



BioMap2

CONSERVING THE BIODIVERSITY OF
MASSACHUSETTS IN A CHANGING WORLD

Gardner

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 not intended for use in state regulations.





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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.

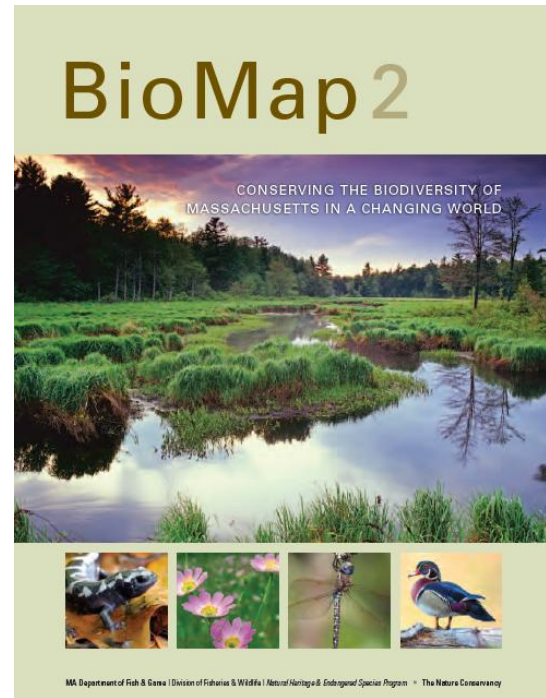
BioMap2 combines NHESP's 30 years of rigorously documented rare species and natural community data with spatial data identifying wildlife species and habitats that were the focus of the Division of Fisheries and Wildlife's 2005 State Wildlife Action Plan (SWAP). *BioMap2* also integrates The Nature Conservancy's 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.

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.



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.

- 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





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 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 Habitats 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**

BioMap2 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





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





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

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.**

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.





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/nhosp.

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/nhosp. 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.



**Natural Heritage
& Endangered
Species Program**

Massachusetts Division of Fisheries and Wildlife
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phone: 508-389-6360 fax: 508-389-7890

For more information on rare species and natural communities, please see our fact sheets online at www.mass.gov/nhosp.



Town Overview

Gardner lies within the Worcester Plateau Ecoregion, an area that includes the most hilly areas of the central upland of Massachusetts with a few high monadnocks and mountains. The dominant forest types present are transition hardwoods and some northern hardwoods. Forested wetlands are common. Surface waters are acidic. Many major rivers drain this area.



Gardner at a Glance

- Total Area: 14,728 acres (23.0 square miles)
- Human Population in 2010: 20,228
- Open space protected in perpetuity: 3,706 acres, or 25.2% percent of total area*
- BioMap2 Core Habitat: 463 acres
- BioMap2 Core Habitat Protected: 205 acres or 44.2%
- BioMap2 Critical Natural Landscape: 2,153 acres
- BioMap2 Critical Natural Landscape Protected: 1,391 acres or 64.6%.

BioMap2 Components

Core Habitat

- 4 Exemplary or Priority Natural Community Cores
- 2 Wetland Cores
- 3 Aquatic Cores
- 5 Species of Conservation Concern Cores**
 - 3 birds, 1 insect, 2 plants

