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

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

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

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

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

What Does Status Mean?

The Division of Fisheries and Wildlife determines a status category for each rare species listed under the Massachusetts Endangered Species Act, M.G.L. c.131A, and its implementing regulations 321 CMR 10.00. Rare species are categorized as Endangered, Threatened or of Special Concern according to the following:

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

In addition NHESP maintains an unofficial watch list of plants that are tracked due to potential conservation interest or concern, but are not regulated under the Massachusetts Endangered Species Act or other laws or regulations. Likewise, described natural communities are not regulated by any law or regulations, but they can help to identify...
ecologically important areas that are worthy of protection. The status of natural communities reflects the documented number and acreages of each community type in the state:

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

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

**BioMap2: One Plan, Two Components**

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

Core Habitat identifies key areas that are critical for the long-term persistence of rare species and other Species of Conservation Concern, as well as a wide diversity of natural communities and intact ecosystems across the Commonwealth. Protection of Core Habitats will contribute to the conservation of specific elements of biodiversity.

Critical Natural Landscape identifies large natural Landscape Blocks that are minimally impacted by development. If protected, these areas will provide habitat for wide-ranging native species, support intact ecological processes, maintain connectivity among habitats, and enhance ecological resilience to natural and anthropogenic disturbances in a rapidly changing world. Areas delineated as Critical Natural Landscape also include buffering upland around wetland, coastal, and aquatic Core Habitats to help ensure their long-term integrity.

The long-term persistence of Massachusetts biological resources requires a determined commitment to land and water conservation. Protection and stewardship of both Critical Natural Landscapes and Core Habitats are needed to realize the biodiversity conservation vision of BioMap2.

**Components of Core Habitat**

Core Habitat identifies specific areas necessary to promote the long-term persistence of rare species, other Species of Conservation Concern, exemplary natural communities, and intact ecosystems.

**Rare Species**

There are 432 native plant and animal species listed as Endangered, Threatened or Special Concern under the Massachusetts Endangered Species Act (MESA) based on their rarity, population trends, and threats to survival. For more information on rare species and natural communities, please see our fact sheets online at [www.mass.gov/nhesp](http://www.mass.gov/nhesp).
Table 1. Species of Conservation Concern described in the State Wildlife Action Plan and/or included on the MESA List and for which habitat was mapped in BioMap2. Note that plants are not included in SWAP, and that marine species such as whales and sea turtles are not included in BioMap2.

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

BioMap2, NHESP staff identified the highest quality habitat sites for each non-marine species based on size, condition, and landscape context.

Other Species of Conservation Concern

In addition to species on the MESA List described previously, the State Wildlife Action Plan (SWAP) identifies 257 wildlife species and 22 natural habitats most in need of conservation within the Commonwealth. BioMap2 includes species-specific habitat areas for 45 of these species and habitat for 17 additional species which was mapped with other coarse-filter and fine-filter approaches.

Priority Natural Communities

Natural communities are assemblages of plant and animal species that share a common environment and occur together repeatedly on the landscape. BioMap2 gives conservation priority to natural communities with limited distribution and to the best examples of more common types.

Vernal Pools

Vernal pools are small, seasonal wetlands that provide important wildlife habitat, especially for amphibians and invertebrate animals that use them to breed. BioMap2 identifies the top 5 percent most interconnected clusters of Potential Vernal Pools in the state.

Forest Cores

In BioMap2, Core Habitat includes the best examples of large, intact forests that are least impacted by roads and development, providing critical habitat for numerous woodland species. For example, the interior forest habitat defined by Forest Cores supports many bird species sensitive to the impacts of roads and development, such as the Black-throated Green Warbler, and helps maintain ecological processes found only in unfragmented forest patches.

Wetland Cores

BioMap2 used an assessment of Ecological Integrity to identify the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Aquatic Cores

To delineate integrated and functional ecosystems for fish species and other aquatic
Species of Conservation Concern, beyond the species and exemplary habitats described above, *BioMap2* identifies intact river corridors within which important physical and ecological processes of the river or stream occur.

**Components of Critical Natural Landscape**

Critical Natural Landscape identifies intact landscapes in Massachusetts that are better able to support ecological processes and disturbance regimes, and a wide array of species and habitats over long time frames.

**Landscape Blocks**

*BioMap2* identifies the most intact large areas of predominately natural vegetation, consisting of contiguous forests, wetlands, rivers, lakes, and ponds, as well as coastal habitats such as barrier beaches and salt marshes.

**Upland Buffers of Wetland and Aquatic Cores**

A variety of analyses were used to identify protective upland buffers around wetlands and rivers.

