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 (MESA), M.G.L. c.131A, and its implementing regulations 321 CMR 10.00. Rare species are categorized as Endangered, Threatened or of Special Concern according to the following:

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

In addition NHESP maintains an unofficial watch list of plants that are tracked due to potential conservation interest or concern, but are not regulated under the Massachusetts Endangered Species Act or other laws or regulations. Likewise, described natural communities are not regulated by any law or regulations, but they can help to identify ecologically important areas that are worthy of...
BioMap2: One Plan, Two Components

BioMap2 identifies two complementary spatial layers, Core Habitat and Critical Natural Landscape.

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
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.

For more information on rare species and natural communities, please see our fact sheets online at www.mass.gov/nhesp.
**Mashpee at a Glance**
- Total Area: 16,385 acres (25.6 square miles)
- Human Population in 2010: 14,006
- Open space protected in perpetuity: 4,389 acres, or 26.8% percent of total area*
- BioMap2 Core Habitat: 5,660 acres
- BioMap2 Core Habitat Protected: 2,272 acres or 40.1%
- BioMap2 Critical Natural Landscape: 9,642 acres
- BioMap2 Critical Natural Landscape Protected: 3,955 acres or 41.0%.

**BioMap2 Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>Number of Acres</th>
<th>Protected Acres</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td><strong>Core Habitat</strong></td>
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<td></td>
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</tr>
<tr>
<td>2 Exemplary or Priority Natural Community Cores</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Wetland Core</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Aquatic Cores</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 Species of Conservation Concern Cores**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 mammal, 10 birds, 2 reptiles, 1 amphibian, 1 fish, 10 insects, 3 mussels, 6 plants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical Natural Landscape</strong></td>
<td></td>
<td></td>
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<tr>
<td>4 Landscape Blocks</td>
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<td></td>
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<tr>
<td>2 Wetland Core Buffers</td>
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<td>7 Aquatic Core Buffers</td>
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</tr>
<tr>
<td>12 Coastal Adaptation Areas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Tern Foraging Areas</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

* 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 Mashpee

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).
Species of Conservation Concern, Priority and Exemplary Natural Communities, and Other Elements of Biodiversity in Mashpee

Mussels
- **Tidewater Mucket**, (*Leptodea ochracea*), SC
- **Eastern Pondmussel**, (*Ligumia nasuta*), SC
- **Triangle Floater**, (*Alasmidonta undulata*), Non-listed SWAP species

Insects

Moths
- **Chain Dot Geometer**, (*Cingilia catenaria*), SC
- **Barrens Buckmoth**, (*Hemileuca maia*), SC
- **Water-willow Stem Borer**, (*Papaipema sulphurata*), T

Butterflies
- **Frosted Elfin**, (*Callophrys irus*), SC

Beetles
- **Purple Tiger Beetle**, (*Cicindela purpurea*), SC

Damselsflies
- **Scarlet Bluet**, (*Enallagma pictum*), T
- **Pine Barrens Bluet**, (*Enallagma recurvatum*), T
- **New England Bluet**, (*Enallagma laterale*), Non-listed SWAP species
- **Little Bluet**, (*Enallagma minusculum*), Non-listed SWAP

Dragonflies
- **Comet Darter**, (*Anax longipes*), SC

Amphibians
- **Four-toed Salamander**, (*Hemidactylium scutatum*), Non-listed SWAP

Fishes
- **American Brook Lamprey**, (*Lampetra appendix*), T

Reptiles
- **Eastern Box Turtle**, (*Terrapene carolina*), SC
- **Eastern Ribbon Snake**, (*Thamnophis sauritus*), Non-listed SWAP

Birds
- **Grasshopper Sparrow**, (*Ammodramus savannarum*), T
- **Upland Sandpiper**, (*Bartramia longicauda*), E
- **American Bittern**, (*Botaurus lentiginosus*), E
- **Piping Plover**, (*Charadrius melodus*), T
- **Northern Harrier**, (*Circus cyaneus*), T
- **Common Tern**, (*Sterna hirundo*), SC
- **Northern Parula**, (*Parula americana*), T
**Vesper Sparrow**, (*Pooecetes gramineus*), T
**Least Tern**, (*Sternula antillarum*), SC
**Barn Owl**, (*Tyto alba*), SC

