

Conservation and Recreation

**An Element of *Sustainable Berkshires*,
Long-Range Plan for Berkshire County**

ADOPTED 3.20.14



SUSTAINABLE BERKSHIRES
Community Strategies For A Sustainable Future

Sustainable Berkshires is a project of the
Berkshire Regional Planning Commission.



*Berkshire
Regional
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INTRODUCTION

Land conservation has been underway in the Berkshires for more than 150 years through the efforts of numerous public, private and non-profit partners. Conservation focus in the region has been placed on preserving several key functional uses and values present in open lands including: drinking water protection, habitat protection, recreational opportunities, and agriculture. Striking a balance between these uses can be challenging. This element explores the vast natural resource and outdoor recreation amenities of the region and establishes a framework for how the system as a whole can advance in the future to successfully balance natural, recreational, economic, and municipal service needs.



The Berkshire region is renowned for its scenic landscape, which provides the backdrop for the busy summer tourist season, outdoor winter sports, and the popular “leaf peeper” visits to take in the famous fall foliage.

THE REGIONAL LANDSCAPE IN CONTEXT

The Berkshire region is an important piece of the larger ecological fabric of the Northeast. Berkshire County contains some of the largest blocks of intact natural landscape in all of southern New England. Sizeable expanses of contiguous open lands in the region stretch across the Taconic Range into Connecticut and Upstate New York, across the Hoosac Range that stretches into Franklin County (MA), and southern Vermont, and across the Berkshire Highlands into the Hampshire and Hampden counties (MA).

ONE LANDSCAPE, MANY USES

The natural landscape of the Berkshires is one of its most defining characteristics and one that greatly contributes to the quality of life and economy of the region. The landscape and natural resources have historically served as catalysts for settlement from trappers, to paper millers, to the stately Gilded Age “cottages” of wealthy families. This natural, rural character is what inspired Hawthorne, Melville, Wharton and other American literary figures to come here, beginning the trend of literature and arts that continues as a hallmark of the region today. It is what spurred naturalists to successfully create the state’s first park in 1898 on Mount Greylock, still the centerpiece of a now expanded network of state parks and reserves, many of which are in the Berkshires.

This trend continues today in the form of second homeowners and those who choose to move to or stay in the region to enjoy the rural lifestyle, arts and culture offerings, and outdoor amenities. As development occurs over time and the range and popularity of outdoor recreation options increases each year, the region will need to determine how to balance different interests and uses. Some of the key uses and values present in the landscape, which will each need to be taken into account in any conservation strategy include biodiversity, outdoor recreation, agriculture, watersheds, energy, and private property rights.

Biodiversity

Berkshire County is one of the most ecologically diverse and intact natural landscapes in the state. It is home to more than 150 state-listed endangered threatened or species of special concern, and its calcareous wetland plant communities are unusual and globally rare. The area provides important forest habitat that connects the northern forests of New England and New York with the forests of the Appalachian Mountain chain, providing safe passage for roaming animals like black bear, fisher and bobcat and treetop habitat for migratory birds. In terms of supporting the greatest number of state-listed species, the Berkshires is overshadowed in the state only by the Cape Cod region that hosts shoreline, tidal marshes and pine barrens. Because of the largely intact, unfragmented forests that stretch from the county westward to the Taconic Range in upstate New York and southward into northwestern Connecticut, this tri-state area has been deemed by The Nature Conservancy (TNC) as one of America’s Last Great Places. Referred to by TNC as the Berkshire Taconic Landscape, this area encompasses “more than 155,000 acres and contains one of the most spectacular, healthiest, and most diverse blocks of intact forest in southern New England.” TNC has also recognized the importance of the Berkshire Highlands forest that blanket the county’s eastern border.

Outdoor Recreation

The Commonwealth owns 40 parks, forests and wildlife management areas in the region, together constituting more than 133,200 acres. These offer a range of year-round recreation options including bird watching, hiking, Nordic skiing, snowshoeing, hunting, snowmobiling, kayaking and canoeing, fishing, swimming, camping, mountain biking and off-road vehicles. Municipalities, nonprofit organizations and land trusts own 40 more sites. The vast majority of conserved lands in the region are open to the public; however, maintaining their properties and balancing recreational use demands remain a challenge for state and other conservation agencies to sustain. Growing and enhancing the network of recreational offerings will require a strategy for ensuring maintenance is sustainable over the long term.

Agriculture

According to the last agricultural census, the region has 66,352- acres of agriculture in 522 farms. Agriculture is a key element of the history, rural character, aesthetic landscape, economy, and long-range sustainability of the region. With a burgeoning local foods movement nationally and in the region, an increased emphasis is being placed on the importance of local farms and locally produced foods. In terms of natural resources, agricultural lands have an important role to play. They are typically located along floodplain areas which are key locations for rare species, include critical transitional habitat areas between fields and forests, and provide movement corridors between conserved lands and waterways in more developed areas.

Ecosystem Services

Current research and practice are placing greater recognition and emphasis on the role that open lands play in providing “passive” economic benefits to municipalities. Referred to as ecosystem services, the core principle is that it is often more cost effective to conserve land rather than try to engineer a solution to problems such as flood abatement and water supply protection. Most of the municipalities with water supply and treatment systems have invested in land protection around reservoirs for this purpose. More recently, there is growing interest in the use of forested areas to slow or mitigate flooding and riverbank erosion resulting from severe storm events. The value of land for municipal benefits such as these will need to be factored in as part of the larger conservation and development strategy for the region.

Energy

The Berkshires are home to the majority of state-identified lands with high wind energy potential away from the highly developed coastline. As illustrated in the map, below, the best wind potential in the state is along the shore and off-shore. The state has been working since passing the Green Communities Act in 2008 to increase renewable energy generation in the state. Because the Berkshires have both wind potential and low levels of development, the region has become a hot spot for wind prospectors and new wind projects. This has ignited numerous local concerns about impacts on habitat, bird and bat species, and aesthetics.

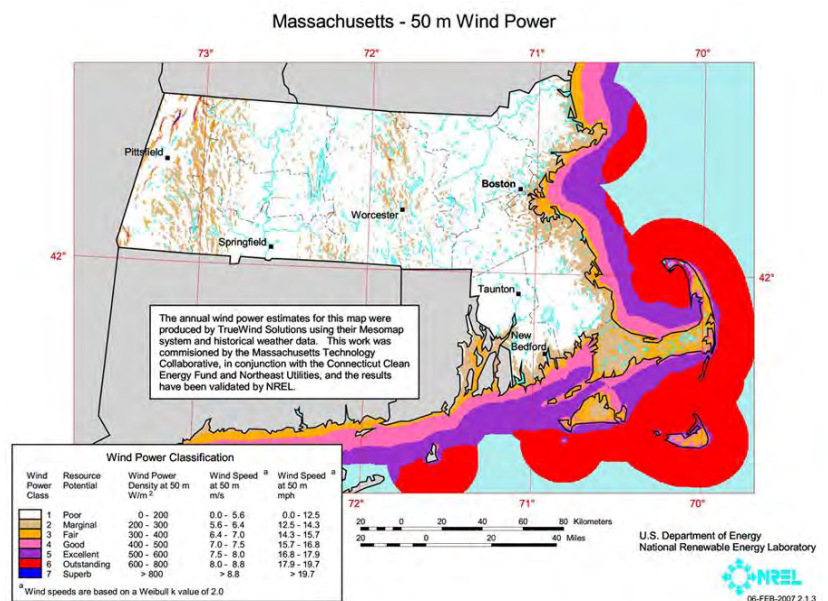


Figure CRI: Massachusetts Wind Resources

Solar development, while generally regarded as passive and unobtrusive, has also been met with local concern. The interplay between agricultural lands, particularly those with prime agricultural soils, and the placement of solar panels places two “green” objectives – local food and renewable energy – potentially at odds as cleared fields make some of the most attractive sites for new solar installations. While a regional energy strategy will be addressed in the Energy and Climate Element of this plan, it is clear that renewable energy has become one of the key uses and interests at play in the open spaces of the Berkshires.

Private Land Development

Private property owners have a large role to play in both conservation and recreation in the region. Almost 70% of the undeveloped land in the county is privately owned, which means that the private sector will continue to drive and shape the landscape of the Berkshires. Over the past several decades, development trends in the region show an increase in scattered rural development, with larger homes on larger lots. Approximately 2,500 acres of natural land were developed in the county between 1991 and 2005. The newly constructed American home expanded in size from an average of 983 square feet in 1950 to an average of 2,700 square feet in 2006 – an almost three-fold increase in size -- while the average American household size decreased 24% in the same time frame. Here in the Berkshires, the county population fell by 9% between 1990 and 2010, while the number of housing units grew by 13%. This land consumption pattern of fewer people in larger homes and on larger lots can eliminate and fragment important habitat and wildlife movement corridors. A strategy for moving forward will need to prioritize areas most important for conservation to help ensure that the most critical areas are kept free of development.

Private property owners will continue to have a significant impact on the future conservation and recreation system in the choices they make with their property. This could include estate planning for land conservation or continued agriculture, land donations to a municipality or conservation entity, development decisions on currently open land, and willingness to retain public access points between their properties and permanently conserved lands. Of the permanently protected lands, nearly 23% is privately owned by nonprofit organizations and landowners, about half of which are placed under conservation or agricultural deed restrictions. Approximately 2/3 of the deed restrictions are agricultural restrictions to protect farmland from development.



Trillium thrive in the forest understory, blooming before the trees leaf out and the canopy blocks the sunlight.

FINDING BALANCE: THREE KEY CHALLENGES

In seeking to forge a balance between all of the uses of the rich landscape, there are three key macro-level issues with which the region and its stakeholders must grapple. These include the land use regulation environment in the state, access to resources for land conservation and management, and the variables and challenges associated with climate change.

Land Use Controls

The state has struggled for decades to revise its land use and zoning enabling legislation to allow municipalities to direct growth and ensure that private development does not impose additional costs to taxpayers. Key issues include an inability to zone solely for agricultural use, Approval Not Required (ANR) development along roadways, and reluctance to imposing impact fees on developers to recoup costs of additional roads and infrastructure required from the municipality to support new development. Each of these support rural sprawl and constrain the ability of a municipality to direct growth towards existing areas and conserve the rural landscape.

Limited Resources

Conservation and recreation land managers in the region, from local land trusts up through state agencies, consistently struggle to appropriately maintain their recreation infrastructure (boat ramps, pavilions, campgrounds, etc.), trails, and education and outreach mechanisms (programs, guides, maps, etc.) with a limited amount of staff and financial resources. This challenge becomes greater as additional demands are placed on natural resource managers such as dealing with invasive species, which requires specialized efforts, materials, and expertise or training. Attempts to highlight and promote recreational properties in the region are hampered because there is not a central portal displaying the various

conservation lands or their amenities. For example, online trail maps are available for most state properties and for many owned by nonprofit organizations, but these reside within the websites of their respective owners. Not all maps and features are entered into a common GIS system. Overcoming these barriers through new or combined funding streams and collaborative approaches and partnerships will be a necessary challenge moving forward.

Climate Change

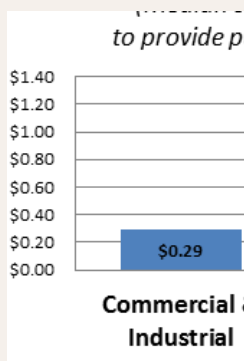
Environmental impacts resulting from climate change may profoundly alter ecological systems and the plants and animals that live within them. Anticipated climate change impacts to the Berkshires include:

- **Increase in Temperature:** The average seasonal temperatures of the region are projected to increase. Temperature increases pose several challenges to native species, for those at their southern reaches of habitat who will need time and connected space to retreat northward in order to survive, and through an increased opportunity for non-native or invasive species to take hold or spread.
- **Changes in Types and Timing of Seasonal Precipitation:** Predictions for the region are that severe storm events will become more frequent, interspersed with periods of drought. This “feast and famine” precipitation cycle will strain natural systems.
- **Earlier Growing Season:** Some plants are already leafing out, blooming and fruiting earlier, and some animal species are migrating and rearing young sooner in the year. Early warm spring temperatures cause some fruiting trees and other plants to flower sooner, making them more vulnerable to periodic freezing temperatures. This has implications for the many animal species whose success rate for rearing young is timed to coincide to the abundance of seasonal food sources, and if blooming and fruiting times are altered, coupled with a change in insect life cycles, many links within the food web will be weakened. This may reduce the successful breeding rates of species ranging from insects to amphibians to birds. The long-term survival of some species may rely on maintaining natural corridors in which species can retreat northward or higher in elevation.

Cost of Community Services (COCS)

One variable that often arises in municipal discussions of conservation is the opportunity loss imposed on the community from lost tax revenue that could have been generated if the land was developed. This issue has been studied in depth across the country in cost of community services studies that assess the net financial benefits of new development after including costs incurred to the community from the development such as roads, services, and infrastructure.

These studies consistently document the fiscal benefits of maintaining open space lands. More than 128 studies found that the taxes collected from residential development did not cover the full cost of the municipal services they receive. Inversely, taxes from industrial/commercial and agricultural/woodlands contribute a net fiscal gain to municipalities, thus subsidizing residential uses. As noted in the table below, the median cost of services for residential land uses for every \$1.00 raised in tax revenue is \$1.19 (a net loss of 19 cents), while the median cost of services for industrial/commercial land use is \$0.29 and for working and open land uses is \$0.37 (net gains of \$0.71 and \$0.63 respectively). Several western Massachusetts communities are included in this study, including Becket and Williamstown. An independent COCS for the town of Lanesborough showed similar results.



(Source: AFT, Fact Sheet, Cost of Community Services Studies, August 2007).

CONSERVATION AND RECREATION THROUGH THE SUSTAINABILITY LENSES

Conservation efforts and recreation amenities contribute greatly to the long-term quality of life and sustainability of the region. A few key contributions are discussed below as they relate to the three sustainability lenses which provide the overarching framework for each element of the regional plan.

Economic Development

- **Cost of Community Services:** As discussed previously, municipal financial and cost of community services studies consistently show that on average, residential development generates significant tax revenue but requires costly public services that typically are subsidized by revenues from commercial/industrial and open/working land uses. (See callout box, above.)
- **Value of Nature-based Business:** As noted in the New England Governors' Conference, Inc. 2009 report, "tourism now eclipses both farming and forestry as a source of employment in rural economies" of the Northeastern US. To meet this trend, the Berkshire tourist industry is rebranding itself, elevating the natural and recreational assets of the region from a supporting role to one that is on par with our cultural attractions. The Berkshire Visitor Bureau has long promoted the Berkshires as "America's Premier Cultural Resort." Its new slogan says it all: "The Berkshires – Nature – Culture - Harmony."

- According to a 2006 study conducted by the U.S. Fish & Wildlife Service, 40% of Mass. residents engage in wildlife-associated recreation, contributing \$1.6 billion to the state economy. Of this figure, as much as \$1.5 billion is spent on trip-related expenses and equipment away from the home. The multiplier effect of this revenue is estimated to reach \$2.6 billion. The three wildlife-associated activities include hunting, fishing and wildlife-viewing. As a single group, anglers generated \$770 million in revenue (48% of this revenue, with boats consisting of 75% of total). Of those who fished, 64% of the time was spent in freshwaters, with bass (lakes and ponds) and trout (streams and rivers) being the fish most often pursued. Wildlife viewers generated \$755 million, and of this, \$149 million was spent on trip-related expenses and equipment.
- According to the Snowmobile Association of Massachusetts (SAM), 17,000 registered snowmobiles generate \$65 million dollars annually to the state's economy. *The Economic Impact Assessment of Snowmobiling* was performed by the Human Dimensions Research Unit of the Department of Natural Resources Conservation at the University of Massachusetts and adjusted for inflation. In partnership with local clubs, SAM maintains several hundred miles of trail throughout the county, with a few extending into Vermont. The Berkshire region hosts approximately 30% of the snowmobile trails in the state, but only accounts 18% of the registered snowmobiles in the state. This suggests a net import of riders visiting the region to access this vast trail system.
- The *Massachusetts Climate Change Adaption Report* notes that each acre of forest in the state provides approximately \$1,500 annually in economic value from forest products, water filtration, flood control and tourism. This indicates that forests contribute more than \$712 million to the Berkshire economy per year. In that same report, the American Forest and Paper Association states that forest harvesting directly supports 3,700 jobs for foresters, loggers, sawmill workers, and wood processing plant workers in Massachusetts, and produces over \$385 million of goods annually.
- **Impact of the Baby Boomers:** The Baby Boomers are recognized as having the most disposable income of all age groups, making them a tourism powerhouse. There are more than 75 million Boomers in the U.S. and they are living longer than any previous population in history. Their retirement has been labeled the "Silver Tsunami." As they retire, they are predicted to migrate away from metropolitan areas, with New England being cited as one of seven major destination areas. When choosing the location of their retirement homes, they cite proximity to the amenities of walking trails, parks and open spaces as the three most influencing factors in a list of 13 recreational and social attractions. This strongly positions the Berkshires as a potential key retirement destination within New England, particularly if second homeowners transition to year-round residents after retirement.
- **Berkshire Creative and Tourism & Hospitality Sector:** In a recent visitor survey conducted by the Berkshire Visitors' Bureau, scenic beauty was the principal reason 88% of all visitors surveyed cited for having selected the region as their destination rather than another area and 42% of visitors engaged in some form of outdoor recreation during their stay. Parents travelling with children were more likely to pursue outdoor recreation, especially kid-friendly sites like Pleasant Valley Wildlife Sanctuary. The tourism industry brings 2.6 million visitors and \$327.25 million of direct spending into the region each year.

Social Equity and Capital

- **Quality of Life:** Residents value the rural landscape, serenity and recreational opportunities that the Berkshire landscape offers. For many residents of the county the great outdoors is only a short walk or drive away from the house.
- **Teachable Landscape:** The natural environment offers an easily accessible learning lab for students in grade school as well as college and beyond. Schools like the BART charter school in Adams take hikes as part of classroom learning experience to augment biology lessons. The Upper Housatonic Valley Experience course for school teachers in the Berkshires and northwestern Connecticut, offered at the Massachusetts College of Liberal Arts (MCLA), provides an overview of the history, economy and environment of the river valley and works with them to integrate local information into state curricula.

- **Health Benefits:** As noted in *America's Great Outdoors, A Promise to Future Generations*, outdoor recreation provides American's physical and emotional rejuvenation and promotes respect for our natural heritage. Research indicates that regular exposure to nature lowers stress, cultivates creativity, and builds self-confidence among young people.

Maximizing Environmental Benefits

- **New England Biodiversity:** The Berkshire region supports the greatest numbers of state-listed species in the state outside of Cape Cod. The Massachusetts Natural Heritage & Endangered Species Program (NHESP) and The Nature Conservancy view the Berkshires as an important focus area in regional efforts to protect the long-term survival of biodiversity in New England.
- **Carbon Sequestration.** As noted by leading New England forest ecologists, the forests of Massachusetts currently sequester enough carbon to equal the carbon emissions of one million homes.

CONSERVATION AND RECREATION PLANNING PROCESS

The goals and policies set forth in this document were identified through a multifaceted public involvement process that engaged state, municipal, non-profit organizations, community leaders, and the public in a strategic discussion of the role and vision for conservation and outdoor recreation in the region.

Public Meetings

Berkshire Regional Planning Commission (BRPC) staff attended eight public input sessions, including five that were hosted by conservation agencies or organizations and three hosted by BRPC.

- May 26, 2011 – DCR Forest Designation Workshop at Berkshire Athenaeum
- June 7, 2012 – Fish and Game Habitat Improvement Workshop at Lenox Town Hall
- July 21, 2011 – Massachusetts Conservation Districts Water Quality Workshop at Berkshire Botanical Gardens
- September 7, 2011 – Stakeholder Roundtable at BRPC Office
- October 19, 2011 – Massachusetts Land Trust Coalition and Berkshire Natural Resources Council networking session at Red Lion Inn
- November 16, 2011 – Division of Conservation Services, State Comprehensive Open Space and Recreation Plan public meeting at Pittsfield City Hall
- November 29, 2011 – BRPC Conservation and Recreation Public Forum at Adams Community Center
- December 14, 2011 – BRPC Conservation and Recreation Public Forum at Lenox Town Hall

Stakeholder Roundtable

A stakeholder roundtable was held to gather first-hand information on opportunities and challenges of land conservation and outdoor recreation planning and management in the region. Fourteen organizations were represented at the meeting, including state natural resource and outdoor recreation agencies, non-profit conservation organizations, land trusts and outdoor sportsmen.

Public Forums

Open space, recreation, and natural resource forums were held on November 29, 2011 in the town of Adams and December 14, 2011 in the town of Lenox. Forums included a presentation on the overall status of conservation and outdoor recreation in the region, followed by a small group exercise that solicited attendee input on future directions for conservation and recreation in Berkshire County. A summary of the forums is contained in Appendix A.

Subcommittee

A subcommittee of 17 representatives of organizations with a focus on conservation and outdoor recreation were invited to participate in a short-term subcommittee to help develop the Conservation and Recreation Element of the plan. The committee met twice to review the document, but members were also invited to submit comments in writing before or after meetings. The committee then met a third time as a joint meeting with the Consortium, as described below.

Consortium

Once the subcommittee had reviewed and revised the draft Conservation and Recreation Element, a joint meeting was held of the subcommittee and Consortium to review the revised document. The Consortium had approved the list of Subcommittee members before the invitation was extended. The intent of the subcommittee was twofold, to broaden the list of stakeholders actively engaged in crafting the plan and to bring specific expertise to the table to assist the Consortium, who have varied experience and expertise, with ensuring the policies developed align with the science, practice and organizational objectives of those entities likely to help implement the plan once it is complete.

Public Workshop

A public workshop was held to display the draft goals of three elements – historic preservation, conservation and recreation, and economy – for review and comment. Participants were provided with post-it notes to place comments and a number of sticky dots with which to indicate their implementation priorities. All input received helped further refine the goals to the final set contained in this document. Community priorities for which actions should be taken first are reflected in the implementation matrix of this element.

CONSERVATION AND RECREATION VISION

The Berkshires offer a connected system of open lands to support diverse habitat and recreational needs. Residents and visitors have, at the ready, a number of guides to what the region has to offer in the activity of their choice. Schools and businesses are able to benefit from the outdoors through equipping and facilitating tours and outings. This supports stewardship and active lifestyles now and in the future. An overarching ethic of natural resource conservation is embraced by the region, which understands and appreciates the many important values represented in the natural landscape. Conservation and development activities work to retain the integrity of the most critically important areas to biodiversity, recreation, and scenery. This is reflected in activities and practices not only in the rural areas, but also in how nature is incorporated and protected within a highly developed context, such as neighborhoods and downtowns, to ensure accessibility and stewardship are present in some way in all areas, not just parks and reserves.

ACHIEVING THE VISION

This vision will be achieved through the collaborative action of communities, land management partners, environmental awareness groups, local businesses, outdoor activity groups and associations, and residents to pursue and implement strategic actions in three main areas as relates to natural resource protection, land conservation and outdoor recreation:

1. **Land Acquisition and Management:** This section reviews the many groups involved in land conservation in the Berkshires and sets goals and strategies for how they can continue to make the most of their limited resources to achieve the region's land acquisition and management objectives.
2. **Habitat and Biodiversity:** This section provides an overview of the habitat and biodiversity of the region and identifies a number of goals for continuing to be good stewards of the rich environment that helps define the Berkshires as a unique and beautiful place. This includes a conservation framework which will serve as a regional guide for priority land acquisitions and sensitive development for habitat protection in the future.
3. **Outdoor Recreation:** This section reviews the wide range of outdoor recreation opportunities afforded by the landscape that offer numerous health and economic benefits to the region. Goals in this section focus on how to improve, expand, and connect recreation events and opportunities and engage more residents and visitors of all ages in their use. This section contains a recreation framework that highlights three main spines or systems that have national or international significance, and are also larger scale initiatives prized and championed locally: Long Distance Trails, Regional Greenways, and River-based Blueways centered on the Hoosic and Housatonic Rivers.

The following sections present current conditions, opportunities and challenges, and the regional goals, policies, and strategies for conservation and recreation in these three areas.

1. LAND CONSERVATION AND MANAGEMENT

The Berkshires' scenic and rural landscape remains largely undeveloped, hosting important undisturbed habitat areas and affording the multitude of outdoor recreational options for residents and visitors alike. Undeveloped land is either conserved as a park, farm, or reserve, or is simply land that is privately held but remains open. As the region charts a course for future conservation, it is first important to understand which lands are being conserved for what purposes, and which lands are currently viewed as "open" but which have no permanent protections in place. This section reviews the current supply and ownership patterns of conserved and open land in the region, the range of partners involved in conservation, and ways by which land is conserved. It then establishes goals and strategies for facilitating conservation partnerships and objectives in the future.

BY THE NUMBERS: CONSERVED LANDS

According to the 2006 Massachusetts State Comprehensive Outdoor Recreation Plan (SCORP), the Berkshires have the largest per capita acreage of recreation and conservation lands in the state, at 1.35 acres per person. By comparison, Cape Cod and the Islands have the second highest per capita acreage at 0.45 acres and the Metro Boston area has the least at 0.03 acres per person. Of the 605,397 acres of land in Berkshire County, approximately 474,730 acres are forested, representing 78% of the county's landscape. Open land covers 8% of the county. Of that, agriculture covers more than 39,000 acres, which makes up approximately 6% of the county. Lakes, ponds and non-forested wetlands account for 32,120 acres (5% of land cover). This last total does not include the small or seasonal wetlands easily missed by large-scale mapping efforts.

Ownership

Thirty-three percent of the land in Berkshire County (approximately 202,714 acres) is permanently protected from development. The majority of these lands (65%) are owned by the Commonwealth, held by the Department of Conservation and Recreation (DCR) and the Division of Fisheries and Wildlife (DFW). In addition to ownership, both state agencies hold easements on additional lands, all of which are open to public recreation. For example, the DFW currently holds conservation easements on more than 9,820 acres in the county (Madden, 2012). Municipalities own 21,186 acres of land that have been identified as being used for drinking water protection or recreation and, for the purposes of this report, are being considered as protected conservation lands. It should be noted, however, that the vast majority if these lands are not deed restricted and thus could be vulnerable to change. Although it is unlikely that a municipality would sell public open space lands for development, a situation could arise in which the public benefits of the land transfer outweigh the cost of losing open land. These figures do not include most town parks, the importance of which should not be overlooked. Although they are generally small in size compared to watershed lands, they are often the most accessible open spaces to people living in city and town centers. Public conservation lands are shown on the Open Space and Recreation map and summarized in Table CRI.

Table CRI:Ownership of Permanently Protected Lands in Berkshire County - 2010

Landowner	Acres of Berkshire County Permanently Protected Land by Ownership	Percent of Permanently Protected Land
Department of Conservation and Recreation (DCR)	107,292	52.9%
Division of Fisheries and Wildlife (DFW)	25,941	12.8%
Municipalities *	21,186	10.5%
National Park Service	4,661	2.3%
Non-Profit Organizations	10,706	5.3%
Land trusts	7,319	3.6%
Other (largely private lands with conservation and agricultural restrictions)	25,609	12.6%
TOTAL	202,714	100.0%

*Note: does not include most town parks and cemeteries, which are categorized as having limited, not permanent protection.

Source: Mass GIS 2010 data, BRPC

Conservation Easements and Agricultural Preservation Restrictions

In addition to fee ownership (listed in Table CRI), deed easements have been placed on more than 38,000 undeveloped acres of land in the county. Of these, 29,783 acres are conservation easements requiring that the land remain in an undeveloped state and 9,515 acres are agricultural preservation restrictions (APRs) requiring that the land remain in some form of agricultural use. In some cases, one conservation entity may hold an easement on land owned by another entity, such as where the DFW holds conservation easements on land owned by a land trust or a municipality.

Public Access

More than 80% of the permanently protected lands owned by public and private entities are open for public use. Public use is often, but not always, restricted in municipal watershed areas. The majority of protected lands not open for public use are active agricultural lands that have been permanently conserved through the state's Agricultural Preservation Restriction program or through land trust easements.

THE GEOGRAPHY OF CONSERVATION AND MANAGEMENT ACTIVITY

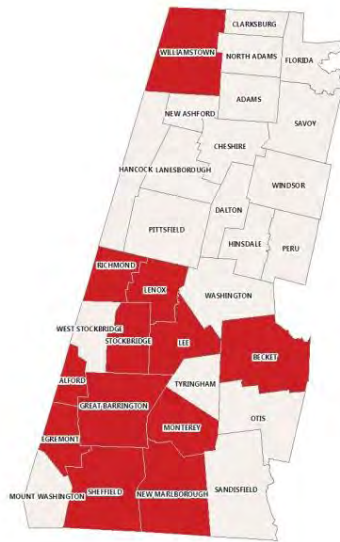
Conservation and land or resource management activity in the region is organized in a number of geographies, with different parties involved in different areas. Some resources or areas may have multiple overlapping conservation groups at work in the same geography, at which point collaboration and communication between entities becomes all the more important. Inversely, some areas may have gaps where no entity is specifically focused on conservation. At the most basic level, the geographies by which conservation activities are organized fall into two types: 1) legal or geopolitical boundaries, such as state, county, or municipal boundaries or legally-defined designations, and 2) resource-driven, natural boundaries defined by the location of specific resources, such as rare species habitat. The different geographies of conservation in the Berkshires, and the partners active therein, are described below.

Legal/Geopolitical

In some cases, conservation activity is directed towards a specific geography because of a town, county or state boundary, each subject to its own mission and policies. These boundaries are a functional way of delineating responsibility, constraints, and access to financial or other resources to achieve aims. In the Berkshires, these take several forms.

Berkshire Land Trusts

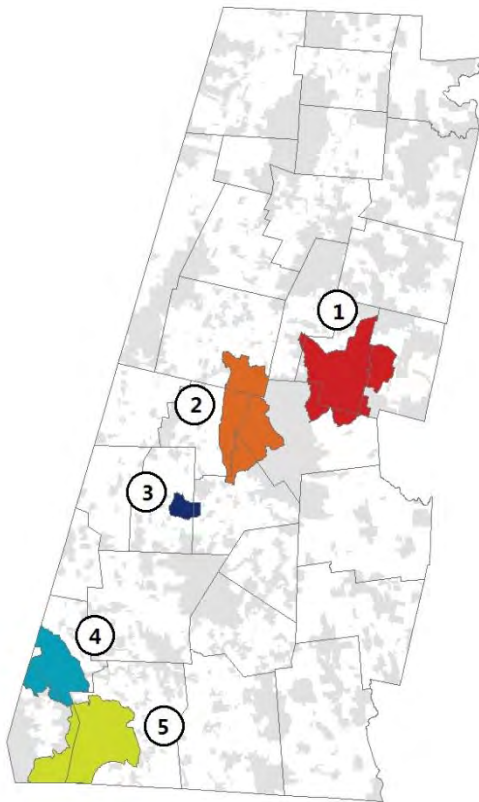
Twelve of the 32 municipalities in the Berkshires have their own local land trust working to conserve land within their municipal boundaries. Ten of these own conservation lands. As illustrated by the map, the majority of these are concentrated in the south-central portion of the county. Today these land trusts protect more than 7,319 acres, which is approximately 4% of the permanently protected lands in the county. Of this the Berkshire Natural Resources Council (BNRC), a region-wide land trust, owns 4,987 acres, 68% of the land trust acreage in the county. BNRC also holds 10,060 acres of land in conservation easements.



Alford Land Trust
Becket Land Trust
Berkshire Natural Resources Council (region-wide)
Egremont Land Trust
Great Barrington Land Conservancy
Laurel Hill Association (Stockbridge)
Lee Land Trust
Lenox Land Trust
Monterey Preservation Land Trust
New Marlborough Land Preservation Trust
Richmond Land Trust
Sheffield Land Trust
Stockbridge Land Trust
Williamstown Rural Lands Foundation

Areas of Critical Environmental Concern (ACECs)

Berkshire County hosts five ACECs. These are places within Massachusetts that receive special recognition from the state Secretary of Energy and Environmental Affairs because of the quality, uniqueness and significance of their natural and cultural resources. In the Berkshires, the high quality of the aquatic habitat and surrounding landscape within the ACEC boundaries is largely responsible for the listing of these areas. ACEC designation requires some additional state agency coordination and public environmental review on development projects that require state permits within the ACEC. It also creates a framework for local and regional stewardship of critical resources and ecosystems.



