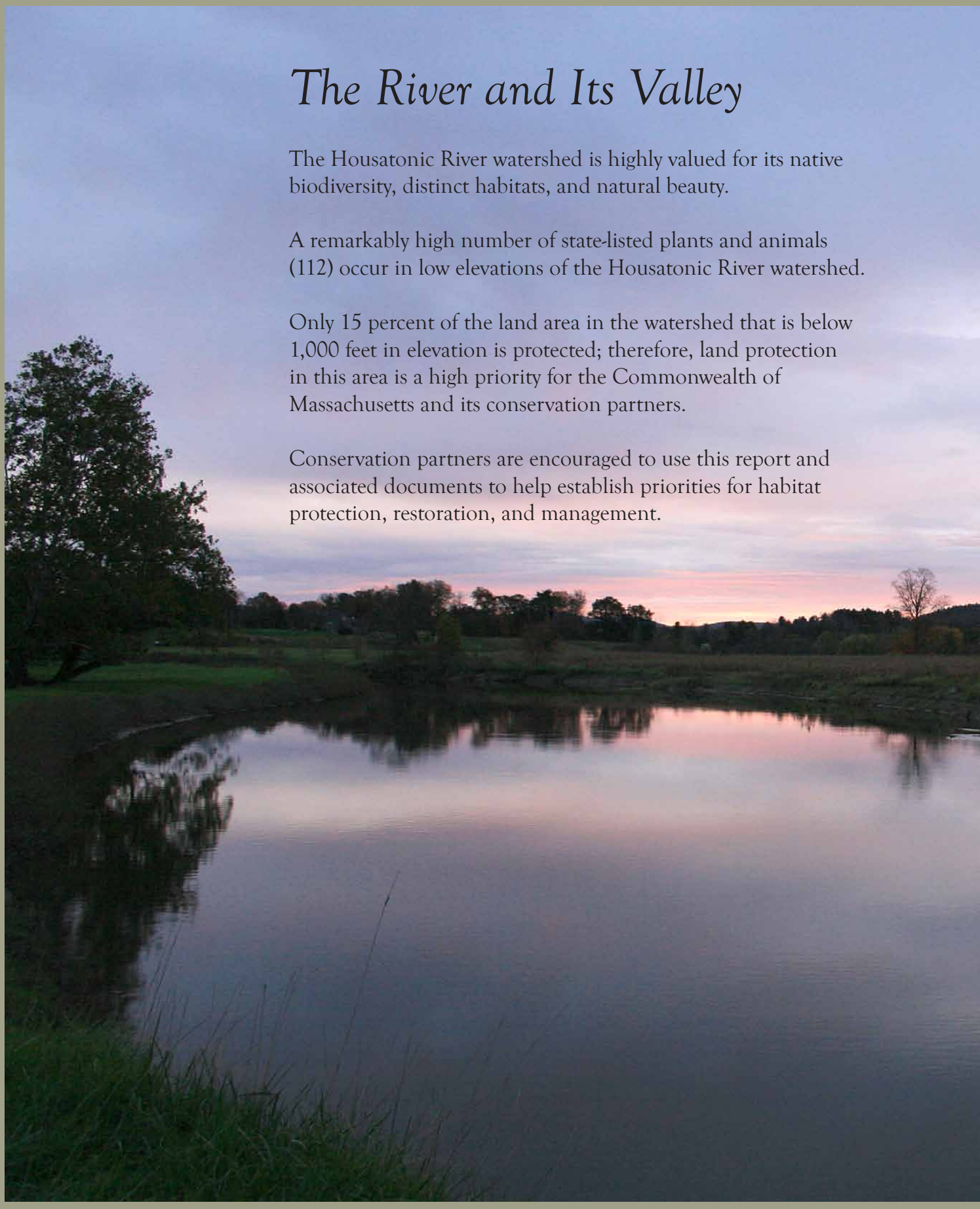
The River and Its Valley

Conserving Biodiversity in the Housatonic River Watershed of Western Massachusetts



Commonwealth of Massachusetts
Department of Fish & Game | Division of Fisheries & Wildlife | Natural Heritage & Endangered Species Program

2011



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The Housatonic River watershed is highly valued for its native biodiversity, distinct habitats, and natural beauty.

A remarkably high number of state-listed plants and animals (112) occur in low elevations of the Housatonic River watershed.

Only 15 percent of the land area in the watershed that is below 1,000 feet in elevation is protected; therefore, land protection in this area is a high priority for the Commonwealth of Massachusetts and its conservation partners.

Conservation partners are encouraged to use this report and associated documents to help establish priorities for habitat protection, restoration, and management.

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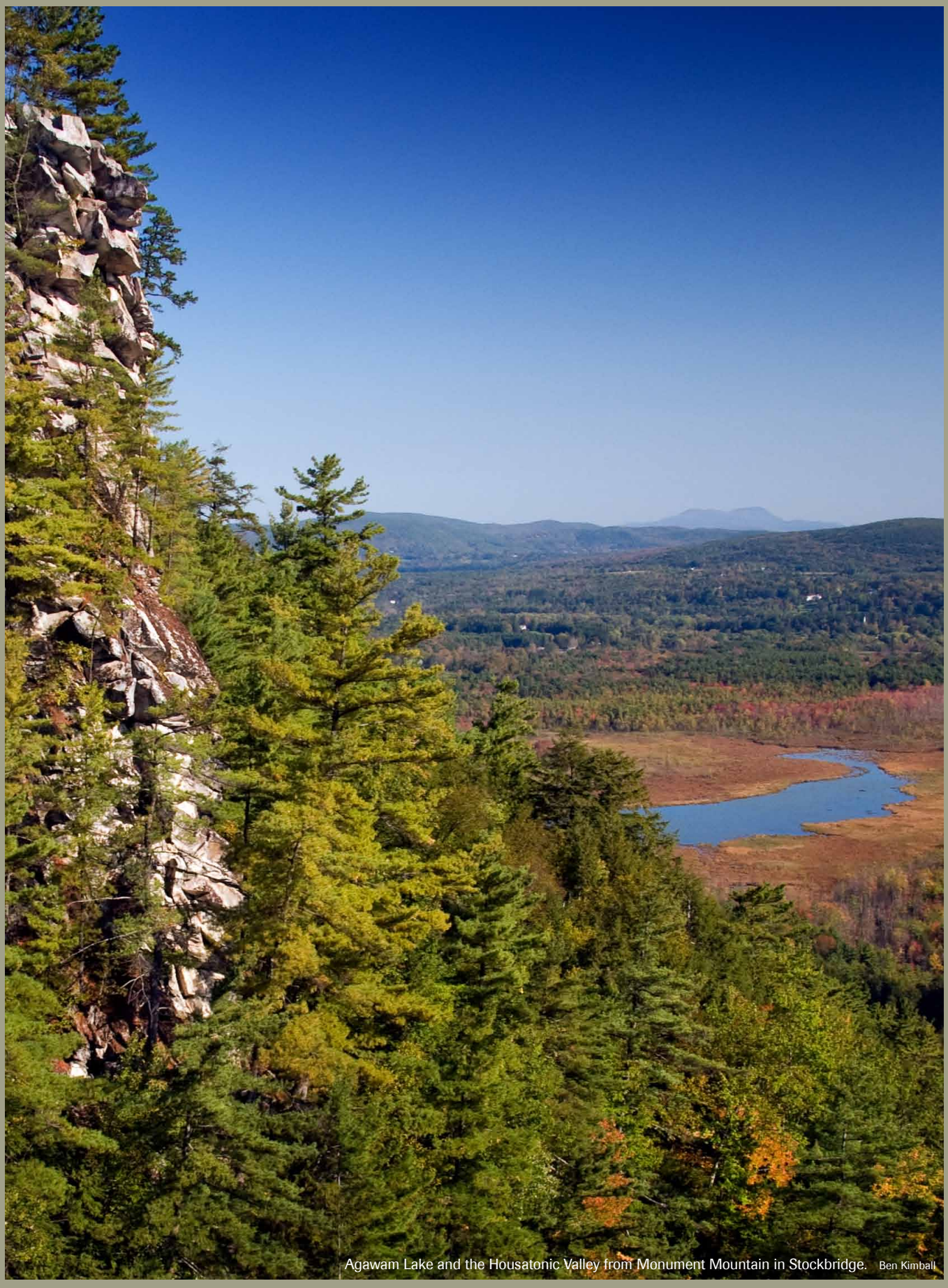
The Housatonic River winding through agricultural lands near Bartholomew's Cobble in Sheffield. Ethan Nedeau



Agawam Lake and the Housatonic Valley from Monument Mountain in Stockbridge. Ben Kimball

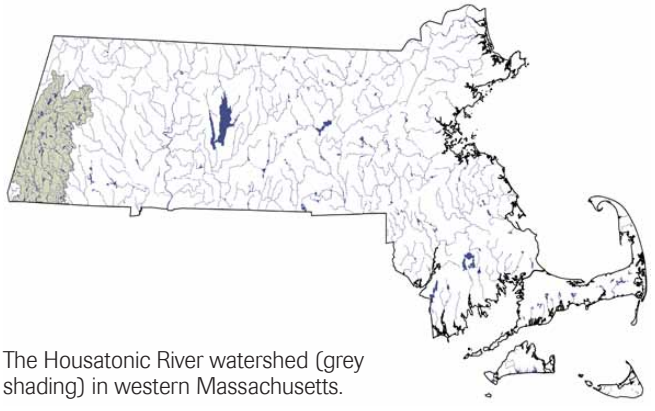
Introduction

There is something special about the Housatonic River watershed in western Massachusetts, with its broad river valley and the backdrop of the Berkshire Hills and Taconic Mountains. The forests, rich soils, and waterways of the watershed helped shape the remarkable natural diversity and special character of the region, as well as influence how humans settled and used the land. The watershed has a long agricultural tradition, with farms and pastures spread across the flat, fertile floodplain of the Housatonic River and extending into the nearby rolling hills. The watershed also has a long industrial history whose heyday has passed; this relied on natural commodities such as timber and limestone, and was powered in part by the Housatonic River. The landscape is now a patchwork quilt of urban areas, brick mill buildings along the Housatonic River, country homes along winding roads, fields of cows and corn, productive apple orchards, and sprawling forests crisscrossed with old stone walls.

