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.
Table of Contents

Introduction

What is BioMap2 – Purpose and applications

One plan, two components

Understanding Core Habitat and its components

Understanding Critical Natural Landscape and its components

Understanding Core Habitat and Critical Natural Landscape Summaries

Sources of Additional Information

Newbury Overview

Core Habitat and Critical Natural Landscape Summaries

Elements of BioMap2 Cores

Core Habitat Summaries

Elements of BioMap2 Critical Natural Landscapes

Critical Natural Landscape Summaries
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.
- 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

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.
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 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**

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.

<table>
<thead>
<tr>
<th>Taxonomic Group</th>
<th>MESA-listed Species of Conservation Concern</th>
<th>Non-listed Species of Conservation Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammals</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Birds</td>
<td>27</td>
<td>23</td>
</tr>
<tr>
<td>Reptiles</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Amphibians</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Fish</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Invertebrates</td>
<td>102</td>
<td>9</td>
</tr>
<tr>
<td>Plants</td>
<td>256</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>413</strong></td>
<td><strong>62</strong></td>
</tr>
</tbody>
</table>

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 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.
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.
BioMap2
Conserving the Biodiversity of Massachusetts in a Changing World

Town Overview
Newbury lies within the Southern New England Coastal Plains and Hills Ecoregion, an area comprised of plains with a few low hills. Forests are mainly central hardwoods with some transition hardwoods and some elm-ash-red maple and red and white pine. Many major rivers drain this area.

Newbury at a Glance
- Total Area: 15,476 acres (24.2 square miles)
- Human Population in 2010: 6,666
- Open space protected in perpetuity: 7,184 acres, or 46.4% percent of total area*
- BioMap2 Core Habitat: 8,133 acres
- BioMap2 Core Habitat Protected: 5,340 acres or 65.7%
- BioMap2 Critical Natural Landscape: 9,233 acres
- BioMap2 Critical Natural Landscape Protected: 6,010 acres or 65.1%.

BioMap2 Components

Core Habitat
- 6 Exemplary or Priority Natural Community Cores
- 2 Forest Cores
- 14 Wetland Cores
- 3 Aquatic Cores
- 1 Vernal Pool Core
- 12 Species of Conservation Concern Cores**
  - 18 birds, 3 reptiles, 4 amphibians, 2 fishes, 1 insect, 2 snails, 4 plants

Critical Natural Landscape
- 4 Landscape Blocks
- 10 Wetland Core Buffers
- 3 Aquatic Core Buffers
- 23 Coastal Adaptation Areas
- 1 Tern Foraging Area

* 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.

For more information on rare species and natural communities, please see our fact sheets online at www.mass.gov/nhesp.
BioMap2 Core Habitat and Critical Natural Landscape in Newbury

BioMap2 Core Habitat

BioMap2 Critical Natural Landscape

1 Mile
Species of Conservation Concern, Priority and Exemplary Natural Communities,
and Other Elements of Biodiversity in Newbury

Snails

- New England Siltsnail, *(Floridobia winkleyi)*, SC
- Coastal Marsh Snail, *(Littoridinops tenuipes)*, SC

Insects

- Mocha Emerald, *(Somatochlora linearis)*, SC

Amphibians

- Four-toed Salamander, *(Hemidactylium scutatum)*, Non-listed SWAP
- Northern Leopard Frog, *(Rana pipiens)*, Non-listed SWAP
- Blue-spotted Salamander, *(Ambystoma laterale)*, SC
- Eastern Spadefoot, *(Scaphiopus holbrookii)*, T

Fishes

- Atlantic Sturgeon, *(Acipenser oxyrinchus)*, E
- Bridle Shiner, *(Notropis bifrenatus)*, SC

Reptiles

- Eastern Ribbon Snake, *(Thamnophis sauritus)*, Non-listed SWAP
- Northern Black Racer, *(Coluber constrictor)*, Non-listed SWAP
- Blanding’s Turtle, *(Emydoidea blandingii)*, T