1. **Hinsdale Flats Watershed ACEC** (designated in 1992; 14,500) acres is located at the headwaters of the East Branch of the Housatonic River.
2. **Upper Housatonic River ACEC** (designated in 2009; 12,000 acres) encompasses the 13-mile corridor of the Housatonic River from southern Pittsfield to northern Lee, and the section of the watershed that drains into this river stretch.
3. **Kampoosa Bog ACEC** (designated in 1995; 1,350 acres) in Stockbridge within a mile of the Housatonic River, includes a 160-acre calcareous fen – an ecological gem unique in the Berkshires.
4. **Karner Brook Watershed ACEC** (designated in 1992; 7,000 acres), stretching across Egremont and Mount Washington, is one of the most scenic landscapes in Massachusetts with wooded mountains, rolling hills, open fields and streams, ponds, and wetlands. Both the South Taconic Trail and the Appalachian National Scenic Trail traverse the ACEC.
5. **Schenob Brook Drainage Basin ACEC** (designated in 1990; 13,750 acres) covers sections of Sheffield, Egremont and Mount Washington. The brook and its associated wetlands comprise one of the most significant natural communities in Massachusetts including the largest continuous calcareous seepage swamp and some of the finest examples of calcareous fens in southern New England.

Municipal Park and Recreation Systems

Municipalities often have a large role in preserving land within their boundaries to offer residents with park and recreation opportunities. This includes open parks, often with improvements such as ball fields or playground equipment, more naturalized reserves with trails and interpretive nature signage, bike paths, and small village greens, pocket parks, or other small areas interspersed in more developed areas. While these are typically viewed as recreation amenities, they are also important linkages for wildlife to live or travel within more developed areas.

Resource- or Amenity-Driven

In some cases, conservation activity is driven by the presence of a specific resource type or amenity. This conservation is typically driven by a non-profit organization with a mission directed towards a specific species or habitat type, or a municipal or state entity directly or indirectly conserving specific resources deemed valuable to the long-term health and viability of the community. Conservation non-profit organizations in the region, the largest of which include Mass. Audubon, The Trustees of Reservations, and The Nature Conservancy, collectively hold 10,706 acres.

Watersheds

There are two main watersheds, the Hudson and Housatonic Rivers, that drain the majority of the county. In addition, headwaters of the Deerfield, Westfield, and Farmington river systems also start here. Volunteer-driven watershed associations are present in each of these watersheds, advocating for water and land stewardship to preserve natural resources and recreational opportunities within their watersheds.

A, F. Hudson River

Located in northern Berkshire and including parts of New York and Vermont, and in the southwest corner of the county, all these waters drain into the Hudson River in New York state. In Berkshire County, this watershed encompasses 130,315 acres in 15 communities. The Hoosic River (A) is the main system within this watershed, encompassing 120,480 acres, while the BashBish Brook watershed (F) encompasses 9,935 acres.

B. Deerfield River

Located in the northern Hoosac Range and flowing eastward toward the Deerfield River in Franklin and Hampshire Counties. In Berkshire County, this watershed encompasses 29,528 acres, mostly in two towns.

C. Westfield River

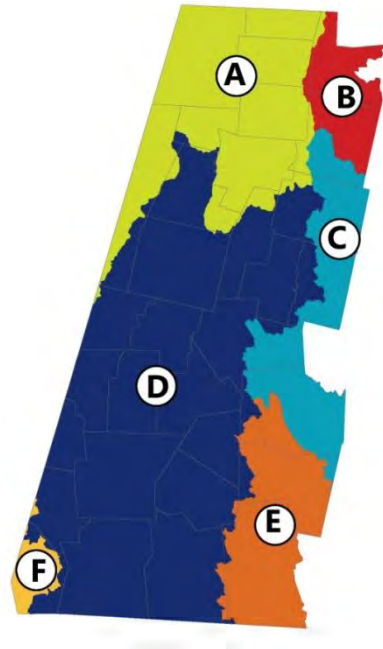
Located in the central Berkshire Hills, flowing eastward through Hampshire and Hamden Counties. In Berkshire County the watershed encompasses 62,713 acres, across five towns. 78 miles of river have been designated as a National Wild and Scenic River.

D. Housatonic River

Located in central and southern Berkshire and including parts of New York and Connecticut. In Berkshire County, this is the largest watershed, encompassing 320,145 acres in 26 communities.

E. Farmington River

Located in the southern Berkshire Hills, flowing eastward through Hamden County. In Berkshire County the watershed encompasses 62,959 acres, across four towns.



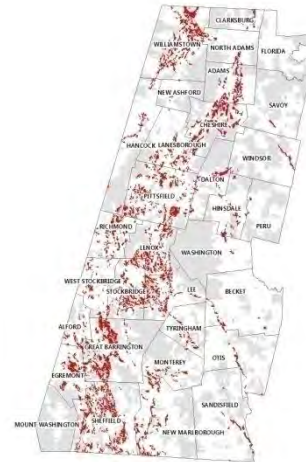
Water Supply

Thirteen of the Berkshires 32 municipalities hold lands for the specific purpose of providing a clean supply of drinking water. These are generally the communities with public infrastructure and larger populations. Typical land holdings for water protection in the county are a few hundred acres in total. The City of Pittsfield is the county's largest single municipal owner, holding 5,911 acres in Pittsfield, Dalton, Hinsdale and Washington. Some of this land connects to Kirvin Park, October Mountain State Forest and private forested lands, providing a large contiguous block of open lands. While water supply protection areas provide a very direct benefit to human residents, the relatively natural state of the land and water bodies also provide wildlife habitat. Not all of these areas are open for public recreational use.



Prime Agricultural Soils

The Agriculture Preservation Restriction (APR) Program was established in 1977 as a key component of state agricultural land preservation. Administered by the Massachusetts Department of Agricultural Resources, this voluntary program offers to pay owners of "prime" and "state important" agricultural land the difference between the "fair market value" and the "agricultural value" of their farms in exchange for a permanent deed restriction. In Berkshire County, there are 43,819 acres of prime agricultural soil, 9,234 acres of which (21%) are currently in APR.



Heritage Landscapes

Heritage landscapes are another notable resource-driven geography. There are a number of notable historic and cultural sites in the region with large land holdings, including a few of the Gilded Age Cottages that have retained a portion of their lands, such as High Lawn Farm, Tanglewood, Cranwell and Kripalu. Few of these lands have been permanently preserved through easements. The issues surrounding these heritage landscapes and buildings are discussed in more detail in the Historic Preservation element of the Sustainability Plan.

CONSERVATION CONSIDERATIONS AND STRATEGIES

The acquisition and management of land in the Berkshires requires the dedication of staff and financial resources over both the short-and long-term. Conservation partners must therefore be strategic in the properties they acquire. There are three main variables that conservation organizations in the region factor into their acquisition decisions.

- **Relationship of Property to Conservation Objectives:** Most conservation entities have a mission or set of priorities that help focus their conservation activities. If an opportunity to purchase a property or easement arises, groups evaluate the importance of the site to meeting their long-term priorities and operating constraints. Priorities typically include species-specific habitat protection, public recreation, public education, or a combination of these.
- **Contiguity of Parcel to Current Conservation Lands:** In general, state and nonprofit conservation organizations prefer to add new acreage onto existing conservation lands or create linkages to better connect existing conservation lands, whether theirs or held by another entity. Protecting large blocks of land increases long-term biodiversity protection values of an area. It also offers a larger area on which to offer outdoor recreation, trails and other facilities. Contiguous lands also ease the costs of long-term maintenance. In general, Massachusetts state agencies have staff and budgets appointed to the management of properties and facilities that already exist. Adding new acreage to an existing property may strain the budget of that particular site, but is easier to absorb the costs of maintaining a larger site than to maintain an entirely new site.
- **Development Status and Context:** Lands that contain structures or other improvements can impose additional maintenance and management concerns or costs to the conservation partner. Conservation entities may refuse to acquire such properties unless the improved portion can be subdivided away from the overall site and not included in the final conserved property. In some instances, the subdivision and sale of the lot(s) containing buildings can subsidize the cost of acquiring the conservation land.



Closing the Deal: The Importance of Collaboration

Land trusts in the region work closely and cooperatively with state agencies to acquire new conservation lands through a variety of mechanisms. When the purchase of an important block of land must be done expediently, and the state agency interested in the property often does not have immediate access to funding, local land trusts will often collaborate on the purchase, providing gap financing to ensure the sale. In some instances, the state will reimburse the land trust when funding becomes available. Alternately, state agencies may come to the aid of the land trust, providing financial support to complete a sale, such as when the DCR or DFW purchase conservation easements on newly purchased land as a way to provide additional capital for the transaction.

LAND CONSERVATION TOOLS AND TECHNIQUES

The vast majority of undeveloped land in the county is privately owned. Maintaining the county's rural and scenic character will require the use of different types of management tools, including the continued acquisition of conservation land and carefully guiding new development.

- **Purchases and Easements:** Purchase of land or interest in land for conservation purposes, or solicitations for acceptance of gifts, is both proactive and reactionary on the part of conservation groups. In some instances conservation organizations approach property owners whose lands hold special qualities, such as having especially high scenic or ecological value, offering new recreational opportunities or maintaining agricultural production. In other instances landowners offer their land to conservation agencies or organizations as a donation or for a fee.

- **Land Use Development Regulations:** Development regulations, or zoning, can also have an impact on the intensity and location of development. Massachusetts has very out-dated and weak land use laws, which facilitates scattered sprawl development through the “Approval Not Required” provisions, making it much more difficult to zone for natural resources uses.

Purchases and Easements

Most landowners who approach conservation organizations have a desire to permanently protect the natural or agricultural qualities that they or their families have nurtured for years or generations. There are a variety of mechanisms that landowners can employ to conserve their land, some of which can provide income or other financial gain to the owners. These include:

- Sale, Fee Simple,
- Bargain Sale,
- Conservation Restriction / Easement,
- Gift of a Remainder Interest,
- Gifts in Fee Simple,
- Bequests, and
- Mass. Chapter 61 Tax Program.

These tools and techniques are described in greater detail in Appendix B: Land Purchase and Easement Types. In some cases, public funding is available for land and easement purchase to protect a specific resource, such as wildlife or water quality. Most of the state conservation programs are administered by the various departments of the Executive Office of Energy and Environmental Affairs (EOEEA). The Federal Emergency Management Agency (FEMA) also provides funding to purchase land or easements of land within floodways or flood-prone areas to help mitigate flood hazards. Beyond these sources, conservation is largely supported through fundraising by conservation organizations through membership fees and charitable donations.

Land Use Development Regulations

Communities can influence where and how development will be allowed to occur through planning, delineating use zones and establishing zoning and town bylaws that govern land use.

- **Bylaws:** There a number of land use regulation tools that aim to direct development away from important natural resource values on the site. Tools such as Open Space Residential Development (OSRD) or Natural Resource Residential Design (NRRD) are both popular tools communities can employ to help direct development in a way that retains contiguous blocks of open land. These tools will be explained in more detail in the **Land Use Element**.
- **Developer Set-Asides:** Setting aside land for conservation purposes is becoming increasingly offered by developers as part of large development project proposals. Donating the land itself or donating a conservation easement on the land may be offered to the municipality in which the development is occurring. The Conservation Commission is often the board to which the offer is directed. The burden of managing and/or monitoring conservation land and deed restrictions has been cited by local Commissions as the reason that they decline these offers.
- **Low Impact Development:** LID design techniques can be employed to reduce the environmental impacts of development. Low Impact Development begins by retaining as much of the natural features of the landscape as possible. This translates into limiting the amount of clearing and impervious area done on the site, retaining mature trees and other vegetation where possible, limiting grading and retaining low-lying spots across the site to disperse and capture stormwater. It also entails designing roads in a way that eliminates or reduces the need for stormwater drainage systems.

OPPORTUNITIES AND CHALLENGES

Community Open Space and Recreation Plans

Open space planning is an opportunity for a community to identify important landscapes that should be conserved for future generations. Twenty-six towns in the county have open space plans, but only two of them are current (North Adams and Pittsfield). To be considered current by the State of Massachusetts, open space plans must be no more than five years old.

Draft State Land Conservation Plan

As stated in the *Draft Statewide Conservation Plan* of 2003, the goal of Massachusetts and its partners is to protect 50,000 acres of land per year, resulting in the conservation of one million acres over the next 20 years. Where possible, the one million acres will preserve connections to another one-half million acres that are undevelopable due to environmental constraints. To achieve this goal the plan recommends utilizing the whole conservation “tool box”, including conservation zoning, cluster development, gifts of land and conservation restrictions, and purchase of land and conservation restrictions.

Aging Landowners Provide Opportunities for Land Conservation

The majority (69%) of undeveloped land in the county is privately owned. Approximately one half of family forest landowners (10 ac. or more) across Massachusetts are 65 or older, while the median age of working Berkshire farmers is 58 years. This indicates that the ownership of substantial open space lands may very well be changing hands in the coming decades. The challenge will be to have agreements and funding in place when these opportunities for further conservation arise.

Limited Resources and Capacities

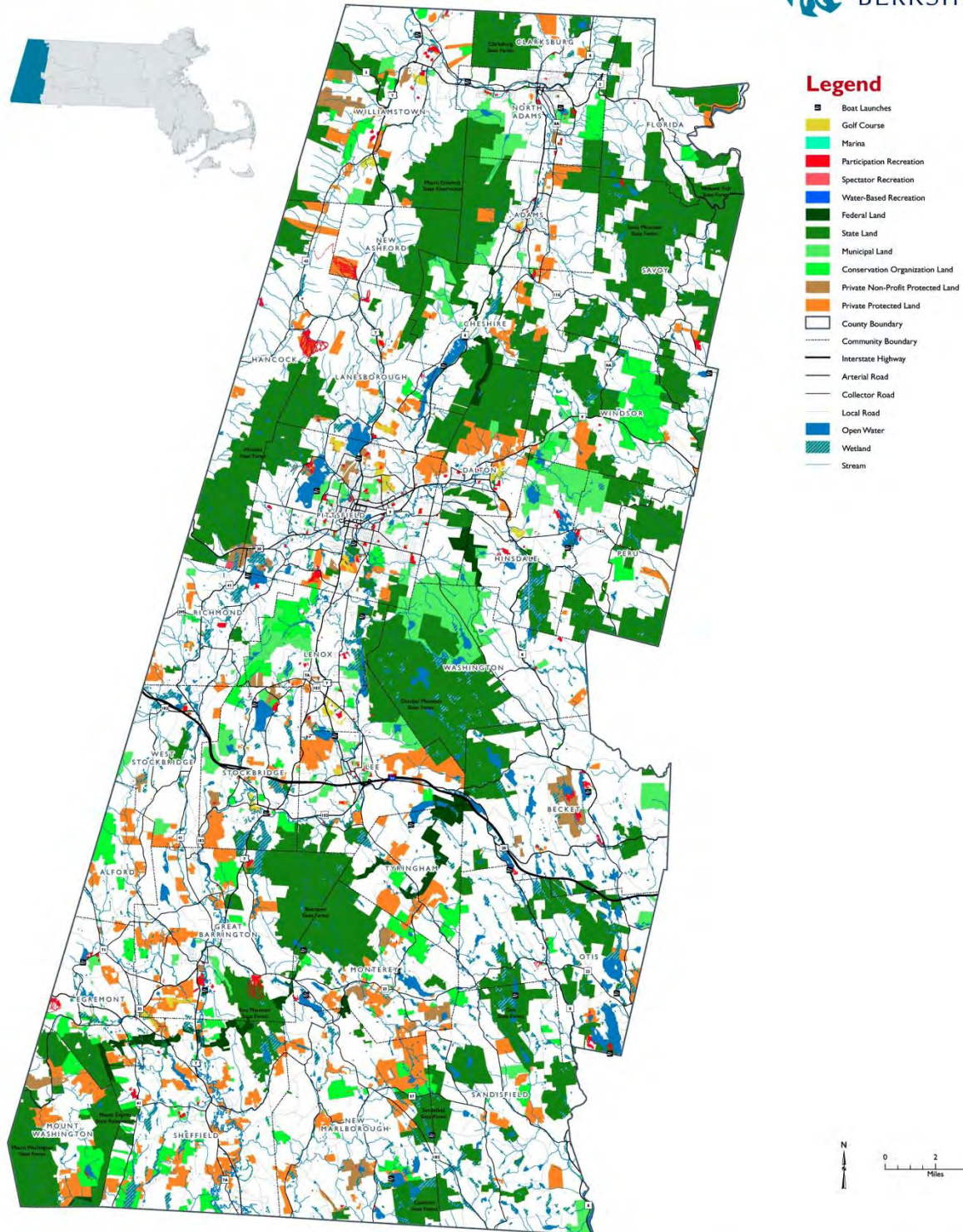
The challenge of maintaining conservation land with limited resources is echoed by all land managers of all sizes in the region, from the small local land trust up to the DCR and DFE. Local land trusts, especially all-volunteer land trusts, struggle to manage lands that they own outright or those on which they hold conservation easements. They struggle with the responsibility of managing land open for public access with little or no professional staff support and little or no budget. Managers must keep vigilant watch over their properties to repair obstructed or eroded trails, maintain structures and parking areas, remove illegally dumped trash and patrol the boundaries for encroachment from neighbors. Land trusts often struggle with the legal responsibilities of record keeping and monitoring land use activities on properties where they hold conservation restrictions, to ensure that activities occurring on the land are in accordance with the restrictions placed on the deed.

PROTECTED OPEN SPACE AND RECREATION

Mapping Protected Areas

The Open Space and Recreation Map on the following page shows the existing areas in the county that are protected on some level from development, with the majority of these areas open for public use.

OPEN SPACE AND RECREATION



GOALS, POLICIES AND STRATEGIES

The following goals, policies, and strategies will be pursued to achieve the vision for conservation and recreation the region:

GOAL CRI.1: Implement a regional conservation strategy that emphasizes collaboration and coordination across municipal boundaries.

Policy CR1.1.1: Increase collaboration and communication of conservation partners within and adjacent to the county.

Strategy A: Annual Conservation Summit

Conservation landowners convene periodic strategic workshops that allow the full spectrum of conservation interests and partners to share their latest work and to improve the lines of communication amongst them. Local Conservation Commissioners should be included in this effort.

Strategy B: Actively Pursue Partnerships Across Political Boundaries

State agencies and conservation partners reach across state and county lines to protect large unfragmented landscapes for wildlife movement and aid in climate change resiliency. In some cases, such as the watershed associations and the Highland Communities Initiative, this already occurs. The cooperative nature of these examples could serve as models for towns and smaller actors located along the boundaries of the county who might benefit from reaching across geopolitical boundaries.

Policy CR1.1.2: Support the continued collaboration between conservation entities and other municipal, private, and non-profit partners in key areas where conservation interests overlap.

Strategy A: Partner to Advance Heritage Landscape Conservation

Collaborate with historical commissions and regional historic preservation entities such as Housatonic Heritage to identify and prioritize historic landscapes for conservation.

Strategy B: Pursue Continued Agricultural Land Preservation

Work with agricultural land owners and farmers to identify and protect key agricultural lands and working landscapes through APR, purchase, or other easement options. Emphasis should be placed on areas of key agricultural soils, contiguous parcels, and presence of important habitat as indicated in BioMap2.

NOTE: Additional goals, policies and strategies for supporting local agriculture are contained in the **Local Food and Agriculture** Element.

GOAL CRI.2: Improve land conservation and management capacity countywide.

Policy CR1.2.1: Improve availability of trainings for local land trusts to support their work .

Strategy A: Facilitate Local Trainings to Support Conservation Entities

Work with Massachusetts Land Trust Coalition to hold training sessions for land trust staff and board members. Training could include legal and land management responsibilities and could be held via internet webinars for ease of attendance for volunteers. Enlist the Massachusetts Association of Conservation Commissioners as a partner and offer the trainings also to local Conservation Commissions, who may assume conservation restriction oversight as part of development projects in their municipalities.

This could also include multi-state trainings in collaboration with adjacent counties in Massachusetts, Vermont, New York, and Connecticut as a means of fostering more dialogue around border conservation priorities and building capacity in those partner groups to better support ecosystem needs.

Strategy B: Regional Conservation Services

Investigate the feasibility of creating a shared, regional services program to aid local land trusts and Conservation Commissions manage the lands they oversee. The program could provide shared staff to monitor land activities and assist with record keeping; staff could also make management recommendations to land trust boards. Providing this service might enable more local Conservation Commissions in the county to accept conservation easements as part of development projects.

Policy CR1.2.2: Retain and improve the financial resources for land acquisition and management in the region.

Strategy A: Community Preservation Act Adoption

The Community Preservation Act (CPA) creates a pool of available funds that are matched by the state to support the acquisition of important lands for sale on the real estate market. Funds can also be used to support historic preservation and affordable housing initiatives. Interested municipalities can work to pass this act at Annual Town Meeting or through City Council. Conservation Commissions, Land Trusts, Housing Committees, and Historical Societies are all encouraged to help champion the adoption of this tool in their community. Recently passed legislation expands the uses of CPA funds to allow development of recreation amenities on non-CPA lands.

Strategy B: Support State Conservation Goals

State and local conservation partners will strive to follow the *Massachusetts Statewide Land Conservation Plan*, whereby the state and its partners aspire to protect 50,000 acres of land per year, resulting in the conservation of 1 million acres over the next 20 years. Petition the State Legislature and the Executive Office of Energy and Environmental Affairs to continue to fund at least \$50 million per year from the Environmental Bond for land protection.

Strategy C: Continue Strong Collaborative Relationships for Conservation and Management

State agencies and local organizations will continue partnering to leverage federal and state funding for land conservation and management in the region.

Strategy D: Regional Advocacy for Conservation and Recreation in State Budget Cycles

Regional partners will continually advocate for DCR and the DFW to have adequate resources to maintain and improve their conservation and management activities. This may take several forms, including joining the BNRC, Environmental League, Mass Audubon, TNC and other conservation organizations call for "One Percent for Nature," whereby at least 1% of the state's total budget is spent on operating support for environmental programs.

Policy CR1.2.3: Improve conservation outreach to property owners.

Strategy A: Regional Outreach Materials

Obtain and distribute informational packets about estate planning and options for land conservation. To the greatest extent possible, this should incorporate or build on existing materials and be designed as a single resource that can be used across the region by all conservation entities. Where resources are limited, prioritize key properties that add to or link existing conservation land, or where land is expected to be put up for sale in the near future. List tax benefits of creating living estates and other financial mechanisms available to landowners. Two excellent sources of information are *Your Land, Your Legacy, Deciding the Future of Your Land to Meet the Needs of You and Your Family* and *Your Land, Your Financial Choices – Running the Number on Forest Conservation Tools*, both published jointly by the Trustees of Reservations and UMass, Amherst.

2. HABITAT AND BIODIVERSITY

The mountain-valley topography of the region defines its settlement patterns, landscape, and important ecosystem and habitat types. From forested mountainsides to winding rivers along the valley floor, the region has a rich and varied landscape that supports over 150 rare species. The following section reviews the different habitat types within this landscape, the challenges being faced now and anticipated for the future, and then identifies strategies to ensure vibrant, healthy ecosystems and biodiversity.

LAND BASED (TERRESTRIAL) HABITATS



Typical northern successional hardwood forest in Kennedy Park, Lenox.

Key Terrestrial Habitat Types

The Berkshires support a long list of plant and animal species, some found nowhere else in the state. Pleasant Valley, for example, supports 645 plant species, more than any other of Mass Audubon's public 53 wildlife sanctuaries in the state.

Forests

Approximately seventy-eight percent of the county, or 474,730 acres, is covered in forest, including many large contiguous areas. Forests in the Berkshires are generally northern hardwood forests on northern facing slopes and transitional hardwoods such as oak on southern facing slopes, with patches that are unusual for Massachusetts, including boreal spruce/fir forests on the higher elevations, ridgetop pitch pine – scrub oak and red maple swamp communities. These large blocks of forested area provide migration links between cooler natural habitats in Vermont and Canada and warmer habitats to the south. As a local habitat type, forests are home to interior-forest-dwelling plant and animal species, such as Northern goshawk, Wood thrush and Broad-winged hawk, and for wide-ranging animals such as moose, bear, bobcat and fisher. The range of elevation, slope and soil types within the region mean they provide a

variety of habitats, increasing the chance for long-term viability for those species which depend on type-specific habitat. Forests also support and protect vernal pools, one of the region's most important habitats that are often overlooked or ignored during development.

Shrub-Forest Uplands

Old field /shrub habitats in New England are generally the areas at the edges between mature forest and open fields in which shrub and young tree species have grown as part of the forest succession. These areas provide important habitat for small species such as rare butterflies, moths, and songbirds that feed on the flowers and berries associated with the wildflowers and flowering shrubs found here. The dense bushy growth creates safe havens for smaller species to nest and hide from larger predators. This transitional plant community is generally short-lived at 20-30 years in duration, after which tree saplings begin to crowd out the shrubs and grasses. The Berkshires currently supports very few large areas dominated by non-wetland shrublands or very early successional forest, as forest cover has largely replaced the abandoned farm fields and shrublands of 50-80 years ago. Many of the shrublands that exist across the region today are small patches of land recovering from human disturbances such as farming, old gravel operations and vacant lots. The Division of Fisheries and Wildlife (DFW) is actively working in select areas of state properties to reestablish early-successional shrub/forest transition areas to support declining species such as the New England Cottontail, American woodcock, and Whip-poor-will. The agency also encourages private landowners to partner in these efforts.

Open Fields and Meadows

According to the 2005 MassGIS land use data, only nine percent of the Berkshire landscape consists of open, non-wetland areas, including croplands, pastures, hayfields and abandoned fields that have not yet reverted to shrublands. The vast majority of these open lands, 76%, are used for agricultural purposes, leaving few undisturbed open fields and meadows available to wildlife. As a result, several grassland bird species that flourished during the height of the agricultural abandonment are experiencing a decline as habitat becomes fewer and farther between. For successful breeding, grassland birds require that meadows and fields remain unmowed until hatchlings have left their nests.

Terrestrial / Aquatic Transition Areas

Floodplain forests and wetland habitats make up the aquatic/terrestrial transition zones. These are highly productive inland ecosystems for both aquatic and terrestrial species. Many species of wildlife require both habitats to complete their life cycles. Amphibians, for example, often live on land but require water for reproduction while some turtles spend most their time in the water but need land for egg laying. These habitats, along with vernal pools, are especially important for the long-term survival of amphibian species, as 20% of the state's native amphibian species are state-listed under the Massachusetts Endangered Species Act (MESA). Access to water is also important for many other animals to drink or to eat aquatic plants or other smaller animals, from large species such as bear and moose to several birds. The zone along waterways, including wetlands, when free from development, are important corridors for migration and movement of many species.

Important Uses and Values of Land-Based Ecosystems

- **Economic Value:** The Massachusetts Climate Change Adaption Report notes that each acre of forest in the state provides approximately \$1,500 annually in economic value from forest products, water filtration, flood control and tourism. This indicates that forests contribute more than \$712 million to the Berkshire economy per year.
- **Watersheds and Water Supply Areas:** More than 10,000 acres of watershed lands are maintained in an undeveloped state to protect public drinking water reservoirs throughout the county.
- **Carbon Sequestration:** A recent study conducted by four New England universities estimate that Massachusetts forests sequester 2.3 metric tons of carbon each year, which represents the carbon emissions of approximately one million homes. The state's forest trees have a relatively high rate of sequestration because they are relatively young in age (80-120 years old) and have spent the last several decades growing at a rapid pace (and as published in Ecological Applications [Thompson, et al, 2011] and press releases). Sequestration rates could continue to increase during the next 50 years as the trees continue to mature and their aboveground biomass increases. The greatest single factor that will influence this rate of sequestration is the rate at which trees are removed from the landscape for development. The study also predicted that the longer growing seasons brought about by climate change could cause a slight increase in sequestration over the next 50 years, but this increase would more than be offset if conversion of forests to developed uses continues at rates seen during the years 1985-1999.
- **Flood Control:** Climate change research indicates that the northeast will experience an increase in the frequency and intensity of severe flood events. Watersheds with functioning forest, floodplain and wetland cover have better water quality and are less prone to the damages caused by peak storm flows. Functioning forest floodplains and wetlands disperse the power and erosive force of floodwaters. Forest lands absorb and hold rainwater 15% more than grasslands and 40% more than disturbed soils.
- **Rural Businesses:** Revenue from farms and forests support local families, some of whom have worked the land for generations. Local farms provide fresh produce and meat, while forests provide wood products, heating fuel and maple syrup.

Current Protections and Management Practices

Terrestrial Management Programs and Incentives

Service Forestry Program

DCR Service Foresters provide technical assistance to forest land owners in complying with the FCPA, identifying tax incentive and grant programs that might be helpful to landowners in managing their forests for long-term private and public benefits.

Forest Conservation Management Practices

Forestry Conservation Management Practices (CMPs) are specific, science-based guidelines for the protection of state-listed species during forest harvesting operations. The CMP strategy is designed to help maximize the protection of state-listed species while allowing forest landowners to manage their forests for timber and other wood products. In the Berkshires, plants, fish, turtles, and salamanders are the main groups of state-listed species of most concern regarding forest harvesting operations.

State Forest Management Practices

The DCR and DFW each conduct forest management practices on their respective properties. The DCR has recently completed its Forest Designation process, whereby each of its properties has been designated as a Reserve (intact mature forests with limited human intrusion to protect natural and long-term evolutionary processes), Woodlands (forests that serve as managed forestry models) and Parklands (providing a recreational focus). Management plans will be created for each individual property to oversee management of the resource and public recreational use. Active forestry practices to create uneven woodland stands and tree diversity will likely occur on woodlands. Through its biodiversity

initiative, the DFW also actively manages some of its forests in an effort to create diverse biological habitats across the state. The Forestry Program manages forest lands, the Upland Habitat Management Program manages old farm fields for meadows and shrublands, and the Ecological Restoration Program, manages degraded habitat for rare species. Both agencies have embarked upon a public review process to keep the public informed of planned management activities, which often involve tree and vegetation removal.

Massachusetts Chapter 61 Tax Program

As described earlier in Section I, the state of Massachusetts offers tax incentives to owners of large open space lands for maintaining their land in an undeveloped state.

Land Conservation Programs

The Executive Office of Energy and Environmental Affairs (EOEEA) offers more than 30 programs that provide technical assistance, loans or grants for natural resource protection, involving land conservation, forestry, water, agriculture and emergency planning. Nine grant programs provide assistance or funding that can be applied to land conservation. While many of the programs are based within the Commonwealth, several agencies also pass through and administer federal funds. The *Energy and Environmental Grant and Loan Guide*, published by EOEEA in 2010, provides an overview of the programs.

Natural Resources Conservation Services (NRCS) Programs

The NRCS oversees several federally funded, nation-wide programs to aid agricultural and forest landowners improve the ways that they manage their properties. NRCS provides technical assistance and financial compensation for conducting and maintaining conservation practices that protect natural resources. Some programs focus on protection of wildlife habitat or water quality, while others focus on creating or improving habitat for declining species, such as grassland birds. In Massachusetts the NRCS also participates in the New England/New York Forestry Initiative, a regional program that may be able to provide technical and financial assistance to forest landowners to develop management plans and implement conservation practices. Typical eligible practices include forest stand improvement, the restoration of rare and declining habitats, early successional habitat management, riparian forest buffers, erosion control on forest trails and landings, stream habitat improvement, and fish passages.