Many people recognize the natural beauty of the region, but they may not realize that the Housatonic River Valley is one of the most biologically diverse areas in Massachusetts, containing uncommon plants and animals that can't be found elsewhere in the state. Long cherished by conservationists, the region's rarest species and natural community types occur in areas that have remained relatively undisturbed over the last 300 years and in unlikely places such as nondescript woodlots, small wetlands bordered by farms or developed areas, or even backyards along the river.

Compared to higher elevations, a disproportionate number of state-listed plants, animals, and uncommon or exemplary natural community types occur in low-elevation (less than 1,000 feet) areas of the Housatonic River watershed. Low elevation areas have been subjected to far more development than higher elevations, and far less of the land area is protected. In fact, only 15 percent of the lands lower than 1,000 feet in elevation are currently protected, yet these areas include habitats for 112 species of state-listed plants and animals, as well as some of the state's least common natural communities, such as calcareous fens. In contrast, 61 percent of lands in the watershed higher than 2,500 feet in elevation are protected, but only 25 species of state-listed plants and animals inhabit those areas. Due to this disparity, protecting the remarkable biodiversity of low-elevation areas of the Housatonic River watershed is one of the highest conservation priorities in the state.

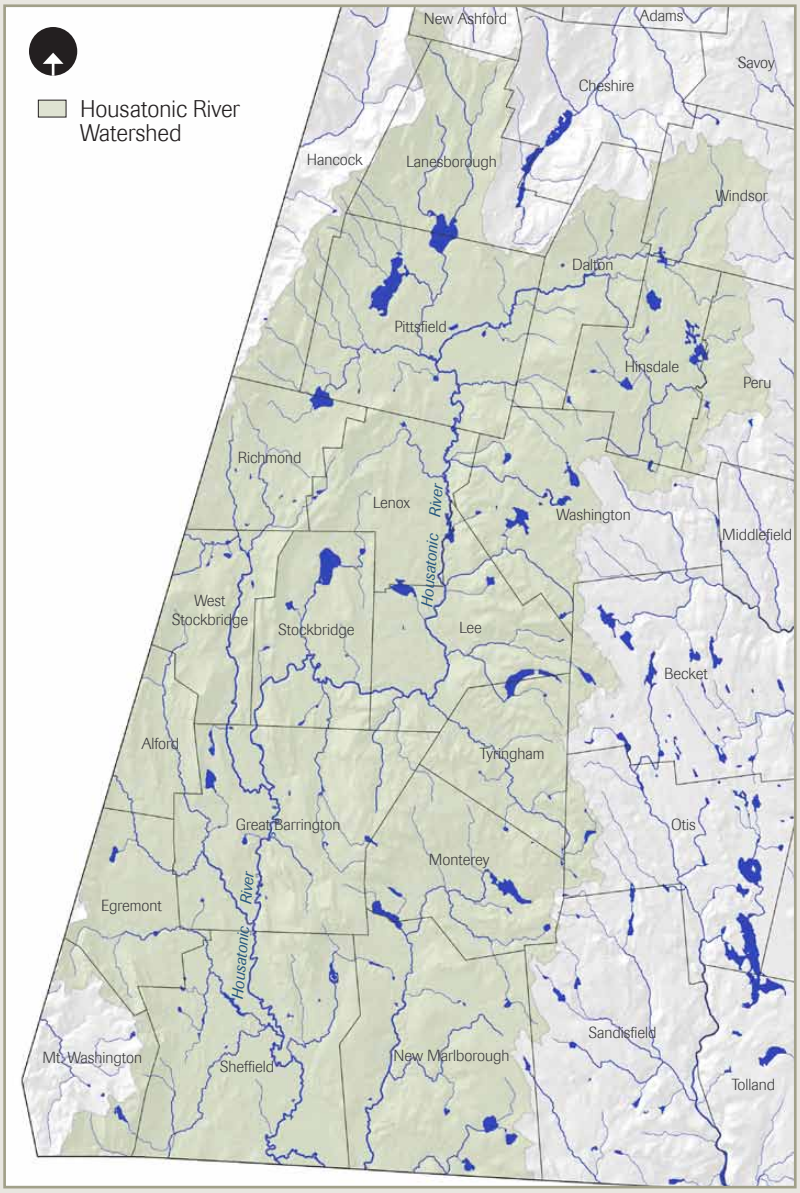
Biodiversity conservation in the Housatonic watershed faces several challenges. One is that the patches of critical habitat that support rare species in the watershed's lowlands tend to be small, fragmented, and often privately owned. Therefore, it is not efficient, or even possible, for the State to protect all of these lands, and local involvement is essential. Given limited time and funding, we need to know where to focus efforts: where is conservation work most needed, and where will it be most effective? Another challenge is to raise awareness of how important the Housatonic River and its floodplains are to regional and statewide biodiversity. Such knowledge can inspire citizens to become proud stewards of their own backyard biodiversity, and to become more engaged in town or regional conservation efforts.

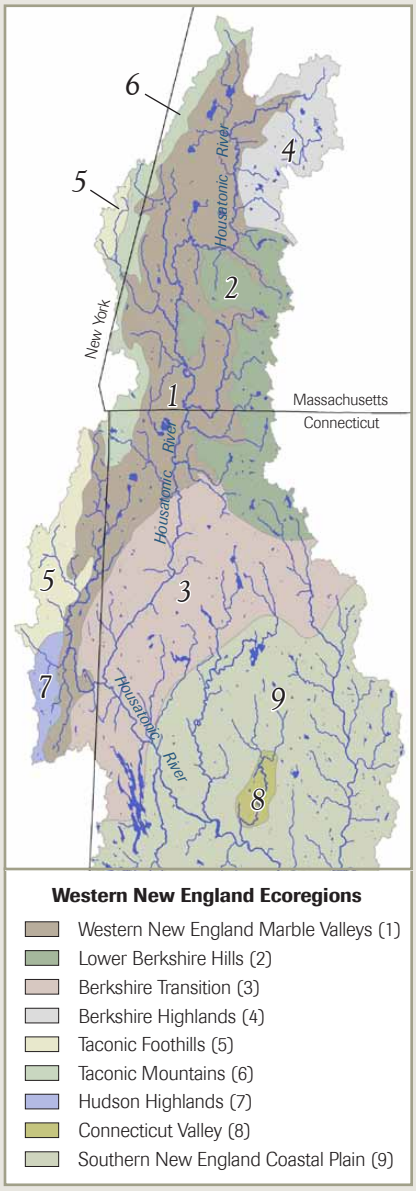


The Housatonic River watershed (grey shading) in western Massachusetts.

The Housatonic River Watershed

The Housatonic River watershed of western New England spans nearly 2,000 square miles of strikingly varied landscape, including the glacially-scoured Taconic Mountains and Berkshire Highlands in the north, the hills of western Connecticut, and the lowlands of the Atlantic coastal plain in the south. The Housatonic River meanders through expansive pastoral lands and cuts sharply through steep rocky ravines along its 149-mile path to Long Island Sound. Lowlands of the Housatonic River watershed fall within the Western New England Marble Valleys ecoregion, famed for its rich deciduous forests, calcareous wetlands, and limestone bedrock. Hundreds of millions of years ago, a shallow marine sea once existed in this region. That sea disappeared when continents converged and connected along a seam that today separates New York and the Lake Champlain basin from the rest of New England. The ancient sea left a legacy of calcium-rich soils that today support a high diversity of plants, animals, and habitats that are uncommon elsewhere in Massachusetts and New England. The last glaciers, which retreated just 10,000-14,000 years ago, rounded the mountains and broadened the valleys, helping to shape the varied terrain that enhances the region's natural diversity and beauty. Patterns of human settlement and natural resource exploitation have also strongly influenced the natural diversity in the region, but some areas have remained relatively undisturbed over the last 300 years, and the watershed continues to include remarkably diverse natural communities, plants, and animals.





