



Pawcatuck River at Avondale (Photo credit: Rebecca Woodward)

CHAPTER 6: ACTION STRATEGIES FOR THE FUTURE

At their September 2017 meeting the Study Committee voted that, based on their determination of regionally and nationally significant values of the rivers, and based on the support of watershed towns, that the committee will pursue Wild and Scenic Rivers designation for the seven rivers in the Wood-Pawcatuck Watershed.

Chapter 5 contains information about the many excellent regulations already in place from the twelve municipalities, as well as Rhode Island and Connecticut state regulations, for each of the Outstandingly Remarkable Values (ORVs). This chapter provides suggested actions which are **voluntary measures** that individual towns, states, federal or non-profit agencies may wish to institute on their own or in conjunction with the Wood-Pawcatuck Watershed Association and the Wild and Scenic Rivers Stewardship Council. Many of these suggested actions are already described in current town, state, and federal regulations, as described in the previous chapter.

Not included in the Mason and Associates' report is a discussion of water quality monitoring in both CT and RI. Key points from the Rhode Island Water Quality Management Plan apply to both states:

- Water quality monitoring is essential for effective water resources management.

- The capacity of the State and its partners to sustain important monitoring programs is an on-going concern.
- Stewardship of aquatic habitats requires monitoring to characterize the ecological health and functioning of the targeted habitat.
- Climate change reinforces the need for monitoring hydrology and habitats that are most vulnerable to its impacts.

In the Wood-Pawcatuck Watershed water quality monitoring is conducted by Rhode Island Department of Environmental Management (RI DEM) through their state monitoring programs (see Part 4, Water Quality Monitoring and Assessment, Water Quality 2035 Rhode Island Water Quality Management Plan), Connecticut Department of Energy and Environmental Protection (CT DEEP) (see CT DEEP Ambient Water Quality Monitoring Program Strategy 2015 - 2024), and the University of Rhode Island Cooperative Extension Watershed Watch Program. Several towns, along with WPWA and the North Stonington Citizen Land Alliance, work with the Watershed Watch program to provide funding and monitoring volunteers. There is also limited monitoring conducted by the US Environmental Protection Agency at a very broad scale usually on a rotating basis.

To monitor threats and assess restoration projects it will be essential to support and expand water quality monitoring at all levels in the watershed.

Identifying Threats

On July 26, 2017 a Rhode Island Stewardship Summit was attended by staff from RI DEM, Rhode Island Department of Administrations Division of Planning, Grow Smart RI, University of Rhode Island (URI) Department of Natural Resources Science, South Kingstown Planning Department, Hopkinton Planning Department, The Nature Conservancy, Save the Bay, National Parks Service (NPS), and several Wood-Pawcatuck Wild and Scenic Rivers Study Committee members. On October 12, 2017 a Connecticut Stewardship Summit was held attended by CT DEEP, Eight-mile River Wild and Scenic Coordinating Council, NPS, and several Wood-Pawcatuck Wild and Scenic Rivers Study Committee members. The participants in these summits helped to identify the following threats to the watershed:

- *Climate change*
Among the negative impacts of climate change, there has been an increase of severe storms, particularly in the northeast region of the country. These storms have resulted in more flooding in low-lying areas along the Wood and

Pawcatuck Rivers. Climate change is also causing increasingly hotter and dryer summers, resulting in drought conditions, warmer streams, and low stream flow.

- *Development including:*

- ◇ Unplanned residential growth and suburban sprawl from nearby urban regions.
- ◇ Improper siting of large commercial installations, such as large solar panel installations on low density zoned areas.
- ◇ Excessive runoff during storms due to impervious surfaces.

Residential development results in increased impervious surfaces, primarily by creating more roads. Impervious surfaces contribute to stormwater runoff into streams, rivers and ponds, which decreases water quality and increases stream temperatures. Residential developments can increase sediments in adjacent rivers, which adversely affects aquatic life. It can also contribute to groundwater contamination of the sole source aquifer. In addition, residential development adds the need for wastewater treatment, either as individual septic systems or large scale treatment plants. While development is a necessary part of any community, steps need to be taken to insure that housing developments have minimal impact on the ORVs of the rivers.

- *Point-Source Pollution*

There are several points of direct discharge into the twelve rivers, including two sewage treatment plants and one industrial plant on the Pawcatuck River. Improper agriculture practices can contribute discharges of herbicides and nutrients that can harm the streams and rivers.

