BioMap2

Guiding Land Conservation for Biodiversity in Massachusetts

Windsor

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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BioMap2: Guiding Land Conservation for Biodiversity in Massachusetts Windsor

Windsor is located in northern Berkshire County, high in the hills of the Berkshires near the southern limit of the Hoosac Range. It sits at the triple divide of three major watersheds, containing headwaters of the Hudson, Connecticut, and Housatonic Rivers (see Figure 1). In northwest Windsor, Dry Brook and McDonald Brook flow north to join the Hoosic River, a tributary to the Hudson. In northeast Windsor, the upper Westfield River flows south into town from Savoy; this river is joined by steep tributaries like Windsor Jambs Brook, and continues east to Cummington. Westfield Brook originates in southeast Windsor and also flows east to join the mainstem Westfield River in Cummington. In southwest Windsor are Pierce and Cady Brooks, two headwater streams of the Housatonic River that flow into Windsor Reservoir, an impoundment in the far southwestern part of town. The reservoir's outlet of Wahconah Falls Brook flows west to join the East Branch Housatonic River in Dalton.

Windsor is one of the less populated towns in the Berkshires, with fewer than 900 inhabitants. Residential areas are concentrated around the village and along roads in the central part of town. Unlike towns in the marble valleys to the west and south, such as Pittsfield and Lee, Windsor has no large businesses, manufacturing operations, or associated commercial or industrial development. The town is largely forested, including sizable areas of intact, forested wetlands in central and northwestern parts, and overall it contains more total area of natural wetlands than developed land. Much of the landscape is protected in perpetuity, including the Peru Wildlife Management Area in south-central Windsor, and Windsor State Forest in the northwest. To the northeast is the Trustees of Reservations' extensively forested Notchview Reservation, which contains over 3,000 acres of woods interlaced with trails used regularly by skiers and other recreationists. Though it lies in the Berkshire Hills, Windsor's terrain is generally only moderately sloped, with many flat areas suitable for agriculture. Open fields are scattered throughout the town, distributed primarily along Route 9 and sections of Nobodys Road south and east of Windsor village.

In the Massachusetts portion of the Housatonic River watershed, the greatest diversity of plants and animals, as well as the greatest number of state-listed species, occur in lowland valley areas along the mainstem river and its major tributaries. Underlying calcareous geology and uncommon instream and floodplain habitats are partly



Windsor at a Glance

- Total area: 22,510 acres (35.2 square miles)
- Human Population in 2009: 870 people
- Open space protected in perpetuity: 10,224 acres, or 45.4%*

BioMap2 Components Core Habitat

- 10 Aquatic Cores: 627 acres
- 1 Forest Core: 825 acres
- 9 Wetland Cores: 426 acres
- 1 Vernal Pool Core: 106 acres
- 2 occurrences of 1 Priority Natural Communities: 24.4 acres
- 1 occurrence of 1 Exemplary Natural Community: 18.1 acres

Species of Conservation Concern**

4 insects, 2 fish, 1 amphibian, 2 reptiles, 6 birds, 10 plants

Critical Natural Landscape

- 8 Upland Buffers of Aquatic Cores: 1,655 acres
- 7 Upland Buffers of Wetland Cores: 1,283 acres
- 2 Landscape Blocks: 7,673 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

Bartram's Shadbush (Amelanchier bartramiana), Threatened

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

Insects

Ocellated Darner (Boyeria grafiana), Special Concern Bristly Black Currant (Ribes lacustre), Special Concern Riffle Snaketail (Ophiogomphus carolus), Threatened Dwarf Scouring-rush (Equisetum scirpoides), Special Concern Ski-tipped Emerald (Somatochlora elongata), Special Concern Frank's Lovegrass (Eragrostis frankii), Special Concern Mustard White (Pieris oleracea), Threatened Long-styled Sanicle (Sanicula odorata), Threatened Fish Northern Mountain-ash (Sorbus decora), Endangered Lake Chub (Couesius plumbeus), Endangered Thread Rush (Juncus filiformis), Endangered Longnose Sucker (Catostomus catostomus), Special Concern Woodland Millet (Milium effusum), Threatened Amphibians Jefferson Salamander (Ambystoma jeffersonianum), Special Concern **Natural Communities Exemplary Natural Communities** Reptiles Wood Turtle (Glyptemys insculpta), Special Concern Hemlock Ravine (Secure) Smooth Green Snake (Opheodrys vernalis), SWAP **Priority Natural Communities** Birds Spruce - Fir Swamp (Vulnerable) American Bittern (Botaurus lentiginosus), Endangered Least Bittern (Ixobrychus exilis), Endangered **BioMap2** Components Mourning Warbler (Oporornis philadelphia), Special Concern **Aquatic Cores** Northern Harrier (Circus cyaneus), Threatened Forest Cores Sedge Wren (Cistothorus platensis), Endangered Landscape Blocks Sharp-shinned Hawk (Accipiter striatus), Special Concern **Upland Buffers of Aquatic Cores** Plants Upland Buffers of Wetland Cores Bailey's Sedge (Carex baileyi), Threatened Vernal Pool Cores Barren Strawberry (Waldsteinia fragarioides), Special Concern Wetland Cores