Critical Natural Landscape

- 2 Landscape Blocks
- 8 Wetland Core Buffers
- 3 Aquatic Core Buffers

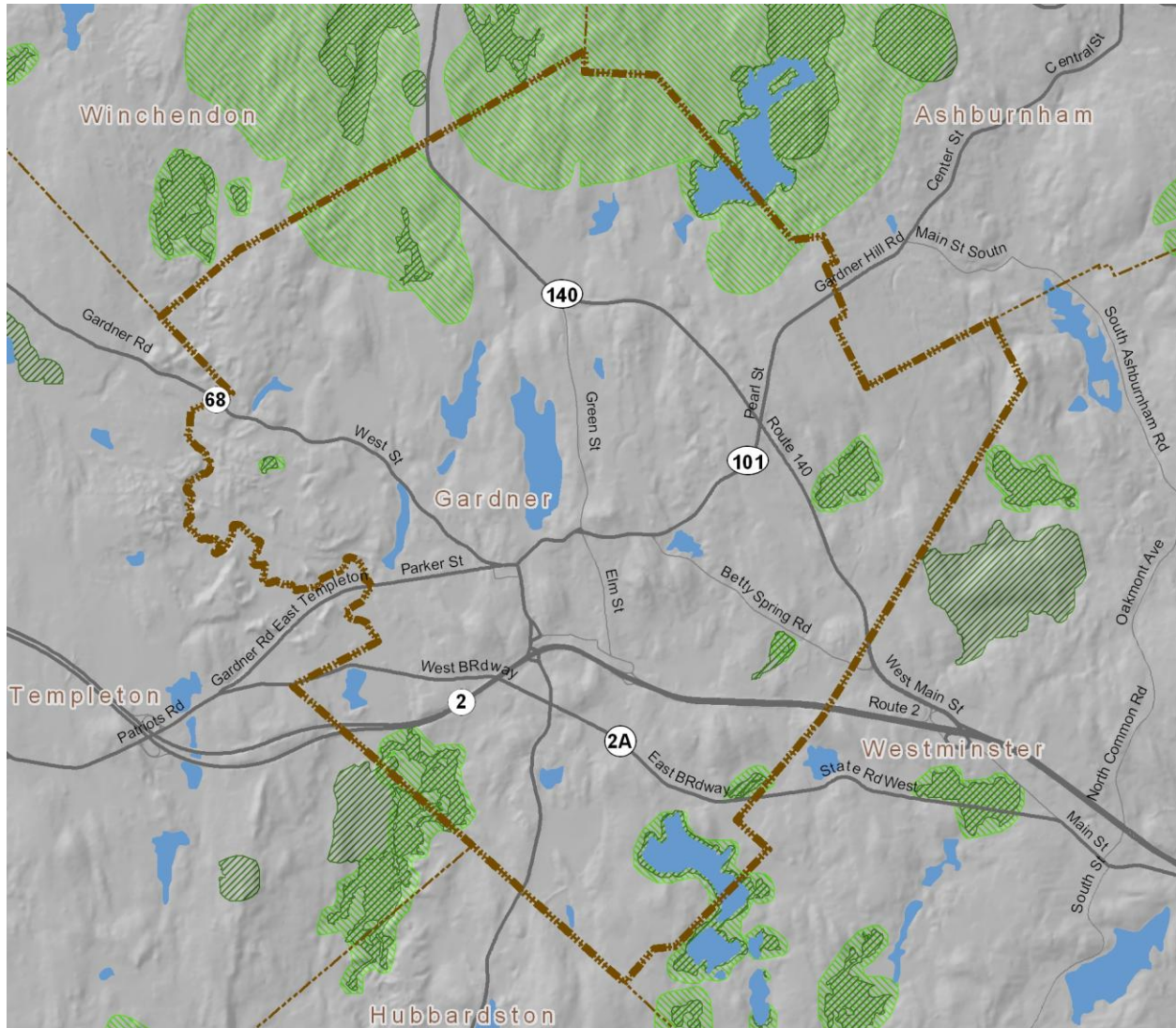
* Calculated using MassGIS data layer "Protected and Recreational Open Space—March, 2012".



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

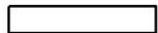




BioMap2 Core Habitat and Critical Natural Landscape in Gardner



-  BioMap2 Core Habitat
-  BioMap2 Critical Natural Landscape

1 Mile




**Natural Heritage
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 Species Program**

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For more information on rare species and natural communities, please see our fact sheets online at www.mass.gov/nhesp.



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

Insects

Moths

[Pitcher Plant Borer](#), (*Papaipema appassionata*), T

Birds

[American Bittern](#), (*Botaurus lentiginosus*), E

[Common Loon](#), (*Gavia immer*), SC

[Eastern Whip-poor-will](#), (*Caprimulgus vociferus*), SC

Plants

[Dwarf Mistletoe](#), (*Arceuthobium pusillum*), SC

[Algae-like Pondweed](#), (*Potamogeton confervoides*), T

Priority Natural Communities

[Kettlehole Level Bog](#), S2

[Acidic Shrub Fen](#), S3

[Level Bog](#), 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.

