

Pioneer Valley Planning Commission

Pioneer Valley Environment Plan

*Protecting greenways and blueways.
Growing vibrant communities in our watershed.*



Produced by the Pioneer Valley Planning Commission with the support
of the U.S. Department of Housing and Urban Development Sustainable
Communities Initiative Regional Planning Grant Program.

March / 2014



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Environment Plan

Protecting greenways and blueways.
Growing vibrant communities in the watershed.

A clean and healthy environment is vital for everyone's quality of life. This includes the natural diversity of biological species and communities, and the ability of ecosystems to be resilient. The human impact on our environment often creates an imbalance in nature disrupting ecological integrity, and human enjoyment of our landscape. The Pioneer Valley Environment Plan strives to correct the imbalances created by humans to restore and or protect ecological integrity, and identify strategies for enhancing community character and quality of life.

Note: This is the executive summary of our plan. To obtain or view a copy of the full plan, visit pvpc.org.

*"My community is sustainable
when we improve the
environment for all."*

*Marcos Marrero,
Holyoke, MA*



- Eliminate or reduce bacteria, pathogen, and nitrogen loading from combined sewer overflows (CSOs).
- Eliminate toxins (including PCBs and pesticides) within the river to reduce human and wildlife exposure.
- Reduce nutrient loading and other nonpoint sources of pollution.
- Promote smart growth, land protection, and environmental conservation to support river health.
- Prevent habitat loss and restore degraded habitat.
- Promote improved flow and fish passage to ensure clean, free-flowing, and plentiful rivers for future generations.
- Prevent erosion and sedimentation induced by human activity.
- Promote greater public access for Connecticut River recreation and increased use of existing recreational facilities.

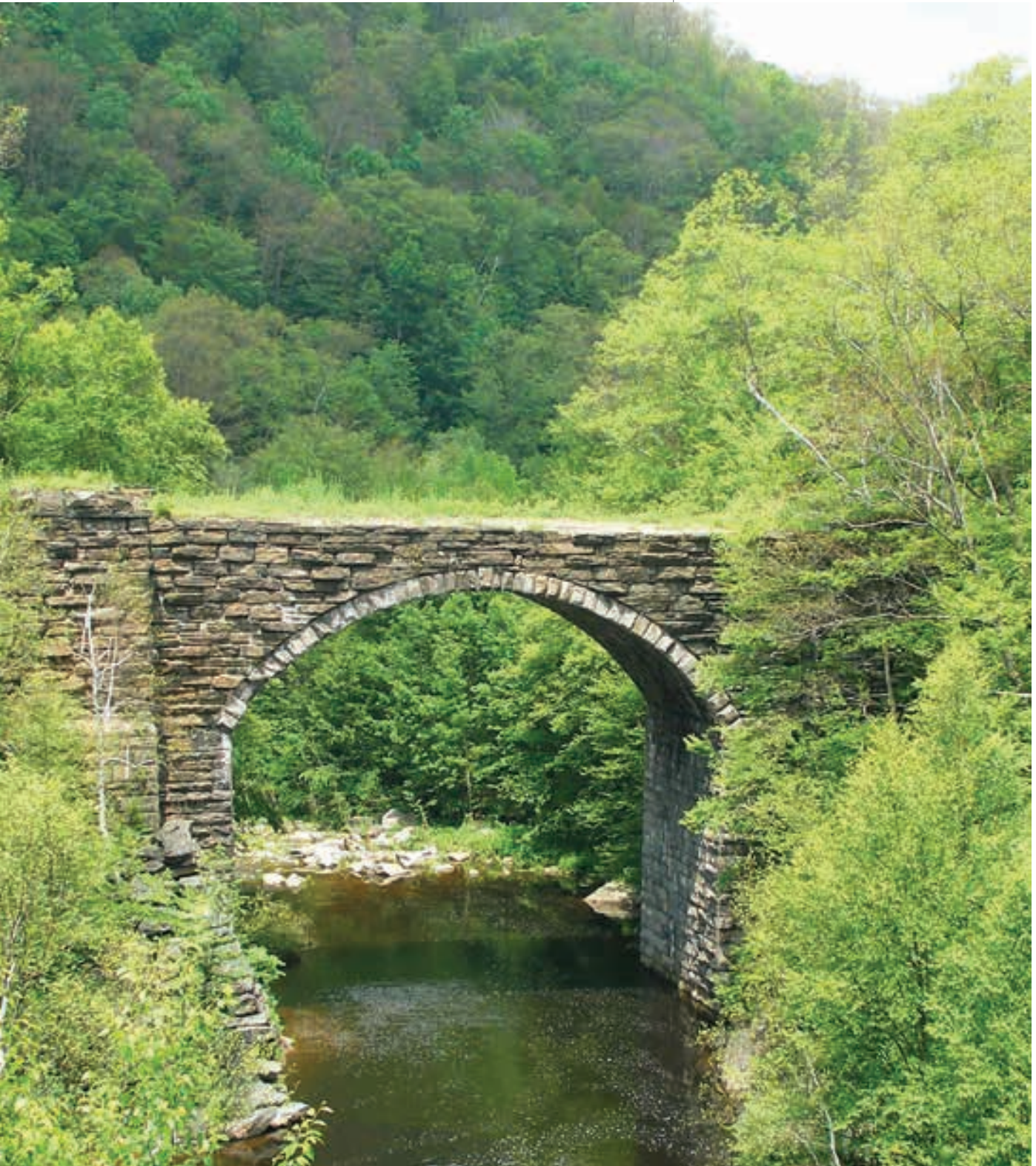


Westfield River in winter.