Regulatory Protections

Massachusetts Environmental Policy Act (MEPA)

Large development projects or those that exceed certain environmental thresholds are often reviewed through MEPA. This act requires that state agencies reviewing the project study the environmental consequences of their actions, including the issuance of permits and the awarding of state funds. The review process, which is open to public comment, requires the developer to take all feasible measures to avoid, minimize, and mitigate damage to the environment. Natural resource thresholds that typically trigger this public review process include alteration of more than 25 acres of land, and significant impacts to wetlands, water supplies, and state-listed species.

The Massachusetts Forest Cutting Practices Act (FCPA)

The FCPA states that public welfare requires the rehabilitation, maintenance, and protection of forestlands for the purposes of conserving water, preventing floods and soil erosion, improving conditions for wildlife and recreation, and insuring a continuous supply of wood. Forest landowners wishing to harvest greater than 25,000 board feet or 50 cords on any parcel of land at any one time must prepare and file a Forest Cutting Plan with the Department of Conservation and Recreation (DCR) and the local Conservation Commission.

DCR Service Foresters review the plan to ensure that Best Management Practices are correctly identified to protect water resources, and that the standards for forest regeneration are being met.

The Berkshire Scenic Mountain Act (Chapter 131: Section 39A)

The Scenic Mountain Act is a state provision that may be adopted by a city or town in Berkshire County that imposes additional regulations on mountainous regions. The elevation above which may be regulated is established in the law, based on the watershed in which the ridgeline is located, as listed below.

- | | |
|------------------------------|---------------------------------|
| ○ Farmington River watershed | 1,500 feet above mean sea level |
| ○ Housatonic River watershed | 1,500 feet above mean sea level |
| ○ Westfield River watershed | 1,600 feet above mean sea level |
| ○ Deerfield River watershed | 1,700 feet above mean sea level |
| ○ Hudson River watershed | 1,700 feet above mean sea level |
| ○ Hoosic River watershed | 1,800 feet above mean sea level |

A city or town which accepts the provisions of this section then creates a map of its designated Scenic Mountain areas and adopts reasonable rules and regulations relative to the development of mountain regions to protect watershed resources and preserve the natural scenic qualities of the environment. Plan review and conditioning of projects is the main purpose of the Act. The local Conservation Commission carries out the provisions of this section. As of 2012, eleven south and central Berkshire County towns have adopted the Berkshire Scenic Mountain Act

Ridgeline and Hillside Zoning Overlay District

Towns may also choose to develop upland zoning that would essentially perform the same function without triggering the review process required by the Scenic Mountain Act. Zoning overlay districts are a set of regulations that are in addition to the base zoning and are usually applied to specific locations. A town may designate its Planning Board, Zoning Board of Appeals, or Select Board to serve as the Special Permit Granting Authority. The Town of Williamstown, for example, has developed such a bylaw for the uplands in the western portion of the town. In addition to these regulations, communities can develop wind turbine bylaws that are protective of community character and avian and bat species.

WATER-BASED (AQUATIC) HABITATS



High gradient cold water streams abound throughout the county.

Key Aquatic Habitat Types

Rivers and Streams

The Berkshires support a variety of riverine habitats, from the high gradients streams of the highlands, to mid-elevation, cool and well-oxygenated tributary streams that often support cold water species, to the larger river systems that fluctuate between cold- and warm-water habitats. For example, both the Housatonic and Hoosic rivers contain reaches where fast-flowing water supports cold water species such as native brook trout, while they also contain meandering reaches of slower-moving, warm water that support a different array of species.

Lakes and Ponds

There are 41 ponds/lakes located in Berkshire County that are recognized Great Ponds by the Department of Environmental Protection (DEP). Great Ponds are defined as any pond or lake that contained more than 10 acres in its natural state. Ponds that once measured 10 or more acres in their natural state, but which are now smaller, are still considered great ponds. In addition to these waterbodies, there are more than 20 lakes, ponds and reservoirs larger than 10 acres that also serve as important open water habitat.

Wetlands

Lakes, ponds and non-forested wetlands account for 32,120 acres of land area in the county (5% of land cover). This total does not include the small or seasonal wetlands that are easily missed by large-scale mapping efforts. Wetlands not only provide wildlife habitat, they can act as living filters for pollutant attenuation and absorb floodwaters, buffering water resources downstream of them. The Hoosic and Housatonic River Watersheds also support some of the best examples of calcareous wetlands in New

England. These globally rare wetlands are uncommon in that their waters are alkaline, supporting some calcium-loving plants that are found nowhere else in the state.

Other Important Uses and Values of Water Based Ecosystems

- **Drinking Water Supply:** Berkshire municipalities maintain 13 reservoirs as public drinking water sources. These water bodies supply the public with fresh water while also providing important wildlife habitat. The lands surrounding the reservoirs are typically managed in a natural, forested state to protect water quantity and quality, providing wildlife habitat for many species requiring open water for a part of their life cycle. Typical species benefitting from these are aquatic invertebrate species, waterfowl, turtles, and amphibians.
- **Recreational Lakes and Ponds:** The region hosts 20 lakes and ponds that have public boat launches maintained by the state access board. Most also host residential development along their shorelines, much of which is second homes and several with summer camps, which contribute to local economies in the region.

Current Protections and Management Practices

Wetland Resource Grant Programs

As stated earlier, EOEEA oversees several conservation and wetland resource protection programs. Although most land-based conservation programs benefit wetland resources, the EOEEA administers more than 15 grant programs that provide assistance or funding that can be directly applied to freshwater resources. Federal and private sources are also available.

NRCS Agriculture Programs

The Natural Resource Conservation Service administers several programs designed to aid farmers and woodlot owners in managing their lands for the protection or improvement of wetland resources areas. Of particular note, the Wetlands Reserve Program focuses on protection and restoration of wetlands through the purchase of easements and enhancement activities.

Natural Resource Grant Programs

Private

The list of grant programs offered by nonprofit organizations, foundations and for-profit businesses is seemingly endless, being too diverse and dynamic to adequately summarize here. Competition for many of these funding sources is on a national and sometimes international level, where competition is intense.

Laws and Regulations

Massachusetts Wetlands Protection Act (WPA)

Massachusetts has some of the strictest wetlands protection policies and regulations in the nation. The WPA regulates any activity that involves filling, excavating, or otherwise altering the ecological functions of wetland resource area, which includes streams, rivers, lakes, ponds and wetlands. Work in these areas can only be conducted with permission granted under a wetlands permit. Work within buffer zones (100 feet of banks or bordering vegetated wetlands) or within the 200-foot riverfront area also requires a WPA permit.

The WPA is administered on a municipal level by Conservation Commissions, manned by local volunteer citizens. The Mass. Association of Conservation Commissioners (MACC) is a state-wide organization that provides training and technical assistance to commissioners and the support staff that work with them. The manual that MACC has developed is an extremely helpful guidance document, often a

mainstay of commissioners as they work to administer the complexities of the WPA. Some of the Conservation Commissions in Berkshire County have staff to provide administrative support, but few of them have professional staff to help them draft Orders of Conditions (OOC) or conduct site visits.

Conservation Commissions often feel at a disadvantage when developers bring large, complex projects before them, quantifying the potential wetland impacts through elaborate calculations that have been supplied by professional engineers and architects. The engineers presenting the project are often more familiar with the WPA than the citizens sitting on the Commission, leaving them feeling overwhelmed and unsure of how to proceed with an OOC that will be protective of wetland resources. The Berkshire Conservation Agent Program (BCAP) was created to provide the professional assistance needed by so many of the commissions in the region. Supported by an array of grants, the program provided to commissions a professional wetlands expert at a subsidized rate that was affordable to them. Several towns in the region have used BCAP to review proposals, ensure proper administration of the WPA and to write protective and legally defensible OOC.

Local Wetlands Bylaws

Municipalities can develop local wetland bylaws that are more protective than the WPA. Statewide, more than 200 Massachusetts municipalities (57% of the total) have adopted local wetland bylaws, the vast majority being located east of the I-495 corridor and on Cape Cod. In Berkshire County only Great Barrington, Peru, Richmond and Stockbridge (12% of the county) have adopted such bylaws.

Floodplain Construction

The State Building Code requires the elevation of structures in the floodplain, with the floor of the lowest habitable area in the structure required to be above the base elevation for floodwaters during a 100-year storm event. The code also reinforces overlay district regulations by prohibiting any change in the flood storage capacity of the area.

Towns in the National Flood Insurance Program are required to adopt local floodplain bylaws to oversee the construction of buildings or structures in the floodplain. These bylaws prohibit certain land use activities and require compensatory storage for construction that does occur within the floodway. All municipalities in the county, with the exception of a few hilltowns, have adopted floodplain bylaws.

Massachusetts River and Stream Crossing Standards

Standards for the design and construction of new river and stream crossings are now in place across the Commonwealth. In general, the standards call for open bottom structures or culverts that span the river or stream channel with natural bottom substrates that generally match upstream and downstream substrates. Bridge spans are generally preferred, but well designed and embedded culverts and open-bottom arches may be installed where appropriate. Crossings should span the channel width a minimum of 1.2 times the bankfull width. Whenever possible, replacement culverts should also meet the design guidelines of new construction.

Lake and Pond Management

Managing lakes to serve as wildlife habitat while also providing recreational opportunities can be a complex and challenging endeavor. Ownership of the lakes is mixed, with the state owning and/or managing many of them, while others are owned by municipalities or private entities. Lake associations, consisting largely of lake property owners, often actively partner with other stakeholders to act as stewards and managers of the lakes on which they live. The DCR Lakes and Ponds Program is the central portal to lake management in Massachusetts. This program provides technical assistance to lake resource managers across the state. The Lakes and Ponds Association of Western Massachusetts (LAPA-West) is a nonprofit organization that provides assistance to lake associations and offers them a network in which

to communicate with each other and other stakeholders in the region. LAPA-West holds an annual symposium that offers workshops on a variety of lake issues.

Many of the lakes and ponds in the county are infested by non-native invasive aquatic plants, the most wide-spread of which is Eurasian water milfoil. Other widespread non-native infestations include Curly Pondweed, Fanwort and European Naiad. Water chestnut, though not yet wide-spread, has been found at Pontoosuc and Onota lakes and in Woods Pond. These plants diminish the use of the lake for swimming, fishing and boating. Lake drawdown is a widely used plant control method, exposing plants along shallow shoreline areas to winter freezing. Weed harvesting is also used to control growth, although dispersal of plant fragments as the harvester moves around the lake can virtually ensure perpetual plant growth where conditions are favorable. Zebra mussels have been discovered in Laurel Lake and in Laurel Brook and the Housatonic River downstream of the lake. A more in-depth discussion of this issue begins on page 40.

PROTECTING BIODIVERSITY NOW AND INTO THE FUTURE

Biodiversity, or biological diversity, refers to the understanding that life on earth is interrelated and interdependent in many complex ways. The more diversity present, whether within a gene pool of a specific species or the number of species within a specific ecosystem, the more resilient life is likely to be in the face of threats or stresses. Because all species function as a system or systems, depending on the scale of focus, if one or more components tip too far out of balance it can trigger a domino effect that negatively impacts other species in the system. It is this tipping point that is of gravest concern in discussions of biodiversity, whether at a local or global scale.

Ecologists identify a number of key threats to biodiversity related to human activity:

- **Habitat loss and degradation:** This can include fragmentation of land-based and aquatic habitat, and degradation of the habitat, altering ecological functions and species diversity.
- **Alterations in ecosystem composition:** The loss or decline of a species can have rippling effects on the interconnectedness of the ecosystem and to overall biodiversity. The concern over species decline on the larger ecosystem is a key reason so much focus is often placed on rare and endangered species protections.
- **Exotic (non-native) or invasive species:** Exotic species can displace or oust populations of native plants and animals, disrupting entire ecosystems.
- **Pollution and contamination:** Pollution of water, soil, and air, typically from human activity, can impact and stress or change ecosystems.
- **Climate change:** Changes in seasonal temperature and precipitation patterns can alter environmental conditions. Species and populations may be lost if they are unable to adapt to new conditions or relocate.

The following sections review the current status and trends of each of these types of threats to biodiversity as they exist or impact the Berkshire region.

1. Habitat Loss or Degradation

Cumulative Impacts of Development

The Massachusetts Audubon Society (Mass Audubon), in partnership with MassGIS, has been tracking development trends across the Commonwealth, comparing land use and ecological data for the years 1971 through 2005. The data is compiled into an index of Ecological Integrity (IEI), which measures the ability of an area to support biodiversity and the ecosystem processes necessary to sustain biodiversity over the long-term.

As part of their most recent analysis, which updated the index to include data for the years 1999-2005, Mass Audubon found that the overall IEI of the Berkshires declined approximately 15% during a 34-year period (1971-2005), largely due to building development and associated roads and driveways. The most pronounced decreases occurred in a band of towns in the western portion of the county, which saw a 15-25% decline in their IEI score. These towns are classified as a “Sprawl Danger Zone” within the region, a designation also seen statewide in the Pioneer Valley and Worcester County. The towns in this band are located in the lower Housatonic River Valley and its western border, and include large swaths of Lanesborough, Pittsfield, Richmond, West Stockbridge, Alford, Egremont, Great Barrington and Sheffield.

In assessing impact, the data not only includes land directly impacted by development (aka the development site) but also secondary habitat disturbances attributable to the new development such as roads, habitat fragmentation, and the effects of runoff, invasive species and domestic animals. The study found that for every one acre of new development in the county, another five acres experienced this type of “hidden” development impact. For the approximately 6,640 acres of development that occurred in 34 years, the ecological integrity of another 33,680 acres diminished.

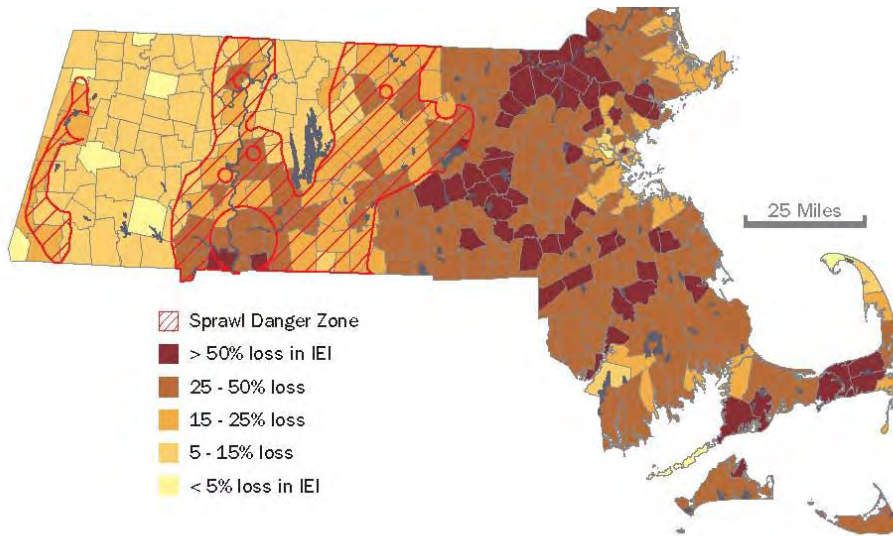


Figure CR2: Percent Change in IEI (1975-2005)

Source: Corcoran and DeNormandie, 2009.

Overall, however, the majority of Berkshire County still has large blocks of undeveloped land and the region’s IEI is rated among the best in the state. The western and eastern highlands of the county support some of the most important, unfragmented habitat in the Commonwealth and have thus been identified as some of the most important in terms of overall future land conservation efforts.

Impaired Waterways Designation

Despite the relatively good water quality within the region, the main river stems of the Hoosic and Housatonic Rivers, as well as several of their tributary streams, are impaired by various types of pollution. As required by the federal Clean Water Act (CWA), the state of Massachusetts evaluates surface waters with respect to their capacity to support specific, designated uses, which includes aquatic life support, fish and shellfish consumption, drinking water supply, and primary (swimming) and secondary (boating) contact-recreation. As required by Section 303(d) of the CWA, Massachusetts lists surface waters that do not meet regulatory water quality standards after the implementation of technology-based controls in order to prioritize them for the development of total maximum daily loads (TMDLs). A TMDL establishes the maximum amount of a pollutant that may be introduced into a water body and still ensure attainment and maintenance of water quality standards. Although the state has invested an enormous amount of resources to evaluating thousands of miles of streams and rivers, and tens of thousands of acres of lakes and ponds, there are still several miles and acres in the county that have not been assessed.

Several water resources in the Berkshires are listed on the 303(d) list maintained by the state. Fecal coliform is a pollutant that notably impairs most of the main river segments and several tributaries in the county, regardless of whether they are in rural or urban settings. PCBs are found in the river and in fish tissues in not only the Housatonic River, but also in some segments of the Hoosic River. The main Hoosic River corridor is also impaired along much of its length by alteration of in-stream or shoreline vegetative cover and flow regime alteration. Twenty-two lakes/ponds in the county, many of which are open for public recreation, are listed as being impaired due to: non-native aquatic plants, most notably Eurasian water milfoil; depletion in dissolved oxygen, which stresses aquatic life in those water bodies; or by mercury in fish tissue.

Road Impacts

Roads impact wildlife in a variety of ways, including direct mortality from vehicle collision and the more indirect impacts of fragmentation of habitat, creation of barriers to movement, incursion of invasive species and degradation of aquatic habitat and water quality. According to the *MassDOT Highway Design Manual* (2006) studies have shown that mortality from vehicles is a threat to wildlife populations when population numbers are already low or when critical habitats occur near roadways. Some long-lived wildlife species with low reproductive rates such as turtles are particularly vulnerable to population declines due to the loss of adults to road mortality. Also, populations with few individuals are more affected because of the relative importance of each individual in maintaining a healthy population. Some species avoid roadways and adjacent areas because of increased noise, pollution, visual disturbance, and predators using roadways as corridors. In Massachusetts, most state-listed reptiles and amphibians are more likely to need accommodation than other species, primarily because of a dependence on at least two distinct habitat types (i.e. uplands and wetlands) that are frequently separated by roads.

The Design Manual established guidelines to reduce environmental impacts and more readily accommodate wildlife during design and construction of roadways and bridges. MassDOT is also partnering with DFW to identify and map wildlife mortality hot spots in an effort to prioritize areas for improvement, whereby local citizens can submit mortality information online.

Wildlife crossings have become a focal point for transportation conferences across globe. The Northeastern Transportation and Wildlife Conference, held biennially since its inception in 2004, has provided valuable data, technical information and case studies from around the globe to state agency staff. This type of information is invaluable as MassDOT coordinates with DFW and other conservation groups coordinate efforts to reduce road impacts.

Stream Continuity

The natural habitat continuity of many of the streams and river segments in the county has been fragmented in a variety of ways, including dams, road crossings and concrete flood chutes. These structures limit or prohibit movement and dispersal of aquatic organisms. Aquatic habitat fragmentation is considered to be a leading cause for the decline of eastern brook trout throughout much of its range in the region. Fragmentation due to dams was identified as the most prevalent disturbance to trout habitat in the state, existing in 65% of subwatersheds where brook trout status is documented. Road impacts were the second and third most common disturbances, with 61% of brook trout streams fragmented by roadways and 59% suffering from sedimentation.

It is increasingly acknowledged that road stream crossings often fragment aquatic habitat and restricts aquatic species movement in a variety of ways. Perched culvert outlets and elevation drops at either end of the culvert prohibits movement of species that are not able to jump into the structures. Constriction

of flow through undersized culverts can cause excessive velocities, turbulence and sedimentation that aquatic organisms cannot overcome. The Stream Continuity Project at UMass Amherst has documented impacts across the state, leading to the development of the Massachusetts River and Stream Crossing Standards. In general, road stream crossings should not constrict flow, should offer continuous flow and substrate, and should span at least 1.2 times the “bankfull width” of the stream channel.

The gathering of road stream crossing surveys in Berkshire County has been championed by Berkshire Environmental Action Team (BEAT). This organization has teamed up with the Housatonic Valley Association (HVA) to gather data in the Housatonic River Watershed and with the Hoosic River Watershed Association in the Hoosic River Watershed. Westfield River Wild & Scenic has overseen data collection in the Westfield Watershed, the headwaters of which lie along the Berkshire Hills from Savoy down to Otis.

2. Alterations in Ecosystem Composition

The Berkshires is home to a wide array of rare plant and animal species and is a priority area of focus for the Mass. Natural Heritage and Endangered Species Program (NHESP), The Nature Conservancy, Mass Audubon and other organizations. The NHESP maintains a list of rare Massachusetts species that are categorized by their level of rarity: Endangered, Threatened or Special Concern. As seen in Table CR2, species listed as Endangered are the rarest of the three categories. Any native species listed as endangered or threatened by the U.S. Fish and Wildlife Service is also included on the state list. Species listed in one of the three state categories are referred by biologists and state-permitting authorities as “state-listed species.” Hereafter in this report, the term “rare” will be used when discussing the concepts of rare species or plant communities, as it is a commonly understood term, and the term “state-listed species” will be used when discussing specific listed species or where there is a regulatory connotation to the discussion.

Table CR2: Rare Species Terminology Decoded

Listing	Meaning	Local Examples
Endangered	"Endangered" (E) species are native species which are in danger of extinction throughout all or part of their range, or which are in danger of extirpation from Massachusetts, as documented by biological research and inventory.	Bog Turtle Timber Rattlesnake American Bittern Peregrine Falcon Several bat species Boreal Turret Snail Pilsbry's Spire Snail Black Cohosh Mountain Spleenwort Andrew' Bottle Gentian Great Blue Lobelia
Threatened	"Threatened" (T) species are native species which are likely to become endangered in the foreseeable future, or which are declining or rare as determined by biological research and inventory.	Northern Harrier Mustard White Butterfly or Dion Skipper Green Dragon Yellow Oak Bristly Buttercup Crooked-stem Aster

Listing	Meaning	Local Examples
Special Concern	"Special Concern" (SC) species are native species which have been documented by biological research or inventory to have suffered a decline that could threaten the species if allowed to continue unchecked, or which occur in such small numbers or with such restricted distribution or specialized habitat requirements that they could easily become threatened within Massachusetts.	Jefferson Salamander Wood Turtle Blackpoll Warbler Creeper (mussel) Brook Snaketail (dragonfly) Ginseng Hemlock Parsley

Intensive biological surveys conducted within the region often discover greater natural diversity and abundance than was previously known or considered to exist in the subject areas. Biological studies conducted on Mount Greylock, in the Housatonic River corridor and in the upper reaches of the Westfield River confirm that unusual and state-listed species of plants and animals survive and await recognition throughout our forests, floodplains, wetlands and waterways. The southern portion of the county has been cited as one of the most ecologically important areas of the region. Sheffield in particular is listed as one of the top 10 towns in Massachusetts with the greatest density of state-listed species, with a total of 98 known species (27 animal and 71 plant species). Sheffield has one of the lowest percentages of protected open space in the county.



Kampoosa Bog in Stockbridge is one of the finest examples of a calcareous fen in New England and home to at least 19 state-listed species.

Identifying and Protecting State-listed Species in the Berkshires

Massachusetts Endangered Species Act (MESA)

MESA, found in Mass. General Laws Chapter 131A, and codified at 321 CMR 10.00, establishes procedures for the listing and protection of rare plants and animals. Activities that occur within Priority Habitat or Estimated Habitat of Rare Species and have the potential for impacting state-listed Endangered, Threatened or Special Concern ("state-listed species") can only occur after review by staff from the NHESP. Activities that are determined to result in the "taking" of a species, can only proceed

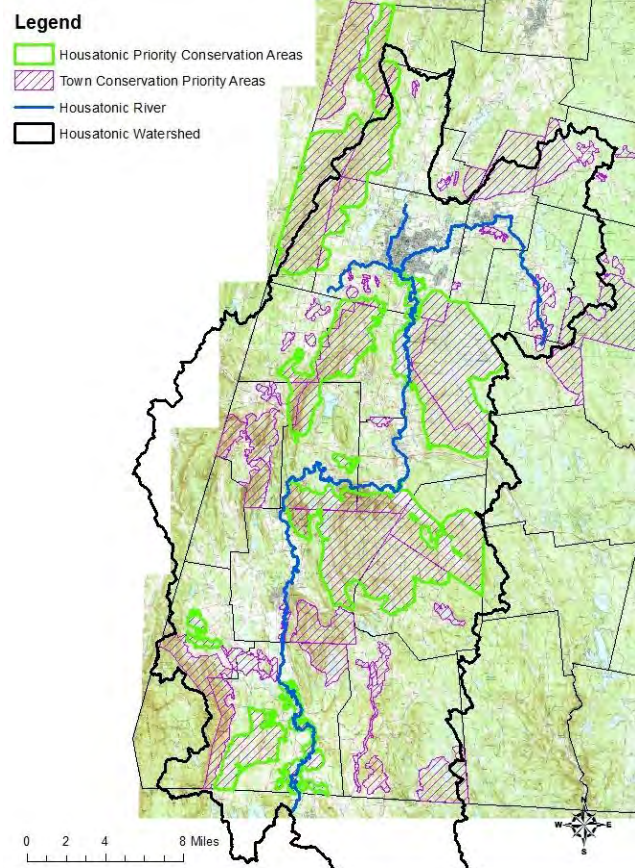
with a conservation management permit. A "take" is defined as, "in reference to animals to harass, harm, pursue, hunt, shoot, hound, kill, trap, capture, collect, process, disrupt the nesting, breeding, feeding or migratory activity or attempt to engage in any such conduct, or to assist such conduct, and in reference to plants, means to collect, pick, kill, transplant, cut or process or attempt to engage or to assist in any such conduct. Disruption of nesting, breeding, feeding or migratory activity may result from, but is not limited to, the modification, degradation or destruction of Habitat." Failure to file under MESA or adhere to the conditions of a Conservation and Management Permit constitutes a violation of MESA and is subject to fine.

The vast majority of the county has not been surveyed for the presence of state-listed species, leaving large gaps in our knowledge of rare species populations and their distribution across the landscape. State-listed species can only be protected by the Mass. Endangered Species Act once they are documented and monitored over time. Conducting additional research and field surveys for species of greatest concern, particularly for those that are known to have been under-surveyed in the past, is a priority action item listed in the state's *Comprehensive Wildlife Conservation Strategy* (2005), the DFW's most recent *State Wildlife Action Plan*.

Housatonic River Watershed Priority Conservation Areas (PCAs)

The Housatonic River watershed has been considered one of the most biologically diverse areas in Massachusetts, containing uncommon plants and animals that are found nowhere else in the state.

During 2008-09 the NHESP oversaw watershed-specific biological field surveys within the Massachusetts section of the Housatonic River Watershed, funded in part by Natural Resources Damages from the G.E. legal settlement. The study area included the river and its floodplain, the lower reaches of its tributaries and other low-elevation habitats. During this work, more than 1,800 locations were surveyed, with nearly 2,500 site visits. The survey work sought to verify or update state-listed species records within the watershed and to document new rare species findings. Through this work 46 state-listed plant species, 30 state-listed animal species and 18 types of priority natural communities were identified. Natural communities are the assemblage of plants and animals in a specific area, based on the physical environment and the natural processes that support them. Soils and the hydrologic regime often dictate the type of plant community that becomes the base of the natural community. Experts updated 135 existing records and documented 170 new occurrences of state-listed species and priority communities. The survey confirmed that the southern Housatonic River Valley in the towns



Priority Conservation Areas as designated by Natural Heritage & Endangered Species Program for the Housatonic watershed (2012).

of Great Barrington and Sheffield are exceptionally biologically rich. The results of this survey, along with a detailed list of state-listed species and uncommon plant community type that reside in the watershed, are presented in a concise and user-friendly document, *The River and its Valley, Conserving Biodiversity in the Housatonic River Watershed of Western Massachusetts*.

In addition to conducting field surveys, the NHESP designated Priority Conservation Areas (PCAs) throughout the watershed. These are areas that contain especially high concentrations of state-listed species and priority natural communities and which are located in close proximity to relatively intact natural landscapes. The PCAs are noted and discussed in town reports that have been created for each of the 19 communities that lie within the watershed. These reports have been made available to the communities, are on line at <http://www.mass.gov/dfwele/dfw/nhesp/conservation/housatonic.htm> and will be useful planning tools as the towns and their conservation partners move forward with natural resources protection efforts.

3. Exotic (non-native) or Invasive Species

The region struggles with a number of aquatic and terrestrial invasive species, the control of which is a common issue raised by state and local conservation land managers. Most invasive species are difficult to completely remove as they are often prolific reproducers and some plants also spread through rhizomes. Mechanical or chemical removal can be expensive, especially if invasives are located in sensitive habitats, such as wetlands, or amidst patches of rare plant species. Post-removal monitoring is required to ensure that the population does not reestablish. In some instances where complete removal is not feasible, land managers may be forced to contain and control invasive species populations so that they do not spread into sensitive habitats.

Invasive Pests

Invertebrates

The Berkshire forests could be severely impacted if one or more of a series of invasive insects becomes established in the region. Ash trees are a major component of many hardwood forest types throughout the Berkshires, and the Emerald Ash Borer has the potential to devastate the ash tree population of an area within a few years of being introduced. The borer has been found in upstate New York and was found in Dalton in the summer of 2012 in one of the baited traps set around the region to detect the arrival of the insect. The state is proposing to establish a quarantine area to stop the transport of wood products out of the area to slow the spread of the borer. The Asian Longhorn Beetle is an invasive wood-boring insect that attacks hardwood trees, including maple, birch and elm. A large infestation of the insect was discovered in Worcester in 2008, forcing the widespread removal of trees throughout the city, including mature shade trees. The stark removal of trees has altered for decades the suburban character of the residential neighborhoods. The Woolly Adelgid has the potential to severely impact the hemlock stands of the region, and has been found in towns in southern Berkshire County. The insect does not tolerate extremely cold weather, which may be one reason why it does not seem to have spread across the higher elevations of the region so far. The forests could become more susceptible to all of these insects if climate change continues to bring warmer winter temperatures.

Zebra mussels, an aquatic invasive species, were discovered in Laurel Lake in the summer of 2009 and have since been documented in Laurel Brook and the Housatonic River downstream of the lake. Zebra mussels can dominate the invertebrate community both in density and biomass in benthic communities, possibly displacing or reducing the abundance of indigenous species. DFW has identified three native species on the Massachusetts Endangered Species Act list that are at greatest risk from the presence of zebra mussels in the western part of the state, one of which is the Pilsbry's Spire Snail, which is known to inhabit only two lakes in the state – Laurel Lake and Stockbridge Bowl.



The Zebra mussels' small size and ability to readily adhere to boats makes it difficult to monitor transport, and once established it is nearly impossible to eradicate them.

According to the DFW, the experience of other states shows there is no practical method to eradicate zebra mussels once they have become established in a waterbody. Calcium and pH are widely considered the most critical parameters in assessing the susceptibility of a water body to zebra mussel survival and reproduction. An assessment of 21 lakes and ponds in the county and some sections of the Housatonic River was conducted in 2009 to identify existing invertebrate species, presence of zebra mussels and to collect water quality samples. The water bodies were divided into three basic categories based on their susceptibility to successful colonization by zebra mussels:

- 1 High Risk (10): Cheshire Reservoir, Housatonic River (Great Barrington to Pittsfield), Lake Buel, Lake Mansfield, Laurel Lake, Onota Lake, Pontoosuc Lake, Prospect Lake, Richmond Pond, and Stockbridge Bowl.
- 2 Medium Risk (4): Ashmere Lake, Shaw Pond, Lake Garfield, and Plunkett Reservoir.
- 3 Low Risk (7): Benedict Pond, Big Pond, Center Pond, Goose Pond, Otis Reservoir, Thousand Acre Pond, and Windsor Pond.

Current Management Methods

- **Public Outreach:** Informing the public about invasive pests and their potential impacts to the state's ecosystems is split between three state agencies: Department of Agricultural Resources (DAR), DFW and DCR. Dividing invasive species control between three agencies can lead to confusion for those citizens interested in aiding state agencies in monitoring and actively participating in control activities. The ecosystem affected determines which agency will take the lead in addressing the pest and conducting public outreach activities. For example, DFW and DCR are working jointly on pests threatening our forests and lakes, while DAR typically takes the lead on pests threatening agricultural operations and gardens. According to DFW, public education to reduce risk of human caused spread of zebra mussels between water bodies can be effective. They refer to Vermont, where zebra mussels were discovered in Lake Champlain in 1992, but have spread to only three

other lakes in the state since that time. In Connecticut the mussels were confirmed in East and West Twin Lakes in 1998 and 2001, but to date no other lakes have been infested in the state.

