BioMap2

CONSERVING THE BIODIVERSITY OF MASSACHUSETTS IN A CHANGING WORLD

Wilbraham

Produced in 2012

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

This information is intended for conservation planning, and is <u>not</u> intended for use in state regulations.

Commonwealth of Massachusetts Department of Fish & Game

Commonwealth of Massachusetts Division of Fisheries & Wildlife

Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries & Wildlife

The Nature Conservancy
Protecting nature. Preserving life.™

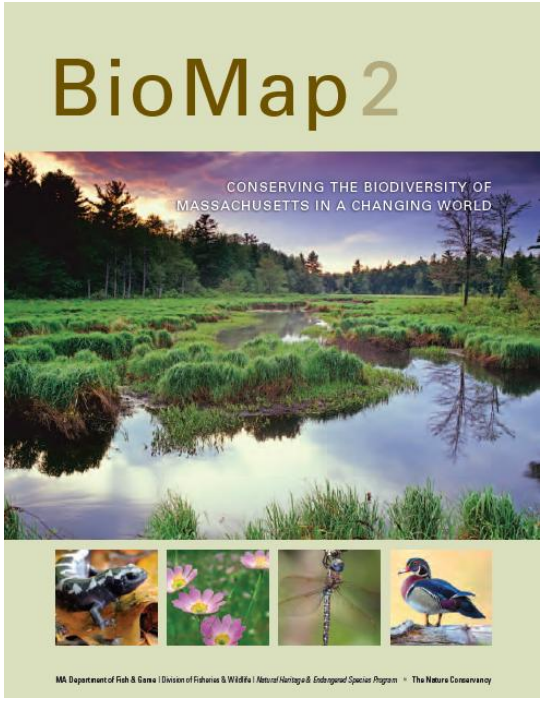
Table of Contents

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.



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

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

Natural Heritage & Endangered Species Program

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

ecologically important areas that are worthy of protection. The status of natural communities reflects the documented number and acreages of each community type in the state:

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

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

BioMap2: One Plan, Two Components

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

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

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

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

Components of Core Habitat

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

Rare Species

There are 432 native plant and animal species listed as Endangered, Threatened or Special Concern under the Massachusetts Endangered Species Act (MESA) based on their rarity, population trends, and threats to survival. For

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

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*.

Taxonomic Group	MESA-listed Species	Non-listed Species of Conservation Concern
Mammals	4	5
Birds	27	23
Reptiles	10	5
Amphibians	4	3
Fish	10	17
Invertebrates	102	9
Plants	256	0
Total	**413**	**62**

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

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

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 www.mass.gov/dfwele/dfw/nhesp/regulatory_review/reg_review_home.htm.

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.**

Natural Heritage & Endangered Species Program

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

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.nhesp.org.

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.nhesp.org. 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

Wilbraham lies on the border of the Connecticut River Valley and the Lower Worcester Plateau Ecoregions. The Connecticut River Valley Ecoregion, the borders of which are primarily defined by the bedrock geology, has rich soils, a relatively mild climate and low rolling topography. The valley floor is primarily cropland and built land. Central hardwoods and transition hardwood forests cover the ridges. The Lower Worcester Plateau Ecoregion is comprised of open hills and transition hardwood and central hardwood forests. Most parts drain to the Chicopee and Quinebaug Rivers.

Wilbraham at a Glance

- Total Area: 14,293 acres (22.3 square miles)
- Human Population in 2010: 14,219
- Open space protected in perpetuity: 2,087 acres, or 14.6% percent of total area*
- *BioMap2* Core Habitat: 3,603 acres
- *BioMap2* Core Habitat Protected: 834 acres or 23.2%
- *BioMap2* Critical Natural Landscape: 3,188 acres
- *BioMap2* Critical Natural Landscape Protected: 737 acres or 23.1%.