Photo: Chris Curtis

Core Environmental Values

- Swimmable and Fishable Rivers
- Clean Drinking Water
- Healthy Fisheries and Wildlife
- Vibrant Human-Riverfront Connections
- Sustainable Land Use and Agriculture



Historic keystone arch bridge over Westfield River, a designated National Wild and Scenic River.

Photo: Chris Curtis





The Connecticut River.

Photo: Chris Curtis

Water quality in the Connecticut River is improving.

The Connecticut River is a natural and scenic resource of great regional and interstate importance, and is a key element in the bi-state area's quality of life and economic prosperity. The water quality in some sections of the Connecticut River in Massachusetts and Connecticut is not currently meeting fishable and swimmable standards due to water pollution discharges which include combined sewer overflows and urban stormwater runoff. The high cost of river clean-up is creating financial hardships for many river communities. In addition, there are other sections which are suffering from impaired water quality due to stream bank erosion and non-point source pollution. Significant federal, state and local resources have been spent on river improvements however, limitations on access to the river and public information about river recreation are hampering the public's opportunity to enjoy these improvements. The Environment Plan evaluates water quality from the perspective of quality of life and how it affects recreational use, habitat integrity and resiliency, and greenways.



Combined sewer overflows continue to be a problem.

Inner city areas such as the canals of Holyoke suffer from a lower quality of water

Combined Sewer Overflows (CSOs) are the primary reason the Connecticut River continues to fail to meet federal fishable-swimmable water quality standards for bacteria. CSOs are a major financial burden in older urban communities, particularly Springfield, Chicopee and Holyoke, MA and Hartford, CT. 50% of the CSO volume, or 99 CSOs, have been eliminated to date with assistance in over \$20 million in federal funding through the Connecticut River Cleanup Committee, and over \$200 million total spent. There are still 64 remaining CSOs in Springfield, Chicopee and Holyoke with \$446 million estimated cost for the remaining CSO remediation. Stormwater is a major problem and represents about 25% of the bacteria loading to the Connecticut River.



Connecticut River Combined Sewer Overflow Locations and Bacteria Levels - show huge increases in bacteria after rainstorms.

Bacteria levels are elevated during wet weather.

In Massachusetts, from South Hadley to Springfield, average bacteria concentrations at locations downstream of CSOs during wet weather events indicate impaired water quality during wet-weather events in excess of Primary (swimmable) and/or Secondary (boating) Recreational Contact Standards. In 2006, the cities of Chicopee, Holyoke, and Springfield, together with the Pioneer Valley Planning Commission, published a study on bacteria levels in the Connecticut River in MA during dry and wet weather. Water quality during dry weather generally met Class B standards (swimmable, fishable). During wet weather, the single upstream sample site, near Northampton, met standards, but downstream all of the combined sewer overflows (CSOs), water quality was significantly impaired. The report determined that during rain storms, 50% of the bacteria in the river in that area came from CSOs, 25% came from stormwater, and 25% came from upstream sources.

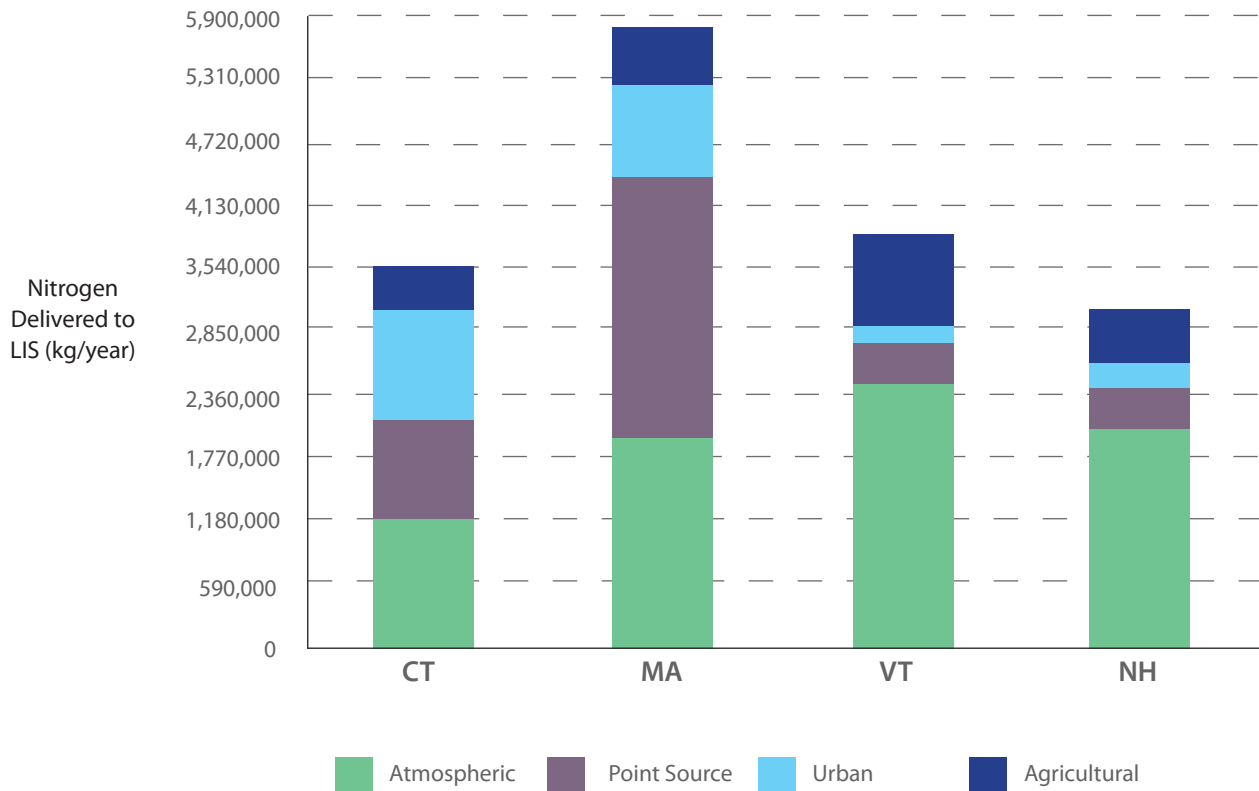


Quabbin Brook.