Biological Surveys

During 2008-2009, the Massachusetts Natural Heritage and Endangered Species Program (NHESP) undertook an ambitious, watershed-specific biological study to improve knowledge of state-listed species and natural communities in the Housatonic River watershed (Table 1) (see footnote). Approximately 50 researchers, including NHESP staff, expert consultants, academic scientists, and graduate students, conducted more than 9,000 hours of field studies. Scientists snorkeled in the Housatonic River to find elusive freshwater mussels, clambered up and down steep riverbanks to catch dragonflies, set nets and traps to catch fish, waded through wetlands seeking turtles and salamanders, crept through stinging nettle and poison ivy to find state-listed plants, and swatted mosquitoes while listening for marsh birds at dawn. They also assessed and mapped uncommon natural communities and vernal pools. The study area included the Housatonic River and its floodplain, the lower reaches of its tributaries, and other habitats in low-elevation areas of the watershed. Surveys sought new populations of state-listed species and uncommon natural communities, updated records nearing 25 years of age, and updated older records (>25 years) that were no longer included on regulatory maps. Additional objectives were to identify high-priority sites for conservation and management, and to provide conservation planning materials to 19 towns within the study area.

Plants

Thirty-one state-listed or Watch List plant species were targeted for surveys, primarily along the Housatonic River floodplain in Sheffield, Great Barrington, Lenox, and

This project was funded through the Massachusetts Sub-Council of the Housatonic River Trustee Council under the auspices of the Massachusetts and Department of the Interior (DOI) Natural Resource Damages Assessment and Restoration (NRD) Program, as part of a legal settlement with the General Electric Company for releasing polychlorinated biphenyls into the Housatonic River and its floodplain.

Surveys at a Glance

- Personnel: Fieldwork was conducted by nearly 50 people, including NHESP staff, expert consultants, university researchers and their technicians, students, and volunteer assistants.
- Survey Sites: More than 1,800 locations were surveyed, with nearly 2,500 site visits.
- Time: Fieldwork was conducted on approximately 495 days, or 9,000 person-hours, during the field seasons of 2008-2009.
- Species and Natural Communities: 46 state-listed plant species, 30 state-listed animal species, and 18 priority natural communities were identified. Surveys updated 135 existing records and documented 170 new records for state-listed species and uncommon natural communities.

Green Dragon (*Arisaema dracontium*). Patricia Swain, NHESP

Table 1. State-listed species and priority natural communities either specifically targeted or found during 2008-2009 surveys.

Common Name	Latin Name	Rank*
Plants		
Black Maple	*Acer nigrum*	SC
Black Cohosh	*Actaea racemosa*	E
Climbing Fumitory	*Adlumia fungosa*	SC
Small-flowered Agrimony	*Agrimonia parviflora*	E
Green Dragon	*Arisaema dracontium*	T
Mountain Spleenwort	*Asplenium montanum*	E
Smooth Rock-cress	*Boechera laevigata*	T
Purple Cress	*Cardamine douglassii*	E
Foxtail Sedge	*Carex alopecoidea*	T
Davis's Sedge	*Carex davisii*	E
Gray's Sedge	*Carex grayi*	T
Hairy-fruited Sedge	*Carex trichocarpa*	T
Tuckerman's Sedge	*Carex tuckermanii*	E
Cat-tail Sedge	*Carex typhina*	T
Narrow-leaved Spring Beauty	*Claytonia virginica*	E
Hemlock Parsley	*Conioselinum chinense*	SC
Showy Lady's-slipper	*Cypripedium reginae*	SC
Wright's Spike-rush	*Eleocharis diandra*	E
Intermediate Spike-sedge	*Eleocharis intermedia*	T
Ovate Spike-rush	*Eleocharis ovata*	E
Hairy Wild Rye	*Elymus villosus*	E
Dwarf Scouring-rush	*Equisetum scirpoides*	SC
Frank's Lovegrass	*Eragrostis frankii*	SC
Andrews' Bottle Gentian	*Gentiana andrewsii*	E
Giant St. John's-wort	*Hypericum ascyron*	E
Great Blue Lobelia	*Lobelia siphilitica*	E
Hairy Honeysuckle	*Lonicera hirsuta*	E
Many-fruited False-loosestrife	*Ludwigia polycarpa*	E
Winged Monkeyflower	*Mimulus alatus*	E
Comb Water-milfoil	*Myriophyllum verticillatum*	E
Tiny Cow-lily	*Nuphar microphylla*	E
Drooping Speargrass	*Poa saltuensis* ssp. *languida*	E
Hill's Pondweed	*Potamogeton hillii*	SC
Ogden's Pondweed	*Potamogeton ogdenii*	E
Bur Oak	*Quercus macrocarpa*	SC
Yellow Oak	*Quercus muehlenbergii*	T
Bristly Buttercup	*Ranunculus pensylvanicus*	T
Swamp Dock	*Rumex verticillatus*	T
Wapato	*Sagittaria cuneata*	T
Long-styled Sanicle	*Sanicula odorata*	T
Wild Senna	*Senna hebecarpa*	E
Shining Wedgegrass	*Sphenopholis nitida*	T
Small Dropseed	*Sporobolus neglectus*	E
Crooked-stem Aster	*Symphyotrichum prenanthoides*	T
Culver's-root	*Veronicastrum virginicum*	T
Barren Strawberry	*Waldsteinia fragarioides*	SC
	Total Species	**46**
Butterflies and Moths		
Dion Skipper	*Euphyes dion*	T
Mustard White	*Pieris oleracea*	T
Ostrich Fern Borer	*Papaipema* sp. 2 near *pterisii*	SC
	Total Species	**3**
Dragonflies		
Arrow Clubtail	*Stylurus spiniceps*	T
Zebra Clubtail	*Stylurus scudderi*	SC
Brook Snaketail	*Ophiogomphus aspersus*	SC
Riffle Snaketail	*Ophiogomphus carolus*	T
Skillet Clubtail	*Gomphus ventricosus*	SC
Spine-crowned Clubtail	*Gomphus abbreviatus*	E
Rapids Clubtail	*Gomphus quadricolor*	T
Harpoon Clubtail	*Gomphus descriptus*	E
Ocellated Darner	*Boyeria grafiana*	SC
Stygian Shadowdragon	*Neurocordulia yamaskanensis*	SC
	Total Species	**10**

Common Name	Latin Name	Rank*
Freshwater Mussels		
Triangle Floater	*Alasmidonta undulata*	SC
Creeper	*Strophitus undulatus*	SC
	Total Species	**2**
Fish		
Burbot	*Lota lota*	SC
Trout Perch	*Percopsis omiscomaycus*	H
Bridle Shiner	*Notropis bifrenatus*	SC
Longnose Sucker	*Catostomus catostomus*	SC
	Total Species	**4**
Salamanders		
Four-toed Salamander	*Hemidactylium scutatum*	NL
Jefferson Salamander	*Ambystoma jeffersonianum*	SC
Marbled Salamander	*Ambystoma opacum*	T
	Total Species	**3**
Turtles		
Wood Turtle	*Glyptemys insculpta*	SC
Bog Turtle	*Glyptemys muhlenbergii*	E
Eastern Box Turtle	*Terrapene c. carolina*	SC
	Total Species	**3**
Marsh Birds		
Virginia Rail	*Rallus limicola*	NL
Sora	*Porzana carolina*	NL
American Bittern	*Botaurus lentiginosus*	E
Least Bittern	*Ixobrychus exilis*	E
King Rail	*Rallus elegans*	E
Common Moorhen	*Gallinula chloropus*	SC
Pied-billed Grebe	*Podilymbus podiceps*	E
Sedge Wren	*Cistothorus platensis*	E
Marsh Wren	*Cistothorus palustris*	NL
Green Heron	*Butorides virescens*	NL
	Total Species	**10**
Priority Palustrine Natural Community Types		
Acidic Graminoid Fen		S3
Alluvial Red Maple Swamp		S3
Black Ash Swamp		S2
Black Ash-Red Maple-Tamarack Calcareous Seepage Swamp		S2
Calcareous Basin Fen		S1
Calcareous Sloping Fen		S2
Level Bog		S3
Major-river Floodplain Forest		S2
Red Maple-Black Ash-Bur Oak Swamp		S2
Small-river Floodplain Forest		S2
Spruce-Fir Boreal Swamp		S3
Transitional Floodplain Forest		S2
Priority Terrestrial Natural Community Types		
Calcareous Forest Seep		S2
Calcareous Rock Cliff Community		S3
Calcareous Rocky Summit/Rock Outcrop		S2
High Terrace Floodplain Forest		S2
Rich, Mesic Forest		S3
Ridgetop Pitch Pine-Scrub Oak Community		S2
Yellow Oak Dry Calcareous Forest		S2
	Total Natural Communities	**19**

***Ranks**

Regulatory Ranks (Massachusetts Endangered Species Act, MESA): E = Endangered, T = Threatened, SC = Special Concern.

Non-Regulatory Ranks: WL = Watch List, NL = Not Listed, H = Historic, S1-S5 = State Ranks.