BioMap2 Components

Core Habitat

- 2 Exemplary or Priority Natural Community Cores
- 3 Aquatic Cores
- 7 Species of Conservation Concern Cores**
  - 5 reptiles, 4 amphibians, 1 insect, 1 mussel, 3 plants

Critical Natural Landscape

- 1 Landscape Block
- 1 Wetland Core Buffer
- 3 Aquatic Core Buffers

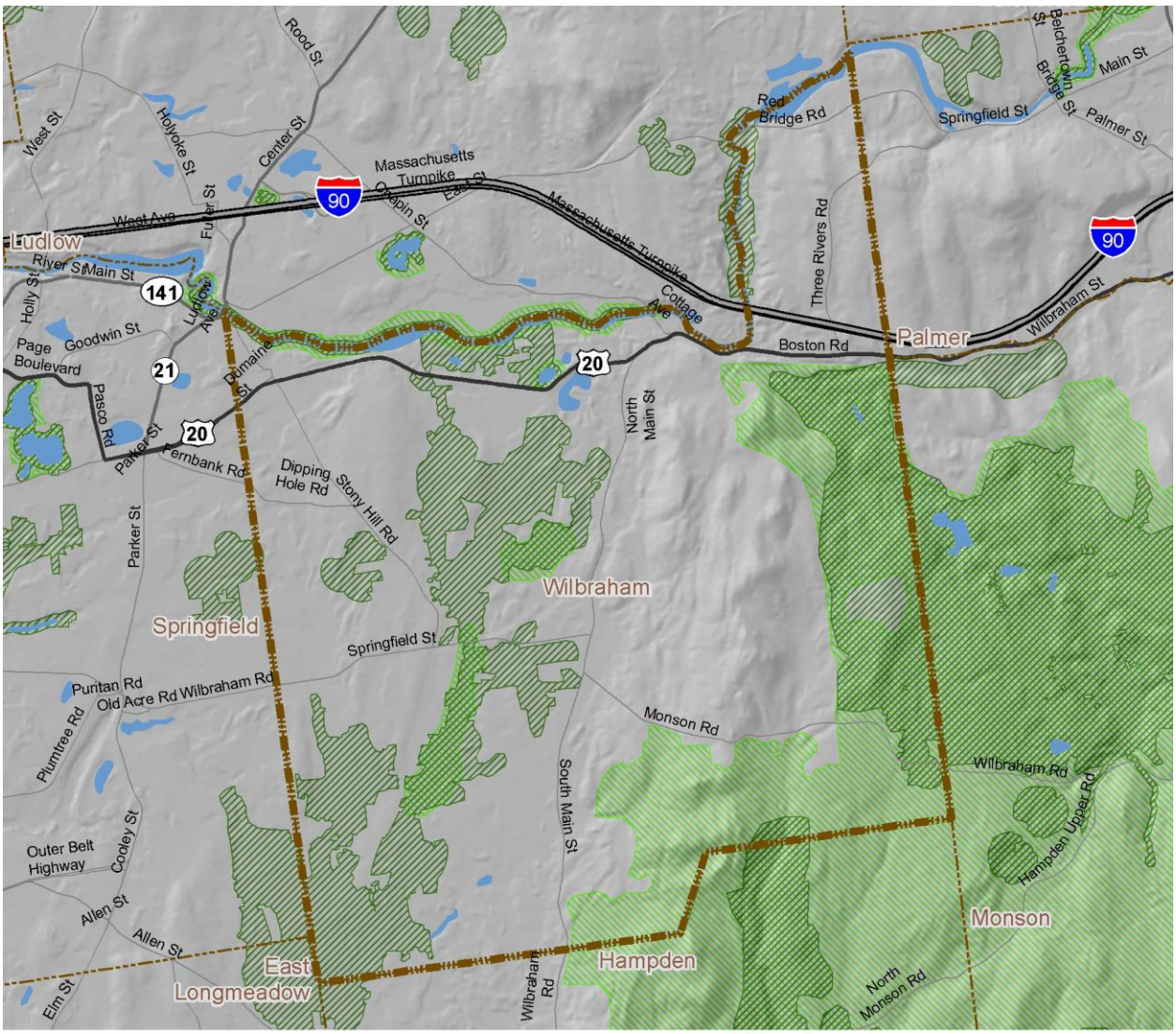
* Calculated using MassGIS data layer "Protected and Recreational Open Space—March, 2012".

