CONSERVING THE BIODIVERSITY OF MASSACHUSETTS IN A CHANGING WORLD

Richmond

Produced in 2012

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

This information is intended for conservation planning, and is **not** intended for use in state regulations.
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Introduction

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

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

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

What Does Status Mean?

The Division of Fisheries and Wildlife determines a status category for each rare species listed under the Massachusetts Endangered Species Act (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 protection. The status of natural communities reflects the documented number and acreages of each community type in the state:

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

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

**BioMap2: One Plan, Two Components**

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
BioMap2
Conserving the Biodiversity of Massachusetts in a Changing World

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 MESA- Non-listed Species of Conservation Group</th>
<th>listed Species</th>
<th>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

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For more information on rare species and natural communities, please see our fact sheets online at www.mass.gov/nhesp.
Species of Conservation Concern, 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/](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.
Town Overview

Richmond lies on the border of the Taconic Mountains and the Western New England Marble Valleys/Berkshire Valley/Housatonic and Hoosic Valley Ecoregions. The Taconic Mountains Ecoregion is an area of high hills and low mountains that contain the highest point in the state, Mt. Greylock. Streams are high gradient and lakes and ponds are rare. Vegetation is generally northern hardwoods with some spruce-fir at higher elevations. The Western New England Marble Valleys Ecoregion is an area drained by the Hoosic and Housatonic Rivers. This ecoregion harbors farms, evergreen forests, transition and northern hardwood forests, and calcareous fens. The limestone-rich bedrock in the area creates alkaline lakes and streams.

Richmond at a Glance

- Total Area: 12,178 acres (19.0 square miles)
- Human Population in 2010: 1,475
- Open space protected in perpetuity: 993 acres, or 8.2% percent of total area*
- BioMap2 Core Habitat: 1,830 acres
- BioMap2 Core Habitat Protected: 218 acres or 11.9%
- BioMap2 Critical Natural Landscape: 3,759 acres
- BioMap2 Critical Natural Landscape Protected: 401 acres or 10.7%.

BioMap2 Components

Core Habitat
- 5 Exemplary or Priority Natural Community Cores
- 1 Forest Core
- 3 Wetland Cores
- 9 Aquatic Cores
- 19 Species of Conservation Concern Cores**
  - 4 birds, 1 amphibian, 1 fish, 1 insect, 14 plants

Critical Natural Landscape
- 2 Landscape Blocks
- 6 Wetland Core Buffers
- 8 Aquatic Core Buffers

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

** See next pages for complete list of species, natural communities and other biodiversity elements.
BioMap2 Core Habitat and Critical Natural Landscape in Richmond
Species of Conservation Concern, Priority and Exemplary Natural Communities,
and Other Elements of Biodiversity in Richmond

Insects

**Butterflies**
- Dion Skipper, \(Euphyes dion\), T

**Amphibians**
- Jefferson Salamander, \(Ambystoma jeffersonianum\), SC

**Fishes**
- Bridle Shiner, \(Notropis bifrenatus\), SC

**Birds**
- American Bittern, \(Botaurus lentiginosus\), E
- Sedge Wren, \(Cistothorus platensis\), E
- Common Moorhen, \(Gallinula chloropus\), SC
- Sora, \(Porzana carolina\), Non-listed SWAP

**Plants**
- Lyre-leaved Rock-cress, \(Arabidopsis lyrata\), E
- Foxtail Sedge, \(Carex alopecoidea\), T
- Creeping Sedge, \(Carex chordorrhiza\), E
- Hitchcock’s Sedge, \(Carex hitchcockiana\), SC
- Fen Sedge, \(Carex tetanica\), SC
- Hemlock Parsley, \(Conioselinum chinense\), SC
- Intermediate Spike-sedge, \(Eleocharis intermedia\), T
- Slender Cottongrass, \(Eriophorum gracile\), T
- Labrador Bedstraw, \(Galium labradoricum\), T
- Barren Strawberry, \(Geum fragarioides\), SC
- Woodland Millet, \(Milium effusum\), T
- Hill’s Pondweed, \(Potamogeton hillii\), SC
- Great Laurel, \(Rhododendron maximum\), T
- Slender Blue-eyed Grass, \(Sisyrinchium mucronatum\), E

**Priority Natural Communities**
- Black Ash-Red Maple-Tamarack Calcareous Seepage Swamp, S2
- Calcareous Seepage Marsh, S2
- Calcareous Slop ing Fen, S2
- Calcareous Rocky Summit/Rock Outcrop Community, S2