**Mammals**
New England Cottontail, (*Sylvilagus transitionalis*), Non-listed SWAP

**Plants**
**Mattamuskeet Panic-grass**, (*Dichanthelium dichotomum ssp. mattamuskeetense*), E
**Redroot**, (*Lachnanthes carolina*), SC
**Dwarf Bulrush**, (*Lipocarpha micrantha*), T
**Pondshore Knotweed**, (*Persicaria puritanorum*), SC
**Terete Arrowhead**, (*Sagittaria teres*), SC
Broom Crowberry, (*Corema conradii*), recently de-listed

**Priority Natural Communities**
**Coastal Atlantic White Cedar Swamp**, S2
**Pitch Pine - Scrub Oak Community**, S2

**Other BioMap2 Components**
**Aquatic Core**
**Wetland 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 Mashpee

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 Mashpee. The elements listed here may not occur within the bounds of Mashpee.

Core 147

Species of Conservation Concern
Mattamuskeet Panic-grass  
* Dichanthelium dichotomum ssp. mattamuskeetense  

Core 151

Wetland Core
Species of Conservation Concern
Bristly Foxtail  
New England Blazing Star  
Common Tern  
Least Tern  
Piping Plover  

Core 171

Species of Conservation Concern
Common Tern  
Least Tern  
Piping Plover  

Core 187

Priority & Exemplary Natural Communities
Coastal Atlantic White Cedar Swamp  
Pitch Pine - Scrub Oak Community  
Species of Conservation Concern
Water-willow Stem Borer  

Core 205

Species of Conservation Concern
Water-willow Stem Borer  

Core 206

Species of Conservation Concern
Little Bluet  

For more information on rare species and natural communities, please see our fact sheets online at [www.mass.gov/nhsp](http://www.mass.gov/nhsp).
### Core 207

| Species of Conservation Concern | Water-willow Stem Borer | *Papaipema sulphurata* | T |

### Core 214

| Species of Conservation Concern | Little Bluet | *Enallagma minusculum* | Non-listed SWAP |

### Core 215

| Species of Conservation Concern | Little Bluet | *Enallagma minusculum* | Non-listed SWAP |

### Core 227

| Species of Conservation Concern | Grasshopper Sparrow | *Ammodramus savannarum* | T |

### Core 232

**Aquatic Core**

### Core 251

| Species of Conservation Concern | Water-willow Stem Borer | *Papaipema sulphurata* | T |
| New England Bluet | *Enallagma laterale* | Non-listed SWAP |
| Pine Barrens Bluet | *Enallagma recurvatum* | T |
| Scarlet Bluet | *Enallagma pictum* | T |
| Comet Darner | *Anax longipes* | SC |
| Eastern Ribbon Snake | *Thamnophis sauritus* | Non-listed SWAP |
| American Brook Lamprey | *Lampetra appendix* | T |
| American Bittern | *Botaurus lentiginosus* | E |
| Northern Parula | *Parula americana* | T |
| New England Cottontail | *Sylvilagus transitionalis* | Non-listed SWAP |

### Core 295

| Species of Conservation Concern | Pondshore Knotweed | *Persicaria puritanorum* | SC |
| Terete Arrowhead | *Sagittaria teres* | SC |
| Eastern Pondmussel | *Ligumia nasuta* | SC |
| Tidewater Mucket | *Leptodea ochracea* | SC |
| Triangle Floater | *Alasmidonta undulata* | Non-listed SWAP |
| Water-willow Stem Borer | *Papaipema sulphurata* | T |
| New England Cottontail | *Sylvilagus transitionalis* | Non-listed SWAP |
Core 299

