



BioMap2

Guiding Land Conservation for Biodiversity in Massachusetts

Lee

This report and associated maps 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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Massachusetts Division of Fisheries and Wildlife

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http://www.mass.gov/dfwele/dfw/nhesp/land_protection/biomap/biomap2_summary_report.pdf

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BioMap2: Guiding Land Conservation for Biodiversity in Massachusetts

Lee

Lee is located in central Berkshire County. Eastern and southern portions of the town are situated within the highlands and hills of the Berkshires, while its western lowlands lie within the marble valleys of Massachusetts portion of the Housatonic River watershed. The Housatonic River flows through the center of Lee; it enters town from the north, flows along the boundary between Lee and Lenox in north Lee, then continues south through the town until it reaches Beartown Mountain and turns sharply to the west. Two sizable tributaries, Sargent Brook and Willow Brook, flow from the west through the marble valleys to meet the Housatonic River. Another tributary, Hop Brook, flows in a northwesterly direction into town from the hills and narrow central valley of Tyringham, joining the Housatonic River at its sharp westward turn by the northern base of Beartown Mountain.

Lee has historically been one of the most populated towns in Massachusetts' Housatonic watershed, and remains so today. Many industrial operations are tied to the Housatonic River. Paper milling, with operations powered by the river, was Lee's primary industry for many years. Lumbering, agriculture, and limestone mining have also been important economically. Many industrial operations, including several mills and a large limestone mine, are still located along the river today. Residential and commercially developed areas are distributed throughout the valley. The town's steep slopes and higher elevations are largely undeveloped, and more than 11,000 acres in these areas, or 64 percent of all land in town, is forested. Some agricultural lands are scattered throughout the valley, mostly either at the perimeters of more heavily developed areas along the river in the northern part of town, or further south along the south side of the Housatonic River near the Hop Brook confluence. Three moderate-sized lakes fall partly within Lee: Laurel Lake and Woods Pond in the north, and Goose Pond in the south.

The lowlands of Lee, where the Housatonic River flows south and then west toward Stockbridge, are part of the Western New England Marble Valleys ecological region (see Figure 1). This is one of the most distinct and

biologically rich ecoregions both in Massachusetts and throughout New England, stretching from northwest Connecticut up through sections of the Hudson River and Lake Champlain watersheds. This ecoregion supports an impressively high percentage of Massachusetts' state-listed species and Priority Natural Communities; some of these are restricted to the ecoregion, while others are



Lee at a Glance

- Total area: 17,289 acres (27.0 square miles)
- Human population in 2009: 5,738 people
- Open space protected in perpetuity: 5,329 acres, or 30.8% of total area*

BioMap2 Components

Core Habitat

- 9 Aquatic Cores: 1,304 acres
- 3 Forest Cores: 3,419 acres
- 9 Wetland Cores: 291 acres
- 5 Priority or Exemplary Natural Communities: 140 acres

Species of Conservation Concern**

- 11 plants, 3 freshwater molluscs, 6 insects, 2 fish, 1 salamander, 1 frog, 1 turtle, 3 birds, 1 mammal

Critical Natural Landscape

- 4 Upland Buffers of Aquatic Cores: 1,671 acres
- 5 Upland Buffers of Wetland Cores: 1,006 acres
- 2 Landscape Blocks: 6,101 acres

*calculated using MassGIS data layer "Protected and Recreational Open Space—November 2010"

**see next page for complete list of species, natural communities, and other biodiversity elements

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

Invertebrates (non-insect)

Freshwater Molluscs

- Creeping (*Strophitus undulatus*), Special Concern
- Triangle Floater (*Alasmidonta undulata*), Special Concern
- Boreal Marstonia (*Marstonia lustrica*), Endangered

Invertebrates (insect)

Dragonflies

- Arrow Clubtail (*Stylurus spiniceps*), Threatened
- Zebra Clubtail (*Stylurus scudderii*), Special Concern
- Stygian Shadowdragon (*Neurocordulia yamaskanensis*), Special Concern

Butterflies

- Dion Skipper (*Euphyes dion*), Threatened
- Mustard White (*Pieris oleracea*), Threatened

Moths

- Ostrich Fern Borer (*Papaipema* sp. 2 nr. *pterisii*), Special Concern

Fish

- Bridle Shiner (*Notropis bifrenatus*), Special Concern
- Longnose Sucker (*Catostomus catostomus*), Special Concern

Amphibians

- Spring Salamander (*Gyrinophilus porphyriticus*), SWAP
- Northern Leopard Frog (*Rana pipiens*), SWAP

Reptiles

- Wood Turtle (*Glyptemys insculpta*), Special Concern

Birds

- American Bittern (*Botaurus lentiginosus*), Endangered
- Bald Eagle (*Haliaeetus leucocephalus*), Endangered
- Common Moorhen (*Gallinula chloropus*), Special Concern

Mammals

- Water Shrew (*Sorex palustris*), Special Concern

Plants

- Andrew's Bottle Gentian (*Gentiana andrewsii*), Endangered
- Bristly Buttercup (*Ranunculus pensylvanicus*), Special Concern
- Bur Oak (*Quercus macrocarpa*), Special Concern
- Fen Sedge (*Carex tetanica*), Special Concern
- Frank's Lovegrass (*Eragrostis frankii*), Special Concern
- Hairy Honeysuckle (*Lonicera hirsuta*), Endangered
- Hemlock Parsley (*Conioselinum chinense*), Special Concern
- Intermediate Spike-sedge (*Eleocharis intermedia*), Threatened
- Labrador Bedstraw (*Galium labradoricum*), Threatened
- Pale Green Orchis (*Platanthera flava* var. *herbiola*), Threatened
- Wapato (*Sagittaria cuneata*), Threatened

Exemplary Natural Communities

- Deep Emergent Marsh (Secure)

Priority Natural Communities

- Black Ash – Red Maple – Tamarack Calcareous Seepage Swamp (Imperiled)
- Calcareous Sloping Fen (Imperiled)
- Hickory – Hop Hornbeam Forest/Woodland (Imperiled)
- Major-river Floodplain Forest (Imperiled)

Other BioMap2 Components

- Aquatic Cores
- Forest Cores
- Landscape Blocks
- Upland Buffers of Aquatic Cores
- Upland Buffers of Wetland Cores
- Wetland Cores

more widespread. In Lee, marshlands of the marble valleys along Housatonic River and Hop Brook provide nesting habitat for the state-endangered American Bittern, a marsh bird of the heron family. Sensitive freshwater muscels called Creeper and Triangle Floater live along the river bottoms of the Housatonic River downstream of the Hop Brook confluence, and filter algae, nutrients, and bacteria from the water for food. The state-listed minnow Bridle Shiner occurs in open water habitats at Goose Pond, and Wood Turtles occupy the lower reaches and wetlands of Hop Brook. Since the focus of development in Lee has been in the valley lowlands, protection of remaining undeveloped lands and natural areas along the river is particularly important for conserving biodiversity.