** See next pages for complete list of species, natural communities and other biodiversity elements.

Natural Heritage & Endangered Species Program

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

BioMap2 Core Habitat and Critical Natural Landscape in Wilbraham



BioMap2 Core Habitat

BioMap2 Critical Natural Landscape

1 Mile

Natural Heritage & Endangered Species Program

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

Species of Conservation Concern, Priority and Exemplary Natural Communities, and Other Elements of Biodiversity in Wilbraham

Mussels

Triangle Floater, (*Alasmidonta undulata*), Non-listed SWAP species

Insects

Dragonflies

Stygian Shadowdragon, (*Neurocordulia yamaskanensis*), SC

Amphibians

Blue-spotted Salamander, (*Ambystoma laterale*), SC
Marbled Salamander, (*Ambystoma opacum*), T
Eastern Spadefoot, (*Scaphiopus holbrookii*), T
Four-toed Salamander, (*Hemidactylium scutatum*), Non-listed SWAP

Reptiles

Wood Turtle, (*Glyptemys insculpta*), SC
Eastern Box Turtle, (*Terrapene carolina*), SC
Eastern Hognose Snake, (*Heterodon platirhinos*), Non-listed SWAP
Northern Black Racer, (*Coluber constrictor*), Non-listed SWAP
Eastern Worm Snake, (*Carphophis amoenus*), T

Plants

Climbing Fern, (*Lygodium palmatum*), SC
Bristly Buttercup, (*Ranunculus pensylvanicus*), SC
Terete Arrowhead, (*Sagittaria teres*), SC

