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

This information is intended for conservation planning, and is not intended for use in state regulations.
Table of Contents

Introduction

What is BioMap2 – Purpose and applications

One plan, two components

Understanding Core Habitat and its components

Understanding Critical Natural Landscape and its components

Understanding Core Habitat and Critical Natural Landscape Summaries

Sources of Additional Information

Buckland Overview

Core Habitat and Critical Natural Landscape Summaries

Elements of BioMap2 Cores

Core Habitat Summaries

Elements of BioMap2 Critical Natural Landscapes

Critical Natural Landscape Summaries
Introduction

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

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

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

What Does Status Mean?

The Division of Fisheries and Wildlife determines a status category for each rare species listed under the Massachusetts Endangered Species Act (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

Get your copy of the BioMap2 report! Download from www.mass.gov/nhesp or contact Natural Heritage at 508-389-6360 or natural.heritage@state.ma.us.

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

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).

---

**BioMap2: One Plan, Two Components**

BioMap2 identifies two complementary spatial layers, Core Habitat and Critical Natural Landscape.
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
Buckland lies on the border of the Berkshire Highlands/Southern Green Mountains and the Vermont Piedmont Ecoregions. The Berkshire Highlands Ecoregion is an area drained by the Deerfield, upper Westfield, Hoosic, and Housatonic Rivers. Lakes and ponds are relatively abundant. This ecoregion has deep soils that support northern hardwoods and spruce-fir forests. The Vermont Piedmont Ecoregion contains transition hardwood and northern hardwood forests. Hills are sometimes quite steep. Surface waters are highly alkaline. This area drains to the Deerfield and Connecticut River basins.

Buckland at a Glance
- Total Area: 12,721 acres (19.9 square miles)
- Human Population in 2010: 1,902
- Open space protected in perpetuity: 378 acres, or 3.0% percent of total area*
- BioMap2 Core Habitat: 1,199 acres
- BioMap2 Core Habitat Protected: 24 acres or 2.0%
- BioMap2 Critical Natural Landscape: 5,079 acres
- BioMap2 Critical Natural Landscape Protected: 93 acres or 1.8%.

BioMap2 Components
Core Habitat
- 2 Exemplary or Priority Natural Community Cores
- 7 Aquatic Cores
- 12 Species of Conservation Concern Cores**
  - 2 amphibians, 1 fish, 5 insects, 3 plants

Critical Natural Landscape
- 1 Landscape Block
- 5 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.

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

For more information on rare species and natural communities, please see our fact sheets online at www.mass.gov/nhesp.
Species of Conservation Concern, Priority and Exemplary Natural Communities, and Other Elements of Biodiversity in Buckland

Insects

Butterflies

Early Hairstreak, (Erora laeta), T

Beetles

Twelve-spotted Tiger Beetle, (Cicindela duodecimguttata), SC

Dragonflies

Ocellated Darter, (Boyeria grafiana), SC
Spine-crowned Clubtail, (Gomphus abbreviatus), SC
Stygian Shadowdragon, (Neurocordulia yamaskanensis), SC

Amphibians

Jefferson Salamander, (Ambystoma jeffersonianum), SC
Spring Salamander, (Gyrinophilus porphyriticus), Non-listed SWAP

Fishes

Longnose Sucker, (Catostomus catostomus), SC

Plants

Mountain Alder, (Alnus viridis ssp. crispa), T
Autumn Coralroot, (Corallorhiza odontorhiza), SC
Tradescant’s Aster, (Symphyotrichum tradescantii), T

Priority Natural Communities

Riverside Rock Outcrop Community, S3
Riverside Seep, S2

Other BioMap2 Components

Aquatic Core
Landscape Block
Aquatic 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 Buckland

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

Core 2468
Species of Conservation Concern
Autumn Coralroot  Corallorhiza odontorhiza  SC

Core 2474
Species of Conservation Concern
Spring Salamander  Gyrinophilus porphyriticus  Non-listed SWAP

Core 2556
Aquatic Core
Priority & Exemplary Natural Communities
Riverside Rock Outcrop Community  S3
Riverside Seep  S2
Species of Conservation Concern
Mountain Alder  Alnus viridis ssp. crispa  T
Tradescant’s Aster  Symphyotrichum tradescantii  T
Ocellated Darter  Boyeria grafiana  SC
Spine-crowned Clubtail  Gomphus abbreviatus  SC
Stygian Shadowdragon  Neurocordulia yamaskanensis  SC

Core 2564
Aquatic Core
Species of Conservation Concern
Early Hairstreak  Erora laeta  T
Ocellated Darter  Boyeria grafiana  SC
Jefferson Salamander  Ambystoma jeffersonianum  SC
Spring Salamander  Gyrinophilus porphyriticus  Non-listed SWAP
Longnose Sucker  Catostomus catostomus  SC