Highland areas of Lee are less ecologically diverse than the valley; however these areas support their own suite of state-listed species, and contain tracts of forested habitat that are fragmented little by human development. They are also relatively well protected for conservation through

various stewardships. Forested, high-gradient headwater streams are found here, and provide habitat for the uncommon Spring Salamander. Lower elevations of October Mountain in northeast Lee support Hickory-Hop Hornbeam Forest, a Priority Natural Community characterized by abundant hickory trees in the forest overstory and the presence of a diverse array of grasses and sedges on the forest floor.

BIODIVERSITY CONSERVATION TARGETS IN LEE: CORE HABITAT, CRITICAL NATURAL LANDSCAPE, AND PRIORITY CONSERVATION AREAS

In this section, we outline areas in Lee that warrant special focus of conservation efforts locally, regionally, and throughout the state. Components of the Natural Heritage & Endangered Species Program's (NHESP's) state-wide BioMap2 project, which incorporates NHESP data and includes findings of studies funded by the Natural Resource Damages Assessment and Restoration Program

Biodiversity Studies in Massachusetts and the Housatonic River Watershed

BioMap2 is a statewide biodiversity conservation plan produced in 2010 by MassWildlife's Natural Heritage & Endangered Species Program and The Nature Conservancy. It is designed to guide strategic biodiversity conservation in Massachusetts over the next decade by focusing land protection and stewardship on the areas that are most critical for ensuring the long-term persistence of rare and other native species and their habitats, Priority Natural Communities, and a diversity of ecosystems. BioMap2 is also designed to include the habitats and Species of Conservation Concern identified in the State Wildlife Action Plan (SWAP).

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 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.

In 2008 and 2009, field surveys were carried out to improve knowledge of the region's biodiversity resources in towns in the Housatonic River watershed in western Massachusetts. During these surveys, coordinated by the Natural Heritage and Endangered Species Program (NHESP) with funds from the Natural Resources Damage Assessment and Restoration (NRD) Program, researchers collected important information about state-listed species and Priority Natural Communities of 19 towns in the region. Surveys were conducted by NHESP staff, expert consultants, academic researchers, and graduate students. Information on the surveys' findings was added to the NHESP database, combined with other NHESP data, and incorporated into Core Habitat of BioMap2. BioMap2 data layers, complete with these data and other information, are now available for use in conservation planning at the town, regional, and state levels.

(NRD) conducted in 2008 and 2009 as part of its Core Habitat and Critical Natural Landscape, were used to delineate and map these areas. The areas range in size from fewer than 10 acres to several thousand acres. Designated areas of Core Habitat, each called a BioMap2 Core (BC), and areas of Critical Natural Landscape (CNL), along with their associated components, are illustrated in Figure 2 and outlined in detail below. BioMap2 components described in this report are those that occur only in Lee, although a given area of Core Habitat or Critical Natural Landscape listed here may extend beyond town boundaries and contain additional components.

To facilitate land protection and stewardship, NHESP further prioritized areas in each of the towns in the watershed using habitat size, habitat conditions, and other biodiversity indicators. Priority Conservation Areas (PCAs) were considered to be of high biodiversity value if they contained concentrations of state-listed species or Priority Natural Communities, or large areas of intact habitat. In each town, up to six Town PCAs were identified. Each Town PCA contains part of at least one BioMap2 Core: in Lee, three Town PCAs were selected. Figure 3 illustrates how BioMap2 Core Habitat and Critical Natural Landscape relate to the distribution of Town PCAs in Lee.

A larger scale prioritization was also conducted to select the Regional PCAs of the highest conservation and stewardship value among all towns in the Massachusetts portion of the Housatonic River watershed. Regional PCAs often cross town boundaries and are quite large, ranging from 373 acres to more than 25,000 acres. Ecological connectivity within these Regional PCAs is important to biodiversity conservation; consequently these large units include select Town PCAs that are of particular biodiversity value to both the town and the region. In this way, biodiversity can be conserved at two scales: locally within each town and within a broader regional context. Parts of two Regional PCAs – Regional PCA 5 and Regional PCA 8 – fall within Lee and encompass Town PCA 1 and Town PCA 3.

All of the BCs in Lee are summarized here, as are their various components, which may include Species of Conservation Concern, Exemplary or Priority Natural Communities, or Aquatic, Forest, Vernal Pool, or Wetland Cores. Components of CNL associated with each BC are also provided. These include Upland Buffers of Aquatic and Wetland Cores, as well as Landscape Blocks.