Photo: Chris Curtis

Efforts to clean up the Connecticut River have been coordinated on a regional basis, under an intergovernmental compact which formed the Connecticut River Clean-up Committee in 1993. The Connecticut River Clean-up Committee, under the direction of the Pioneer Valley Planning Commission, has secured over \$20 million in federal funding support and matching funds to help address this regional problem.

Predicted Nitrogen Load Delivered to Long Island Sound from Connecticut River Watershed States



Nitrogen loading from the Connecticut River to the Long Island Sound continues to be a source of impairment.

Nitrogen loading from the Connecticut River to the Long Island Sound continues to be a source of impairment. Nonpoint source pollution is the greatest source of nitrogen pollution (64.7%), of that, 15.5% derives from agricultural sources and 10.6% from urban sources. Best Management Practices (BMP) implementation or agricultural and other non-urban BMPs may be the most cost effective approach for improving water quality. Stormwater continues to be major contributor of NPS pollution as evidenced by water quality data collected on dry versus wet days.

Exposure to toxins cause impacts to fish, wildlife, and humans.

A statewide fish consumption advisory for mercury exists. In 2008, the U.S. EPA issued a TMDL for mercury load reduction to meet federal and state water quality standards. The mercury TMDL coupled with the results of the Connecticut River Fish Tissue Study in 2000 (US EPA) have resulted in expanded fish advisories for the Connecticut River for additional toxins including PCBs, DDT, and dioxin. At risk populations are children under 12, women who are pregnant or may become pregnant, women of child-bearing age, or breast-feeding women and should pay extra attention to the advisories.

The natural flow regime of the Connecticut River watershed is highly altered.

The natural flow regime of the Connecticut River and its tributaries has been highly altered. This altered flow regime is a primary threat to floodplain forests, estuarine communities, migratory and resident fish, and aquatic invertebrates. The fragmentation by dams and poorly designed culverts is one of the primary threats to aquatic species in the United States. In the Connecticut River basin in MA and CT, there are 1,422 dams (224 regulated by the Massachusetts Office of Dam Safety), which translates to densities of one dam per 6.6 km of river. Impacts on aquatic species involve loss of access to quality habitat for one or more life stages of a species, including limiting the ability of anadromous fish species to reach preferred freshwater spawning habitats from the sea, and preventing brook trout populations from reaching thermal refuges.

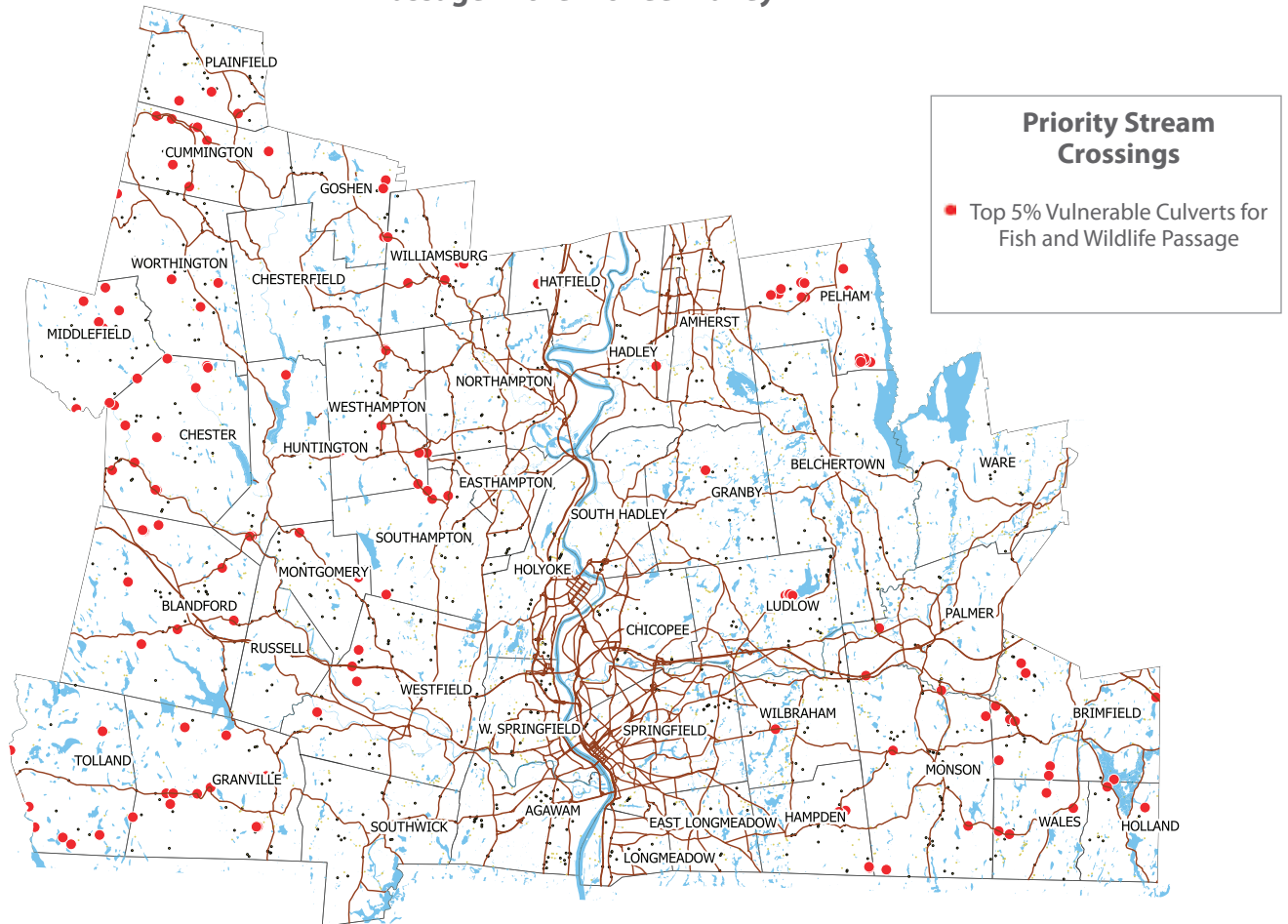
In addition to dams, culverts can create alterations in the natural hydrology of a river, create impediments for wildlife passage, and create blockages during extreme storm events that lead to localized flooding. There are 2,885 culverts in the region and 673 bridge stream crossings. The top 5% deemed most vulnerable to extreme weather and heavy rainfall are shown in red in the following. Fragmentation of dams and poorly designed culverts is a primary threat to aquatic species.