Priority Natural Communities

Inland Atlantic white cedar swamp, S2
Calcareous Basin Fen, S1

Other *BioMap2* Components

Aquatic Core
Landscape Block
Aquatic Core Buffer
Wetland Core Buffer

E = Endangered
T = Threatened
SC = Special Concern

Natural Heritage & Endangered Species Program

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

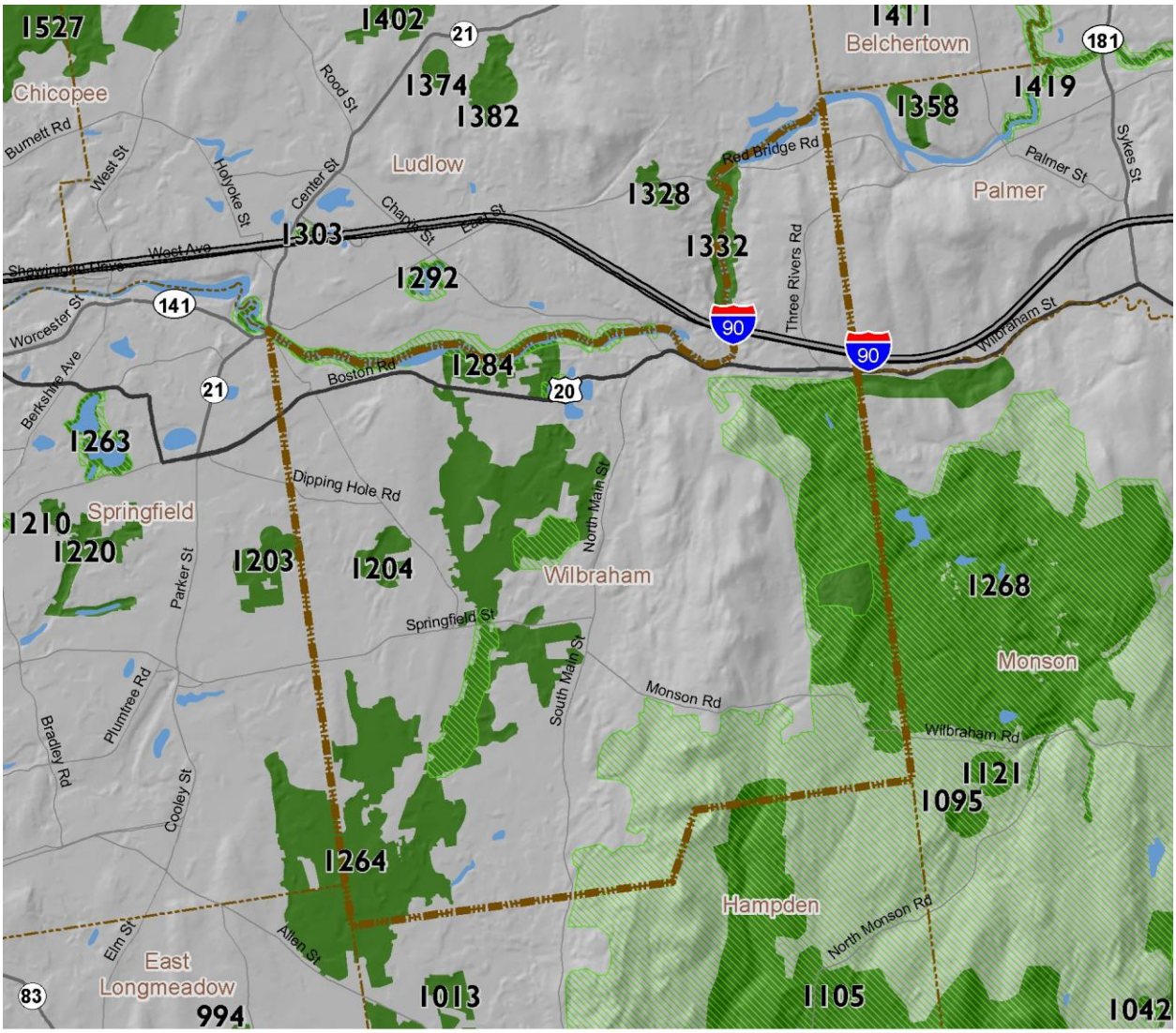
S1 = Critically Imperiled communities, typically 5 or fewer documented sites or very few remaining acres in the state.
S2 = Imperiled communities, typically 6-20 sites or few remaining acres in the state.
S3 = Vulnerable communities, typically have 21-100 sites or limited acreage across the state.

Natural Heritage & Endangered Species Program

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

BioMap2 Core Habitat in Wilbraham

Core IDs correspond with the following element lists and summaries.



BioMap2 Core Habitat

BioMap2 Critical Natural Landscape

1 Mile

Natural Heritage & Endangered Species Program

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

Elements of *BioMap2* Cores

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

Core 1105

Species of Conservation Concern		
Climbing Fern	*Lygodium palmatum*	SC
Four-toed Salamander	*Hemidactylium scutatum*	Non-listed SWAP
Eastern Box Turtle	*Terrapene carolina*	SC
Wood Turtle	*Glyptemys insculpta*	SC

Core 1203

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

Core 1204

Species of Conservation Concern		
Blue-spotted Salamander	*Ambystoma laterale*	SC
Northern Black Racer	*Coluber constrictor*	Non-listed SWAP

Core 1264

Aquatic Core		
Priority & Exemplary Natural Communities		
Calcareous Basin Fen		S1
Inland Atlantic white cedar swamp		S2
Species of Conservation Concern		
Bristly Buttercup	*Ranunculus pensylvanicus*	SC
Climbing Fern	*Lygodium palmatum*	SC
Blue-spotted Salamander	*Ambystoma laterale*	SC
Eastern Spadefoot	*Scaphiopus holbrookii*	T
Four-toed Salamander	*Hemidactylium scutatum*	Non-listed SWAP
Eastern Worm Snake	*Carphophis amoenus*	T
Northern Black Racer	*Coluber constrictor*	Non-listed SWAP

Core 1268

Wetland Core		
Aquatic Core		
Species of Conservation Concern		
Four-toed Salamander	*Hemidactylium scutatum*	Non-listed SWAP
Marbled Salamander	*Ambystoma opacum*	T

