cm long, each containing up to 12 flat, roundish seeds with a depressed center. Fruits are produced from mid August through late September, and may persist into October. Plants spread vegetatively by rhizomes and may form dense clonal patches.

AIDS TO IDENTIFICATION: Wild Senna has compound leaves and pods similar to those of other species in the Pea family. It is distinguished by:

- Club-shaped or obovoid petiole glands
- Joints of pods are about as long as wide
- Yellow flowers have five distinct petals that are not fused



Wild Senna has compound leaves with distinct petiolar glands, flowers with petals that are not fused, and seed pods with nearly square joints. Illustration by Elizabeth Farnsworth.

SIMILAR SPECIES: Wild Senna is the only native *Senna* species known from Massachusetts. Partridge Pea (*Chamaecrista fasciculata*) might be mistaken for Wild Senna but it is smaller, rarely reaching 80 cm (30 inches) in height, and has larger flowers (> 2.5 cm).

POPULATION STATUS IN MASSACHUSETTS: Wild Senna is listed under the Massachusetts Endangered Species Act as Endangered. All listed species are protected from killing, collecting, possessing, or sale, and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. Wild Senna is currently known from Hampshire and Middlesex Counties and was documented historically from Berkshire, Franklin, Hampden, Worcester, Essex, Suffolk, Norfolk, and

Plymouth Counties. Wild Senna was never common in Massachusetts and population declines during the 20th century have left it in a precarious position. A total of 25 populations were documented in Massachusetts during the 19th and 20th centuries; as of 2000, only two extant populations were known. Succession following agricultural abandonment and development are probably the primary causes for this decline.

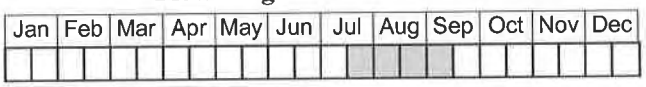
RANGE: Wild Senna is found from Maine to Ontario south to Georgia.

HABITAT: Wild Senna often occurs in areas with a history of disturbance, such as roadsides, fields, agricultural lands, utility rights-of-way, and the scour zone along stream edges. It may occur in both wetland and moist upland contexts; areas with rich alluvial soil are especially favorable. It is not typically found in areas with a forest canopy, but it does well in thickets in association with coarse herbs and shrubs.

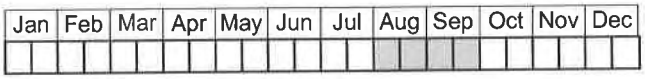
THREATS AND MANAGEMENT RECOMMENDATIONS:

Extant populations of Wild Senna are on land owned or managed by the Massachusetts Division of Fisheries and Wildlife, affording good potential for protection and management. One population on a power line right-of-way is potentially threatened by infrastructure maintenance, and vegetation management is needed to maintain early successional habitats in and around remaining populations. All active management of rare plant populations (including invasive species removal) is subject to review under the Massachusetts Endangered Species Act, and should be planned in close consultation with the Massachusetts Natural Heritage & Endangered Species Program.

Flowering in Massachusetts



Fruiting in Massachusetts



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Updated 2015

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

APPENDIX D:
Fact Sheets for Natural Communities in Ashfield

Acidic Graminoid Fen

State Rank: S3 - Vulnerable

Acidic Graminoid Fen, sedges, shrub patches on peat. Photo: Patricia Swain, NHESP.

Acidic Graminoid Fens are sedge and sphagnum-dominated acidic peatlands that experience some groundwater and/or surface water flow but no calcareous seepage. Standing water is often present throughout much of the growing season.

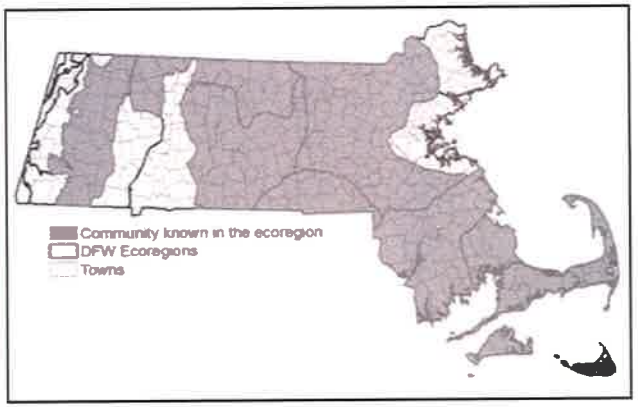
Description: Acidic Graminoid Fens (AGF) are acidic peatlands dominated by mixed sedges and other graminoids with herbaceous species. Shrubs occur in clumps but are not dominant. Peat mats may be quaking and unstable and often have pools of standing water. Sphagnum usually covers the surface below the sedges and forms the peat.

Characteristic Species: Species of Sphagnum moss are the most common plants in all acidic peatlands. Acidic Graminoid Fens are the most species-rich of the acidic peatland communities. Typical graminoids include cotton-grasses and other sedges such as beaked sedge, slender woolly-fruited sedge, white-beaked sedge, and twig-sedge. Threeway sedge and buckbean are characteristic of wet, nutrient enriched edges. Associated herbaceous species include St. John's-wort, arrow-arum, and rose pogonia. Large cranberry can be abundant. There is patchy tree and shrub cover, including red maple saplings, swamp azalea, highbush blueberry, sweet pepper-bush, poison sumac, leatherleaf, and water-willow.

Acidic Graminoid Fen with large area of buckbean and threeway sedge. Photo: Patricia Swain, NHESP.

Differentiating from Related Communities: Acidic Graminoid Fens are dominated by sedges or other graminoids such as cottongrass and lack extensive shrubs. Acidic Shrub Fens have extensive low shrubs and are not dominated by graminoids. Dense water-willow and sweet gale are indicative and characteristic. Level Bogs and Kettlehole Level Bogs have deep and well developed sphagnum peat. Graminoids are present but not dominant, and shrubs are dominated by leatherleaf. Sea-level Fens occur between estuarine marshes and upland seepage slopes. Diagnostic species include saltmarsh straw-sedge, saltmarsh spike-sedge, and Olney's threesquare. Twig-sedge at the edges of salt marshes is also an indicator of Sea-level Fens.

Buckbean flowers. Photo: Patricia Swain, NHESP.



Habitat for Associated Fauna: Due to the extended periods of saturation, lack of nutrients, and the high acidity and low oxygen content of the water, acidic peatlands are inhospitable to many animal species. Winged animals and large terrestrial animals can use peatlands as part of their habitat and then move on when conditions are unfavorable. Moose and white-tailed deer browse in acidic peatlands; their trails are often evident across the peat mat. Bears are attracted to the cranberries and blueberries in season. Many bird species use peatlands for part of the year as nesting or foraging habitat. Many dragonflies and damselflies inhabit acidic peatlands, especially where there is adjacent open water.

Examples with Public Access: Tully Lake property (USACE), Royalston; Quaboag WMA, Brookfield; Noquochoke WMA, Dartmouth; Hockomock Swamp WMA, Bridgewater; Grassy Pond, Acton.

Acidic Graminoid Fen with white-beaked sedge. Photo: Patricia Swain, NHESP.

From: *Classification of Natural Communities of Massachusetts* http://www.mass.gov/nhesp/
Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife, 1 Rabbit Hill Rd., Westborough, MA 01581
Updated: 2016
(508) 389-6360

Northern Hardwoods - Hemlock - White Pine Forest

State Rank: S5 - Secure

Young NHHWP Forest with scattered evergreen ferns. Photo: Patricia Swain, NHESP.

Description: The Northern Hardwoods - Hemlock - White Pine Forest (NHHWPF) is the prevailing forest in higher elevations of western and north-central Massachusetts, with smaller occurrences throughout on north facing slopes and in ravines. It is an uneven aged forest with a closed canopy dominated by a mix of long lived deciduous and evergreen trees, with sparse shrub and herbaceous layers. The forest structure is dominated by single tree fall and replacement with occasional small to medium blowdown events; stand replacement events are uncommon. The neutral to moderately acidic soils have moderate levels of nutrients and retain some moisture except during extreme droughts. Leaf litter decomposes rapidly resulting in a shallow layer of leaf litter.

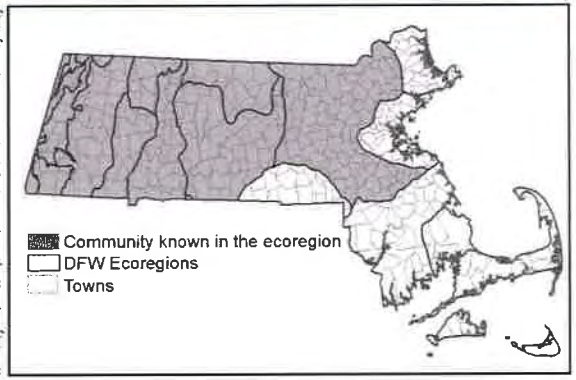
The closed canopies of Northern Hardwoods - Hemlock - White Pine Forests are generally deciduous with a mix of conifers. The shrub and herbaceous layers are sparse. NHHWPF occur in cool areas.

Characteristic Species: NHHWPF are generally deciduous with scattered hemlocks and white pines but may have internal patches of nearly pure conifers. Canopies include variable combinations of sugar maple, white ash, yellow birch, American beech, black cherry, red oak, and bitternut hickory with eastern hemlock and usually emergent white pine. Red maple, paper birch, and aspen are occasional. A subcanopy includes any of the tree species, as well as hop-hornbeam or striped maple. The shrub layer is usually open, but often has scattered clumps of hobblebush, red-berried elderberry, fly-honeysuckle, or tree saplings. The herbaceous layer is sparse, but fairly diverse, with intermediate woodfern, Christmas fern, clubmosses, Canada mayflower, white wood aster, and wild oats. Occasional spring herbaceous species include trilliums, early yellow violet, broad-leaved spring beauty, and trout-lily.

Differentiating from Related Communities: To the north and upslope of NHHWPF are Spruce - Fir - Northern Hardwoods Forests (SFNHF). Red spruce is abundant in SFNHF, and white pine uncommon. NHHWPF has 25-50% of hemlock plus white pine overall:

Striped maple in flower, typical shrub of NHHWPF. Photo: Patricia Swain, NHESP.

red spruce are uncommon if present. Within the matrix of NHHWPF, subtypes with distinct species assemblages are named separately. All types of northern hardwood forests, including NHHWPF are dominated by northern hardwoods. In Successional Northern Hardwood Forests northern hardwoods are generally in the subcanopy or shrub layer with an abundance of white birch and/or aspens in the canopy. Rich, Mesic Forest (RMF) is nutrient- and species-rich, usually within the NHHWPF area: RMF lack conifers, beech, and red oak. The understory has dense spring ephemerals and lacks intermediate wood fern, Christmas fern, and wild sarsaparilla. Red Oak - Sugar Maple Transition Forest has red oak as a dominant, with sugar maple, American beech, and black birch. Other northern hardwoods are occasional associates. Spring ephemerals are not abundant. Oak - Hemlock - White Pine Forests occur to the south and in warmer areas; they are dominated by a mix of oak species and lack sugar maple. The shrub layer is dominated by blueberries and huckleberries.



Habitat for Associated Fauna: NHHWPF are the common type of forest in the cooler parts of the state. They provide habitat for common wide ranging species. The best occurrences of NHHWPF are large and incorporate variation in species and structure including multiple layers of vegetation, snags, tree cavity den sites (used by a variety of bird and mammal species) and fallen large woody material (used by various amphibian, reptile, and invertebrate species). Covering large areas means inclusion of variation such as interior forest, dense conifer stands, beech seed production, seeps, pockets of wetland, and small patches of dense, earlier successional shrub species.

Examples with Public Access: Chalet WMA, Cheshire; Mohawk Trail SF, Charlemont; Three Mile Pond WMA, Sheffield; Tully Mtn. WMA, Orange.

Light flecks in young NHHWP Forest. Photo: Patricia Swain, NHESP.

From: *Classification of Natural Communities of Massachusetts* http://www.mass.gov/nhesp/
Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife, 1 Rabbit Hill Rd., Westborough, MA 01581
Updated: 2016
(508) 389-6360

Rich Conifer Swamp

State Rank: S3 - Vulnerable

Rich Conifer Swamp with patchy moss on hummock likely created by a fallen tree, now rotted away. Photo: Glenn Motzkin.

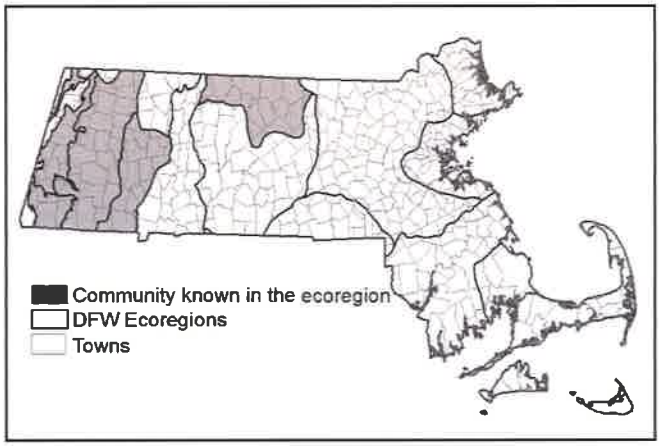
Description: The generally closed canopies of Rich Conifer Swamps are dominated by mixed conifers with a high proportion of deciduous trees. Mineral-enriched water flows or seeps into the community and supports a high diversity of species in all strata. The surface is hummocky with areas of moss on the hummocks where most woody plants grow. The hollows may have water, bare ground, or herbaceous plant cover. Although the surface of the substrate may be dry by late summer, many hollows remain wet and mucky.

Characteristic Species: The vegetation of Rich Conifer Swamps is variable. The canopy is dominated by conifers (eastern hemlock, balsam fir, or red spruce, alone or together) mixed with red maple, yellow birch, American elm, and black ash. Species indicative of mineral enriched conditions are typical in the understory. Dense patches in the shrub layer may include spicebush, witch hazel, or hornbeam with saplings of the canopy trees. The variable and diverse herbaceous layer may include jack-in-the-pulpit, foamflower, lesser mitrewort, wild oats, oak-fern, delicate sedge, swamp-saxifrage, northern horse-balm, golden ragwort, golden saxifrage, rough-leaved goldenrod, and purple avens.

Rich Conifer Swamps are species- and nutrient-rich swamps dominated by hemlock, balsam fir, or red spruce mixed with hardwoods including black ash. They usually have pockets of moss rather than sphagnum lawns.

Spicebush leaves and ripe fruit, often found in Rich Conifer Swamps. Photo: Chris Evans, University of Illinois, Bugwood.org.

Differentiating from Related Communities: All the following may have scattered patches of eastern hemlock. Rich Conifer Swamps are characterized by a canopy of mixed red spruce, hemlock, balsam fir and deciduous trees including black ash, and species such as spicebush that indicate less acidic conditions with greater nutrient availability, and pockets of moss rather than sphagnum lawns. The canopy in Red Spruce Swamps is dominated by red spruce: lower strata are sparse. Sphagnum often forms a continuous ground cover. In Hemlock Swamps eastern hemlock is the dominant canopy species throughout the community. Lower strata are sparse. Sphagnum often forms a continuous ground cover. Red Maple Swamps and named variants such as Red Maple - Black Gum Swamps are dominated by deciduous trees, particularly red maple. Atlantic White Cedar Swamps are dominated by Atlantic white cedar.