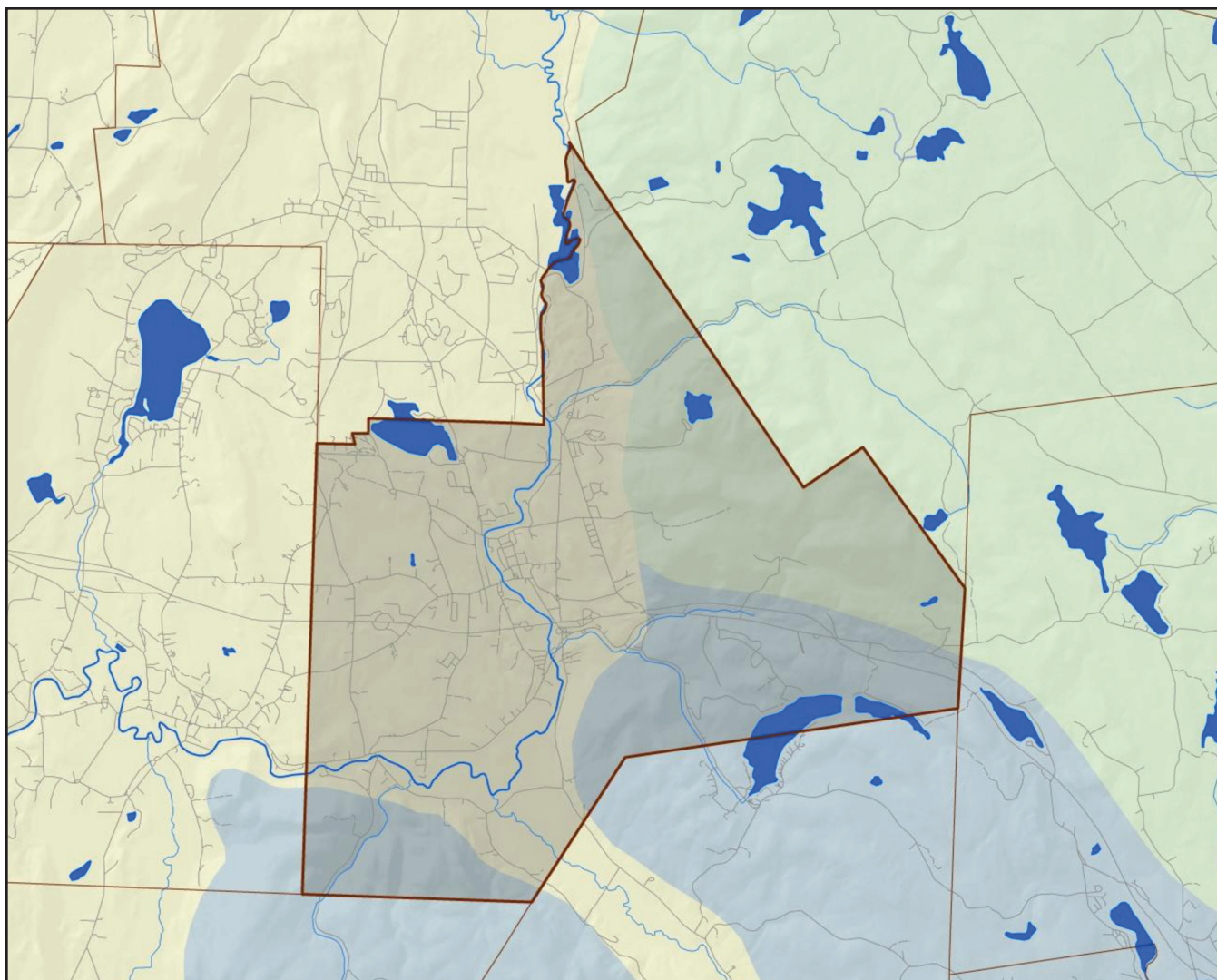


Figure 1. Town boundaries and ecoregions of Lee, Massachusetts.

Core Habitat and Critical Natural Landscape Components in Lee

Areas of Core Habitat in Lee, called BioMap2 Cores (BCs), are summarized here, as are the various components of each BC, which may include Species of Conservation Concern, Exemplary or Priority Natural Communities, and Aquatic, Forest, or Wetland Cores. Components of Critical Natural Landscape (CNL) associated with each BC are also described. These include Upland Buffers of Aquatic and Wetland Cores, as well as Landscape Blocks.

BC1658 and CNL883

This large BC lies mostly on Beartown Mountain and extends into Tyngham and Stockbridge. It contains large tracts of forested area, including two Forest Cores (one 167 acres and one 570 acres), and is part of a large

Landscape Block in CNL 883. It also includes land along Beartown Brook, which flows north to the Housatonic River from the southwest corner of the town, and Mad River, a small tributary to Hop Brook. Both streams support an uncommon salamander species.

Spring Salamander (*Gyrinophilus porphyriticus*), SWAP: Spring Salamander adults inhabit clean, cold, high-gradient brooks and headwater seeps in forest habitat, usually at elevations above 300 feet. 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. Spring Salamanders in BC1658 occur along Beartown Brook, Mad River, and smaller tributaries of these streams.