Core 2810
Forest Core
Wetland Core
Aquatic Core
Vernal Pool Core
Priority & Exemplary Natural Communities
Hickory - Hop Hornbeam Forest/Woodland  S2

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).
Rich, Mesic Forest Community
Species of Conservation Concern
- Back's Sedge: Carex backii
- Broad Waterleaf: Hydrophyllum canadense
- Climbing Fumitory: Adlumia fungosa
- Mountain Alder: Alnus viridis ssp. crispa
- Purple Clematis: Clematis occidentalis
- Tradescant’s Aster: Symphyotrichum tradescantii
- Woodland Millet: Milium effusum
- Twelve-spotted Tiger Beetle: Cicindela duodecimguttata
- Ocellated Darter: Boyeria grafiana
- Jefferson Salamander: Ambystoma jeffersonianum
- Spring Salamander: Gyrinophilus porphyriticus
- Longnose Sucker: Catostomus catostomus

Core 2966
Aquatic Core
Priority & Exemplary Natural Communities
- Cobble Bar Forest: S2
- High-energy Riverbank: S3
- Riverside Seep: S2
Species of Conservation Concern
- Barren Strawberry: Geum fragarioides
- Bristly Black Currant: Ribes lacustre
- Mountain Alder: Alnus viridis ssp. crispa
- Muskflower: Mimulus moschatus
- Ocellated Darter: Boyeria grafiana
- Jefferson Salamander: Ambystoma jeffersonianum
- Wood Turtle: Glyptemys insculpta
- Longnose Sucker: Catostomus catostomus

Core 2943F
Forest Core
Wetland Core
Aquatic Core
Priority & Exemplary Natural Communities
- High-energy Riverbank: S3
- Major-river Floodplain Forest: S2
- Rich, Mesic Forest Community: S3
- Riverside Rock Outcrop Community: S3
Species of Conservation Concern
- Broad Waterleaf: Hydrophyllum canadense
- Dwarf Scouring-rush: Equisetum scirpoides

For more information on rare species and natural communities, please see our fact sheets online at [www.mass.gov/nhesp](http://www.mass.gov/nhesp).
<table>
<thead>
<tr>
<th>Name</th>
<th>Scientific Name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Giant St. John’s-wort</td>
<td>Hypericum ascyron</td>
<td>E</td>
</tr>
<tr>
<td>Green Dragon</td>
<td>Arisaema dracontium</td>
<td>T</td>
</tr>
<tr>
<td>Hitchcock’s Sedge</td>
<td>Carex hitchcockiana</td>
<td>SC</td>
</tr>
<tr>
<td>Mountain Alder</td>
<td>Alnus viridis ssp. crispa</td>
<td>T</td>
</tr>
<tr>
<td>Purple Clematis</td>
<td>Clematis occidentalis</td>
<td>SC</td>
</tr>
<tr>
<td>Shore Sedge</td>
<td>Carex lenticularis</td>
<td>T</td>
</tr>
<tr>
<td>Spiked False Oats</td>
<td>Trisetum spicatum</td>
<td>E</td>
</tr>
<tr>
<td>Tradescant’s Aster</td>
<td>Symphyotrichum tradescantii</td>
<td>T</td>
</tr>
<tr>
<td>Arrow Clubtail</td>
<td>Stylurus spiniceps</td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Cobra Clubtail</td>
<td>Gomphus vastus</td>
<td>SC</td>
</tr>
<tr>
<td>Ocellated Darner</td>
<td>Boyeria grafiana</td>
<td>SC</td>
</tr>
<tr>
<td>Riffle Snaketail</td>
<td>Ophiogomphus carolus</td>
<td>T</td>
</tr>
<tr>
<td>Riverine Clubtail</td>
<td>Stylurus amnicola</td>
<td>E</td>
</tr>
<tr>
<td>Stygian Shadowdragon</td>
<td>Neurocordulia yamaskanensis</td>
<td>SC</td>
</tr>
<tr>
<td>Zebra Clubtail</td>
<td>Stylurus scudderi</td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Jefferson Salamander</td>
<td>Ambystoma jeffersonianum</td>
<td>SC</td>
</tr>
<tr>
<td>Spring Salamander</td>
<td>Gyrinophilus porphyriticus</td>
<td>Non-listed SWAP</td>
</tr>
<tr>
<td>Wood Turtle</td>
<td>Glyptemys insculpta</td>
<td>SC</td>
</tr>
<tr>
<td>Longnose Sucker</td>
<td>Catostomus catostomus</td>
<td>SC</td>
</tr>
<tr>
<td>Shortnose Sturgeon</td>
<td>Acipenser brevirostrum</td>
<td>E</td>
</tr>
<tr>
<td>Bald Eagle</td>
<td>Haliaeetus leucocephalus</td>
<td>T</td>
</tr>
<tr>
<td>Vesper Sparrow</td>
<td>Poecetes gramineus</td>
<td>T</td>
</tr>
</tbody>
</table>

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 2468

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

Autumn Coralroot, a member of the Orchid family, is a brown-purple saprophyte, obtaining its nourishment from dead organic matter in the soil rather than from photosynthesis. It grows in either light soil or rich humus in open deciduous or mixed forests.