Species of Conservation Concern

| Little Bluet | Enallagma minusculum | Non-listed SWAP |

Core 507A

Forest Core
Aquatic Core

Priority & Exemplary Natural Communities

Kettlehole Level Bog S2

Species of Conservation Concern

<table>
<thead>
<tr>
<th>Adder's-tongue Fern</th>
<th>Ophioglossum pusillum</th>
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</thead>
<tbody>
<tr>
<td>Broad Tinker's-weed</td>
<td>Triosteum perfoliatum</td>
<td>E</td>
</tr>
<tr>
<td>Bushy Rockrose</td>
<td>Crocanthemum dunsomum</td>
<td>SC</td>
</tr>
<tr>
<td>Dwarf Bulrush</td>
<td>Lipocarpha micrantha</td>
<td>T</td>
</tr>
<tr>
<td>Maryland Meadow Beauty</td>
<td>Rhexia mariana</td>
<td>E</td>
</tr>
<tr>
<td>Ovate Spike-sedge</td>
<td>Eleocharis ovata</td>
<td>E</td>
</tr>
<tr>
<td>Papillose Nut Sedge</td>
<td>Scleria pauciflora</td>
<td>E</td>
</tr>
<tr>
<td>Plymouth Gentian</td>
<td>Sabatia kennedyana</td>
<td>SC</td>
</tr>
<tr>
<td>Pondshore Knotweed</td>
<td>Persicaria puritanorum</td>
<td>SC</td>
</tr>
<tr>
<td>Sandplain Flax</td>
<td>Linum intercursum</td>
<td>SC</td>
</tr>
<tr>
<td>Terete Arrowhead</td>
<td>Sagittaria teres</td>
<td>SC</td>
</tr>
<tr>
<td>Torrey's Beak-sedge</td>
<td>Rhynchospora torreyana</td>
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</tr>
<tr>
<td>Weak Rush</td>
<td>Juncus debilis</td>
<td>E</td>
</tr>
<tr>
<td>Tidewater Mucket</td>
<td>Leptodea ochracea</td>
<td>SC</td>
</tr>
<tr>
<td>Barrens Buckmoth</td>
<td>Hemileuca maia</td>
<td>SC</td>
</tr>
<tr>
<td>Barrens Daggermoth</td>
<td>Acronicta albarufa</td>
<td>T</td>
</tr>
<tr>
<td>Chain Dot Geometer</td>
<td>Cingilia catenaria</td>
<td>SC</td>
</tr>
<tr>
<td>Coastal Heathland Cutworm</td>
<td>Abagrotis nefascia</td>
<td>SC</td>
</tr>
<tr>
<td>Coastal Swamp Metarranthis Moth</td>
<td>Metarranthis pilosaria</td>
<td>SC</td>
</tr>
<tr>
<td>Gerhard's Underwing Moth</td>
<td>Catocala herodias gerhardi</td>
<td>SC</td>
</tr>
<tr>
<td>Melsheimer's Sack Bearer</td>
<td>Cicinnus melshemer</td>
<td>T</td>
</tr>
<tr>
<td>Pine Barrens Speranza</td>
<td>Speranza exonerata</td>
<td>SC</td>
</tr>
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<td>Pine Barrens Zale</td>
<td>Zale lunifera</td>
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<td>The Pink Streak</td>
<td>Dargida rubripennis</td>
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</tr>
<tr>
<td>Unexpected Cycnia</td>
<td>Cycnia inopinatus</td>
<td>T</td>
</tr>
<tr>
<td>Water-willow Stem Borer</td>
<td>Papaipema sulphurata</td>
<td>T</td>
</tr>
<tr>
<td>Frosted Elfin</td>
<td>Callophrys irus</td>
<td>SC</td>
</tr>
<tr>
<td>Purple Tiger Beetle</td>
<td>Cicindela purpurea</td>
<td>SC</td>
</tr>
<tr>
<td>Little Bluet</td>
<td>Enallagma minusculum</td>
<td>T</td>
</tr>
<tr>
<td>New England Bluet</td>
<td>Enallagma laterale</td>
<td>T</td>
</tr>
<tr>
<td>Pine Barrens Bluet</td>
<td>Enallagma recurvatum</td>
<td>T</td>
</tr>
<tr>
<td>Scarlet Bluet</td>
<td>Enallagma pictum</td>
<td>T</td>
</tr>
<tr>
<td>Comet Darner</td>
<td>Anax longipes</td>
<td>SC</td>
</tr>
</tbody>
</table>
### Spatterdock Darner
- **Scientific Name:** Rhionaeschna mutata
- **Status:** SC