responsible for this high level of biodiversity. Windsor is somewhat removed from the valley, lying up on the Berkshire Plateau; nevertheless it contains a remarkably high diversity of species, many of which are uncommon and seldom documented in other towns in the region. The hawk Northern Harrier winters near the widespread wet fields and marshes northwest of Windsor village. Larvae of the dragonfly Ski-tipped Emerald live along the bottoms of the town's streams, often in areas dammed by beavers, while adults dwell in nearby uplands. The Lake Chub lives in the clear, cold, and fast-flowing waters of the upper Westfield River and its tributary to the south, Westfield Brook. In Massachusetts, this minnow species is documented from only a handful of towns in Berkshire and Hampshire Counties.

BIODIVERSITY CONSERVATION TARGETS IN WINDSOR: CORE HABITAT, CRITICAL NATURAL LANDSCAPE, & PRIORITY CONSERVATION AREAS

Overview

In this section, we outline areas in Windsor that warrant special focus of conservation efforts locally, regionally and throughout the state. Components of the Natural Heritage & Endangered Species Program's (NHESP's) statewide BioMap2 project, which incorporates NHESP data and includes findings of studies funded by the Natural Resource Damages Assessment and Restoration Program (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. 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. Only BioMap2 components that occur in Windsor are described in this report, though a given area of Core Habitat or Critical Natural Landscape listed here may extend outside of the town's 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 uncommon species or Priority Natural Communities, or large areas of in-

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.

tact habitat. In each town, a total of one to six Town PCAs were selected. Each Town PCA contains part of at least one BioMap2 Core; in Windsor, four Town PCAs were selected in order to preserve biodiversity in areas where it may be protected in perpetuity. Figure 3 illustrates how BioMap2 Core Habitat and Critical Natural Landscape relate to the distribution of Town PCAs in Windsor.

A larger scale prioritization was also conducted to select Regional PCAs of the highest conservation and stewardship value among all towns in 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, and these large units often include select Town PCAs that are of particular ecological significance 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. No Regional PCAs fall within Windsor - the nearest Regional PCAs, Regional PCAs 5 and 7, are located to the southeast in Washington and Pittsfield, and to the west in Lanesborough, Pittsfield, and Hancock.

Core Habitat and Critical Natural Landscape Components in Windsor

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

BC2230 and BC2273 (no CNL)

These two small cores, located along Westfield and Shaw Brooks in southeast Windsor, provide habitat for statelisted plant species.

BC2247 and BC2260 (no CNL); BC2338 and CNL1332

These BCs, ranging from 50 to 150 acres, provide habitat for a state-listed butterfly. BC2338 falls within CNL1332, while the others are not associated with any CNL.

BioMap2: Guiding Land Conservation for Biodiversity in Massachusetts Windsor



Figure 1. Windsor is part of the Berkshire Highlands ecoregion, and lies in the headwaters of the Connecticut, Housatonic, and Hudson River watersheds.

BC2364 and CNL1132

This BC in north-central Windsor provides habitat for a state-listed bird species. A small part of BC2364 overlaps an Upland Buffer of CNL1132, which surrounds BC2436.

BC2350, BC2355, BC2376, and CNL1332

These BCs in northwest Windsor contain Wetland Cores; each is between 10 and 20 acres in size and is surrounded by an Upland Buffer of CNL1332.