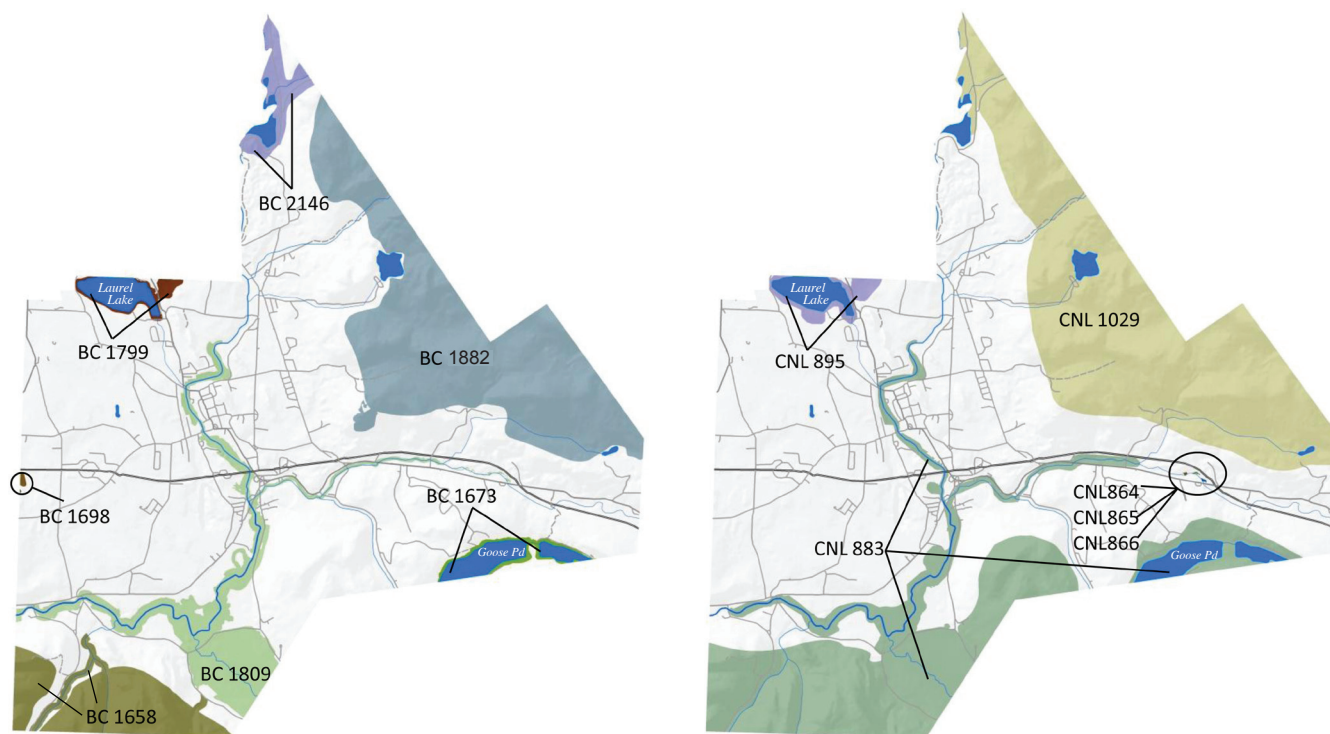


Figure 2. Lee includes a total of seven BioMap2 Cores (BC; left) and six areas of Critical Natural Landscape (CNL; right).

BC1673 and CNL883

This 235-acre core includes portions of Goose Pond (and Upper Goose Pond) as well as nearby uplands in southeast Lee, and is part of CNL883's very large Landscape Block. BC1673 is surrounded by Upland Buffer of CNL883. Goose Pond is a mountain lake managed as a wildlife area. It is just southwest of October Mountain State Forest, and its eastern extent is managed by the National Park Service as part of the Appalachian Trail Corridor. The pond itself extends into Tyringham and is a popular destination for boaters and other outdoor recreationists. It also includes habitat for a state-listed fish species.

Bridle Shiner (*Notropis bifrenatus*), Special Concern:

The Bridle Shiner is a small, straw-colored minnow with a distinct dark lateral band that runs from the tip of the snout to the base of the tail. It is typically found in clear water in slack areas of streams and rivers, as well as in lakes and ponds, and is sensitive to turbidity, invasive plant species, and severe changes in flow regime. This fish is generally associated with submerged aquatic vegetation, but it also uses areas of open water to school.

BC1698 (no CNL)

BC1698 is a 17-acre area in eastern Stockbridge and western Lee known to contain a state-listed invertebrate species. Five acres of it fall within Lee.

BC1799 and CNL895

BC1799 includes 224 acres in northwest Lee and south Lenox, and is surrounded by Upland Buffers of CNL895. Laurel Lake constitutes most of BC1799, but the core also contains the lake's nearby uplands and a large wetland area to the east of the lake. State-listed plant and invertebrate species occur in this core; however, Zebra Mussels were recently discovered in Laurel Lake and may negatively impact future aquatic diversity in this BC, the stream outlet of Laurel Lake, and the Housatonic River downstream. Several state-listed plants, a state-listed snail, and one Priority Natural Community are documented in BC1799.

Plants

Hemlock Parsley (*Conioselinum chinense*), Special Concern:

Hemlock Parsley is a perennial herbaceous plant of forested swamps that have a somewhat sparse tree canopy. It generally grows in enriched soils overlying calcareous bedrock.

Labrador Bedstraw (*Galium labradoricum*), Threatened:

In Massachusetts, this slender perennial herbaceous plant of the madder family (Rubiaceae) is known to occur only in calcareous fens, wet meadows, and swamps of the upper Housatonic River watershed.

Hairy Honeysuckle (*Lonicera hirsuta*), Endangered:

This plant is a high-climbing and shrubby vine of dry to mesic rocky woods, typically found in calcareous soils. It is

very rare in Massachusetts, and occurs only in the far western part of the state.

Freshwater Molluscs

Boreal Marstonia (*Marstonia lustrica*), Endangered: This is a small snail with a greenish or brownish translucent shell. They inhabit lakes that are well vegetated with submersed aquatic plants and rich in nutrients, especially calcium and magnesium. The species is only known from two lakes in Massachusetts.

Natural Community

Black Ash – Red Maple – Tamarack Calcareous Seepage Swamp (Imperiled): This Priority Natural Community type is a mixed deciduous-coniferous forested swamp that occurs in areas with calcium-rich groundwater seepage. Its characteristic nutrient enrichment supports many state-listed calcium-loving plants, including several sedge species. This moderately large (16 acre) example of a Black Ash – Red Maple – Tamarack Calcareous Seepage Swamp is in good condition despite the presence of some exotic invasive species.

BC1809 and CNL883; CNL864, CNL865, and CNL866

BC1809 is very large – more than 11,000 acres in total size – and stretches along the Housatonic River mainstem in Stockbridge and Lee, as well as along several tributaries, including Hop Brook in Tyringham, Mohawk Lake Brook in Stockbridge, and the Williams River in West Stockbridge. In Lee, this core occurs along the mainstem of the Housatonic River as well as its tributaries Greenwater Pond Brook and Hop Brook. It is surrounded by extensive Upland Buffers and falls within a Landscape Block of CNL883, as well as three small and discrete Upland Buffers of CNL864, CNL865, and CNL866 that lie along Greenwater Brook. It includes areas directly along the river that are used extensively by humans, yet still supports diverse biological resources associated with the river itself, including nearby wetlands and floodplains. Several small areas along Hop Brook and Greenwater Pond Brook, amounting to 13 acres, are designated as BioMap2 Aquatic Core. The lower reaches of Hop Brook include large areas of wet fields and marshes around the stream; these wetlands are more than half a mile wide in places. More than 200 acres of this area are designated as a Wetland Core. BioMap2 components described here include many state-listed plants and animals, Exemplary Natural Communities, and Priority Natural Communities that are part of BC1809 within the boundaries of Lee.

Plants

Andrew's Bottle Gentian (*Gentiana andrewsii*), Endangered: This tall perennial herb with showy flowers is typically

found adjacent to wetlands in relatively moist habitats that are not entirely inundated by water. It is a member of the gentian family (*Gentianaceae*), and has vibrant blue-violet flowers that bloom in late summer to early autumn.