### Eastern Spadefoot
- **Scientific Name:** Scaphiopus holbrookii
- **Status:** T

### Eastern Box Turtle
- **Scientific Name:** Terrapene carolina
- **Status:** SC

### Eastern Hognose Snake
- **Scientific Name:** Heterodon platirhinos

### Eastern Ribbon Snake
- **Scientific Name:** Thamnophis sauritus

### Northern Black Racer
- **Scientific Name:** Coluber constrictor

### Smooth Green Snake
- **Scientific Name:** Opheodrys vernalis

### Barn Owl
- **Scientific Name:** Tyto alba
- **Status:** SC

### Eastern Whip-poor-will
- **Scientific Name:** Caprimulgus vociferus
- **Status:** SC

### Grasshopper Sparrow
- **Scientific Name:** Ammodramus savannarum
- **Status:** T

### Northern Harrier
- **Scientific Name:** Circus cyaneus
- **Status:** T

### Upland Sandpiper
- **Scientific Name:** Bartramia longicauda
- **Status:** E

### Vesper Sparrow
- **Scientific Name:** Poecetes gramineus
- **Status:** T

### New England Cottontail
- **Scientific Name:** Sylvilagus transitionalis

---

### Core 507B

#### Aquatic Core

**Species of Conservation Concern**

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pondshore Knotweed</td>
<td>Persicaria puritanorum</td>
<td>SC</td>
</tr>
<tr>
<td>Redroot</td>
<td>Lachnanthes caroliana</td>
<td>SC</td>
</tr>
<tr>
<td>Eastern Pondmussel</td>
<td>Ligumia nasuta</td>
<td>SC</td>
</tr>
<tr>
<td>Tidewater Mussel</td>
<td>Leptodea ochracea</td>
<td>SC</td>
</tr>
<tr>
<td>Barrens Buckmoth</td>
<td>Hemileuca maia</td>
<td>SC</td>
</tr>
<tr>
<td>Gerhard’s Underwing Moth</td>
<td>Catocala herodias gerhardi</td>
<td>SC</td>
</tr>
<tr>
<td>Frosted Elfin</td>
<td>Callophrys irus</td>
<td>SC</td>
</tr>
<tr>
<td>Oak Hairstreak</td>
<td>Satyrium favonius</td>
<td>SC</td>
</tr>
<tr>
<td>Little Bluets</td>
<td>Enallagma minusculum</td>
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</tr>
<tr>
<td>New England Bluets</td>
<td>Enallagma laterale</td>
<td></td>
</tr>
<tr>
<td>Pine Barrens Bluets</td>
<td>Enallagma recurvatum</td>
<td>T</td>
</tr>
<tr>
<td>Comet Darner</td>
<td>Anax longipes</td>
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<td>Four-toed Salamander</td>
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<td>Eastern Ribbon Snake</td>
<td>Thamnophis sauritus</td>
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<td>Coluber constrictor</td>
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<td>Smooth Green Snake</td>
<td>Opheodrys vernalis</td>
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<tr>
<td>Barn Owl</td>
<td>Tyto alba</td>
<td>SC</td>
</tr>
<tr>
<td>New England Cottontail</td>
<td>Sylvilagus transitionalis</td>
<td></td>
</tr>
</tbody>
</table>
Core Habitat Summaries

Core 147

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

Mattamuskeet Panic-grass is found in seasonally wet, sunny habitats that are often created through some form of human disturbance or intervention. These include trails, powerlines, roadsides and ditches which have been opened up in or near a swamp, marsh, or streambed. The exposed, damp to wet soils are predominantly sandy, but often covered with a thin peaty or organic layer that indicates an originally bog-like habitat.