- **Boat Inspections and Washing:** Boat inspectors at public launch sites can require that watercraft owners fill out Clean Boat Certification Forms stating that the craft has been inspected and cleaned before launching into their lakes, ponds or rivers. If the owner cannot testify that the boat has been cleaned according to set protocols, then he/she can be prohibited from launching or face a fine.

Plants

A 1997 state-wide survey of floodplain forests found invasive plant species in every site studied. Sites most impacted are those with open or disturbed areas. Marsh bird surveys of 81 sites in the Housatonic River Watershed conducted in 2008-09 found that most wetland ecosystems contained invasive plant species, notably Common Reed and Purple Loosestrife. Both of these species spread rapidly and densely, outcompeting and almost completely obliterating other plant species, making it less suitable for some species of birds. Japanese knotweed is another plant species commonly found invading riparian habitat, where it also forms dense stands that obliterate native species. The Trustees of Reservations (TTOR) has determined that invasive plant species is the single greatest threat to biodiversity on their lands (Richburg, 2008).

Exotic aquatic plant species are changing the ecology and recreational use of many of our lakes and ponds. Prolific invasive plant growth crowd out native plant communities, cause reduced dissolved oxygen levels during decomposition of plant biomass, and can restrict swimming, boating and fishing opportunities. Fifteen Berkshire County lakes and ponds are listed in Section 4a, "Impairment Not Caused by a Pollutant" in the *Draft Massachusetts Year 2012 Integrated List of Waters* because of infestations of invasive, non-native aquatic plants, almost all of them impaired by Eurasian Water Milfoil.

Current Management Methods:

- **Plant Bans:** Noting that most of the invasive plant species are escapees from the landscape and garden industry, many states are banning the sale of the species that are found to have the greatest invasive properties. Massachusetts has banned the sale and propagation of several traditionally favorite trees and shrubs, including multiflora rose, Japanese barberry, rose ragosa, Norway maple, burning bush, oriental bittersweet, autumn olive and many others. These plants were widely used because of their hardiness, attractive flowers and/or abundant berries. Some exotic plants are now being recognized for altering the health of native birds and other animals that graze on them.
- **Management Activities:** Many landowners and managers are developing management plans and conducting invasive plant removal or control activities. Relatively small infestations can be controlled manually using hand tools or mowing, but controlling large infestations of several acres or hundreds of acres will often require the hiring of professional herbicide applicators. Because many of the species are extremely persistent, both manual and chemical controls may need to be conducted for years in order to succeed. The burden of controls having to be done over a series of several years can be costly, possibly prohibitively costly. Acknowledging that complete eradication of invasive species is unrealistic in most cases, the TTOR has developed guidelines to help land managers prioritize their control efforts to ensure that finite dollars and human resources are used in the most effective way possible.
- **In-lake Controls:** There are several methods of controlling invasive aquatic plant growth in lakes and ponds, and these are discussed in very clear terms in the *Practical Guide to Lake Management in Massachusetts* (Wagner, 2004). Some methods such as harvesting do not remove excessive growth, but it does control growth to the extent that recreational activities are enhanced. Herbicides are used across several lakes in the county, usually requiring repeated periodic applications. Pulling out plants by hand and benthic barriers can successfully remove invasive populations if caught early in the infestation and the area affected is relatively small.
- **Winter Drawdown:** Winter drawdown is probably the most widely used control method in the region to control aquatic invasive plant growth along the shoreline. While drawdowns can be

somewhat successful in killing nuisance exotic plants by freezing and killing root systems, drawdowns also bring the risk of killing native beneficial plant species or assemblages that reside alongside the exotic plants, reducing the abundance and richness of plant cover needed by young fish, amphibians and turtles to avoid heavy predation. Draw downs also increase mortality rates of slow-moving organisms, such as mussels and snails that are not able to move to deeper waters fast enough. Turtles, amphibians and other organisms settle in loose mud or leaf litter at the bottom of water bodies to overwinter, and these species can also experience a greater mortality rate, as their soils are exposed, dried and frozen during drawdown. Drawdown impacts can be quantified by conducting a thorough pre-drawdown biological survey of the area to be exposed, including overwintering cycles, followed by a post-drawdown biological survey to determine mortality and suggest any changes that could help reduce mortality.

- **Boat Inspections:** According to the DCR Lakes and Ponds Program, 3,537 boat surveys were conducted at 17 public ramps across the state in 2008. Of these, 21% of the boats inspected were transporting aquatic plant fragments. Of these fragments, 279 (40%) were non-native and were removed from the boats/gear and discarded.

4. Pollution and Contamination

Non-Point Source Pollution

Nonpoint source pollution, largely from stormwater runoff, is the single greatest source of pollution to our waterways. Stormwater runoff from impervious surface areas such as buildings, driveways, roads and parking lots impacts water quality in several ways: by altering timing and volume of natural hydrologic flow regimes, contributing increasing levels of sediment and pollutant loads, and increasing water temperature. Storm drain infrastructure systems have been in place for several decades or more, some dating back a century or more. These systems collect runoff from surrounding areas and discharge directly into receiving waterways with no treatment whatsoever. Agricultural runoff can also be a significant source of non-point source pollution from animal waste, nutrient loads from fertilizers, and siltation. A number of federal and state agencies have programs to work with farmers to employ best management practices, but participation is voluntary.

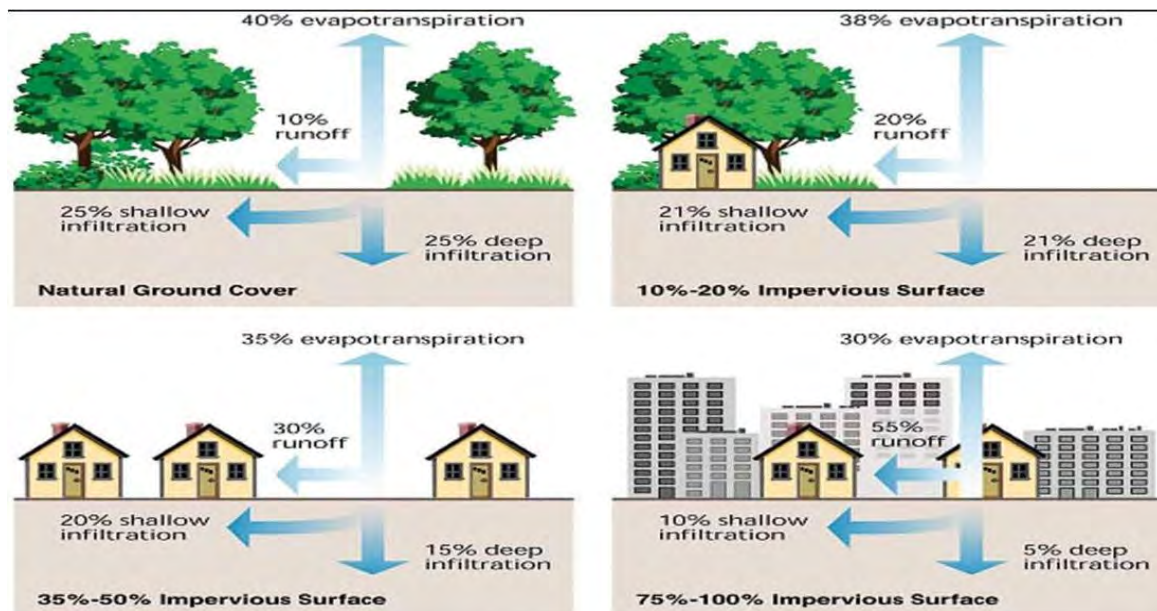


Figure CR3: Illustrates the Increase in Surface Runoff and the Corresponding Reduction in Infiltration

Source: Fed. Interagency Stream Restoration Working Group 1998

A new study found that 80% of stream macroinvertebrate species declined when a mere 0.5% to 2% of the watershed became covered by impervious surface area. This is much lower than the 10-20% of imperviousness that scientists currently cite is the level at which stream degradation begins to occur. Further, macroinvertebrate communities were more vulnerable in high-gradient, small-watershed streams like those in our highlands, which tend to be cold water fisheries and of a higher quality.

A 2011 modeling study conducted by the U.S.G.S, in cooperation with state environmental agencies, found that impervious surface cover was a significant variable influencing fish assemblages in streams and rivers. The study found that, keeping all other factors the same, a unit increase of impervious surface coverage within a stream or river's watershed resulted in a 3.7%-decrease in relative abundance and a 5.4%-decrease in fish species richness within that stream or river. The decrease in brook trout relative abundance was 8.7%, more than twice that of overall abundance. The variable of percent forest cover was found to have a positive correlation with the abundance of both overall fish assemblage and brook trout. Percent flow alteration from groundwater withdrawal was also found to negatively influence species abundance.

Runoff is the main contributor to soil erosion and sediment transport. Sediment buildup smothers habitat and developing eggs and lowers flood storage capacity. Sediment is also widely recognized as a major transport for pollutants such as nutrients, petrochemicals, pathogens, and metals. Runoff is a main conduit for phosphorus, the nutrient of concern for freshwater habitats. One study in Maine found that even careful development of woodland into two-acre house lots caused a two- to 10-fold increase in phosphorus concentrations in runoff (BRPC, 2003).

Under most circumstances new development is no longer allowed to discharge stormwater into nearby waterways without treatment of some kind. Rather, developers must meet the Massachusetts Stormwater Policy, which for most development requires removal of 80% total suspended solids. Detention basins are the most common means of managing stormwater in large development sites.

Other treatment is required for commercial or industrial land uses that have a high probability of other pollutants in runoff, such as auto fuel or repair shops and sites that handle or store chemicals.

Landscaping practices are another factor in determining the pollutant load of runoff. Improper use of fertilizers and insecticides, such as over-applying chemicals or allowing them to reach water resources (through direct overland flow or through stormdrain systems) during rain events are major contributors of pollution in developed settings. It is estimated that 80-90% of phosphorus reaches waterways adhered to sediment, with lawns and streets being the two largest sources of total and dissolved phosphorus. Yet surveys reveal that less than 25% of residents consider lawn fertilizer a cause of water quality problems and that only 10-20% of them have conducted soil tests to determine if their lawns actually need fertilizers. Studies confirm that the two most important sources of consumer lawn care information are product labels and store attendants, yet few retailers hold educational workshops for their customers or staff regarding proper use of lawn care products.

Best Practice Highlight: Low Impact Development

Low Impact Development (LID) is an approach to site planning and design that reduces stormwater runoff impacts from developed areas. The goal of LID is to work with developed and developing areas to identify opportunities to reduce runoff and prevent pollution. To achieve this goal, LID mimics natural landscapes and stormwater pathways by using small-scale, decentralized practices that maintain infiltration rates and reduce new surface runoff rates. LID works at the lot or site level as opposed to most stormwater controls that are placed at the bottom of the drainage area for an entire development.

The guiding principles of LID are:

- Minimize impervious areas;
- Minimize disturbance from development;
- Preserve natural landscape features including forest, vegetated areas, and native soils;
- Disconnect hydrologic elements (roofs, downspouts, parking areas, etc.);
- Maintain/increase flow paths and times of travel; and
- Use decentralized treatment practices, often combining treatments into a “treatment train.”

Road runoff is now beginning to be managed along roadways by redesigning swale and catch basin systems when roads are upgraded or reconstructed. Vegetated or stone-lined swales slow storm flows and capture debris and sediment more effectively than dirt ditches or paved swales. Deep sump catch basins that have some capacity for capturing and holding settled out sediment are replacing older catch basins with no sediment storage. While these design improvements improve water quality in the areas in which they are employed, it should be noted that storm drain improvements only occur during new construction or reconstruction projects; simply resurfacing a roadway does not require storm drain improvements. Thus, inclusion of new stormwater management techniques is scattered and will take decades or more to complete across the region.

5. Climate Change

Berkshire County contributes to the biodiversity of the region by hosting plant communities that are not found or are less common in other parts of the state and southern New England. Seventeen habitats were evaluated by the state for their vulnerability to the various impacts of climate change, including temperature increases, hydrologic cycle alteration and increased frequency of extreme events (floods, windstorms, ice storms, and drought). A habitat's adaption and survival will depend on its resiliency to climate change and our ability to reduce non-climate stressors, such as nonpoint source pollution, hydrologic flow alteration, habitat destruction and invasive plants and pests.

The Habitat Vulnerability Scoring System is as follows:

- 7 Habitat at risk of being eliminated from the state due to climate change
- 6 Majority of habitat at risk of being eliminated (i.e. >50% loss), but unlikely to be eliminated entirely
- 5 Extent of habitat at risk of being moderately reduced (i.e. <50% loss)
- 2-4 Extent of habitat may not change appreciably under climate change, habitat may expand or habitat may expand greatly

Table CR3: Selected Habitat Vulnerability to Climate Change

Habitat(s)	Vulnerability	Climate Adaptation Needs	Vulnerability Score
<ul style="list-style-type: none"> Smaller Coldwater Lakes and Ponds: Goose Pond, Laurel Lake, Onota Lake, Otis Reservoir, Stockbridge Bowl, Windsor Pond 	Of the more than 60 lakes/ponds/reservoirs in the county, only six provide coldwater habitat. The cooler temperatures support aquatic fish and organisms not able to survive in the majority of water bodies scattered across the region. These uncommon habitats are highly vulnerable to climate change due to altered inflow regimes and the projected increase in summer temperatures.	Reduce stressors such as thermal and nonpoint source pollution and altered flows patterns from impervious surface area. Improve shoreline vegetation to capture runoff and provide shade.	7
<ul style="list-style-type: none"> Spruce-fir Forest 	These habitats are already surviving on the southern edge of their range and are at risk of disappearing due to increased temperatures, decreased cloud moisture, ice storms and invasive insects.	Reduce human intrusion; monitor for invasive pests.	7
<ul style="list-style-type: none"> Spruce-fir Boreal Swamp 	These habitats are already surviving on the southern edge of their range and are at risk of disappearing due to increased temperatures, decreased cloud moisture, ice storms and invasive insects.	Reduce human intrusion; monitor for invasive forest pests	6-7

Habitat(s)	Vulnerability	Climate Adaptation Needs	Vulnerability Score
<ul style="list-style-type: none"> Coldwater Rivers and Streams 	<p>Cold water streams and rivers support trout and other thermal-sensitive aquatic species. Western Massachusetts hosts most of this type of habitat in the state.</p>	<p>Reduce stressors such as thermal and nonpoint source pollution, altered flows patterns from impervious surface areas and road crossing impacts.</p> <p>Maintain forest canopy to mitigate surface runoff and provide shading.</p> <p>Remove dam impoundments where feasible.</p>	5-6
<ul style="list-style-type: none"> Northern Hardwoods Forest Emergent Marches and Wet Meadows Riparian Floodplain Forest 	<p>Northern hardwood forests are widespread in the Berkshires but less robust in the eastern portion of the state. Stressors such as invasive pests could accelerate the loss of species.</p> <p>Emergent marshes, wet meadows and riparian forests serve as flood control as well as important habitat. These habitats already suffer from invasive species; warmer temperatures favor new infestations.</p>	<p>Monitor for invasive forest pests.</p> <p>Reduce stressors such as thermal and nonpoint source pollution, altered flow patterns from impervious surface areas.</p> <p>Maintain water recharge.</p>	5-6
<ul style="list-style-type: none"> Vernal Pools 	<p>Vernal pool hydrology threatened by less inundation periods due to earlier/drier spring/summer seasons and by cycles of drought; as a result obligate species breeding success reduced.</p> <p>Hardwood swamps typically occur in lower elevations where development pressure is greater.</p>	<p>Investigate potential vernal pool sites; certify when verified.</p> <p>Maintain forest cover.</p> <p>Limit forest fragmentation.</p> <p>Maintain groundwater recharge.</p>	4-5
<ul style="list-style-type: none"> Shrub Swamp Warmwater Ponds, Lakes, & Rivers 	<p>These habitats are at low risk of vulnerability due to climate change. They are most vulnerable to nonpoint source pollution and habitat alteration in their watershed.</p>	<p>Reduce stressors such as development impacts; maintain water recharge; maintain or improve undeveloped shoreline and buffer areas; monitor for invasive species and actively manage where ecologically necessary.</p>	2-4

Source: Manomet Center for Conservation Sciences, 2010

Climate Change and Hydrologic Alterations

The scientific community is largely in agreement that climate change is altering the weather and precipitation patterns of the northeastern region of the U.S. Warmer late winter temperatures will result in more rain-on-snow storm events, leading to higher spring melt flows, which typically are already the highest flows of the year. Data from USGS streamflow gauges across the northeast show a clear increase in flow since 1940, with an indication that a sharp “stepped” increase occurred in the 1970s. This is shown to occur not only in developed watersheds, but also within many New England watersheds that have been reforested, and this type of land cover change would tend to reduce, rather than increase, flood peaks.

Extreme storm events are expected to increase both in number and in magnitude. Some scientists predict that the recurrence period for extreme storm and flood events will be significantly reduced, with some projecting that the 10-year storm may more realistically have a recurrence interval of 6 years, a 25-year storm may have a recurrence interval of 7.5-14 years, and the 100-year storm may have a recurrence interval of 49 years. Widespread severe storm events and resulting flooding of 2005, 2006, 2010, and 2011 in Massachusetts seem to support the theory that recurrence times are being reduced.

The increased peak flows of severe storm events impact wetland resources in several ways. Ponding of water behind undersized crossings interrupts stream flow, and can lead to increases in temperature, conditions that threaten fragile cold water fisheries already stressed by climate change. During the storm, water quality is degraded by increased turbidity, stream channels are eroded and scoured, streambank vegetation is damaged or lost, and aquatic biota is displaced or killed. Post-storm stream morphology and flow regimes are altered, habitat is damaged, and sediment deposition in receiving waters smothers aquatic breeding grounds and reduces storage capacity.

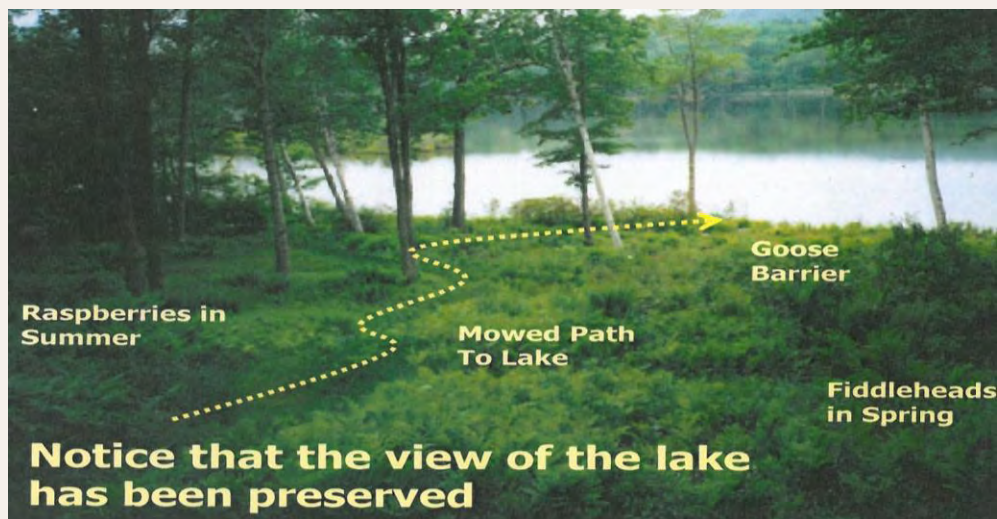
Public works infrastructure was simply not designed to accommodate the increase in storms. Flooded, failed and washed out road stream crossings exacerbate erosion and contribute additional sediment loads to receiving streams and rivers. One public works superintendent estimates that at one particularly troublesome crossing at least 1,500 tons of gravel was washed into the stream in a storm in 2007 and 2,500 tons of gravel washed into the stream during Tropical Storms Irene and Lee in 2011. Most existing public works infrastructure in the state is decades or, in many instances, more than a century old.

Best Practice Highlight: Vegetative Buffers

Maintaining natural vegetation along riparian corridors or along lake and pond shorelines mitigate the impacts of stormwater runoff through a series of physical and chemical mechanisms. Forest lands absorb and hold rainwater 15% more than grasslands and 40% more than disturbed soils. The stems of living and dead vegetation physically impede surface flow, slowing water's movement and its capacity to carry pollutant-laden sediment. Soils with complex root systems attend to be more porous and are more adept at filtering, absorbing and processing pollutants carried by runoff.

As summer temperatures continue to rise, it will be ever more important to reduce surface runoff and facilitate infiltration of rain water to maintain natural water temperatures in rivers and lakes. Maintaining or improving forest cover to directly shade the streams, wetlands and vernal pools underneath help to temper the effects of hot summer days. The forest canopy also shades and maintains natural soil temperatures, important for those waterbodies receiving groundwater recharge during low-flow or drought conditions.

Maintaining or improving forest cover along stream banks is critically important for cold water fisheries, not only for the ecological health of the streams themselves, but also for the rivers or lakes into which they flow. These cooler waters provide year-round habitat for brook trout and several rare species that require cold, oxygen-rich waters, and the areas where they discharge into rivers and lakes provide seasonal refuge for species that migrate there to survive warm summer conditions. Planting even a narrow buffer of trees 15-20 feet wide along open stream channels can provide the shade needed to help offset the temperature increases of climate change.



The shade provided by lakeshore trees benefit the natural aquatic system in a variety of ways. Shade directly cools the water, providing much-needed cooler temperatures required by the young fish and other organisms that live in shallower waters. Shade also inhibits the unbridled growth of noxious aquatic plants, most of which flourish under sunny, warm conditions. Lakeshore vegetation can provide landowner benefits by protecting eroding shorelines, providing privacy, adding shade, attracting birds and butterflies and increasing the value of the property (properties with mature vegetation are worth on average 20% more on the real estate market). Ferns and fruiting shrubs can provide seasonal gourmet delights.

BIODIVERSITY PRIORITIES BY HABITAT TYPE

In discussing the habitat health to support strong biodiversity now and into the future, it is useful to review the best practices and critical threats facing the types of habitat present in the region.

Table CR4: Summary of Conservation Objectives and Threats*, Listed by General Habitat Type

Habitat Type	Conservation Objectives	Current Threats
Forests	<ul style="list-style-type: none"> Minimize fragmentation of this largest contiguous habitat type Minimize human intrusion in specific areas to preserve natural processes and protect sensitive, interior forest-dwelling wildlife Increase vernal pool protection Protect rural economic opportunities for timber and maple syrup production 	<ul style="list-style-type: none"> Fragmentation from development Climate change (select forest types) Invasive tree pests Ridgeline development
Shrub-Forest Uplands	<ul style="list-style-type: none"> Expand this habitat for declining species, preferably in partnership with conservation land managers 	<ul style="list-style-type: none"> Forest maturity Invasive species prone
Open Fields and Meadows	<ul style="list-style-type: none"> Protect and manage this habitat for grassland species Habitat protection and agricultural production align for overall public benefit 	<ul style="list-style-type: none"> Sprawl development Frequent or early season mowing practices Loss of farmland
Floodplain Forests	<ul style="list-style-type: none"> Protect the ecological function of these forests for wildlife habitat and flood protection 	<ul style="list-style-type: none"> Encroaching development PCB contamination in the Housatonic River from Pittsfield south Invasive species
Rivers and Streams	<ul style="list-style-type: none"> Reduce impacts of stormwater runoff on water quality and quantity Continue to identify water quality impairments and pursue improvement projects Focus protection efforts on cold water habitats where possible 	<ul style="list-style-type: none"> Impervious surface area PCBs Nonpoint source pollution (in particular sediment, phosphorus, bacteria) Climate change Fragmentation by dams and roads
Lakes and Ponds	<ul style="list-style-type: none"> Reduce water quality and quantity impacts of stormwater runoff Engage shoreline property owners in lake/pond protection activities Continue to identify and pursue invasive species control 	<ul style="list-style-type: none"> Residential nonpoint source pollution (in particular sediment, phosphorus, bacteria) Loss of shoreline vegetation Invasive species
Wetlands	<ul style="list-style-type: none"> Strictly enforce wetland regulations to reduce impacts Focus protection efforts on high quality calcareous wetlands 	<ul style="list-style-type: none"> Impervious surface area Nonpoint source pollution Invasive species Illegal draining, mowing Illegal dumping

* Not intended to be an all inclusive list, but a summarization.

Particularly Vulnerable Resources

Bats

The Berkshires provide important habitat for resident and migrating bats. Some bat species in the region are being extirpated by white nose syndrome (WNS). Although the reasons are not well understood, WNS deplete bats' winter fat reserves too quickly by the middle of winter. The affected bats exhibit unusual behavior, often moving to cold parts of the hibernacula or leaving it during the day and during cold winter weather in an attempt to find food during a time when insects are not available. Mortality rate of the bats found in Berkshire hibernacula is alarmingly high, 95-100% in some sites. There is no known method of curing sick animals or preventing the spread of the disease to healthy bat populations and it is currently not known if effected populations will be able recover. It appears that the fungus responsible for WNS originated in Europe. In order to reduce further spreading of the disease, Massachusetts DFW has closed hibernacula on state property.

Bat and avian mortality at wind energy generating facility sites is a concern that is heightened by the impacts of WNS. Until bat species populations affected by WNS can rebound, wind turbine installation must be conducted in an especially careful manner. Promising new studies indicate that raising wind-turbine cut-in speed (the lowest wind speed at which turbines generate power to the utility system) reduced bat mortalities at two wind turbine sites. Relatively small changes to wind turbine operation resulted in nightly reductions in bat mortality 44-93%, with < 1% of total annual power output (Arnett, et al, 2010). Understanding site design and operational options will be critical as the region and the state move forward in developing wind energy facility siting standards.

Vernal pools

Vernal pools are indispensable to biodiversity, both locally and globally. In many upland areas, where the nearest wetland or other waterbody is thousands of feet away, vernal pools are the only aquatic breeding grounds in the area. Some of the state's rarest amphibians, including the mole salamanders (Jefferson, spotted, marbled salamanders) and some species of freshwater snails and clams, are inexorably linked to the vernal pool in which they were hatched. Most live out their lives within ¼ miles of their natal pool, returning to breed. For a species with a narrow or small distribution, a specific vernal pool may be the only place in the region that the creature is found. If that pool is destroyed, that specific population of creatures could become locally extinct.

Vernal pools that are associated with Wetland Resources, such as riverfront or forested wetlands, are afforded some protection by the Mass. Wetland Protection Act. However, small isolated pools not associated with a Wetland Resource are not protected by the Act. Because vernal pools are only prominently noticeable part of the year when they hold water, these vital habitats are vulnerable to development. There are 968 mapped potential vernal pools in the county, 78% of which are on privately owned land. Much of the development in the Berkshires occurs by clearing forest lands.



Vernal pool in Peru, Spring 2012.

Coldwater Habitats

Although Eastern Brook Trout survive throughout the county, their populations have been reduced by a variety of activities. According to the Eastern Brook Trout Joint Venture, the highland tributaries of the Housatonic, Hoosic and Westfield harbor naturally reproducing populations that occupy 50-90% of the available habitat. The greatest disturbance to brook trout habitat in the region is stream fragmentation caused by dams, prohibiting movement of fish and other aquatic organisms. Stream fragmentation from road and sedimentation were also cited as common disturbances to habitat in the state. Sedimentation impacts may increase as climate change causes more frequent and more severe storm events, resulting in more turbid flood waters and greater stream bank erosion. Thermal increases due to discharges from industry, roads and parking lots also impact the habitat value of the Hoosic and Housatonic Rivers. This is most pronounced in the case of the concrete flood chutes in Adams and North Adams which lack any natural vegetation buffers to slow and filter water runoff.

Riparian Corridors

Aquatic habitats and their surrounding riparian and floodplain areas are some of our most biologically productive areas. They also provide resiliency against the impacts of climate change. Yet only 13% of the Housatonic River's riparian area is permanently protected from development and 17% of the Hoosic River's is protected. The Wetlands Protection Act provides some protection from development within 200 feet of streams and rivers, but development is not prohibited entirely from this area. Development within the floodplain is discouraged, but can be allowed if compensatory flood storage is created in the vicinity.

KEY OPPORTUNITIES AND CHALLENGES

Climate Change Adaptation

Climate change will place a number of stresses on the natural environment over the next several decades. This could potentially mean significant changes in our natural systems and the loss of some species from the region altogether. Taking action at a regional, municipal, and household level to reduce impacts of some of the biodiversity threats identified reviewed in this report will be important to helping the region's natural systems retain health and resiliency in the face of climate change.

Housatonic River Cleanup

General Electric (GE) operated along the Housatonic River in Pittsfield for more than 40 years. Before environmental regulations were in place to regulate water use, water from the river was used for cooling and then discharged back into the river. Over several decades, this practice of releasing water, combined with spills and unregulated disposal methods, introduced large quantities of polychlorinated biphenyls (PCBs) into the river. Contaminated soils in and along the river have been found all the way to Long Island Sound, particularly behind dams where sediment gathered. The river bears the distinction of possessing some of the highest concentrations of PCBs in the nation in the segment of the Housatonic River between southern Pittsfield and Woods Pond in Lenox.

General Electric, federal and state agencies are in current negotiations that require GE to remove PCBs from the river and nearby contaminated areas. The cleanup site consists of the 254-acre GE facility in Pittsfield, along with the Housatonic River channel, its banks and floodplains from Pittsfield, downstream through Massachusetts and Connecticut.

The first two miles of the river have largely been remediated, from the Newell Street Bridge to the confluence of the East and West Branches of the East Branch Housatonic River. In accordance with the Consent Decree, cleanup activities of the first ½ mile of East Branch Housatonic River, between the Newell and Lyman Street bridges, were lead and paid for by GE. Cleanup activities involved removal of 18,000 cubic yards of river channel sediment and placement of armoring and vegetated plantings for stabilization. Construction was conducted 1999-2002. Cleanup activities for the next 1 ½ miles of river, from the Lyman Street bridge to the confluence of the East and West Branches of the river, was lead by the EPA, with the EPA and GE jointly paying for the cleanup. Cleanup activities included 91,700 cubic yards of sediment during the years 2002-07.

These efforts have led to a reduced level of PCBs in these stretches of the river. The major invertebrate populations in this stretch of river have risen to levels expected in a "clean" river, twice the levels present prior to the cleanup. Rare species were not seen in these areas during the 2008-9 surveys. Silver Lake is in the process of being capped. PCBs are still entering the river system from the old GE site (the William Stanley Business Park) and from Unkamet Brook.

The next phases of the cleanup process have been a source of discussion and debate. A wide variety of cleanup options for removal of contaminated river sediment, riverbank and floodplain have been developed by General Electric. The company has combined the options into seven different possible scenarios, with impacts ranging from no or little land disturbance, to extensive soil removal and restoration that could total 2.9 million cubic yards and occur over more than 700 acres. This latter scenario is estimated to take more than 50 years to complete.

The cleanup of the Housatonic River is considered by many Berkshire County residents to be the single greatest issue of environmental importance for the region. The level and extent of cleanup has been heavily debated over the course of decades. Opinions vary within the different stakeholder groups: the regulatory agencies, Massachusetts DEP and DFW and the U.S. EPA, continue to negotiate; some in the conservation community advocate for an extensive, more thorough removal of PCBs while other conservationists favor limited excavation and PCB removal; some residents and property owners are pressing for complete cleanup while others favor little or no PCB removal. The EPA's preferred remedial alternatives report is due to be issued in winter 2012. Regardless of the cleanup scenario selected, it is clear that the cleanup activities will have a significant impact on the ecology of the river and on the communities involved.