Westfield River in Autumn

Photo: Chris Curtis

Critical Culverts for Fish and Wildlife Passage in the Pioneer Valley



There are 2,885 culvert crossings of roads in the region. This map shows the culverts that are most critical to maintaining stream flow and related ecological functions that support fish, animal, and plant life.

Source: University of Massachusetts River and Stream Continuity Project, 2012

There are 235,908 acres in the Pioneer Valley suitable for open space protection that are currently unprotected.

Just over 15% of the Pioneer Valley is protected open space and/or parks. In Environmental Justice Areas, only 5.8% of the land area is protected open space and parks.

Mapping the parks and open space priority protection areas.

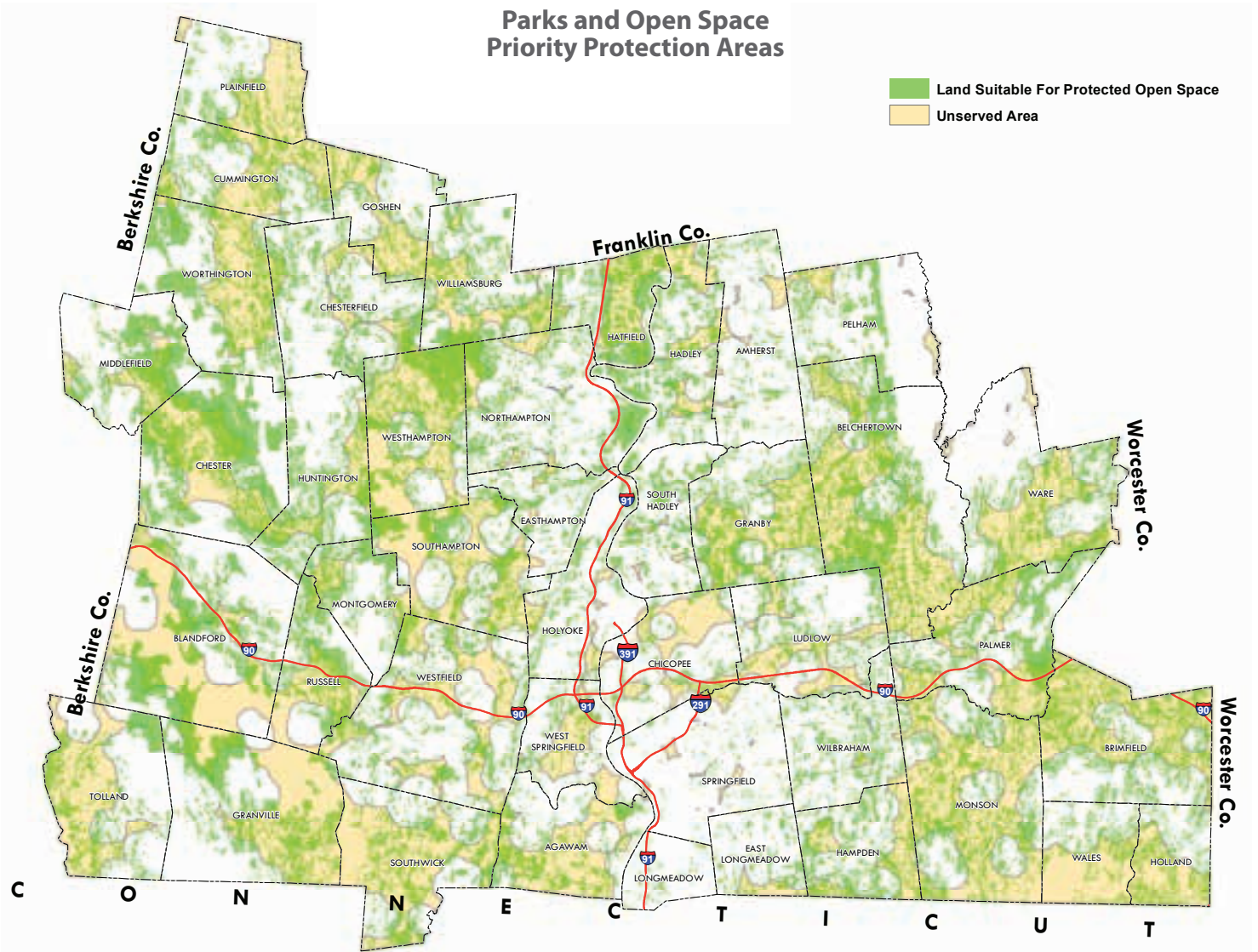
PVPC mapped a one mile accessibility buffer around the protected open space and parks and identified 'unserved' areas as those areas that are not within a one mile walking distance of protected open space or a park. This data layer was overlayed with "Land Suitable for Protected Open Space." The Pioneer Valley Regional Land Use Plan *Valley Vision* identifies Priority Protection Areas for the region as Land Suitable for Open Space Protection. MassGIS natural resource datalayers used to map this layer include: watersheds for public water supplies reservoirs and Zone II aquifer recharge areas, 100-year flood plains, wetlands and 100' buffer zones, steep slopes over 15%, and active farmland. Existing developed land and permanently protected land were then extracted from the natural resource datalayer. The remaining land is identified as "land suitable for open space protection" totaling 235,908 acres in the Pioneer Valley. The overlapping 'unserved' and 'suitable for protected open space' are identified as Parks and Open Space Priority Protection Areas to target funding and resources in the coming years.