Core 151

A 445-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.

Bristly Foxtail is a perennial, rhizomatous grass of coastal habitats such as salt marsh and salt pond margins. Its most recognizable feature is its spike-like panicle that is exceptionally dense with golden bristles. This grass is found in scattered colonies, most often in linear patches along the upper borders of salt marshes, estuaries, and salt pond margins out of normal tidal reach.

New England Blazing Star is an endemic, globally rare, perennial composite of dry, sandy grasslands and clearings. In Massachusetts, New England Blazing Star inhabits open, dry, low-nutrient sandy soils of grasslands, heathlands, and barrens. It thrives in fire-influenced natural communities that are periodically disturbed and devoid of dense woody plant cover.

The Common Tern is a small seabird that nests in colonies on sandy or gravelly islands and barrier beaches, but also occurs on rocky or cobbly beaches and salt marshes. It feeds on small fish, crustaceans, and flying insects in the open ocean, bays, tidal inlets, and between islands.

Diminutive yet feisty, the Least Tern is a spring and summer colonial nester on Massachusetts’ sandy beaches. For nesting, it favors for sites with little or no vegetation. In Massachusetts, the Least Tern nests on sandy or gravelly beaches periodically scoured by storm tides, resulting in sparse or no vegetation; it also takes advantage of dredge spoils. Along the coast, the Least Tern forages in shallow-water habitats, including bays, lagoons, estuaries, river and creek mouths, tidal marshes, and ponds.

Piping Plovers on the East Coast nest on sandy coastal beaches and relatively flat dunes with sparse vegetation. They typically lay their eggs in the narrow area of land between the high tide line and the foot
of the coastal dunes. They can be particularly sensitive to anthropogenic disturbance, but the state's population has responded very well to coordinated management.

Core 171

A 71-acre Core Habitat featuring Species of Conservation Concern.

The Common Tern is a small seabird that nests in colonies on sandy or gravelly islands and barrier beaches, but also occurs on rocky or cobbly beaches and salt marshes. It feeds on small fish, crustaceans, and flying insects in the open ocean, bays, tidal inlets, and between islands.

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Core 187

A 583-acre Core Habitat featuring Priority Natural Communities and a Species of Conservation Concern.

Coastal Atlantic White Cedar Swamps are acidic, low-nutrient basin swamps dominated by Atlantic white cedar in the overstory and a mixture of species in the understory. This community type typically occurs in basins on the Atlantic Coastal Plain. This example of Coastal Atlantic White Cedar Swamp, though small, is in good condition.

Pitch Pine/Scrub Oak Communities are globally rare, fire-dependent, shrub-dominated communities, with scattered trees and occasional openings. They provide habitat for many rare species, and develop on dry, poor, usually sandy, soils. This moderate-sized example of Pitch Pine-Scrub Oak community is in good condition, with intact natural processes like fire and good species diversity. It is one of the larger unfragmented examples of this type on Cape Cod.

The Water-willow Stem Borer is a yellowish moth with purple-brown shading that inhabits shallow portions of coastal plain wetlands where water-willow grows. It is endemic to southeastern Massachusetts.
Core 205

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

The Water-willow Stem Borer is a yellowish moth with purple-brown shading that inhabits shallow portions of coastal plain wetlands where water-willow grows. It is endemic to southeastern Massachusetts.

Core 206

A 11-acre Core Habitat featuring a Species of Conservation Concern.

The Little Bluet, a very small damselfly, inhabits ponds with sparse emergent or aquatic vegetation and a sandy substrate.

Core 207

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

The Water-willow Stem Borer is a yellowish moth with purple-brown shading that inhabits shallow portions of coastal plain wetlands where water-willow grows. It is endemic to southeastern Massachusetts.