- *Habitat fragmentation*

Habitat fragmentation occurs when large blocks of contiguous habitats are subdivided into smaller, isolated parcels. In suburban landscapes such as the Wood-Pawcatuck Watershed, this is caused primarily by building roads and housing developments. These barriers in the landscape make it difficult or impossible for many native species that need to disperse across the landscape to breed, such as turtles and frogs, to travel between habitats that provide for critical parts of their annual cycle. Increased fragmentation can lead to major reductions in the diversity of flora and fauna in a region, particularly native species that require contiguous habitats.

- *Invasive species*
Invasive species can be detrimental to the native flora and fauna of the Wood-Pawcatuck Watershed. Invasive species are non-native plants or animals that negatively impact native species. They originate from other regions of North America or from other continents. Lacking natural predators that control their populations, they can invade habitats and extirpate native plants and animals. Invasive species are often introduced inadvertently by people who live or recreate in the watershed.
- *Limited resources for protected lands*
One way to protect lands is to purchase them for conservation. Many organizations can be involved in this process including local land trusts, town municipal land trusts, state and federal agencies and private non-profit organizations. However, these agencies and groups often have limited funds for both the purchase of lands and management of the lands after purchase.

These threats present key management challenges to protecting the ORVs of the rivers and their corridors. Strategies to protect the ORVs can be found in the following plans:

- Rhode Island State Wildlife Action Plan
- Connecticut State Wildlife Action Plan
- Rhode Island Water Quality 2035
- Wood-Pawcatuck Watershed Flood Resiliency Management Plan
- Connecticut Green Plan
- Pawcatuck River Bacteria TMDL
- Connecticut Bacteria TMDL Shunock River

Geology and Hydrology

Geology - The geologic features of the Wood-Pawcatuck Watershed are not currently under threat.

- The Charlestown Moraine is such a large feature that other than land conservation there are no suggestions for special protection at this time. The Champlin Park in Westerly covers a small section of the moraine and allows hikers to see some of the key geological features, such as kames and kettle ponds. This park includes educational signage and explanations regarding the features of the moraine.

- Green Fall Rift Valley is contained almost entirely within the Pachaug State forest.
- Dead Swamp is protected by a conservation easement held by the town of West Greenwich.

Hydrology - There are a number of threats to the hydrology of the Wood-Pawcatuck Watershed. Hydrology is the science that studies the distribution, movements, and quality of water in the watershed.

1. Development – More housing developments in the twelve rural towns in the Wood-Pawcatuck Watershed will lead to more runoff into the rivers, which will cause water quality degradation, erosion, and loss of habitat.
2. Flooding – All seven rivers within the Wood-Pawcatuck Watershed have experienced flood events over the past decade, especially in areas with residential and commercial developments within the floodplain of each of the rivers. Increased flooding is due to:
 - a. Buildings located on natural flood plains.
 - b. Channelization, or straightening, of the rivers.
 - c. Improperly functioning dams and other structures such as road culverts.
 - d. Increases in impervious surface that lead to increased water velocity and increased runoff into the rivers.
3. Water withdrawals – There are increasing ground water withdrawals for municipal wells and surface water withdrawals for irrigation. These can cause extreme low flow for small tributaries when there are low rain years, impacting the habitat value of the streams.
4. Climate change – The changing climate causes more frequent storms with larger amounts of rainfall, as well as longer dry periods without measureable precipitation. These changes in precipitation can both increase the timing and severity of flooding, and also decrease stream flow. One of the biggest direct threats of climate change is that stream temperatures may be warming over time. Warm water, especially during low flow months in the summer, can reduce or eliminate appropriate habitat for many macroinvertebrates and wild brook trout.