MESA ranks are subject to change; please visit the NHESP website for updated lists: www.mass.gov/dfwele/dfw/nhesp.

Rich, Mesic Forest with Wild Leek (*Allium tricoccum*). Steve Johnson

Flower of Culver's-root (*Veronicastrum virginicum*). Jennifer Garrett, NHESP

Pittsfield. Surveyors exceeded expectations, finding 165 records of 46 state-listed plant species, including multiple new records of some, resulting in new or updated records of 22 Endangered species (46 records), 15 Threatened species (68 records), and 9 Special Concern species (51 records). Populations of four species never before documented in the study area were located: Smooth Rock-cress, Purple Cress, Cat-tail Sedge, and Barren Strawberry. One species, the Rich Woods Sedge, had not been documented in Massachusetts since 1922. Survey results for state-listed plants reinforced the exceptionally high conservation value of the Housatonic River floodplain in Massachusetts.

Moths and Butterflies

Surveys targeted two Threatened butterflies, the Dion Skipper and Mustard White, and one Special Concern moth, the Ostrich Fern Borer. Surveys focused on larvae and adults. These insect species each require a particular host plant during the caterpillar phase of their lives; the Dion Skipper eats sedges, the Mustard White eats plants in the mustard family, and the Ostrich Fern Borer eats stems and roots of the Ostrich Fern. These host plants were also surveyed. For the Mustard White, surveyors updated a historic record (>25 years old), confirmed populations at three known locations, and identified two new locations. The Dion Skipper was found at six locations, and three of these were new. The Ostrich Fern Borer was found at six of seven survey sites, all new occurrences. The Gold-spotted Ghost Moth, a globally rare species, was identified during Ostrich Fern Borer surveys in Sheffield.

Riffle Snaketail (*Ophiogomphus carolus*). Glenn Corbiere

Mustard White (*Pieris oleracea*). M.W. Nelson, NHESP

Dragonflies

Dragonflies are insects whose aquatic larvae inhabit wetlands, lakes, and rivers of all sizes, and whose terrestrial adults are agile fliers, often observed well upland of their larval habitat. State-listed riverine dragonflies were surveyed in shallow water, on riverbanks, and within nearby uplands along 50 miles of the Housatonic River and 31 of its tributaries. A total of 48 species were recorded during the surveys. The ten state-listed species found doubled the number known from the study area. Also, the number of state-listed species occurrences increased from eight to 29. These statistics highlight the importance of the Housatonic River and its tributaries for conservation of riverine dragonflies in Massachusetts.

Freshwater Mussels

This project targeted two state-listed freshwater mussel species—Triangle Floater and Creeper—and surveys also documented the distribution and status of all mussel species in the Housatonic River and its tributaries. Biologists snorkeled and waded at 44 sites in the Housatonic River and eight sites in five tributaries. Although both of the state-listed mussels were found to be widespread in the Housatonic River, densities were usually low, populations were generally comprised of older animals, and there was little evidence of reproduction. An anomaly is that one of the state's best populations of Triangle Floater was documented in the Housatonic River in Pittsfield. It appears that some freshwater mussel populations in the Housatonic River may be in decline, but long-term monitoring is needed to provide better information about trends.

Creepers (*Strophitus undulatus*). Ethan Nedeau

Fish

The upper Housatonic River historically supported a high diversity of both resident and migratory fish species, but many were lost due to dam construction and other landscape alterations during the last three centuries. Four fish species were targeted during the recent surveys, three of which are Species of Special Concern: Longnose Sucker, Bridle Shiner, and Burbot. The latter species has not been seen in the Massachusetts portion of the Housatonic watershed for more than 70 years. Surveys also targeted the Trout-Perch, last documented in the 1940s near the mouth of the Green River but now presumed extirpated from the state. Of the target species, only the Bridle Shiner was found during the survey, and only in Hop Brook in Lee and Tyringham.

Salamanders

The Jefferson Salamander and Four-toed Salamander were the primary focus of amphibian surveys, although

Triangle Floater (*Alasmidonta undulata*) in its natural position on the river bottom, where it feeds by filtering food from the water. Ethan Nedeau

The Marbled Salamander (*Ambystoma opacum*) was documented in Massachusetts's Housatonic watershed for the first time. Steve Johnson

Wood Turtle (*Glyptemys insculpta*) from Hop Brook. Ethan Nedeau

American Bittern (*Botaurus lentiginosus*). Sallie Gentry

a variety of other salamanders, frogs, and toads were also documented. Visual searches of egg masses, larvae, and adults of the Jefferson Salamander were conducted during April and May. This species was identified at 56 vernal pools and 21 other small waterbodies, greatly increasing the number of known populations in the watershed. The Four-toed Salamander was removed from the Massachusetts Endangered Species (MESA) List in 2008, after the surveys in this study were initiated. Four-toed Salamander surveys targeted nests and adult females, and found them at seven of 32 sites. Finally, the Marbled Salamander, a Threatened species never before documented in the Housatonic River watershed in Massachusets, was found at three vernal pools in Stockbridge.

Turtles

Surveys targeted the Wood Turtle and Eastern Box Turtle, both of which are species of Special Concern. Wood Turtle surveys were conducted at eight sites along the Housatonic River and at 32 sites in 15 tributaries. They were found throughout the study area, and the presence of juvenile Wood Turtles indicates recent successful reproduction. Eastern Box Turtles were not found, despite anecdotal accounts of their presence in Berkshire County and the discovery of a shell in 2009.

Marsh Birds

In 2008 and 2009, surveys targeted ten species of marsh birds at 81 survey sites. Surveyors broadcast recordings of birdcalls to elicit vocal responses, noted those birds that were seen or heard, and described habitat conditions. All target species were identified at least once during surveys, except the Pied-billed Grebe. The Virginia Rail (not state-listed) was the most commonly noted marsh bird species, occurring at 62 percent of all survey sites. The Least Bittern, King Rail, and Sedge Wren, all Endangered species in Massachusetts, were found at the fewest locations. Target species were identified in a variety of marsh types, but especially where cattail was present. Most of the wetlands also contained the invasive Common Reed and Purple Loosestrife, both known to alter wetland habitat, making it less suitable for some species of birds.

Vernal Pools

Vernal pools are temporary bodies of fresh water that typically fill in the winter or spring and retain water until they

A vernal pool in Pittsfield. Noah Charney

Early spring at a Red Maple - Black Ash - Bur Oak Swamp in Sheffield. Patricia Swain, NHESP

dry during the summer. In Massachusetts, vernal pools provide important breeding habitat for amphibians, especially salamanders, and are protected by state wetland regulations. Prior studies analyzing aerial photographs indicated that as many as 786 vernal pools (i.e., Potential Vernal Pools) may occur in the Housatonic River watershed, but only 70 had been certified. Over two consecutive springs, a total of 520 Potential Vernal Pools were surveyed in the study area. Of these, 361 contained obligate vernal pool species, including salamanders, wood frogs, and fairy shrimp, and therefore met current vernal pool certification criteria.

Jefferson Salamander (*Ambystoma jeffersonianum*) eggs. Noah Charney

Priority Natural Communities

Twelve types of Priority Natural Communities had been previously identified in the study area, including one Critically Imperiled type (Calcareous Basin Fen) and eleven others designated as Vulnerable or Imperiled. Surveys were intended to update existing records of the Priority Natural Community types, and to describe any new examples of them. Target community types were identified at 47 survey sites. Ecologists updated 20 existing records and documented 27 new ones. A total of 18 Priority Natural Community types were observed, and several of these were the first documented records in the watershed, including Alluvial Red Maple Swamp, Calcareous Rocky Summit, and High-terrace Floodplain Forest. In addition, an entirely new community type was identified and described in Lenox: Red Maple-Black Ash-Bur Oak Swamp.

The Housatonic River and its floodplain in the Housatonic Valley Wildlife Management Area in Pittsfield. Ethan Nedeau

Special Places

The four areas profiled here are just a sample of the many special places found throughout the watershed. This report focuses specifically on low-elevation areas because they are biologically rich and under-protected compared to the highlands.

Upper Housatonic River Valley

One of the most biologically diverse areas in the Housatonic watershed lies along the Housatonic River corridor between the urban and industrial lands of Pittsfield and Woods Pond in Lee. This area includes a long, low-gradient reach of the Housatonic River and lower ends of its East and West branches, extensive floodplain wetlands and forests, and high-quality headwater streams that drain the western slopes of October Mountain. Thirty-four species of state-listed plants and animals have been documented in this area, as well as Exemplary and Priority Natural Communities associated with the Housatonic River's floodplain forests and wetlands.

The agricultural and industrial use of the upper Housatonic River and its floodplains, as well as the extensive urbanization in the greater Pittsfield area, have subjected this entire area to myriad stressors—yet natural biological diversity is very high. It is impossible to know what species, communities, and ecosystem services have been lost from the area as a result of past disturbances. Threats continue, including increases in urban development near Pittsfield, the presence of invasive plants throughout both wetlands and uplands, pollution from old or new industries, and disturbance from remediation for past pollution.