Eastern Box Turtle	*Terrapene carolina*	SC
Eastern Hognose Snake	*Heterodon platirhinos*	Non-listed SWAP
Smooth Green Snake	*Opheodrys vernalis*	Non-listed SWAP
Wood Turtle	*Glyptemys insculpta*	SC

Core 1284

Aquatic Core
Species of Conservation Concern

Swamp Dock	*Rumex verticillatus*	T
Terete Arrowhead	*Sagittaria teres*	SC
Triangle Floater	*Alasmidonta undulata*	Non-listed SWAP
Eastern Hognose Snake	*Heterodon platirhinos*	Non-listed SWAP

Core 1332

Species of Conservation Concern

Stygian Shadowdragon	*Neurocordulia yamaskanensis*	SC
Four-toed Salamander	*Hemidactylium scutatum*	Non-listed SWAP

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

Core Habitat Summaries

Core 1105

A 2,467-acre Core Habitat featuring Species of Conservation Concern.

Climbing Fern does not have the characteristic overall shape of most ferns. Instead, it is an evergreen, ivy-like plant which sprawls over the ground or climbs clockwise short distances up shrubs and coarse herbs. Climbing Fern grows in moist pine-oak-maple woods with an open understory, in moist thickets, and along stream margins. This plant prefers acidic soils that are sandy and rich in humus, but nutrient-poor.

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 MA 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.

The Eastern Box Turtle is a terrestrial turtle, inhabiting many dry and moist woodland and early successional habitat. Development, roads, collection, and disease are the primary conservation concerns.

Wood Turtle habitat is streams and rivers, preferably with long corridors of undeveloped, connected uplands. They also use fields and early succesional 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.

Core 1203

A 153-acre Core Habitat featuring a Species of Conservation Concern.

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

Core 1204

An 88-acre Core Habitat featuring Species of Conservation Concern.

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

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

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

Core 1264

A 2,537-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.

Calcareous Basin Fens are sedge-shrub peatlands occurring in well-defined basins that have calcareous water inputs. These uncommon communities are the least rich of the three types of calcareous fen communities described in Massachusetts. This example of Calcareous Basin Fen is unusual in its setting within a far more acidic community type, an Inland Atlantic White Cedar Swamp. It is in good condition and is well buffered to impacts of human development.

Inland Atlantic White Cedar Swamps are forested wetlands dominated by Atlantic white cedar, with hemlock, spruce, red maple, and yellow birch. As in all Atlantic White Cedar swamps, water-saturated peat overlies the mineral sediments. This example of Inland Atlantic White Cedar Swamp is moderately sized, of good quality, and largely undisturbed.

Bristly Buttercup is an annual or short-lived perennial herb with small, pale yellow flowers. A habitat generalist, Bristly Buttercup grows in a variety of areas that tend to have open to filtered light and that are wet to periodically flooded. It often inhabits areas with some disturbance.

Climbing Fern does not have the characteristic overall shape of most ferns. Instead, it is an evergreen, ivy-like plant which sprawls over the ground or climbs clockwise short distances up shrubs and coarse herbs. Climbing Fern grows in moist pine-oak-maple woods with an open understory, in moist thickets, and along stream margins. This plant prefers acidic soils that are sandy and rich in humus, but nutrient-poor.

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.

The Eastern Spadefoot is a short-legged, squat, big-headed toad with unmistakable cat-like, vertically elliptical pupils. This burrowing species requires dry, sand or sandy loam soils characteristic of Pitch Pine barrens, coastal oak woodlands or sparse shrub growth, interspersed with temporary ponds. It prefers areas with leaf litter, and may be found in farmland areas. In the warmer months, from April to September, the Spadefoot comes up to breed in vernal pools after prolonged warm and heavy rains.

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 MA 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.