Hydrology Action Plan

A. Preserve and protect water quality and quantity.

- 1. Monitor water quality** - Ensure that state and local organizations such as URI Watershed Watch, a volunteer, citizen-based water monitoring program, continue monitoring and capturing data from geographically representative sites. Collect stream flow and water quality data as needed to support the protection of these resources.
- 2. Continue to operate USGS river gages** - Ensure continued monitoring of the US Geological Service (USGS) gages on the Beaver, Queen, Usquepaugh, Shunock, Wood and Pawcatuck Rivers. Two of the gages on the Pawcatuck River have been operating and providing water flow records since 1940.
- 3. Address impaired waters** - Impaired waters are those that are impacted by pollution from stormwater runoff, development, and other human processes. Most of these impairments entail excess bacteria or nutrients. Support approved plans by both state and federal agencies for impaired sections of rivers in the designated reaches. This usually entails better management of stormwater runoff.
- 4. Protect riparian buffers** - Riparian buffers protect water quality as well as provide habitat and scenic value. State regulations in RI require at least one hundred feet of vegetated buffers on either side of rivers. In CT, DEEP Fisheries Division promotes hundred foot set back. Encourage protection of these buffers and establish replanting programs where feasible.
- 5. Protect water flow** - Maintain, protect, and enhance water flow regimes that support the habitat requirements of native river fauna, while accommodating demands for water supply, waste assimilation, commercial, industrial, and agricultural uses. CT Stream Flow Standards and Regulations use approved classifications to protect streams in the watershed. RI uses regulations developed for the Freshwater Wetlands Act.
- 6. Conserve land** - Conserve undeveloped and sensitive land within the Wood-Pawcatuck Watershed, particularly within one-quarter mile of the Wild and Scenic River segments, to limit impervious cover and mitigate the effects of urbanization. Corridor protection strategies that prevent or limit placement of infrastructure within the corridor will protect the river system from future erosion and flood losses.
- 7. Increase green canopy** - Increase urban/suburban forest canopy cover within developed areas of the Wood-Pawcatuck Watershed to aid in stormwater quantity and quality management, while decreasing runoff temperatures. Also, promote the use of other green infrastruc-

ture techniques, such as vegetated roofs and walls in the built environment, to better manage runoff in the watersheds.

- 8. Protect drainage** - Protect and restore natural drainage patterns where feasible through stream restoration projects. One type of restoration is “daylighting,” which redirects or uncovers previously buried streams.
- 9. Improve water quality** - Use low-impact development techniques to pre-treat runoff prior to discharging to any tributaries.
- 10. Practice bioretention** – Bioretention is a way of retaining runoff on a site using such practices as rain gardens or retention basins. They are designed to remove contaminants from the water before it runs into the river. Publicize the benefits of bioretention areas and promote the use of these and other green infrastructure and/or low-impact development techniques for managing runoff from nearby farms and developed areas.
- 11. Plan for pollutant spills** - Ensure that the affected towns’ public works, fire, or police departments, and both states, have emergency plans for accidental pollutant spills and have equipment for such emergencies on hand.
- 12. Follow best practices for road salt and sand** - Work with local municipal Departments of Public Works (DPW), highway departments, and the Connecticut and Rhode Island Departments of Transportation to promote best management practices that minimize road salt and sand runoff to wetlands, streams, and rivers. Research alternatives to road salt, and encourage towns to use them.
- 13. Encourage best practices for property owners** - Reduce pollution from landscaping chemicals and reduce water consumption. Provide advice to citizens on proper use of lawn chemicals to prevent over-treatment. Encourage riparian landowners through an education campaign to reduce runoff on their property, minimize impervious surfaces and minimize pesticide and fertilizer use. Often this can be accomplished by maintaining an appropriate buffer between the treated land and the waterway.
- 14. Encourage farming best management practices (BMPs)** – BMPs help protect water quality and provide economic benefits. Encourage BMPs by providing financial incentives and technical assistance to farmers.
- 15. Consider water in land use planning** - Ensure that land use planning includes adequate water supply resources, stormwater drainage

systems, and wastewater treatment systems (both onsite and centralized wastewater treatment systems) as well as permanent and temporary soil stabilization techniques and groundcover for all disturbed areas.

- 16. Identify threats from septic systems** - Partner with towns to identify the degree of threat from potential faulty and/or illicitly discharging septic systems, which may result in bacterial and nutrient contamination of nearby streams and groundwater.