Birds

- Upland Sandpiper, *(Bartramia longicauda)*, E
- American Bittern, *(Botaurus lentiginosus)*, E
- Sedge Wren, *(Cistothorus platensis)*, E
- Least Bittern, *(Ixobrychus exilis)*, E
- Saltmarsh Sharp-tailed Sparrow, *(Ammodramus caudactus)*, Non-listed SWAP
- Sanderling, *(Calidris alba)*, Non-listed SWAP
- Seaside Sparrow, *(Ammodramus maritimus)*, Non-listed SWAP
- Short-billed Dowitcher, *(Limnodromus griseus)*, Non-listed SWAP
- Sora, *(Porzana carolina)*, Non-listed SWAP
- Common Tern, *(Sterna hirundo)*, SC
- Common Moorhen, *(Gallinula chloropus)*, SC
- Least Tern, *(Sternula antillarum)*, SC
- Barn Owl, *(Tyto alba)*, SC
- Eastern Whip-poor-will, *(Caprimulgus vociferus)*, SC
- Piping Plover, *(Charadrius melodus)*, T
- Northern Harrier, *(Circus cyaneus)*, T
- Bald Eagle, *(Haliaeetus leucocephalus)*, T
King Rail, *(Rallus elegans)*, T

Plants

- **Estuary Arrowhead**, *(Sagittaria montevidensis ssp. spongiosa)*, E
- **Hemlock Parsley**, *(Conioselinum chinense)*, SC
- **Seabeach Needlegrass**, *(Aristida tuberculosa)*, T
- **Long’s Bulrush**, *(Scirpus longii)*, T

Priority Natural Communities

- **Estuarine Intertidal: Brackish Tidal Marsh**, S1
- Maritime Dune Community, S2
- **Marine Subtidal: Flats**, S2
- **Hickory - Hop hornbeam Forest/Woodland**, S2
- **Estuarine Intertidal: Salt Marsh**, S3

Other BioMap2 Components

- **Forest Core**
- **Aquatic Core**
- **Wetland Core**
- **Vernal Pool Core**
- **Landscape Block**
- **Aquatic Core Buffer**
- **Wetland Core Buffer**
- **Coastal Adaptation Area**
- **Tern Foraging Area**

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 Newbury

Core IDs correspond with the following element lists and summaries.
Elements of BioMap2 Cores

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

Core 2958
Species of Conservation Concern
Four-toed Salamander  *Hemidactylium scutatum*  Non-listed SWAP

Core 2960
Species of Conservation Concern
Blue-spotted Salamander  *Ambystoma laterale*  SC

Core 2973
Priority & Exemplary Natural Communities
Estuarine Intertidal: Salt Marsh  S3

Core 2981
Species of Conservation Concern
Northern Black Racer  *Coluber constrictor*  Non-listed SWAP

Core 2984
Priority & Exemplary Natural Communities
Hickory - Hop hornbeam Forest/Woodland  S2

Core 2986
Priority & Exemplary Natural Communities
Estuarine Intertidal: Salt Marsh  S3

Core 2987
Species of Conservation Concern
Hemlock Parsley  *Conioselinum chinense*  SC

Core 2988
Priority & Exemplary Natural Communities
Estuarine Intertidal: Salt Marsh  S3

Core 2992
Forest Core
Wetland Core
Priority & Exemplary Natural Communities
Estuarine Intertidal: Brackish Tidal Marsh  S1
Species of Conservation Concern
Mocha Emerald  *Somatochlora linearis*  SC
Eastern Ribbon Snake  *Thamnophis sauritus*  Non-listed SWAP
Eastern Whip-poor-will  *Caprimulgus vociferus*  SC
Sora  *Porzana carolina*  Non-listed SWAP
## Core 2995
- Wetland Core