Fen Sedge (*Carex tetanica*), Special Concern: This narrow-leaved perennial is a grass-like sedge that grows in open calcareous meadows and fens. It is a slender plant and is between five inches and two feet in height. In Massachusetts, it occurs primarily in the calcareous areas of the marble valleys in the western part of the state.

Frank's Lovegrass (*Eragrostis frankii*), Special Concern: This annual grass grows in open, sandy and silty riverbars and rivershores. In Massachusetts, Frank's Lovegrass is found only along the Housatonic and Connecticut Rivers, typically near floodplain forests.

Intermediate Spike-sedge (*Eleocharis intermedia*), Threatened: This densely-tufted grass-like annual is found on muddy, alkaline river banks and pond shores, and is usually visible during periods of low water when mud is exposed.

Pale Green Orchis (*Platanthera flava* var. *herbiola*), Threatened: This perennial orchid grows in a variety of mesic to wet habitats, usually near moving water.

Insects

Arrow Clubtail (*Stylurus spiniceps*), Threatened: This dragonfly is part of the diverse Gomphidae family. Nymphs, or larvae, are aquatic and live on bottoms of swift-flowing, sandy rivers and some lakes, while adults are terrestrial and inhabit riparian and upland areas.

Dion Skipper (*Euphyes dion*), Threatened: This butterfly inhabits sedge wetlands, including calcareous fens, riparian marshes, wet meadows, and sedge areas of shrub swamps, where their larvae feed on various sedges (*Carex* species). Adults feed on the nectar of flowers of species such as Common Milkweed (*Asclepias syriaca*) in upland fields.

Ostrich Fern Borer (*Papaipema* sp. 2 nr. *pterisii*), Special Concern: This moth species has bright orange-yellow forewings overlaid with darker brownish-orange, and uniform pinkish-tan hindwings. It inhabits floodplain forests with abundant Ostrich Fern (*Matteucia struthiopteris*), which the moth larvae require as a food source. In Massachusetts, this species is found only in the western part of the state.

Stygian Shadowdragon (*Neurocordulia yamaskanensis*), Special Concern: This dragonfly species is part of a family known as emeralds (*Corduliidae*). It is a dull brown color, unlike most other emeralds, which are generally characterized by brilliant green eyes and metallic green highlights on the face, thorax, and abdomen. It is elusive, usually appearing only for a short time after sunset

and before dark. It occurs along lakes with rocky shores and medium to large rivers that are relatively unvegetated. Like other dragonflies, it has both an aquatic larval phase and a terrestrial adult phase.

Zebra Clubtail (*Stylurus scudderii*), Special Concern: This dragonfly species inhabits mid-size forest streams with intermittent rapids. Like other dragonflies, Zebra Clubtail larvae spend their lives buried in sandy substrates of the streams and rivers they inhabit; adults live in nearby upland areas, and typically breed from July to September.

Freshwater Molluscs

Creeper (*Strophitus undulatus*), Special Concern: Like most freshwater mussels, the Creeper burrows in stream bottoms, filters algae and bacteria from the water, and uses a fish host to transform from young larvae into juvenile mussels. This freshwater mussel occurs in various reaches of the Housatonic River mainstem. Most animals found here are older individuals whose reproduction may be limited.

Triangle Floater (*Alasmidonta undulata*), Special Concern: This species was recommended for delisting in 2011. This small freshwater mussel (generally no more than three inches in length) occupies low- to mid-gradient streams, or occasionally lakes, that contain sand and gravel substrates. Like other freshwater mussels, it lives on the streambottom, filters algae and bacteria for food, and its larvae require a fish host. Like the Creeper, this freshwater mussel species is found in various locations in the Housatonic River mainstem.

Fish

Longnose Sucker (*Catostomus catostomus*), Special Concern: This species is a torpedo-shaped fish with a snout extending beyond its downturned mouth. It is typically found in cool, lower order streams and rivers with rocky bottoms. These fish rely on clean and well-oxygenated gravel substrates to rear their eggs. In Massachusetts, they are found only in the western part of the state.

Birds

American Bittern (*Botaurus lentiginosus*), Endangered: This species is a mottled brown heron-like bird that feeds and nests primarily in large cattail, tussock, or shrub marshes, and is very sensitive to disturbance. Its coloring and unique behavior of pointing its bill skyward when threatened, sometimes swaying to mimic movement of grasses in the wind, make it well-camouflaged in marsh habitat.

Exemplary Natural Communities

Deep Emergent Marsh (Secure): This is a fairly common natural community that is broadly-defined as a grass, sedge and/or cattail wetland. It occurs in saturated and mucky mineral soils, and is inundated seasonally and retains standing water throughout the year. It generally

forms in broad, flat areas bordering slow rivers, or along pond margins that grade into shrub swamps.

Priority Natural Communities

Calcareous Sloping Fen (Imperiled): This Priority Natural Community type is an open, sedge-dominated wetland that occurs on slight to moderate slopes with calcareous groundwater seepage. It tends to be a 'hot spot' for uncommon species, containing state-listed plants like fen sedge (*Carex tetanica*) and sweet coltsfoot (*Petasites frigidus* var. *palmatus*), as well as state-listed turtles and butterflies. The Calcareous Sloping Fen in BC1809 is less than one acre, but is part of a larger wetland complex.

Major-river Floodplain Forest (Imperiled): In Massachusetts, this Priority Natural Community type is known to occur along mainstem sections of large rivers, including the Connecticut and Housatonic. Flooding is frequent and soils are typically sandy loams with no organic material. Silver Maple (*Acer saccharinum*) is the dominant overstory tree species, and several species of elm (*Ulmus* species) also grow here. Shrubs are often lacking, but herbaceous plants and ferns are typical. In BC1809 in Lee, this community occurs as patches along the Housatonic River mainstem just upstream of its confluence with Hop Brook. The occurrence is of moderate size (33 acres), and contains many exotic invasive species.

Small-river Floodplain Forest (Imperiled): Small-river Floodplain Forests have tree canopies composed primarily of Silver Maples, often with Green Ash, and typically occur on alluvial soils of small rivers and streams. In Massachusetts, they are most often found along small tributaries of the Connecticut and Nashua Rivers as well as other small rivers in the eastern part of the state, though they are also less commonly found in the Housatonic River watershed. As with Major-river Floodplain Forests, Silver Maple (*Acer saccharinum*) is the dominant overstory tree along smaller rivers; however more shrubs are present in the understory, and herbaceous plants are very diverse. This example of Small-river Floodplain Forest along Hop Brook is small but in excellent condition, and is well buffered by natural vegetation.