B. Preserve and protect important high- and medium-yield aquifers.

- 1. Promote aquifer protection** - Promote extended aquifer protection through land use regulations, acquisitions, and landowner stewardship.
- 2. Conserve water** - Actively promote water conservation. Encourage communities to consider mandatory conservation measures to augment volunteer efforts during droughts. Develop homeowner incentives to conserve water.
- 3. Encourage rainwater reuse** - Actively promote rainwater harvesting and reuse. Encourage communities to consider requirements for capture and storage of rainfall for non-potable water uses on development projects to help better manage stormwater runoff and reduce the use of potable water. Encourage all landowners in methods of returning water to the ground instead of running off the property, including the use of rain barrels and rain garden installation. (See Rhode Island Drought Management Plan and Connecticut Drought Management Plan)
- 4. Preserve hydrology** - Work with planning boards, town engineers, conservation commissions and developers, and landowners to consider maintaining or restoring predevelopment hydrology in order to protect groundwater recharge capability. Appropriate techniques include limiting impervious surfaces, rainwater harvesting, the use of swales and other low-impact development measures, and best management practices that assist infiltration. Post-development runoff cannot be greater than pre-development levels, which is why each town needs staff that is capable of interpreting stormwater calculations.

C. Develop flood resiliency

- 1. Protect floodplains and wetlands** - Maintain the ability of floodplains and wetlands to efficiently absorb water and protect the river from runoff-related pollution. Assess floodplain and wetland mapping for the corridors and determine ways to improve it, coordinating with state and federal agencies. Work with town boards to inform them of the importance of floodplains for flood-

water storage and to encourage protection of floodplains and wetlands when considering development proposals.

- 2. Mitigate Flooding** – In 2017 the Wood-Pawcatuck Watershed Association produced a Flood Resiliency Management Plan (FRMP) for the Wood-Pawcatuck Watershed (wpwa.org/flood_resiliency.html). This comprehensive document examines all the factors contributing to flooding the watershed and makes specific recommendations to alleviate or mitigate those factors. In general the recommendations are:
- a. Remove, replace, or repair in-stream structures such as culverts, bridges and dams that contribute to flooding.
 - b. Conserve and restore flood plains, river corridors, and wetlands in a natural condition.
 - c. Reduce runoff volumes, flooding, and water quality impacts through improved stormwater management and the use of green stormwater infrastructure.
 - d. Improve stream meanders. Fluvial geomorphic assessments done on the Wood and Pawcatuck Rivers indicate that many areas have been straightened or channelized. This upsets the rivers' natural tendency to meander and evolve a channel form that is in equilibrium, or at balance, with the water and sediment inputs of their watersheds.

Information concerning all these potential projects, including a prioritized list of structures and potential funding sources, can be found in the FRMP. An example of a small project that could be done at a town level is to replace road culverts with box culverts that are open at the bottom. This can be done when the town is ready repair or resurface the road. Some funding may be obtained through state emergency management projects to reduce flooding. An example of a large project which the Stewardship Committee may want to implement would be to restore natural stream meanders in the Pawcatuck River, below the Bradford fish structure.

For the purposes of this Stewardship Plan, the recommendation is to have the Stewardship Committee work with the towns, states, and federal agencies to implement as many of the projects recommended in the FRMP as possible. The advantage of many of these projects is that by reducing flooding issues they also tend to improve water quality and increase habitat values. Therefore many of these projects can also be used to protect and improve other ORVs.

Ecosystems

The Wood-Pawcatuck Watershed is currently seventy-five percent undeveloped. While the exact amount differs between the rivers, all of them benefit from low levels of development and consequently low amounts of impervious surface. Studies have shown that streams in watersheds with less than ten percent impervious surface have good to excellent water quality and more stable stream banks. The 2016 CT Integrated Water Resources Management program address stream protection and restoration. The major threats to ecosystems in the watershed are similar to those for hydrology:

1. Development
2. Climate change

Ecosystem Action Plan

A. Preserve and protect habitat.

- 1. Purchase properties and conservation easements** to directly protect land by permanently prohibiting clearing forests and building structures in or near the rivers. Work with local land trusts, non-government agencies, and state agencies to identify and develop a priority list of important habitat parcels.
- 2. Protect habitats and corridors** identified as high priority by the Rhode Island and Connecticut Natural Heritage Programs and the State Wildlife Action Plans.
- 3. Protect riparian zones** - Work with the states, local communities and land-owners to protect riparian zones from unnecessary clearing and land alteration.
- 4. Protect vegetative buffers** - Ensure that appropriate buffers are maintained to help lower water temperatures.
- 5. Restore streambeds** - Restore streambeds impacted by road sand deposition and seek solutions to reduce future road sand and other sedimentation. Involve town DPWs and state Departments of Transportation as appropriate.
- 6. Conserve contiguous habitat** – Continue to work with communities, state agencies, local land trusts and other non-profit entities to identify conservation strategies that will provide contiguous habitat, corridors, and linkages among habitat types to address the needs of diverse plant and wildlife populations.
- 7. Carefully site any new trails and river accesses** to make sure they do not encroach into sensitive core habitats.