**Upland Habitat to Support Coastal Adaptation**

*BioMap2* identifies undeveloped lands adjacent to and up to one and a half meters above existing salt marshes as Critical Natural Landscapes with high potential to support inland migration of salt marsh and other coastal habitats over the coming century.

The conservation areas identified by *BioMap2* are based on breadth and depth of data, scientific expertise, and understanding of Massachusetts’ biodiversity. The numerous sources of information and analyses used to create Core Habitat and Critical Natural Landscape are complementary, and outline a comprehensive conservation vision for Massachusetts, from rare species to intact landscapes. In total, these robust analyses define a suite of priority lands and waters that, if permanently protected, will support Massachusetts’ natural systems for generations to come.

**Legal Protection of Biodiversity**

*BioMap2* presents a powerful vision of what Massachusetts would look like with full protection of the land most important for supporting the Commonwealth’s biodiversity. While *BioMap2* is a planning tool with no regulatory function, all state-listed species enjoy legal protection under the Massachusetts Endangered Species Act (M.G.L. c.131A) and its implementing regulations (321 CMR 10.00). Wetland habitat of state-listed wildlife is also protected under the Wetlands Protection Act Regulations (310 CMR 10.00). The Natural Heritage Atlas contains maps of Priority Habitats and Estimated Habitats, which are used, respectively, for regulation under the Massachusetts Endangered Species Act and the Wetlands Protection Act. For more information on rare species regulations, and to view Priority and Estimated Habitat maps, please see the Regulatory Review page at http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/.

*BioMap2* is a conservation planning tool that does not, in any way, supplant the Estimated and Priority Habitat Maps which have regulatory significance. Unless and until the *BioMap2* vision is fully realized, we must continue to protect our most imperiled species and their habitats.
Understanding Core Habitat Summaries

Following the Town Overview, there is a descriptive summary of each Core Habitat and Critical Natural Landscape that occurs in your city or town. These summaries highlight some of the outstanding characteristics of each Core Habitat and Critical Natural Landscape, and will help you learn more about your city or town’s biodiversity. You can find out more information about many of these species and natural communities by looking at specific fact sheets at www.mass.gov/nhesp.

Additional Information

For copies of the full BioMap2 report, the Technical Report, and an interactive mapping tool, visit the BioMap2 website via the Land Protection and Planning tab at www.mass.gov/nhesp. If you have any questions about this report, or if you need help protecting land for biodiversity in your community, the Natural Heritage & Endangered Species Program staff looks forward to working with you.

Contact the Natural Heritage & Endangered Species Program

By phone  508-389-6360
By fax  508-389-7890
By email  natural.heritage@state.ma.us
By Mail  100 Hartwell Street, Suite 230
         West Boylston, MA 01583

The GIS datalayers of BioMap2 are available for download from MassGIS at www.mass.gov/mgis.
Town Overview

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

Royalston at a Glance

- Total Area: 27,229 acres (42.5 square miles)
- Human Population in 2010: 1,258
- Open space protected in perpetuity: 11,005 acres, or 40.4% percent of total area*
- BioMap2 Core Habitat: 5,228 acres
- BioMap2 Core Habitat Protected: 2,645 acres or 50.6%
- BioMap2 Critical Natural Landscape: 23,168 acres
- BioMap2 Critical Natural Landscape Protected: 10,201 acres or 44.0%.

BioMap2 Components

Core Habitat
- 15 Exemplary or Priority Natural Community Cores
- 2 Forest Cores
- 16 Wetland Cores
- 7 Aquatic Cores
- 2 Vernal Pool Cores
- 24 Species of Conservation Concern Cores**
  - 1 bird, 1 reptile, 3 amphibians, 5 insects, 2 mussels, 3 plants

Critical Natural Landscape
- 3 Landscape Blocks
- 14 Wetland Core Buffers
- 6 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 Royalston

![Map of BioMap2 Core Habitat and Critical Natural Landscape in Royalston](image)

- **BioMap2 Core Habitat**
- **BioMap2 Critical Natural Landscape**

1 Mile

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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 Royalston

Mussels
- Triangle Floater, (*Alasmidonta undulata*), Non-listed SWAP
- Creeper, (*Strophitus undulatus*), SC

Insects

Moths
- Pink Sallow Moth, (*Psectraglaea cariosa*), SC

Damselflies
- New England Bluet, (*Enallagma laterale*), Non-listed SWAP

Dragonflies
- Spine-crowned Clubtail, (*Gomphus abbreviatus*), SC
- Stygian Shadowdragon, (*Neurocordulia yamaskanensis*), SC
- Ski-tipped Emerald, (*Somatochlora elongata*), SC

