

BioMap and Living Waters

Guiding Land Conservation for Biodiversity in Massachusetts

Core Habitats of Harvard

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 not intended for use in state regulations.

Produced by:

**Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries and Wildlife
Executive Office of Environmental Affairs
Commonwealth of Massachusetts**

Produced in 2004



BioMap and Living Waters: Guiding Land Conservation for Biodiversity in Massachusetts

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* Depending on the location of Core Habitats,
your city or town may not have all of these sections.

Spring Salamander
(*Gyrinophilus porphyriticus*)
Species of Special Concern

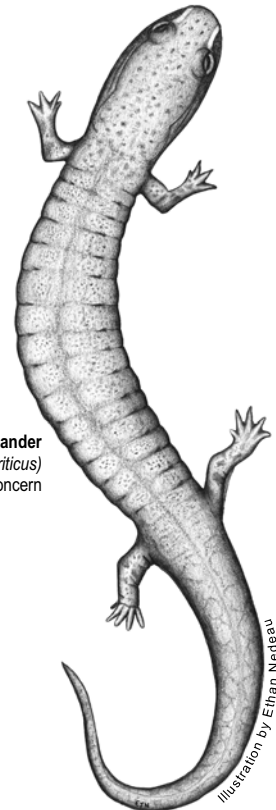


Illustration by Ethan Nedean

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Massachusetts Division of Fisheries and Wildlife
North Drive, Westborough, MA 01581
Tel: (508) 792-7270, Ext. 200 Fax: (508) 792-7821
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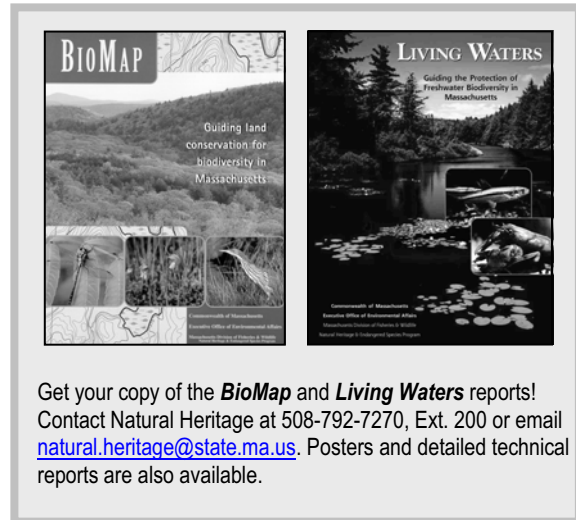
Introduction

In this report, the Natural Heritage & Endangered Species Program provides you with site-specific biodiversity information for your area. Protecting our biodiversity today will help ensure the full variety of species and natural communities that comprise our native flora and fauna will persist for generations to come.

The information in this report is the result of two statewide biodiversity conservation planning projects, *BioMap* and *Living Waters*. The goal of the BioMap project, completed in 2001, was to identify and delineate the most important areas for the long-term viability of terrestrial, wetland, and estuarine elements of biodiversity in Massachusetts. The goal of the Living Waters project, completed in 2003, was to identify and delineate the rivers, streams, lakes, and ponds that are important for freshwater biodiversity in the Commonwealth. These two conservation plans are based on documented observations of rare species, natural communities, and exemplary habitats.

What is a Core Habitat?

Both BioMap and Living Waters delineate *Core Habitats* that identify the most critical sites for biodiversity conservation across the state. Core Habitats represent habitat for the state's most viable rare plant and animal populations and include exemplary natural communities and aquatic habitats. Core Habitats represent a wide diversity of rare species and natural communities (see Table 1), and these areas are also thought to contain virtually all of the other described species in Massachusetts. Statewide, BioMap Core Habitats encompass 1,380,000 acres of uplands and wetlands, and Living Waters identifies 429 Core Habitats in rivers, streams, lakes, and ponds.



Core Habitats and Land Conservation

One of the most effective ways to protect biodiversity for future generations is to protect Core Habitats from adverse human impacts through land conservation. For Living Waters Core Habitats, protection efforts should focus on the *riparian areas*, the areas of land adjacent to water bodies. A naturally vegetated buffer that extends 330 feet (100 meters) from the water's edge helps to maintain cooler water temperature and to maintain the nutrients, energy, and natural flow of water needed by freshwater species.

In Support of Core Habitats

To further ensure the protection of Core Habitats and Massachusetts' biodiversity in the long-term, the BioMap and Living Waters projects identify two additional areas that help support Core Habitats.