- 8. Protect land corridors** - Focus on creating land protection corridors, dispersal and migratory wildlife routes through which terrestrial and aquatic flora and fauna will be able to move and adapt, as climate disturbance increasingly impacts biological processes and drives species north.
- 9. Carefully site new alternative energy installations** – Limit large installations to already impacted areas in the towns. Encourage updated best management practices when located in a river buffer. Develop new town ordinances to properly site installations so that they protect watersheds and forests areas.
- 10. Encourage land conservation easements and restrictions** - Educate and encourage landowners to consider Conservation Easements (CE) and the importance of maintenance and enforcement of these restrictions. Consider providing funding to budget-strapped local land trusts whose lack of capacity makes it difficult to do the required annual monitoring of all CEs.
- 11. Encourage current use programs** - Encourage conservation and the preservation of existing forest, farm, and recreational land through programs such as Farm, Forest, and Open Space. These programs can be used by landowners who want to keep their land in open space but are not able or willing to execute a permanent conservation restriction/easement agreement.
- 12. Reduce light pollution** – Unnecessary ambient lighting can have negative effects on wildlife behavior. This is particularly important along river corridors where wildlife concentrates. The watershed has been identified as part of the last remaining dark sky region in southern New England by The Nature Conservancy. Many towns already have “dark sky” ordinances which other towns could consider adopting. Dark sky ordinances are consistent with the NPS program to protect “night skies as a natural resource,” www.nps.gov/subjects/night skies/natural.htm.

B. Protect and enhance coldwater fisheries resources.

- 1. Raise awareness about streams** - Collaborate with anglers’ organizations, aquatic biologists, naturalists, local school systems, and others to increase public awareness and appreciation of how headwater streams work. Focus on minimum low flows, the recreational value of coldwater fisheries, and the ways that individuals can both enjoy and contribute to sustaining these remarkable resources. Conduct outreach focused on engineers who develop stormwater systems for projects, municipal members of planning and conservation boards, and others whose decisions affect stormwater management and land use change.

2. **Protect brooks** - Protect small, cold, headwater brooks, which are necessary for reproduction and rearing of juvenile fish and thermal refuge during periods of high temperatures.
3. **Improve culverts and crossings** - Improve stream habitat by replacing and/or upgrading poorly designed culverts and other stream crossings. (See recommendations in the Wood-Pawcatuck Watershed Flood Resiliency Management Plan).
4. **Preserve canopies** - Preserve forest canopies over coldwater fisheries resources to ensure streams remain shaded.
5. **Protect water flow** - Maintain, protect, and enhance water flow regimes that support the needs of native river plants and animals, while accommodating demands for water supply, waste assimilation, commercial, industrial and agricultural uses.
6. **Maintain riverbanks** - Conduct stream assessments to identify and repair man-made bank disturbances and/or erosion impacting natural structure and reducing riparian vegetative cover.
7. **Address data gaps** - Support the Connecticut and Rhode Island State Wildlife Action Plan and the Connecticut DEEP and Rhode Island DEM coldwater fishery programs to address data gaps in brook trout population and status.

C. Protect and Enhance Anadromous Fisheries.

1. **Support fish passage projects** on the all the designated rivers. These include constructing structures such as fish ladders and nature-like rock ramps.
2. **Consider removal of unused dams** – This process should involve the communities to ensure that important functions of the dams are taken into account.

D. Minimize the Effect of Non-Native Invasive Species.

1. **Monitor invasive species** – Work with state agencies to monitor the presence of species that have the ability to thrive and spread aggressively outside their native range, both aquatic and land-based. Help local communities find out about methods for control and eradication. Communicate with and educate the public for prevention and control.
2. **Raise awareness about invasives** - Post signs warning of non-native invasive aquatics at boat launch sites, reminding boaters to check their boats for hitchhiking plants. Provide educational materials for lake and pond associations on invasive terrestrial and aquatic flora and fauna, including the proper cleaning of boats and motors to prevent transport and spread of invasives.

Present programs and prepare articles for local media to educate the broader public about aquatic invasives, how to identify them, and things individuals can do to prevent the establishment and spread of invasives.