Amphibians
- Four-toed Salamander, (*Hemidactylium scutatum*), Non-listed SWAP
- Spring Salamander, (*Gyrinophilus porphyriticus*), Non-listed SWAP
- Blue-spotted Salamander, (*Ambystoma laterale*), SC

Reptiles
- Wood Turtle, (*Glyptemys insculpta*), SC

Birds
- American Bittern, (*Botaurus lentiginosus*), E

Plants
- Dwarf Mistletoe, (*Arceuthobium pusillum*), SC
- Smooth Rock-cress, (*Boechera laevigata*), SC
- Sand Violet, (*Viola adunca*), SC

Priority Natural Communities
- Black Ash Swamp, S2
- Kettlehole Level Bog, S2
- Acidic Shrub Fen, S3
- Level Bog, S3
- Spruce-Fir Swamp, S3

Exemplary Natural Communities
- Alluvial Hardwood Flat
- Forest Seep Community
**BioMap2**
Conserving the Biodiversity of Massachusetts in a Changing World

- Hemlock-Hardwood Swamp
- Inland Acidic Pondshore/Lakeshore
- Low-energy Riverbank
- Shallow Emergent Marsh
- Shrub Swamp

**Other BioMap2 Components**
- Forest Core
- Aquatic Core
- Wetland Core
- Vernal Pool Core
- Landscape Block
- Aquatic Core Buffer
- Wetland Core Buffer

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

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).
BioMap2 Core Habitat in Royalston

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

### Core 2583

<table>
<thead>
<tr>
<th>Species of Conservation Concern</th>
<th>Viola adunca</th>
<th>SC</th>
</tr>
</thead>
</table>

### Core 2602/2659/2681/2711/2712/2727/2736/2753/2760/2761/2779/2783/2816/2855/2917/2925

**Wetland Core**

### Core 2621

**Forest Core**

**Aquatic Core**

**Wetland Core**

<table>
<thead>
<tr>
<th>Priority &amp; Exemplary Natural Communities</th>
<th>Hickory - Hop Hornbeam Forest/Woodland</th>
<th>S2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-energy Riverbank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shallow Emergent Marsh</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species of Conservation Concern</th>
<th>Strophitus undulatus</th>
<th>SC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creeper</td>
<td>Strophitus undulatus</td>
<td>SC</td>
</tr>
<tr>
<td>Triangle Floater</td>
<td>Alasmidonta undulata</td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Arrow Clubtail</td>
<td>Stylurus spiniceps</td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Spine-crowned Clubtail</td>
<td>Gomphus abbreviatus</td>
<td>SC</td>
</tr>
<tr>
<td>Zebra Clubtail</td>
<td>Stylurus scudderi</td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Sharp-shinned Hawk</td>
<td>Accipiter striatus</td>
<td>SC</td>
</tr>
</tbody>
</table>

### Core 2668

<table>
<thead>
<tr>
<th>Species of Conservation Concern</th>
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### Core 2692

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<th>Species of Conservation Concern</th>
<th>Viola adunca</th>
<th>SC</th>
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</table>

### Core 2693

<table>
<thead>
<tr>
<th>Species of Conservation Concern</th>
<th>Neurocordulia yamaskanensis</th>
<th>SC</th>
</tr>
</thead>
</table>

### Core 2775

| Vernal Pool Core | |
|------------------||

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**Natural Heritage & Endangered Species Program**

For more information on rare species and natural communities, please see our fact sheets online at [www.mass.gov/nhesp](http://www.mass.gov/nhesp).
Core 2776

Wetland Core
Priority & Exemplary Natural Communities
- Acidic Shrub Fen S3
- Black Ash Swamp S2
- Kettlehole Level Bog S2
- Spruce-Fir Swamp S3

Species of Conservation Concern
- Blue-spotted Salamander *Ambystoma laterale* SC
- Four-toed Salamander *Hemidactylium scutatum* Non-listed SWAP

Core 2790

Species of Conservation Concern
- Sand Violet *Viola adunca* SC

Core 2797

Forest Seep Community

Core 2801

Aquatic Core
Species of Conservation Concern
- Sand Violet *Viola adunca* SC
- New England Bluet *Enallagma laterale* Non-listed SWAP