BC2436, CNL1132 and CNL1332

BC2436 contains three Wetland Cores in north-central Windsor along Drowned Land Brook that make up 176 acres in total. The northwest corner of this BC falls within a Landscape Block of CNL1332; however, most of BC2436 is surrounded by the Upland Buffer of CNL1132, to the east of CNL1332. BC2436 includes one state-listed plant, one state-listed salamander, and one state-listed turtle species:

Bristly Black Currant (*Ribes lacustre***), Special Concern**: This short shrub grows at fairly high elevations near streams, seeps, swamps, and sometimes ledges in somewhat rich, cool, moist woods.

Jefferson Salamander (*Ambystoma jeffersonianum*), Special Concern: This salamander breeds in vernal pools and fish-free areas of open water in marshes. Young spend their early lives in vernal pools, safe from predation, and adults spend most of their time in upland forest areas.

Wood Turtle (*Glyptemys insculpta***), Special Concern**: This is a medium-sized turtle with a sculpted upper shell and



Figure 2. Windsor includes a total of 18 BioMap2 Cores (BCs; left) and seven areas of Critical Natural Landscape (CNL; right). Overlap between these two layers is shown in Figure 3.

orange coloration on its feet and neck. Ideal habitat for this species includes streams and rivers with long corridors of undeveloped, connected uplands.

BC2407 and CNL1329

BC2407 is a small core located along Phelps Brook in northeast Windsor and extends north into Savoy. It includes an Aquatic Core and is surrounded by the Upland Buffer of CNL1329.

BC2206 and CNL1066

BC2206 is in south-central Windsor. It includes an Aquatic Core and is surrounded by an Upland Buffer and lies within a Landscape Block of CNL1066. It is just east of the Peru Wildlife Management Area along Westfield Brook, and includes one state-listed marshbird species.

American Bittern (*Botaurus lentiginosus***), Endangered**: This 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.

BC2215 and CNL1055

BC2215 lies along Wahconah Falls Brook and its riparian areas, primarily in Dalton. It includes a 344-acre Aquatic Core that is surrounded by an Upland Buffer of CNL1055. In addition to its area in Dalton, BC2215 also includes small areas in Hinsdale (4 acres) and Windsor (5 acres). The 5-acre part of BC2215 in Windsor lies in the far southwest part of town, just downstream of the dam at Windsor Reservoir, and supports one state-listed dragonfly species.

Ocellated Darner (*Boyeria grafiana*), **Special Concern**: Larvae of this dragonfly species typically inhabit clear, shallow, rocky, swift-flowing streams like Wahconah Falls Brook, as well as large, rocky lakes with little vegetation. Adults inhabit nearby uplands, often preferring forests with mixed coniferous and deciduous trees.

BC2219 and CNL1066

BC2219 includes a 14-acre Aquatic Core and is surrounded by an Upland Buffer CNL1066. It lies along a small tributary to Westfield Brook in the southern part of town and contains habitat for one state-listed marshbird.

American Bittern (Botaurus lentiginosus), Endangered: This 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.

BC2228 and CNL1066

BC2228 includes over 500 acres in south-central Windsor. An Aquatic Core, as well as habitat for one state-listed marsh bird and one plant are found in the northern section of BC2228 along the upper reaches of Westfield Brook. To the south, higher in the hills of the Peru Wildlife Management Area, is habitat for a raptor species. The Aquatic Core is surrounded by an Upland Buffer of CNL1066, and the BC as a whole is part of a Landscape Block of the same CNL. State-listed species in BC2228 include one plant and two birds.

Bailey's Sedge (*Carex baileyi***), Threatened**: This is a perennial, herbaceous, grass-like plant of freshwater wetlands and moist woodlands.

American Bittern (Botaurus lentiginosus), Endangered: This 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.

Sharp-shinned Hawk (*Accipiter striatus***), Special Concern**: This hawk species nests in mixed woodlands and coniferous forests, often with nearby open areas. They are sensitive to disturbance in nesting areas, although they do occasionally nest near human development. In Windsor, they occur in relative isolation, within the Peru Wildlife Management Area.

BC2279 and CNL1075

BC2279 includes an area of Aquatic Core in the central part of town along the headwaters of Humes Brook, just south of the village of Windsor along Route 9. Its northwestern portion is surrounded by an Upland Buffer of CNL1075 and it supports three species of state-listed plants:

Bartram's Shadbush (*Amelanchier bartramiana***), Threatened**: This is a northern shrub that thrives in mountain thickets and on steep, wooded rocky slopes.

Thread Rush (*Juncus filiformis*), **Endangered**: This plant is a grass-like perennial that is restricted to springy, wet to moist soils along pond shores and in wetlands.