BC1882 and CNL1029

BC1882 is defined by a large area of Forest Core. It lies along the northeast boundary of Lee, almost entirely within a large Landscape Block of CNL1029. It includes three areas of Wetland Core surrounded by Upland Buffer of CNL1029, and a Priority Natural Community:

Hickory – Hop Hornbeam Forest/Woodland (Imperiled): This Priority Natural Community type is an open, hardwood forest dominated by various hickory species with a significant number of Hop Hornbeam trees in the

subcanopy. They are characterized by a sparse shrub layer, and a nearly continuous cover of grasses and sedges on the forest floor. In Massachusetts, Hickory – Hop Hornbeam Forests are found throughout the state, usually in areas with non-acidic bedrock. This example of the community is large, and despite evidence of some human disturbance, is in very good condition and contains few exotic invasives.

BC2146 and CNL1029

BC2146 is a very large core (more than 7,000 acres) that includes areas along the Housatonic River and its tributaries in Pittsfield, Washington, Lenox, and Lee. 251 acres of it occur in Lee, along the Housatonic River mainstem just upstream of the lime quarry around Woods Pond. The eastern part of the core falls within a Landscape Block of CNL1029, but areas along Woods Pond are not part of any CNL. This area also contains Wetland and Aquatic Cores and their Upland Buffers and provides habitat for a variety of species of conservation concern, including plants, insects, amphibians, and birds.

Plants

Bur Oak (*Quercus macrocarpa*), Special Concern: Bur Oak is a broadly distributed tree species that reaches the eastern limit of its distribution in western Massachusetts, where it is restricted to wetlands near limestone hills or outcrops.

Bristly Buttercup (*Ranunculus pensylvanicus*), Special Concern: This is an herbaceous wetland plant that grows in sunny to partly-shaded edges and openings in floodplains.

Wapato (*Sagittaria cuneata*), Threatened: In Massachusetts, Wapato is found primarily in riverine floodplain habitat settings such as alkaline backwaters, oxbow ponds, and small shallow depressions with muddy substrates. Wapato particularly favors stagnant or very slow-moving water.

Insects

Arrow Clubtail (*Stylurus spiniceps*), Threatened: This dragonfly is part of the diverse family Gomphidae. Nymphs, or larvae, are aquatic and live on bottoms of swift-flowing, sandy rivers and some lakes, while adults are terrestrial and inhabit riparian and upland areas.

Zebra Clubtail (*Stylurus scudderii*), Special Concern: This dragonfly inhabits mid-sized, forested streams with intermittent rapids. Like other dragonflies, Zebra Clubtail nymphs, or larvae, spend their lives buried in sandy substrates of streams; adults live in nearby upland areas, and typically breed from July to September.

Mustard White (*Pieris oleracea*), Threatened: This butterfly, whose larvae feed on plants of the mustard family, inhabits wet forest openings as well as wet meadows,

fields, and pastures. In Massachusetts, it only occurs in central Berkshire County near the southern extent of its natural range.

Amphibians

Northern Leopard Frog (*Rana pipiens*), SWAP: Adult Northern Leopard Frogs are found in marshes, wet meadows, and peatlands in the narrow band between open water and uplands; they retreat to the water of ponds and small streams when threatened. The herbivorous tadpoles require open water habitat for development. Many observations have been made of this species in the Housatonic River watershed, including areas in BC2146.

Birds

American Bittern (*Botaurus lentiginosus*), Endangered: This species is a mottled brown heron-like bird that feeds and nests primarily in large cattail, tussock, or shrub marshes, and is very sensitive to disturbance. Its coloring and unique behavior of pointing its bill skyward when threatened, sometimes swaying to mimic movement of grasses in the wind, make it well-camouflaged in marsh habitat.

Bald Eagle (*Haliaeetus leucocephalus*), Endangered: These well-known eagles nest in tall trees along large lakes and rivers. The bulk of their diet consists of fish. Large lakes and rivers like the Housatonic also support important winter congregations of Bald Eagles.

Common Moorhen (*Gallinula chloropus*), Special Concern: This species is a duck-like marshbird that inhabits shallow freshwater marshes and typically nests in dense cattail beds adjacent to open water.