Habitat for Associated Fauna: Rich Conifer Swamps are part of the habitat of large mobile animals. Ground level browsers, including white tail deer, snow shoe hare, and New England cottontail, use shrubby areas in the community. Conifer swamps tend to have dense shade and are relatively cool in the summer, making them preferred areas for animals that get hot, such as moose. Areas of Rich Conifer Swamps where water stands through the spring can function as amphibian breeding habitat.

Examples with Public Access: Appalachian Trail Corridor, Sheffield; Agawam Lake WMA, Great Barrington; Hinsdale Flats WMA, Hinsdale; Savoy WMA and Notchview Reservation (TTOR), Windsor; Hiram H. Fox WMA, Chester; Otis SF, Sandisfield; Orange WCE (MGLT), Orange.

Rich Conifer Swamp with mixed species and a denser shrub layer than in other types of conifer swamps. Photo: Glenn Motzkin.

From: *Classification of Natural Communities of Massachusetts* http://www.mass.gov/nhesp/
Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife, 1 Rabbit Hill Rd., Westborough, MA 01581
Updated: 2016
(508) 389-6360

Rich, Mesic Forest

State Rank: S3 – Vulnerable

Rich, Mesic Forest with maidenhair fern in dense understory. Photo: Charlie Eiseman.

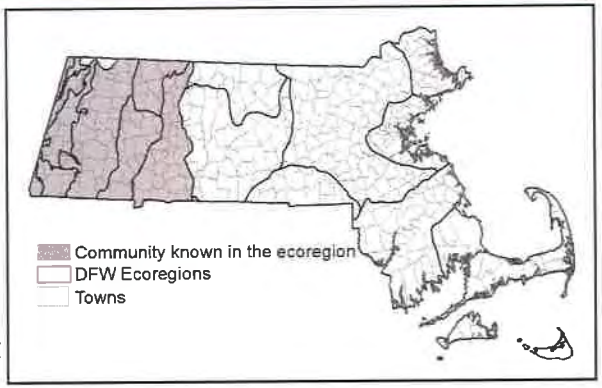
Description: Rich, Mesic Forests (RMF) are restricted to elevations below 2,400 ft. (~650 m), usually on east or southeast-facing, concave, mid- to lower slopes with downslope movement of nutrients and organic matter. Rich refers to rich in nutrients; they are also rich in species. Mesic is the moderate moisture regime. Soils are usually deep, with leaves and other plant litter quickly incorporated into the soil, so that there is rarely more than one year's accumulation of leaves on the forest floor. The dominant trees of RMF are very shade-tolerant and able to establish and grow under low-light conditions of a full canopy. Species of lower layers are also shade tolerant and can make use of transient light patches from small canopy gaps. RMF are noted for having abundant herbaceous species: spring ephemerals (plants that flower before tree leaf out and have foliage that disappears in late spring) are characteristic, along with slightly later bloomers that keep their leaves into summer and others that flower later.

Rich, Mesic Forest is a western Massachusetts variant of northern hardwood forest. Sugar maple dominates the canopy. The diverse herbaceous layer includes many spring wild flowers on moist, nutrient rich slopes.

Characteristic Species: Rich Mesic Forests are dominated by sugar maple, with white ash, bitternut hickory, elm species, and basswood. Hop hornbeam is commonly in the subcanopy. The often sparse shrub layer may have pagoda dogwood, leatherwood, or red-berried. Elderberry. The herbaceous layer usually has a dense mix of species starting in early spring. Typical species include bloodroot, Dutchman's breeches, squirrel corn, toothwort, maidenhair fern, late blue cohosh, sweet cicely, wild leek, plantain-leaf sedge Goldie's fern, glade-fern, and/or zigzag goldenrod.

Bloodroot (L) and Dutchman's breeches (R), Spring ephemerals typical of, but not limited to, Rich, Mesic Forests. Photos: P. Swain, NHESP.

Differentiating from Related Communities: Rich, Mesic Forest is usually within the Northern Hardwoods - Hemlock - White Pine Forest (NHHWPF) or in the transition between it and the oak dominated forests to the south: RMF lacks conifers, beech, and oaks. The understory has dense spring ephemerals with late blue cohosh and/or wild leek, and lacks abundant evergreen wood fern and wild sarsaparilla found in NHHWPF. NHHWPF has abundant eastern hemlock, white pine, American beech, and red oak. Enriched NHHWP may have scattered spring ephemerals, but also early yellow violet and broad-leaved spring beauty that usually indicate lower nutrient availability. Red Oak - Sugar Maple Transition Forest has red oak as a dominant, with sugar maple, American beech, and black birch. Spring ephemerals are uncommon. Most occurrences of RMF in Massachusetts are west of the Connecticut River Valley, Sugar Maple - Oak - Hickory Forest (SMOHF) is to the east. The presence of multiple species of hickories and oaks in SMOHF is a main difference between these two types. Broad-leaved woodland-sedge is close to being an indicator of SMOHF. RMF has semi-evergreen plantain-leaf sedge instead. RMF is characterized by very dense herbaceous growth of spring ephemerals; SMOHF shares some of the species but with fewer individuals of fewer species. SMOHF has evergreen wood ferns that RMF lacks.



Habitat for Associated Fauna: All upland forest types provide valuable structural attributes such as tree cavity den sites (used by a variety of bird and mammal species) and large woody material (used by various amphibian, reptile, and invertebrate species). Very few animal species are strongly associated with Rich, Mesic Forests to the exclusion of other community types. Species such as mole salamanders that breed in vernal pools use the surrounding upland, deciduous forests for foraging and hibernation. Most of the small mammals of forests occur in RMFs, although some are limited to their geographical distribution. Large mammals include RMFs as parts of their habitat, but are usually more dependent on size of undisturbed forest than on the precise type.

Examples with Public Access: Day Mountain WMA, Dalton; Maple Hill WMA, West Stockbridge; The Hopper - Mt. Greylock SR, Williamstown; Knightville and Hiram Fox WMAs, Cheshire; Appalachian Trail, Tyringham.

Rich, Mesic Forest with mixed tree sizes and almost continuous herbaceous layer in mid summer Photo: Patricia Swain, NHESP.

From: *Classification of Natural Communities of Massachusetts* http://www.mass.gov/nhesp/
Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife, 1 Rabbit Hill Rd., Westborough, MA 01581
Updated: 2016
(508) 389-6360

APPENDIX E:
Public Participation Materials

Open Space & Recreation Plan Committee Meeting Notice

Thursday, April 28, 2016
7:00pm-8:30pm
Ashfield Town Hall
412 Main Street, Ashfield MA 01330

Contact: Alan Rice – (413) 628-4613

Agenda

1. **Open the meeting**
2. **Introductions**
3. **Overview of Ashfield Open Space & Recreation Plan (OSRP) update process (Pat Smith, Franklin Regional Council of Governments)**
4. **Review draft revised maps for OSRP update (Pat Smith and Committee)**
5. **Indentify priorities for updates using 2016 DLTA grant funds (Pat Smith and Committee)**
6. **Determine specific areas of interest/timeframes from Committee members**
7. **Establish project schedule and set next meeting date**
8. **Adjourn the meeting**

Ashfield Open Space and Recreation Planning Committee

April 28, 2016

Sign-in Sheet

Please Print Clearly

Name	Affiliation	Mailing Address/ Email	Phone Number
Kayce Warren	Ashfield Interim Town Admin	~~PO Box 560~~ PO Box 560 Ashfield MA 01330	413-628-4441 x 7
Barbara Miller	Ashfield resident	kbbpmiller@yahoo.com 193 Cummington Rd	413-628-4568
Millie Balbizo	ZBA	73 Briar Rock Rd (SFIS zip) millie.balbize@gmail.com	413-625-6605
Anne Capra Madocks	Conservation Commission	68 Plainfield Road annecapra447@gmail.com	413-628-4546
Judith HAUPT	Chair Park Commission	755 Wilson Spruce Cn. Rd. 01330 judy@southfacefarm.com	413-628-3268
ALAN RICE	PLANNING BOARD	230 SOUTH ST. RICEPIERCE@VERIZON.NET	413-628-4613
Nancy GARVIN	Hist. Soc.	Box 234, 01330 nancy.garvin@star.net	625-6234
Duncan Colter	BOH	Box 75 01330 makana958@verizon.net	628-3326

PUBLIC FORUM

ASHFIELD OPEN SPACE & RECREATION PLAN COMMITTEE

JUNE 23, 2016 AT 7:00 PM
ASHFIELD TOWN HALL

Public Information Meeting Goals:

- Develop Community Awareness of OSRP Goals
- Invite Public Comment and Suggestions
- Awareness of Action Plan and Timeline

PLEASE JOIN US AND SHARE YOUR INPUT AS WE BEGIN THE UPDATES TO THE OPEN SPACE & RECREATION PLAN. WE LOOK FORWARD TO HEARING FROM YOU!

Committee Charge:

- Update the Open Space & Recreation Plan as required and to better position the Town of Ashfield to receive state and federal grant consideration
- Review of Critical Sections – Community Setting, Environmental Inventory & Analysis, Inventory of Lands & Conservation/Recreational Interests
- Determine scenic and environmental issues facing the Town

Technical Assistance provided by the Franklin Regional Council of Governments District Local Technical Assistance Grant funded from the Department of Housing and Community Development.

AGENDA AND MEETING NOTICE

Ashfield Open Space and Recreation Plan Update Meeting

Thursday, June 23, 2016
7:00 p.m. – 8:30 p.m.
Ashfield Town Hall
412 Main Street
Ashfield, MA 01330

1. 7:00 p.m. – Introductions (Alan Rice, Ashfield OSRP Update Committee Chair)

2. 7:10 p.m. – Public Forum
   a. Overview of the Ashfield Open Space and Recreation Plan update process (Pat Smith, Franklin Regional Council of Governments)
   b. 2008 Open Space and Recreation Plan Action Plan Status Update
   c. Review of 2013 Ashfield Open Space Survey Results
   d. Public discussion of Open Space and Recreation priorities for Ashfield

3. 7:50 p.m. – Initial Review of Draft Section 3: Community Setting (Pat Smith, FRCOG, and Committee)

4. 8:10 p.m. – Review of draft revised maps for Ashfield Open Space and Recreation Plan update (Pat Smith, FRCOG, and Committee)

5. 8:25 p.m. – Review project schedule and set next meeting date (Pat Smith, FRCOG, and Committee)

6. 8:30 p.m. – Adjourn meeting

Ashfield Open Space and Recreation Planning Committee
PUBLIC FORUM AND MEETING
June 23, 2016
Sign-in Sheet

Please Print Clearly

Name	Affiliation	Mailing Address/ Email	Phone Number
Helen Boyden		P.O. Box 304	628-3307
Douglas Field		64 BULLITT RD	628-3343
Anne Guryan	ZBA	PO Box 55	628-3222
Douglas H. Gamson		PO Box 113	628-4408
Philip K Lussier		plussier@whitneyacres.com	628-3279
Faye Whitney		PO Box 87	628-3279
John Nawrocki		P.O. Box 35	628-3924
Alan Lilly		1144 Watson Spruce	628-4577
Nancy Garvin		Box 234	625-6234

Ashfield Open Space Recreation Plan Committee Meeting

When: Thu, 10 November, 2016 7:00 PM – 8:00 PM
Where: Ashfield Town Hall,412 Main Street, Ashfield MA 01330 (map)

Description:

1. 7:00 p.m. – Introductions (Alan Rice, Ashfield OSRP Update Committee Chair)

2. 7:10 p.m. – Review of Minutes of 6/23/16 meeting and Public Forum

3. 7:20 p.m. – Final Review of Second Draft of Section 3: Community Setting (Pat Smith, FRCOG, and Committee)

4. 7:50 p.m. – Initial Review of Draft Section 4: Environmental Inventory and Analysis (Pat Smith, FRCOG, and Committee)

5. 8:15 p.m. – Open Space Mapping

6. 8:20 p.m. – Review project accomplishments and discuss future plans (Pat Smith, FRCOG, and Committee)

7. Items not reasonably anticipated by the Chair 48 hours in advance of the meeting

8. 8:30 p.m. – Adjourn meeting

The listing of matters are those reasonably anticipated by the Chair which may be discussed at the meeting. Not all items listed may in fact be discussed, and other items not listed may also be brought up for discussion to the extent permitted by law.

Ashfield Open Space and Recreation Planning Committee
MEETING
November 10, 2016
Sign-in Sheet

Please Print Clearly

Name	Affiliation	Mailing Address/ Email	Phone Number
Anne Capra	Conservation Commission	annecapra447@gmail.com	
Barb Miller	Ag Commission	kbbpmiller@yahoo.com	628-4596
Alan Rice	Planning Board	RICEPIPER@VERIZON.NET	628-4613
Nancy Garvin		nancy.garvin@star.net	625-6234
Anne Yuryan	ZBA		
Mollie Babbitt	ZBA	mollie.babbitt@gmail.com	413 625 6005
Kayce Warren	Interim Administrator (you've got it!)		
Pat Smith	FRCOG		
Duncan Colter Bolt			628-3326

Open Space & Recreation Plan Update Committee Meeting Notice

Thursday, March 23, 2017
7:00pm
Ashfield Town Hall
412 Main Street, Ashfield MA 01330

Contact: Alan Rice – (413) 628-4613

Agenda

1. **Open the meeting**
2. **Introductions**
3. **Review of grant funding for 2017 calendar year**
4. **Review of work-in-progress (calendar year 2016)**
5. **Identify priorities for updates for 2017, using DLTA grant funds**
6. **Establish project schedule and set next meeting date(s)**
7. **Items not reasonably anticipated by the Chair 48 hours in advance of the meeting**
8. **Adjourn the meeting**

Ashfield Open Space and Recreation Planning Committee
MEETING
March 23, 2016
Sign-in Sheet

Please Print Clearly

Name	Affiliation	Mailing Address/ Email	Phone Number
Judy Haupt	Park Commission	judy@southfacefarm.com	628-3268
Mollie Babize	ZBA	mollie.babize@gmail.com	625-6005
Nancy Garvica	AHS	Nancy.garvica@star.net	625-6034
Anne Lemyan	ZBA CIA 1115	PO Box 55 Ashfield 01330	628-3222
ALAN RICE	PLANNING BOARD	230 SOUTH ST. ASHFIELD RICEPIPE@VERIZON.NET	628-4613
PAT SMITH	FRCOG		
Barbara Miller	Ag Comm	193 Cummington Rd. kbbpmiller@yahoo.com	628-4596

Open Space Plan Minutes
5/11/2017

Present: Alan Rice, Chair, Planning Board (AR)
Kayce Warren, Town Admin. (KW)
Nancy Garvin, Historical Commission (NG)
Anne Yuryan, Zoning Board of Appeals (AY)
Duncan Colter, Board of Health (DC)
Judy Haupt, Park Commission (JH)

Absent: Anne Capra, Conservation Commission
Mollie Babize, Zoning Board of Appeals
Barbara Miller, Ag Commission
Susan Todd, Ashfield Trails

Meeting opens at 7:08PM.