Skinner State Park, South Hadley

Photo: Chris Curtis

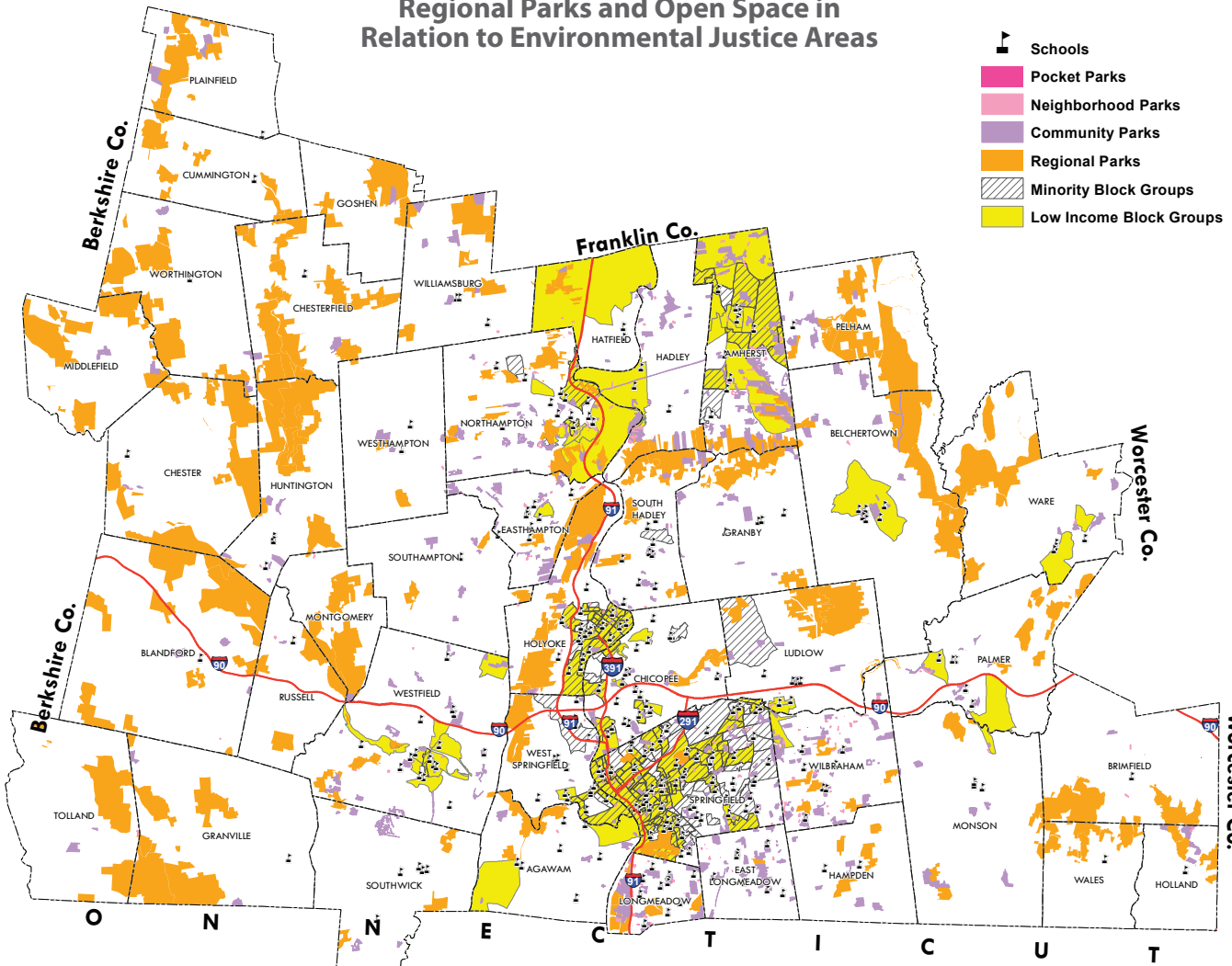
Parks and Open Space Priority Protection Areas



There is a lack of protected open space and parks within Environmental Justice areas.

The region has a wealth of protected open spaces and parks, (as shown in the map below), however, only 5.8% of this parkland is located within the Environmental Justice areas.