## Core 2996
- Forest Core
- Aquatic Core
- Wetland Core
- Vernal Pool Core

### Species of Conservation Concern

<table>
<thead>
<tr>
<th>Species</th>
<th>Common Name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long's Bulrush</td>
<td>Scirpus longii</td>
<td>T</td>
</tr>
<tr>
<td>New England Bluet</td>
<td>Enallagma laterale</td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Blue-spotted Salamander</td>
<td>Ambystoma laterale</td>
<td>SC</td>
</tr>
<tr>
<td>Four-toed Salamander</td>
<td>Hemidactylum scutatum</td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Blanding's Turtle</td>
<td>Emydoidea blandingii</td>
<td>T</td>
</tr>
<tr>
<td>Northern Black Racer</td>
<td>Coluber constrictor</td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Bridle Shiner</td>
<td>Notropis bifrenatus</td>
<td>SC</td>
</tr>
<tr>
<td>American Bitter</td>
<td>Botaurus lentiginosus</td>
<td>E</td>
</tr>
<tr>
<td>Least Bitter</td>
<td>Ixobrychus exilis</td>
<td>E</td>
</tr>
<tr>
<td>Sora</td>
<td>Porzana carolina</td>
<td>Non-listed SWAP</td>
</tr>
</tbody>
</table>

## Core 3018B
- Aquatic Core
- Wetland Core

### Priority & Exemplary Natural Communities

- Black Oak - Scarlet Oak Forest/Woodland: S3S4
- Coastal Forest/Woodland: S3
- Coastal Interdunal Marsh/Swale: S1
- Estuarine intertidal: brackish tidal marsh: S1
- Estuarine intertidal: salt marsh: S3
- Marine subtidal: flats: S2
- Maritime beach strand community: S3
- Maritime dune community: S2
- Oak - hickory forest: S4

### Species of Conservation Concern

<table>
<thead>
<tr>
<th>Species</th>
<th>Common Name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estuary Arrowhead</td>
<td>Sagittaria montevidensis ssp. spongiosa</td>
<td>E</td>
</tr>
<tr>
<td>Hemlock Parsley</td>
<td>Conioselinum chinense</td>
<td>SC</td>
</tr>
<tr>
<td>Long's Bulrush</td>
<td>Scirpus longii</td>
<td>T</td>
</tr>
<tr>
<td>Seabeach Dock</td>
<td>Rumex pallidus</td>
<td>T</td>
</tr>
<tr>
<td>Seabeach Needlegrass</td>
<td>Aristida tuberculosa</td>
<td>T</td>
</tr>
<tr>
<td>Silverling</td>
<td>Paronychia argyrocoma</td>
<td>E</td>
</tr>
<tr>
<td>Coastal Marsh Snail</td>
<td>Littoridinops tenuipes</td>
<td>SC</td>
</tr>
<tr>
<td>New England Siltsnail</td>
<td>Floridobia winkleyi</td>
<td>SC</td>
</tr>
<tr>
<td>Eastern Spadefoot</td>
<td>Scaphiopus holbrooki</td>
<td>T</td>
</tr>
<tr>
<td>Northern Leopard Frog</td>
<td>Rana pipiens</td>
<td>Non-listed SWAP</td>
</tr>
</tbody>
</table>