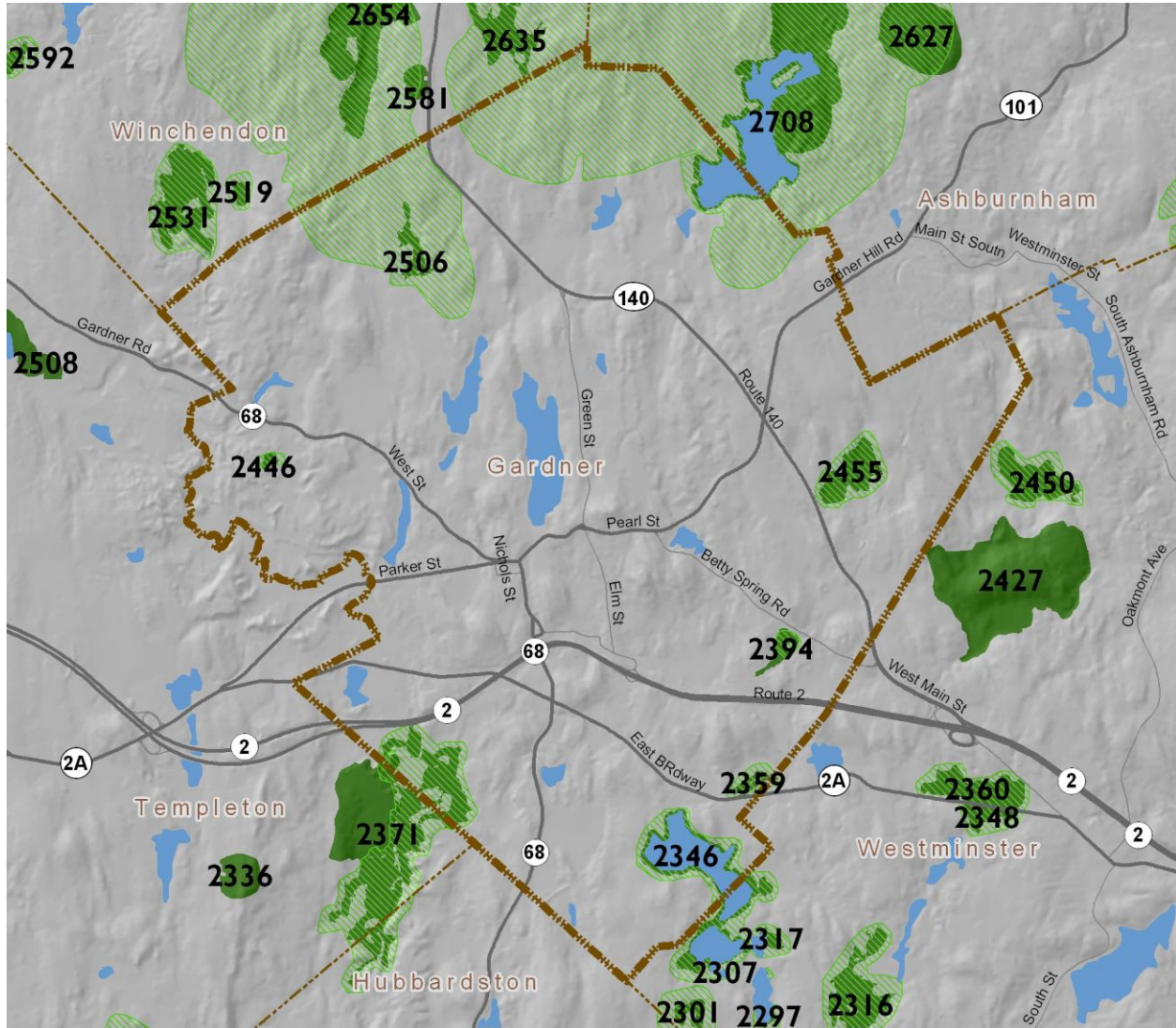
S3 = Vulnerable communities, typically have 21-100 sites or limited acreage across the state.





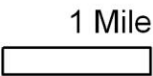


BioMap2 Core Habitat in Gardner

Core IDs correspond with the following element lists and summaries.