Much of the landscape in this region is already protected for conservation; however there are many more opportunities for land protection. Conservation lands here include the George L. Darey Housatonic Valley Wildlife Management Area (owned by the Massachusetts Division of Fisheries and Wildlife), October Mountain State Forest, and Massachusetts Audubon Society's Canoe Meadows Wildlife Sanctuary. In 2009, 12,280 acres in this region was designated as the Upper Housatonic River Area of Critical Environmental Concern (ACEC) by the Massachusetts Executive Office of Energy and Environmental Affairs. This designation emphasizes the exceptional value of this area for natural biodiversity, archaeological resources, agriculture, and recreation.

Northern Leopard Frog (*Rana pipiens*). Bill Byrne, DFW

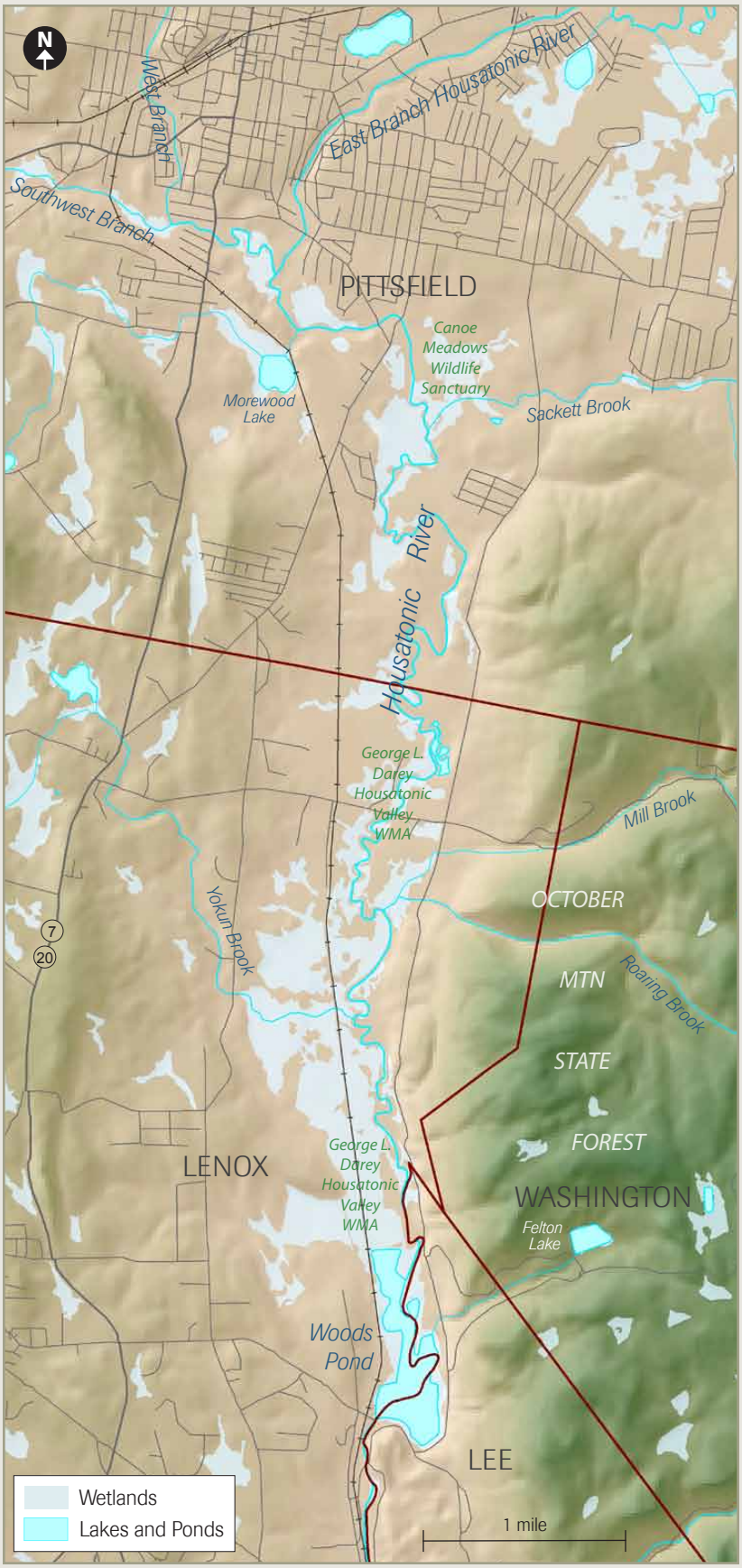
Spring Salamander (*Gyrinophilus porphyriticus*). Patrick Zephyr

Upper Housatonic River Valley

West Branch Housatonic River in Pittsfield.
Ethan Nedeau

Housatonic River floodplain in Lenox.
Jennifer Garrett, NHESP

Lower Woods Pond in Lenox/Lee.
Ethan Nedeau



Looking across the Housatonic River toward October Mountain in the Housatonic Valley Wildlife Management Area. Ethan Nedeau

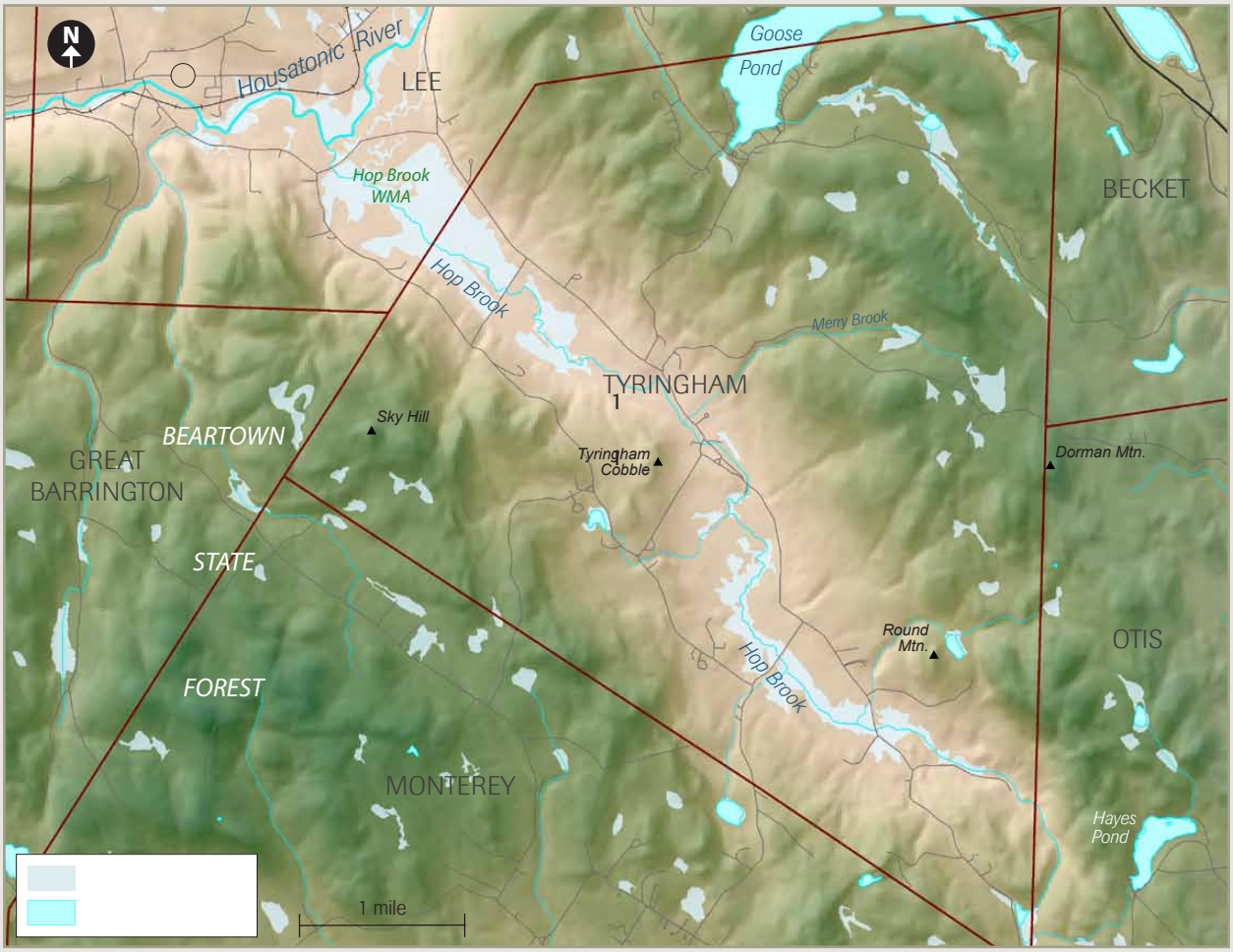
Hop Brook Valley

The pastoral Hop Brook Valley in Lee and Tyringham, along with a reach of the nearby Housatonic River corridor at the mouth of Hop Brook, has become an island of Priority Natural Communities and habitat for state-listed species. Urban and industrial lands in Lee effectively isolate this valley from the biologically rich floodplains of the Housatonic River that exist north of Woods Pond and to the west in Stockbridge. Highland areas that surround the narrow and steeply-sloped Hop Brook Valley are large tracts of mostly intact forestlands that are either state-owned (Beartown State Forest) or privately held; in addition, the Appalachian Trail National Scenic Corridor passes through this valley en route from Beartown State Forest to Upper Goose Pond.