Hoosic River Restoration

The ecology of the Hoosic River is severely degraded by concrete flood-control chutes in Adams and North Adams. In some areas, concrete completely encases the river channel. The chutes themselves do not have the natural substrate needed to support aquatic biota or allow safe migration of aquatic species and the water heats up flows to unnaturally high levels during the summer months. Water temperature increases stress the systems of aquatic biota by directly increasing metabolism to dangerous levels and indirectly by causing lower dissolved oxygen. The impacts of the concrete chutes are heightened in that they fragment and disconnect river segments of cold water fishery habitats. Efforts are ongoing to identify mechanisms by which the chutes could be modified to create more natural habitat conditions while maintaining the flood control protection for the built environment. Prior to the installation of the chutes, there were several hurricane-related storms which caused significant property damage and some loss of life in both communities; the complete removal of the chutes is therefore not being considered as a viable option.

A CONSERVATION FRAMEWORK FOR BERKSHIRE COUNTY

A conservation framework for Berkshire County is a unified strategy that can be collaboratively pursued by all conservation entities active within the region. The strategy aims to identify those areas which will offer the most benefit to the region in terms of protecting habitat and biodiversity while also considering priority resource areas and connections for outdoor recreation. This framework was developed using a variety of inputs and will ultimately be implemented through both direct conservation and guided development patterns. The intent is to provide an overarching guide to all conservation entities active in the region as well as those in adjacent regions of Massachusetts, Vermont, Connecticut and New York, to help align conservation activities. This is a guide; it is not regulatory. It is anticipated that individual conservation groups will need to balance this framework with realities of potential development opportunities, financial and staff resources, and mission-based priorities. However, having a single guide can help make connections across municipal and state boundaries to help clarify critical areas for conservation as they relate to biodiversity and recreation in the region and beyond.

Building the Conservation Framework Map

The conservation framework was developed in collaboration with conservation and recreation entities in the region, public input received at public forums, and scientific information available in map form. As a base foundation, we started with the Open Space and Recreation Map (found in Section I, Land Conservation and Management), which shows the existing protected lands in the county. We then added additional mapping layers that displayed areas within the county that are environmentally sensitive or important habitat linkages. The culmination of these efforts resulted in the Berkshire Conservation Framework, the map of which is found at the end of Section 3, Outdoor Recreation. The framework emphasizes three main points relating to habitat and biodiversity:

1. Align Land Protection with Biodiversity Protection

To date, conservation activity in the region has tended to focus on areas of higher elevation. In some cases, these areas were less suitable for development and were easier to acquire financially. In other cases, they were highly desirable sites for conservation and recreation due to scenery and topography. What this has resulted in, however, is a conservation pattern that focuses on the areas which tend to be less rich in biodiversity and rare species habitat, as the number of rare species tends to decrease with elevation. The vast majority of lands in the county above 3,000 feet in elevation are protected from development, while they host 24 state-listed species. Inversely, only 15% of the land 1,000 feet or below in elevation are protected, while these lands host 112 state-listed species (Barbour et al, 1998). These sensitive lowlands continue to face the greatest pressure of residential and commercial development, requiring the careful balancing of conservation, community character and economic development. This disparity has prompted the Massachusetts Natural Heritage Endangered Species Program to cite the watershed as one of the highest conservation priorities in the state. Priority Habitats of Rare Species areas are shown in hatched green on the Natural Resources Map.

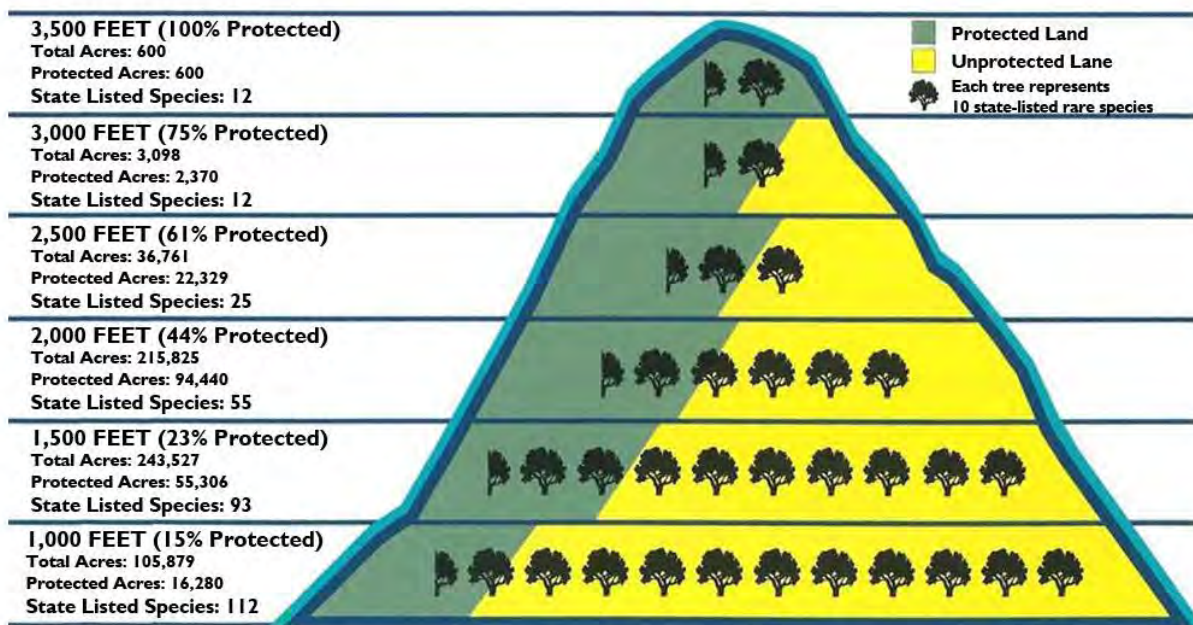


Figure CR3: Land Protection Status by Elevation and Presence of State Listed Species

Source: *Massachusetts Natural Heritage Endangered Species Program (1998)*

2. Maximize Conservation of Important Habitat Areas

Mapped information is a starting point for identifying and quantifying the presence and extent of different species or habitats and provides a strong base from which to start a conversation and strategy for natural resource and biodiversity conservation in the region. Three statewide projects provide a depth of information and expertise to help guide the creation of a conservation strategy for the Berkshires.

BioMap 2

Biomap2 is a data and mapping project, the intent of which is to provide a statewide map of priority areas in terms of their contribution to biodiversity and the long-term health and survival of state-listed species and natural communities, to serve as a guide to conservation entities. BioMap2 combines two key data sets:

- NHESP's combined 30 years of state-listed species and natural community data with spatial data to identify important wildlife habitat areas.
- The Nature Conservancy's assessment of large, well-connected, and intact ecosystems and landscapes across the Commonwealth.

The statewide map classifies habitat in two basic categories:

- **Core Habitat:** areas critical for the long-term survival of state-listed species and other Species of Conservation Concern. Protecting the ecological function of these habitats will help us conserve biodiversity for the next generation. These areas cover approximately 19% of the county, of which 54% are permanently protected from development. These areas are shown in green in the Natural Resources Map.

- **Critical Natural Landscape:** large natural landscape blocks that typically surround Core Habitats and have been minimally impacted by development. These areas provide additional habitat acreage, travel corridors between habitats, help filter invasive species incursion and improve the overall resilience of a habitat to climate change impacts. These areas cover approximately 43% of the county, 45% of which are protected from development.

Table CR5: Conservation Status of Important Habitat Lands in Berkshire County

Acres of Core Habitat		Acres of Critical Natural Landscape	
Total Acres	Acres Currently Conserved	Total Acres	Acres Currently Conserved
202,394	108,883	376,050	170,756

Source: Mass GIS, Berkshire Regional Planning Commission, 2012

Conservation Assessment and Prioritization System (CAPS)

MassDEP, the University of Massachusetts in Amherst and the Massachusetts Office of Coastal Zone Management (CZM) developed CAPS, a mapping analysis tool that produces a map of the most intact forests, wetlands and landscapes. The analysis evaluates and rates the ability of a resource area to support plants and animals and the natural processes necessary to sustain them over the long term, resulting in an Index of Ecological Integrity. The model factors in a number of variables which can contribute to habitat degradation including habitat loss, landscape fragmentation, impact of domestic (e.g., cats and dogs) or edge (e.g., raccoons, skunks, and cowbirds) predators, and invasive plants. Refer to the CAPS map where, in general, the darker the green the more intact the habitat.

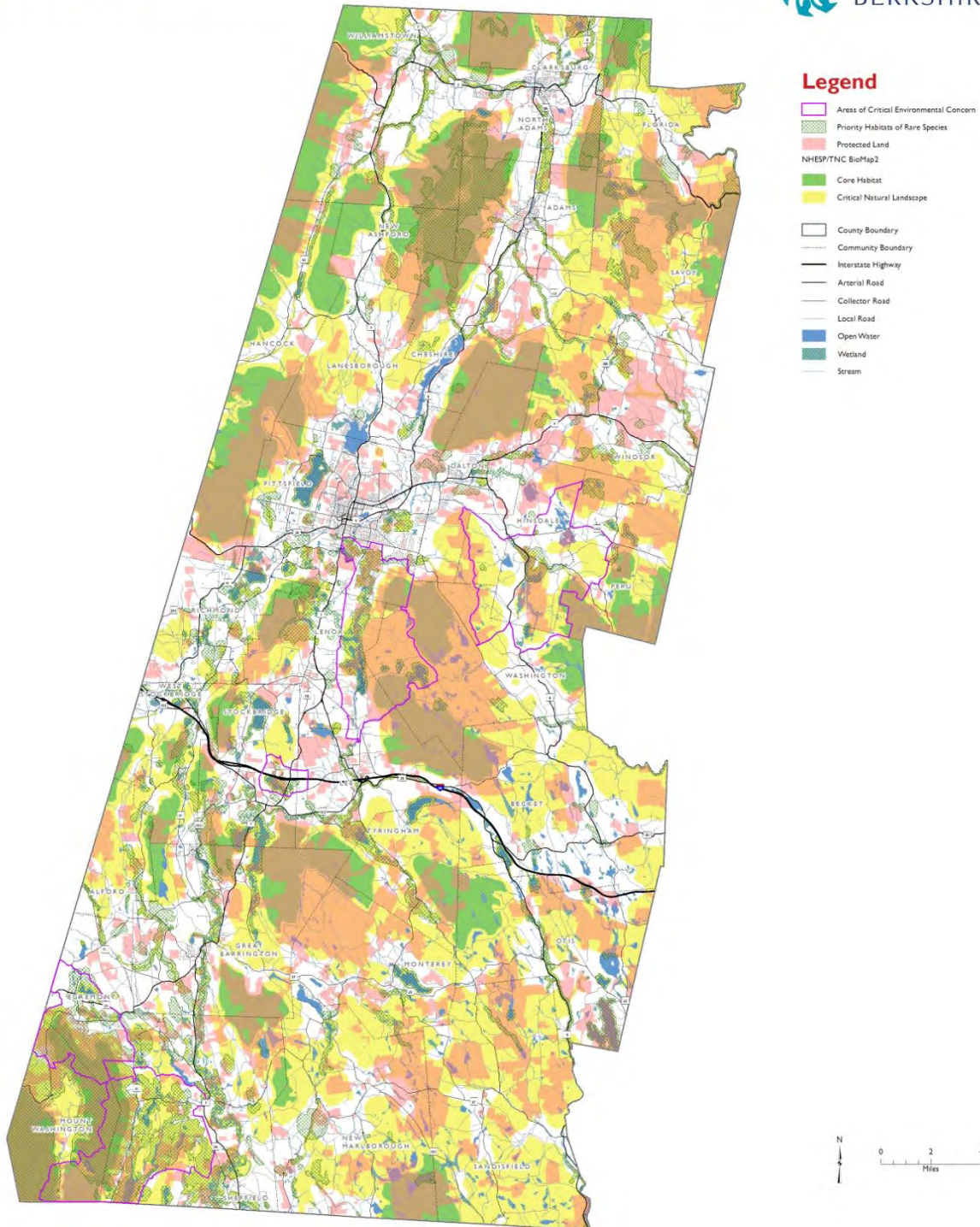
Priority Conservation Areas (CPAs)

Special funding from the Natural Resource Damage Assessment program, combined with state funds, has allowed the NHESP to conduct intense biological surveys within the Housatonic River Watershed. Using BioMap2 as a foundation, NHESP identified and mapped Priority Conservation Areas (PCAs) for within the watershed. These areas are included in the town reports generated for each of the 19 communities with lands in the watershed. The purpose of these reports is to aid residents and community leaders in prioritizing areas of the town for long-term protection of biodiversity in the state. These town reports can be found on the NHESP website at www.mass.gov/dfwele/dfw/nhesp/conservation/housatonic. PCAs in the county range from 373 in size to more than 25,000 acres, and are found on the PCA insert map on page 39.

3. Create Connections for Wildlife Movement and Recreation

Once key areas were identified on the map, a focus was also placed on identifying connections between large tracts of conserved land. Areas to be included in the conservation framework as areas for future prioritization included river corridor areas which are both critical habitat areas but also have high recreation value; connections between scattered conservation sites; followed a small wetland channel or other natural resource value; or enlarged existing contiguous areas. Lastly, areas identified as important by local conservation and recreation groups were given consideration as the map was being created. Please note that Agricultural Preservation Restriction lands and prime agricultural soils were not included as agricultural preservation priorities will be addressed in the Local Food and Agriculture Section. However, readers and practitioners are invited to use both maps as they are both high-priority conservation focus areas with many geographic overlaps.

SENSITIVE HABITATS



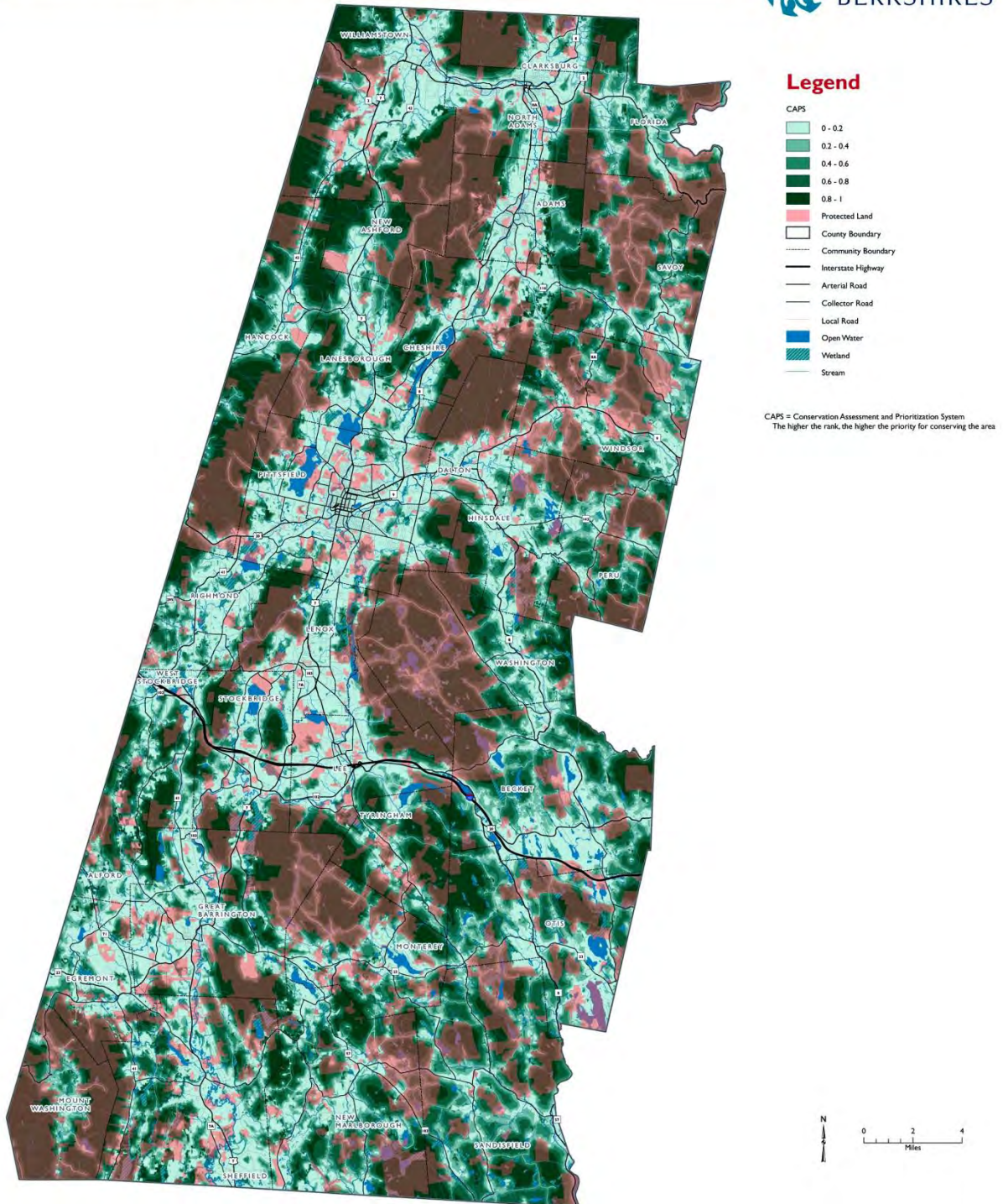
4/24/2014



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This map was created by the Berkshire Regional Planning Commission and is intended for general planning purposes only. This map shall not be used for engineering, survey, legal, or regulatory purposes. MassGIS, MassDOT, BRPC or the communities may have supplied portions of this data.

NATURAL RESOURCES



DEVELOPING THE BERKSHIRE CONSERVATION FRAMEWORK MAP

The Berkshire conservation framework map is based on scientific information provided by biologists, ecologists, and mapping specialists. It is a tool to help us achieve the Vision. Linkages and buffer areas were created that connect or expand existing protected lands into larger areas for the long-term preservation of biodiversity.

Existing Mapping Projects

Step One: we drew directly from the data layers of these four mapping initiatives to create the base for the areas we are calling Berkshire Conservation Priority Areas. These data layers were described in more detail when they were first discussed in Section 2, Habitat and Biodiversity.

Priority Habitats of Rare Species

The Priority Habitats data layer represents the geographic extent of habitats of state-listed rare species in Massachusetts based on observations documented within the last 25 years in the database of the [Natural Heritage & Endangered Species Program](#) (NHESP). All Priority Habitats in this data layer are shown on the map.

BioMap 2

BioMap2 is a data and mapping project to prioritize areas according to their contribution to biodiversity and the long-term health and survival of state-listed species and natural communities. All areas classified as Core Habitat, which are critical for the long-term survival of state-listed species and other Species of Conservation Concern, are shown on the map. Additional areas classified as Critical Natural Landscapes were used as reference in creating connections to support habitat, protect wildlife travel corridors, and improve the overall resilience of a habitat to climate change impacts and non-native invasions.

Priority Conservation Areas (PCAs)

The NHESP has conducted intense biological surveys within the Housatonic River Watershed, an area which is one of the most biodiverse in the state. Using BioMap2 as a foundation, NHESP identified and mapped PCAs within the watershed that warrant extra conservation attention. All Housatonic PCAs are shown on the map.

Conservation Assessment and Prioritization System (CAPS)

CAPS is a mapping analysis tool that produces a map of the most intact forests, wetlands and landscapes. The analysis evaluates and rates the ability of a resource area to support plants and animals and the natural processes necessary to sustain them over the long term. The mapped Berkshire conservation framework used this data set as a reference in creating connections between habitats identified in the Housatonic PCAs and BioMap2.

Connections for Wildlife Movement and Outdoor Recreation

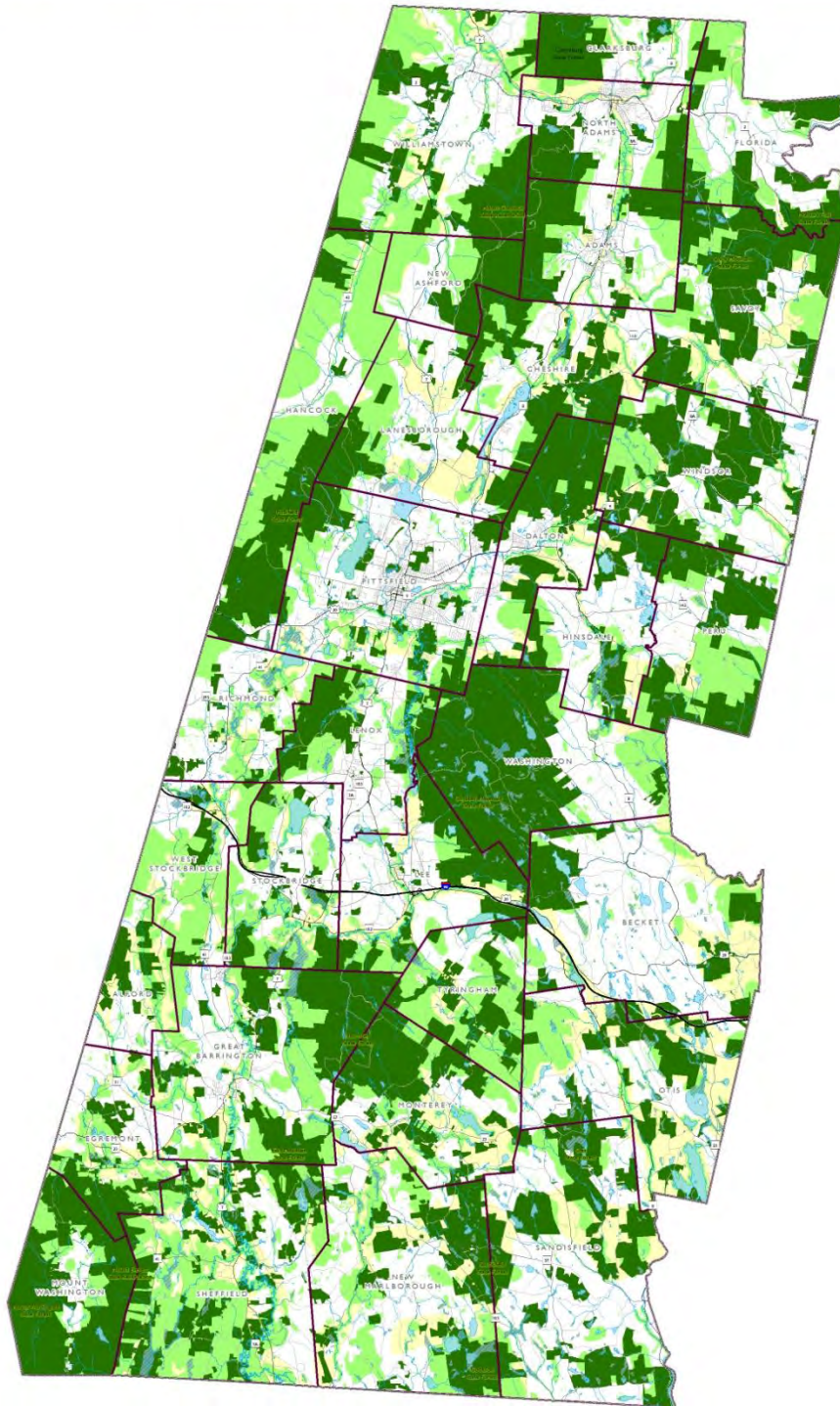
Step two: we incorporated areas identified as important by local conservation and recreation groups and by citizens who attended public forums. Notable areas were greenways within the main stem valleys of the Housatonic and Hoosic Rivers for walking, biking and paddling, and for protecting corridors for connecting or extending long-distance trails such as the Mahican-Mohawk and Taconic Crest trail systems.

HOW TO USE THE BERKSHIRE CONSERVATION FRAMEWORK MAP

It is important to note that this framework map is a regional guide – it does not possess any regulatory authority. The framework is developed for use on a regional scale and does not in any way limit or prohibit land use activities on any specific parcel or parcels of land. While the map does identify areas which should be prioritized for conservation as is possible, it does not mean that no development should occur in the Berkshire Conservation Priority Areas. Where conservation is not possible or desirable, private property owners may develop as zoning and other applicable regulations allow. However, the goal for new development in those areas is that it proceed more carefully in consideration of the natural and open space values present.

Due to the rich biodiversity and recreation options offered in the region, the framework includes fairly large areas, which would mean significant additions to the current supply of permanently conserved lands in the region. However, it is not envisioned that all of the land in the framework will be permanently conserved in its natural state. Rather, it is assumed and intended that the mapped framework be used when setting regional or municipal policies on development patterns across the county and in considering some future development projects. The purpose of the framework is to serve as a dynamic, fluid initiative to support biodiversity now and in the future. It offers a regional planning tool that advises future land protection efforts when balanced with careful residential and business development.

CONSERVATION FRAMEWORK



Legend

Habitat and Protected Land

- Current Permanently Protected Land
- Berkshire Conservation Priority Areas
 - BioMap2 Core Habitat
 - Priority Habitat of Rare Species
 - Priority Conservation Areas
 - CAPS > 0.8
- Berkshire Conservation Priority Area Connections

Water

- Major Rivers
- Other Rivers and Streams
- Wetlands
- Lakes and Ponds

Municipal and Infrastructure

- County Boundary
- Municipal Boundary
- Interstate Highway
- Roads



4/24/2014



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GOALS, POLICIES AND STRATEGIES

The following goals, policies, and strategies will be pursued to achieve the vision for conservation and recreation the region:

GOAL CR2.1: Develop and conserve in ways that will help support rich biodiversity now and in the future.

Policy CR2.1.1: Implement the conservation framework through aligning conservation policy and practice across the region.

Strategy A: Solicit Letters of Support or Adoption from all Conservation Groups

Work to solicit and secure letters of support or adoption of the conservation framework from all groups active in the region, including non-profits, land trusts, municipalities and state departments. The purpose of this letter is to acknowledge the map as the accepted guide for conservation in the region so that this tool can achieve its potential as a strategic tool to support coordination and alignment of conservation activity. It is understood that organizations and communities will have other conservation priorities, such as those related to agriculture or recreation, but recognition of the conservation framework for habitat protection values will help support a unified approach across the region. This is especially important as it relates to geopolitical boundaries, whether state, county, or municipal, to help strengthen continuity of conservation lands over time.

Strategy B: Encourage Municipalities to Reflect Conservation Framework in New or Updated Plans

The state encourages municipalities to develop and regularly update their Open Space and Recreation Plans. These plans identify conservation and recreation priorities based on community input and help guide municipal investment in new land acquisition, facility creation or improvement, and programming. As communities in the region draft or update these plans, they should incorporate the conservation framework into their overall conservation strategy, specifically as relates to policy or practice for habitat and biodiversity protections.

Policy CR2.1.2: Track and report progress on Conservation Framework map implementation.

Strategy A: Implement Procedures to Ensure GIS Conservation Data is Complete

Parcel-based data for conservation lands is maintained by the state through MassGIS, however, the data is incomplete and typically lags behind conditions on-the-ground due to the lapse of time between MassGIS data updates. Local maintenance of the data will help track conservation activity in the region and help ensure accuracy of the data that could also be used for maps and guides. While some conservation partners and municipalities occasionally send acquisition information to Berkshire Regional Planning Commission to incorporate in the open space data for the region, this is neither consistent nor comprehensive. BRPC should work with conservation entities to develop a mutually agreed upon methodology for keeping the GIS data updated on some regular schedule.

Strategy B: Report Annual Progress Through Berkshire Benchmarks and Conservation Partners

BRPC works to secure funding to support a regular report of annual conservation progress. The frequency of this update will depend on available resources and the determination of what intervals are most meaningful to track real progress and engage in a strategic discussion. Such a report should highlight progress not only in acres accumulated but also policies and practices adopted by conservation entities or municipalities to support conservation. This acknowledges those taking actions and highlights any best practices that could inform others in the region.

Strategy C: Revise Conservation Framework as Needed to Reflect Best Available Data

The conservation framework should be considered a living document that should be updated to show both new permanently conserved lands and also reflect changing priorities which may result from new or more refined data on habitat. The framework is intended to provide a best reflection of which lands are most critical to important habitat areas and to biodiversity over time. It is anticipated as climate science and ecological knowledge continue to advance, and more local data is gathered, the region may need to adapt the map to reflect the new best practices.

GOAL CR2.2: Improve knowledge and documentation of species of conservation concern.**Policy CR2.2.1: Improve and expand efforts to identify and protect species of concern populations.****Strategy A: Pursue Additional Field Surveys**

Continue to conduct field surveys to identify locations and habitat ranges for species of greatest concern; particularly for those that are known to have been under-surveyed in the past as identified in the *Massachusetts State Wildlife Action Plan (SWAP)*.

Strategy B: Increase Knowledge of State-listed Species

Consistent with the Massachusetts SWAP, coordinate the work of state, non-profit, and local biologists to conduct additional research on the life cycles and habitat needs of state-listed species in order to develop effective methods for the long-term protection and survival of those species.

Strategy C: Vernal Pool Identification and Certification

Work with volunteers and local landowners in efforts to investigate potential vernal pools; alert local Conservation Commissions and Planning Boards of their existence; certify vernal pools for greater protection under the Wetland Protection Act.

Strategy D: Protect Bat Species

The Executive Office of Energy and Environmental Affairs directs additional resources to the long-term protection of bat species in the state.

- Continue to monitor bat colonies affected by white nose syndrome (WNS).
- Continue to work with spelunkers and other cavers to reduce the potential spread of WNS by closing bat hibernacula to the public and ensuring compliance with the closures.
- The BRPC and regional conservation partners work with avian and bat experts, NHESP and DFW biologists and other state and federal agency personnel to develop wind energy facility siting standards that are protective of avian and bat species. Standards should be based on the newest available scientific evidence about wind turbine impacts on wildlife populations and mitigation options that are available to reduce those impacts. Existing development guidelines issued by the U.S. Fish and Wildlife Service in March 2012 (*Land-based Wind Energy Guidelines*) could be used as a reference.
- Continue to investigate and disseminate wind turbine mitigation techniques that show promising results, such as reducing cut-in speeds and curtailing operation during migration seasons.

Strategy E: Advocate for State Endangered Species Program Funding

Increase state financial support for the NHESP, which is underfunded and understaffed. Additional resources are needed to ensure that the agency can meet the legal and programmatic responsibilities entrusted to it.

GOAL CR2.3: Municipalities employ land use tools and practices that support habitat connectivity and minimize adverse impacts from developed areas.

NOTE: See also Land Use Element.

Policy CR2.3.1: Provide educational materials and guides on nature-friendly development tools in order to encourage and support their use and adoption.**Strategy A: Educate About Local Tools and Regulations to Support Landscape and Character**

BRPC, possibly with neighboring regional planning agencies, should develop a regional resource guide highlighting land use tools that communities can use to protect the area's natural resources. Tools that might be highlighted include, but are not limited to, the Berkshire Scenic Mountains Act, local wetlands bylaws, local scenic road bylaws, and conservation zoning. Adoption of the Community Preservation Act could also be highlighted as a financial tool available to towns. As a start to this process, BRPC should consider using its existing Planning Toolbox Series as a foundation upon which to build, update and expand.

Strategy B: Habitat Sensitive Design Standards Book

Create a design guidance document that communities can adopt as part of the permitting process to aid architects and developers with landscape and building layout. The Town of Franklin has created a practical and informative guidance document that can be used as a foundation upon which towns can build.

Policy CR2.3.2: Work with the MassDOT, the region's Metropolitan Planning Organization, and local Department of Public Works (DPWs) to reduce habitat fragmentation impacts caused by transportation infrastructure.**Strategy A: Identify High Mortality Rate Road Segments and Prioritize Them for Improvements**

MassDOT, DFW, Berkshire Environmental Action Team (BEAT) and other conservation partners should continue to track and prioritize for improvement roads that have high wildlife mortality rates. Although state-listed species are a high priority, crossings of large animals should also be monitored.

Strategy B: Implement Wildlife Crossing Best Practices

MassDOT should continue to coordinate with and draw experience from state transportation departments from across the nation in designing and constructing wildlife crossings in high wildlife mortality sites. MassDOT encourages and supports the attendance of local engineering firms and local DPW staff at the Northeastern Transportation and Wildlife Conference.