-  BioMap2 Core Habitat
-  BioMap2 Critical Natural Landscape





Elements of BioMap2 Cores

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

Core 2346

- Aquatic Core
- Wetland Core
- Priority & Exemplary Natural Communities
- Level Bog S3
- Species of Conservation Concern
- Algae-like Pondweed *Potamogeton confervoides* T

Core 2359

- Priority & Exemplary Natural Communities
- Acidic Shrub Fen S3

Core 2371

- Wetland Core
- Species of Conservation Concern
- Eastern Whip-poor-will *Caprimulgus vociferus* SC
- Grasshopper Sparrow *Ammodramus savannarum* T
- Vesper Sparrow *Pooecetes gramineus* T

Core 2394

- Priority & Exemplary Natural Communities
- Level Bog S3
- Species of Conservation Concern
- Dwarf Mistletoe *Arceuthobium pusillum* SC
- Pitcher Plant Borer Moth *Papaipema appassionata* T

Core 2446

- Priority & Exemplary Natural Communities
- Kettlehole Level Bog S2

Core 2455

- Aquatic Core
- Species of Conservation Concern
- American Bittern *Botaurus lentiginosus* E

Core 2506

- Wetland Core





Core 2708

Aquatic Core

Wetland Core

Vernal Pool Core

Species of Conservation Concern

Algae-like Pondweed	<i>Potamogeton confervoides</i>	T
Bartram's Shadbush	<i>Amelanchier bartramiana</i>	T
Dwarf Mistletoe	<i>Arceuthobium pusillum</i>	SC
Pod-grass	<i>Scheuchzeria palustris</i>	E
Sand Violet	<i>Viola adunca</i>	SC
Slender Cottongrass	<i>Eriophorum gracile</i>	T
Bog Elfin	<i>Callophrys lanoraieensis</i>	T
Forcipate Emerald	<i>Somatochlora forcipata</i>	E
Incurvate Emerald	<i>Somatochlora incurvata</i>	E
Ski-tipped Emerald	<i>Somatochlora elongata</i>	SC
Subarctic Darner	<i>Aeshna subarctica</i>	E
American Bittern	<i>Botaurus lentiginosus</i>	E
Common Loon	<i>Gavia immer</i>	SC





Core Habitat Summaries

Core 2346

A 257-acre Core Habitat featuring Wetland Core, Aquatic Core, Priority Natural Communities, and a 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.

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.

Level Bogs are dwarf-shrub peatlands, generally with pronounced hummocks and hollows in sphagnum moss. These wetland communities are very acidic and nutrient-poor because the peat isolates them from nutrients in groundwater and streams. This example of Level Bog occurs as several 10 acre patches of floating mat and vegetation found along the margin of a partially developed lake. It is in good condition, despite its proximity to development.

Algae-like Pondweed is an aquatic plant with fine thread-like leaves. This plant is endemic primarily to the Atlantic coast plain and can be found in acidic lakes and ponds.

Core 2359

A 13-acre Core Habitat featuring Priority Natural Communities.

Acidic Shrub Fens are shrub-dominated acidic peatlands found primarily along pond margins in the eastern and central part of the state. These wetland communities experience some groundwater and/or surface water inputs, but no calcareous seepage. This example of Acidic Shrub Fen is in fair condition, and is degraded by its lack of buffer to development and pollution.

Core 2371

A 469-acre Core Habitat featuring Wetland Core 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 284-acre Wetland Core is the 3rd largest in this ecoregion and among the largest 20% of Wetland Cores statewide.

Eastern Whip-poor-wills are nocturnal, ground-nesting birds of open dry oak woodlands and pine barrens. Their diet consists primarily of moths taken on the wing. Though seldom seen, their call was





once a common nighttime sound of summer nights across Massachusetts. Whip-poor-wills have experienced a dramatic range contraction in Massachusetts over the past few decades, and are now mostly relegated to a handful of large pine barrens. This range contraction is believed to be the result of development and the habitat succession caused by fire suppression. Whip-poor-wills often reclaim their former haunts following active habitat management, such as prescribed fire and targeted logging.

Grasshopper Sparrows nest in dry grasslands. Natural situations include sandplain grasslands, but they have adapted well to anthropogenic habitats such as airports and landfills. They are very sensitive to changes in plant composition and respond well to the effects of fire management.

Vesper Sparrows typically nest in large open, dry sites with a mixture of short herbaceous vegetation and bare ground. They have become rare breeders in Massachusetts despite being attracted to anthropogenic landscapes for breeding, such as potato fields, abandoned sandpits, and the disturbed margins of airports.