Core 2812

Priority & Exemplary Natural Communities
- Level Bog S3

Core 2814

Priority & Exemplary Natural Communities
- Level Bog S3
- Shrub Swamp

Core 2815

Species of Conservation Concern
- Sand Violet *Viola adunca* SC

Core 2818

Species of Conservation Concern
- Sand Violet *Viola adunca* SC

Core 2819

Species of Conservation Concern
- Sand Violet *Viola adunca* SC
Core 2853
Vernal Pool Core
Species of Conservation Concern
  Sand Violet  \textit{Viola adunca}  SC
  Blue-spotted Salamander  \textit{Ambystoma laterale}  SC

Core 2896
Priority & Exemplary Natural Communities
  Hemlock-Hardwood Swamp

Core 2899
Priority & Exemplary Natural Communities
  Hemlock-Hardwood Swamp

Core 2900
Priority & Exemplary Natural Communities
  Hemlock-Hardwood Swamp

Core 2907
Species of Conservation Concern
  Sand Violet  \textit{Viola adunca}  SC

Core 2913
Aquatic Core
  Wetland Core
  Species of Conservation Concern
    Triangle Floater  \textit{Alasmidonta undulata}  Non-listed SWAP
    Zebra Clubtail  \textit{Stylurus scudderi}  Non-listed SWAP
    Wood Turtle  \textit{Glyptemys insculpta}  SC
    American Bittern  \textit{Botaurus lentiginosus}  E

Core 2918
Priority & Exemplary Natural Communities
  Hemlock-Hardwood Swamp

Core 2922
Species of Conservation Concern
  Sand Violet  \textit{Viola adunca}  SC

Core 2924
Priority & Exemplary Natural Communities
  Hemlock-hardwood swamp

Core 2926
Species of Conservation Concern
  Sand Violet  \textit{Viola adunca}  SC
Core 2927
Priority & Exemplary Natural Communities
Hemlock-Hardwood Swamp

Core 2929
Aquatic Core
Priority & Exemplary Natural Communities
Acidic Rocky Summit/Rock Outcrop Community
Circumneutral Talus Forest/Woodland S3
Northern Hardwoods - Hemlock - White Pine Forest
Species of Conservation Concern
Climbing Fumitory Adlumia fungosa SC
Purple Clematis Clematis occidentalis SC
Sand Violet Viola adunca SC
Creeper Strophitus undulatus SC
Triangle Floater Alasmidonta undulata Non-listed SWAP
New England Bluet Enallagma laterale Non-listed SWAP
Four-toed Salamander Hemidactylium scutatum Non-listed SWAP
Wood Turtle Glyptemys insculpta SC
American Bittern Botaurus lentiginosus E

Core 2931
Wetland Core
Species of Conservation Concern
Dwarf Mistletoe Arceuthobium pusillum SC

Core 2932
Wetland Core
Priority & Exemplary Natural Communities
Hemlock-Hardwood Swamp
Species of Conservation Concern
Dwarf Mistletoe Arceuthobium pusillum SC

Core 2934
Forest Core
Aquatic Core
Wetland Core
Priority & Exemplary Natural Communities
Acidic Shrub Fen S3
Alluvial Hardwood Flat
Inland Acidic Pondshore/Lakeshore
Spruce-Fir Swamp S3
Species of Conservation Concern
Smooth Rock-cress Boechera laevigata SC
Pink Sallow Psectraglaea carnosa SC
<table>
<thead>
<tr>
<th>Species Program</th>
<th>Common Name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>New England Bluet</td>
<td><em>Enallagma laterale</em></td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Ski-tipped Emerald</td>
<td><em>Somatochlora elongata</em></td>
<td>SC</td>
</tr>
<tr>
<td>Spine-crowned Clubtail</td>
<td><em>Gomphus abbreviatus</em></td>
<td>SC</td>
</tr>
<tr>
<td>Blue-spotted Salamander</td>
<td><em>Ambystoma laterale</em></td>
<td>SC</td>
</tr>
<tr>
<td>Four-toed Salamander</td>
<td><em>Hemidactylum scutatum</em></td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Spring Salamander</td>
<td><em>Gyrinophilus porphyriticus</em></td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>American Bittern</td>
<td><em>Botaurus lentiginosus</em></td>
<td>E</td>
</tr>
</tbody>
</table>

Core 2937
Forest Core

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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 Habitat Summaries

Core 2583
A <1-acre Core Habitat featuring a Species of Conservation Concern.
Sand Violet, a low-growing perennial herb with showy purple-violet flowers, grows in disturbed habitats, usually in full sun, on moist to very dry soils. It competes poorly with other plants and relies on periodic disturbance to remove potential competitors.