Minutes of 3/23/ 2017 approved as amended. 5-0-1

MVP – KW opens the meeting with requests of letters of support for the Municipal Vulnerability Preparedness (MVP) grant program from the OSP/Planning Board, Park Commission, Trails Committee, Con Comm, Ag Committee, Board of Health and Highway Dept. A sample letter has been provided and will be forwarded to Board of Health, Ag Commission and Ashfield Trails. This grant is in concert with the Town Of Conway and is designed to)1 Identify climate change affected hazards in the shared South River Corridor,)2 Identify those hazardous impacts on farms, water health, recreation, roads and bridges, etc. and)3 put into place a mitigation plan to deal with those predicted impacts. This grant will be administered by the FRCOG who will do a 2 part series of workshops to structure the effects on the impacts as above. If this grant is approved, it will give the Towns access to other grants available for disaster mitigation.

Chapter 3 – Add Mollie's introduction (AR with MB)

Chapter 4 - Revisions review (AR) and send to (AY)

Chapter 5 – Find Field land, Bullitt Reservation on the recreation inventory, Find South Face Farm on Chapter 61 inventory.(NG)

ADA - (JH) discusses the enormity of the ADA requirements in light of the time /$ involved in adhering to measurement guidelines for all our recreation lands and facilities and creating a plan to provide handicap accessibility for same. Also discussed was Ashfield's portion of the DAR for ADA accessibility and whether we include Ashfield Rod and Gun whose facility is actually in Plainfield but is a big part of recreation for Ashfield. Those facilities are not handicap accessible. A call to Pat Smith for clarification has not been returned. (AR) will ask (KW) about this process as she has experience with Deerfield's OSP. (JH) will get the ADA requirements to Ashfield Trails for their participation.

Map Database – (AR) will get update from (BM).

Next Meeting: June 1st, 7PM with Patricia Smith, FRCOG

Respectfully Submitted,
Judy Haupt

Open Space Plan Minutes
6/27/2017

Present: Alan Rice, Chair, Planning Board (AR)
Anne Capra, Conservation Commission (AC)
Mollie Babize, Zoning Board of Appeals (MB)
Barbara Miller, Ag Commission (BM)
Nancy Garvin, Historical Commission (NG)
Anne Yuryan, Zoning Board of Appeals (AY)
Duncan Colter, Board of Health (DC)
Judy Haupt, Park Commission (JH)

Absent: Kayce Warren, Town Admin. (KW)
Susan Todd, Ashfield Trails

Meeting opens at 7:05PM.

Minutes of 5/11/ 2017 approved as amended. 5-0-3. JH moved to approve, AY seconded

Pat's email of today – (email attached to the end of the minutes) – AR focused on the notes that Pat Smith had made for the committee to concentrate on. The first comments were drawing attention to what information was in each table. She suggested that we consider organizing the data by map and parcel number rather than alphabetically by owner name. The group concurred that this would be appropriate. BM can re-organize the tables to reflect this.

Pat highlighted that there are several columns in the publicly owned lands that need completing, including the current use and condition, and the recreational value. AC noted that this should reflect the recreational *potential* of the parcel in the future, i.e., is it underutilized, are there trails planned, etc. Group members will fill in what they know about, and if there are gaps, the job will be distributed for people to go and take a look at the parcel.

AR indicated the steps after section 6, 7, and 8, which is section 9 – the 7 year action plan. Each board and commission needs to weigh in on what their priorities are. The discussion around this indicated that the boards and commissions need to see what is in the previous drafts in order to do this. Want to avoid stovepiping the process.

AC asked to look at the budget to see how much money is involved with FRCOG. She felt that for the amount indicated, they should be providing more complete documents that pull the information from one section to the next, and the committee should not have to fill in so many blanks. She commented on this from her experience in writing these plans for other towns and what it cost. AR indicated that he would talk to Pat about this.

AR asked that the committee review the draft Section 5 that was provided by Pat and get comments to him by 7/11.

ADA considerations – JH and AC will work on this part. The group identified the parcels that should be evaluated and they include:

Belding Park
Arnold Brewers Park
Stroheker Rd (stone bridge)

Town Hall and Parking lot
Properties around the ball field on Bronson Ave. and Buckland Rd.
Town Common

Inventory Map – AR unrolled the map that reflects the Section 5 lands that was prepared by FRCOG from the table that NG and BM prepared. Committee members identified some corrections with just a casual glance. NG and BM will take in corrections to the table and deliver them to FRCOG. MB thought that the map should have a narrative to help understand the status of land protection and working land in the town. Other suggestions included overlays of the trails, waters/wetlands, Native American information, soils, etc. The map can be used to identify gaps in protection, as well as threats to the landscape. AY commented that protection does not need to be the ultimate goal of an open space plan, as this diminishes the tax base. There was consensus on this point, but there are other ways to encourage open space benefits without permanent protection.

There were other technical considerations concerning the cartography of the map. Permanent protection should be identified as to CR or APR, maybe not with different colors, but with different patterns. AY noted that some of the lands that are private are combined with town lands on the legend, which is misleading.

Action Steps –

- Section 5 comments to AR by 7/11
- Finalize Section 3 – AR and MB, soon, and distribute to the committee
- Mapping corrections – BM and NG
- Map with additional overlays – ask Pat to have for next meeting (7/18/2017)
- Acquire shape files for Ashfield Trails – NG to ask her husband, Phil Pless may also have (should snowmobile trails be included?)
- Next meeting – 7/18/2017 at 7:00 pm

Next Meeting: July 18th, 7PM

Respectfully Submitted,
Barbara Miller

Pat's email of 6/27/2017:

Folks,

I just finished meeting with Alan in preparation for tonight's Ashfield OSRP Update Committee meeting. I apologize that I am unable to attend tonight's meeting, as I have been appointed to an Elementary School Building Committee in my own Town of Orange that is having its first meeting tonight.

I am attaching for your information the following documents related to the draft *Section 5: Inventory of Lands of Conservation and Recreation Interest*:

- Word document of First Draft of Section 5 dated 6-27-17 with updated text and tables inserted (Alan has hard copies to distribute tonight)

- Copy of Section 5 from 2008 OSRP for comparison (PDF) (Alan has hard copies to distribute tonight)

- Revised copy of master property list (version 2_PAS) including some new tabs that I created

- New working Excel version of Table 5-4 that I created

- New working Excel version of Table 5-6

I want to thank everyone who worked on pulling together the property data for this section, particularly Barb and Nancy. It was incredible to have all the information in one master Excel file to work with. Great job! Because so much work was done on updating the information and there have been so many new parcels protected since 2008, I did not go back to review the specific data included in the 2008 tables.

Alan also has a revised large-scale working Open Space map based on the new data. I should note that Ryan created the working map based on the first master property list, before the version 2 arrived in my inbox, so there may be some anomalies that result from that. Please feel free to mark up the map and note any corrections, additions, etc.

Here are a couple of notes on the draft that may help you to figure out what I did in creating this draft, since I cannot be there to respond to questions (I have highlighted areas in yellow that I would particularly appreciate your input on):

- Table 5-1 (p. 5-5) has changed in the way that some of the categories are organized and the numbers and percentages have been adjusted both here and in the feeder tables.

- I have added subtotals on all the tables where I thought they would be helpful (e.g., Chapter lands on Table 5-1 and specific state agencies on Table 5-2).

- Table 5-4: Privately-Owned Land Permanently Protected from Development in Ashfield has been re-organized so that it breaks out Conservation Organizations, Other Private Organizations, CRs, and APRs.

- Table 5-6 (Chapter 61, 61A and 61B Lands) has been revised to add property owner data. The sample tables that I sent out had not included that column, but I thought it would be helpful.

- The data in the tables are currently organized alphabetically by Owner Name. Another approach would to put them in numeric order based on the Assessor's Map/Lot ID numbers. We can make the change fairly easily if the Committee feels strongly that it would be better to do it differently.

I look forward to hearing back from you all with comments and suggestions on how to improve this first draft of Section 5. Please note that there are several tables that require significant Committee input to identify key characteristics of State and Town-owned parcels:

- Table 5-2: State-Owned Land Managed by State Conservation Agencies in Ashfield

- Table 5-3: Town-Owned Land Permanently Protected from Development in Ashfield

- Table 5-5: Town-Owned Parcels of Land with Limited Protection from Development

Also, S*ection D. Inventory of Recreational Resources* (p. 5-25) would benefit from the addition of more details and a review of information inserted from the 2008 Plan that may be outdated or incorrect.

I will look forward to meeting with you all later this summer, perhaps in mid- to late August, depending on everyone's schedules. I will be working on preparing the following materials for you to review at that time:

- First Draft Section 6: Community Goals

- First Draft Section 7: Analysis of Needs

- First Draft Section 8: Goals and Objectives

- Second Draft Section 5

- Revised maps

I will be in the office tomorrow and Thursday if any questions come up tonight that I help with.

Hope everyone has a wonderful 4th of July!

Thanks,

Patricia A. Smith

Senior Land Use Planner

Event: Open Space & Recreation Plan Update Committee Meeting

When: Tue, Jul 18 2017 07:00 pm

Where: Ashfield Town Hall,412 Main Street,Ashfield MA 01330

Status:

Agenda:

1. **Open the Meeting (Chair)**
2. **Review and approval of minutes from previous meeting(s)**
3. **Review of Section 5/open space mapping**
4. **Review of other mapping, as available**
5. **Update on ADA requirements section**
6. **Update on finalization of Section 3**
7. **Revisit budget/FRCOG contributions moving forward**
8. **Upcoming meeting(s)/timeline**
9. **Items not reasonably anticipated by the chair 48 hours in advance of the meeting**
10. **Adjourn the Meeting**

Ashfield Open Space and Recreation Planning Committee
MEETING
July 18, 2017
Sign-in Sheet

Please Print Clearly

Name	Affiliation	Mailing Address/ Email	Phone Number
K. Warren	Town Administrator	townadmin@ashfield.org	628-4441 x7
Judy Haupt	Park Commission	judy@southfacefarm.com	628-3268
Mollie Babizg	ZBA	mollie.babizg@gmail.com	625-6005
Anne Capra	Conservation Commission	annecapra447@gmail.com	628-4546, 625-6234
Nancy Garvin	Ag Comm	nancy.garvin@sfaa.net	
Alan Rice	PLANNING BOARD	RICEPIPER@VERIZON.NET	628-463
Anne Guryan	ZBA + CoA		628-3322
PAT SMITH	FRCOG		
Duncan Colter	B.O. Health		628-3326

Event: Open Space & Recreation Plan Update Committee Meeting

When: Thursday, October 19 2017 07:00 pm

Where: Ashfield Town Hall,412 Main Street,Ashfield MA 01330

Status:

Agenda:

1. **Open the Meeting (Chair)**
2. **Review and approval of minutes from previous meeting(s)**
3. **Final Review of Section 5/open space mapping**
4. **Discussion of Sections 6: Community Goals; 7: Analysis of Needs; and 8: Goals and Objectives**
5. **Review of Section 9: 7-Year Action Plan including status updates and proposed new Action Items**
6. **Update on ADA requirements section**
7. **Upcoming meeting(s)/timeline, including planning for Public Forum**
8. **Items not reasonably anticipated by the chair 48 hours in advance of the meeting**
9. **Adjourn the Meeting**

Ashfield Open Space and Recreation Planning Committee
MEETING
October 19, 2017
Sign-in Sheet

Please Print Clearly

Name	Affiliation	Mailing Address/ Email	Phone Number
ALAN RICE	PLANNING BOARD	RICEPIPER@VERIZON.NET	628-4613
Nancy GARVIN	AHS	nancy.garvin@starnet	625-6234
Barbara Miller	Ag Com	kbbpmiller@yahoo.com	628-4596
Judy Haight	PARKS	judy@southfacefarm.com	628-3268
PAT SMITH	FINCOM		
ANNE YURYAN	ZBA + CoA		628-3222
Duncan Colten	BOH		628-3326

APPENDIX F:
ADA Self-Evaluation And Transition Plan

TOWN OF ASHFIELD

OFFICE OF THE SELECT BOARD

412 Main Street
PO Box 560
Ashfield, MA 01330
Phone: 413-628-4441 x7
Fax: 413-628-0228
selectboard@ashfield.org

Select Board Policy: 17-01

Date Adopted: 08-21-2017

DISABILITY DISCRIMINATION GRIEVANCE POLICY

It is the policy of the Town of Ashfield not to discriminate on the basis of disability. This Grievance Procedure has been established to meet the requirements of the American with Disabilities Act of 1990 (ADA). It may be used by anyone who wishes to file a complaint alleging discrimination on the basis of disability in the provision of services, activities, programs, or benefits by the Town of Ashfield. The Ashfield Personnel Policy governs employment-related complaints of disability discrimination. Every opportunity will be made available to receive citizen comments, complaints, and to resolve grievances or inquiries.

Complaints should be submitted by the grievant and/or his/her designee as soon as possible, but no later than sixty (60) calendar days after the alleged violation to:

ADA Coordinator

412 Main Street

P.O. Box 560

Ashfield MA 01330

Telephone: 413-628-4441 ext. 7

Email: townadmin@ashfield.org

Office Hours: Monday-Thursday, 9:00 am to 4:00 pm, Fridays by Appointment

STEP 1

The Town ADA Coordinator will be available to meet with citizens and employees during regular business hours to receive complaints. The ADA Coordinator is responsible for coordinating the efforts of the Town of Ashfield to comply and investigate any complaints.

When a complaint, grievance, request for program policy interpretation, or clarification is received either in writing, through a meeting, or telephone call, a record will be created which shall include the name, address, telephone number of the person complainant and the nature of their request or complaint. Anonymous complaints or requests for information will be accepted and a record created with available information.

If the person, making the complaint or request for information is identified, the complaint, grievance, request for program policy interpretation, or clarification will be responded to within fifteen (15)

calendar days in a format that is sensitive to the needs of the recipient (i.e. verbally, enlarge type, etc.). There will be an automatic extension of fifteen (15) calendar days if the ADA Coordinator is on vacation, out of the office, or for other reasonable cause. The written response from the ADA Coordinator will include position of the Town of Ashfield and substantive resolution of the complaint.

If the grievance is not resolved at this level, it will progress to Step 2.

STEP 2

If the grievance is not resolved in Step 1, then a written grievance will be submitted to the ADA coordinator. Assistance in writing the grievance will be available if requested. All written grievances will be responded to within fifteen (15) calendar days by the ADA Coordinator in a format that is sensitive to the needs of the recipient. There will be an automatic extension of fifteen (15) calendar days if the ADA Coordinator is on vacation, out of the office, or for other reasonable cause.

If the grievance is not resolved at this level, it will progress to Step 3.

STEP 3

If the grievance is not satisfactorily resolved in Step 2, complainants will have the opportunity to appeal to the Select Board, pursuant to the provisions of the Open Meeting Law. The Select Board shall issue a written decision to the complainant, and others as qualified by the law, no later than fifteen (15) calendar days after the meeting.