---

**Natural Heritage & Endangered Species Program**

For more information on rare species and natural communities, please see our fact sheets online at [www.mass.gov/nhesp](http://www.mass.gov/nhesp).
<table>
<thead>
<tr>
<th>Species Name</th>
<th>Scientific Name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlantic Sturgeon</td>
<td><em>Acipenser oxyrinchus</em></td>
<td>E</td>
</tr>
<tr>
<td>Bridle Shiner</td>
<td><em>Notropis bifrenatus</em></td>
<td>SC</td>
</tr>
<tr>
<td>Shortnose Sturgeon</td>
<td><em>Acipenser brevirostrum</em></td>
<td>E</td>
</tr>
<tr>
<td>American Bittern</td>
<td><em>Botaurus lentiginosus</em></td>
<td>E</td>
</tr>
<tr>
<td>Bald Eagle</td>
<td><em>Haliaetus leucocephalus</em></td>
<td>T</td>
</tr>
<tr>
<td>Barn Owl</td>
<td><em>Tyto alba</em></td>
<td>SC</td>
</tr>
<tr>
<td>Common Moorhen</td>
<td><em>Gallinula chloropus</em></td>
<td>SC</td>
</tr>
<tr>
<td>Common Tern</td>
<td><em>Sterna hirundo</em></td>
<td>SC</td>
</tr>
<tr>
<td>Eastern Whip-poor-will</td>
<td><em>Caprimulgus vociferus</em></td>
<td>SC</td>
</tr>
<tr>
<td>Grasshopper Sparrow</td>
<td><em>Ammodramus savannarum</em></td>
<td>T</td>
</tr>
<tr>
<td>King Rail</td>
<td><em>Rallus elegans</em></td>
<td>T</td>
</tr>
<tr>
<td>Least Bittern</td>
<td><em>Ixobrychus exilis</em></td>
<td>E</td>
</tr>
<tr>
<td>Least Tern</td>
<td><em>Sternula antillarum</em></td>
<td>SC</td>
</tr>
<tr>
<td>Northern Harrier</td>
<td><em>Circus cyaneus</em></td>
<td>T</td>
</tr>
<tr>
<td>Piping Plover</td>
<td><em>Charadrius melodus</em></td>
<td>T</td>
</tr>
<tr>
<td>Saltmarsh Sharp-tailed Sparrow</td>
<td><em>Ammodramus caudactus</em></td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Sanderling</td>
<td><em>Calidris alba</em></td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Seaside Sparrow</td>
<td><em>Ammodramus maritimus</em></td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Sedge Wren</td>
<td><em>Cistothorus platensis</em></td>
<td>E</td>
</tr>
<tr>
<td>Sharp-shinned Hawk</td>
<td><em>Accipiter striatus</em></td>
<td>SC</td>
</tr>
<tr>
<td>Short-billed Dowitcher</td>
<td><em>Limnodromus griseus</em></td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Sora</td>
<td><em>Porzana carolina</em></td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Upland Sandpiper</td>
<td><em>Bartramia longicauda</em></td>
<td>E</td>
</tr>
</tbody>
</table>
Core Habitat Summaries

Core 2958

A 120-acre Core Habitat featuring a Species of Conservation Concern.

Four-toed Salamanders live in forested habitats surrounding swamps, bogs, marshes, vernal pools, and other fish-free waters that are used as breeding sites. Most breeding sites in Massachusetts are characterized by pit-and-mound topography with significant sphagnum-moss cover. Eggs are typically laid in mounds or patches of sphagnum moss that overhang water. Upon hatching, the larvae wriggle through the moss and drop into the water, where they will develop for several weeks prior to metamorphosis.

Core 2960

An 83-acre Core Habitat featuring a Species of Conservation Concern.

Adult and juvenile Blue-spotted 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 2973

A 5-acre Core Habitat featuring Priority Natural Communities.

The Salt Marsh community type is a graminoid-dominated, tidally flooded, coastal community with several vegetative zones. Salt Marshes form in areas subject to oceanic tides, but sheltered from wave energy. At over 16,000 acres, this example of Salt Marsh is the largest in New England. It is generally in good condition and largely under conservation ownership.

Core 2981

A <1-acre Core Habitat featuring a Species of Conservation Concern.

The Northern Black Racer is a snake of young upland forests, shrublands such as pitch pine/scrub oak communities and rock cliffs. Although relatively common, its range appears to be constricting and its abundance has been declining.

Core 2984

A 3-acre Core Habitat featuring a Priority Natural Community.

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 small example of Hickory - Hop Hornbeam
Forest/Woodland, on the top of a serpentine knoll, has high diversity with scattered invasive exotic species. The surrounding land includes development and successional forest.

Core 2986

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

The Salt Marsh community type is a graminoid-dominated, tidally flooded, coastal community with several vegetative zones. Salt Marshes form in areas subject to oceanic tides, but sheltered from wave energy. At over 16,000 acres, this example of Salt Marsh is the largest in New England. It is generally in good condition and largely under conservation ownership.