Core 2394

A 23-acre Core Habitat featuring a Priority Natural Community and Species of Conservation Concern.

Level Bogs are dwarf-shrub peatlands, generally with pronounced hummocks and hollows in sphagnum moss. These wetland communities are very acidic and nutrient-poor because the peat isolates them from nutrients in groundwater and streams. This is a classic example of a Level Bog community bordering a pond. Although somewhat affected by an adjacent railroad embankment, it is considered to be of good quality.

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*).

Pitcher Plant Borer moths inhabit Sphagnum bogs with pitcher plants (*Sarracenia purpurea*). The larvae bore into and feed on the roots of pitcher plants, also consuming the foliage in later instars.

Core 2446

A 6-acre Core Habitat featuring a Priority Natural Community.

Kettlehole Level Bogs are acidic dwarf-shrub peatlands with little water input or outflow that form in circular depressions left by melting ice blocks in sandy glacial outwash. The vegetation in Kettlehole Level Bogs usually grows in rings. This example of Kettlehole Level Bog, although poorly buffered, is in good condition with a well-developed bog mat.

Core 2455

A 69-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 2506

A 29-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 2708

An 851-acre Core Habitat featuring Wetland Core, Aquatic Core, Vernal Pool Core, 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 152-acre Wetland Core is among the largest 20% of Wetland Cores statewide and in this ecoregion.

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.

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.

Algae-like Pondweed is an aquatic plant with fine thread-like leaves. This plant is endemic primarily to the Atlantic coast plain and can be found in acidic lakes and ponds.

Bartram's Shadbush thrives in mountain thickets, near sphagnum bogs and on high-elevation, steep, wooded, rocky slopes.

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*).

Pod-grass, an erect, rush-like plant, inhabits open acidic peatlands, often in areas that are dominated by sedges and sphagnum mosses.

Sand Violet, a low-growing perennial herb with showy purple-violet flowers, grows in disturbed habitats, usually in full sun, on moist to very dry soils. It competes poorly with other plants and relies on periodic disturbance to remove potential competitors.





Slender Cottongrass is a plant of swamps and peatlands. Habitats in Massachusetts include acidic and calcareous fens and portions of seepage swamps.

The Bog Elfin is a very small lycaenid butterfly. It inhabits black spruce (*Picea mariana*) swamps and bogs. Larvae feed on the new growth at the branch tips of black spruce.

The Forcinate Emerald, a large dragonfly, inhabits pools in bogs and small forested streams.

The Incurvate Emerald, a large dragonfly, inhabits sphagnum bogs.

Ski-tipped Emeralds are dragonflies that inhabit small to medium-sized streams that may have a moderate or very sluggish flow and dense or little emergent vegetation.

Subarctic Darners, large dragonflies, inhabit sphagnum bogs and deep fens with wet sphagnum. The nymphs are aquatic, living in soupy sphagnum pools and among aquatic vegetation.