**Other BioMap2 Components**
- Forest Core
- Aquatic Core
- Wetland Core

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).
Landscape Block
Aquatic Core Buffer
Wetland Core Buffer

E = Endangered
T = Threatened
SC = Special Concern
S1 = Critically Imperiled communities, typically 5 or fewer documented sites or very few remaining acres in the state.
S2 = Imperiled communities, typically 6-20 sites or few remaining acres in the state.
S3 = Vulnerable communities, typically have 21-100 sites or limited acreage across the state.
**BioMap2 Core Habitat in Richmond**

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

Core 1860
- Forest Core
- Wetland Core
- Aquatic Core
- Species of Conservation Concern
  - Downy Arrowwood: *Viburnum rafinesquianum* E
  - Hill's Pondweed: *Potamogeton hillii* SC
  - Long-leaved Bluet: *Houstonia longifolia* E
  - Lyre-leaved Rock-cress: *Arabidopsis lyrata* E
  - Smooth Rock-cress: *Boechera laevigata* SC
  - Jefferson Salamander: *Ambystoma jeffersonianum* SC
  - Sora: *Porzana carolina* Non-listed SWAP

Core 1871
- Species of Conservation Concern
  - Jefferson Salamander: *Ambystoma jeffersonianum* SC

Core 1899
- Aquatic Core
- Species of Conservation Concern
  - Hill's Pondweed: *Potamogeton hillii* SC

Core 1912
- Aquatic Core
- Priority & Exemplary Natural Communities
  - Black Ash-Red Maple-Tamarack Calcareous Seepage Swamp S2
  - Calcareous Sloping Fen S2
- Species of Conservation Concern
  - Barren Strawberry: *Geum fragarioides* SC
  - Fen Sedge: *Carex tetanica* SC
  - Hitchcock's Sedge: *Carex hitchcockiana* SC
  - Labrador Bedstraw: *Galium labradoricum* T
  - Slender Blue-eyed Grass: *Sisyrinchium macronatum* E
  - Jefferson Salamander: *Ambystoma jeffersonianum* SC
Core 1924

Wetland Core
Aquatic Core
Species of Conservation Concern
Hill's Pondweed  \textit{Potamogeton hillii}  SC

Core 1928

Aquatic Core
Species of Conservation Concern
Labrador Bedstraw  \textit{Galium labradoricum}  T
Jefferson Salamander  \textit{Ambystoma jeffersonianum}  SC

Core 1930

Species of Conservation Concern
Jefferson Salamander  \textit{Ambystoma jeffersonianum}  SC

Core 1937

Aquatic Core
Priority & Exemplary Natural Communities
Black Ash-Red Maple-Tamarack Calcareous Seepage Swamp  S2
Calcareous Rocky Summit/Rock Outcrop Community  S2
Calcareous Seepage Marsh  S2
Species of Conservation Concern
Great Laurel  \textit{Rhododendron maximum}  T
Hemlock Parsley  \textit{Conioselinum chinense}  SC
Labrador Bedstraw  \textit{Galium labradoricum}  T
Woodland Millet  \textit{Milium effusum}  T
Jefferson Salamander  \textit{Ambystoma jeffersonianum}  SC

Core 1939

Wetland Core
Aquatic Core
Species of Conservation Concern
Fen Sedge  \textit{Carex tetanica}  SC
Intermediate Spike-sedge  \textit{Eleocharis intermedia}  T
Slender Cottongrass  \textit{Eriophorum gracile}  T
American Bittern  \textit{Botaurus lentiginosus}  E
Sedge Wren  \textit{Cistothorus platensis}  E

Core 1963

Species of Conservation Concern
Hitchcock's Sedge  \textit{Carex hitchcockiana}  SC