The Hop Brook Valley contains several Priority Natural Community types, including Calcareous Sloping Fen, Small-river Floodplain Forest, Calcareous Forest Seep, and Rich Mesic Forest, as well as high quality examples of more common community types such as Deep Emergent Marsh and Wet Meadow. Eight state-listed plant species, including the Endangered Andrews Bottle Gentian and Tuckerman's Sedge, occur in the valley's wetlands. Ten state-listed animal species are found here as well. Wetlands offer habitat for marsh birds such as American Bittern and King Rail, and stream habitats support rare mussels, dragonflies, turtles, and fish.

Some lands in the valley are already protected. For example, the 206-acre Tyringham Cobble, originally protected by town residents, is now owned by The Trustees of Reservations. The presence of the Appalachian Trail presents opportunities for landowners and conservation groups to work together to protect more lands along it. Much of the valley is comprised of privately owned wetlands and sprawling tracts of former or current crop and grazing lands, and thus protection of biodiversity in the valley benefits greatly from local involvement in conservation efforts.

Walking trails at Tyringham Cobble. Ben Kimball



Hop Brook Valley

Wet meadow in the Hop Brook Valley in Tyringham. Patricia Serrentino

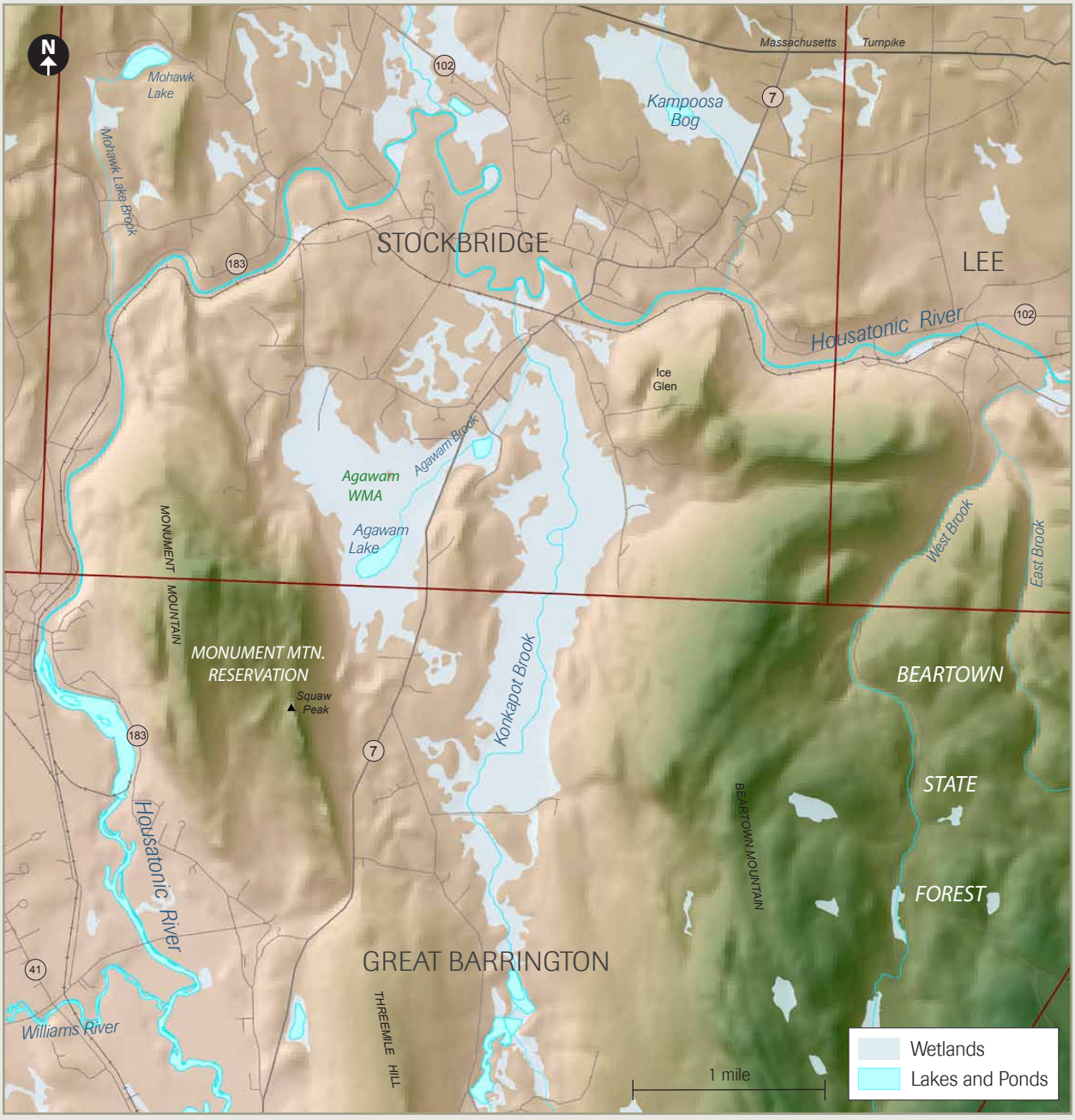
Konkapot Brook and its expansive floodplain wetlands in Stockbridge. Ethan Nedeau

Middle Housatonic River Valley

High-quality stream, wetland, and upland habitats are clustered in parts of Stockbridge and Great Barrington. The Konkapot Brook watershed drains north through the Monument Valley from Great Barrington into Stockbridge, with Beartown Mountain rising to the east and the dramatic cliffs of Monument Mountain to the west. Extensive wetlands all along the stream corridors of both Konkapot Brook and its tributary Agawam Brook host a significant diversity of plant and bird species. The Housatonic River corridor in Stockbridge, near the mouth of Konkapot Brook, supports state-listed aquatic species despite being heavily modified through urban, agricultural, and recreational land use. Kampoosa Bog lies just north of the Stockbridge village center and is one of the most important wetland habitats in the state. The Kampoosa Bog Drainage Basin was designated an Area of Critical Environmental Concern in 1995 because it contains a premier example of a calcareous fen, which supports many rare species.

Overall, 48 state-listed species occur in these areas. They consist of 32 plants and 16 animals, including birds, dragonflies, freshwater mussels, amphibians, and reptiles. The vast wetlands along Konkapot Brook are the only place where the state-Endangered Sedge Wren was documented during the 2008-2009 marsh bird surveys, and American Bittern and Common Moorhen were also identified in these wetlands. The area includes a Critically Imperiled Calcareous Basin Fen and two of the state's best

Sedge Wren (*Cistothorus platensis*). Jerry Oldennettel



Middle Housatonic River Valley

and largest examples of Black Ash-Red Maple-Tamarack Calcareous Seepage Swamps.

The proximity of these valuable habitats to roadways, railways, and developed areas, as well as the high percentage of privately owned lands in the area, makes it difficult to protect them. The extensive protected lands of Beartown State Forest and Monument Mountain Reservation undoubtedly help to maintain the quality of the low-elevation stream and wetland habitats in the valley floor below, but conservation partners and residents should seek ways to protect more of these important areas in Stockbridge and Great Barrington.

Fairy Shrimp
Ethan Nedeau

Limestone outcrops that support calcium-loving plants are common throughout the southern Housatonic River Valley. Michael Batcher