Eastern Worm Snakes are small, glossy, thin snakes, and range from 4 to 11 inches in length. They are typically brown dorsally and bright pink ventrally. The Eastern Worm Snake is a fossorial snake, spending most of the year underground, under rotting logs and woody debris, and in moist piles of

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

leaves and compost. The Eastern Worm Snake prefers moist, non-saturated, sandy soil and woody debris. It occurs in deciduous hardwood forest, mixed pine-hardwoods, pine forest, rights-of-ways, early successional fields, and ecotonal areas abutting such habitats. They are rarely observed due to their fossorial nature, small size, and dull coloring.

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

Core 1268

A 4,130-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.

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.

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 MA 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.

Adult and juvenile Marbled Salamanders inhabit upland forests during most of the year, where they reside in small-mammal burrows and other subsurface retreats. Adults migrate during late summer or early fall to breed in dried portions of vernal pools, swamps, marshes, and other predominantly fish-free wetlands. Eggs are deposited under logs, leaf-litter, or grass tussocks and hatch after being inundated by fall rains. Larvae metamorphose during late spring, whereupon they disperse into upland forest.

The Eastern Box Turtle is a terrestrial turtle, inhabiting many dry and moist woodland and early successional habitat. Development, roads, collection, and disease are the primary conservation concerns.

Eastern Hognose Snakes are shy, slow-moving, thick-bodied snakes that specialize in feeding on toads, although they eat other amphibians or other small animals as well. They require sandy soils in their habitat; both wooded and open habitats are known.

A small to medium-sized snake, adult Smooth Green Snakes are 14-20 inches long with a uniform light green back and yellow to white venter. The Smooth Green Snake is found in moist open or lightly forested habitat where grasses and shrubs are abundant (edges of marshes, wet meadows, fields, and forest edges or open forests, grasslands, blueberry barrens, pine barrens) and prefers to forage on the ground with activity in the daytime. Smooth Green Snake overwinter in rodent burrows, ant mounds and rock crevices, either singly or communally.

Wood Turtle habitat is streams and rivers, preferably with long corridors of undeveloped, connected uplands. They also use fields and early succesional habitat extending up to 500 meters on both sides of

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

the waterways. Mowing and roads are the primary causes of mortality. Collection is also a conservation concern.

Core 1284

A 366-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.

Swamp Dock is a tall, herbaceous perennial of swamps and wet lowland woods, with numerous, inconspicuous, drooping green flowers. Swamp Dock is found in water or in places that are periodically flooded, such as stream and river floodplains, swamps, marshy shores and drainage or irrigation ditches, and possibly brackish situations.

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

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.

Eastern Hognose Snakes are shy, slow-moving, thick-bodied snakes that specialize in feeding on toads, although they eat other amphibians or other small animals as well. They require sandy soils in their habitat; both wooded and open habitats are known.

Core 1332

A 169-acre Core Habitat featuring Species of Conservation Concern.