Core 2602
A 2-acre Core Habitat featuring Wetland Core.
Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Core 2621
A 3,410-acre Core Habitat featuring Forest Core, Wetland Core, Aquatic Core, Priority Natural Communities, and Species of Conservation Concern.
Forest Cores are the best examples of large, intact forests that are least impacted by roads and development. Forest Cores support many bird species sensitive to the impacts of roads and development and help maintain ecological processes found only in unfragmented forest patches.

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

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

Hickory-Hop Hornbeam Forests are open, hardwood forests dominated by various hickory species with significant hop hornbeam in the subcanopy. This community is characterized by a sparse shrub layer, and a nearly continuous cover of grasses and sedges. This relatively small example of Hickory-Hop Hornbeam Forest is in good condition, with high species diversity and no signs of anthropogenic disturbance or exotic invasive species.

Low-Energy Riverbanks are open herbaceous communities occurring on sandy or silty mineral soils of river and streambanks that do not experience severe flooding or ice scour. This large example of Low-Energy Riverbank is of excellent quality, with few exotic species, good species diversity, excellent buffering within a natural landscape, and intact natural hydrologic processes.
The Shallow Emergent Marsh community is a graminoid wetland found in broad, flat areas bordering rivers or along pond margins. They commonly occur in abandoned beaver ponds, and differ from Deep Emergent Marshes in having less standing water. This example of Shallow Emergent Marsh is large and narrow, with good habitat diversity, including shrub patches and open water in addition to the predominant meadow-like marsh.

Creepers are freshwater mussels that inhabit low-gradient reaches of small to large rivers with sand or gravel substrates. Cool to warm water with diverse fish assemblages best support Creepers.

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 Arrow Clubtail is a large dragonfly whose aquatic nymphs inhabit medium to large, swift-flowing, sandy-bottomed rivers and occasionally large lakes. The terrestrial adults inhabit riparian areas and the surrounding uplands, and return to the water body to mate and lay eggs.

Larvae of Spine-crowned Clubtail dragonflies are aquatic and burrow just under the top of silty to sandy bottom sediments in medium to large rivers.

The Zebra Clubtail dragonfly inhabits sand-bottomed streams and small rivers with riffles as larvae. Adults feed over the same streams. Surrounding upland forests provide protection while adults reach sexual maturity.

Sharp-shinned Hawks nest in mixed woodlands and coniferous forests, often with nearby open areas. They are sensitive to disturbance around the nest, but they do occasionally nest near human development.

Core 2659

A 58-acre Core Habitat featuring Wetland Core.

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

Core 2668

A 2-acre Core Habitat featuring a Species of Conservation Concern.

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

Core 2681

A 62-acre Core Habitat featuring Wetland Core.
Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Core 2692
A 222-acre Core Habitat featuring Species of Conservation Concern.

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

Stygian Shadowdragons are dragonflies that are found on lakes with rocky shores and medium to large rivers that are relatively unvegetated.

Core 2693
A 9-acre Core Habitat featuring a Species of Conservation Concern.

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

Core 2711
A 5-acre Core Habitat featuring Wetland Core.

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

Core 2712
A 45-acre Core Habitat featuring Wetland Core.

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

Core 2727
A 1-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.
Core 2728
A <1-acre Core Habitat featuring Wetland Core.
Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Core 2736
A <1-acre Core Habitat featuring Wetland Core.
Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Core 2753
A 2-acre Core Habitat featuring Wetland Core.
Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Core 2760
A <1-acre Core Habitat featuring Wetland Core.
Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Core 2761
A <1-acre Core Habitat featuring Wetland Core.
Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Core 2775
An 88-acre Core Habitat featuring Vernal Pool Core.
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 2776**

A 210-acre Core Habitat featuring Wetland Core, Priority Natural Communities, 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.

Acidic Shrub Fens are shrub-dominated acidic peatlands found primarily along pond margins in the eastern and central part of the state. These wetland communities experience some groundwater and/or surface water inputs, but no calcareous seepage. This example of Acidic Shrub Fen is exceptionally large and is extremely well buffered by natural vegetation. It is in good condition, with good species and structural diversity and little evidence of human disturbance.

Black Ash Swamps are a variant of red maple swamps with black ash co-dominant in the canopy. The soils that support Black Ash Swamps are enriched with less acidic, more nutrient-rich groundwater seepage. This small Black Ash Swamp in a large protected corridor has unusually high species diversity within a surrounding wetland area dominated by Red Maple Swamp. The entire wetland has a mosaic of diverse habitats with several types of NHESP priority natural communities.