Regional Parks and Open Space in Relation to Environmental Justice Areas





The Connecticut Riverwalk, Springfield
Photo: Chris Curtis

Vibrant human-riverfront connections are needed.

The Connecticut River has been cleaned up considerably over the past two decades and is now far more attractive for recreation. In many areas, however, the river has been fenced by highways, railroads and incompatible commercial development, which has reduced opportunities for public access. Some areas of the river are heavily used for recreation, while other areas are neglected. Communities need to reconnect with the river, and find ways to bring people back to the river. To reverse the longstanding cycle of riverfront neglect and abandonment, and to bring urban riverfront areas to life, it is critical to invest in riverfronts. Priority projects for achieving this goal include:

- Complete design and construction of proposed Connecticut Riverwalk and Bikeway sections in Agawam, West Springfield, and Chicopee;
- Complete construction of the Holyoke Canalwalk;
- Link the Connecticut Riverwalk in Springfield to Forest Park and Agawam;
- Create new hiking trails along Connecticut River Byway;
- Establish a new trailhead for the New England National Scenic Trail Access in Hadley, MA;
- Create a Ferry Road Canoe/Kayak access in North Hadley, MA; and,
- Create trail linkages along the Jacob's Ladder Trail and Route 112 Scenic Byways;

The Environment Plan includes strategies to improve water quality in our rivers, support sustainable land use and farmland, protect drinking water supplies, create vibrant human-riverfront connections, protect fisheries and wildlife, and build a regional trail network.

Protect & Promote Swimmable & Fishable Rivers

MAINTAIN

Connecticut River website www.ConnecticutRiver.us

90

Maintain website broadly used by the public for information about recreational access to the Connecticut River, water quality for swimming and boating, fish consumption advisories, and other recreational news and information.

PARTNERS:
PVPC

CROSS-CUTTING STRATEGIES:



PLAN

Bi-state CT River Corridor Management

91

Develop a bi-state “report card” on indicators of CT River watershed health, including pollution (nitrogen, bacteria), percent of land which is impervious, number of CSOs, acres of land protected, miles of bike paths, and host annual event to release report card.

PARTNERS:
PVPC; CRCOG; FRCOG

CROSS-CUTTING STRATEGIES:



CONTINUE

Connecticut River Bacteria Monitoring Program

92

Seek funding for continued water quality monitoring and collaboration with local watershed organizations to monitor water quality at sites in Franklin County, MA, VT and NH.

PARTNERS:
PVPC; Connecticut River Watershed Council

CROSS-CUTTING STRATEGIES:



CONTINUE**Remediation of Combined Sewer Overflows**

93

Seek bi-state collaboration to secure federal funding for CSO remediation including establishment of bi-state legislative coalition to direct funding to CT River; seek funds from Environmental Bond Bill for CT River in MA; and create Green Infrastructure Small Grants funding program.

PARTNERS:
PVPC; CRCOG

CROSS-CUTTING STRATEGIES:

**DEVELOP****A Pilot for Zero Net Energy Wastewater Treatment Plant on Connecticut River**

94

Identify a Connecticut River community to serve as pilot study for implementing Zero Net Energy Wastewater Treatment Plant. Consider Integrated Resource Management of water, wastewater, and energy as part of pilot study.

PARTNERS:
PVPC, Municipalities

CROSS-CUTTING STRATEGIES:

**ADOPT****Stormwater Utilities**

95

Assist communities to adopt stormwater utilities. A local Stormwater Utility can generate revenue for stormwater infrastructure operation and maintenance.

PARTNERS:
Public Works Departments, Planning Boards, CEO

CROSS-CUTTING STRATEGIES:

**IMPLEMENT****Local Stormwater and Erosion Control Standards**

96

Implement or amend local stormwater bylaw/ordinances to comply with NPDES MS4 Permit requirements including Stormwater Pollution Prevention Plans, best management practices for on-site control and treatment of stormwater, and post-construction operation and maintenance requirements and enforcement.

PARTNERS:
Planning Boards

CROSS-CUTTING STRATEGIES:

**IMPLEMENT****Green Infrastructure Zoning Incentives**

97

Create zoning incentives for green roofs, permeable parking lots, on-site stormwater recharge and other green infrastructure.

PARTNERS:
Planning Boards

CROSS-CUTTING STRATEGIES:



Support Sustainable Land Use & Agriculture

EXPAND

The Compact for Pioneer Valley Conservation

98

Continue land conservation, stewardship and wetland permitting assistance offered through the Compact. Seek funding to capitalize a Revolving Loan Fund for land conservation bridge funds.

PARTNERS:
PVPC, Conservation Commissions,
Open Space Committees
CROSS-CUTTING STRATEGIES:



IMPLEMENT

Priority Protection Areas / Critical Lands Acquisition Program

99

Build on Hampden County Farmland Mapping Project and protect prioritized farmland and other Priority Protection Areas from willing sellers through fee acquisition, transfer of development rights, APR/CR, and zoning mechanisms mentioned herein.

PARTNERS:
PVPC, Agricultural Commissions,
Open Space Committees
CROSS-CUTTING STRATEGIES:



IMPROVE

Access to Parks and Open Space in Environmental Justice Areas

100

Expand healthy recreational opportunities by creating and/or expanding opportunities for access to open space and parks in EJ Areas.

PARTNERS:
PVPC, Municipalities
CROSS-CUTTING STRATEGIES:



ADOPT

The Community Preservation Act (CPA)

101

Assist additional Pioneer Valley communities in adopting the CPA. The CPA provides dedicated funding for historic preservation, low and moderate income housing, and open space protection including recreational development.