In BioMap, areas shown as *Supporting Natural Landscape* provide buffers around the Core Habitats, connectivity between Core Habitats, sufficient space for ecosystems to function, and contiguous undeveloped habitat for common species. Supporting Natural Landscape was



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generated using a Geographic Information Systems (GIS) model, and its exact boundaries are less important than the general areas that it identifies. Supporting Natural Landscape represents potential land protection priorities once Core Habitat protection has been addressed.

In Living Waters, *Critical Supporting Watersheds* highlight the immediate portion of the watershed that sustains, or possibly degrades, each freshwater Core Habitat. These areas were also identified using a GIS model. Critical Supporting Watersheds represent developed and undeveloped lands, and can be quite large. Critical Supporting Watersheds can be helpful in land-use planning, and while they are not shown on these maps, they can be viewed in the Living Waters report or downloaded from www.mass.gov/mgis.

Understanding Core Habitat Species, Community, and Habitat Lists

What's in the List?

Included in this report is a list of the species, natural communities, and/or aquatic habitats for each Core Habitat in your city or town. The lists are organized by Core Habitat number.

For the larger Core Habitats that span more than one town, the species and community lists refer to the entire Core Habitat, not just the portion that falls within your city or town. For a list of all the state-listed rare species within your city or town's boundary, whether or not they are in Core Habitat, please see the town rare species lists available at www.nhesp.org.

The list of species and communities within a Core Habitat contains only the species and

Table 1. The number of rare species and types of natural communities explicitly included in the BioMap and Living Waters conservation plans, relative to the total number of native species statewide.

BioMap		
Biodiversity Group	Species and Verified Natural Community Types	
	Included in BioMap	Total Statewide
Vascular Plants	246	1,538
Birds	21	221 breeding species
Reptiles	11	25
Amphibians	6	21
Mammals	4	85
Moths and Butterflies	52	An estimated 2,500 to 3,000
Damselflies and Dragonflies	25	An estimated 165
Beetles	10	An estimated 2,500 to 4,000
Natural Communities	92	> 105 community types
Living Waters		
Biodiversity Group	Species	
	Included in Living Waters	Total Statewide
Aquatic Vascular Plants	23	114
Fishes	11	57
Mussels	7	12
Aquatic Invertebrates	23	An estimated > 2500

natural communities that were explicitly included in a given BioMap or Living Waters Core Habitat. Other rare species or examples of other natural communities may fall within the Core Habitat, but for various reasons are not included in the list. For instance, there are a few rare species that are omitted from the list or summary because of their particular sensitivity to the threat of collection. Likewise, the content of many very small Core Habitats are not described in this report or list, often because they contain a single location of a rare plant



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species. Some Core Habitats were created for suites of common species, such as forest birds, which are particularly threatened by habitat fragmentation. In these cases, the individual common species are not listed.

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, 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, the Natural Heritage & Endangered Species Program 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 any laws or regulations, but they can help to identify ecologically important areas that are worthy of protection. The status of natural

Legal Protection of Biodiversity

BioMap and Living Waters present a powerful vision of what Massachusetts would look like with full protection of the land that supports most of our biodiversity. To create this vision, some populations of state-listed rare species were deemed more likely to survive over the long-term than others.

Regardless of their potential viability, all sites of state-listed species have full legal protection under the Massachusetts Endangered Species Act (M.G.L. c.131A) and its implementing regulations (321 CMR 10.00). Habitat of state-listed wildlife is also protected under the Wetlands Protection Act Regulations (310 CMR 10.37 and 10.59). The **Massachusetts Natural Heritage Atlas** shows **Priority Habitats**, which are used for regulation under the Massachusetts Endangered Species Act and Massachusetts Environmental Policy Act (M.G.L. c.30) and **Estimated Habitats**, which are used for regulation of rare wildlife habitat under the Wetlands Protection Act. For more information on rare species regulations, see the *Massachusetts Natural Heritage Atlas*, available from the Natural Heritage & Endangered Species Program in book and CD formats.

BioMap and Living Waters are conservation planning tools and do not, in any way, supplant the Estimated and Priority Habitat Maps which have regulatory significance. Unless and until the combined BioMap and Living Waters vision is fully realized, we must continue to protect all populations of our state-listed species and their habitats through environmental regulation.

communities reflects the documented number and acreages of each community type in the state:

- **Critically Imperiled** communities typically have 5 or fewer documented sites or have very few remaining acres in the state.
- **Imperiled** communities typically have 6-20 sites or few remaining acres in the state.
- **Vulnerable** communities typically have 21-100 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 Habitat to ensure continued protection.