Core 2987

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

In Massachusetts, Hemlock Parsley is usually found in swamps, wet meadows, bogs or fens, and marshy forests. It can tolerate shady environments and wet, acidic soils, although it is usually found in less acidic (circumneutral to limy) wetlands.

Core 2988

A 11-acre Core Habitat featuring a Priority Natural Community.

The Salt Marsh community type is a graminoid-dominated, tidally flooded, coastal community with several vegetative zones. Salt Marshes form in areas subject to oceanic tides, but sheltered from wave energy. At over 16,000 acres, this example of Salt Marsh is the largest in New England. It is generally in good condition and largely under conservation ownership.

Core 2992

A 1,261-acre Core Habitat featuring Forest Core, Wetland Core, a Priority Natural Community, and Species of Conservation Concern.

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.

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 Brackish Tidal Marsh community is often found in stretches of coastal rivers where salt and fresh water mix, and consists of mixed herbaceous vegetation that is flooded by daily tides. The community is structurally diverse, including high marsh and low marsh. This example of Brackish Tidal Marsh is the largest in Massachusetts, and is well buffered in the landscape, although exotic invasive species are present.
The Mocha Emerald dragonfly breeds in small to medium-sized streams that flow through woods or swamps. The young spend a year or more in the streams, and then emerge as adults that live in surrounding upland forests.

Eastern Ribbon Snakes are a medium-sized, very thin snake ranging from 7 to 34 inches long at maturity. They are active during the day and live in wetlands and edges of open water being comfortable in water and on land, eating amphibians, insects, and occasional fish. This species hibernates in ant mounds, rodent burrows, crayfish burrows, and bank burrows.

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 the result of development and the habitat succession caused fire suppression. Whip-poor-wills often reclaim their former haunts following active habitat management, such as prescribed fire and targeted logging.

Soras are secretive marshbirds that typically nest in dense cattail marshes with interspersed open water.

**Core 2995**

A 16-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 2996**

An 8,784-acre Core Habitat featuring Forest Core, Wetland Core, Aquatic Core, Vernal Pool Core, and Species of Conservation Concern.

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.

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.

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.
Long’s Bulrush is a globally rare, robust sedge of open peaty wetlands. In Massachusetts, Long’s Bulrush is known to occur in acidic fen and wet meadow communities associated with rivers.

New England Bluets are damselflies whose habitat includes coastal plain ponds, open water in swamps, and other ponds and lakes. It occurs only in the northeastern United States and is most common from eastern Massachusetts into Connecticut.

Adult and juvenile Blue-spotted 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.

Four-toed Salamanders live in forested habitats surrounding swamps, bogs, marshes, vernal pools, and other fish-free waters that are used as breeding sites. Most breeding sites in Massachusetts are characterized by pit-and-mound topography with significant sphagnum-moss cover. Eggs are typically laid in mounds or patches of sphagnum moss that overhang water. Upon hatching, the larvae wriggle through the moss and drop into the water, where they will develop for several weeks prior to metamorphosis.

Blanding’s Turtle is a medium sized turtle. It inhabits a mix of seasonal pools, marshes, shrub swamps, forest, and open uplands. After overwintering in the deep muds of wetlands, Blanding’s Turtles move overland to vernal pools and shrub swamps to feed and mate. Loss of only a few adults annually can cause populations to decline as they do not reproduce until late in life (14-20 yrs), and have low replacement rates due to low nest and juvenile survivorship. Roads are the primary cause of adult mortality.

The Northern Black Racer is a snake of young upland forests, shrublands such as pitch pine/scrub oak communities and rock cliffs. Although relatively common, its range appears to be constricting and its abundance has been declining.

Bridle Shiners are small (<5 cm) minnows that are found in clear water in slack areas of streams and rivers and are also found in lakes and ponds.

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

Least Bitterns are heron-like birds that typically nest in cattail marshes interspersed with open water and are very sensitive to disturbance.

Soras are secretive marshbirds that typically nest in dense cattail marshes with interspersed open water.