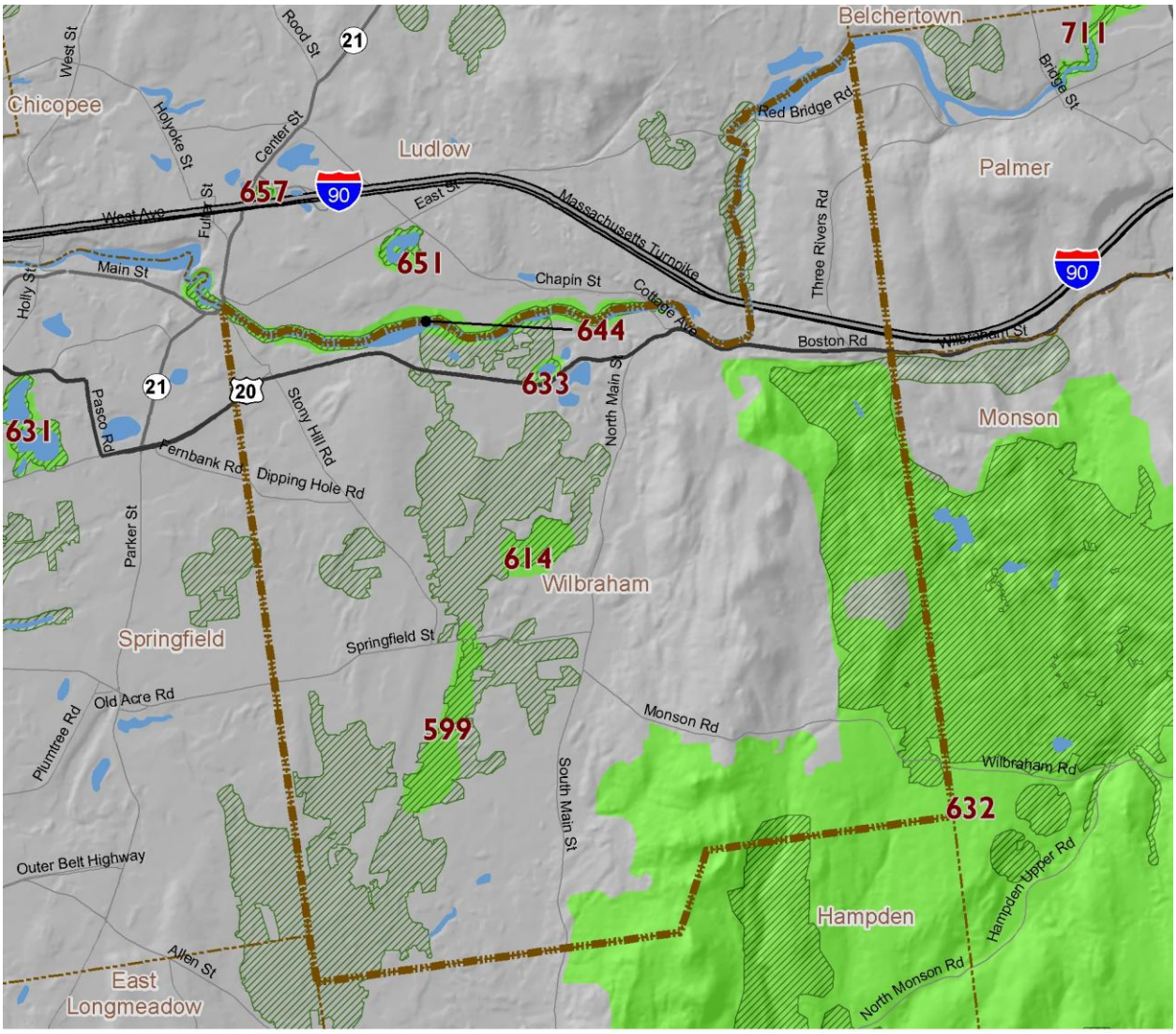
Stygian Shadowdragons are dragonflies that are found on lakes with rocky shores and medium to large rivers that are relatively unvegetated.

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 MA 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.

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

BioMap2 Critical Natural Landscape in Wilbraham

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



Natural Heritage & Endangered Species Program

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

Elements of *BioMap2* Critical Natural Landscapes

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

CNL 599

Aquatic Core Buffer

CNL 614

Wetland Core Buffer

CNL 632

Aquatic Core Buffer
Landscape Block
Wetland Core Buffer

CNL 633

Aquatic Core Buffer

CNL 644

Aquatic Core Buffer

Critical Natural Landscape Summaries

CNL 599

A 202-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 614

A 106-acre Critical Natural Landscape featuring 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 632

A 22,068-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.

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

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.

At 22,045 acres, this mostly forested Landscape Block is the fourth largest in the Worcester Plateau Ecoregion, and is among the largest 20% of all Blocks across Massachusetts. These large forested landscapes provide invaluable wildlife habitat and other ecosystem values such as clean drinking water and absorbing carbon from the atmosphere. This Block is almost completely unprotected.

CNL 633

A 22-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 644

A 357-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.

Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230, West Boylston, MA 01583
phone: 508-389-6360 fax: 508-389-7890

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.nhesp.org.