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Understanding Core Habitat Summaries

Following the BioMap and Living Waters Core Habitat species and community lists, there is a descriptive summary of each Core Habitat that occurs in your city or town. This summary highlights some of the outstanding characteristics of each Core Habitat, 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.nhesp.org.

Next Steps

BioMap and Living Waters were created in part to help cities and towns prioritize their land protection efforts. While there are many reasons to conserve land – drinking water protection, recreation, agriculture, aesthetics, and others – BioMap and Living Waters Core Habitats are especially helpful to municipalities seeking to protect the rare species, natural communities, and overall biodiversity within their boundaries. Please use this report and map along with the rare species and community fact sheets to appreciate and understand the biological treasures in your city or town.

Protecting Larger Core Habitats

Core Habitats vary considerably in size. For example, the average BioMap Core Habitat is 800 acres, but Core Habitats can range from less than 10 acres to greater than 100,000 acres. These larger areas reflect the amount of land needed by some animal species for breeding, feeding, nesting, overwintering, and long-term survival. Protecting areas of this size can be

very challenging, and requires developing partnerships with neighboring towns.

Prioritizing the protection of certain areas within larger Core Habitats can be accomplished through further consultation with Natural Heritage Program biologists, and through additional field research to identify the most important areas of the Core Habitat.

Additional Information

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 508-792-7270, Ext. 200

by Fax: 508-792-7821

by Email: natural.heritage@state.ma.us.

by Mail: North Drive
Westborough, MA 01581

The GIS datalayers of BioMap and Living Waters Core Habitats are available for download from MassGIS: www.mass.gov/mgis

Check out www.nhesp.org for information on:

- Rare species in your town
- Rare species fact sheets
- BioMap and Living Waters projects
- Natural Heritage publications, including:
 - * Field guides
 - * Natural Heritage Atlas, and more!



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BioMap: Species and Natural Communities

Harvard

Core Habitat BM494

Natural Communities

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Black Ash Swamp		Imperiled
Riverside Seep		Imperiled
Small-River Floodplain Forest		Imperiled

Plants

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Ovate Spike-Sedge	<i>Eleocharis ovata</i>	Endangered
Small Bur-Reed	<i>Sparganium natans</i>	Endangered
Wild Senna	<i>Senna hebecarpa</i>	Endangered

Invertebrates

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Elderberry Long-Horned Beetle	<i>Desmocerus palliatus</i>	Special Concern

Vertebrates

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Blanding's Turtle	<i>Emydoidea blandingii</i>	Threatened
Blue-spotted Salamander	<i>Ambystoma laterale</i>	Special Concern
Spotted Turtle	<i>Clemmys guttata</i>	Special Concern
Wood Turtle	<i>Clemmys insculpta</i>	Special Concern

Core Habitat BM542

Vertebrates

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Wood Turtle	<i>Clemmys insculpta</i>	Special Concern



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BioMap: Species and Natural Communities

Harvard

Core Habitat BM570

Vertebrates

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Blanding's Turtle	<i>Emydoidea blandingii</i>	Threatened
Blue-spotted Salamander	<i>Ambystoma laterale</i>	Special Concern

Core Habitat BM590

Natural Communities

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Alluvial Red Maple Swamp		Vulnerable
High-Terrace Floodplain Forest		Imperiled
Low-Energy Riverbank		Secure
Pitch Pine - Scrub Oak Community		Imperiled

Plants

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Cat-Tail Sedge	<i>Carex typhina</i>	Threatened
Climbing Fern	<i>Lygodium palmatum</i>	Special Concern
Houghton's Flatsedge	<i>Cyperus houghtonii</i>	Endangered
Ovate Spike-Sedge	<i>Eleocharis ovata</i>	Endangered
Philadelphia Panic-Grass	<i>Panicum philadelphicum</i>	Special Concern

Invertebrates

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Blueberry Sallow	<i>Apharetra dentata</i>	-----
Pine Barrens Itame	<i>Itame sp. 1 near inextricata</i>	Special Concern
Pine Barrens Zanclognatha	<i>Zanclognatha martha</i>	Threatened
Pink Sallow	<i>Psectraglaea carnosae</i>	Special Concern



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BioMap: Species and Natural Communities