Decisions of the Select Board will be final. Appeals may be made to the Massachusetts Commission Against Discrimination (MCAD) and/or Equal Employment Opportunity Commission (EEOC). All written complaints received by the ADA Coordinator, appeals to the Selectboard and responses, will be held by the Town of Ashfield for a period of at least three years.

Massachusetts Commission Against Discrimination (MCAD)

436 Dwight Street, Suite 220

Springfield MA 01103-1317

Telephone: 413-739-2145

Equal Employment Opportunity Commission (EEOC)

475 J.F.K Federal Building

Government Center

Boston MA 02203-0506

Telephone: 617-565-3200

TOWN OF ASHFIELD

OFFICE OF THE SELECT BOARD

412 Main Street
PO Box 560
Ashfield, MA 01330
Phone: 413-628-4441 x7
Fax: 413-628-0228
selectboard@ashfield.org

July 31, 2017

Re: Appointment of Americans with Disabilities Act Coordinator

At a meeting held on Monday, July 31, 2017, the Select Board completed the following vote:

> Select Board Member Coler made a motion to appoint Kayce D. Warren, Town Administrator, as the Town of Ashfield Americans with Disabilities Act Coordinator, motion seconded by Select Board Member Olanyk. VOTE (2-0-0), unanimous.

A True Attestation of Vote

Bridget S. Rodrigue

Bridget S. Rodrigue, Town Clerk

Thank you very much for your consideration. If you have any further question, please don't hesitate to contact me either by telephone or via email at townadmin@ashfield.org.

Sincerely,

Kayce D. Warren
Interim Town Administrator

ADA Self-Evaluation Report
Town of Ashfield - Open Space and Recreation Plan
June 30, 2017

Table of Contents

Section 1 Transition Plan

Section 2 Facility Inventories
- Belding Memorial Park – Lower
- Belding Memorial Park – Upper
- Brewer Tatro Memorial Woods
- Stroheker Road Trailhead
- Town Common
- Town Hall
- 44 Buckland Road and Bronson Avenue Parking Lot

Section 3 Administrative Policies

Section 1: Transition Plan

On June 29 and 30, 2017, Anne Capra (Conservation Commission) and Judy Haupt (Parks Commission) assessed town-owned parks and recreation facilities for Americans with Disability Act (ADA) compliance, and Naomi Clark (representative from the disabled community) provided review of the plan and recommendations. In addition to the facilities inventoried in this plan, other private or publicly owned recreation facilities exist in town that are not included in this survey because they are not under the care and control of the Town of Ashfield.

The following plan provides a summary of each of the town-owned recreation and conservation areas, recommended actions for improving accessibility, and a Facility Inventory Worksheet with a detailed assessment of each of the features present and comments regarding the accessibility of the feature.

Belding Memorial Park – Lower
Buckland Road

Entrance to Town Beach

Existing Conditions:
Belding Memorial Park is a 12.5-acre parcel that wraps around the southeast corner of Ashfield Lake, including frontage on Main Street and Buckland Road. Upper Park is accessed from Main Street; Lower Park is accessed from Buckland Road. A park master plan was completed in 2010 by Dodson and Flinker Associates, however much of the plan has not been implemented.

Lower Belding Memorial Park is on the east end of Ashfield Lake and consists of two parking lot, the town beach with a floating dock for swimmers, bathrooms and changing rooms, grassy field and picnic area, tennis courts, swings, and a gravel surface trail along the eastern lake shoreline, across the outlet stream, connecting to Upper Park. The picnic area, beach, tennis courts and trail are not handicapped accessible. The bathrooms and parking lot do have accessible features, as noted in the attached worksheet. It is possible for a vehicle to drive across the grassy field up to the picnic area at the top of the hill, although this access is not posted or promoted. It is possible to drive to the "kiddie pool" area to access the water.

Recommendations for Improved Accessibility:

1. Install grab bars in the handicap bathroom stall in the men's and women's bathrooms.
2. Position trash/recycle containers so there is no impediment to bathrooms.
3. Consider purchase of a floating beach wheelchair to provide access across the soft beach sand into the water. (e.g. Mobi Chair www.mobi-chair.com)
4. Consider installation of a removable beach access mat to provide a hard surfaced path across soft sand (e.g. AccessMat www.accessrec.com/ada-access-mats)
5. Designate handicapped parking spot in front of tennis courts, and install sign.
6. Provide accessible gate entrance to tennis courts including accessible path from parking lots and gate lever that can be opened with a closed fist.

Schedule: 2018-2024

Responsible Entity: Parks Commission

Soft sand on beach approach to water and floating dock at Town Beach

Grassed approach to tennis courts from Buckland Road, and double 10' swing gates with chain and carabeener lock (with broom!)

Grill facility on top of hill at picnic area.

Steps from picnic area on top of hill to beach.

Entrance to men's bathroom. Trash and recycling receptacles obstructing clear path.

Entrance to women's bathroom and water fountain.

Facility Inventory **LOCATION:** Belding Memorial Park - Lower Buckland Road, Ashfield, MA

ACTIVITY	EQUIPMENT	NOTES
Picnic Facilities Not accessible; see comments below.	Tables & Benches	Located adjacent to accessible paths Access to Open Spaces Back and Arm Rests Adequate number
	Grills	Height of Cooking Surface Located adjacent to accessible paths
	Trash Cans	Located adjacent to accessible paths
	Picnic Shelters	Located adjacent to accessible paths Located near accessible water fountains, trash can, restroom, parking, etc.
Trails Not accessible		Surface material Dimensions Rails Signage (for visually impaired)
Swimming Facilities	Pools N/A	Entrance Location from accessible parking Safety features i.e. warning for visually impaired
	Beaches Soft sand from parking lot to water. Swimming dock non-slip surface and ladder has two railings	Location from accessible path into water Handrails Location from accessible parking Shade provided
Play Areas (tot lots) Not accessible	All Play Equipment i.e. swings, slides	Same experience provided to all
	Access Routes	Located adjacent to accessible paths Enough space between equipment for wheelchair
Game Areas: *tennis	Access Routes	Located adjacent to accessible paths Berm cuts onto courts
	Equipment	Height Dimensions Spectator Seating
Boat Docks N/A	Access Routes	Located adjacent to accessible paths Handrails
Fishing Facilities N/A - people fish off the dam and shore; approach not accessible	Access Routes	Located adjacent to accessible paths Handrails
	Equipment	Arm Rests Bait Shelves Handrails Fish Cleaning Tables
Programming	Are special programs at your facilities accessible?	Learn-to-Swim Guided Hikes Interpretive Programs
Services and Technical Assistance	Information available in alternative formats i.e. for visually impaired	No
	Process to request interpretive services (i.e. sign language interpreter) for meetings	No

Picnic area at top of hill. Grassed access road, not accessible by wheelchair.

No; picnic table open ended for wheelchair

gravel, greater than 3/8" minus in some places, dirt in others. No ramp to bridge at dam, and 12: lip.

Approach is grass; single door not accessible; double 10' swing gate with chain and carabeener lock.

Approach to water not accessible. Ladder on dock has two railings.

Lower Belding Memorial Park is on the west end of Ashfield Lake and consists of the town beach with a floating dock for swimmers, bathrooms and changing rooms, grassy field and picnic area, tennis courts, playground, and gravel surface trail connecting to Upper Park on the west end of the lake.

The picnic area, beach, tennis courts, and trail are not handicapped accessible. The bathrooms and parking lot do have accessible features, described under the respective sections below.

LOCATION Belding Memorial Park - Lower

PARKING			
Total Spaces		*Required Accessible Spaces*	
Up to 25		1 space X	
26-50		2 spaces	
51-75		3 spaces	
76-100		4 spaces	
101-150		5 spaces	
151-200		6 spaces	
201-300		7 spaces	
301-400		8 spaces	
401-500		9 spaces	
Specification for Accessible Spaces	*Yes*	*No*	*Comments/Transition Notes*
Accessible space located closest to accessible entrance			No Accessible entrances
Where spaces cannot be located within 200 ft of accessible entrance, drop-off area is provided within 100 ft.			N/A
Minimum width of 13 ft includes 8 ft space plus 5 ft access aisle	X		
Van space – minimum of 1 van space for every accessible space, 8 ft wide plus 8 ft aisle. Alternative is to make all accessible spaces 11 ft wide with 5 ft aisle.	X		The one accessible space would accommodate a van. One signed space at entrance to beach.
Sign with international symbol of accessibility at each space or pair of spaces	X		
Sign minimum 5 ft, maximum 8 ft to top of sign		X	
Surface evenly paved or hard-packed (no cracks)		X	Hard-packed gravel/dirt parking lot; generally level but subject to ponding
Surface slope less than 1:20, 5%	X		water in spots.
Curbcut to pathway from parking lot at each space or pair of spaces, if sidewalk (curb) is present			N/A
Curbcut is a minimum width of 3 ft, excluding sloped sides, has sloped sides, all slopes not to exceed 1:12, and textured or painted yellow			N/A
RAMPS			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Slope Maximum 1:12			No ramps / N/A
Minimum width 4 ft between handrails			
Handrails on both sides if ramp is longer than 6 ft			
Handrails at 34" and 19" from ramp surface			
Handrails extend 12" beyond top and bottom			
Handgrip oval or round			
Handgrip smooth surface			
Handgrip diameter between 1¼" and 2"			
Clearance of 1½" between wall and wall rail			
Non-slip surface			
Level platforms (4ft x 4 ft) at every 30 ft, at top, at bottom, at change of direction			

LOCATION Belding Memorial Park - Lower

SITE ACCESS, PATH OF TRAVEL, ENTRANCES			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Site Access			
Accessible path of travel from passenger disembarking area and parking area to accessible entrance			See previous comments.
Disembarking area at accessible entrance			
Surface evenly paved or hard-packed			
No ponding of water			
Path of Travel			
Path does not require the use of stairs			See previous comments.
Path is stable, firm and s lip resistant			
3 ft wide minimum			
Slope maximum 1:20 (5%) and maximum cross pitch is 2% (1:50).			
Continuous common surface, no changes in level greater than ½ inch			
Any objects protruding onto the pathway must be detected by a person with a visual disability using a cane			
Objects protruding more than 4" from the wall must be within 27" of the ground, or higher than 80"			
Curb on the pathway must have curb cuts at drives, parking and drop-offs			
Entrances			
Primary public entrances accessible to person using wheelchair, must be signed, gotten to independently, and *not* be the service entrance			The public restroom is the only building on the facility. See ~~restrooms for accessibility~~ assessment.
Level space extending 5 ft. from the door, interior and exterior of entrance doors			
Minimum 32" clear width opening (i.e. 36" door with standard hinge)			
At least 18" clear floor area on latch, pull side of door			
Door handle no higher than 48" and operable with a closed fist			
Vestibule is 4 ft plus the width of the door swinging into the space			
Entrance(s) on a level that makes elevators accessible			
Door mats less than ½" thick are securely fastened			
Door mats more than ½" thick are recessed			
Grates in path of travel have openings of ½" maximum			
Signs at non-accessible entrance(s) indicate direction to accessible entrance			
Emergency egress – alarms with flashing lights and audible signals, sufficiently lighted			

LOCATION Belding Memorial Park - Lower

STAIRS and DOORS			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Stairs Cement stairs, no handrails from grassed picnic area on top of hill to beach - not accessible.			
No open risers			
Nosings not projecting			
Treads no less than 11" wide			
Handrails on both sides			
Handrails 34"-38" above tread			
Handrail extends a minimum of 1 ft beyond top and bottom riser (if no safety hazard and space permits)			
Handgrip oval or round			
Handgrip has a smooth surface			
Handgrip diameter between 1¼" and 1½"			
1½" clearance between wall and handrail			
Doors Only doors are to restroom facility.			
Minimum 32" clear opening	X		
At least 18" clear floor space on pull side of door	X		
Closing speed minimum 3 seconds to within 3" of the latch	X		
Maximum pressure 5 pounds interior doors	X		
Threshold maximum ½" high, beveled on both sides	X		
Hardware operable with a closed fist (no conventional door knobs or thumb latch devices)		X	
Hardware minimum 36", maximum 48" above the floor	X		
Clear, level floor space extends out 5 ft from both sides of the door	X		Inside bathroom, not outside.
Door adjacent to revolving door is accessible and unlocked			N/A
Doors opening into hazardous area have hardware that is knurled or roughened			N/A

LOCATION Belding Memorial Park - Lower

RESTROOMS – also see Doors and Vestibules			
Specification	*Yes*	*No*	*Comments/Transition Notes*
5 ft turning space measured 12" from the floor	X		
At least one Sink:			
Clear floor space of 30" by 48" to allow a forward approach	X		
Mounted without pedestal or legs, height 34" to top of rim	X		Two sinks - lower sink is 26" from floor; higher sink is 35" from floor.
Extends at least 22" from the wall	X		
Open knee space a minimum 19" deep, 30" width, and 27" high			Lower sink is 22" wide; higher sink is 33" wide
Cover exposed pipes with insulation		X	
Faucets operable with closed fist (lever or spring activated handle)		X	
At least one Stall: one accessible stall in mens and womens rooms			
Accessible to person using wheelchair at 60" wide by 72" deep	X		
Stall door is 36" wide	X		
Stall door swings out	X		
Stall door is self closing	X		
Stall door has a pull latch	X		
Lock on stall door is operable with a closed fist, and 32" above the floor	X		
Coat hook is 54" high			
Toilet			
18" from center to nearest side wall	X		
42" minimum clear space from center to farthest wall or fixture	X		
Top of seat 17"-19" above the floor	X		
Grab Bars			
On back and side wall closest to toilet		X	
1¼" diameter			
1½" clearance to wall			
Located 30" above and parallel to the floor			
Acid-etched or roughened surface			
42" long			
Fixtures			
Toilet paper dispenser is 24" above floor	X		
One mirror set a maximum 38" to bottom (if tilted, 42")	X		
Dispensers (towel, soap, etc) at least one of each a maximum 42" above the floor	X		

Concrete walkway around bathroom building is 3-4' wide. A trash can is also stored along the pathway making it impassable for someone in a wheelchair (if they could even get to the bathrooms since the approach is soft sand.