PARTNERS:
Conservation Commissions, Open
Space Committees, Planning Boards,
Historic Commissions
CROSS-CUTTING STRATEGIES:



USE

CPA funds to leverage state and federal funds for land conservation projects

102

Use CPA funds as match for state and federal land acquisition funding and/or Conservation Restrictions, and Agricultural Preservation Restrictions.

PARTNERS:
Municipalities, PVPC
CROSS-CUTTING STRATEGIES:



ESTABLISH**Local Conservation Funds**

103

Establish local Conservation Funds to accept donations, town meeting appropriations, and other funding sources for land conservation and stewardship projects.

PARTNERS:
Conservation Commissions

CROSS-CUTTING STRATEGIES:

**CREATE AND MAINTAIN****Active Agricultural Commissions**

104

Active Agricultural Commissions can sponsor Right-to-Farm Bylaws, inventory and identify local agricultural properties, create marketing programs and materials, and host community events.

PARTNERS:
Planning Boards, Conservation Commissions, Open Space Committees

CROSS-CUTTING STRATEGIES:

**ADOPT****Right to Farm Bylaws**

105

Assist communities to adopt Right to Farm bylaws which encourage the pursuit of agriculture, promotes ag-based economic opportunities, and helps protect farmland by reducing conflict with abutters.

PARTNERS:
Agricultural Commissions, Planning Boards, Conservation Commissions, Open Space Committees

CROSS-CUTTING STRATEGIES:

**ADOPT****Environmental Protection Bylaws**

106

Seek to implement environmental protection bylaws, including river protection, Green Development Performance Standards, Low Impact Development, and Floodplain Regulations, including addressing climate change impacts

PARTNERS:
Planning Boards, Conservation Commissions

CROSS-CUTTING STRATEGIES:

**CREATE****Transfer of Development Rights Zoning (TDR)**

107

Implement TDR Bylaws that allow development rights to be purchased in designated Sending Areas and transferred to Receiving Areas for use in more compact residential or commercial development projects.

PARTNERS:
Planning Boards, Agricultural Commissions, Conservation Commissions, Open Space Committees

CROSS-CUTTING STRATEGIES:



ADOPT**Scenic Upland Protection Zoning**

108

Scenic upland protection zoning can regulate alterations to the land which may negatively affect the scenic and environmental quality of these areas.

PARTNERS:
Planning Boards, Commissions,
Conservation Commissions, Open
Space Committees
CROSS-CUTTING STRATEGIES:



Protect Clean Drinking Water Supplies

COMPLETE**Supply and Demand Forecasts for Public Water Supplies**

109

In conjunction with Hazard Mitigation Plans development and updates, complete 5-year supply and demand projections for public water supplies

PARTNERS:
PVPC

CROSS-CUTTING STRATEGIES:

IMPLEMENT**Bi-State Approach to Water Supply Protection in Westfield and Farmington River Watersheds**

110

Promote contiguous land protection in southwest Hampden County, MA to Hartford, CT through Forest Legacy Designation for the area, and water supply protection overlay zoning.

PARTNERS:
PVPC; CRCOG

CROSS-CUTTING STRATEGIES:

**COMPLETE****Vulnerability Assessments and Protect Critical Infrastructure**

111

Inventory, update and conduct vulnerability assessments of critical infrastructure to flooding and other weather impacts, including energy generation, electrical transmission and distribution, communication networks, drinking and wastewater facilities, roads and highways, railways, dams and flood dikes and healthcare facilities. Take needed steps to improve resilience.

PARTNERS:
Municipalities

CROSS-CUTTING STRATEGIES:

**CREATE****Storm-proofed infrastructure**

112

Increase resilience of water/ wastewater infrastructure, streets and roads, flood dikes, sewer and water lines, to severe storm events and flooding. Take action to harden and raise the level of infrastructure, as funds become available.

PARTNERS:
Municipalities

CROSS-CUTTING STRATEGIES:



CREATE**Emergency Intermunicipal Water Connections**

113

Identify options for creating emergency water supply inter-connections with neighboring communities, and seek formal agreements to purchase water in emergencies. Physical, piped emergency connections, and agreements to purchase water, should be put into place in advance of emergencies.

PARTNERS:
Municipalities

CROSS-CUTTING STRATEGIES:

**UPGRADE****Stream Crossings, Bridges and Culverts**

114

Pro-actively replace underperforming culverts and bridges with structures designed to meet the MA Stream Crossing Standards to accommodate floods and promote wildlife passage. Identify and prioritize culverts for replacement. Prepare for disaster replacement by designing generic plans for different types of stream crossings to implement in emergency repairs. Integrate replacements into road and utility infrastructure projects to off-set costs and access funding opportunities.

PARTNERS:
**Public Work Departments,
Conservation Commissions**

CROSS-CUTTING STRATEGIES:



Protect & Promote Healthy Fisheries and Wildlife

SUPPORT**Dam Removal of High Hazard Dams in Stressed Basins**

115

Audit and upgrade energy efficiency in older leaky municipal buildings. A municipality can partner, using an Energy Service Company (ESCO) where appropriate.

PARTNERS:
PVPC, MA DER, Municipalities

CROSS-CUTTING STRATEGIES:

**UPDATE****Flood Maps**

116

Work with FEMA to raise priority for update of flood insurance maps in the region, using LiDAR elevation surveys and climate models, and identify at-risk facilities, and flood zones in need of protective zoning.