Kettlehole Level Bogs are acidic dwarf-shrub peatlands with little water input or outflow that form in circular depressions left by melting ice blocks in sandy glacial outwash. The vegetation in Kettlehole Level Bogs usually grows in rings. The vegetation of this very nice Kettlehole Level Bog has typical concentric ring zonation around a center with sphagnum, low bog shrubs and scattered Black Spruce. This community is in a mosaic of good wetland communities on protected land along a river corridor.

Spruce-Fir Boreal Swamps are forested wetlands dominated by red spruce and balsam fir. These swamps are typically found at stream headwaters or in poorly drained basins in the higher, western and north-central parts of the state. These two patches of Spruce-Fir Swamp within a corridor of conservation land are in very good condition. They are in a mosaic with other priority and more common natural communities, that together provide diverse conditions for constituent species.

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

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

Core 2779
A <1-acre Core Habitat featuring Wetland Core.

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

Core 2783
A 45-acre Core Habitat featuring Wetland Core.

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

Core 2790
A 4-acre Core Habitat featuring a Species of Conservation Concern.

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

Core 2797
A <1-acre Core Habitat featuring a Priority Natural Community.

Forest Seeps are in areas on wet slopes in hardwood forests where groundwater seeps out of the earth. The overstory is similar to that of the surrounding forest, but many typical wetland ferns, herbs, and shrubs occur as well. This small example of Forest Seep is in good condition and is nicely buffered within a large naturally vegetated area. It is free of exotic invasive species.

Core 2801
A 345-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.

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

Core 2812
A 3-acre Core Habitat featuring a Priority Natural Community.
Level Bogs are dwarf-shrub peatlands, generally with pronounced hummocks and hollows in sphagnum moss. These wetland communities are very acidic and nutrient-poor because the peat isolates them from nutrients in groundwater and streams. This example of Level Bog is in excellent condition, with a well-developed sphagnum mat and good structural and species diversity. It is largely buffered by natural vegetation and shows little sign of human disturbance.

Core 2814
A 46-acre Core Habitat featuring Priority Natural Communities.
Level Bogs are dwarf-shrub peatlands, generally with pronounced hummocks and hollows in sphagnum moss. These wetland communities are very acidic and nutrient-poor because the peat isolates them from nutrients in groundwater and streams. This example of Level Bog is in excellent condition, with a well-developed sphagnum mat and good structural and species diversity. It is largely buffered by natural vegetation and shows little sign of human disturbance.

Shrub Swamp communities are a common and variable type of wetlands occurring on seasonally or temporarily flooded soils. They are often found in the transition zone between emergent marshes and swamp forests. This example of Shrub Swamp is large and is in excellent condition, with relatively little human disturbance and an intact natural hydrologic system.

Core 2815
A <1-acre Core Habitat featuring a Species of Conservation Concern.
Sand Violet, a low-growing perennial herb with showy purple-violet flowers, grows in disturbed habitats, usually in full sun, on moist to very dry soils. It competes poorly with other plants and relies on periodic disturbance to remove potential competitors.

Core 2816
A 15-acre Core Habitat featuring Wetland Core.
Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes — those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Core 2818
A 5-acre Core Habitat featuring a Species of Conservation Concern.
Sand Violet, a low-growing perennial herb with showy purple-violet flowers, grows in disturbed habitats, usually in full sun, on moist to very dry soils. It competes poorly with other plants and relies on periodic disturbance to remove potential competitors.

**Core 2819**

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

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

**Core 2853**

A 312-acre Core Habitat featuring Vernal Pool Core and 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.

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

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

**Core 2855**

A 163-acre Core Habitat featuring Wetland Core.

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

The 163-acre Wetland Core is among the largest 20% of Wetland Cores statewide and in this ecoregion.

**Core 2896**

A 1-acre Core Habitat featuring a Priority Natural Community.

Hemlock-Hardwood Swamps are acidic forested swamps that have hemlock as the dominant canopy species. These forested wetlands occur on saturated soils in poorly drained basins throughout the state. This large, mature Hemlock-Hardwood Swamp with pit and mound microtopography is well buffered by a large block of moderately logged upland forest.
Core 2899
A <1-acre Core Habitat featuring a Priority Natural Community.
Hemlock-Hardwood Swamps are acidic forested swamps that have hemlock as the dominant canopy species. These forested wetlands occur on saturated soils in poorly drained basins throughout the state. This large, mature Hemlock-Hardwood Swamp with pit and mound microtopography is well buffered by a large block of moderately logged upland forest.

Core 2900
A <1-acre Core Habitat featuring a Priority Natural Community.
Hemlock-Hardwood Swamps are acidic forested swamps that have hemlock as the dominant canopy species. These forested wetlands occur on saturated soils in poorly drained basins throughout the state. This large, mature Hemlock-Hardwood Swamp with pit and mound microtopography is well buffered by a large block of moderately logged upland forest.