Northern Mountain-ash (Sorbus decora), Endangered: This is a small tree that grows at forest edges on high-elevation, rocky summits.

BC2331 and CNL1322

BC2331 includes more than 12,000 acres and encompasses much of the upper Westfield River and its riparian areas in nine different towns, including long stretches of streams in Cummington, Chesterfield, and Huntington. Two sections of this BC occur in east Windsor – one is along Steep Bank Brook and the Westfield River immediately downstream of Steep Bank Brook in east-central Windsor, and the other is along Westfield and Meadow Brooks in southeast Windsor. Both extend further east into Cummington. Both sections also contain parts of an Aquatic Core and are surrounded by an Upland Buffer of CNL1322. Several species of state-listed plants, dragonflies, and fish occur in BC2331, as well as one Exemplary Natural Community.

Plants

Barren Strawberry (*Waldsteinia fragarioides***) Special Concern:** This plant is a short, herbaceous perennial that occurs near streams in the rich soils of a variety of forest types. There are several occurrences in BC2331.

Dwarf Scouring-rush (Equisetum scirpoides), Special Concern: This is a perennial, evergreen fern-ally that grows in a variety of cool, usually wet habitats, including hummocks in swamps, moist stream banks, and areas under conifers containing groundwater seeps.

Insects

Riffle Snaketail (*Ophiogomphus carolus***), Threatened**: This dragonfly inhabits clear, cold, and rocky streams that are fast-flowing and contain relatively few pools. Nymphs, or aquatic larvae, burrow in stream bottoms in areas that contain sand or other fine material as substrate.

Ski-tipped Emerald (Somatochlora elongata), Special Concern: This dragonfly species inhabits small to medium sized streams having slow to moderate streamflow and varying amounts of emergent vegetation.

Fish

Longnose Sucker (*Catostomus catostomus***), Special Concern**: This 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.

Lake Chub, (*Couesius plumbeus*), Endangered: This fish is an elongate, round-bodied minnow that is restricted to clear, cold lakes and clear, cold, fast-flowing rivers. In Massachusetts, it has been found only in rivers, and prefers areas with gravel or cobble substrates and very little vegetation.

Exemplary Natural Community

Hemlock Ravine (Secure): This is an evergreen forest made up primarily of hemlocks, with dense, nearly closed canopies that cast deep shade so that very few plants grow below. It generally occurs on moist, north-facing slopes or ravines. This small Hemlock Ravine is in good condition, with good size and age structure, although it has hiking trails and a small population of volunteer Norway Spruce is present.

BC2546 and CNL1332

BC2546 covers 2,522 acres in western Windsor, as well as more than 8,000 additional acres in Dalton, Cheshire, and Savoy. Much of this BC has been protected through an impressive combined stewardship of federal, state, and private entities. BC2546 is nearly coincident with a large Landscape Block of CNL1332, much of which is Forest Core. Northern Hardwood Forest is the prevailing matrix forest type, though it is interspersed with rarer natural community types at higher elevations. The easternmost portion of BC2546 is in Windsor in the west-central part of town, and includes areas of woodlands and forested wetlands, and select reaches of several headwater streams. BC2546 in Windsor supports 13 state-listed species, several Aquatic and Wetland Cores, and a vernal pool along the town's boundary with Dalton. Upland Buffers surround the Aquatic and Wetland Cores.

Plants

Bailey's Sedge (*Carex baileyi***), Threatened**: This is a perennial, herbaceous, grass-like plant of freshwater wetlands and moist woodlands.

Bristly Black Currant (*Ribes lacustre***), Special Concern**: This is a short shrub that grows at fairly high elevations near streams, seeps, ledges, and swamps in somewhat rich, cool, moist woods.

Dwarf Scouring-rush (Equisetum scirpoides), Special Concern: This plant is a perennial, evergreen fern-ally that grows in a variety of cool, usually wet habitats, including hummocks in swamps, moist stream banks, and areas under conifers containing groundwater seeps.

Frank's Lovegrass (*Eragrostis frankii***), Special Concern**: This species is an annual grass that grows in open, sandy and silty riverbars, as well as river shores.

Long-styled Sanicle (Sanicula odorata), Threatened: This is an herbaceous perennial plant that occurs in small openings in shade or filtered light, on rich, mesic substrate such as on floodplain terraces.