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).
### Core 1965

**Species of Conservation Concern**
- Jefferson Salamander *Ambystoma jeffersonianum* SC

### Core 1978

**Aquatic Core**
- Species of Conservation Concern
  - Hill’s Pondweed *Potamogeton hillii* SC

### Core 2023

**Forest Core**
- Wetland Core
- Aquatic Core
- Vernal Pool Core

**Priority & Exemplary Natural Communities**
- Rich, Mesic Forest Community S3

**Species of Conservation Concern**
- Adder’s-tongue Fern *Ophioglossum pusillum* T
- Back’s Sedge *Carex backii* E
- Bush’s Sedge *Carex bushii* E
- Chestnut-colored Sedge *Carex castanea* E
- Crooked-stem Aster *Symphyotrichum prenanthoides* SC
- Dwarf Scouring-rush *Equisetum scirpoides* SC
- Fen Sedge *Carex tetanica* SC
- Handsome Sedge *Carex formosa* T
- Hill’s Pondweed *Potamogeton hillii* SC
- Hitchcock’s Sedge *Carex hitchcockiana* SC
- Intermediate Spike-sedge *Eleocharis intermedia* T
- Northern Bedstraw *Galium boreale* E
- Pale Green Orchis *Platanthera flava var. herbiola* T
- Smooth Rock-cress *Boechera laevigata* SC
- Early Hairstreak *Erora laeta* T
- Mustard White *Pieris oleracea* T
- Four-toed Salamander *Hemidactylium scutatum* Non-listed SWAP
- Jefferson Salamander *Ambystoma jeffersonianum* SC
- Spring Salamander *Gyrinophilus porphyriticus* Non-listed SWAP

### Core 2037

**Wetland Core**
- Aquatic Core

**Species of Conservation Concern**
- Creeping Sedge *Carex chordorrhiza* E
Foxtail Sedge  Carex alopecoidea  T
Slender Cottongrass  Eriophorum gracile  T
Dion Skipper  Euphyes dion  T
Bridle Shiner  Notropis bifrenatus  SC
American Bittern  Botaurus lentiginosus  E
Common Moorhen  Gallinula chloropus  SC
Sora  Porzana carolina  Non-listed SWAP

Core 2341B
Forest Core
Wetland Core
Aquatic Core
Vernal Pool Core
Priority & Exemplary Natural Communities
Rich, Mesic Forest Community  S3
Species of Conservation Concern
Bristly Black Currant  Ribes lacustre  SC
Crooked-stem Aster  Symphyotrichum prenanthoides  SC
Jefferson Salamander  Ambystoma jeffersonianum  SC
Spring Salamander  Gyrinophilus porphyriticus  Non-listed SWAP
Core Habitat Summaries

Core 1860

A 1,761-acre Core Habitat featuring Forest Core, Wetland Core, Aquatic 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.

Though small from a statewide perspective, this 1,106-acre Forest Core is the third largest in the ecoregion. It provides important habitat in the otherwise fragmented Berkshire Valleys ecoregion. This core is partially protected, with additional protection needed to support habitat functions.

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.

This shrub occurs on open rocky ridgelines, lightly wooded summits, and dry rocky slopes in open northern hardwood stands.

Hill's Pondweed is an herbaceous, submersed, aquatic plant with very slender stems. Hill’s Pondweed’s habitat is cold, clean, alkaline bodies of water.

Long-leaved Bluet grows in dry, sunny or lightly shaded habitats. Rocky openings with ledges and bedrock exposures are particularly favorable; dry sterile fields, gravel banks, roadsides, quarries and similar human-influenced habitats also provide suitable habitat.

In Massachusetts, Lyre-leaved Rock-cress, a member of the mustard family, inhabits thin soils and crevices of calcareous rocky cliffs, outcrops, and ledges, in full to filtered sun.

In Massachusetts, Smooth Rock-cress, a biennial mustard, inhabits rich, rocky deciduous woods, rich rocky hillsides, ledges, talus slopes, and floodplain thickets and woodlands. It occupies open to shaded sites on dry to mesic soils.

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

Soras are secretive marshbirds that typically nest in dense cattail marshes with interspersed open water.
Core 1871
A 62-acre Core Habitat featuring a Species of Conservation Concern.

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

Core 1899
An 8-acre Core Habitat featuring Aquatic Core and a Species of Conservation Concern.

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

Hill’s Pondweed is an herbaceous, submersed, aquatic plant with very slender stems. Hill’s Pondweed’s habitat is cold, clean, alkaline bodies of water.

Core 1912
A 168-acre Core Habitat featuring Aquatic Core, Priority Natural Communities, 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.

Black Ash-Red Maple-Tamarack Calcareous Seepage Swamps are mixed deciduous-coniferous forested swamps occurring in areas where there is calcium-rich groundwater seepage. This nutrient enrichment supports many rare calcium-loving plant species. This small example of a Black Ash-Red Maple-Tamarack Calcareous Seepage Swamp is in good condition and is associated with several state-listed plant species.

Calcareous Sloping Fens are open, sedge-dominated wetlands occurring on slight to moderate slopes where there is calcareous groundwater seepage. They tend to be “hot spots” for uncommon species, often containing multiple state-listed species. This small calcareous sloping fen is in a pipeline cut maintained by mowing the surrounding agriculture field. It has diverse native species and some invasive exotics.

Barren Strawberry is a short herbaceous perennial that occurs on rich soils near streams in a variety of forest types.

In Massachusetts, the Fen Sedge grows primarily in open, wet fens and meadows where there is calcareous groundwater seepage. It also occurs in openings within large calcareous seepage swamps.