Core 2907
An 11-acre Core Habitat featuring a Species of Conservation Concern.
Sand Violet, a low-growing perennial herb with showy purple-violet flowers, grows in disturbed habitats, usually in full sun, on moist to very dry soils. It competes poorly with other plants and relies on periodic disturbance to remove potential competitors.

Core 2913
A 2,139-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 136-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.
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 Zebra Clubtail dragonfly inhabits sand-bottomed streams and small rivers with riffles as larvae. Adults feed over the same streams. Surrounding upland forests provide protection while adults reach sexual maturity.
Wood Turtle habitat is streams and rivers, preferably with long corridors of undeveloped, connected uplands. They also use fields and early successional habitat extending up to 500 meters on both sides of...
the waterways. Mowing and roads are the primary causes of mortality. Collection is also a conservation concern.

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

**Core 2917**  
An 18-acre Core Habitat featuring Wetland Core.

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

**Core 2918**  
A 3-acre Core Habitat featuring a Priority Natural Community.

Hemlock-Hardwood Swamps are acidic forested swamps that have hemlock as the dominant canopy species. These forested wetlands occur on saturated soils in poorly drained basins throughout the state. This large, mature Hemlock-Hardwood Swamp with pit and mound microtopography is well buffered by a large block of moderately logged upland forest.

**Core 2922**  
A 7-acre Core Habitat featuring a Species of Conservation Concern.

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

**Core 2924**  
A 7-acre Core Habitat featuring a Priority Natural Community.

Hemlock-Hardwood Swamps are acidic forested swamps that have hemlock as the dominant canopy species. These forested wetlands occur on saturated soils in poorly drained basins throughout the state. This large, mature Hemlock-Hardwood Swamp with pit and mound microtopography is well buffered by a large block of moderately logged upland forest.

**Core 2925**  
A 29-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.
Core 2926

A 3-acre Core Habitat featuring a Species of Conservation Concern.

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

Core 2927

A 2-acre Core Habitat featuring a Priority Natural Community.

Hemlock-Hardwood Swamps are acidic forested swamps that have hemlock as the dominant canopy species. These forested wetlands occur on saturated soils in poorly drained basins throughout the state. This large, mature Hemlock-Hardwood Swamp with pit and mound microtopography is well buffered by a large block of moderately logged upland forest.

Core 2929

A 951-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.

Acidic Rocky Summits are open communities of shrubs, scattered grasses, mosses, lichens and occasional trees found on exposed rocky summits. These areas are dry with little soil, and can often be found as patches within other ridgetop communities. This moderate-sized example of Acidic Rocky Summit is associated with an Acidic Talus slope, and is surrounded by one of the largest and most mature Northern Hardwoods-Hemlock-White Pine forests in the stat-

Circumneutral Talus Forest communities develop on boulder strewn slopes below slightly acidic cliffs or rock outcrops. There is often a gradient of vegetation density as the slope changes, with more trees on the lower slope. This example of Circumneutral Talus Slope, which occurs as two patches, is of moderate size but in very good condition, with good diversity and an excellent buffer of natural vegetation.

Northern Hardwoods-Hemlock-White Pine Forests have a mix of evergreen and deciduous trees, with a closed, full canopy, and sparse shrub and herbaceous layers. It commonly occurs on north facing slopes and ravines with moderately acidic soils. This large example of Northern Hardwoods-Hemlock-White Pine Forest has a diversity of age structures, and provides habitat to many of our more common wildlife species, such as bear, moose, deer, and neotropical migrant birds.

Climbing Fumitory is an herbaceous biennial vine that can reach lengths of 10 feet. It is usually found in the shade climbing over talus at the base of cliffs.

Purple Clematis is a graceful, woody vine of sub-acid rocky slopes and outcrops. A member of the buttercup family, it has opposite or whorled leaves and pendant bluish or purple flowers that bloom from May to June.
Sand Violet, a low-growing perennial herb with showy purple-violet flowers, grows in disturbed habitats, usually in full sun, on moist to very dry soils. It competes poorly with other plants and relies on periodic disturbance to remove potential competitors.

Creepers are freshwater mussels that inhabit low-gradient reaches of small to large rivers with sand or gravel substrates. Cool to warm water with diverse fish assemblages best support Creepers.

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.

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.

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

Wood Turtle habitat is streams and rivers, preferably with long corridors of undeveloped, connected uplands. They also use fields and early successional habitat extending up to 500 meters on both sides of the waterways. Mowing and roads are the primary causes of mortality. Collection is also a conservation concern.