Core 3018B

A 28,895-acre section of a larger 35,194-acre Core Habitat featuring Wetland Core, Aquatic Core, Priority Natural Communities, and Species of Conservation Concern.

All along the North Shore, from the mouth of the Merrimack River to the north shore of Cape Ann, stretches the Great Marsh, an extraordinary expanse of salt marsh. This marsh and its attendant barrier islands, such as Plum Island, support 25 MESA-listed rare species of birds, fish, snails, plants, and even the Eastern Spadefoot toad. The mouth of the Merrimack is home to a few federally Endangered Atlantic
and Shortnose Sturgeons, as well as nesting and over-wintering Bald Eagles. On Plum Island, the North Pool, a freshwater impoundment in the salt marsh, is considered one of the most productive marsh bird sites in southern New England, supporting the entire suite of MESA-listed rare marsh birds, along with significant populations of Sora and Marsh Wren. A little to the south, the long barrier beach at Crane Beach is one of Massachusetts’ major nesting sites for the federally Threatened Piping Plover, as well as strong numbers of Least Terns.

Black Oak-Scarlet Oak Forest is a fairly open oak/heath community maintained by regular fire. Often occurring on dry slopes, this community grades into Mixed Oak and Pine-Oak Forests. The subcanopy is sparse, and the shrub layer dense. This young occurrence of Black Oak - Scarlet Oak Woodland is on two upland islands in the Merrimack River with few exotics and good natural diversity.

Coastal Forests are mixed deciduous communities, and are often shorter than forests further inland, but taller than maritime forests. They may have dense shrubs and vines. This community is found in sheltered areas along the coast. These patchy occurrences of Coastal Forest are on marsh island uplands on conservation land succeeding from past agricultural use.

The Coastal Interdunal Marsh/Swale community is a graminoid- or shrub-dominated coastal community that occurs in shallow depressions between sand dunes. They occur as part of a dune system, and the best examples are complexes of numerous swales. This example of the Coastal/Interdunal Marsh/Swale community is in good condition, and is well buffered within a naturally vegetated landscape.

The Brackish Tidal Marsh community is often found in stretches of coastal rivers where salt and fresh water mix, and consists of mixed herbaceous vegetation that is flooded by daily tides. This Core includes three examples of Brackish Tidal Marsh including the largest in Massachusetts, which is well buffered in the landscape, although exotic invasive species are present.

The Salt Marsh community type is a graminoid-dominated, tidally flooded coastal community with several vegetative zones. Salt Marshes form in areas subject to oceanic tides, but sheltered from wave energy. At over 16,000 acres this example of Salt Marsh is the largest in New England. It is generally in good condition and largely under conservation ownership.

Marine Subtidal Flats, often called eelgrass beds, are offshore communities dominated by eelgrass (Zostera marina) that occur in shallow water. They provide important habitat for juvenile fish and invertebrates, and feeding grounds for shorebirds. This example of Marine Subtidal Flats is extremely sparsely vegetated but has a rich diversity of invertebrate fauna that provide forage for many species of birds.

Maritime Beach Strand communities are sparsely vegetated, narrow, wrack-strewn areas between the line of high tide and the foredunes. They are usually part of barrier beach systems and are found seaward of any dunes, but above daily high tides. This important example of Maritime Beach Strand extends over 2 miles. It is in very good condition despite heavy recreational use in some areas, provides important shorebird nesting habitat, and is well buffered by other coastal natural communities.

The Maritime Dune Community consists of patches of herbaceous plants interspersed with areas of bare sand and shrubs. It occurs on windswept dunes within the salt spray zone, and often grades into shrubland or woodlands on more sheltered back dunes. This Core has two examples of Maritime Dunes, one covering 600 windswept acres and the other 900 acres. The larger is poorly buffered from
development and is heavily disturbed by human impacts and invasive plant species. At the smaller site, there are over a dozen Coastal Interdunal Marsh/Swales of various sizes and composition, another type of uncommon natural community.