LOCATION Belding Memorial Park - Lower

FLOORS, DRINKING FOUNTAINS, TELEPHONES			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Floors N/A			
Non-slip surface			
Carpeting is high-density, low pile, non-absorbent, stretched taut, securely anchored			
Corridor width minimum is 3 ft			
Objects (signs, ceiling lights, fixtures) can only protrude 4" into the path of travel from a height of 27" to 80" above the floor			
Drinking Fountains			
Spouts no higher than 36" from floor to outlet		X	
Hand operated push button or level controls		X	
Spouts located near front with stream of water as parallel to front as possible		X	
If recessed, recess a minimum 30" width, and no deeper than depth of fountain		X	
If no clear knee space underneath, clear floor space 30" x 48" to allow parallel approach		X	
Telephones No public telephones			
Highest operating part a maximum 54" above the floor			
Access within 12" of phone, 30" high by 30" wide			
Adjustable volume control on headset so identified			
SIGNS, SIGNALS, AND SWITCHES			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Switches, Controls and Signs No electricity, no switches, no fire alarms, no public accessible outlets			
Switches and controls for light, heat, ventilation, windows, fire alarms, thermostats, etc, must be a minimum of 36" and a maximum of 48" above the floor for a forward reach, a maximum of 54" for a side reach	X		
Electrical outlets centered no lower than 18" above the floor			
Warning signals must be visual as well as audible			Not tested
Signs Bathrooms are not signed as accessible.			
Mounting height must be 60" to centerline of the sign			
Within 18" of door jamb or recessed			
Letters and numbers a t least 1¼" high			
Letters and numbers raised .03"			
Letters and numbers contrast with the background color			

Belding Memorial Park - Lower

LOCATION

SWIMMING POOLS – accessibility can be via ramp, lifting device, or transfer area			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Ramp at least 34" wide with a non-slip surface extending into the shallow end, slope not exceeding 1:6 with handrails on both sides			N/A
Lifting device			
Transfer area 18" above the path of travel and a minimum of 18" wide			
Unobstructed path of travel not less than 48" wide around pool			
Non-slip surface			

LOCATION

SHOWER ROOMS - Showers must accommodate both wheel-in and transfer use			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Stalls 36" by 60" minimum, with a 36" door opening			
Floors are pitched to drain the stall at the corner farthest from entrance			N/A
Floors are non-slip surface			
Controls operate by a single lever with a pressure balance mixing valve			
Controls are located on the center wall adjacent to the hinged seat			
Shower heads attached to a flexible metal hose			
Shower heads attached to wall mounting adjustable from 42" to 72" above the floor			
Seat is hinged and padded and at least 16" deep, folds upward, securely attached to side wall, height is 18" to the top of the seat, and at least 24" long			
Soap trays without handhold features unless they can support 250 pounds			
2 grab bars are provided, one 30" and one 48" long, or one continuous L shaped bar			
Grab bars are placed horizontally at 36" above the floor line			

LOCATION

PICNICKING			
Specification	*Yes*	*No*	*Comments/Transition Notes*
A minimum of 5% of the total tables must be accessible with clear space under the table top not less than 30" wide and 19" deep per seating space and not less than 27" clear from the ground to the underside of the table. An additional 29" clear space (totaling 48") must extend beyond the 19" clear space under the table to provide access			Not accessible - on top of grassed hill. Grassed driveway to the site.
For tables without toe clearance, the knee space under the table must be at least 28" high, 30" wide and 24" deep.			
Top of table no higher than 32" above ground			
Surface of the clear ground space under and around the table must be stable, firma nd slip-resistant, and evenly graded with a maximum slope of 2% in all directions			
Accessible tables, grills and fire rings must have clear ground space of at least 36" around the perimeter			

Belding Memorial Park – Upper
Main Street

Accessible picnic area at Upper Park

Existing Conditions:
Access to Upper Park is from Main Street at a large dirt parking lot. There is one signed handicapped parking spot next to a concrete walkway and picnic area that accommodates wheelchairs. No other areas/facilities at the park are ADA accessible. A gravel access road to the boat launch does exist, however there is no level pad for a wheelchair, or accessible dock at the water's edge.

Recommendations for Improved Accessibility:

1. Develop an accessible boat launch and dock at Ashfield Lake.
2. Develop an accessible viewing area. Vista pruning of the forested lake edge will be performed in 2017. A mowed lawn abuts this area, and is currently not accessible.

Schedule: 2018-2024

Responsible Entity: Parks Commission

Gravel access road to boat launch

Grassed walkway to lake

Facility Inventory **LOCATION:** Belding Memorial Park - Upper Main Street, Ashfield, MA

ACTIVITY	EQUIPMENT	NOTES
Picnic Facilities	Tables & Benches	Located adjacent to accessible paths YES
		Access to Open Spaces YES
		Back and Arm Rests NO - back only
		Adequate number YES
	Grills	Height of Cooking Surface 17"
		Located adjacent to accessible paths YES
	Trash Cans	Located adjacent to accessible paths NO
	Picnic Shelters	Located adjacent to accessible paths N/A
		Located near accessible water fountains, trash can, restroom, parking, etc. N/A
Trails	Not accessible	Surface material grass/gravel
		Dimensions
		Rails
		Signage (for visually impaired)
Swimming Facilities N/A	Pools	Entrance
		Location from accessible parking
		Safety features i.e. warning for visually impaired
	Beaches	Location from accessible path into water
		Handrails
		Location from accessible parking
		Shade provided
Play Areas (tot lots) N/A	All Play Equipment i.e. swings, slides	Same experience provided to all
	Access Routes	Located adjacent to accessible paths
		Enough space between equipment for wheelchair
Game Areas: N/A *ballfield *basketball *tennis	Access Routes	Located adjacent to accessible paths
		Berm cuts onto courts
	Equipment	Height
		Dimensions
		Spectator Seating
Boat Docks N/A	Access Routes	Located adjacent to accessible paths
		Handrails
Fishing Facilities	Access Routes	Located adjacent to accessible paths Fishing is allowed from the shore and on the pond. Access to these areas is not accessible. A ~~compacted aggregate driveway exists to the~~ current boat launch, ~~however there is no~~ access pad for a wheelchair.
		Handrails
	Equipment	Arm Rests
		Bait Shelves
		Handrails
		Fish Cleaning Tables
Programming N/A	Are special programs at your facilities accessible?	Learn-to-Swim
		Guided Hikes
		Interpretive Programs
Services and Technical Assistance	Information available in alternative formats i.e. for visually impaired	
	Process to request interpretive services (i.e. sign language interpreter) for meetings	

Belding Memorial Park consists of the Upper Park on Main Street on the south side of the lake, and Lower Park on the east end of the lake, including the town beach and tennis courts. The Lower Park has been assessed separately. The park is managed by the Parks Commission.

Upper Park is a large open field overlooking Ashfield Lake. Trails and wide mowed paths provide access by foot to the lake in several areas. A dry oak forest provides a woodland buffer between the mowed park fields and the lake. A section of the woodland buffer is scheduled for vista pruning in 2017 to provide more open views of the lake from within the park.

LOCATION Belding Memorial Park - Upper

PARKING			
Total Spaces		*Required Accessible Spaces*	
Up to 25		1 space X	
26-50		2 spaces	
51-75		3 spaces	
76-100		4 spaces	
101-150		5 spaces	
151-200		6 spaces	
201-300		7 spaces	
301-400		8 spaces	
401-500		9 spaces	
Specification for Accessible Spaces	*Yes*	*No*	*Comments/Transition Notes*
Accessible space located closest to accessible entrance	X		There is a large gravel lot adjacent to Route 116. A spot closest to the concrete walkway leading to the accessible picnic table and grill is signed for handicapped parking.
Where spaces cannot be located within 200 ft of accessible entrance, drop-off area is provided within 100 ft.			
Minimum width of 13 ft includes 8 ft space plus 5 ft access aisle	X		
Van space – minimum of 1 van space for every accessible space, 8 ft wide plus 8 ft aisle. Alternative is to make all accessible spaces 11 ft wide with 5 ft aisle.	X		
Sign with international symbol of accessibility at each space or pair of spaces	X		
Sign minimum 5 ft, maximum 8 ft to top of sign	X		
Surface evenly paved or hard-packed (no cracks)		X	
Surface slope less than 1:20, 5%	X		
Curbcut to pathway from parking lot at each space or pair of spaces, if sidewalk (curb) is present			N/A
Curbcut is a minimum width of 3 ft, excluding sloped sides, has sloped sides, all slopes not to exceed 1:12, and textured or painted yellow			N/A
RAMPS			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Slope Maximum 1:12			N/A
Minimum width 4 ft between handrails			
Handrails on both sides if ramp is longer than 6 ft			
Handrails at 34" and 19" from ramp surface			
Handrails extend 12" beyond top and bottom			
Handgrip oval or round			
Handgrip smooth surface			
Handgrip diameter between 1¼" and 2"			
Clearance of 1½" between wall and wall rail			
Non-slip surface			
Level platforms (4ft x 4 ft) at every 30 ft, at top, at bottom, at change of direction			

Brewer Tatro Memorial Woods
Hawley Road

Sign on Hawley Road at parking area

Existing Conditions:
The Brewer Tatro Memorial Woods is under the care and control of the Conservation Commission, and was donated to the town in 1977 by Esther D. and Phillip H. Steinmetz. This property is hilly and forested without any trails or other recreational facilities. The local Girl Scouts troop has expressed interest in developing a trail here in the near future.

Non-accessible parking is available at the pullout on the north side of Hawley Road. This area is maintained through the courtesy of The Trustees of Reservations as it also provides parking for their Bear Swamp Reservation located to the south and west.

Recommendations for Improved Accessibility:
Due to the hilly landscape, this site may not be appropriate for the development of ADA compliant accessible facilities.

Schedule: N/A

Responsible Entity: Conservation Commission


Parking area on Hawley Road, across the street from entrance to Bear Swamp Reservation


Large vernal pool adjacent to parking area on Hawley Road

Facility Inventory **LOCATION:** Brewer Tatro Memorial Woods
Hawley Road, Ashfield, MA

ACTIVITY	EQUIPMENT	NOTES
Picnic Facilities N/A	Tables & Benches	Located adjacent to accessible paths
		Access to Open Spaces
		Back and Arm Rests
		Adequate number
	Grills	Height of Cooking Surface
		Located adjacent to accessible paths
	Trash Cans	Located adjacent to accessible paths
	Picnic Shelters	Located adjacent to accessible paths
		Located near accessible water fountains, trash can, restroom, parking, etc.
Trails N/A		Surface material
		Dimensions
		Rails
		Signage (for visually impaired)
Swimming Facilities N/A	Pools	Entrance
		Location from accessible parking
		Safety features i.e. warning for visually impaired
	Beaches	Location from accessible path into water
		Handrails
		Location from accessible parking
		Shade provided
Play Areas (tot lots) N/A	All Play Equipment i.e. swings, slides	Same experience provided to all
	Access Routes	Located adjacent to accessible paths
		Enough space between equipment for wheelchair
Game Areas: N/A *ballfield *basketball *tennis	Access Routes	Located adjacent to accessible paths
		Berm cuts onto courts
	Equipment	Height
		Dimensions
		Spectator Seating
Boat Docks N/A	Access Routes	Located adjacent to accessible paths
		Handrails
Fishing Facilities N/A	Access Routes	Located adjacent to accessible paths
		Handrails
	Equipment	Arm Rests
		Bait Shelves
		Handrails
		Fish Cleaning Tables
Programming N/A	Are special programs at your facilities accessible?	Learn-to-Swim
		Guided Hikes
		Interpretive Programs
Services and Technical Assistance N/A	Information available in alternative formats i.e. for visually impaired	
	Process to request interpretive services (i.e. sign language interpreter) for meetings	

NOTE: The Brewer Tatro Memorial Woods is under the care and control of the Conservation Commission, and was donated to the town in 1977 by Esther D. and Phillip H. Steinmetz. This property currently functions as forested open space. There are no recreational facilities, including trails, at this site. The local Girl Scouts troop has expressed interest in developing a trail here in the near future.

Non-ADA accessible parking is available at a pullout on the side of the road, maintained by The Trustees of Reservations, which also provides parking for their Bear Swamp Reservation, located to the south and west of the Brewer Tatro property.

Stroheker Road Trailhead
Stroheker Road

Existing Conditions:
The trailhead to the Stroheker Road – TTOR Overlook Trail is located on a small parcel of town owned land at the intersection of Stroheker Road and Route 112. There are no facilities at this location other than a kiosk. Non-accessible parking is available on the east side of Route 112 in a grassy area at the mile 35.0 sign.

Recommendations for Improved Accessibility:
This is a single track trail, traversing a steep, forested landscape. It is not appropriate for accessibility improvements. Only the trailhead is on town-owned property. The remainder of the trail crosses private property through the permission of landowners.

Schedule: N/A

Responsible Entity: Ashfield Trails Committee

Trailhead kiosk

Stroheker Road street sign at Route 112. Trailhead to Ashfield Mountain trail on east side of Route 112, across the street from the kiosk.

Stroheker Road trailhead

Facility Inventory **LOCATION:** Stroheker Road Trailhead
Stroheker Road, Ashfield, MA

ACTIVITY	EQUIPMENT	NOTES
Picnic Facilities N/A	Tables & Benches	Located adjacent to accessible paths
		Access to Open Spaces
		Back and Arm Rests
		Adequate number
	Grills	Height of Cooking Surface
		Located adjacent to accessible paths
	Trash Cans	Located adjacent to accessible paths
	Picnic Shelters	Located adjacent to accessible paths
		Located near accessible water fountains, trash can, restroom, parking, etc.
Trails N/A		Surface material
		Dimensions
		Rails
		Signage (for visually impaired)
Swimming Facilities N/A	Pools	Entrance
		Location from accessible parking
		Safety features i.e. warning for visually impaired
	Beaches	Location from accessible path into water
		Handrails
		Location from accessible parking
		Shade provided
Play Areas (tot lots) N/A	All Play Equipment i.e. swings, slides	Same experience provided to all
	Access Routes	Located adjacent to accessible paths
		Enough space between equipment for wheelchair
Game Areas: N/A *ballfield *basketball *tennis	Access Routes	Located adjacent to accessible paths
		Berm cuts onto courts
	Equipment	Height
		Dimensions
		Spectator Seating
Boat Docks N/A	Access Routes	Located adjacent to accessible paths
		Handrails
Fishing Facilities N/A	Access Routes	Located adjacent to accessible paths
		Handrails
	Equipment	Arm Rests
		Bait Shelves
		Handrails
		Fish Cleaning Tables
Programming N/A	Are special programs at your facilities accessible?	Learn-to-Swim
		Guided Hikes
		Interpretive Programs
Services and Technical Assistance N/A	Information available in alternative formats i.e. for visually impaired	
	Process to request interpretive services (i.e. sign language interpreter) for meetings	

NOTE: The trailhead to the Stroheker Road - TTOR Overlook Trail is located an a small parcel of town owned land at the intersection of Stroheker Road and Route 112. There are no facilities at this location other than a kiosk. Non-ADA accessible parking is available on the east side of Route 112 in grassy area at mile 35.0 sign.

Town Common
Main Street

Existing Conditions:
The Town Common is located next door to the Fire Station on Main Street, which is also Route 116. This is 4.5 acre parcel consists of 1.2 acres of mowed lawn with the remainder forested. A paved sidewalk parallels the site along Main Street. Cars also informally parallel park along the road. The property is protected from development by a Conservation Restriction, and therefore, no "facilities" are located at this location. Town sponsored events occur here throughout the year. Additional parking is available across the street at the First Congregational Church, however this is not town-owned parking.

Curb cut at crosswalk across Main Street / Route 116 to sidewalk adjacent to Town Common lawn

Parking at the First Congregational Church consists of two handicapped accessible parking spots: 1) at the front of the building at the top of the driveway at Main Street; and, 2) east of the church at the rear door. The spot at the top of the driveway is next to a concrete sidewalk and approximately 30' from a crosswalk with curb cuts that lead to the Town Common.

Parking spot at First Congregational Church, crosswalk, and curb cuts to sidewalk on both sides of Main Street/Route 116

Recommendations for Improved Accessibility:
Due to the Conservation Restriction's prohibition on new structures, no improvements are recommended for this site.