Core 214

A 16-acre Core Habitat featuring a Species of Conservation Concern.

The Little Bluet, a very small damselfly, inhabits ponds with sparse emergent or aquatic vegetation and a sandy substrate.

Core 215

A 45-acre Core Habitat featuring a Species of Conservation Concern.

The Little Bluet, a very small damselfly, inhabits ponds with sparse emergent or aquatic vegetation and a sandy substrate.

Core 227

An 18-acre Core Habitat featuring a Species of Conservation Concern.

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.
Core 232

A 66-acre Core Habitat featuring Aquatic Core.

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

Core 251

A 482-acre Core Habitat featuring Aquatic Core and Species of Conservation Concern.

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

The Water-willow Stem Borer is a yellowish moth with purple-brown shading that inhabits shallow portions of coastal plain wetlands where water-willow grows. It is endemic to southeastern Massachusetts.

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.

Pine Barrens Bluets, small damselflies, are restricted to coastal plain ponds and similar wetlands.

Scarlet Bluets are small (just over an inch long) damselflies with red eyes and orange bodies. They inhabit acidic sandy ponds with floating vegetation.

The Comet Darter is a large dragonfly that inhabits ponds with emergent vegetation as both larvae and adults. Surrounding upland forests provide protection while adults reach sexual maturity.

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.

The American Brook Lamprey is a primitive, eel-like fish. They live in clear, cool streams. Adults spawn in pea gravel substrates, while the larvae live in areas with substrates consisting of fine sand and muck, often in backwaters or stream margins.

American Bitterns are heron-like birds that nest primarily in large cattail, tussock or shrub marshes and are very sensitive to disturbance.
In Massachusetts, the Northern Parula breeds in wet woodlands, such as red maple and Atlantic white cedar swamps, river margins, and small wetland depressions. Breeding sites in the state must support the moss-like lichen, Old-Man's Beard (*Usnea* spp.), which the Parula uses to build its nests.

The New England Cottontail is a medium-sized cottontail rabbit. It is an early successional or thicket-dwelling species, once found statewide in Massachusetts, including in Dukes and Nantucket counties. Suitable habitat can be found in both forests and shrublands, where there is a dense understory with food and cover in close association. Typical habitats include native shrub associations, beaver flowages, old fields and pastures, and early successional forests.

**Core 295**

A 1,069-acre Core Habitat featuring Aquatic Core and Species of Conservation Concern.

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

Pondshore Knotweed is a globally rare, trailing, annual wildflower of the Buckwheat family, found on the upper shores of coastal plain ponds in the Northeast. In Massachusetts, Pondshore Knotweed inhabits the sandy, peaty, or cobble upper shores of acidic, low-nutrient, coastal plain ponds. It requires pronounced water level fluctuation, acidic, nutrient-poor water and substrate, and an open, exposed shoreline, free from major soil disturbance.

Terete Arrowhead is a perennial emergent aquatic plant of the water-plantain family, which grows in shallow water along the muddy, sandy, or peaty margins of coastal plain ponds.

Eastern Pondmussels, large freshwater mussels, are most abundant in southeastern Massachusetts. They inhabit streams, rivers, and small to large lakes and ponds; they show no preference for substrate, depth, or flow conditions. As sedentary filter feeders they are vulnerable to the alterations of water bodies.

In Massachusetts, the Tidewater Mucket, a freshwater mussel, prefers natural coastal freshwater ponds of several acres in size with clear, clean water and sandy substrates. It almost always occurs near the seacoast.

Triangle Floaters are freshwater mussels commonly found in low-gradient river reaches with sand and gravel substrates and low to moderate water velocities, although they are found in a wide range of substrate and flow conditions.

The Water-willow Stem Borer is a yellowish moth with purple-brown shading that inhabits shallow portions of coastal plain wetlands where water-willow grows. It is endemic to southeastern Massachusetts.