Policy CR2.3.3: Protect and improve aquatic connectivity.**Strategy A: Complete Bridge and Culvert Inventory**

Complete bridge and culvert assessments for all road crossings in the county. Work with UMass to gather data on the road crossings not yet inventoried and entered into its database. Support the local volunteer groups who have been the backbone of data gathering in the region.

Strategy B: Flood Vulnerability Assessment

Identify and prioritize for improvement the road crossings most vulnerable to flooding in an effort to reduce the impacts of severe storm events. Improve the response and repair of damaged road crossings during and after severe flood events so that repair work is conducted in a manner that reduces the risk of future flood damage while also protecting ecosystem function and wildlife movement. This requires improved communication between FEMA, MEMA, DEP, DOT and local officials. This includes the establishment of clear guidelines that local DPWs should follow regarding pre-disaster planning and post-disaster reporting and construction.

NOTE: See also Infrastructure and Services Element.

Strategy C: Advocate for Updated Methodologies

Conservation and transportation partners in the region should work with MassDOT, Mass DEP and the engineering community in the state to update the methodology used in determining bridge and culvert design to better accommodate severe storm events. This also pertains to stormwater management systems which also may be undersized.

Strategy D: Educate and Promote the Massachusetts Stream Crossing Standards

MassDOT and local municipalities should each incorporate the Massachusetts Stream Crossing Standards in all new and improvement road projects. To support this, MassDOT will continue to partner with conservation organizations, the engineering community and local DPWs to hold workshops about implementing the Stream Crossing Standards. Include in these workshops successful examples of wildlife crossings that have been proven to reduce wildlife impacts.

Strategy E: Targeted Dam Removals

Prioritize dam removals to achieve the greatest ecological benefits, while also meeting other regional needs. Prioritization should include restoring cold water habitats and other sensitive aquatic ecosystems, while also considering benefits such as recreational access. Prioritization should also consider whether dams targeted for removal could possibly serve as renewable energy sources in the future. Partners in the prioritization of dams will likely include dam owners and the Division of Ecological Restoration, DFW, DEP, the Department of Energy Resources, BRPC and conservation organizations. NOTE: See also **Climate and Energy** Element.

GOAL CR2.4: Work collaboratively to successfully reduce invasive species impacts.**Policy CR2.4.1: Improve tracking and monitoring of invasive species.****Strategy A: Invasives Task Force**

Establish a countywide Invasives Task Force to coordinate invasive species identification, monitoring, and management in the region. This task force could work with conservation partners and the local media to raise public awareness about the invasive species posing the greatest threats to the region.

Strategy B: Engage Communities and Volunteers to Monitor Invasives

Petition the DCR and DAR to expand the public awareness campaign on invasive species awareness directly to municipal officials and local residents. The campaign should clearly state the ecological, cultural and economic devastation that could occur from invasive insects such as the Emerald Ash Borer, Asian Longhorn Beetle and Woolly Adelgid.

- Develop an extensive, on-the-ground monitoring program for invasive pests of greatest concern.
- Recruit and educate volunteers to conduct field work; enlist student conservation classes and groups as partners.
- Expand monitoring across the region to identify new infestations. Enlist educated volunteers to monitor the forests of the region.

Strategy C: Create a Central, User-friendly Reporting System

- Create a single, central internet portal about all invasive species that residents can refer to and report to when they find one. Make this portal the first site that comes up on Google and other search engines.
- Similarly, create a single, central phone number that people can call to report invasive species they have found.

Policy CR2.4.2: Prioritize restoration efforts to control invasive species.

Strategy A: Collaborative Area-Wide Approach to Invasive Species Management

As invasive species are found in an area, land owners may benefit from guidance on relative threats, methods of spread, and best means of control. Because invasives can spread to adjacent areas if conditions are right, land owners should be encouraged to work with adjacent neighbors to achieve a more holistic management approach. Particular focus might be where neighboring properties suffer from the same species or where one property is a seed source for a region.

Strategy B: Educate Land Managers on Invasive Species

Educated land managers on how best to deal with invasive species on their properties. Invasive species management guidelines created by The Trustees of Reservations may be a helpful reference.

GOAL CR2.5: Work to restore habitat impacted by pollution and prevent future impacts to safeguard a clean environment for future generations.

Policy CR2.5.1: Promote practices that minimize the impacts of stormwater runoff.

Strategy A: Regional Low-Impact Design Workshops

Conduct a series of workshops on Low Impact Development (LID) techniques to maintain natural land cover and reduce impervious surface area. Highlight success stories of developments that have utilized LID techniques. Efforts should target audiences that have very direct influences on development patterns, including developers, engineering/landscape design firms, planning boards and conservation commissions. BRPC should take the lead in facilitating this effort, likely partnering with federal, regional and state organizations.

Strategy B: Municipal LID Education and Training

Increase local permitting boards' knowledge of LID techniques so that they will feel comfortable and confident in reviewing and requiring these techniques in development projects that come before them. This can be achieved through resource guides and periodic trainings, such as an annual training as board membership changes over time.

Strategy C: Protect Sensitive Ecosystems

Identify and prioritize sensitive wetland resource areas and other sensitive habitats being impacted or that have the potential to be impacted by runoff from development. Partners in prioritizing areas will likely include NHESP, DFW, DEP, BRPC and local conservation organizations. BRPC will work with municipalities in those areas to develop LID standards, and possibly to consider other land use tools to reduce impervious surface areas.

Strategy D: Prohibit New Stormwater Discharges

Town permitting authorities and inspectors ensure that no new stormwater discharges or surface runoff enters their municipal storm drain systems, including both new and redevelopment projects. Municipalities will work with developers to correct unintended discharges if they occur after construction is completed.

Strategy E: Conduct an Ecological Landscaping Program for Landowners

Create an educational program that educates residential and business landowners about the potential environmental impacts of traditional landscaping techniques and offer alternatives to minimize those impacts. Enlist the landscapers, nurseries and garden centers as partners in this effort by holding the workshops at retail stores where people purchase landscape products. Workshops at these shops will inform both the buying population and the retail staff. Promote the workshop series through a variety of media, including print, radio and trade newsletters, such as chambers of commerce.

Policy CR2.5.2: Protect and improve shoreline habitat.**Strategy A: Educate on Vegetative Buffers**

Continue to educate municipal officials and waterfront landowners about the value of increasing vegetated buffer plantings to reduce surface runoff and facilitate infiltration of rain water to maintain natural water temperatures in our rivers and lakes.

Policy CR2.5.3: Strategically continue land protection along waterways and shorelines.**Strategy A: Emphasize Conserving Lowland Habitats**

Conservation partners are encouraged to focus land acquisition and conservation efforts on lower elevation sites as a nearer term priority. These areas support many state-listed species, exemplary plant communities and calcareous wetlands in the region but are particularly susceptible to development or development-related impacts. While these sites can often be challenging to acquire, conservation partners, including municipalities, could collaborate to craft an approach to encourage property owners to consider direct conservation or habitat-sensitive approaches. Permanent land conservation of floodplain areas could be used as a component of the cleanup of PCBs from the Housatonic River

Strategy B: Forest and Land Management Plan Advocacy

Regional conservation partners reach out to private landowners of unfragmented habitat and educate them on the importance of their lands to regional biodiversity. Aid them in developing land management and/or forest management plans to maximize the protection of biodiversity and habitat linkages.

Strategy C: Homeowner Education and Outreach

Conduct a region-wide campaign to educate shoreline property owners, realtors and developers of the ecological benefits of maintaining or improving vegetated buffers. Partners in this effort could include environmental groups, lake associations, and landscape architects.

Policy CR2.5.4: Work to remove Berkshire Waters from the Massachusetts Integrated List of Waters (303(d) List).

Strategy A: Identify Issues, Prioritize Improvement Projects

BRPC and Berkshire municipalities, partnering with watershed associations, lake associations and other conservation organizations, continue to conduct assessments where water quality degradation is known or suspected to exist. BRPC and conservation partners continue to actively pursue improvement projects to address water quality degradation in the watersheds of the county. Nonpoint source pollution from development and/or storm events should be prioritized for design and construction projects.

Strategy B: Collaboratively Support Watershed Management Efforts

Support watershed associations and lake and pond associations in their efforts to conduct improvement projects within their areas of focus. Associations develop management plans to investigate known pollutant contributors and identify new potential contributors in their watersheds. Outreach efforts should be targeted to waterfront property owners to education them on how their land use activities affect the water quality of their river, lake or pond. Sites are prioritized for pursuit of funding to conduct mitigation projects.

Policy CR2.5.5: Maintain or improve cold water fisheries.

Strategy A: Shoreline Vegetative Buffers and Shading

Watershed associations and local Trout Unlimited (TU) chapters identify sites where installing shoreline vegetation along streams and rivers will protect or improve water quality and temperature. Even a narrow buffer of trees 15-20 feet wide along stream channels can provide the shade needed to help offset the temperature increases of development and climate change.

Strategy B: Brook Trout Protection

DFW and TU should continue to participate in the Eastern Brook Trout Joint Venture as a way to stay current with brook trout protection efforts across the greater eastern U.S.

Strategy C: Mitigate Thermal Pollution

BRPC and conservation partners continue to investigate potential options to mitigate thermal pollution throughout the county resulting from impervious surface areas. In the hilltowns, focus areas should be town centers and roadways that discharge into high quality streams; in lowlands focus should be centered on protecting cold water tributaries to our rivers that serve as refuge areas for trout and other sensitive species during hot weather and low flow periods. In the Hoosic Watershed, particular focus should be placed on ways to reduce impacts from industry and concrete flood chutes in the in the downtowns of Adams and North Adams.

Policy CR2.5.6: Create a nonpoint source pollution, particularly stormwater management, educational program for municipal officials.

Strategy A: Nonpoint Source Pollution Education

BRPC and other regional planning agencies explore the creation of the Nonpoint Education for Municipal Officials program in Massachusetts. Consider housing the program within the regional planning agencies or UMass Amherst, looking to University of Connecticut as a model.

Strategy B: Maximize Impact of Existing Education Opportunities in the Region

MassDOT and the Baystate Roads Program offer environmental educational workshops for local DPWs that focus particularly on improving stormwater management and flood control along the road systems.

Strategy C: Training for Local Development Review Boards

Empower local permitting authorities (conservation commissions, planning boards, zoning boards of appeals) to reduce impervious surface area, retain shoreline vegetation and require Low Impact Development techniques in the development projects that come before them. Provide training sessions, that include several real life development projects that have utilized vegetated buffers and LID techniques.

Strategy D: Highlight Best Practices Around the Region and State

Highlight state and local development and public works environmental success stories to serve as practical examples of what is being done by colleagues in the region. This could be the development of a guidebook, comprised largely of real life examples of low impact development techniques and projects from around the Northeast that employ them and of recent road improvement projects that meet the Stream Crossing Standards. The guidebook should be offered in print and on the internet.

Policy CR2.5.7: Strengthen and enforce wetland resource protection policies and regulations.**Strategy A: Advocate Enhanced Vernal Pool Protections at State Level**

Work with the Mass DEP, Mass. Association of Conservation Commissioners and other interested parties in expanding the Wetlands Protection Act to include all vernal pools not currently protected under the Act, including a buffer zone large enough to protect important habitat surrounding the pools.

Strategy B: Continue the Berkshire Conservation Agent Program

Pursue continued funding for the Berkshire Conservation Agent Program (BCAP), which provides technical support to the volunteer Conservation Commissions in the region that administer the Mass. Wetlands Protection Act.

Strategy C: Increase the Number of Local Wetlands Bylaws in the County

Local wetland bylaws are a powerful tool communities can employ to better protect wetland habitats in their jurisdiction, yet only four Berkshire towns have adopted such bylaws. BRPC and BCAP will work to develop resources highlighting the form and function of these bylaws, including model text and community-specific maps illustrating where bylaws are present. This information can be then shared with local planning boards and conservation commissions to inform them, as well as elected officials and residents, about this tool and its role in natural resource protection.

GOAL CR2.6: Encourage municipalities, businesses and residents to be knowledgeable and conscientious stewards of the region's natural resources.
Policy CR2.6.1: Increase the public's awareness of the region's unique ecological value.**Strategy A: Educate About Region's Biodiversity**

Publicize the availability of the NHESP Survey booklet, *The River and Its Valley, Conserving Biodiversity in the Housatonic River Watershed of Western Massachusetts*. Issue a press release announcing its availability in local libraries and online. Distribute it to school districts in the watershed.

Strategy B: Work with Natural Heritage to Maintain Updated Community Profiles for the Region

Promote the availability of new, community-specific planning documents created by NHESP for each of the 19 municipalities in the Housatonic River Watershed to town officials, conservation organizations and land trusts in the watershed. Lobby the NHESP to update and create similar documents for the communities of the Hoosic River Watershed.

Policy CR2.6.2: Increase the public's awareness of environmental issues.

Strategy A: Educate landowners on how their land use activities affect water quality.

- Inform landowners of the impacts of their lawn maintenance activities, providing them with tips to control stormwater runoff and avoid contributing pollutants to nearby waterways.
- Prioritize neighborhoods for storm drain stenciling campaigns, informing people that storm drains discharge into nearby waterways with absolutely no treatment.

Policy CR2.6.3: Encourage and increase public involvement in the Rest of River Cleanup.

Strategy A: Public Involvement

Conservation stakeholders and municipalities in the Rest of River Cleanup area should advocate for more public involvement in the cleanup negotiation process. To date, public involvement has been sparse. This is a critical opportunity for the region to address longstanding pollution issues that impact environmental quality and recreational uses of natural areas. Some key themes that the region's advocates have stressed to date include:

- Conservation organizations, agencies and interested citizens' work together to find common ground and work cooperatively to press their issues throughout the public and negotiation process with GE.
- Strongly advocate for adaptive management strategies as work proceeds through the Rest of River area.
- Emphasize the importance of restoration of habitat and hydrologic function after Rest of River cleanup activities.

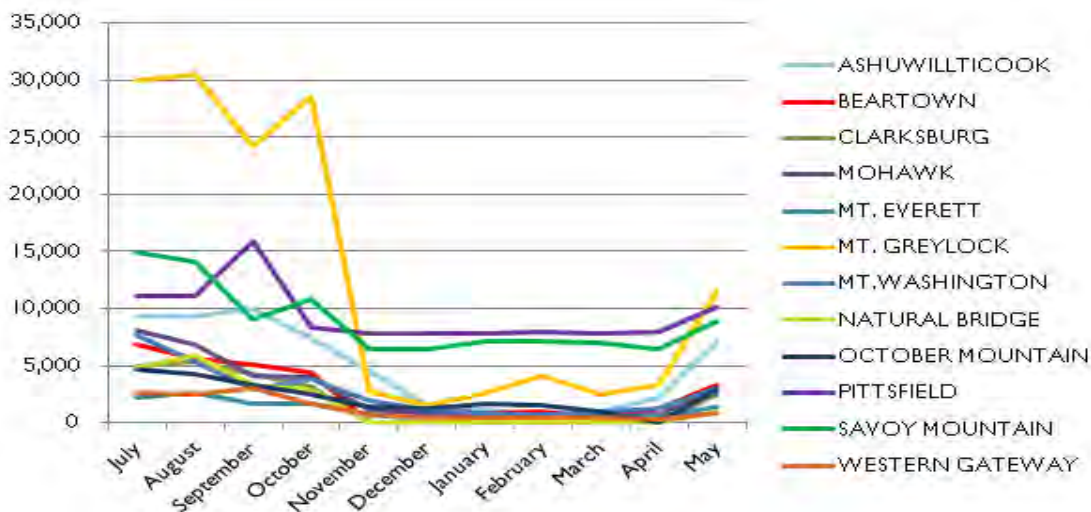
3. OUTDOOR RECREATION

Berkshire County is fortunate to have a wealth of outdoor recreation options. With a notable system of state parks and reservations and a large number of independent and municipal holdings, residents and visitors to the region have many opportunities to enjoy nature and recreation right outside their doors. This system is a hallmark of the Berkshires and one that is highly valued by residents who wish to see it further expanded and connected. The following sections highlight the current recreation resources available for public use and establish the goals, policies and strategies for how to enhance this system into the future.

KEY OUTDOOR RECREATION AREAS

The county boasts 22 state parks, forests and reserves managed by the Department of Conservation and Recreation (DCR). Large DCR holdings include October Mountain State Forest (~16,100 acres and the state's largest) Savoy Mountain State Forest (~11,100 acres), Mount Greylock State Reservation (~12,500 acres), Beartown State Forest (~12,000 acres), and Pittsfield State Forest (~10,000 acres). The system of parks and reserves provides a wide range of outdoor recreation options throughout the year, but are used most heavily during the summer vacation season. Many of the state forests offer camping and visitor amenities, while a few offer special facilities such as visitor centers, swimming beaches, and lakes or ponds with boat launches. While summer months tend to be more active, as illustrated in Figure CR3, there are higher levels of winter activity in Pittsfield and Savoy Mountain State Forests, which are both popular destinations for snowmobiling. The state's highest peak, Mount Greylock, is by far the most visited site in the region for hiking, taking a scenic drive or bike ride, or viewing fall foliage.

Figure CR4: Monthly Visitation to Selected State Outdoor Recreation Sites



Source: MA Department of Conservation and Recreation, 2011

Wildlife Management Areas (WMAs) and conservation easements, managed by the Division of Fisheries and Wildlife (DFW), are another important recreational resource, offering 28 properties for public use. Whereas many DCR properties tend to have recreational facilities such as camping and extensive trail systems, WMAs are managed primarily for wildlife conservation and often lack such developed infrastructure. Some WMAs have trails, but these are often not formally maintained as such. Motor

vehicles are not allowed on WMA lands outside of roadways and off-road vehicles are prohibited. The county hosts nine WMAs larger in size than 1,000 acres, with Chalet (~6,400 acres), Peru (4,700 acres) and Stafford Hill (1,600 acres) being the three largest sites. WMAs are best enjoyed by those who prefer more of a wilderness experience. These lands are open to the public for hiking and wildlife viewing, but visitors should be careful during popular hunting seasons, such as those for deer, turkey, pheasant, and bear.

In addition to the major reserves held and managed by the state, there are a wide variety of conservation partners with reserves that offer and encourage public recreation. Some notable examples are those held by The Trustees of Reservations, including Notchview in Windsor, a destination for Nordic skiing in the region, and Monument Mountain in Great Barrington, a popular hiking spot. The Massachusetts Audubon Society also owns and operates Canoe Meadows in Pittsfield and Pleasant Valley Wildlife Sanctuary in Lenox. Each offers hiking trails, interpretive signage and many wildlife viewing opportunities. Berkshire Natural Resources Council owns a number of properties, notably Olivia's Overlook on 408 acres in Lenox and Richmond and the 736-acre Hoosac Range reserve east of North Adams city center. Several other conservation partners, including local land trusts, also typically allow public use of their lands for visitors to enjoy, such as Becket's Historic Quarry and Forest.

KEY OUTDOOR RECREATION ACTIVITIES

The land, lakes, and rivers of the region accommodate a wide selection of year-round outdoor recreation opportunities. The following sections review key assets of the region by activity type.

Table CR6: Popular Seasonal Outdoor Recreation Activities in the Berkshires

	Activity	Spring	Summer	Fall	Winter
Land	Nature and Wildlife Viewing	●	●	●	●
	Birding	●	●	●	●
	Hiking	●	●	●	●
	Snowshoeing				●
	Mountain Biking	●	●	●	
	Cycling	●	●	●	
	Off-Road Vehicles	◐	●	●	◐
	Snowmobiling				●
	Hunting	●	◐	●	●
	Nordic Skiing				●
	Downhill Skiing				●
Water	Swimming		●		
	Kayaking/Canoeing/Boarding	●	●	●	◐
	Boating (Sail/motor)	◐	●	◐	
	Fishing/Ice Fishing	●	●	●	●

Land-Based Outdoor Recreation

Nature and Wildlife Viewing

Many species that were once rare or extirpated have returned to the area, offering us the thrill of viewing or encountering them. Notable residents that have returned are turkey, bear, moose, herons and birds of prey, particularly the iconic bald eagle. Figures compiled by the U.S. Fish and Wildlife Service in 2006 indicate that approximately 1.9 million residents participated in wildlife viewing activities in Massachusetts. Sixty-seven viewing sites have been identified across the state as exceptional wildlife viewing areas, and six of these areas are in Berkshire County. The viewing sites were chosen by to be published in the *Massachusetts Wildlife Viewing Guide*, a key tool for finding the best places to watch wildlife. Some areas, such as Mount Greylock and Monument Mountain contain open cliffs that offer bird's eye views of raptors, while others such as Darey or Moran WMAs offer large open, unforested landscapes in which to view large game species and birds. The rich diversity of our terrain and habitats offer botanists plant species found nowhere else in the state. A guide to the sites is available in print and web-based media.



Table CR7: Berkshire County Wildlife Viewing Areas

Property Name	Location	Ownership
Mount Greylock State Reservation	Adams, Cheshire, Lanesborough, New Ashford, North Adams, Williamstown	DCR
Darey Housatonic Valley Wildlife Management Area	Lenox	DFW
Pleasant Valley Wildlife Sanctuary	Lenox	Mass Audubon Society
Bartholomew's Cobble	Sheffield	The Trustees of Reservations
Monument Mountain	Stockbridge	The Trustees of Reservations
Eugene D. Moran Wildlife Management Area	Windsor	DFW

Source: Mass. Wildlife Viewing Guide

Birding

The region hosts seven sites that have been designated by Mass Audubon as Important Bird Areas (IBAs):

1. Hoosic Plateau
2. Mount Greylock
3. Eugene Moran Wildlife Management Area
4. Central Berkshire Lakes
5. Upper Housatonic Valley
6. Konkapot and Agawam Marshes
7. Mill Pond and Marshes (Smiley's Pond)

These key sites have been identified as contributing to the preservation of significant bird populations or communities across the state. Birds rare to the state such as the blackpoll warbler, mourning warbler, common moorhen, and American and least bitterns can be found in these areas. A wide variety of waterfowl and wading birds can be found in the lowland lakes, ponds and marshes.

Hiking and Walking

Hiking trails are found throughout the region in all DCR properties and many of the DFW properties. Trail systems also abound in public properties owned by municipalities, non-profit conservation organizations and land trusts. The region's varied topography make it possible to offer a wide range of trails for different levels of difficulty.

In addition to these site-specific day hike options, the region is fortunate to have three long-distance hiking trails:

1. **The Appalachian National Scenic Trail (AT):**

The AT is a 2,180-mile hiking trail that spans 14 states along the east coast from Georgia to Maine.

Completed in 1937, the trail is now an internationally renowned recreation destination that sees 2-3 million visitors on its various stretches each year.

The 89 miles of trail that traverse Massachusetts from Connecticut to Vermont are all located in Berkshire County. The Appalachian Trail Conservancy, National Park Service, and the state have conserved 38,972 acres of land in the county along the route. It is the only long-distance hiking trail in the state that is fully protected along its entire length.



2. **Taconic Crest Trail:** The Taconic Crest Trail winds 35 miles across the Massachusetts and New York borders into Vermont along the Taconic Mountain Range in the northwest edge of the county. The South Taconic Trail is a 12-mile hike in the southwest section of the county reaching into neighboring New York and Connecticut.

3. **Mahican-Mohawk Trail:** This trail, envisioned as a 100-mile long-distance trail from the Connecticut to the Hudson, follows the corridor of the historic Native American trade route from the Connecticut River to Hudson River in upstate New York. The route would preserve an important historic trail (even traversing the original trail in one location) and form an east-west connection to and between the trails and amenities of the Connecticut River Greenway to the east with those in the Hudson River Valley Greenway to the west. Today, approximately 34 miles of the trail are open and designated in Massachusetts as woodland trail, on-road segments, and water trail on the Deerfield River. Although primarily envisioned as a hiking trail, different segments are also appropriate for cycling, snowmobiling, horseback riding, and paddling.

In addition to hiking trails, the region offers a number of other trails for different activities. These trails are discussed in greater detail under each activity type.



Promoting Active, Healthy Lifestyles

In January 2012 the Departments of Conservation and Recreation, Public Health, and Agricultural Resources signed a joint resolution with the mutual goal of encouraging people to maintain a healthy lifestyle through year-round outdoor recreation and quiet enjoyment in our state parks and eating locally grown and produced agricultural products. The DCR has identified several trails in its forests and parks that are relatively easy to walk or hike.

Healthy Heart Trails are identified by a green heart symbol, each measure approximately 1.5 miles or less in length and graded at easy to moderate in activity level. Seven Healthy Heart Trails have been identified in Berkshire County, two of which are ADA accessible:

- Ashuwillticook Rail Trail – Lanesborough, Cheshire, Adams (ADA)
- Benedict Pond Loop Trail – Beartown State Forest, Monterey
- Gillmore Short Loop Trail – Tolland State Forest, Otis
- Bradley Farm Loop Trail – Mt. Greylock State Reservation, Lanesborough
- York Lake Loop Trail – Sandisfield State Forest, Sandisfield
- Elder Trail – Natural Bridge State Park, North Adams
- Tranquility Trail – Pittsfield State Forest, Pittsfield (ADA)

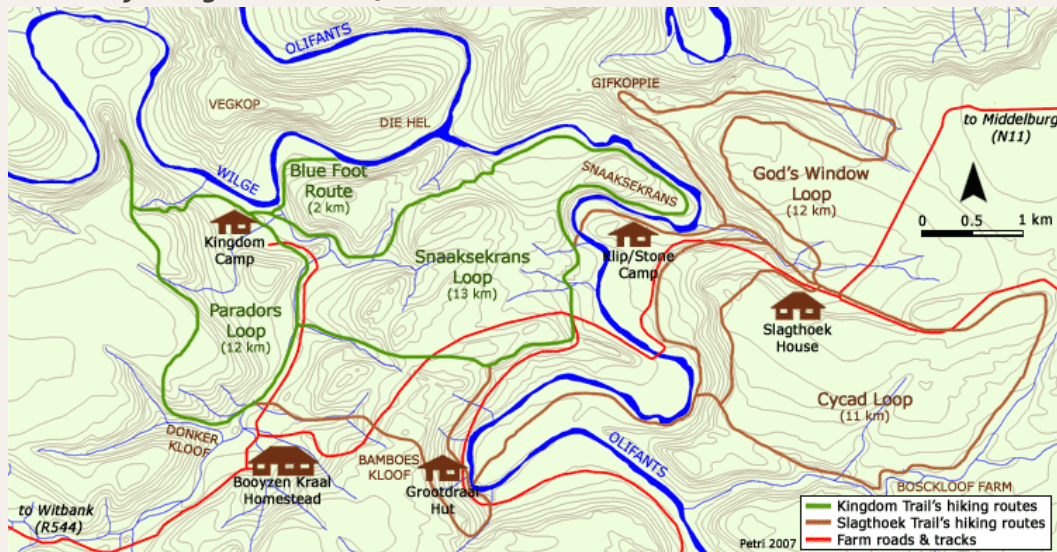
Mountain Biking

There are eight DCR properties (listed below) with trails designated for mountain biking. Kennedy Park, a Lenox town-owned park, is also a well known mountain biking destination. These properties are scattered across the county.

- Beartown State Forest
- Mt. Greylock State Reservation
- Mt. Washington State Forest
- October Mountain State Forest
- Pittsfield State Forest
- Savoy Mountain State Forest
- Tolland State Forest
- Windsor State Forest

The Berkshire Chapter of the New England Mountain Biking Association (NEMBA) has been actively working with the DCR to identify and maintain sustainable trails in state forests and parks. The organization's vision for the region is to identify and maintain the trails most suitable and sustainable for mountain biking, retire or replace unsustainable trails, and expand the trail system where appropriate. In 2009 NEMBA created a mountain biking vision plan for the Pittsfield State Forest, and is currently participating in the resource management planning process for the forest.

Case Study: Kingdom Trails of Northeastern VT



The Berkshire Chapter of the New England Mountain Biking Association would like to see the region investigate the development of a series of trails similar to those that have been created in partnership with the Kingdom Trails of northeastern Vermont. This nonprofit organization creates and maintains more than 100 miles of biking and hiking trail, many of which serve as cross-country and snowshoe trails in the winter. The trails are located across the properties of more than 55 individual landowners, and are partially supported by affordable user fees. This is somewhat similar to the trail systems maintained by snowmobile clubs across Massachusetts, whereby local clubs groom and maintain trails across a mix of public and private lands. Kingdom Trails hosts events throughout the year and conducts bicyclist educational programs encouraging users to protect the resources on which the trails are located, such as discouraging biking during mud season. Because the Berkshires is located so much closer to the metro New York and Boston areas than the Northeast Kingdom, the region may be well situated as a mountain biking tourist destination.

Cross-country skiing and snowshoeing

There are several non-profit and private properties across the region that offer trails for cross-country skiing and snowshoeing, while DCR lists 12 state forests that also offer winter trail systems. Although most of the trails are not groomed, many trails do get packed down through use and are easily accessed. Five sites groom their trails specifically for cross-country skiing:

- Notchview, Windsor
- Hilltop Orchard, Richmond
- Cranwell, Lenox
- Kennedy Park, Lenox
- Canterbury Farm, Becket

Hunting

Hunting is a long-standing tradition in Berkshire County, with a total of 21 game species available, including popular species such as white tailed deer, bear, turkey, pheasant and various waterfowl. While hunting for different game species is open in all four seasons, the fall shotgun deer season is the most popular. Hunting is allowed on all state-owned conservation lands except for certain designated areas. Pheasants are stocked in seven WMAs, two state forests, and 14 other sites across the county.

Off-Road Vehicles (ORVs)

The Berkshires hosts all four state forests that allow ORVs: October Mountain (30 miles of trails), Beartown (25 miles of trails), Tolland (15 miles of trails) and Pittsfield (14 miles of trails). Through informal surveys, the DCR estimates that the majority of ORV users in Pittsfield State Forest were Massachusetts residents. This is in contrast to October Mountain and Beartown state forests, where the majority of visitors were out-of-state residents. The state of Connecticut does not allow motorized vehicles in their state parks, so these southern forests are popular with riders from that state.

Snowmobiles

The Berkshires host a large portion of the Statewide Snowmobile Trail System (SSTS). This 2,000-plus mile system is unique in that it is comprised of both public and private lands that crisscross the state, reaching into nearby counties and other states. This trail system exists only seasonally and private property access arrangements are structured accordingly. The statewide trail system is operated and maintained by the 30 local clubs that form the Snowmobile Association of Massachusetts (SAM) which works closely with the Massachusetts DCR. Trail passes are required to access the private land portions of the Statewide Snowmobile Trail System.



The marina on Pontoosuc Lake, a popular boating, swimming and fishing destination located in Pittsfield and Lanesborough.

Water-Based Recreation

Boating

The county has more than 30 lakes and ponds that are open to the public, twenty of which have public boat launches. Most of the larger recreational lakes that better accommodate motorboats are located in the Housatonic River Watershed, with the exceptions being Cheshire Reservoir (in the Hoosic Watershed) and Big Pond and Otis Reservoir (in the Farmington Watershed).

Kayaking and Canoeing

The county's rivers serve as blueway recreational routes for canoeists and kayakers. Overall, there are more than 25 formal boat launches and canoe/kayak access sites on the rivers across the county. Sections of the Housatonic and Hoosic rivers can be paddled much of the year. Traveling the full lengths of the rivers through the county is difficult without some brief land-based travel due to a number of dams. A popular and easy paddling route is the stretch of the Housatonic River that meanders through the George Darey Wildlife Management Area in Lenox, with easy boat access areas at each end of the trip at New Lenox Road and Crystal Street. Sections of the river as it flows through the towns of Lee, Stockbridge, Great Barrington and Sheffield are also relatively easy to paddle, although dams segment the river into small sections, requiring portage or exits. Sections of the Hoosic River are also popular paddling areas, but again the river is segmented by dams.