Oak-Hickory Forests are dominated by a variety of oak species, with hickories present in lower densities. They generally occupy upper slopes or ridgetops. A subcanopy commonly present includes hop hornbeam, flowering dogwood, and shadbush. This Oak-Hickory Forest occurs as many small pockets in the upland edges around a large salt marsh. The salt marsh, brooks, other wetlands, and roads separate the patches. Old mining depressions occur throughout.

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.
**BioMap2 Critical Natural Landscape in Newbury**

Critical Natural Landscape IDs correspond with the following element lists and summaries.
Elements of BioMap2 Critical Natural Landscapes

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

**CNL 1335**
- Aquatic Core Buffer
- Landscape Block
- Wetland Core Buffer

**CNL 1341**
- Coastal Adaptation Area

**CNL 1342**
- Coastal Adaptation Area

**CNL 1343**
- Coastal Adaptation Area

**CNL 1344**
- Aquatic Core Buffer
- Wetland Core Buffer

**CNL 1362**
- Aquatic Core Buffer
- Coastal Adaptation Area
- Landscape Block
- Tern Foraging Area
Critical Natural Landscape Summaries

CNL 1335

A 2,322-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 1341

A 28-acre Critical Natural Landscape featuring Coastal Adaptation Area.

The coastal habitats of Massachusetts are particularly vulnerable to potential sea-level rise in the next century, which many estimates suggest is likely to exceed one meter. Therefore, in addition to prioritizing current coastal habitats, the creators of BioMap2 examined the landward side of salt marshes to determine where these habitats might move to as sea levels rise. Undeveloped lands adjacent to and up to one and a half meters above existing salt marshes were identified, and included as Critical Natural Landscapes with high potential to support inland migration of salt marsh and other coastal habitats over the coming century.

CNL 1342

A 99-acre Critical Natural Landscape featuring Coastal Adaptation Area.
The coastal habitats of Massachusetts are particularly vulnerable to potential sea-level rise in the next century, which many estimates suggest is likely to exceed one meter. Therefore, in addition to prioritizing current coastal habitats, the creators of BioMap2 examined the landward side of salt marshes to determine where these habitats might move to as sea levels rise. Undeveloped lands adjacent to and up to one and a half meters above existing salt marshes were identified, and included as Critical Natural Landscapes with high potential to support inland migration of salt marsh and other coastal habitats over the coming century.

CNL 1343
A 9-acre Critical Natural Landscape featuring Coastal Adaptation Area.

CNL 1344
A 414-acre Critical Natural Landscape featuring Aquatic Core Buffer and Wetland Core Buffer.

CNL 1362
A 50,627-acre Critical Natural Landscape featuring Aquatic Core Buffer, Landscape Block, Coastal Adaptation Area, and Tern Foraging Area.

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.

This 8,989-acre Landscape Block is the fourth largest of 62 Blocks in the ecoregion. Unlike Landscape Blocks in much of the state that are dominated by upland forests, this coastal Landscape Block is dominated by unique and important salt marsh, barrier beach, and estuary habitats.

The coastal habitats of Massachusetts are particularly vulnerable to potential sea-level rise in the next century, which many estimates suggest is likely to exceed one meter. Therefore, in addition to prioritizing current coastal habitats, the creators of BioMap2 examined the landward side of salt marshes to determine where these habitats might move to as sea levels rise. Undeveloped lands adjacent to and up to one and a half meters above existing salt marshes were identified, and included as Critical Natural Landscapes with high potential to support inland migration of salt marsh and other coastal habitats over the coming century.

Terns range widely from their breeding colonies to forage. While the breeding and staging areas for Roseate, Arctic, Common, and Least Terns were included in the Species of Conservation Concern Core Habitat for BioMap2, tern foraging areas were included in BioMap2 as part of Critical Natural Landscape. The extent of foraging habitat for Arctic, Common, and Roseate Terns depends on the size of the breeding colony. For Least Tern, all shallow marine and estuarine waters within 2 miles of recent colony sites and up to 1 mile offshore were mapped as foraging habitat.
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.