Schedule: N/A

Responsible Entity: Selectboard

Facility Inventory **LOCATION:** Town Common, Main Street, Ashfield, MA

ACTIVITY	EQUIPMENT	NOTES
Picnic Facilities N/A	Tables & Benches	Located adjacent to accessible paths
		Access to Open Spaces
		Back and Arm Rests
		Adequate number
	Grills	Height of Cooking Surface
		Located adjacent to accessible paths
	Trash Cans	Located adjacent to accessible paths
	Picnic Shelters	Located adjacent to accessible paths
		Located near accessible water fountains, trash can, restroom, parking, etc.
Trails N/A		Surface material
		Dimensions
		Rails
		Signage (for visually impaired)
Swimming Facilities N/A	Pools	Entrance
		Location from accessible parking
		Safety features i.e. warning for visually impaired
	Beaches	Location from accessible path into water
		Handrails
		Location from accessible parking
		Shade provided
Play Areas (tot lots) N/A	All Play Equipment i.e. swings, slides	Same experience provided to all
	Access Routes	Located adjacent to accessible paths
		Enough space between equipment for wheelchair
Game Areas: N/A *ballfield *basketball *tennis	Access Routes	Located adjacent to accessible paths
		Berm cuts onto courts
	Equipment	Height
		Dimensions
		Spectator Seating
Boat Docks N/A	Access Routes	Located adjacent to accessible paths
		Handrails
Fishing Facilities N/A	Access Routes	Located adjacent to accessible paths
		Handrails
	Equipment	Arm Rests
		Bait Shelves
		Handrails
		Fish Cleaning Tables
Programming N/A	Are special programs at your facilities accessible?	Learn-to-Swim
		Guided Hikes
		Interpretive Programs
Services and Technical Assistance N/A	Information available in alternative formats i.e. for visually impaired	
	Process to request interpretive services (i.e. sign language interpreter) for meetings	

NOTE: The Town Common is located next door to the Fire Station. The property is protected from development by a Conservation Restriction, therefore there are no "facilities" at this location. Town sponsored events occur here throughout the year. Parking is available across the street at the First Congregational Church, and assessed as part of this report.

LOCATION Town Common

PARKING SEE COMMENTS			
Total Spaces		*Required Accessible Spaces*	
Up to 25		1 space	
26-50		2 spaces	
51-75		3 spaces	
76-100		4 spaces	
101-150		5 spaces	
151-200		6 spaces	
201-300		7 spaces	
301-400		8 spaces	
401-500		9 spaces	
Specification for Accessible Spaces	*Yes*	*No*	*Comments/Transition Notes*
Accessible space located closest to accessible entrance			There is no designated parking at the Town Common. On street parking is technically illegal along a state highway, and Main Street is also Route 116. The First Congregational Church, located across the street, allows their parking lot to be used for activities on the Common. There are two handicapped accessible parking spots: at the front of the building at the top of the driveway, and behind the church at the rear door. Both spots are signed. The spot at the front of the building is next to a concrete sidewalk, and approximately 30' from a crosswalk with adequate curbcuts.
Where spaces cannot be located within 200 ft of accessible entrance, drop-off area is provided within 100 ft.			
Minimum width of 13 ft includes 8 ft space plus 5 ft access aisle			
Van space – minimum of 1 van space for every accessible space, 8 ft wide plus 8 ft aisle. Alternative is to make all accessible spaces 11 ft wide with 5 ft aisle.			
Sign with international symbol of accessibility at each space or pair of spaces			
Sign minimum 5 ft, maximum 8 ft to top of sign			
Surface evenly paved or hard-packed (no cracks)			
Surface slope less than 1:20, 5%			
Curbcut to pathway from parking lot at each space or pair of spaces, if sidewalk (curb) is present			
Curbcut is a minimum width of 3 ft, excluding sloped sides, has sloped sides, all slopes not to exceed 1:12, and textured or painted yellow			
RAMPS N/A			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Slope Maximum 1:12			
Minimum width 4 ft between handrails			
Handrails on both sides if ramp is longer than 6 ft			
Handrails at 34" and 19" from ramp surface			
Handrails extend 12" beyond top and bottom			
Handgrip oval or round			
Handgrip smooth surface			
Handgrip diameter between 1¼" and 2"			
Clearance of 1½" between wall and wall rail			
Non-slip surface			
Level platforms (4ft x 4 ft) at every 30 ft, at top, at bottom, at change of direction			

LOCATION Town Common

SITE ACCESS, PATH OF TRAVEL, ENTRANCES			SEE COMMENTS
Specification	*Yes*	*No*	*Comments/Transition Notes*
Site Access			
Accessible path of travel from passenger disembarking area and parking area to accessible entrance			See notes above about access from parking across the street at the church, sidewalk and curbcuts. A concrete sidewalk runs along the
Disembarking area at accessible entrance			north side of the Common. There are no curb
Surface evenly paved or hard-packed			cuts or resting spots/pullouts for persons in a wheelchair.
No ponding of water			The entire site is grass and not accessible.
Path of Travel			
Path does not require the use of stairs			
Path is stable, firm and s lip resistant			
3 ft wide minimum			
Slope maximum 1:20 (5%) and maximum cross pitch is 2% (1:50).			
Continuous common surface, no changes in level greater than ½ inch			
Any objects protruding onto the pathway must be detected by a person with a visual disability using a cane			
Objects protruding more than 4" from the wall must be within 27" of the ground, or higher than 80"			
Curb on the pathway must have curb cuts at drives, parking and drop-offs			
Entrances			
Primary public entrances accessible to person using wheelchair, must be signed, gotten to independently, and *not* be the service entrance			
Level space extending 5 ft. from the door, interior and exterior of entrance doors			
Minimum 32" clear width opening (i.e. 36" door with standard hinge)			
At least 18" clear floor area on latch, pull side of door			
Door handle no higher than 48" and operable with a closed fist			
Vestibule is 4 ft plus the width of the door swinging into the space			
Entrance(s) on a level that makes elevators accessible			
Door mats less than ½" thick are securely fastened			
Door mats more than ½" thick are recessed			
Grates in path of travel have openings of ½" maximum			
Signs at non-accessible entrance(s) indicate direction to accessible entrance			
Emergency egress – alarms with flashing lights and audible signals, sufficiently lighted			

Town Hall
412 Main Street

Handicapped parking spot at Town Hall

Existing Conditions:
Town Hall is a historic town-owned building. Community events and occasional recreational events occur here. Thus, the building has been included in the ADA assessment as a town-owned recreation facility.

There is one accessible parking spot in front of Town Hall. The sign is on a removable chain across the front of the spot which also serves as access to the side and back of the Fire Station and Town Hall. The parking space and access path to the building have changes in level measuring ¼ to ½", and there is a ½ to 1" lip between the pavement and the stone path.

A ramp on the west side of the building is recognized as an emergency exit from inside the building. The ramp is not accessible due to a 2" change in level from the pavement to the ramp, and the screw latch on the interior of the door at 5' high.

Doors, mats and stairways on the first floor are accessible. An elevator provides transport between floors. The bathrooms are located in the basement and are accessible.

Walkway and ramp on west side of Town Hall.

Recommendations for Improved Accessibility:
The Massachusetts Office of Disability conducted an Accessibility Site Survey at Town Hall on November 6, 2009. The Ashfield Building Committee has recently revisited this document and will be preparing a Municipal ADA Improvement Grant application for FY18. The Committee has not yet identified a scope of work for the grant application.

1. Improve access at front door and from ramp by leveling walkways and transition between surfaces.
2. Consider recommendations to be developed by the Town Hall building Committee.

Schedule: 2018-2024

Responsible Entity: Town Hall Building Committee, Selectboard

Facility Inventory **LOCATION:** Town Hall, 412 Main Street, Ashfield, MA

ACTIVITY	EQUIPMENT	NOTES
Picnic Facilities N/A	Tables & Benches	Located adjacent to accessible paths
		Access to Open Spaces
		Back and Arm Rests
		Adequate number
	Grills	Height of Cooking Surface
		Located adjacent to accessible paths
	Trash Cans	Located adjacent to accessible paths
	Picnic Shelters	Located adjacent to accessible paths
		Located near accessible water fountains, trash can, restroom, parking, etc.
Trails N/A		Surface material
		Dimensions
		Rails
		Signage (for visually impaired)
Swimming Facilities N/A	Pools	Entrance
		Location from accessible parking
		Safety features i.e. warning for visually impaired
	Beaches	Location from accessible path into water
		Handrails
		Location from accessible parking
		Shade provided
Play Areas (tot lots) N/A	All Play Equipment i.e. swings, slides	Same experience provided to all
	Access Routes	Located adjacent to accessible paths
		Enough space between equipment for wheelchair
Game Areas: N/A *ballfield *basketball *tennis	Access Routes	Located adjacent to accessible paths
		Berm cuts onto courts
	Equipment	Height
		Dimensions
		Spectator Seating
Boat Docks N/A	Access Routes	Located adjacent to accessible paths
		Handrails
Fishing Facilities N/A	Access Routes	Located adjacent to accessible paths
		Handrails
	Equipment	Arm Rests
		Bait Shelves
		Handrails
		Fish Cleaning Tables
Programming N/A	Are special programs at your facilities accessible?	Learn-to-Swim
		Guided Hikes
		Interpretive Programs
Services and Technical Assistance	Information available in alternative formats i.e. for visually impaired	
	Process to request interpretive services (i.e. sign language interpreter) for meetings	

Town Hall is a historic town-owned building. Community events and occasional recreational events occur here. Thus, the building has been included in the ADA assessment as a town-owned recreational facility.

The Massachusetts Office of Disability conducted an Accessibility Site Survey at Town Hall on November 6, 2009. The Ashfield Building Committee has recently re-visited this document and will be preparing a Municipal ADA Improvement Grant application for FY18. The Committee has not yet identified a scope of work for the grant application.

LOCATION Town Hall

PARKING			
Total Spaces		*Required Accessible Spaces*	
Up to 25		1 space X	
26-50		2 spaces	
51-75		3 spaces	
76-100		4 spaces	
101-150		5 spaces	
151-200		6 spaces	
201-300		7 spaces	
301-400		8 spaces	
401-500		9 spaces	
Specification for Accessible Spaces	*Yes*	*No*	*Comments/Transition Notes*
Accessible space located closest to accessible entrance	X		
Where spaces cannot be located within 200 ft of accessible entrance, drop-off area is provided within 100 ft.			N/A
Minimum width of 13 ft includes 8 ft space plus 5 ft access aisle	X		
Van space – minimum of 1 van space for every accessible space, 8 ft wide plus 8 ft aisle. Alternative is to make all accessible spaces 11 ft wide with 5 ft aisle.	X		The one accessible space would accommodate a van.
			The sign hangs on a chain across the front of the space, approximately 3' high. The chain is removable to allow vehicular access behind Town Hall and the adjacent Fire Station.
Sign with international symbol of accessibility at each space or pair of spaces	X		
Sign minimum 5 ft, maximum 8 ft to top of sign		X	The parking space is paved, with some cracks. A stone pathway leading from the parking to the entrance has changes in level measuring 1/4-1/2", There is a 1/2-1" lip between the pavement and the stone path.
Surface evenly paved or hard-packed (no cracks)		X	
Surface slope less than 1:20, 5%	X		
Curbcut to pathway from parking lot at each space or pair of spaces, if sidewalk (curb) is present			N/A
Curbcut is a minimum width of 3 ft, excluding sloped sides, has sloped sides, all slopes not to exceed 1:12, and textured or painted yellow			N/A
RAMPS			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Slope Maximum 1:12	X		A ramp is provided on the west side of the building, recognized as an emergency exit
Minimum width 4 ft between handrails	X		from the interior of the building. the approach to the ramp is over pavement that is in severe
Handrails on both sides if ramp is longer than 6 ft	X		disrepair, which creates changes in level over
Handrails at 34" and 19" from ramp surface	X		1/2 inch. There is a two inch change fromt eh
Handrails extend 12" beyond top and bottom	X		pavement to the ramp.
Handgrip oval or round	X		
Handgrip smooth surface	X		
Handgrip diameter between 1¼" and 2"	X		
Clearance of 1½" between wall and wall rail			N/A
Non-slip surface	X		
Level platforms (4ft x 4 ft) at every 30 ft, at top, at bottom, at change of direction		X	

LOCATION Town Hall

SITE ACCESS, PATH OF TRAVEL, ENTRANCES			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Site Access			
Accessible path of travel from passenger disembarking area and parking area to accessible entrance	X		See previous comments under parking.
Disembarking area at accessible entrance	X		
Surface evenly paved or hard-packed	X		
No ponding of water	X		
Path of Travel			
Path does not require the use of stairs	X		See previous comments under parking.
Path is stable, firm and s lip resistant	X		
3 ft wide minimum	X		
Slope maximum 1:20 (5%) and maximum cross pitch is 2% (1:50).	X		
Continuous common surface, no changes in level greater than ½ inch		X	
Any objects protruding onto the pathway must be detected by a person with a visual disability using a cane	X		
Objects protruding more than 4" from the wall must be within 27" of the ground, or higher than 80"	X		
Curb on the pathway must have curb cuts at drives, parking and drop-offs			N/A
Entrances			
Primary public entrances accessible to person using wheelchair, must be signed, gotten to independently, and *not* be the service entrance		X	Not signed.
Level space extending 5 ft. from the door, interior and exterior of entrance doors	X		
Minimum 32" clear width opening (i.e. 36" door with standard hinge)	X		
At least 18" clear floor area on latch, pull side of door	X		
Door handle no higher than 48" and operable with a closed fist	X		
Vestibule is 4 ft plus the width of the door swinging into the space			N/A
Entrance(s) on a level that makes elevators accessible	X		
Door mats less than ½" thick are securely fastened		X	Less than 1/2" but not securely fastened.
Door mats more than ½" thick are recessed	X		
Grates in path of travel have openings of ½" maximum			N/A
Signs at non-accessible entrance(s) indicate direction to accessible entrance		X	
Emergency egress – alarms with flashing lights and audible signals, sufficiently lighted			Located at ramp on west side of building. Emergency alarm not tested.

LOCATION Town Hall

STAIRS and DOORS			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Stairs Stairs from entrance to first floor.			
No open risers	X		
Nosings not projecting	X		
Treads no less than 11" wide	X		
Handrails on both sides	X		
Handrails 34"-38" above tread	X		33"
Handrail extends a minimum of 1 ft beyond top and bottom riser (if no safety hazard and space permits)	X		
Handgrip oval or round	X		
Handgrip has a smooth surface	X		
Handgrip diameter between 1¼" and 1½"	X		
1½" clearance between wall and handrail	X		
Doors			
Minimum 32" clear opening	X		
At least 18" clear floor space on pull side of door	X		
Closing speed minimum 3 seconds to within 3" of the latch	X		
Maximum pressure 5 pounds interior doors	X		
Threshold maximum ½" high, beveled on both sides	X		
Hardware operable with a closed fist (no conventional door knobs or thumb latch devices)		X	
Hardware minimum 36", maximum 48" above the floor	X		
Clear, level floor space extends out 5 ft from both sides of the door	X		Varies room to room; 3-5' or more generally.
Door adjacent to revolving door is accessible and unlocked			N/A
Doors opening into hazardous area have hardware that is knurled or roughened			N/A

NOTES

Doors on the first floor were assessed. The second floor auditorium space was not assessed. First floor space for classes (yoga, Tai Chi, etc.).