Fishing/ Ice Fishing

Fishing is allowed year-round in Berkshire waters. Trout are stocked in dozens of streams and river sites throughout the region in spring and during a short season in select waterways in the autumn. There are catch-and-release areas in Lee and Glendale. Broodstock salmon are stocked in Goose Pond, Onota Lake and Stockbridge Bowl. Ice fishing is a major winter activity in Berkshire County. Our frozen lakes and ponds often support ice not found in the eastern portion of the state or southern New England, drawing anglers into the region. Several fishing derbies are held throughout the county, often sponsored by area sporting clubs or held as fundraising events. Fly fishing is also a popular option and some guided trips are now offered by private companies.

Swimming

The county is blessed with lakes and ponds, and many of the county's municipalities host swimming areas with beaches. While some municipal beaches are open to the public at large, many are only open to town residents. Seven DCR state forests host public swimming beaches, although there may be a small parking fee associated with their use. There are no outdoor pools open to the general public in the county. The need for additional swimming facilities has been cited in several open space plans throughout the region.

Other Outdoor Recreation Options

Parks and Recreation Fields

There are dozens of municipally-owned parks that provide outdoor recreation opportunities across the county, with the city of Pittsfield alone owning 29 of these. The parks are typically located within the more developed areas of towns or cities and have improvements such as ball fields, playgrounds, and other facilities. Some exceptions to this include Windsor Park in North Adams which is structured more like a state park with a camping, boating, and hiking emphasis; Kirvin Park in Pittsfield which is largely forested with trails leading into October Mountain State Forest; and Kennedy Park in Lenox, with many trails that make it a popular hiking, mountain biking and cross-country skiing destination. Often overlooked are the public school grounds that host playing fields or playgrounds, and which can be used by the public when not being used specifically for sports events or during school hours. Larger parks are shown in light green and playing fields are shown in red on the Open Space and Recreation Map.

Golf

There are twelve 18-hole golf courses in the region, most of which are open to the public, and five 9-hole golf courses all open to the public. These open spaces can provide travel corridors for wildlife, and are often used for snowshoeing or cross-country skiing in the winter. All courses are privately owned and none are permanently protected lands.

Table CR8: Golf Courses of the Berkshires

Course or Club Name	Location	Par	Course Rating (men/women)	Public/Private
18-Hole Golf Courses				
Bas Ridge Golf Course	Hinsdale	70	63.7/65.9	Public
Berkshire Hills Country Club	Pittsfield	72	72.8/72.9	Private
Cranwell Golf Club	Lenox	70	70.8/70.2	Public
Country Club of Pittsfield	Pittsfield	71	71.5/71.8	Private
Egremont Country Club	Egremont	71	68.7/68.1	Semi-private
Pontoosuc Lake Country Club	Pittsfield	70	69.7/74.7	Public
Skyline Country Club	Lanesborough	71	68.8/67.5	Semi-private
Stockbridge Country Club	Stockbridge	71	73.1/72.2	Private
Taconic Country Club	Williamstown	71	73.5/71.4	Semi-private
Wahconah Country Club	Dalton	71	72.5/75.1	Semi-private
Waubeeka Golf Links	Williamstown	71	70.6/69.6	Semi-private
Wyantenuck Country Club	Great Barrington	70	70.8/70.3	Private
9-Hole Golf Courses				
Donnybrook Country Club	Lanesborough	36	74.2/69.2	Public
Forest Park Country Club	Adams	34	65.9/68.8	Semi-private
General Electric Athletic Association	Pittsfield	36	70.6/69.2	Semi-private
Greenock Country Club	Lee	35	69.8/70.6	Semi-private
North Adams Country Club	Clarksburg	36	67.0/68.4	Semi-private

Source: *Berkshire County Golf Guide, Berkshire Eagle, 2010*

Bike Trails

The Berkshire Bike Path Council has been tireless in their pursuit of a Connecticut-to-Vermont biking trail through the county, using the Ashuwillticook Rail Trail as the central spine for this endeavor. The long-term vision is that this trail will one day extend from Connecticut to Vermont, serving as a central trail from which links will reach out into town centers and to other public recreational sites. Currently the Ashuwillticook Rail Trail provides 12-miles of paved way that is flat and family-friendly, the region's only paved multi-use trail. Much of the trail follows Cheshire Reservoir and the Hoosic River, offering visitors a chance to enjoy lake, wetland and riverine ecosystems. Users from across the region widely support the extension of the rail trail towards North Adams, roughly following the river corridor. A grant from the National Scenic Byway Program is currently funding an effort to locate a bicycle/pedestrian trail along Route 2 that would connect the downtown areas of North Adams and Williamstown, again following the Hoosic River corridor. Bike planning is a major component of a multi-modal transportation system.

Bicycling Through The Berkshires A COUNTY-WIDE VISION

Bicycling Through The Berkshires is a vision for a border-to-border network of bicycle paths and routes that will provide safe opportunities for exploring and enjoying our county's natural, cultural and historic resources, and for promoting public health and alternative transportation.

Partners

Berkshire Bike Path Council
Berkshire Cycling Association
Berkshire Natural Resources Council
Berkshire Regional Planning Commission
Massachusetts Department of Conservation and Recreation
MassHighway
National Park Service
Rivers & Trails Program
Upper Housatonic Valley National Heritage Area

Local Committees

Adams, Cheshire, Great Barrington,
Lanesborough, Lee, Lenox, Pittsfield,
Sheffield, Stockbridge, &
Williamstown-North Adams

Berkshire BIKE PATH



Berkshire Bikeway Vision

With assistance from the National Park Services, this map was developed as part of the Berkshire Bikeway Implementation Plan, whereby the county is connected by bike trails in neighboring Connecticut and Vermont.

On-Road Cycling

On-road biking is also becoming more popular, with several trail routes and loops mapped throughout the region and “share the road” signs becoming more prominent. While technically this can be enjoyed on all roads, cyclists typically have to balance the narrow road widths on most roads in Berkshire County with relative traffic volumes. Steep grades are found in many locations. The five southern Berkshire towns of Lee, Lenox, Stockbridge, Great Barrington and Sheffield have created a coordinated series of routes through these towns. Cycling on a road versus a bike path is preferred by fans of the sport and a number of formal and informal biking groups have begun to organize across the county, notably Berkshire Cycling Association (BCA) , to orchestrate group rides. These serve the dual purpose of making the ride a fun group event as well as enhancing the visibility and safety of the riders through their presence in a group.

Downhill Skiing

The region hosts four ski areas – Bousquet, Butternut, Catamount and Jiminy Peak – and is a popular east coast destination for downhill skiing. In addition to skiing, the owners have diversified their offerings over the years and now include summer options such as tubing, zip lines, outdoor concerts, and conferences to help balance out the seasonality of the skiing industry.

Camping

There are 19 camping facilities across the county, seven of which are located within DCR state forests, one owned by the city of North Adams and eleven of which are privately owned. Campers typically engage in a variety of outdoor activities while visiting, often hiking, biking, and kayaking when not at their campsite. They also patronize shops, restaurants, and cultural venues.

Summer Camps

The Berkshires are home to a large number of summer camps, generally located along a lake or pond. It should be noted that these properties are not permanently protected from development, but they do contribute to the rural character of the region. While these options are typically private, for-profit endeavors they, like campgrounds, are direct examples of recreation-based economic activity in the region, often providing substantial revenue to local shops and businesses to the rural town in which they are located.

Outdoor Events and Races

The region has seen an increase in the number of competitive race events. The Josh Billings Runaround, a charitable triathlon event in Stockbridge, has been in operation for several decades. Recently numerous new additions have been made to the roster of events in the region including the Lenox Memorial Day Marathon and, for the more adventurous, the Thunderbolt Ski Race in Adams. The Hoosic River Watershed Association holds its annual Riverfest event each spring, at which canoeing and rafting the Hoosic River is a popular offering. Sports clubs and other groups host fishing derbies and turkey shoots, often as fundraisers for local causes.

OPPORTUNITIES AND CHALLENGES

The State of our State Facilities

Massachusetts is a national leader in creating public outdoor recreation lands, with nearly 10% of the state's land mass in state forest or parks ownership. However, according to the Environmental League of Massachusetts, the state is ranked 48th in its spending per capita on its state parks, at \$63 per person for park services, less than half the nation-wide average of \$139 per person. The forest and parks system relies heavily on state budget funding: 85% of DCR budget comes from the General Fund, 7% from fees and leases, and 8% from federal funds. The DCR suffered a 25% budget cut between 2000 and 2006 which resulted in a \$1.2 billion backlog of maintenance projects. State budget cuts cost the DCR 20% of its staff in the last five years, while at the same time new lands were added to their management responsibilities and public attendance rates increased. As a result, several parks are no longer staffed, trails have fallen into disrepair, and portions of DCR roadways are closed. The loss of services or facilities have been cited as a concern by local officials and tourism business owners who, unaware that some amenities are closed, have inadvertently directed visitors to the sites only to have them return and complain about being misdirected. Although DCR's Western Region hosts a significant portion of the agency's land, including some of the largest properties in the state, the only consistent interpretive program offered to the public is at Mount Greylock State Reservation.

Illegal ORV use on DCR and DFW lands are a consistent environmental problem, as the vehicles tear up vegetation and soil and damage natural resources. Continued cuts in budgets severely hinder state agency staff to patrol and enforce vehicle prohibitions.

Trail Mix and Maintenance

Trail erosion has been cited by local outdoor enthusiasts and organizations as one of the most pressing issues in the region. Most of the trails were created decades ago when there was little thought of soil erosion or sediment transport into wetland resource areas. Not all trails experience the same problems. Some trails have erosion and/or compaction issues due to overuse, while others are becoming overgrown and disappearing from lack of use.

Some activities, such as mountain biking, motor bikes and off-road vehicles (ORVs), require trails that are less prone to erosion and soil disturbance. Trail construction for motorized vehicles presents the greatest challenges. Motorbike and ORV riders are looking for trail systems that encompass many miles on which to ride, but locating such a large trail system is difficult in an area where the mountainous terrain and poorly drained soils are prone to erosion. Most of the trails that have been designated as off-road vehicle trails are old logging roads, which were built as temporary roads to reach good timber stands. They were not created to withstand constant motorized use.



Creating a sustainable, stable system of off-road vehicle trails will require substantial funding. The DCR recently received a cost estimate of \$600,000 to repair two miles of Skyline Trail in Pittsfield State Forest, which includes four stream crossings. The work involves bringing in truck loads of fill to rebuild trail bed, improving drainage, installing culverts and wetland restoration. It is unsure at this time if funding will become available for construction at this scale.

At this time there is no dedicated funding source directed to DCR for maintenance or upgrades to the trail system. Recently enacted off-road vehicle legislation provides money, obtained through ORV registration and a portion of off-road vehicle-related fines, to a trail fund where a minimum of 25% of must be spent on trail acquisition, development and maintenance. The DCR does direct some funding from the Recreational Trails Grant Program to volunteer organizations who maintain the trails that they use. Snowmobile clubs and other frequent trail users donate thousands of hours to clearing trails of fallen trees and repairing eroded trail sections and patching or constructing bridges. DCR organizes and oversees Park Serve Day every spring, but volunteers are becoming fewer and fewer.

Over the next several years the DCR will be developing comprehensive management plans for each of its properties. Public input and participation will be part of the planning process, so this is an excellent opportunity for the agency to work with the various recreational groups to identify the trails most appropriate for the various uses and to outline the work and funding needed to make trail repairs and changes. This is currently underway for the Pittsfield State Forest, where ORV and mountain biking representatives are providing input to DCR staff.

Outfitters and Tour Guides

Although the region is robust with natural resources, there is not a central portal to locate professional outfitters and outdoor guides operating in the area. There are outdoor recreation programs offered by DCR and DFW, and several nonprofit organizations, but these programs are scattered across the region and are relatively small in scale. As an example, Mass Audubon recently issued and sent a seasonal catalog of programs in Central and Western Massachusetts, but this was sent only to its membership. The few private companies that offer guided tours and activities in the Berkshires are not well known or easy to find. Visitors searching for an outdoor outfitter or guide online stumble upon them randomly, often through the websites of inns and bed & breakfasts rather than by direct searches.

The Berkshire tourist base has traditionally been visitors from the NYC/NJ metropolitan area. Surveys indicate that urban and suburban visitors have a desire to participate in outdoor recreation activities, but may be uncomfortable hiking or venturing into forest lands unguided. Further, children who are never introduced to wilderness activities are far less inclined to take up these activities as adults. Increasing the number or raising the profile of professional outfitters in the western Massachusetts has been identified as a need by several scenic byway committees across the Western Massachusetts region, and has long been a goal of the Jacob's Ladder Trail Scenic Byway, Inc.

Advertising Outdoor Lands and Trails

Many rural communities in the region have voiced a desire to increase the visitation of outdoor recreationists as a way to support local tourism. On almost any given day, particularly in the summer, an outdoor program is occurring somewhere in the Berkshires: a hike, a paddle, a nature class. If someone wishes to embark on one of these outdoor adventures on a given day, they must have a basic knowledge of the various state agencies and nonprofits that offer programs in the region and be able to search the

websites of each to find something to do. This can be a challenge for tourists and local residents alike. The DCR, F&W and many of the nonprofit organizations post trail and facility maps on their websites, most of which can be sorted by town or by activity of interest. Many of the nonprofit organizations also maintain user-friendly websites and maps. While these are extremely useful for people searching for an outdoor experience, the information remains scattered across the internet. Not all of the trails in the county have been digitally mapped, leaving a gap on the overall inventory of trail systems in the county.

Meeting Additional Recreation Needs

Twenty five Berkshire County municipalities have developed Open Space and Recreation Plans. As part of the planning process, they conduct a public survey of their residents to identify current and future recreational needs of the community. When reviewing the results of several of these surveys, BRPC found that a few common themes resonate throughout the region. The need for trails on gentle terrain and greater access to swimming areas are most often cited as the greatest outdoor recreation needs in the county. Many surveys also indicated a desire to create new trails that loop in and out of town centers or that link to existing trail systems outside town centers. The desire to bridge the gap between in-town trails and out-of-town trails is understandable, as most town centers and villages are located in the valleys while most of the large trail systems in the county are located in state properties in the higher elevations.

Outdoor Recreation Accessibility

Retaining Access Points

As is typical of rural areas, there are numerous informal access points or arrangements whereby land owners allow public to cross through their property in order to reach a conservation property or water resource. For example, woodlot owners and farmers have a tradition of allowing the public to access their land, historically to hunt or fish. Many landowners still honor this tradition, but use is often limited to local residents or friends through word of mouth. As development occurs or properties change hands, these arrangements can be lost, reducing public access to outdoor recreation options. Conservation partners and municipalities can work to formally retain important access to land and water resources to ensure that future generations are able to readily access recreation opportunities.

Improving Accessibility

Although the region is endowed with public lands that offer a variety of recreational opportunities, the hilly Berkshire terrain naturally presents a mobility challenge for some. Most of the hiking trails in the DCR state parks and forests, and to a large extent those on the lands of DFW, traverse steep slopes and ridgelines. The DCR lands with accessible trails are the Ashuwillticook Rail Trail (12 mi), Pittsfield State Forest (0.75 mi) and Savoy Mountain (0.25 mi). Although there are some properties and trails in the lowlands, they are not as widely known or publicly advertised as such.

Resident surveys conducted by municipalities as part of open space and recreation planning often cite the need for relatively level, easy trails that can accommodate seniors, families with young children or people with limited mobility. Expanding the Ashuwillticook Rail Trail and creating new bike/pedestrian trails is seen as a way to meet the demand for level, accessible trails.

Accessible camping is offered at October Mountain and Savoy State Forests. In addition to these efforts, approximately 25-30 paraplegic hunters participate each year in a special deer hunting season offered by DFW, averaging a 25% success rate. The Berkshires typically host two or three sites, which are staffed by a mix of state workers and volunteers.

Improving Urban Access to Outdoor Recreation

People living in the urban and suburban population centers of the county have small parks in which to recreate, but they may be miles from a state forest or park in which they can experience a natural or wilderness experience. Those without vehicles and who do not have the ability to bike or walk to the state forests are essentially cut off from visiting them, as there is no public transit provided to these properties.

Recreation Access for Youth

As part of the America's Great Outdoors Initiative, listening sessions with youth were conducted throughout the U.S. Many young people describe the outdoors as "remote, mysterious, and sometimes, scary." Many stated that they did not feel that they had the skills necessary to go camping, hiking, and mountain biking. More importantly, many said that nobody ever took them outside. A common complaint was the lack of environmental education built into their school curriculum and the cutbacks in field trips to the outdoors. Young people who did state that they had spent a lot of time outdoors attributed this to their parents and caregivers.



The conditions stated by youth across the country may also occur here in the Berkshires. Adult attendees of DCR and BRPC public forums raised the issue of young people being disconnected from the land. Attendees of these forums, who tended to be avid conservationists or outdoor recreation enthusiasts, noted that fewer parents are spending time with their children outdoors, that fewer are hunting and fishing with them, and that schools did not seem to take students on field trips for hiking, snowshoeing, or learning about wildlife.

DCR sponsors several family educational and recreational programs throughout the year. The agency has also has created the No Child Left Inside initiative in an effort to promote the state park system as a way to increase outdoor recreation participation of children and families. The agency has created a homepage with user-friendly links to parks and activities across the Commonwealth. During the past few summers the DCR has sponsored the Annual Great Park Pursuit, whereby teams are challenged to visit different state parks, participate in special activities and track their adventures with stories and photos on their personal Great Park Pursuit homepage.

DFW sponsors outdoor educational programs for children and youth, including Kids Ice Fishing events, the Youth Turkey Hunt Program and the Growing Up Wild program (this last for educators). Mass Audubon and many other nonprofit conservation organizations also offer nature or recreational programs. While some of these agencies and groups do participate in school programs, there is no organizational mechanism to establish permanent and robust outdoor recreational programs in local school districts in the region.

In 2005 regional environmental groups formed the Berkshire Environmental Education Network, led and administered in large part through the Flying Cloud Institute. The Network, with lead members Berkshire Museum, Housatonic Valley Association, Massachusetts Audubon Society, and the Center for Eco Technology, strives to connect non-profit professionals with local school teachers to offer a greater variety of environmental education opportunities for the region's school children. A major offering of BEEN is the annual Berkshire Environmental Educators Conference, where teachers and non-profits have the opportunity to discuss their work, share best practices, and plan collaborations.

Declining Wildlife-based Recreation

The numbers of hunters and anglers in Massachusetts is on the decline, a trend that is evident in many states across the country. According to DFW, the number of resident hunters in Massachusetts declined by 49% between the years 1958 and 2008. According to the *2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation for Massachusetts*, between 1996 and 2006 the number of hunters in the state declined 13% and the number of anglers declined 29%. The survey noted that wildlife watching in the state also decreased 21% during the 1996-2006 time period, although this category increased in several other states around the country.

Aging hunters are retiring from the sport and less young people are taking up the sport. Asked in a 2005 survey why they would not participate in a youth hunt, the majority of youth cited time constraints as the greatest barrier, with 81% citing "School", 54.5% citing "Work" and 30% citing "Sports or hobbies." The next two greatest barriers were: "Not having people to go with" (28%) and "Lack of opportunities" (24%). A major source of revenue for purchasing and managing state conservation land has traditionally come from fees collected from hunting and fishing licenses. If the number of licenses continues to decline, the state will need to identify new revenue sources to close the financing gap. Hunters also help wildlife management by keeping populations in balance. A lack of hunting activity could result in overpopulation of certain species and cause an increase in human-wildlife conflicts in yards or roadways. High population numbers can also result in food or range scarcity which can be harmful to the animals.

Feeling Comfortable in the Woods

For people who are not introduced to the natural world by family or friends, the great outdoors might not seem so great – in fact it can be a scary place to be. Programs to help people feel more comfortable in the woods are offered by state and local sporting clubs. A few are highlighted here.

Becoming an Outdoors Woman (BOW) Program: DFW oversees this program, which is designed to teach outdoor skills to women. A sampling of hands-on workshop offerings may include basic fishing, beginning shotgun, kayaking, map & compass, reading the woods, archery, pond and stream adventures, nature photography, martial arts, outdoor and game cooking, and edible plants. Workshops are held throughout the year as part of an international initiative.

Berkshire Sporting Clubs: Many sportsmen and women participate in outdoor activities through local rod and gun or sporting clubs. Nine Berkshire towns (Cheshire, Egremont, Great Barrington, Lenox, Lee, Pittsfield, Sheffield, Stockbridge and Williamstown) have membership-driven clubs which often own property and facilities. The clubs provide an important service to the sportsmen and women of the area by providing shooting ranges, hosting fishing derbies, and sponsoring education and youth hunting programs. It is estimated that approximately 3,000 people belong to Berkshire County sporting clubs, and that they are the main avenue for introducing young people to hunting and fishing. There are two local chapters of Trout Unlimited: the Taconic Chapter that focuses on the Housatonic, Westfield, Farmington and Deerfield watersheds, and the Hoosic Chapter that focuses on the Hoosic River Watershed. Many clubs also belong to the Berkshire County League of Sportsmen, which is an umbrella organization working to protect the interests of hunter and anglers, and to promote responsible wildlife-based recreation.

Berkshire Knapsackers and AMC's Berkshire Chapter: These two long-established outing groups offer regular guided hikes throughout the county year-round. Hikes are classified by level of difficulty and the presence of a guide makes those less familiar with hiking and the outdoors feel more comfortable.

A RECREATION FRAMEWORK

In crafting a vision for recreation in the Berkshires, three main networks of “spines” become evident. Long-distance trails, greenways, and blueways each were mentioned in public workshops across the region as priorities. These also each represent regional-scale amenities. The following recreation framework illustrates these amenities functioning as a system, including how they overlap with land conservation priorities and connect to downtown areas.

1. Long Distance Trails

There are three long-distance trails through the region: Appalachian Trail, Mohican-Mohawk Trail, and the Taconic Crest Trail. While the Appalachian Trail is the longest and most widely recognized of the three, significant efforts have been underway to define, interpret, and raise in prominence the other two. The long-term vision is to connect the trails to each other and to other major networks in adjacent regions to allow additional long-distance travel routes to hikers. These can also ultimately contain linkages to local parks and trail networks. Achieving this vision will require coordination across municipal, county and state boundaries by a wide array of stakeholders, including the Native American tribes on whose history the latter two trails focus.

2. Greenways

Another major vision for the region includes integrating local bike trail and greenway planning into a set of larger Western New England Greenways. These greenways are envisioned by bicyclists and regional planners of Connecticut, Massachusetts and Vermont as a contiguous network of bike routes connecting New York City with Montreal. The idea is to begin at the East Coast Greenway in Norwalk, CT and connect with Quebec's famed Route Verte. Organizations in each of the three states are already working on creating bike/ped trails, and by coordinating these efforts a network that stretches more than 250 miles could be created. In Berkshire County, an extended Ashuwillticook Rail Trail is expected to serve as the “central spine” of such a network through the Berkshires. This effort is being shepherded in the county by the Upper Housatonic Valley National Heritage Area, the Berkshire Bike Path Council and the BRPC.



3. River Blueways

The more populated cities and towns in the county have grown in the valleys of the Housatonic and Hoosic Rivers. Over the past decade, many of these communities have begun to evaluate ways to improve the accessibility and use of the rivers. Initiatives in several communities are now reconnecting local citizens to the rivers in their neighborhoods.

The development pattern of the county is strongly aligned to its waterways, particularly the Housatonic and Hoosic rivers which flow generally north-south through the county. These rivers touch the main population centers of the county, providing a feature within their downtowns and a blueway connection between them. The two watershed associations active with those rivers have been strong advocates for the rivers and help facilitate their use, appreciation, and stewardship through such means as guided canoe or kayak tours and events. Many residents expressed the desire to have these two rivers become a more prominent and accessible feature in their downtowns and beyond. These two rivers therefore form the third spine along which recreation improvement efforts can be focused. As with the bike path and trails, this “spine” can then have many other connections from adjacent areas which connect and expand its use and enjoyment.

Housatonic River Greenway

Some notable efforts along this river include the creation of trails or greenways along the river to provide citizens with views or access points. As noted in the *Housatonic Greenway, A Progress Report*, there are several past, present and future efforts in the Housatonic River Watershed to create a greenway along the main stem and some tributaries of the river.

- Four new river access sites were recently installed by Housatonic Valley Association in Pittsfield, Lenox, Lee and Sheffield. A portage route around the Glendale Dam is being pursued in Stockbridge.
- The city of Pittsfield has been actively working on its Westside Riverway initiative to create green public spaces along the West Branch of the Housatonic River. The initiative began in 2007 when the City held a public visioning process to gather ideas and identify potential areas for improvement. Since then the City has partnered with environmental organizations and agencies and with General Electric to install canoe launches and a wetland wildlife viewing platform. Partners are now working to remove the Mill Street dam. Once the dam is removed, it will be possible to canoe the length of the river from Wahconah Park to Woods Pond in Lenox Dale.
- Several interest groups in the Town of Lee would like to see a greenway along the Housatonic River in the downtown area, including the Conservation Commission, Lee Land Trust, Lee Bike Committee and Lee Chamber of Commerce. This greenway would be used by local residents, while it would also create a recreational destination for visitors considering a stay in local motels and bed and breakfasts. A grant from the National Scenic Byways Program is currently funding an effort to create a bike path along the river that is envisioned to connect the downtowns of Lee, Stockbridge and Lenox Dale.
- The Great Barrington Riverwalk provides an ADA accessible trail that follows the river 1/2 mile through downtown Great Barrington. This initiative also has an extremely successful volunteer-based maintenance program in which citizens not only clean the walkway, but conduct landscaping and invasive plant species removal along the trail and on the riverbank. Expansion of the trail is envisioned.

- The Housatonic Valley Association has created a trail along the river in Hinsdale to highlight the river and its industrial heritage. A portion of the trail is ADA accessible, a rarity in the hilly terrain of the Berkshires.

Highlighting the Hoosic River

In the northern portions of the county, the Hoosic River Watershed Association (HooRWA) has been working with other regional partners to increase accessibility to the river, installing new canoe/kayak launches.

More recently HooRWA and bicyclists in North County communities have been pursuing trails and green space along the river corridor. HooRWA has partnered with communities in Vermont and New York State to create greenways in the river corridor, most recently celebrating a ground breaking of a trail in Hoosick Falls, New York. An effort to create a bike trail that will connect downtown North Adams and Williamstown, envisioned to follow the river wherever possible, has been underway since 2008. A project to finalize the route of the trail in North Adams and to attain 100% engineering of the route in Williamstown will be conducted in 2013-2014.

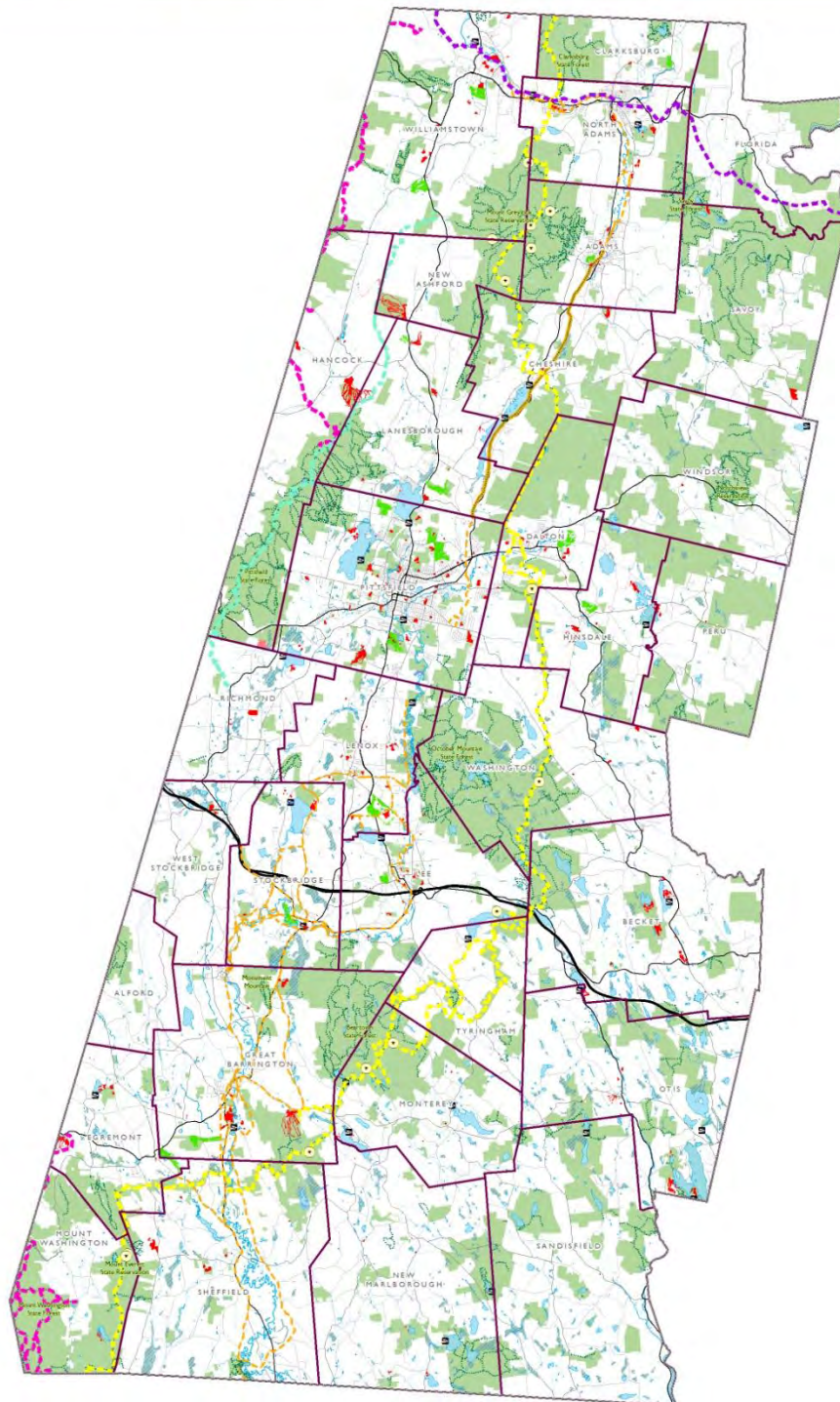
In North Adams and Adams, use and enjoyment of the river faces the added challenge of channelized concrete flood control chutes through the downtown areas. Citizens and town officials in Adams, partnering with HooRWA, approached the U.S. Army Corps of Engineers in an effort to investigate options that could be considered for modifications within the chutes. They were envisioning a river channel that would provide natural functions, such as improved habitat and reduced thermal increases.

More recently the Hoosic River Revival Coalition has emerged with a primary focus on re-envisioning what is possible with these more engineered portions of the river. Using success stories from places such as Providence, RI and San Antonio, TX, this group is working to develop scenarios for the flood chutes and adjacent land. While initial efforts have focused on North Adams, additional work and strategies can eventually be extended to downtown Adams where the Ashuwillticook Trail has already made a notable improvement along much of the flood control area.

RECREATION FRAMEWORK MAP

The Recreation Framework Map shows the locations of existing outdoor recreation areas across Berkshire County, including state forests and park, conservation lands and trails. This map can be used as a foundation upon which to expand and add new areas, and to create new linkages between these areas.

Outdoor Recreation Framework



Legend

- Trails**
- Appalachian Trail
 - Mahican Trail
 - Skyline Trail
 - Taconic Trail
 - Hiking Trails**
 - Ashuwilltcook Rail Trail
 - Potential Bike Path
 - Appalachian Trail Shelters

- Recreation Destinations**
- Publicly Accessible Land
 - Golf Course
 - Marina
 - Participation Recreation
 - Spectator Recreation
 - Water-Based Recreation

- Water**
- Boat Launch
 - Major Rivers
 - Other Rivers and Streams
 - Lakes and Ponds
 - Wetlands

- Municipal and Infrastructure**
- County Boundary
 - Community Boundary
 - Interstate Highway
 - Arterial Road

** Note: Not all trails in the region are shown. Trails shown represent those for which GIS data is currently available.



11/29/2011



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This map was created by the Berkshire Regional Planning Commission and is intended for general planning purposes only. This map shall not be used for engineering, survey, legal, or regulatory purposes. MassGIS, MassDOT, BRPC or the communities may have supplied portions of this data.