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

Core 2931
A 70-acre Core Habitat featuring Wetland 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.

The 70-acre Wetland Core is among the largest 20% of Wetland Cores in this ecoregion.

A member of the Christmas Mistletoe family, Dwarf Mistletoe is a very small fleshy shrub, usually no more than 0.8 inch tall, that parasitizes conifer trees. In Massachusetts, Dwarf Mistletoe occurs in peatlands varying from kettlehole peat bogs to spruce-fir-birch headwater swamps, generally on the branches of black spruce (Picea mariana).

Core 2932
A 189-acre Core Habitat featuring Wetland Core, a Priority Natural Community, 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.

The 189-acre Wetland Core is among the largest 20% of Wetland Cores statewide and in this ecoregion.

Hemlock-Hardwood Swamps are acidic forested swamps that have hemlock as the dominant canopy species. These forested wetlands occur on saturated soils in poorly drained basins throughout the state. This large, mature Hemlock-Hardwood Swamp with pit and mound microtopography is well buffered by a large block of moderately logged upland forest.

A member of the Christmas Mistletoe family, Dwarf Mistletoe is a very small fleshy shrub, usually no more than 0.8 inch tall, that parasitizes conifer trees. In Massachusetts, Dwarf Mistletoe occurs in peatlands varying from kettlehole peat bogs to spruce-fir-birch headwater swamps, generally on the branches of black spruce (*Picea mariana*).

Core 2934

A 1,929-acre Core Habitat featuring Forest Core, Wetland Core, Aquatic Core, Priority Natural Communities, and Species of Conservation Concern.

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

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

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

Acidic Shrub Fens are shrub-dominated acidic peatlands found primarily along pond margins in the eastern and central part of the state. These wetland communities experience some groundwater and/or surface water inputs, but no calcareous seepage. This example of Acidic Shrub Fen is exceptionally large, and is extremely well buffered by natural vegetation. It is in good condition, with good species and structural diversity and little evidence of human disturbance.

Alluvial Hardwood Flats are moist deciduous forests on river-deposited sediments along small rivers and large streams. Black cherry with red maple dominates the canopy above scattered shrubs and a dense and diverse herbaceous layer.

Three examples of Alluvial Hardwood Flat community including one that is in an extensive area of conservation land. Although it is next to a road, regular natural flooding events maintain the high diversity of native species without exotics.
Inland Acidic Pondshores/Lakeshores are submerged or saturated for a significant part of the year or continuously in wet years. Plants of the community emerge during low water periods. This example of Inland Acidic Pondshore/Lakeshore is extensive, in very good condition, and within a large complex of various wetland types that buffer it from development.

Spruce-Fir Boreal Swamps are forested wetlands dominated by red spruce and balsam fir. These swamps are typically found at stream headwaters or in poorly drained basins in the higher, western and north-central parts of the state. These two patches of Spruce-Fir Swamp within a corridor of conservation land are in very good condition. They are in a mosaic with other priority and more common natural communities, which together provide diverse conditions for constituent species.

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.

The Pink Sallow Moth inhabits sandplain pitch pine/scrub oak barrens and heathlands, and possibly also ridgetop barrens and bogs; it is associated with ericaceous vegetation. Larval host plants are undocumented, but almost certainly include lowbush blueberries (*Vaccinium pallidum* and *V. angustifolium*).

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.

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

Larvae of Spine-crowned Clubtail dragonflies are aquatic and burrow just under the top of silty to sandy bottom sediments in medium to large rivers.

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

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

Spring Salamander adults inhabit clean, cold, high-gradient brooks and headwater seeps in forest habitat, usually at elevation >100 m. Larvae are entirely aquatic and largely nocturnal, spending daylight hours buried below the streambed or hidden under stones. Adults are semi-aquatic and spend most of their time under cover objects along the margins of brooks, springs, and seeps; however, they will venture into upland forest during rainy weather.
American Bitterns are heron-like birds that nest primarily in large cattail, tussock or shrub marshes and are very sensitive to disturbance.

Core 2937
A 2,464-acre Core Habitat featuring Forest Core.

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.
BioMap2 Critical Natural Landscape in Royalston

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

**CNL 1316**
- Aquatic Core Buffer
- Landscape Block
- Wetland Core Buffer

**CNL 1319**
- Aquatic Core Buffer
- Landscape Block
- Wetland Core Buffer
Critical Natural Landscape Summaries

CNL 1316

A 30,617-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 1319

An 18,148-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.
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