Core 2474

A 172-acre Core Habitat featuring a Species of Conservation Concern.

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.

Core 2556

A 388-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.

Riverside Rock Outcrop communities are sparsely vegetated areas in crevices on riverside rock outcrops where soil accumulates. The community occurs on flood-scoured bedrock along rivers. This example of Riverside Rock Outcrop has associated Riverside Seep patches that support an unusual assemblage of plant species. These two riverside communities are of good quality and are partially buffered by forested land.

Riverside Seeps are a mixed herbaceous community that occurs at the base of steep riverbanks where groundwater seeps out of the bottom of the upland slope. This enrichment leads to high species diversity. This example of Riverside Seep is of good size and quality, and is partially buffered by naturally forested land.

Mountain Alder in Massachusetts occurs in several habitat types which combine open, exposed areas and cool local temperatures. The most common habitat is exposed ledges, boulders, and cobble bars on the edges of the Connecticut and Deerfield Rivers. Many of these high-energy river shores are influenced by seasonal flooding.

Tradescant’s Aster is a graceful white-rayed aster seldom more than 1.5 feet tall. It grows tenaciously rooted in cracks of rocky stream or riverbanks and adjacent exposed ledges that are subject to flooding.
Ocellated Darners are dragonflies whose nymphs inhabit clear, shallow, rocky, swift-flowing streams and large, rocky, poorly vegetated lakes. Adults also inhabit nearby uplands, often forests with mixed coniferous and deciduous trees.

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.

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

**Core 2564**

A 1,007-acre Core Habitat featuring Aquatic Core and Species of Conservation Concern.

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

The Early Hairstreak butterfly inhabits mature northern hardwood forest and associated openings. Larvae feed on the developing fruits and leaves of beech trees.

Ocellated Darners are dragonflies whose nymphs inhabit clear, shallow, rocky, swift-flowing streams and large, rocky, poorly vegetated lakes. Adults also inhabit nearby uplands, often forests with mixed coniferous and deciduous trees.

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.

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.

In Massachusetts, the torpedo-shaped Longnose Sucker is found mainly in cool upper sections of streams and rivers with rocky to gravel substrates. These fish may swim miles to deposit their eggs on clean and well-oxygenated gravel substrates.

**Core 2810**

A 5,046-acre Core Habitat featuring Forest Core, Wetland Core, Aquatic Core, Vernal Pool 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.

This 4,116-acre Forest Core is among the largest 20% of Forest Cores in the state and provides important forest interior habitat. It is partially protected by Catamount State Forest and other entities.

---

**Natural Heritage & Endangered Species Program**

Massachusetts Division of Fisheries and Wildlife
1 Rabbit Hill Road, Westborough, MA 01581
phone: 508-389-6360  fax: 508-389-7890

For more information on rare species and natural communities, please see our fact sheets online at [www.mass.gov/nhesp](http://www.mass.gov/nhesp).
Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

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

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

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 example of a Hickory - Hop Hornbeam Forest/Woodland is large and beautiful with patches scattered on the hill, one of the state's best examples of the community-type.

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.

Two examples of Rich, Mesic Forest including a small patch that is recovering from years of anthropogenic disturbance which have resulted in exotic invasive species. However it has exceptional floral diversity and several state-listed rare species.

Back’s Sedge is a perennial herbaceous sedge of dry, rich woodlands.

Broad Waterleaf is a plant of rich, moist, limy woods.

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.

Mountain Alder in Massachusetts occurs in several habitat types which combine open, exposed areas and cool local temperatures. The most common habitat is exposed ledges, boulders, and cobble bars on the edges of the Connecticut and Deerfield Rivers. Many of these high-energy river shores are influenced by seasonal flooding.

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.

Tradescant’s Aster is a graceful white-rayed aster seldom more than 1.5 feet tall. It grows tenaciously rooted in cracks of rocky stream or riverbanks and adjacent exposed ledges that are subject to flooding.

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

Twelve-spotted Tiger Beetles are dark brown to black in color, with white markings on the elytra (wing covers). The beetle larvae dig burrows into dark clay and silt banks along riverbanks and pond shores.
The adult beetles disperse widely and may be found far from their larval habitats, often in sand pits or along sandy roads and paths.

Ocellated Darners are dragonflies whose nymphs inhabit clear, shallow, rocky, swift-flowing streams and large, rocky, poorly vegetated lakes. Adults also inhabit nearby uplands, often forests with mixed coniferous and deciduous trees.