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

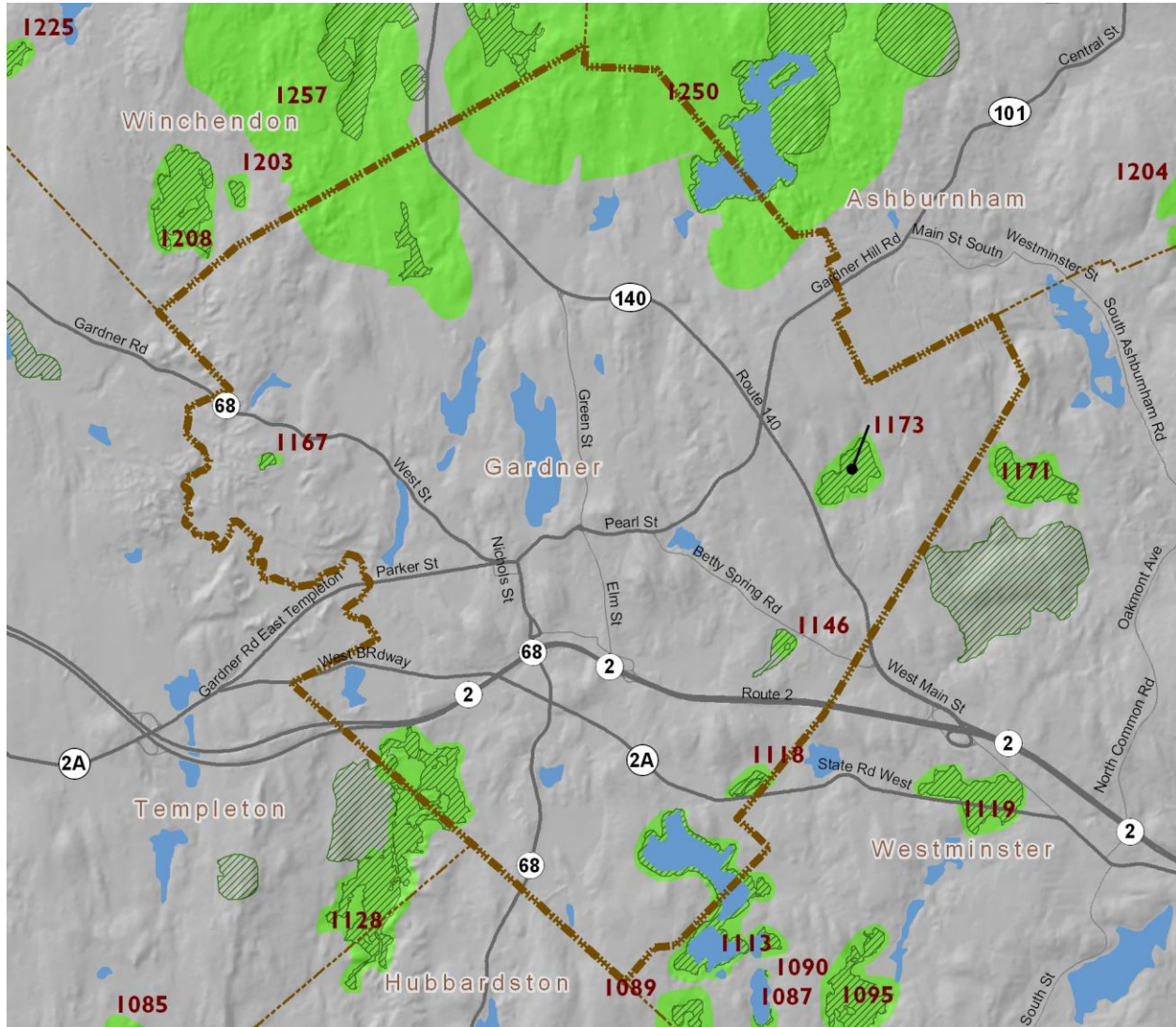
Common Loons rely upon large, clear lakes as breeding habitat. They only leave the water to tend to their nests, which are either placed in shoreline vegetation, or upon specially designed nesting platforms built for them by conservationists. Their diet consists primarily of fish, and Common Loons have been shown to be particularly vulnerable to human disturbance and toxins, especially mercury.





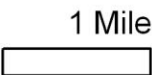


BioMap2 Critical Natural Landscape in Gardner

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



-  BioMap2 Core Habitat
-  BioMap2 Critical Natural Landscape



Natural Heritage
& Endangered
Species Program

Massachusetts Division of Fisheries and Wildlife
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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 Gardner. The elements listed here may not occur within the bounds of Gardner.

CNL 1113

Aquatic Core Buffer
Wetland Core Buffer

CNL 1118

Wetland Core Buffer

CNL 1128

Wetland Core Buffer

CNL 1146

Wetland Core Buffer

CNL 1167

Wetland Core Buffer

CNL 1173

Aquatic Core Buffer

CNL 1250

Aquatic Core Buffer
Landscape Block
Wetland Core Buffer

CNL 1257

Landscape Block
Wetland Core Buffer





Critical Natural Landscape Summaries

CNL 1113

A 411-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 1118

A 36-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 1128

A 554-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 1146

A 16-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 1167

A 10-acre Critical Natural Landscape featuring Wetland Core Buffer.

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CNL 1173

A 110-acre Critical Natural Landscape featuring Aquatic 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 1250

A 4,304-acre Critical Natural Landscape featuring Aquatic Core Buffer, Wetland Core Buffer and Landscape Block.

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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 1257

A 2,792-acre Critical Natural Landscape featuring 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.

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Natural Heritage & Endangered Species Fund

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