Mats on first floor at lift not secured to floor, but less than 1/2" (essentially flat, not pile).

Screen door at emergency exit (ramped exterior) - Handle is not for closed grip. Sign on door notes "Door to be held open when building occupancy exceeds 50 people". Screw latch on emergency door at 5' high.

LOCATION Town Hall

RESTROOMS – also see Doors and Vestibules			
Specification	*Yes*	*No*	*Comments/Transition Notes*
5 ft turning space measured 12" from the floor	X		
At least one Sink:			
Clear floor space of 30" by 48" to allow a forward approach	X		
Mounted without pedestal or legs, height 34" to top of rim	X		
Extends at least 22" from the wall	X		
Open knee space a minimum 19" deep, 30" width, and 27" high	X		
Cover exposed pipes with insulation			N/A
Faucets operable with closed fist (lever or spring activated handle)	X		
At least one Stall:			
Accessible to person using wheelchair at 60" wide by 72" deep	X		
Stall door is 36" wide	X		
Stall door swings out	X		
Stall door is self closing	X		
Stall door has a pull latch	X		
Lock on stall door is operable with a closed fist, and 32" above the floor	X		
Coat hook is 54" high			
Toilet			
18" from center to nearest side wall	X		
42" minimum clear space from center to farthest wall or fixture	X		
Top of seat 17"-19" above the floor	X		
Grab Bars			
On back and side wall closest to toilet		X	on side wall
1¼" diameter	X		
1½" clearance to wall	X		
Located 30" above and parallel to the floor	X		
Acid-etched or roughened surface	X		
42" long	X		
Fixtures			
Toilet paper dispenser is 24" above floor	X		
One mirror set a maximum 38" to bottom (if tilted, 42")	X		
Dispensers (towel, soap, etc) at least one of each a maximum 42" above the floor	X		

LOCATION Town Hall

FLOORS, DRINKING FOUNTAINS, TELEPHONES			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Floors			
Non-slip surface			Old wood floors throughout the building, may be slippery when wet. At main entrance, no slip, weather resistance flooring. Linoleum tiles in basement and bathrooms.
Carpeting is high-density, low pile, non-absorbent, stretched taut, securely anchored	X		
Corridor width minimum is 3 ft	X		
Objects (signs, ceiling lights, fixtures) can only protrude 4" into the path of travel from a height of 27" to 80" above the floor	X		
Drinking Fountains N/A			
Spouts no higher than 36" from floor to outlet			
Hand operated push button or level controls			
Spouts located near front with stream of water as parallel to front as possible			
If recessed, recess a minimum 30" width, and no deeper than depth of fountain			
If no clear knee space underneath, clear floor space 30" x 48" to allow parallel approach			
Telephones No public telephones			
Highest operating part a maximum 54" above the floor			
Access within 12" of phone, 30" high by 30" wide			
Adjustable volume control on headset so identified			
SIGNS, SIGNALS, AND SWITCHES			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Switches, Controls and Signs			
Switches and controls for light, heat, ventilation, windows, fire alarms, thermostats, etc, must be a minimum of 36" and a maximum of 48" above the floor for a forward reach, a maximum of 54" for a side reach	X		
Electrical outlets centered no lower than 18" above the floor	X		
Warning signals must be visual as well as audible			Not tested
Signs			
Mounting height must be 60" to centerline of the sign	X		
Within 18" of door jamb or recessed	X		
Letters and numbers a t least 1¼" high	X		
Letters and numbers raised .03"	X		On "Exit" and handcapped signs
Letters and numbers contrast with the background color	X		

Town Hall

LOCATION

SWIMMING POOLS – accessibility can be via ramp, lifting device, or transfer area			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Ramp at least 34" wide with a non-slip surface extending into the shallow end, slope not exceeding 1:6 with handrails on both sides			N/A
Lifting device			
Transfer area 18" above the path of travel and a minimum of 18" wide			
Unobstructed path of travel not less than 48" wide around pool			
Non-slip surface			

LOCATION

SHOWER ROOMS - Showers must accommodate both wheel-in and transfer use			
Specification	*Yes*	*No*	*Comments/Transition Notes*
Stalls 36" by 60" minimum, with a 36" door opening			
Floors are pitched to drain the stall at the corner farthest from entrance			N/A
Floors are non-slip surface			
Controls operate by a single lever with a pressure balance mixing valve			
Controls are located on the center wall adjacent to the hinged seat			
Shower heads attached to a flexible metal hose			
Shower heads attached to wall mounting adjustable from 42" to 72" above the floor			
Seat is hinged and padded and at least 16" deep, folds upward, securely attached to side wall, height is 18" to the top of the seat, and at least 24" long			
Soap trays without handhold features unless they can support 250 pounds			
2 grab bars are provided, one 30" and one 48" long, or one continuous L shaped bar			
Grab bars are placed horizontally at 36" above the floor line			

LOCATION

PICNICKING			
Specification	*Yes*	*No*	*Comments/Transition Notes*
A minimum of 5% of the total tables must be accessible with clear space under the table top not less than 30" wide and 19" deep per seating space and not less than 27" clear from the ground to the underside of the table. An additional 29" clear space (totaling 48") must extend beyond the 19" clear space under the table to provide access			N/A
For tables without toe clearance, the knee space under the table must be at least 28" high, 30" wide and 24" deep.			
Top of table no higher than 32" above ground			
Surface of the clear ground space under and around the table must be stable, firma nd slip-resistant, and evenly graded with a maximum slope of 2% in all directions			
Accessible tables, grills and fire rings must have clear ground space of at least 36" around the perimeter			

44 Buckland Road and Bronson Avenue Parking Lot

Driveway from Buckland Road and adjacent lawn for overflow parking

Existing Conditions:
The Town owns two small parcels at 44 Buckland Road and on Bronson Avenue adjacent to and associated with the ballfields owned and operated by the Trustees of Smith Academy. Therefore, the ballfields and playground were not assessed as part of this report, just the parking and access as provided on town-owned property.

44 Buckland Road – A steeply sloped, 100-foot long paved driveway from Buckland Road terminates at a parking lot adjacent to the ballfield. Some overflow parking is accommodated on the adjacent lawn. There are no signed handicapped parking spots in this lot. There is a port-o-potty at the northern end of the parking lot that is not accessible.

Buckland Road parking lot adjacent to ballfield

Bronson Avenue Parking Lot – This is an unpaved parking lot for approximately 15 cars. There is no signed handicapped parking spot. Across the street from the lot is an uneven asphalt walkway and concrete steps approximately 70' long, with hand railings.

Recommendations for Improved Accessibility:
Due to the distance and grade change from Bronson Ave to the ballfields, no accessibility improvements to the Bronson Avenue parking lot are recommended. The following recommendations are for the parking lot at Buckland Road:

1. Provide a signed handicapped parking spot close to the ballfield.
2. Consider providing a handicapped accessible port-o-potty at this facility.

Schedule: 2018-2024

Responsible Entity: Selectboard

Parking lot on Bronson Avenue

Unpaved walkway from Bronson Avenue parking lot to ballfields

Steps and unpaved walkway from Bronson Avenue to ballfields

Facility Inventory **LOCATION:** 44 Buckland Road and Bronson Ave Parking Lot Ashfield, MA

ACTIVITY	EQUIPMENT	NOTES
Picnic Facilities N/A	Tables & Benches	Located adjacent to accessible paths
		Access to Open Spaces
		Back and Arm Rests
		Adequate number
	Grills	Height of Cooking Surface
		Located adjacent to accessible paths
	Trash Cans	Located adjacent to accessible paths
	Picnic Shelters	Located adjacent to accessible paths
		Located near accessible water fountains, trash can, restroom, parking, etc.
Trails N/A		Surface material
		Dimensions
		Rails
		Signage (for visually impaired)
Swimming Facilities N/A	Pools	Entrance
		Location from accessible parking
		Safety features i.e. warning for visually impaired
	Beaches	Location from accessible path into water
		Handrails
		Location from accessible parking
		Shade provided
Play Areas (tot lots) N/A	All Play Equipment i.e. swings, slides	Same experience provided to all
	Access Routes	Located adjacent to accessible paths
		Enough space between equipment for wheelchair
Game Areas: N/A *ballfield *basketball *tennis	Access Routes	Located adjacent to accessible paths
		Berm cuts onto courts
	Equipment	Height
		Dimensions
		Spectator Seating
Boat Docks N/A	Access Routes	Located adjacent to accessible paths
		Handrails
Fishing Facilities N/A	Access Routes	Located adjacent to accessible paths
		Handrails
	Equipment	Arm Rests
		Bait Shelves
		Handrails
		Fish Cleaning Tables
Programming N/A	Are special programs at your facilities accessible?	Learn-to-Swim
		Guided Hikes
		Interpretive Programs
Services and Technical Assistance N/A	Information available in alternative formats i.e. for visually impaired	
	Process to request interpretive services (i.e. sign language interpreter) for meetings	

NOTE: The Town owns two small parcels at 44 Buckland Road and on Bronson Avenue adjacent to and associated with the ballfields owned and operated by the Trustees of Smith Academy. Therefore, the ballfields and playground were not assessed as part of this report, just the parking and access as provided on town-owned property. There was no designated handicapped parking at either location. The parking lot on Bronson Avenue is immediately adjacent to one of the ballfields.

TOWN OF ASHFIELD

OFFICE OF THE SELECT BOARD

412 Main Street
PO Box 560
Ashfield, MA 01330
Phone: 413-628-4441 x7
Fax: 413-628-0228
selectboard@ashfield.org

Select Board Policy: 17-01

Date Adopted: 08-21-2017

DISABILITY DISCRIMINATION GRIEVANCE POLICY

It is the policy of the Town of Ashfield not to discriminate on the basis of disability. This Grievance Procedure has been established to meet the requirements of the American with Disabilities Act of 1990 (ADA). It may be used by anyone who wishes to file a complaint alleging discrimination on the basis of disability in the provision of services, activities, programs, or benefits by the Town of Ashfield. The Ashfield Personnel Policy governs employment-related complaints of disability discrimination. Every opportunity will be made available to receive citizen comments, complaints, and to resolve grievances or inquiries.

Complaints should be submitted by the grievant and/or his/her designee as soon as possible, but no later than sixty (60) calendar days after the alleged violation to:

ADA Coordinator

412 Main Street

P.O. Box 560

Ashfield MA 01330

Telephone: 413-628-4441 ext. 7

Email: townadmin@ashfield.org

Office Hours: Monday-Thursday, 9:00 am to 4:00 pm, Fridays by Appointment

STEP 1

The Town ADA Coordinator will be available to meet with citizens and employees during regular business hours to receive complaints. The ADA Coordinator is responsible for coordinating the efforts of the Town of Ashfield to comply and investigate any complaints.

When a complaint, grievance, request for program policy interpretation, or clarification is received either in writing, through a meeting, or telephone call, a record will be created which shall include the name, address, telephone number of the person complainant and the nature of their request or complaint. Anonymous complaints or requests for information will be accepted and a record created with available information.

If the person, making the complaint or request for information is identified, the complaint, grievance, request for program policy interpretation, or clarification will be responded to within fifteen (15)

calendar days in a format that is sensitive to the needs of the recipient (i.e. verbally, enlarge type, etc.). There will be an automatic extension of fifteen (15) calendar days if the ADA Coordinator is on vacation, out of the office, or for other reasonable cause. The written response from the ADA Coordinator will include position of the Town of Ashfield and substantive resolution of the complaint.

If the grievance is not resolved at this level, it will progress to Step 2.

STEP 2

If the grievance is not resolved in Step 1, then a written grievance will be submitted to the ADA coordinator. Assistance in writing the grievance will be available if requested. All written grievances will be responded to within fifteen (15) calendar days by the ADA Coordinator in a format that is sensitive to the needs of the recipient. There will be an automatic extension of fifteen (15) calendar days if the ADA Coordinator is on vacation, out of the office, or for other reasonable cause.

If the grievance is not resolved at this level, it will progress to Step 3.

STEP 3

If the grievance is not satisfactorily resolved in Step 2, complainants will have the opportunity to appeal to the Select Board, pursuant to the provisions of the Open Meeting Law. The Select Board shall issue a written decision to the complainant, and others as qualified by the law, no later than fifteen (15) calendar days after the meeting.

Decisions of the Select Board will be final. Appeals may be made to the Massachusetts Commission Against Discrimination (MCAD) and/or Equal Employment Opportunity Commission (EEOC). All written complaints received by the ADA Coordinator, appeals to the Selectboard and responses, will be held by the Town of Ashfield for a period of at least three years.

Massachusetts Commission Against Discrimination (MCAD)

436 Dwight Street, Suite 220

Springfield MA 01103-1317

Telephone: 413-739-2145

Equal Employment Opportunity Commission (EEOC)

475 J.F.K Federal Building

Government Center

Boston MA 02203-0506

Telephone: 617-565-3200

APPENDIX G:
Lists of Wildlife Species in Ashfield

Source: DeGraaf, Richard M and Yamasaki, Mariko. 2001. *New England Wildlife: Habitat, Natural History, and Distribution.*

Mammal Species

ORDER
Family
Common name (*Scientific name*)

DIDELPHIMORPHIA (FORMERLY MARSUPIALIA)
Didelphidae
Virginia opossum (*Didelphis virginiana*) 301

INSECTIVORA
Soricidae
Masked shrew (*Sorex cinereus*) 302
Water shrew (*Sorex palustris*) 303
Smoky shrew (*Sorex fumeus*) 303
Long-tailed shrew (*Sorex dispar*) 304
~~Pygmy shrew (*Sorex hoyi*)~~ 305
Northern short-tailed shrew (*Blarina brevicauda*) 306
Least shrew (*Cryptotis parva*) 307
Talpidae
Hairy-tailed mole (*Parascalops breweri*) 307
Eastern mole (*Scalopus aquaticus*) 308
Star-nosed mole (*Condylura cristata*) 308

CHIROPTERA
Vespertilionidae
Little brown myotis (*Myotis lucifugus*) 309
Northern long-eared bat (*Myotis septentrionalis*) 311
Indiana myotis (*Myotis sodalis*) 312
Eastern small-footed myotis (*Myotis leibii*) 313
Silver-haired bat (*Lasionycteris noctivagans*) 313
Eastern pipistrelle (*Pipistrellus subflavus*) 314
Big brown bat (*Eptesicus fuscus*) 315
Red bat (*Lasiurus borealis*) 316
Hoary bat (*Lasiurus cinereus*) 317

LAGOMORPHA
Leporidae
Eastern cottontail (*Sylvilagus floridanus*) 318
~~New England cottontail (*Sylvilagus transitionalis*)~~ 319
Snowshoe hare (*Lepus americanus*) 320
~~European hare (*Lepus europaeus*)~~ 321
~~Black-tailed jackrabbit (*Lepus californicus*)~~ 322

RODENTIA
Sciuridae
Eastern chipmunk (*Tamias striatus*) 323
Woodchuck (*Marmota monax*) 324
Gray squirrel (*Sciurus carolinensis*) 324
Red squirrel (*Tamiasciurus hudsonicus*) 325
Southern flying squirrel (*Glaucomys volans*) 326
Northern flying squirrel (*Glaucomys sabrinus*) 327
Castoridae
Beaver (*Castor canadensis*) 327
Muridae
Deer mouse (*Peromyscus maniculatus*) 328
White-footed mouse (*Peromyscus leucopus*) 329
Southern red-backed vole (*Clethrionomys gapperi*) 330
Meadow vole (*Microtus pennsylvanicus*) 331
Rock vole (*Microtus chrotorrhinus*) 332
Woodland vole (*Microtus pinetorum*) 333
Muskrat (*Ondatra zibethicus*) 335
Southern bog lemming (*Synaptomys cooperi*) 334
~~Northern bog lemming (*Synaptomys borealis*)~~ 335
Norway rat (*Rattus norvegicus*) 336
House mouse (*Mus musculus*) 337
Zapodidae
Meadow jumping mouse (*Zapus hudsonius*) 337
Woodland jumping mouse (*Napaeozapus insignis*) 338
Erethizontidae
Porcupine (*Erethizon dorsatum*) 339

CARNIVORA
Canidae
Coyote (*Canis latrans*) 340
~~Gray wolf (*Canis lupus*)~~ 341
Red fox (*Vulpes vulpes*) 342
Gray fox (*Urocyon cinereoargenteus*) 343
Ursidae
Black Bear (*Ursus americanus*) 344
Procyonidae
Raccoon (*Procyon lotor*) 346
Mustelidae
~~American marten (*Martes americana*)~~ 347
Fisher (*Martes pennanti*) 348
Ermine (*Mustela erminea*) 349
Long-tailed weasel (*Mustela frenata*) 350
Mink (*Mustela vison*) 351
Striped skunk (*Mephitis mephitis*) 351
River otter (*Lontra canadensis*) 352
Felidae
~~Mountain lion (*Puma concolor*)~~ 353
~~Lynx (*Lynx canadensis*)~~ 354
Bobcat (*Lynx rufus*) 356

ARTIODACTYLA
Cervidae
White-tailed deer (*Odocoileus virginianus*) 357
Moose (*Alces alces*) 358

The following lists the references on mammals for further reading on life histories and distribution.