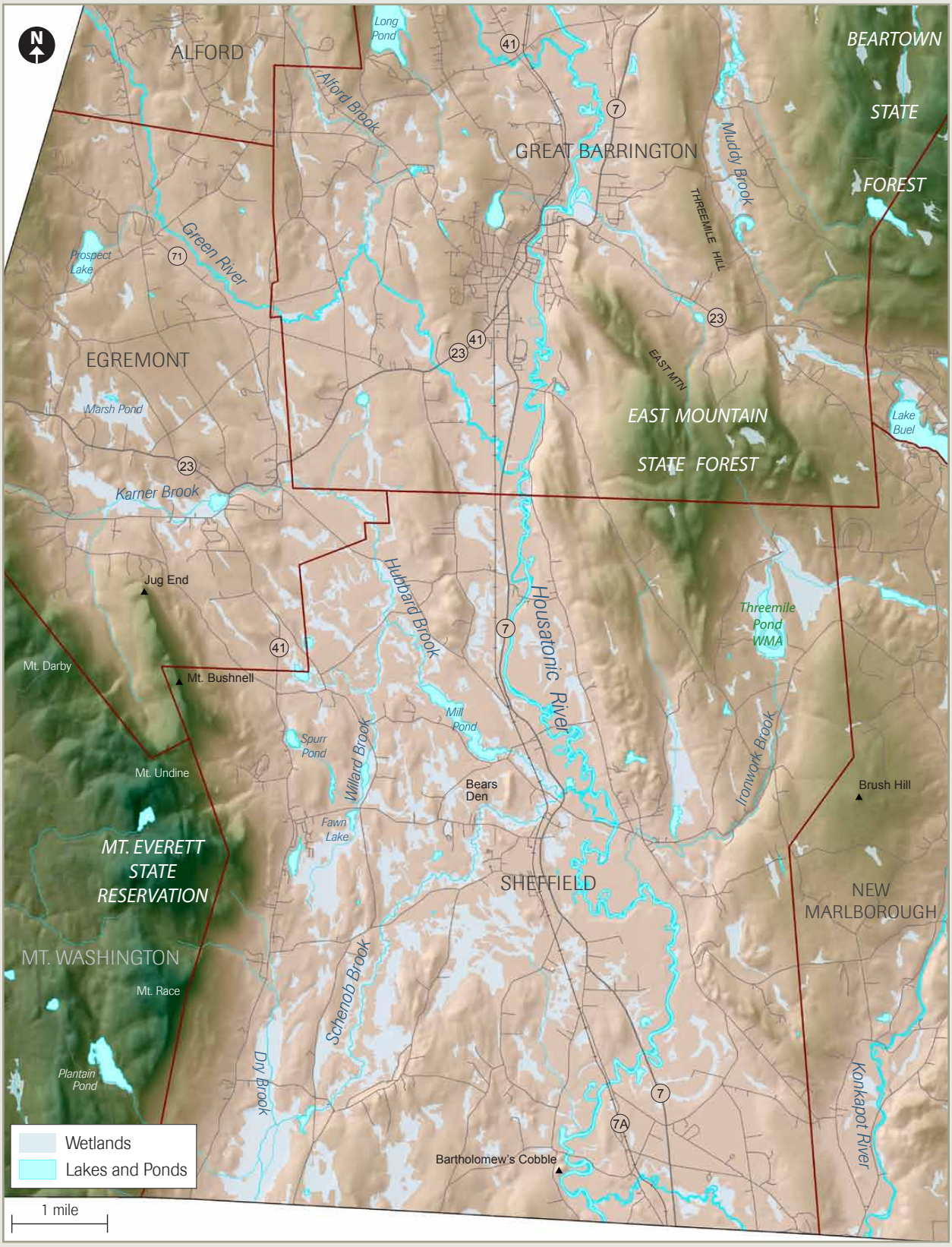
Southern Housatonic River Valley

The lower Housatonic River Valley in the towns of Sheffield and Great Barrington, including tributary watersheds of Schenob Brook, Hubbard Brook, and the Green River, is one of the most biologically rich areas in the entire state. The town of Sheffield ranks third in Massachusetts for the number of records of state-listed species and Priority Natural Communities, and is the only town outside of the southeastern coastal plain or Cape Cod that ranks in the top ten of these towns of highest biodiversity.

This area contains exceptionally high concentrations of state-listed plants (64 species), including 32 Endangered and 16 Threatened species. Most of these state-listed plant species inhabit the region's numerous floodplain forests, rich woods, and calcareous wetlands, cliffs, and outcrops. Twenty state-listed animals also occur here, including species rarely, if ever, encountered elsewhere in Massachusetts. These include groundwater-dwelling amphipods and a species of snail restricted to calcareous habitats.

The biological importance of this region has long been recognized, and some of the most valuable lands are already protected, including Bartholomew's Cobble in Sheffield and wetlands in the Schenob Brook watershed. Like Kampoosa Bog in Stockbridge, the Schenob Brook Drainage Basin was designated an Area of Critical Environmental Concern, in this case in 1990, largely because

Ostrich Fern in the Housatonic River floodplain. Michael Batcher



Southern Housatonic River Valley

of its remarkable calcareous seepage swamp and calcareous fens. The nearby Karner Brook Watershed in Egremont and Mount Washington is another Area of Critical Environmental Concern, designated in 1992. Although some areas are protected, much of the prime agricultural lands and forests along the Housatonic River floodplain and in the gently rolling hills to the east and west are privately owned. Similar to other low-elevation areas of the Housatonic watershed, the high proportion of privately owned lands presents both challenges and opportunities for land protection, which will benefit greatly from landowner awareness and participation.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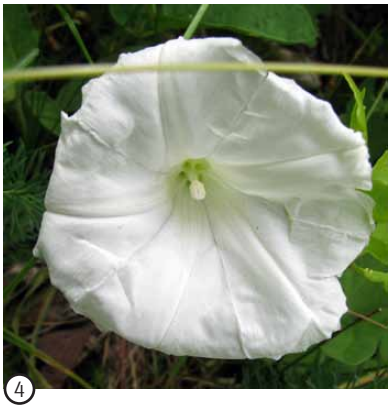
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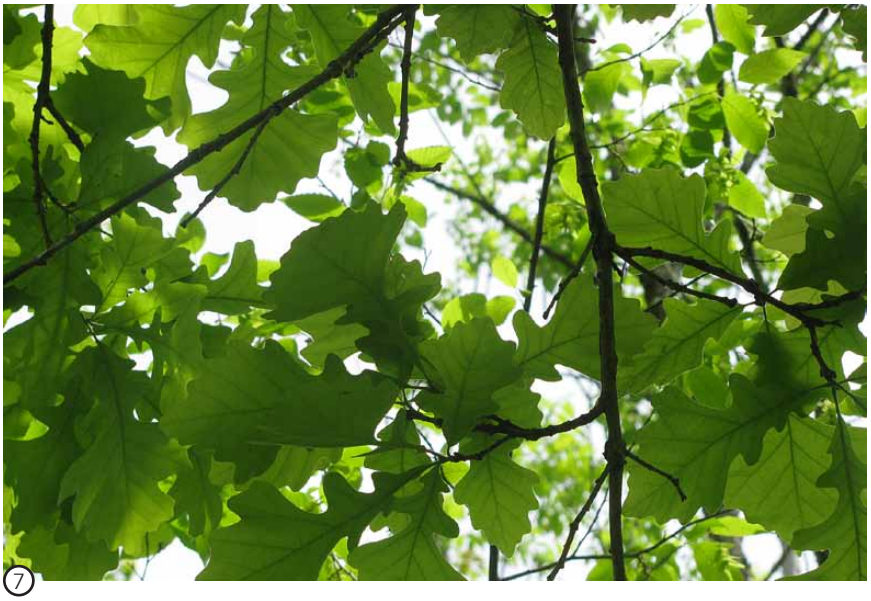
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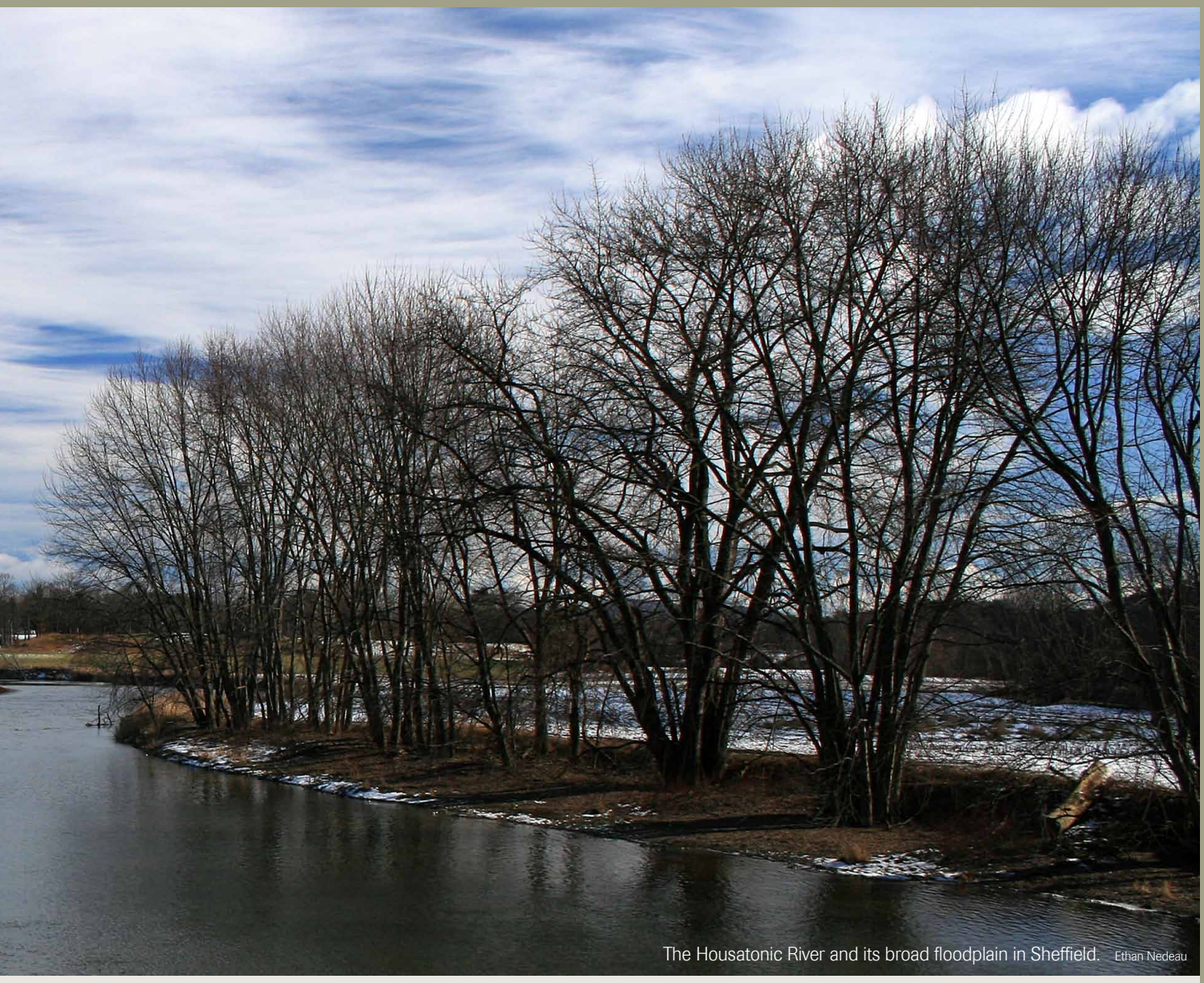
Plant diversity: (1) Drooping Speargrass (*Poa saltuensis* ssp. *languida*), (2) Narrow-leaved Spring Beauty (*Claytonia virginica*), (3) Tuckerman's Sedge (*Carex tuckermanii*), (4) Low Bindweed (*Calystegia spithamaea*), (5) Showy Lady's-slipper (*Cypripedium reginae*), (6) Yellow Lady's-slipper (*Cypripedium parviflorum*), (7) Bur Oak (*Quercus macrocarpa*). Photos 1, 3-7 by Jennifer Garrett, NHESP; Photo 2 by Tony Gola.