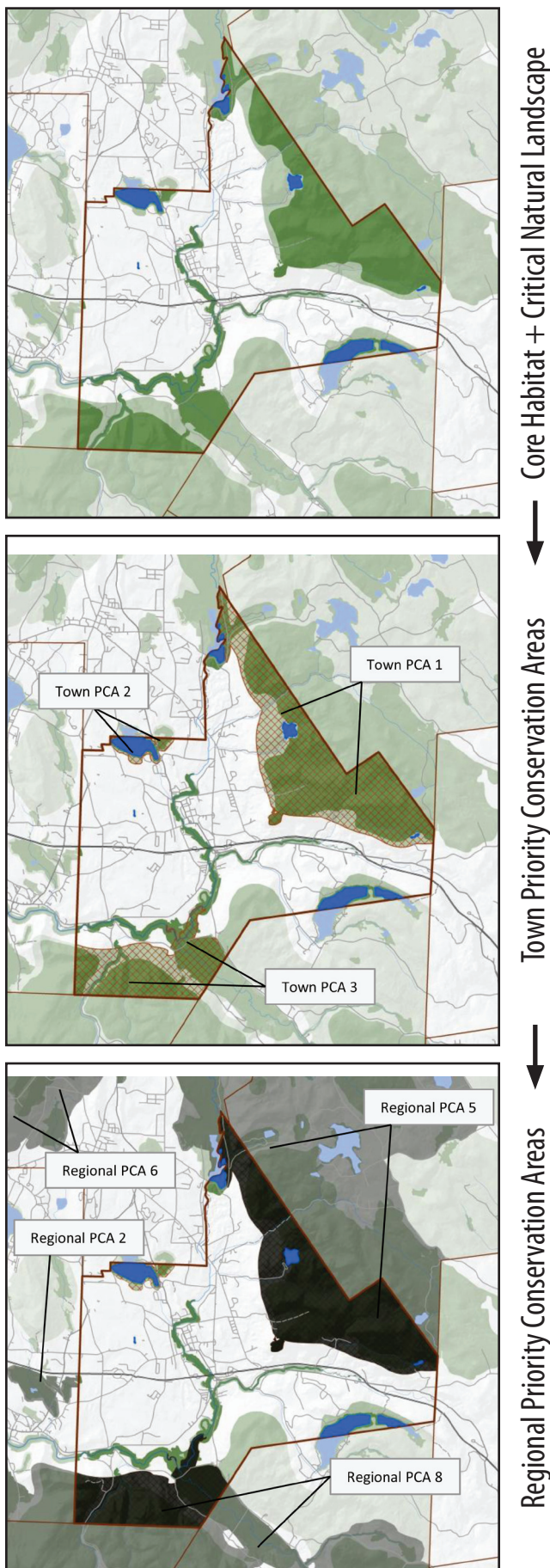
Mammals

Water Shrew (*Sorex palustris*), Special Concern: This semi-aquatic shrew commonly inhabits banks of swift, rocky-bedded streams in dense conifer or mixed forests.

Priority Conservation Areas in Lee

The town of Lee contains three areas identified as Town Priority Conservation Areas by NHESP. Two of these three Town PCAs are each part of larger Regional PCAs:

Town PCA 1/Regional PCA 5: Town PCA 1 is part of the larger Regional PCA 5 that incorporates much of western Washington, southeast Pittsfield, northeast Lenox, and northeast Lee. Within Regional PCA 5 are many mountains and headwater streams that lie east of the Housatonic River in these towns, including Roaring and Mill Brooks in Washington and Lenox, and Mountain and Commons Brooks, which flow from October Mountain in Washington and Lee. This Regional PCA also contains a stretch of the Housatonic River from central Pittsfield in the north



to Woods Pond in the northern part of Lee. Within Lee, Regional PCA 5 and Town PCA 1 overlap and both contain all of BC1882 and other areas of October Mountain in CNL1029's Landscape Block, totaling 3,693 acres. The area includes a large Forest Core, a Wetland Core and, in lower elevations, an occurrence of Hickory-Hop Hornbeam Forest/ Woodland, Priority Natural Community.

Town PCA 2: Town PCA 2 consists of a 244-acre area around Laurel Lake in northwest Lee. It supports several state-listed upland plant species, and includes a 16-acre section of Black Ash-Red Maple-Tamarack Calcareous Seepage Swamp. It also supports the Boreal Marstonia, a state-Endangered freshwater snail. Several aquatic components of BioMap2 are associated with this PCA, which contains part of CNL895. Invasive Zebra Mussels were recently discovered in this PCA, and may threaten future aquatic biodiversity within the PCA and in areas downstream.

Town PCA 3/Regional PCA 8: Town PCA 3 is part of Regional PCA 8, which encompasses nearly 20,000 acres in parts of Pittsfield, Washington, Lee, and Lenox including highland areas and headwater streams of the Housatonic River mainstem in this region. In Lee, Regional PCA 8 and Town PCA 3 together comprise 2,216 acres in the southern part of town. Within Lee's boundaries, these PCAs incorporate parts of both BC1658 (in and near Beartown State Forest) and BC1809 (near the mouth of Hop Brook). This area supports numerous state-listed species, including the Wood Turtle, which inhabits floodplains of lower Hop Brook, and the American Bittern, which breeds and nests in emergent marshes in the same area. It also contains, embedded in CNL883's Landscape Block, large tracts of forested land in Beartown State Forest, including a 570-acre Forest Core, and surrounds the headwaters of Beartown Brook, which joins the Housatonic River mainstem just downstream of the Hop Brook confluence.

Figure 3. Core Habitat (dark green), Critical Natural Landscape (light green), Town Priority Conservation Areas (PCAs; reddish-brown grid), and Regional Priority Conservation Areas (black) in Lee. Town PCAs make up 5,650 acres, or 32.7 percent of the town's total area. Regional PCAs make up 5,419 acres, or 31.3 percent of the town's total area.

Glossary

Aquatic Cores (in BioMap2, a component of Core Habitat) include intact river corridors within which important physical and ecological processes of the river or stream occur, delineated using integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern. To identify those areas integrally connected to each river and stream, each river segment was buffered 30 meters. All wetlands wholly or partially contained within this buffer were then included, and the combination of the river channel, the adjacent buffer, and the connected wetlands make up this riverine Core Habitat.

BioMap2 Cores (BCs) (called Core Habitats in BioMap2) identify 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.

Certified Vernal Pools are temporary ponds or other fishless wetlands that meet certain biological and physical criteria to be classified as essential breeding habitat for a number of amphibian and invertebrate species, such as Wood Frog, Spotted Salamander, Blue-spotted Salamander, Jefferson Salamander, Marbled Salamander, and Intricate Fairy Shrimp. The certification of vernal pool habitat in The Commonwealth is administered by the Natural Heritage & Endangered Species Program. A number of regulations incorporate protections for certified vernal pools (please see http://www.mass.gov/dfwele/dfw/nhsp/vernal_pools/pdf/vpcert.pdf for more information).

Critical Natural Landscape (CNL) (part of BioMap2) identifies large natural landscape areas 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.

Cobbles are small hills or rocky knolls made of marble and quartzite. The alkaline soils derived from the calcareous rocks support a distinct and diverse flora. Examples include Bartholomew's Cobble in southern Sheffield and Tyringham Cobble in Tyringham.

Critically Imperiled natural communities typically have five or fewer documented sites or have very few remain-

ing acres in the state. Natural Community types ranked as Critically Imperiled are in the Priority Natural Communities category.

Disturbance, in an ecological sense, is an event that disrupts the normal structure and function of an ecosystem. Disturbances often produce bare soil and openings in forests where rapidly growing, sun-loving species, including invasive exotic species, can grow. Human activities have accelerated the number and types of disturbances in many ecosystems.

Ecoregions are areas of relatively homogeneous ecological systems, including vegetation, soils, climate, geology, and patterns of human uses.