Citations by Region

North America

Chapman, J. A.; Feldhamer, G. A. 1982. *Wild mammals of North America, biology, management, and economics*. Baltimore, Md.: Johns Hopkins University Press. 1,168 pp.

Hall, E. R.; Kelson, K. R. 1959. *The mammals of North America*. 2 volumes. New York: Ronald Press.

Whitaker, J. O., Jr.: Hamilton, W. J., Jr. 1998. *Mammals of the eastern*

Amphibian and Reptile Species

ORDER
Family
Common name (*Scientific name*)

CAUDATA
~~Necturidae~~
~~Mudpuppy (*Necturus maculosus*)~~ 26
Ambystomatidae
~~Marbled salamander (*Ambystoma opacum*)~~ 26
Jefferson salamander (*Ambystoma jeffersonianum*) 27
~~Blue-spotted salamander (*Ambystoma laterale*)~~ 29
Spotted salamander (*Ambystoma maculatum*) 30
Salamandridae
Red-spotted newt (*Notophthalmus v. viridescens*) 31
Plethodontidae
Northern dusky salamander (*Desmognathus fuscus*) 32
Northern redback salamander (*Plethodon cinereus*) 33
~~Northern slimy salamander (*Plethodon glutinosus*)~~ 34
Four-toed salamander (*Hemidactylium scutatum*) 35
Northern spring salamander (*Gyrinophilus p. porphyriticus*) 35
Northern two-lined salamander (*Eurycea bislineata*) 36

ANURA
~~Pelobatidae~~
~~Eastern spadefoot (*Scaphiopus holbrookii*)~~ 37
Bufonidae
Eastern American toad (*Bufo a. americanus*) 38
~~Fowler's toad (*Bufo fowleri*)~~ 39
Hylidae
Northern spring peeper (*Pseudacris c. crucifer*) 40
Gray treefrog (*Hyla versicolor*) 40
Ranidae
Bullfrog (*Rana catesbeiana*) 41
Green frog (*Rana clamitans melanota*) 42
~~Mink frog (*Rana septentrionalis*)~~ 43
Wood frog (*Rana sylvatica*) 43
Northern leopard frog (*Rana pipiens*) 44
Pickerel frog (*Rana palustris*) 45

TESTUDINES
Chelydridae
Common snapping turtle (*Chelydra s. serpentina*) 46
Emydidae
Spotted turtle (*Clemmys guttata*) 47
~~Bog turtle (*Clemmys muhlenbergii*)~~ 47
Wood turtle (*Clemmys insculpta*) 48
~~Eastern box turtle (*Terrapene c. carolina*)~~ 49
~~Map turtle (*Graptemys geographica*)~~ 50
~~Plymouth redbelly turtle (*Pseudemys rubriventris bangsi*)~~ 51
Painted turtle (*Chrysemys picta*),
Eastern painted turtle (*Chrysemys p. picta*), and
Midland painted turtle (*Chrysemys picta marginata*) 52
~~Blanding's turtle (*Emydoidea blandingii*)~~ 53
Kinosternidae
Common musk turtle (*Sternotherus odoratus*) 53
Trionychidae
~~Eastern spiny softshell (*Apalone s. spinifera*)~~ 54

~~SQUAMATA—SUBORDER SAURIA~~
~~Scincidae~~
~~Five-lined skink (*Eumeces fasciatus*)~~ 55

SQUAMATA—SUBORDER SERPENTES
Colubridae
Northern water snake (*Nerodia s. sipedon*) 56
Northern brown snake (*Storeria d. deka yi*) 56
Northern redbelly snake (*Storeria o. occipitomaculata*) 57
Common garter snake (*Thamnophis sirtalis*),
Eastern garter snake (*Thamnophis s. pallidulus*), and
Maritime garter snake (*Thamnophis s. sauritus*) 58
Ribbon snake (*Thamnophis sauritus*),
Eastern ribbon snake (*Thamnophis s. sauritus*), and
Northern ribbon snake (*Thamnophis s. septentrionalis*) 59
~~Eastern hognose snake (*Heterodon platyrhinos*)~~ 60
Northern ringneck snake (*Diadophis punctatus edwardsii*) 60
~~Eastern worm snake (*Carphophis a. amoenus*)~~ 61
Northern black racer (*Coluber c. constrictor*) 62
Eastern smooth green snake (*Liochlorophis vernalis*) 62
Black rat snake (*Elaphe o. obsoleta*) 63
Eastern milk snake (*Lampropeltis t. triangulum*) 64
~~Viperidae~~
~~Northern copperhead (*Agkistrodon contortrix mokasen*)~~ 64
~~Timber rattlesnake (*Crotalus horridus*)~~ 65

The following lists references on amphibian and reptiles for further reading on life histories and distribution.

Citations by Region

Eastern North America

Carr, A. 1995. *Handbook of turtles: The turtles of the United States, Canada, and Baja California.* 9th ed. Ithaca, N.Y.: Cornell University Press. 542 pp.

Dickerson, M. C. 1969. *The frog book.* New York: Dover Publications. 253 pp.

Ernst, C. H.; Barbour, R. W. 1972. *Turtles of the United States.* Lexington: University Press of Kentucky. 347 pp.

Ernst, C. H.; Barbour, R. W. 1989. *Snakes of eastern North America.* Fairfax, Va.: George Mason University Press. 282 pp.

Petranka, J. W. 1998. *Salamanders of the United States and Canada.* Washington, D.C.: Smithsonian Institution Press. 587 pp.

Wright, A. H.; Wright, A. A. 1949. *Handbook of frogs, amphibians and toads of the United States and Canada.* 3rd ed. Ithaca, N.Y.: Comstock. 640 pp.

Bird Species

ORDER
Family
Subfamily
Common name (*Scientific name*)

~~GAVIIFORMES~~
~~Gaviidae~~
~~Common loon (*Gavia immer*)~~ 80

~~PODICIPEDIFORMES~~
~~Podicipedidae~~
~~Pied-billed grebe (*Podilymbus podiceps*)~~ 81

~~PELECANIFORMES~~
~~Phalacrocoracidae~~
~~Double-crested cormorant (*Phalacrocorax auritus*)~~ 82

CICONIIFORMES
Ardeidae
American bittern (*Botaurus lentiginosus*) 83
Least bittern (*Ixobrychus exilis*) 84
Great blue heron (*Ardea herodias*) 85
Great egret (*Ardea alba*) 86
Snowy egret (*Egretta thula*) 86
~~Little blue heron (*Egretta caerulea*)~~ 87
~~Cattle egret (*Bubulcus ibis*)~~ 88
Green heron (*Butorides virescens*) 89
~~Black-crowned night-heron (*Nycticorax nycticorax*)~~ 90
~~Yellow-crowned night-heron (*Nyctanassa violacea*)~~ 91
~~Threskiornithidae~~
~~Glossy ibis (*Plegadis falcinellus*)~~ 91
Cathartidae
Turkey vulture (*Cathartes aura*) 92

ANSERIFORMES
Anatidae
Anserinae
Canada goose (*Branta canadensis*) 93
~~Mute swan (*Cygnus olor*)~~ 94
Anatinae
Wood duck (*Aix sponsa*) 95
~~Gadwall (*Anas strepera*)~~ 96
~~American wigeon (*Anas americana*)~~ 97
American black duck (*Anas rubripes*) 98
Mallard (*Anas platyrhynchos*) 99
Blue-winged teal (*Anas discors*) 100
~~Northern shoveler (*Anas clypeata*)~~ 100
~~Northern pintail (*Anas acuta*)~~ 101
Green-winged teal (*Anas crecca*) 102
~~Canvasback (*Aythya valisineria*)~~ 103
~~Ring-necked duck (*Aythya collaris*)~~ 104
~~Bufflehead (*Bucephala albeola*)~~ 105
~~Common goldeneye (*Bucephala clangu*~~
Hooded merganser (*Lophodytes cucull*
Common merganser (*Mergus merganse*
~~Red-breasted merganser (*Mergus serrat*~~

FALCONIFORMES
Accipitridae
Pandioninae
Osprey (*Pandion haliaetus*)
Accipitrinae
Bald eagle (*Haliaeetus leucocephalus*)
Northern harrier (*Circus cyaneus*)
Sharp-shinned hawk (*Accipiter striatus*)
Cooper's hawk (*Accipiter cooperii*)
Northern goshawk (*Accipiter gentilis*)
Red-Shouldered hawk (*Buteo lineatus*)
Broad-winged hawk (*Buteo platypterus*)
Red-tailed hawk (*Buteo jamaicensis*)
Rough-legged hawk (*Buteo lagopus*)
~~Golden eagle (*Aquila chrysaetos*)~~
Falconidae
Falconinae
American kestrel (*Falco sparverius*)
~~Merlin (*Falco columbarius*)~~
Peregrine falcon (*Falco peregrinus*)

GALLIFORMES
Phasianidae
Phasianinae
~~Gray partridge (*Perdix perdix*)~~
Ring-necked pheasant (*Phasianus colchic*
Tetraoninae
Ruffed grouse (*Bonasa umbellus*)
~~Spruce grouse (*Falcipennis canadensis*)~~
Meleagridinae
Wild turkey (*Meleagris gallopavo*)
Odontophoridae
Northern bobwhite (*Colinus virginianus*)

GRUIFORMES
Rallidae
~~King rail (*Rallus elegans*)~~
Virginia rail (*Rallus limicola*)
Sora (*Porzana carolina*)
Common moorhen (*Gallinula chloropus*)
~~American coot (*Fulica americana*)~~

CHARADRIIFORMES
Charadriidae
Killdeer (*Charadrius vociferus*)
Scolopacidae
~~Willet (*Catoptrophorus semipalmatus*)~~
Spotted sandpiper (*Actitis macularia*)
~~Upland sandpiper (*Bartramia longicauda*~~
Common snipe (*Gallinago gallinago*)
American woodcock (*Scolopax minor*)

Laridae
Larinae
~~Ring-billed gull (*Larus delawarensis*)~~ 138
Herring gull (*Larus argentatus*) 139
~~Great black-backed gull (*Larus marinus*)~~ 140
~~*Sterninae*~~
~~Common tern (*Sterna hirundo*)~~ 140
~~Black tern (*Chlidonias niger*)~~ 141

COLUMBIFORMES
Columbidae
Rock dove (*Columba livia*) 142
Mourning dove (*Zenaida macroura*) 142

CUCULIFORMES
Cuculidae
Coccyzinae
Black-billed cuckoo (*Coccyzus erythropthalmus*) 143
Yellow-billed cuckoo (*Coccyzus americanus*) 144

STRIGIFORMES
Tytonidae
Barn owl (*Tyto alba*) 145
Strigidae
Eastern screech-owl (*Otus asio*) 146
Great horned owl (*Bubo virginianus*) 147
~~Snowy owl (*Nyctea scandiaca*)~~ 148
~~Northern Hawk owl (*Surnia ulula*)~~ 148
Barred owl (*Strix varia*) 149
~~Great gray owl (*Strix nebulosa*)~~ 150
Long-eared owl (*Asio otus*) 151
~~Short-eared owl (*Asio flammeus*)~~ 152
~~Boreal owl (*Aegolius funereus*)~~ 153
Northern saw-whet owl (*Aegolius acadicus*) 153

CAPRIMULGIFORMES
Caprimulgidae
Chordeilinae
Common nighthawk (*Chordeiles minor*) 154
Caprimulginae
Whip-poor-will (*Caprimulgus vociferus*) 155

APODIFORMES
Apodidae
Chaeturinae
Chimney swift (*Chaetura pelagica*) 156
Trochilidae
Trochilinae
Ruby-throated hummingbird (*Archilochus colubris*) 156

CORACIIFORMES
Alcedinidae
Cerylinae
Belted kingfisher (*Ceryle alcyon*) 157

Picidae
Picinae
Red-headed woodpecker (*Melanerpes erythrocephalus*) 158
Red-bellied woodpecker (*Melanerpes carolinus*) 159
Yellow-bellied sapsucker (*Sphyrapicus varius*) 160
Downy woodpecker (*Picoides pubescens*) 161
Hairy woodpecker (*Picoides villosus*) 162
~~Three-toed woodpecker (*Picoides tridactylus*)~~ 162
~~Black-backed woodpecker (*Picoides arcticus*)~~ 163
Northern flicker (*Colaptes auratus*) 164
Pileated woodpecker (*Dryocopus pileatus*) 165

PASSERIFORMES
Tyrannidae
Fluvicolinae
Olive-sided flycatcher (*Contopus cooperi*) 166
Eastern wood-pewee (*Contopus virens*) 167
~~Yellow-bellied flycatcher (*Empidonax flaviventris*)~~ 168
~~Acadian flycatcher (*Empidonax virescens*)~~ 168
Alder flycatcher (*Empidonax alnorum*) 169
Willow flycatcher (*Empidonax traillii*) 170
Least flycatcher (*Empidonax minimus*) 170
Eastern phoebe (*Sayornis phoebe*) 171
Tyranninae
Great Crested flycatcher (*Myiarchus crinitus*) 172
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