Conserving Biodiversity

The Housatonic River watershed is a complex mosaic of natural and developed lands and contains a broad range of habitat types; within that mosaic are numerous special areas that harbor high concentrations of state-listed plants, animals, and natural communities. Studies carried out in 2008 and 2009 provided updated information about these important conservation elements. Ten Endangered, five Threatened, and six Special Concern species were added to the long list of state-listed plants and animals already known to occur in the study area. New natural community records were also added, including for several uncommon types such as High-terrace Floodplain Forest and Calcareous Rocky Summit. Even the Housatonic River itself, long known for its industrial history and unfortunate legacy of pollution, supports state-listed dragonflies, mussels, fish, and turtles. Nevertheless, NHESP records indicate that while very few native species are known to have been extirpated from the watershed in the recent past, many are less common and less widely distributed than they once were.

The 2008-2009 field studies help provide a new scientific baseline, establishing benchmarks for measuring how well we are preserving native species for generations to come. By improving our understanding of the region's species and habitats, they also strengthen the roles of the Massachusetts Endangered Species Act and Wetlands Protection Act in safeguarding critical plant and wildlife habitats. And finally, the results help guide local and state conservation organi-



The Housatonic River and its broad floodplain in Sheffield. Ethan Nedeau

zations—and local citizens—in targeting new priority sites for protection efforts in the region. Data were also vital for delineating Core Habitat in *BioMap2* (see next page), a statewide biodiversity conservation plan produced in 2010 by NHESP and The Nature Conservancy.

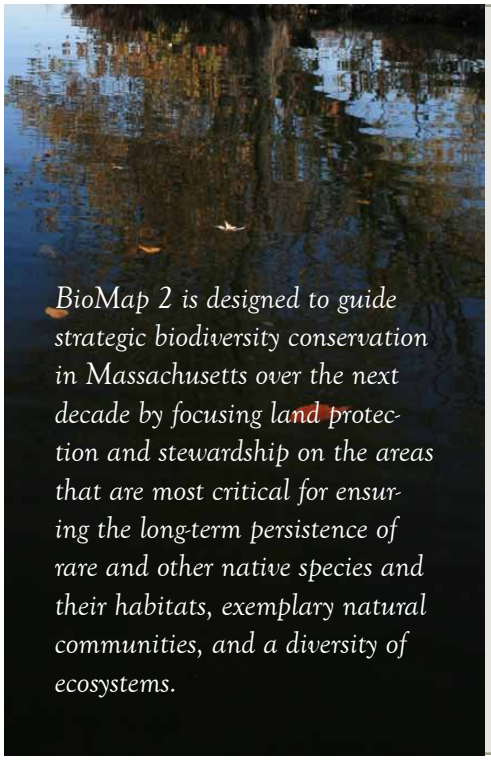
As part of the conservation planning process, Priority Conservation Areas (PCAs) were chosen from *BioMap2* Core Habitat and Critical Natural Landscape. One to six Town PCAs were selected for each town within the Housatonic watershed. These PCAs usually contain high concentrations of state-listed species and Priority Natural Communities, and are often near or within large, relatively intact natural landscapes, such as extensive tracts of forestland. In addition to the Town PCAs, a larger-scale prioritization was also conducted, resulting in the delineation of Regional PCAs. Ecological connections are an important aspect of biodiversity conservation within these Regional PCAs. Consequently, the Regional PCAs often contain select Town PCAs and transcend town boundaries; this facilitates protection of lands both locally within each town and within a broader regional context. The separate areas of BioMap2 Core Habitat (BioMap2 Cores), areas of Critical Natural Landscape, and Town and Regional PCAs are described in detailed reports prepared for 19 towns in the watershed.

In many cases, locations of state-listed plants, state-listed animals, and Priority Natural Communi-

The Housatonic River Valley and Taconic Range from Spruce Peak in Great Barrington. Ben Kimball

ties do not fall within Town or Regional PCAs; this does not diminish their importance, but rather highlights opportunities for citizens or local conservation groups to protect areas that are simply too small or isolated to become region-wide or statewide priorities. It is not efficient, or even possible, for the state to protect every parcel of land that harbors state-listed species and therefore local involvement is essential. Many groups are actively involved with conservation and stewardship in the watershed.

Protecting biodiversity is not the only reason to conserve lands. Land conservation is also a tool to preserve agricultural traditions, maintain valuable sources of locally grown produce, protect important municipal water supplies, keep areas open for nature-based recreation, and preserve historically or culturally significant areas. All of these reasons can be complementary, and such a broad range of conservation efforts can effectively protect more area and build a network of interconnected lands that are even better able to support natural ecosystems and native species. The Massachusetts Division of Fisheries and Wildlife is committed to working with local and regional conservation partners to protect and restore the natural heritage and special places that are so important to the vitality and identity of the Housatonic River watershed.

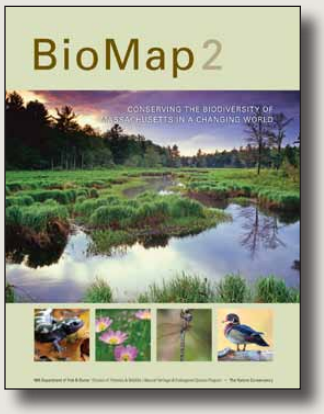


BioMap 2 is designed to guide strategic biodiversity conservation in Massachusetts over the next decade by focusing land protection and stewardship on the areas that are most critical for ensuring the long-term persistence of rare and other native species and their habitats, exemplary natural communities, and a diversity of ecosystems.

BioMap2

BioMap2 is the most complete and accurate conservation planning tool currently available to towns and conservation partners in Massachusetts. It provides a framework for statewide biodiversity protection and management that is based on the location, size, condition, and connectivity of important species, habitats, and ecosystems. *BioMap2* consists of two main components which complement each other:

- Core Habitat identifies key areas to ensure the persistence of species of conservation concern, exemplary natural communities, and intact ecosystems across Massachusetts. The new species and priority natural community records recently collected in the Housatonic River watershed were incorporated into *BioMap2* Core Habitat.
- Critical Natural Landscape was created to identify and prioritize 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.



For More Information

Housatonic River Natural Resource Restoration
www.ma-housatonicrestoration.org/

Natural Resource Damage Assessment and Restoration Program for Massachusetts
www.mass.gov/dep/cleanup/sites/nrd/nrd.htm

Natural Resource Damage Assessment and Restoration Program for New England
www.fws.gov/newengland/Contaminants-NRDAR.htm

Massachusetts Natural Heritage & Endangered Species Program
www.mass.gov/dfwele/dfw/nhesp/nhesp.htm

Biodiversity in the Housatonic River Watershed
www.mass.gov/dfwele/dfw/nhesp/conservation/housatonic.htm

Species Fact Sheets
www.mass.gov/dfwele/dfw/nhesp/species_info/species_home.htm

Natural Community Information
www.mass.gov/dfwele/dfw/nhesp/natural_communities/natural_communities.htm

BioMap2
www.mass.gov/dfwele/dfw/nhesp/land_protection/biomap/biomap_home.htm

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

Massachusetts Division of Fisheries and Wildlife
North Drive, Westborough, MA 01581
Tel: (508) 389-6360 Fax: (508) 389-7891

On the cover: Woods Pond in Lenox (Ethan Nedeau). Cover page insets from left: Narrow-leaved Spring Beauty (Tony Gola), Mustard White (M.W. Nelson, NHESP), and American Bittern (Sallie Gentry).

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