Harvard

Vertebrates

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
American Bittern	<i>Botaurus lentiginosus</i>	Endangered
Blanding's Turtle	<i>Emydoidea blandingii</i>	Threatened
Blue-spotted Salamander	<i>Ambystoma laterale</i>	Special Concern
Eastern Box Turtle	<i>Terrapene carolina</i>	Special Concern
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	Threatened
King Rail	<i>Rallus elegans</i>	Threatened
Least Bittern	<i>Ixobrychus exilis</i>	Endangered
Pied-Billed Grebe	<i>Podilymbus podiceps</i>	Endangered
Spotted Turtle	<i>Clemmys guttata</i>	Special Concern
Upland Sandpiper	<i>Bartramia longicauda</i>	Endangered
Vesper Sparrow	<i>Poocetes gramineus</i>	Threatened
Water Shrew	<i>Sorex palustris</i>	Special Concern
Wood Turtle	<i>Clemmys insculpta</i>	Special Concern

Core Habitat BM648

Vertebrates

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
American Bittern	<i>Botaurus lentiginosus</i>	Endangered
Common Moorhen	<i>Gallinula chloropus</i>	Special Concern
Least Bittern	<i>Ixobrychus exilis</i>	Endangered

Core Habitat BM674

Vertebrates

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	Threatened



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BioMap: Core Habitat Summaries

Harvard

Core Habitat BM494

Along the Nashua River, this Core Habitat encompasses high-quality examples of natural riverside communities and riparian habitats that support several rare species of turtles and salamanders. The area also provides habitat for Endangered plant species, such as Wild Senna, and invertebrates like the Elderberry Longhorned Beetle.

Natural Communities

This Core Habitat contains a high-quality Riverside Seep community. A Riverside Seep is a mixed herbaceous community that occurs at the base of steep riverbanks where groundwater seeps out of the bottom of the upland slope. This enrichment leads to high species diversity. Here the undisturbed community consists of several Black Ash-dominated seepy areas occurring along a slope above floodplain forest. The Core Habitat also has a small but good example of Small-River Floodplain Forest along a tributary stream. Small-River Floodplain Forests are Silver Maple-Green Ash forests occurring on alluvial soils of small rivers and streams. They occur on small tributaries of the Connecticut and Nashua Rivers and along some small rivers of eastern Massachusetts.

Plants

Three Endangered plant species are found within riparian areas of this Core Habitat. One of only two Massachusetts populations of the Endangered Wild Senna grows here. In oxbows, the Ovate Spike-Sedge and Small Bur-Reed are also found.

Invertebrates

This Core Habitat includes a long stretch of the Nashua River, along which wetlands and meadows with thickets of Elderberry provide habitat for the Elderberry Longhorned Beetle. Apparently most of this habitat is unprotected. This Core Habitat is within close enough proximity to Core Habitat in Lunenburg and Shirley to allow dispersal of Elderberry Longhorned Beetles between these two areas.

Vertebrates

This Core Habitat provides significant habitat for Blanding's, Wood, and Spotted Turtles, as well as Blue-spotted Salamanders. Habitat for the first two species is most closely associated with the Nashua River and its tributaries. Habitat for Spotted Turtles and Blue-spotted Salamanders occurs in or near clusters of small floodplain wetlands and vernal pools, mostly between the Nashua River and downtown Ayer, including the areas along Nonacoisus Brook.

Core Habitat BM542

Vertebrates

This long Core Habitat provides habitat for Wood Turtles along Spring Brook and Bower Brook in Harvard. It contains meandering streams and a good diversity of adjacent habitats, including shrub and forested wetlands, meadows, upland forests, and small fields. Habitat protection that extends at least 1/4 mile into uplands adjacent to streams and wetlands is needed to protect Wood Turtles from habitat degradation and human-caused mortality.



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BioMap: Core Habitat Summaries

Harvard

Core Habitat BM570

Vertebrates

This Core Habitat encompasses nearly five miles of Beaver Brook and its headwater tributaries, as well as adjacent deep and shallow freshwater marshes, forested wetlands, uplands, and vernal pools. This Core Habitat supports a population of Blanding's Turtles that has been the focus of intensive field investigations at the upper reaches of Beaver Brook and near Muddy Pond. The wooded swamps adjacent to Beaver Brook and the vernal pools and upland forests west of Oak Hill Road provide habitat for Blue-spotted Salamanders.

Core Habitat BM590

This large Core Habitat, anchored by the Nashua River, supports one of the most diverse assemblages of rare vertebrate animals in the state. In particular, it contains the largest known population of Blanding's Turtles remaining in Massachusetts and, perhaps, in New England. Several high-quality natural communities are found along the Nashua River, and habitat diversity within the Core Habitat supports an array of native species. For example, grasslands support Grasshopper Sparrows, wetland habitats support rare plant species, and upland habitats, such as heathlands and Pitch Pine-Scrub Oak barrens, support a variety of rare moth species. Parts of this Core Habitat are under conservation ownership, and protecting the remaining areas would provide connectivity between existing conservation land, creating a large and relatively unfragmented reserve for this Core Habitat's biodiversity.