The New England Cottontail is a medium-sized cottontail rabbit. It is an early successional or thicket-dwelling species, once found statewide in Massachusetts, including in Dukes and Nantucket counties.
Suitable habitat can be found in both forests and shrublands, where there is a dense understory with food and cover in close association. Typical habitats include native shrub associations, beaver flowages, old fields and pastures, and early successional forests.

**Core 299**

A 26-acre Core Habitat featuring a Species of Conservation Concern.

The Little Bluet, a very small damselfly, inhabits ponds with sparse emergent or aquatic vegetation and a sandy substrate.

**Core 507A**

A 20,462-acre section of a larger 24,490-acre Core Habitat featuring Forest Core, Aquatic Core, Priority Natural Communities, and Species of Conservation Concern.

From the Cape Cod Canal south through the Crane Wildlife Management Area, a wide sweep of barrens and Coastal Plain Ponds is home to 43 species of rare and uncommon plants and animals. Much of this area is the Massachusetts Military Reservation; its airfield supports one of the state's better populations of sandplain grassland birds - Grasshopper Sparrow, Vesper Sparrow, and Upland Sandpiper - while the barrens to the north support the best populations of Whip-poor-will state-wide. Crane WMA is the site of the state's largest population of the federally Endangered and globally imperiled Sandplain Gerardia. Three species of globally rare damselflies, Scarlet Bluet, Pine Barrens Bluet, and New England Bluet, as well as the large, showy, and rare Comet Darner, inhabit the Coastal Plain Ponds scattered across this landscape.

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.

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

**Core 507B**

A 4,028-acre section of a larger 24,490-acre Core Habitat featuring Aquatic Core and Species of Conservation Concern.

Johns Pond drains to Waquoit Bay via the Childs and Quashnet Rivers. These water bodies and nearby uplands support 17 species of rare and uncommon plants and animals. Johns Pond and nearby ponds are home to two species of rare freshwater mussels, including one of the state's best populations of Tidewater Mucket, and to four species of rare and uncommon damselflies and dragonflies, including the globally rare Pine Barrens Bluet.
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 Mashpee

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 Mashpee. The elements listed here may not occur within the bounds of Mashpee.

CNL 67
Coastal Adaptation Area
Tern Foraging Area

CNL 68
Coastal Adaptation Area
Tern Foraging Area

CNL 70
Coastal Adaptation Area
Tern Foraging Area

CNL 110
Aquatic Core Buffer

CNL 126
Aquatic Core Buffer
Coastal Adaptation Area
Tern Foraging Area

CNL 166
Aquatic Core Buffer
Landscape Block

CNL 190
Aquatic Core Buffer

CNL 340
Aquatic Core Buffer
Coastal Adaptation Area
Landscape Block
Tern Foraging Area
Critical Natural Landscape Summaries

**CNL 67**

A 2-acre Critical Natural Landscape featuring Coastal Adaptation Area and Tern Foraging 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.

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.

**CNL 68**

A <1-acre Critical Natural Landscape featuring Coastal Adaptation Area and Tern Foraging Area.

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**CNL 70**

A 2,829-acre Critical Natural Landscape featuring Coastal Adaptation Area and Tern Foraging Area.

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**CNL 110**

A 12-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 126**

A 104-acre Critical Natural Landscape featuring Aquatic Core Buffer, Coastal Adaptation Area, and Tern Foraging Area.

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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.

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At 26,176 acres, this Landscape Block is the third largest in the ecoregion and among the largest 20% of all Blocks statewide, which is especially important in the fragmented landscapes of Cape Cod. Unlike Landscape Blocks in much of the state that are dominated by upland forests, this coastal Landscape Block includes both extensive upland forest and a relatively high percentage of open lands and other important sandplain habitats. Much of this Block is protected by the Massachusetts Military Reservation. A very small portion of this Landscape Block occurs in Barnstable.

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.

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Help Save Endangered Wildlife!

Please contribute on your Massachusetts income tax form or directly to the Natural Heritage & Endangered Species Fund.

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