GOALS, POLICIES AND STRATEGIES

The following goals, policies, and strategies will be pursued to achieve the vision for conservation and recreation the region:

GOAL CR3.1: Offer a comprehensive system of high-quality outdoor recreation options that maximizes health and economic benefits to the region.

Policy CR3.1.1: Identify and pursue a variety of traditional and non-traditional resources to support maintenance of outdoor recreation trails and facilities.

Strategy A: Increase Funding for State Properties

Petition the state legislature to increase funding to the Department of Conservation and Recreation (DCR) and the Division of Fisheries and Wildlife (DFW) so that they can maintain their properties and facilities. Local residents and tourists alike note the run-down condition of the DCR facilities, which does not set our region in a good light. Restore environmental spending to a minimum of 1% of the total state operating budget, directing a significant portion of this funding to the maintenance of DCR facilities.

Strategy B: Engaging Volunteers and Private Investment in Maintenance Projects

A number of non-profit and corporate groups help organize volunteers to conduct trail maintenance activities. In some cases these projects are selected through a competitive application process, others are less formal. Land management entities should work to identify those groups willing to assist in these endeavors and coordinate with them to set out a list of projects for one-time trail team work or ongoing maintenance responsibility such as through an adopt-a-trail program. This will provide low- or no-cost trail maintenance and make management dollars in the region go further.

Strategy C: Non-Profit and Volunteer Mountain Bike Trail Maintenance

Support the Berkshire Chapter of NEMBA as they work to emulate the Kingdom Trails of northeastern Vermont. This nonprofit organization creates and maintains more than 100 miles of biking and hiking trail, and hosts events and bicyclist educational programs throughout the year to encourage use and protection of these trails and surrounding areas. Because the Berkshires is located so much closer to the metro New York and Boston areas than the Northeast Kingdom, the region may be well situated as a mountain biking tourist destination.

Strategy D: Assist DCR to Develop Management Plans for Region's Resources

The Berkshire conservation and outdoor recreation groups should work with DCR to prioritize forests and parks where facilities and trail systems are the most degraded. These groups then provide input as the agency develops comprehensive management plans for each state forest and park in the region. This active participation is needed to demonstrate to upper management DCR staff that such plans are needed and supported by the public.

Strategy E: Bolster DCR Resources

Urge DCR to actively pursue federal conservation and recreation funds and direct state matching funds towards trail maintenance to increase the longevity of the trails and minimize environmental impacts to sensitive and aquatic habitats.

Strategy F: Communicate About Maintenance and Closures

As DCR experiences reductions in staff and services, or conducts maintenance projects that close facilities or roadways, staff should more clearly communicate these changes to local municipalities and tourist venues. In this way, local people and business owners will not direct visitor or group events to sites or services that are not open to the public.

Policy CR3.1.2: Grow the region's notoriety as a prime outdoor recreation destination in the northeast.**Strategy A: Improve Marketing of Outdoor Offerings**

Conservation partners work with Berkshire Visitor Bureau and other tourism organizations to increase the packaging, promotion, and distribution of trail maps and activity guides geared to different user groups to help improve community awareness and use of different outdoor recreation options. This could include sportsman's activities, birding and other activities as well as outdoor events and destinations.

Strategy B: Market Outdoor Businesses to Increase Economic Benefits to Region

There are a number of local businesses centered on gear and guidance for outdoor activities and adventures. Marketing materials and regional outdoor guides should include notes on related local businesses to help connect interested parties with the equipment they need, whether a boat rental, fly fishing guide, or group activity options.

Strategy C: Create a One-Stop Web Presence for Outdoor Recreation

Form a central partnership between the Berkshire Visitors Bureau, state agencies, nonprofit organizations and private outfitters to create an easily-found, user-friendly central tourist portal to outdoor facilities and programs in the region. Include easy links to maps of public recreational facilities and trail systems.

Strategy D: Support and Expand the List of Outdoor Races

Races can be a great means of drawing new visitors to the region as people tend to link race participation with vacation plans. Whether road or trail races, these events draw people in, highlight healthy lifestyles, and raise money for charitable causes. An inventory and marketing of these events could help identify opportunities to add new options to the schedule. The Western Massachusetts Athletic Club, NEMBA and other special sport event organizers can help assist with this.

Strategy E: Conduct a Recreation Market Study

Conduct a market study that assesses the relative economic impact of different types of recreation to help link public and private investment into outdoor recreation facilities and maintenance, quantifying demand and return on investment. This may also highlight demand patterns across activities that could not only inform investment decisions, but also how activities are packaged and marketing in the future.

GOAL CR3.2: Cultivate an integrated trail system with a focus on diversity and connectivity.**Policy CR3.2.1: Support planning and implementation of a Western New England Greenway that integrates existing regional bike planning and implementation efforts.****Strategy A: Coordinate with Western New England Greenway Partners**

Entities in the region working on bike planning, including the Berkshire Bikepath Council, Berkshire Regional Planning Commission, and Housatonic Heritage, should work to coordinate both with each other and with partners in adjacent regions in Connecticut, Vermont and beyond to plan and implement a Western New England Greenway.

Strategy B: Support Ashuwillticook Rail Trail Extension

State, municipal and community groups should work aggressively to expand bike/pedestrian trails across the county to meet the public interest and demand for these facilities. Extending the Ashuwillticook Rail Trail northward and southward is a region-wide priority, although opportunities to create spurs from the trail or to create new trails that link public open space or neighborhoods should not be ignored.

Strategy C: Continually Pursue Bike Path Planning, Engineering and Construction Funding

Work as municipalities and a region to continuously pursue funding sources to gradually implement the vision for a bike network across the region. In the past, federal Scenic Byways grants have been very helpful in advancing bikepath planning, engineering, and construction projects. Efforts should be made to continue to pursue these as well as other transportation, infrastructure, or other eligible grants from a variety of sources. Municipalities may likely need to commit some matching funds for this and the willingness of communities to provide matching funds should be considered in project prioritization.

Strategy D: Community Outreach and Promotion of Bike and Bikepath Benefits

Bike advocates and regional recreation groups should coordinate to proactively foster a common expectation, desire, and understanding of the vision and benefits for the regional bike system to residents. This will help advance implementation which has been historically stalled by small NIMBY groups as communities attempt to move forward with implementation. Cultivating an understanding of the benefits of bike paths to the region and adjacent properties from the vast body of national research on this topic will help foster a more informed dialogue around this issue and support local political will and reduce community resistance for moving projects forward. This could be supported by study of the current Ashuwillticook Trail segments for a local example of experience.

Policy CR3.2.2: Continue to extend, connect and promote long-distance routes.**Strategy A: Expand the Mahican-Mokawk and Taconic Crest Trails**

The DCR and other conservation partners should continue pursuing the creation and permanent protection of long-distance trail systems across the Western New England – Upstate New York region, most notably the Mahican-Mohawk and Taconic Crest Trail systems. Where outright purchase of land is unaffordable, consider conservation easements. Where the route must travel along public roadways, pursue transportation enhancement funding for wider shoulders or sidewalks for increased safety.

Strategy B: Long-Distance Trail Connections

The region should work, as trails are planned or maintained, to ensure that connections are made or retained between long-range trails and each other or between local trails and the longer-distance routes.

Strategy C: Long-Distance Trail Promotion

Work with planning and management entities to develop interpretive materials and trail guides to highlight the history and natural features of the trails. Creating maps are especially important for the Mahican-Mohawk and Taconic Crest Trails, which are disjointed and less well known.

Policy CR3.2.3: Encourage diverse trail options to accommodate a range of use needs.**Strategy A: Regional Trail Strategy**

Work with stakeholders to determine a regional trail strategy that accommodates the needs of various user groups while minimizing user conflicts and environmental impacts. User groups and the DCR should work in a coordinated fashion to determine the trails most suitable to specific uses, such as mountain biking and ATVs. Determining these uses will drive future trail maintenance, design and repair. As part of the overall strategy, attention should be paid to opportunities to close, repair or reroute trail sections that discharge into wetland resources or state-listed species habitats due to steep slope or poor design.

Strategy B: Investigate the Creation of a Mountain Biking System in the Region

Support the New England Mountain Biking Association (NEMBA) as they work with DCR and other property holders to reevaluate the mountain biking trails with the aim of creating a first-class system. This would mean striking the balance to offer an enhanced and varied biking experience while minimizing soil erosion in sloped or wet areas. Some of the trails designated for mountain biking are steep and erosion prone. The group has in the past and would in the future, volunteer hundreds of hours of trail maintenance time on DCR properties, which will help DCR further their maintenance program with little to no additional resources. The group has prioritized two properties as a starting point – Mt. Greylock State Reservation and Pittsfield State Forest – but could then shift focus of their volunteer efforts to additional properties in discussion with DCR and others.

Strategy C: Support the Cultivation of a Statewide Snowmobile Trail System

Continue to work with the Snowmobile Association of Massachusetts and its member clubs to permanently protect a connected statewide snowmobile trail system and to bridge existing gaps in the system.

Commonwealth Connections: A greenway vision for Massachusetts

In 1999 the Dept. of Environmental Management (the current DCR) oversaw a state-wide effort to develop a greenway vision for Massachusetts. The result of this effort was *Commonwealth Connections, A greenway vision for Massachusetts*, a document that reflects the priorities of the greenways and trails community across the state and within each region. Six major recommendations have emerged for the Berkshires:

1. Permanently protect, secure and buffer the region's three major long-distance hiking trails. At the time of this effort, only 50% of the 72-mile Taconic Crest Trail system and 15% of the 100-mile Mahican-Mohawk Trail was permanently protected.
2. Create links between the AT and the Taconic Crest Trail systems.
3. Create greenway corridors that strategically link protected open spaces.
4. Create and protect the Housatonic River Greenway. This references the river greenway that was proposed in Pittsfield in the late 1980s.
5. Complete the Ashuwillticook Rail Trail and support efforts to create a north-south bikeway from Vermont to Connecticut.
6. Create a protected greenway corridor along the Westfield River.

These recommendations remain valid today and were restated by people attending the outdoor recreational forums that have been held across the region by state agencies and BRPC.

GOAL CR3.3: Increase accessibility of recreation offerings.

Policy CR3.3.1: Strengthen linkages between conservation and recreation options in developed areas with those in the outlying rural landscape.

Strategy A: Linking Parks into a Network

Conservation partners, including municipalities, should continue to link existing protected lands that both protect natural systems and could support outdoor recreation. While the Conservation Framework contains many of these lands in rural areas, specific additional efforts may be needed within developed areas to connect parks to each other or to nearby conservation areas. This supports wildlife, but could also add trail areas to support longer recreation experiences for runners, hikers, bikers, and families.

Strategy B: Link Recreation Options to Neighborhoods and Downtowns

Recreation and increased activity can be supported by making the options easily accessed without use of a car. This helps ensure that mobility-limited people such as children, seniors, or others without access to a car can easily get outdoors. Municipalities and neighborhood groups should explore opportunities to link public conservation lands and parks to town/city centers.

Strategy C: Facilitate Regional Transportation Access for Mobility-limited Populations

DCR, Berkshire Regional Transit Authority and neighborhood groups work cooperatively to investigate the creation of public transportation services to select state forests or nonprofit conservation lands where programs are offered. Even if this is done seasonally, on weekends, or during select events, it will help connect seniors, youth, and others without access to a car a means of reaching some nearby recreation amenities.

Policy CR3.3.2: Reintroduce Berkshire residents and children to the natural world.**Strategy A: Regularly Highlight Active Living Options in Local Media**

Work with local media to create special outdoor recreation or healthy living sections in print, video and online promoting upcoming outdoor activities and programs to visitors and local residents alike. This could be in coordination with health and wellness initiatives focused on healthy living for all ages. NOTE: See also the goals, policies and strategies in the **Housing and Neighborhoods** Element.

Strategy B: Support Educational Sites Designed to Get Kids of All Ages Outside

School systems and early childhood education centers should work with municipalities and businesses to create learning sites and trails near natural areas to promote outdoor activity and learning to children. This could include Born Learning Trails for early childhood aged children or more science- and history-focused interpretive trails for older children. One successful model that could be more broadly employed in the region is the Appalachian Trail Conservancy's *Trail to Every Classroom (TTEC)* project, which has been connecting elementary and middle school teachers with the AT for the past five years. A formal summer workshop provides teacher training and ideas and helps implement and coordinate both classroom and outdoor activities. While targeted primarily to "Trail Town", the term is not strictly defined, and would encompass a fairly large number of Berkshire school districts. Dalton and Great Barrington schools have participated to date.

Strategy C: Increase School Use of Outdoors to Support Curricula

Municipal school districts should reach out to conservation agencies and nonprofits to create a series of field trips that could include low-cost activities such as hiking and group binocular rentals for wildlife watching. This could be accomplished by expanding the efforts of the Berkshire Environmental Educators Network, which focuses on environmental education. Winter trips could include wildlife tracking and group rentals of snowshoes. These efforts could be in partnership with health organizations as part of efforts to reduce obesity in youth. Local sporting clubs could also serve as resources for their school districts.

GOAL CR3.4: Improve and Enhance Use and Access to Rivers and Lakes**Policy CR3.4.1: Improve river access and continuity to enhance recreational uses.****Strategy A: Reduce Portage Needs for Paddlers**

Watershed associations and recreational groups work with Department of Ecological Restoration to identify and prioritize a few key dams for removal and, where removal is not possible, investigate additional portage areas. Dam removals of the Mill Street dam in Pittsfield, and the Columbia and Willow Mill dams in Lee could improve canoe/kayaking opportunities, while also providing environmental and economic development benefits to their respective communities. Improved portage around dams where removal is less likely, such as Woods Pond in Lenox Dale, Eagle Mill in Lee and Rising Pond in Glendale, should also be pursued.

Strategy B: Identify and Secure Greenway Space and Access Points Along Rivers and Streams

Support watershed associations, municipalities, parks committees, and others' work to create more and improved access to rivers. In the north, this includes the work of HooRWA and the Hoosic River Revival as they focus on highlighting the river as a focal asset in the downtown. In central and south county, this means working with the Rest of River cleanup process to ensure that plans include creating trails, bridges, linkages, and access points along the river and in downtowns of impacted communities.

Policy CR3.4.2: Lakes Protection

Strategy A: Support Invasive Species Control Efforts

All boat access points post educational information on ways to minimize the spreading of aquatic invasive species, including plants and zebra mussels. Where possible, monitors attend boat launches to educate boaters on the best ways to inspect and clean their boats. Where resources are limited, lakes most vulnerable to zebra mussel infestations, including the busiest launches or those located on the 10 Berkshire waterbodies determined to be at highest risk of successful colonization, should receive higher priority.

Policy CR3.4.3: Enhance swimming opportunities

Strategy A: Improve Public Beach Access

There are a limited number of public beaches that do not have a residency requirement. Opportunities to add new or highlight underused public beach and swimming options on state and other lands could help meet this recreational demand.

Strategy B: Explore Community Pool Space

Some of the larger communities may wish to provide some community swimming pool space to enable residents, particularly those who cannot afford a pool membership at current facilities, additional options for swimming. As temperatures continue to rise, demand for swimming will likely only increase.

IMPLEMENTATION

On March 20, 2014, the Berkshire Regional Planning Commission adopted the entire Sustainable Berkshires plan, which is comprised of eight elements:

- Economy
- Housing and Neighborhoods
- Climate and Energy
- Conservation and Recreation
- Local Food and Agriculture
- Historic Preservation
- Infrastructure and Services
- Land Use

The new regional plan, including the goals, policies and strategies set forth in this element, will be implemented by a variety of actors over the next decade. The plan contains numerous strategies, some of which are longer-term or “big ticket” items that will take some time and planning; others are already underway or can be implemented immediately. As a regional plan, this is a non-regulatory document whose main purpose is to set a cohesive strategy for the Berkshire region to align actions, priorities, and investments to yield the greatest benefit to the region.

Because implementation will be an active and evolving process over the next decade, the implementation strategy for all eight elements is contained under separate cover to allow it to be used as a working document. Updates to the elements will occur as needed over time to reflect major needs and trends of the region. However, the Implementation addendum to the plan is an administrative document that will serve three functions:

1. A schedule of implementation timeframes, responsible parties, and potential funding sources to be used or pursued;
2. A tracking mechanism for implementation actions taken over time to record progress as it is made; and
3. A planning tool to help the Commission and its other implementation partners pull out certain strategies to pursue in one or three-year action plans to help focus effort and achieve results.

In addition to the implementation addendum, a number of data points will be tracked over time to measure change in certain metrics. These metrics were selected based on available data that relates to the goals and strategies called for in each element. The metric reports will be openly available online through BRPC’s Berkshire Benchmarks program website (www.berkshirebenchmarks.org).

Appendices



Conservation and Recreation Element

- A:** Conservation and Recreation Forums
- B:** Land Conservation Tools and Techniques

APPENDIX A: CONSERVATION AND RECREATION PUBLIC FORUMS

Two public forums were held, one in the Town of Adams at the Adams Community Center on November 29, 2011 and one in the Town of Lenox at the Lenox Town Hall on December 14, 2011. Each two-hour forum had a three-part format:

1. **Open House:** A number of maps were on display and staff was available to answer any questions.
2. **Presentation:** Senior Planner Lauren Gaherty provided an overview of key trends and statistics in conservation and recreation in the Berkshires.
3. **Small Group Breakout Sessions:** Attendees were broken into small groups of 6-8 people to work with a map and worksheet to discuss and record their priorities for the future of conservation and recreation in the region. Each group then reported to the others on their top 2-3 priorities from their discussion.

SMALL GROUP BREAKOUT SESSION: ADAMS COMMUNITY CENTER

Group #1: Theme: connectivity

Priority 1: Stream and river connectivity.

- River restoration : continue Housatonic River clean-up and Hoosic River flood chute options, and remove/improve dams county-wide
- Healthy rivers and streams for wildlife habitat
- Improved stormwater management

Priority 2: Wildlife connectivity.

- Support working landscapes.
- Public education on invasive species to decrease their spread
- Talk to Peter Milanesi at DFW about wildlife connections

Priority 3: Trail connectivity.

- Trail connectivity of all types
- Extend Ashuwillticook Rail Trail to Vermont and Connecticut borders
- Map note: corridors for bike path are noted in the general area along the Housatonic River in south county and the Hoosic River in north county
- Map note: fill in the snowmobile gap that exists in this area: northeast Washington and southern Hinsdale

Other Issues:

- Support, preserve and protect working landscapes.
 - Map note: new APR should be added to map for Fairfield Farm in Williamstown
 - Map note: Green River Farms in flux
- Expand development control tools
 - Promote infill development
 - Look into development mitigation or compensation; the land bank mechanism used on the Cape & Vineyard offered as example
- Reduce energy use to lessen climate change impacts
- Strive for closed loop / zero waste

Group #2: Theme: increase public awareness

Priority #1: Education / marketing / community involvement

- Market our assets
- Youth involvement in environmental activities

Priority #2: Trail mix and maintenance

- Beaded necklace of a Housatonic River Greenway project
- Rail Trail extension
- Assessment of state parks as to improvements / modernization needed
- Activities listed:
 - Swimming
 - Safe hiking
 - Biking
 - Horse trails and multi-use trails, especially Oct. Mountain State Forest
 - Hang gliding
 - Skating rinks

Priority #3: Planning and zoning – zoning tools such as infill development

- Farms and Berkshire Grown
- Cluster and Open Space & Recreation Districts encouraged
- Infill development
- Avoid building higher than 1,000 feet in elevation
- Wind bylaws
- Wetland protection
- Regional planning
- More state funding
- Endangered species
- Water resource protection

Other Issues:

- Strategic economic linkages
 - Land use patterns / tax revenue/ net monetary gains
 - Agriculture / local economy
 - Tourism / economy

SMALL GROUP BREAKOUT SESSION: LENOX TOWN HALL

Note: Due to a larger number of groups, each group was asked to highlight the top two priorities rather than top three in the interest of time.

Group #1: Theme: develop means for connecting people to the land

Priority #1: Strengthen Stewardship to support funding for projects and community education about existing recreational areas; difficulty of maintaining trails is a theme throughout the topic of recreation.

- There is a clear sense that individual and community stewardship of our open spaces is needed
- There is trail potential, but not the manpower or care for them.
 - Lots of land locked up in trails, but won't let user groups maintain them because of liability.
 - DCR cuts of employees
 - Not the wherewithal to train volunteers.
- ATV community would like a trail system that is not degraded; plan for a physically designed system that can support that use; trail engineering is needed; volunteers are not enough
- Do we want big machines making our trails?

- Hook up lands and people who would preserve them.
- Funding is key – CPA funding potential source

Priority #2: Raise awareness and plan for climate change and where we are going with it

- Noted recent storm changes are a concern. Conserve open spaces of forests & farms.

Other Issues:

- Improve farm viability.
 - Turnover of farms a concern
 - Look up landowners and young farmers
 - Cannot find 2-3 acres to farm for nursery or young farmers
- Conservation Commissioners are volunteers. Need sustainable development practices – regional guidelines would be helpful. Impervious pavement sneaks in and out of plans. New areas new Hoosic River to put Dufour business, Big Y and Rt .102 in Lee cited as examples of problems or where better practices could have been taken.
- Affordable land and homes. People want houses in big pieces of land; from a utilitarian standpoint, not viable
- Invasive species eradication, especially in bordering areas near pristine areas – this topic is important for both conservation and outdoor recreation.
 - Education is important, but expensive.
 - Best management practices needed.
 - Preservation of cultural resources – stone walls, etc.
 - People more connected to land

Other Issues:

- Would like to see extensive network of bike paths and bike lanes, with main point being one of safety. It is not always physically possible or safe.
 - There is trail potential, but not the manpower or care for them

Group #2: overarching themes are stewardship, strategic acquisition, sustainable tourism

Priority #1: Better stewardship of the open space land that we have

- Take the long view of the Housatonic River cleanup – real cleanup of the river
- Glen portion being sold (near Greylock Glen state land)
- Illegal dumping
- Protect views and large unfragmented forests
- All towns pass Scenic Mountain Act

Priority #2: Strategic acquisition for long-term use and sustainable ecotourism

- Add contiguous land to already protected and linking protected lands
- Field in places for people to play
- Reduce Sprawl – make cities/towns more attractive places to live

Other Issues:

- Change regulations for funding to direct funding for park maintenance
- ATVs and erosion
 - Motorized vehicles are a problem
 - Designate space for ATVs, but not on state land

Group #3: overarching theme is maintaining existing lands

Priority #1: Protect/preserve and assure our commitment to natural resources (forests, parks, lakes, ponds, rivers)

- Enforcement on existing protected lands

- Laws to protect air quality
- Farmland going to change hands – go where? How to make them WORKABLE?
- Achieve alternative energy sources without compromising forests, etc.
- Housatonic River Clean-up: this theme transcends both conservation and recreation

Priority #2: Protect/preserve/find adequate funding for existing recreation areas.

- Appropriate funding for state forests, parks, lakes, ponds, rivers
- Expand /maintain recreation areas for all age groups
- Complete rail trail throughout Berkshire County

Group #4: synergistic partnership of landscape protection and the economy

Priority #1: Enhance working landscapes and natural resource areas for agriculture and connections

- Maximize APR lands to maintain agricultural landscape
- Plan corridors for protected lands and corridors for transportation and development
- Wildlife movement corridors
- Invasive species management
- Natural resource management – farms, water, air
- DCR state forest planning – logging large tracts
- Map note: northwest Sheffield and most of Egremont highlighted as priority area for agricultural, historic, ecological and scenic corridor

Priority #2: Expand conservation education

- Educate realtors
- Develop guidelines for sensitive development

Other Issues:

- Concern: ORV use doesn't impact other uses

Group #5: overarching theme is to utilize land protection tools available to landowners and towns

Priority #1: Use the Agricultural Preservation Restriction (APR) fund and the Community Preservation Act (CPA) as funding sources for land protection

- Lobby support for more APR funding to save family farming; use funding to buy and protect more land along rivers
- Towns are encouraged to pass the CPA
 - Deliver tonight's program (via volunteers) to all high schools and communities
 - Combine information about the APR and CPA programs at town forums

Priority #2: Support zoning reform for more mixed uses in already developed areas

Other Issues:

- Support brownfields remediation
- Keep ridges "natural" – not with towers, etc.
- Towns enact Scenic Mountain Act
- Protect "views" or create views wherever they are trails
- More mountain bike opportunities – current ATV trails are destroyed
- More easy/leisure trails near homes
- More walking opportunities of a mile or two
- Bike trails to Connecticut and Vermont – "rails WITH trails" preferred

Map notes:

- Roaring Brook in Lee highlighted: Concern about protecting streams (like Roaring Brook) from logging activity (runoff/silting, etc)

- Mid-eastern section of Lanesborough and mid-western section of Cheshire, west of Cheshire Reservoir, highlighted: many rare species and wildlife connections important to protect
- Western end of West Street, Pittsfield: agricultural education

Group #6: overarching theme is maintaining current open space landscape

Priority #1: maintain viable forest and farm industries

- Map important agricultural soils
- Attract and foster rural industry in concert with conservation ideals
- Development of light industry near transportation and other “logical” areas
- Policing own wild places to keep them wild
- Streams and water quality
- Wild lands and vistas
- Map notes: large tracts highlighted for unfragmented landscapes for wildlife
 - Central Sheffield, Great Barrington and Stockbridge, westward through to the New York border of Mount Washington, Egremont, Alford, West Stockbridge and Richmond
 - Northern half of Sandisfield northwest through Monterey and southern Tyringham to connect scattered, existing protected lands to Beartown State Forest
 - Large midsections of Windsor and Savoy to connect scattered protected lands, including Peru, Moran and Savoy Wildlife Management Areas to Windsor and Savoy Mountain State Forests.
 - Large sections of Cheshire, Adams and North Adams to connect scattered protected lands, including Chalet and Stafford Hill Wildlife Management Areas to Mount Greylock State Reservation

Priority #2: Current public forests/parks trails and facilities not maintained or supervised; they “underwhelm visitors”

Other Issues:

- Continuation of bike trail or develop other trails
- Urban trailhead
- Fishing, boating, canoeing and kayak
- More accessible trails
- Map note: Connect foot trails along the western-Berkshire/New York border through the towns of Richmond, West Stockbridge, Alford and Egremont

APPENDIX B: LAND PURCHASE AND EASEMENT TYPES

Most landowners who approach conservation organizations have a desire to permanently protect the natural or agricultural qualities that they or their families have nurtured for years or generations. There are a variety of mechanisms that landowners can employ to conserve their land, some of which can provide income or other financial gain to the owners.

- **Sale, Fee Simple:** In this scenario the landowner sells the land to a conservation agency or organization for the market price or close to market price.
- **Bargain Sale:** Under this method, the landowner sells the property to a charitable organization for less than fair market value. Bargain sales may be a good choice for landowners who wish to preserve their land but need income from the sale. The seller is eligible for income tax deductions, with an overall result that might be comparable to a sale at market value.
- **Conservation Restriction / Easement:** A conservation restriction (CR), or easement, is a legal agreement between a landowner and another entity in which the owner agrees to restrict the use of the land. Activities such as farming, forest management, recreation and other limited land uses that the property owner wishes to pursue are often allowed. Common restrictions include prohibitions on development activity or disruption of vegetation. CRs yield the landowner tax credits and possible real estate abatement. The land owner continues to own the property, but if the land is sold, the new owners must comply with provisions of the conservation restriction. CRs can be donated or sold. CRs are typically held by 1) governmental agencies (Agricultural Preservation Restriction [APR] & Forest Legacy Programs are examples), 2) land trusts, environmental organizations or other nonprofit entities, and 3) municipalities. The APR program is highly competitive, with preference given to working farms with highly productive agricultural soils.
- **Gift of a Remainder Interest:** A landowner can give away property to a conservation organization but retain the right to live on it. At the death of the landowner, the full ownership of the land transfers to the conservation organization. A gift of a remainder interest will include mutually agreeable conditions concerning the maintenance and management of the land during the landowner's lifetime. The donor of a remainder interest can generally claim a related income tax deduction and potentially high real estate taxes are eliminated.
- **Gifts in Fee Simple:** Most of the land protected by conservation groups has been acquired through outright gifts of the land by generous and willing donors. The donor may make specific stipulations as to the use of the land such as "forever wild" or passive recreational use only. Donors are entitled to an income tax deduction of the value of the property. The deduction is allowed to be up to 30% of the donor's taxable income each year for a period of five years, up to the value of the donation. In addition, both property taxes and estate taxes on the land are eliminated.
- **Bequests:** A landowner can convey land to an organization such as a land trust in their will. A deduction from the value of one's taxable estate is allowed for land bequeathed for public purposes.
- **Mass. Chapter 61 Tax Program:** To encourage property owners to maintain their land as open space, the State of Mass. has enacted a tax abatement program. Chapters 61, 61A and 61B of the Mass. General Laws provide a means to assess open land at a fraction of its fair market value. The owners make a commitment to maintain the undeveloped condition of the land for a set period of time. If the landowner decides to sell the land for development within that time, the last five years of back taxes must be paid to the town. In addition, the sale is delayed for 120 days, during which the town in which the land is located is given the right of first refusal to purchase the land for fair market value. This allows towns to acquire land that they have identified as being significant for its ecological, scenic or cultural qualities. Towns can assign their right of first refusal to another party, such as a land trust or nonprofit organization.

APPENDIX B: LAND CONSERVATION TOOLS AND TECHNIQUES

LAND CONSERVATION TOOLS AND TECHNIQUES

The vast majority of undeveloped land in the county is privately owned. Maintaining the county's rural and scenic character will require the use of different types of management tools, including the continued acquisition of conservation land and carefully guiding new development.

- **Purchases and Easements:** Purchase of land or interest in land for conservation purposes, or solicitations for acceptance of gifts, is both proactive and reactionary on the part of conservation groups. In some instances conservation organizations approach property owners whose lands hold special qualities, such as having especially high scenic or ecological value, offering new recreational opportunities or maintaining agricultural production. In other instances landowners offer their land to conservation agencies or organizations as a donation or for a fee.
- **Land Use Development Regulations:** Development regulations, or zoning, can also have an impact on the intensity and location of development.

Purchases and Easements

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Funding Sources

There are several traditional state and federal funding sources for the purchase of land or easements for conservation or water quality purposes. Most of the state programs are administered by the various departments of the Executive Office of Energy and Environment. FEMA flood and hazard mitigation funding is also a source of funding if the purchase of land or easements of land within floodways or flood-prone areas is being considered. Fundraising by local conservation organizations is also an extremely important funding source.

Land Use Development Regulations

Communities can influence where and how development will be allowed to occur through planning, delineating use zones and establishing zoning and town bylaws that govern land use.

- **Open Space Residential Development:** OSRD is a type of residential development that requires the clustering of dwelling units and the set aside of open space based upon the value of the natural resources on the site. This site context development approach encourages the permanent protection of open space, agricultural land, forestry land, wildlife habitat, wetlands and other natural resources. OSRD also encourages a less sprawling and more efficient form of development that consumes less open land and minimizes the total amount of disturbance on the site as compared to traditional subdivisions.
- **Developer Set-Asides:** Setting aside land for conservation purposes is becoming increasingly offered by developers as part of large development project proposals. Donating the land itself or donating a conservation easement on the land may be offered to the municipality in which the development is occurring. The Conservation Commission is often the board to which the offer is directed. The burden of managing and/or monitoring conservation land and deed restrictions has been cited by local Commissions as the reason that they decline these offers.
- **Low Impact Development:** LID design techniques can be employed to reduce the environmental impacts of development. Low Impact Development begins by retaining as much of the natural features of the landscape as possible. This translates into limiting the amount of clearing and impervious area done on the site, retaining mature trees and other vegetation where possible, limiting grading and retaining low-lying spots across the site to disperse and capture stormwater. It also entails designing roads in a way that eliminates or reduces the need for stormwater drainage systems.