Natural Communities

This Core Habitat contains an extensive area of high-quality Low-Energy Riverbank along the Nashua River. Low-Energy Riverbanks are open herbaceous communities occurring on sandy or silty mineral soils of river and streambanks that do not experience severe flooding or ice scour. Here the community contains good species and habitat diversity, including riparian woodlands and gravel bars. An excellent Alluvial Red Maple Swamp also occurs along the Nashua River in this Core Habitat. Alluvial Red Maple Swamps are a type of Red Maple Swamp that occurs in low areas along rivers and streams. Regular flooding enriches the soil with nutrients, resulting in an unusual set of associated trees and plants. Upland communities in this Core Habitat include a small Pitch Pine-Scrub Oak community of high quality.

Plants

Several scattered populations of the Cat-Tail Sedge, which has a thick terminal spike resembling that of cattails, are found in wetland areas of this Core Habitat. Two other rare members of the sedge family are found in this Core Habitat: the Endangered Ovate Spike-Sedge, and the Endangered Houghton's Flatsedge.

Invertebrates

This Core Habitat includes Pitch Pine - Scrub Oak barrens inhabited by rare moths such as the Pine Barrens Itame and the Pine Barrens Zanclognatha, as well as heathland habitat for the Pink Sallow moth and the Blueberry Sallow moth. It is likely that this Core Habitat is inhabited by other rare invertebrates, for example, the Slender Clearwing Sphinx moth.



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BioMap: Core Habitat Summaries

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Vertebrates

Within this Core Habitat, the Nashua River and adjacent wetlands and uplands support the largest known population of Blanding's Turtles remaining in Massachusetts and, perhaps, in New England. Vernal pools, forested wetlands, and adjacent upland forests provide significant habitat for Spotted Turtles and Blue-spotted Salamanders, while dry upland forests provide significant habitat for Eastern Box Turtles. The Nashua River and its tributaries also contain significant habitat for Wood Turtles.

The grasslands of Fort Devens within this Core Habitat support the fourth largest population of Grasshopper Sparrows in Massachusetts. Sandy, sparsely vegetated habitats associated with training areas and abandoned gravel pits adjacent to the Nashua River support small numbers of Vesper Sparrows.

Core Habitat BM648

Vertebrates

A good mix of deep and shallow freshwater marsh habitats supports a variety of breeding and migrant marsh birds and waterfowl, including Least Bitterns, American Bitterns, Common Moorhens, Marsh Wrens, Virginia Rails, and Soras. Although relatively small in area, this wetland supports one of the most diverse assemblages of freshwater wetland birds in Massachusetts.

Core Habitat BM674

Vertebrates

This Core Habitat encompasses dry sandy fields within the Delaney Wildlife Management Area in Boxborough that support breeding Grasshopper Sparrows. Periodic mowing or burning will be necessary to maintain the grassland habitat required by this species.



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Living Waters: Species and Habitats

Harvard

Core Habitat LW190

Plants

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Lesser Bladderwort	<i>Utricularia minor</i>	Watch Listed

Core Habitat LW212

Invertebrates

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Triangle Floater	<i>Alasmidonta undulata</i>	Special Concern

Core Habitat LW287

Plants

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Water Marigold	<i>Megalodonta beckii</i>	Watch Listed



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Core Habitat LW190

This small pond adjacent to the Nashua River supports the Lesser Bladderwort, an uncommon freshwater plant. Bladderworts are carnivorous plants, trapping tiny aquatic animals in their pouch-like "bladders." Native freshwater plants like the Lesser Bladderwort are an important component of aquatic communities, and warrant conservation attention if we are to maintain healthy freshwater ecosystems.

Core Habitat LW212

This section of the Nashua River supports a diverse group of freshwater mussels, including five of the state's twelve species. The rare Triangle Floater is found here, anchored in the firmer sands and gravels beneath river runs.

Core Habitat LW287

A population of Water Marigold, an uncommon plant most often found in Berkshire County, has an eastern foothold in Bare Hill Pond. Native freshwater plants like the Water Marigold are an important component of aquatic ecosystems, providing habitat and nutrition for fishes and invertebrates, and adding oxygen to the water through photosynthesis.



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