Thread Rush (*Juncus filiformis*), **Endangered**: This species is a grass-like perennial restricted to springy, wet to moist soils along pond shores and in wetlands.

Woodland Millet (*Milium effusum*), Threatened: This is a tall, conspicuous grass that grows in mesic calcareous wooded or forested slopes, often in open glade habitat within. Fish

Longnose Sucker (*Catostomus catostomus***), Special Concern**: This 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.

Snakes

Smooth Green Snake (Opheodrys vernalis) SWAP: This readily identifiable snake species is a uniform green color on its back, and its belly is white or light yellow. It is small and is typically found in edges of marshes, wet meadows, fields, and forest edges or open forests.

Birds

American Bittern (Botaurus lentiginosus), Endangered: This 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.

Least Bittern (*Ixobrychus exilis*), **Endangered**: This small, wading marshbird is a member of the heron family with a long neck and bill, and a black crown. It typically nests in marshes with dense, tall vegetation, such as cattails, in areas that are interspersed with open water. They are very sensitive to disturbance, particularly by invasive marsh plants like Purple Loosestrife and Phragmites.

Northern Harrier (*Circus cyaneus***), Threatened**: These hawks, sometimes referred to as Marsh Hawks, establish nesting and feeding territories in large shrublands with nearby wet meadows, grasslands, and abandoned fields. They are very sensitive to human disturbance and their nests are vulnerable to a variety of ground predators, including dogs.

Sedge Wren (*Cistothorus platensis*), Endangered: This bird is a perching species that inhabits wetlands dominated by short grasses and sedges – it typically nests in large, wet meadows. These birds are sensitive to loss of wet meadow habitat due to changes in hydrology that drain or reduce moisture in nesting areas, some agricultural activities, and encroachments by invasive plant species. Sharp-shinned Hawk (*Accipiter striatus*), Special Concern: This hawk species nests in mixed woodlands and coniferous forests, often in locations with nearby open areas for hunting. These birds are sensitive to disturbance while nesting, but they do occasionally raise their young near areas of human development.

Priority Natural Community

Spruce – Fir Swamp (Vulnerable): This natural community is a forested wetland dominated by the trees Red Spruce and Balsam Fir. It is typically found at stream headwaters or in poorly drained basins in the higher, western and north-central parts of the state. These two occurrences – 2.7 and 21 acres in size – are both good examples of this community type. One is on protected land; the other is near protected open space and surrounded by undeveloped forested area.

BioMap2: Guiding Land Conservation for Biodiversity in Massachusetts Windsor

Priority Conservation Areas in Windsor

Windsor contains four areas designated as Priority Conservation Areas (PCAs) by NHESP. All are Town PCAs; no Regional PCAs fall within the boundaries of the town.

Town PCA 1: This 441-acre PCA falls along Windsor Brook to the northwest of Windsor village. It includes some areas that are residentially developed, but also has extensive areas of forested wetland and supports nine different statelisted species – many of which, including the marshbird Least Bittern and plants like the Bristly Black Currant, are associated with intact wetland ecosystems.

Town PCA 2: This PCA encompasses the western section of BC2546 in Windsor that falls south of North Street and north of Berkshire Trail within CNL1332. It contains an 845-acre area of Forest Core, a smaller 106-acre area of Vernal Pool Core, and several Wetland Cores. It also supports state-listed plant and bird species, and the Priority Natural Community called Spruce – Fir Swamp.

Town PCA 3: This small PCA just south of Windsor village supports several state-listed plant species associated with riparian wetlands of small headwater streams. It is essentially congruent with BC2279 and includes an area of Aquatic Core.

Town PCA 4: PCA 4 in Windsor includes two streams – Westfield River and Westfield Brook – and their immediate tributaries and adjacent riparian areas. The area supports two state-listed fish species, state-listed plants, and state-listed dragonflies. It also includes zones of Aquatic Core in BC2331 and associated Upland Buffer of CNL1322.



Figure 3. Core habitat (dark green), Critical Natural Landscape (light green), and Town Priority Conservation Areas (PCAs; reddish-brown grid) in Windsor. Town PCAs make up 3,633 acres in Windsor, or 16.1 percent of the town's total land 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/nhesp/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 land-scape) that in the past might have had connected habitats (for example, unbroken forest, continuous river, or undisrupted 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'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 Bio-Map2'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



To learn more about the Natural Heritage & Endangered Species Program and the Commonwealth's rare species, visit our web site at: www.nhesp.org.