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.

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.

In Massachusetts, the torpedo-shaped Longnose Sucker is found mainly in cool upper sections of streams and rivers with rocky to gravel substrates. These fish may swim miles to deposit their eggs on clean and well-oxygenated gravel substrates.

Core 2966

A 1,985-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.

Cobble Bar Forests are found on bands of cobble-sized rocks deposited by powerful rivers during annual flood events. They are characterized by open forests of stunted sycamores and cottonwoods growing on sandy cobble bars. This example of Cobble Bar Forest is good sized, with excellent diversity and structure, and is relatively well buffered within a natural landscape.

High-Energy Riverbank communities are sparse, open graminoid communities found on cobble and sand deposits along fast-flowing rivers that experience severe flooding and ice scour. This small example of High Energy Riverbank is in fair condition, with moderate species diversity and some human disturbance.

Riverside Seeps are a mixed herbaceous community that occurs at the base of steep riverbanks where groundwater seeps out of the bottom of the upland slope. This enrichment leads to high species diversity. Despite the presence of an exotic invasive species, this large example of a Riverside Seep has good species diversity and is well buffered by naturally forested land.

Barren Strawberry is a short herbaceous perennial that occurs on rich soils near streams in a variety of forest types.
Bristly Black Currant is a low, bristly to spiny, straggling shrub measuring up to 3 feet in height. Bristly Black Currant is usually found in cool ravines and borders of swamps in upland regions of Massachusetts.

Mountain Alder in Massachusetts occurs in several habitat types which combine open, exposed areas and cool local temperatures. The most common habitat is exposed ledges, boulders, and cobble bars on the edges of the Connecticut and Deerfield Rivers. Many of these high-energy river shores are influenced by seasonal flooding.

Muskflower, a yellow-flowered, herbaceous perennial, occurs in springs, riverside seeps and wet roadside ditches.

Ocellated Darners are dragonflies whose nymphs inhabit clear, shallow, rocky, swift-flowing streams and large, rocky, poorly vegetated lakes. Adults also inhabit nearby uplands, often forests with mixed coniferous and deciduous trees.

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.

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.

In Massachusetts, the torpedo-shaped Longnose Sucker is found mainly in cool upper sections of streams and rivers with rocky to gravel substrates. These fish may swim miles to deposit their eggs on clean and well-oxygenated gravel substrates.

Core 2943F

A 4,980-acre section of a larger 93,990-acre Core Habitat featuring Forest Core, Wetland Core, Aquatic Core, Priority Natural Communities, and Species of Conservation Concern.

The lower Deerfield River and many of its tributaries are part of the extensive Connecticut River Core Habitat. This part of the Core supports 30 rare and uncommon species, from Longnose Suckers in Poland Brook to the Green Dragon (a relative of Jack-in-the-pulpit) in the wetland near the Deerfield’s mouth. Many rare plants cling to the banks of the Deerfield in its steeper stretches, including Mountain Alder, Purple Clematis, and Tradescant’s Aster.

High-Energy Riverbank communities are sparse, open graminoid communities found on cobble and sand deposits along fast-flowing rivers that experience severe flooding and ice scour. This example of High-Energy Riverbank is in good condition, but is threatened by upstream manipulations of water flow.

Major-River Floodplain Forests are dominated by silver maple. This community is found along the floodplains of large rivers. The soils here are enriched with nutrients brought by annual floods, resulting in a diversity of plants and insects. This Core has six examples of Major-river Floodplain Forest occurring in patches along the Deerfield River. At least one of these patches is very large, of high-quality, and is free of exotic species and human disturbances.
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 mature example of Rich, Mesic Forest is a regional variant lacking the full species diversity of its community type. It is structurally and topographically diverse, despite past logging, and exotic invasive species are established.

Riverside Rock Outcrop communities are sparsely vegetated areas in crevices on riverside rock outcrops where soil accumulates. The community occurs on flood-scoured bedrock along rivers. This example of Riverside Rock Outcrop occurs in conjunction with other important riverine communities along the Deerfield. The presence of several such communities near each other enhances the habitat value of each.

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.
BioMap2 Critical Natural Landscape in Buckland

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

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).
Elements of BioMap2 Critical Natural Landscapes

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

CNL 1158
   Aquatic Core Buffer
   Wetland Core Buffer

CNL 1183
   Aquatic Core Buffer

CNL 1285
   Aquatic Core Buffer
   Landscape Block
   Wetland Core Buffer

CNL 1329
   Aquatic Core Buffer
   Landscape Block
   Wetland Core Buffer
Critical Natural Landscape Summaries

CNL 1158
A 1,099-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 1183
A 14-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 1285
A 9,048-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.

For more information on rare species and natural communities, please see our fact sheets online at www.mass.gov/nhesp.
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 1329

A 111,531-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.