PARTNERS:
PVPC, Municipalities

CROSS-CUTTING STRATEGIES:

**IMPROVE****Flood Zoning**

117

Adopt improved zoning to prevent new development in flood zones, increase flood resilience of buildings, and provide protection of basement and first floor levels.

PARTNERS:
Municipalities

CROSS-CUTTING STRATEGIES:



IMPLEMENT**Northeast Regional Mercury Total Maximum Daily Load (TMDL)**

118

In order to reduce mercury deposition in rivers and levels in fish, implement the Northeast Regional Mercury Total Maximum Daily Load (TMDL) for successful control of in-state and regional reductions in mercury sources

PARTNERS:

MA DEP

CROSS-CUTTING STRATEGIES:

**CONDUCT****Fishing Survey and Fish Consumption Advisory Outreach**

119

Conduct a study to determine level of subsistence fishing on CT River; Conduct outreach to these communities about fish consumption advisories to protect public health.

PARTNERS:

PVPC

CROSS-CUTTING STRATEGIES:



Create Vibrant Human-Riverfront Connections

CONDUCT**Bi-State Trail Linkages Study**

120

Conduct a bi-state trail linkages study to identify opportunities for linking trails, such as the Connecticut Riverwalk and Farmington Canal Heritage Trail, between Massachusetts and Connecticut.

PARTNERS:

PVPC

CROSS-CUTTING STRATEGIES:

**CREATE****Greenway System of Trails and Parks**

121

Design and construct missing trail links between states and regions focusing on Priority Protection Areas and protect missing links in the regional greenway system.

PARTNERS:

PVPC, Municipalities

CROSS-CUTTING STRATEGIES:

**EXPAND****Connecticut River Paddlers Trail**

122

Expand the Connecticut River Paddlers Trail southward from Vermont and New Hampshire into Massachusetts and Connecticut.

PARTNERS:

VT River Conservancy, AMC, TPL

CROSS-CUTTING STRATEGIES:



SUPPORT**Pioneer Valley Regional Trails Coalition**

123

Participate in the development and implementation of a Pioneer Valley Regional Trails Coalition to increase local/regional capacity for developing and stewarding regional trail networks.

PARTNERS:
PVPC

CROSS-CUTTING STRATEGIES:

**IMPLEMENT****Zoning for Bike and Pedestrian Amenities to Support an Intermodal Pedestrian and Bicycle Network**

124

Help communities adopt zoning bylaws to require sidewalks, bike path connectors, bike parking and amenities in new developments, and internal pedestrian linkages in large projects.

PARTNERS:
Planning Boards, Public Works
Departments, PVPC, MDOT

CROSS-CUTTING STRATEGIES:

**CONTINUE****To Enhance www.ConnecticutRiver.us To Support Recreational Use of the River**

125

Connect 'Live Well Springfield' and Pioneer Valley Asthma Coalition's initiatives with the website to promote use of riverwalk and river access sites in Springfield; promote river user groups such as PV Rows; encourage linkage with the CT River Blueways web atlas (under development) and ConnecticutRiver.us.

PARTNERS:
PVPC

CROSS-CUTTING STRATEGIES:

**SEEK****Funding for New England National Scenic Trail Access**

126

Advance design and construction of a new trailhead, including improved trailhead signage, interpretive information and safe, attractive parking for the New England National Scenic Trail (NENST) near its crossing of the Connecticut River Byway.

PARTNERS:
PVPC

CROSS-CUTTING STRATEGIES:

**SUPPORT****Connecticut Riverwalk and Bikeway Build-Out**

127

Work with Chicopee, Agawam, West Springfield and Holyoke to complete the design and build-out of Connecticut Riverwalk segments

PARTNERS:
PVPC, municipalities
CROSS-CUTTING STRATEGIES:



Build a Regional Trail Network

DESIGN AND CONSTRUCT

Connecticut River Byway Trail System

128

Seek funding too design and construct four trails and river access areas along Connecticut River Byway:

- Red Rocks River Trail along the riverbank in North Hadley, MA,
- Porter Phelps Huntington House to Mount Warner Trail in Hadley;
- Connecticut River to Mount Holyoke Range Trail in South Hadley;
- Connecticut River Car-top Boat Access at Ferry Road in North Hadley, MA.

PARTNERS:
PVPC; MA DCR

CROSS-CUTTING STRATEGIES:



CREATE

Connecticut River Greenway Park and Trail, Northampton, MA

129

Support the City of Northampton's efforts to develop river access for CT River Greenway riverfront park and multi-use trail along CT River from Norwottuck Rail Trail on Damon Road to Elm Court, Hatfield.

PARTNERS:
City of Northampton

CROSS-CUTTING STRATEGIES:



CREATE

Linkages to Chicopee River Delta Park

130

Promote linkage with the Connecticut Riverwalk at the Chicopee River delta, and connection to the Chicopee Riverwalk in downtown Chicopee.

PARTNERS:
City of Chicopee; PVPC

LINK

The Connecticut Riverwalk to Forest Park and Agawam

131

In Springfield, increase use of the Connecticut Riverwalk for mobility and exercise, by linking it to Forest Park and Agawam.

PARTNERS:
PVPC, municipalities
CROSS-CUTTING STRATEGIES:



CROSS CUTTING STRATEGIES ICONS: The following icons are used in reference to issues and strategies related to other element plans of this report.



TRANSPORTATION



ENVIRONMENT



GREEN INFRASTRUCTURE



LAND USE



ECONOMIC DEVELOPMENT



CLIMATE ACTION



HOUSING



FOOD SECURITY



BROWNFIELDS



Canoeing lessons at Pioneer Valley Riverfront Club,
Connecticut River, Springfield MA Photo: Chris Curtis



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