Hitchcock’s Sedge occurs in rich mesic woods, often in areas overlying calcareous bedrock.

Labrador Bedstraw, a slender perennial herb of the madder family, inhabits calcareous fens, wet meadows, and swamps, often on hummocks or tussocks in full or filtered sunlight.

For more information on rare species and natural communities, please see our fact sheets online at www.mass.gov/nhesp.
Slender Blue-eyed Grass, a member of the Iris family, inhabits sunny, calcium-rich wetlands. These include fields, meadows, borders of calcareous fens, and, occasionally, moist roadsides with limey soils.

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

**Core 1924**

A 21-acre Core Habitat featuring Wetland Core, Aquatic Core, and a Species of Conservation Concern. Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

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

Hill’s Pondweed is an herbaceous, submersed, aquatic plant with very slender stems. Hill’s Pondweed’s habitat is cold, clean, alkaline bodies of water.

**Core 1928**

A 109-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.

Labrador Bedstraw, a slender perennial herb of the madder family, inhabits calcareous fens, wet meadows, and swamps, often on hummocks or tussocks in full or filtered sunlight.

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

**Core 1930**

A 127-acre Core Habitat featuring a Species of Conservation Concern.

Adult and juvenile Jefferson Salamanders inhabit upland forests during most of the year, where they reside in small-mammal burrows and other subsurface retreats. Adults migrate during late winter or early spring to breed in vernal pools and fish-free areas of swamps, marshes, or similar wetlands. Larvae metamorphose in late summer or early fall, whereupon they disperse into upland forest.
Core 1937

A 300-acre Core Habitat featuring Aquatic Core, Priority Natural Communities, 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.

Black Ash-Red Maple-Tamarack Calcereous Seepage Swamps are mixed deciduous-coniferous forested swamps occurring in areas where there is calcium-rich groundwater seepage. This nutrient enrichment supports many rare calcium-loving plant species. This is a large example of a good-quality Black Ash - Red Maple - Tamarack Calcereous Seepage Swamp that is associated with several state-listed plant species.

Calcereous Rocky Summit/Rock Outcrop Communities are sparsely vegetated, dry, open communities, typically found on the ridge tops in the marble regions of Berkshire County. Their open aspect is maintained by trees uprooting and falling. This small calcereous rock outcrop has good diversity and moderate landscape context in association with other priority communities.

Calcereous Seepage Marshes are marshy wetlands enriched by calcereous groundwater seepage. Of the three types of calcereous fen communities described in Massachusetts, they are intermediate in richness and in botanical rarities. This large seepage marsh has good native diversity and some patches of non-native invasive species. It is surrounded by another priority community.

Great Laurel, a member of the Heath family, is an evergreen shrub or small tree that grows up to 10 m high. It is a plant of moist woods, swamps, and the edges of ponds.

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.

Labrador Bedstraw, a slender perennial herb of the madder family, inhabits calcereous fens, wet meadows, and swamps, often on hummocks or tussocks in full or filtered sunlight.

Woodland Millet is typically found on steep slopes in rich, mesic forest communities with calcereous soils. Its microhabitat often includes the drier, rocky upper slopes of the woodland.

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

Core 1939

A 160-acre Core Habitat featuring Wetland Core, Aquatic Core, and Species of Conservation Concern.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.
The 127-acre Wetland Core is among the largest 20% of Wetland Cores statewide and in this ecoregion. Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

In Massachusetts, the Fen Sedge grows primarily in open, wet fens and meadows where there is calcareous groundwater seepage. It also occurs in openings within large calcareous seepage swamps.

In Massachusetts, Intermediate Spike-sedge, a small, densely tufted annual, is found on muddy, alkaline river banks and pond shores, usually during periods of low water when mud is exposed.

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

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

Sedge Wrens nest in large wet meadows. They are sensitive to changes in hydrology and seral succession.

Core 1963
An 11-acre Core Habitat featuring a Species of Conservation Concern.

Hitchcock’s Sedge occurs in rich mesic woods, often in areas overlying calcareous bedrock.

Core 1965
A 125-acre Core Habitat featuring a Species of Conservation Concern.

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

Core 1978
An 8-acre Core Habitat featuring Aquatic Core and a Species of Conservation Concern.

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

Hill’s Pondweed is an herbaceous, submersed, aquatic plant with very slender stems. Hill’s Pondweed’s habitat is cold, clean, alkaline bodies of water.

Core 2023
A 3,414-acre Core Habitat featuring Forest Core, Wetland Core, Aquatic Core, Vernal Pool Core, Priority Natural Communities, and Species of Conservation Concern.