Endangered species are in danger of extinction throughout all or a significant portion of their range or are in danger of extirpation from Massachusetts. Endangered is a category of state-listed species defined in the Massachusetts Endangered Species Act (M.G.L. c.131A) and listed in its regulations (321 CMR 10.00).

Exemplary Natural Communities are the best examples documented of relatively common (Secure) types of natural communities.

Forest Cores (in BioMap2, a component of Core Habitat) identify the best examples of large, intact forests that are least impacted by roads and development, providing critical "forest interior" habitat for numerous woodland species.

Fragmented Landscape, in ecological and conservation terms, refers to the idea that a large spatial area (the landscape) that in the past might have had connected habitats (for example, unbroken forest, continuous river, or undisturbed grasslands) have become interspersed with artifacts of human development that alter habitat and ecological processes – or that the human influence has come to dominate the land leaving patches, or fragments, of natural habitat surrounded by development.

Imperiled communities typically have 6-20 sites or few remaining acres in the state. Natural Community types ranked as Imperiled are included in the Priority Natural Communities category.

Landscape Blocks (component of BioMap2 Critical Natural Landscape), the primary component of Critical Natural Landscape, are large areas of intact and predominately natural vegetation, consisting of contiguous forests, wetland, rivers, lakes, and ponds, as well as coastal habitats such as

barrier beaches and salt marshes. Pastures and power-line right-of-way, which are less intensively altered than most developed areas, were also included since they provide habitat and connectivity for many species.

Landscape Context refers to taking the broadest view of the ability of ecosystems or species populations to maintain themselves where they are by considering the siting within the larger area. For example, a wooded area within a city park has a very different, urban context than a wooded area on a farm.

MESA (Massachusetts Endangered Species Act) (M.G.L. c.131A) and its implementing regulations (321 CMR 10.00) provide regulatory protection of rare species and their habitats. MESA protects rare species and their habitats by prohibiting the “Take” of any plant or animal species listed as Endangered, Threatened, or Special Concern by the MA Division of Fisheries & Wildlife.

Natural Communities are assemblages of species that occur together in space and time. These groups of plants and animals are found in recurring patterns that are classified and described by their dominant biological and physical features.

Nymphs, sometimes informally referred to as larvae, are the young, immature form of dragonflies and some other invertebrates. Dragonfly nymphs are aquatic. On maturing, they change into the flying terrestrial adults that are seen along rivers and lakes, and nearby uplands.

Priority Natural Communities include types of natural communities with limited distribution, or relatively few occurrences, and/or low acreages in Massachusetts.

Protected in Perpetuity refers to land owned as conservation land by a public entity in Massachusetts whose lands come under the authority of Massachusetts Constitution Article 97, or federal land owned by a federal conservation agency, or by a non-profit dedicated to land conservation; or for which the conservation values have been protected by legal restrictions on the deed or by a conservation easement (conservation restriction).

Secure types of natural communities typically have over 100 sites or abundant acreage across the state; excellent examples are identified as Core Habitat to ensure continued protection and are referred to as Exemplary Natural Communities.

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. Special Concern is a category of state-listed species defined in the

Massachusetts Endangered Species Act (M.G.L. c.131A) and listed in its regulations (321 CMR 10.00).

Species of Conservation Concern (in BioMap2, a component of Core Habitat) include those species that meet the criteria for listing under the Massachusetts Endangered Species Act, as well as a number of species that do not meet these criteria for listing, but are considered to be of conservation concern within Massachusetts, such as inclusion in the State Wildlife Action Plan (SWAP).

State-listed Species are species listed under the Massachusetts Endangered Species Act (M.G.L. c.131A) and its regulations (321 CMR 10.00). – that is, Endangered, Threatened, or Special Concern species.

SWAP (State Wildlife Action Plan), approved in 2006, the Massachusetts Division of Fisheries and Wildlife’s State Wildlife Conservation Strategy, most often referred to as the State Wildlife Action Plan (SWAP), is a comprehensive document to help guide wildlife conservation decision making for Massachusetts’ wildlife for many years.

SWAP Species were identified as being those in greatest need of conservation in the Massachusetts Division of Fisheries and Wildlife’s State Wildlife Conservation Strategy, most often referred to as the State Wildlife Action Plan (SWAP).

Threatened species are likely to become Endangered in Massachusetts in the foreseeable future throughout all or a significant portion of their range. Threatened is a category of state-listed species defined in the Massachusetts Endangered Species Act (M.G.L. c.131A) and listed in its regulations (321 CMR 10.00).

Upland Buffers of Aquatic Cores (component of BioMap2’s Critical Natural Landscape) identify protective upland areas adjacent to all Aquatic Cores. A variable width buffer, that extends deeper into surrounding unfragmented habitats than into developed areas, was used to include the most intact areas around Aquatic Cores. The conservation of wetland buffers will support habitats and functionality of each aquatic area, and also include adjacent uplands that are important for many species that move between habitat types.

Upland Buffer of Wetland Cores (component of BioMap2’s Critical Natural Landscape) identify protective upland areas adjacent to all Wetland Cores. A variable-width buffer, that extends deeper into surrounding unfragmented habitats than into developed areas, was used to include the most intact areas around the Wetland Cores. The conservation of wetland buffers will support habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.

Variant of a natural community refers to a named subtype of a more broadly defined type of community. In Massachusetts the term is not a formal designation, but rather is intended as an aid for understanding community relationships.

Vernal Pools, also known as ephemeral pools, autumnal pools, and temporary woodland ponds, typically fill with water in the autumn or winter due to rainfall and rising groundwater and remain ponded through the spring and into summer. They usually dry completely by the middle or end of summer each year. Vernal pools are unique wildlife habitats best known for the amphibians and invertebrate animals that use them to breed.

Vernal Pool Cores (BioMap2, component of Core Habitat) identify, based on a GIS model, the highest quality most interconnected clusters of Potential Vernal Pools (a dataset of likely vernal pools identified from interpretation of aerial photographs) and the habitat between them.

Vulnerable communities typically have 21-100 sites or limited acreage across the state. Natural Community types ranked as Vulnerable are in the Priority Natural Communities category.

Wetland Cores (BioMap2, component of Core Habitat) identify, based on a GIS model, the least disturbed wetlands within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated 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.

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.