The Core Habitat of Lenox Mountain and Yokun Brook is home to 20 rare and uncommon species of plants and animals. A Forest Core covers much of Lenox Mountain itself. One of the state’s best populations of Jefferson Salamanders is found in the lowlands and lower slopes of the mountain, along...
Yokun Brook. The rich bedrock here, especially along Yokun Brook and near Mahanna Cobble, supports four Endangered plants, as well as eleven other rare plants.

Rich, Mesic Forests are a variant of northern hardwood forests, dominated by sugar maple with a diverse herbaceous layer that includes many spring wild flowers, in a moist, nutrient-rich environment. This Core has two examples of Rich, Mesic Forest including one that is of moderate size, but in very good condition, with topographical diversity - rock outcrops, gullies, and the like - that provides a rich array of microhabitats for various unusual plant species.

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

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

Core 2037

A 525-acre Core Habitat featuring Wetland Core, Aquatic Core, and Species of Conservation Concern.

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

The 176-acre Wetland Core is among the largest 20% of Wetland Cores statewide and in this ecoregion.

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

Creeping Sedge is a perennial, herbaceous, grass-like plant of sphagnum bogs and fens, usually in areas over calcareous bedrock. It is named for its unusual prostrate, creeping growth pattern, where decumbent stems from the previous year send up new shoots from the nodes.

Foxtail Sedge is a perennial, herbaceous, grass-like plant found in calcareous wet meadows of river floodplains.

Slender Cottongrass is a plant of swamps and peatlands. Habitats in Massachusetts include acidic and calcareous fens and portions of seepage swamps.
Dion Skipper Butterflies inhabit sedge wetlands. Adults nectar in nearby upland fields.

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.

Common Moorhens are fowl-like marshbirds that typically nest in dense cattail beds adjacent to open water.

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

**Core 2341B**

A 10,352-acre section of a larger 11,593-acre Core Habitat featuring Forest Core, Wetland Core, Aquatic Core, Vernal Pool Core, Priority Natural Communities, and Species of Conservation Concern.

Much of the Town of Hancock and of Pittsfield State Forest is in a large Forest Core that stretches north-south along the Taconic Range here. Although this part of a Core Habitat is not a rare species hotspot, it does support three rare species, including several good populations of Jefferson Salamander.

Rich, Mesic Forests are a variant of northern hardwood forests, dominated by sugar maple with a diverse herbaceous layer that includes many spring wild flowers, in a moist, nutrient-rich environment. This patch of Rich, Mesic Forest is surrounded by a large area of northern hardwood forest. There are scattered invasive species throughout this working forest.

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

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

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

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.
BioMap2 Critical Natural Landscape in Richmond

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

CNL 913
- Aquatic Core Buffer

CNL 933
- Aquatic Core Buffer
- Wetland Core Buffer

CNL 945
- Aquatic Core Buffer

CNL 951
- Aquatic Core Buffer
- Wetland Core Buffer

CNL 952
- Aquatic Core Buffer
- Wetland Core Buffer

CNL 957
- Aquatic Core Buffer
- Landscape Block
- Wetland Core Buffer

CNL 970
- Aquatic Core Buffer
- Landscape Block
- Wetland Core Buffer

CNL 997
- Aquatic Core Buffer
- Wetland Core Buffer

CNL 1332
- Aquatic Core Buffer
- Landscape Block
- Wetland Core Buffer
Critical Natural Landscape Summaries

CNL 913

A 377-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 933

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

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

CNL 945

A 16-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 951

A 171-acre Critical Natural Landscape featuring Aquatic Core Buffer and Wetland Core Buffer.

A variety of analyses were used to identify protective upland buffers around wetlands and rivers. One, the variable width buffers methodology, included the most intact areas around each wetland and river, by extending deeper into surrounding unfragmented habitats than into developed areas adjacent to each wetland. Other upland buffers were identified through the rare species habitat analysis. In this way, the conservation of wetland buffers will support the habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.
CNL 952

A 203-acre Critical Natural Landscape featuring Aquatic Core Buffer and Wetland Core Buffer.

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

CNL 957

A 1,348-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 970

An 8,426-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.

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At 8,079 acres, this is one of a few Landscape Blocks, and the fourth largest Block, in the Berkshire Valleys ecoregion, especially important in an otherwise more fragmented ecoregion. This Block is partially protected.

**CNL 997**

An 829-acre Critical Natural Landscape featuring Aquatic Core Buffer and Wetland Core Buffer.

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

**CNL 1332**

An 84,791-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.
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.