3. **Monitor invasive aquatic weeds** - Where feasible as time and funding permit, conduct baseline mapping of aquatic invasive weeds along the rivers using Rhode Island and Connecticut state guidelines. Additionally, those areas previously mapped should be periodically revisited to determine if any invasive plant growth has occurred.
4. **Encourage native plantings** - Encourage landscaping using native plants, at home and at businesses, to support native wildlife, particularly pollinators. Planting native species reduces the potential for new invasive species from other areas to establish themselves in the watershed
5. **Organize clean-up efforts to reduce invasive plants** - Support biodiversity in riparian habitat by organizing river clean-up days with local volunteers to remove common terrestrial non-native invasive species such as Japanese knotweed, Japanese barberry, Asian bittersweet, and glossy buckthorn.

E. Educate the public about river ecology and ways to keep rivers healthy.

1. **River signage** – have the name of each river posted at every bridge crossing. Include the words “A Wild and Scenic River”.
2. **Engage town and state agencies** - Work with town DPW road crews and Rhode Island and Connecticut Department of Transportation agencies who could help alert the public to the significance of Wild and Scenic Rivers.
3. **Raise awareness through events** - Sponsor local events to raise public understanding about native wildlife and the impacts of development patterns on habitat and ecosystem integrity. For example, provide Wild and Scenic River outreach information at community events, fairs, festivals, canoe races, fishing events, and other public gatherings.
4. **Engage utility companies** - Work with private and public utility companies on creating and updating utility corridor management plans that recognize the importance of maintaining healthy wetlands, stream and river riparian buffers, and of reducing the use of chemical pesticides in or near these sensitive areas.
5. **Engage the public** - Engage with residents and others in the watershed on ecological issues, particularly with regard to recognizing that the streams, streambanks, and riparian areas, including riparian buffers and corridors, are sensitive places that might be conserved, restored, and protected.
6. **Pursue education opportunities** - Pursue opportunities to educate landowners, developers, and local land use boards about the causes of non-

point-source pollution, its potential impacts on water quality and instream resources, and methods—such as best management practices—for reducing or eliminating it. Pursue opportunities to demonstrate the use of best management practices such as expanding riparian native vegetation buffers to control non-point-source pollution.

- 7. Engage school-aged children** – Work with local schools to conduct educational and recreational programs so children will learn about and understand the importance of the rivers to their communities. Champion the river as a classroom with “on-water education” and field trips to the rivers.
- 8. Teach watershed science to teachers** - conduct courses for teachers in the use of the AWESome (ACTIVE WATERSHED EDUCATION) Curriculum.
- 9. Teach watershed science to citizens** - Educate citizens about the geographic extent and functions of the rivers in the Wood-Pawcatuck Watershed, the specific needs for protection of and improvement to the rivers systems, and the benefits of a healthy watershed to individuals and communities.
- 10. Promote stewardship** - Encourage the public to speak out on issues and to participate in the stewardship of the proposed designated area.
- 11. Build an educational network** - Encourage organizations with existing education and outreach programs to continue and expand their efforts, through cooperation among those organizations. Develop methods to provide information and education about the Wood-Pawcatuck Watershed.

Cultural

Rivers are the life blood of the communities in the Wood-Pawcatuck Watershed. It is important to note that the Wild and Scenic Rivers designation is as much about celebrating the communities’ ties to the rivers as it is about the rivers themselves. From pre-European times to today, residents and visitors in the watershed have shared an emotional and spiritual as well as practical connection to the rivers.

There are many examples of indigenous archeological sites throughout the watershed, particularly along the Wood, Pawcatuck and Green Fall Rivers. Extensive Native American ceremonial stonework can be seen throughout the river region, including Manitou hassunash, and hassuneutunk, the walls and serpent effigy of the Narragansett Indians. Landmarks in the watershed contain many names from the Narragansetts and Mashantucket Pequots, such as the Usquepaugh River.

Many watershed towns have villages named after the mills that were instrumental in their establishment. Remnants of these early mills are found throughout the

rivers today. Agriculture remains an important aspect of the watershed. The prime agricultural soils in the large floodplains along the banks of all seven rivers were historically significant to the founding of the first colonial towns and are still heavily utilized to this day.

Cultural Action Plan

A. Preserve and protect cultural resources

- 1. Study our historical relationship with the rivers** - Encourage the Stewardship Council to work with representatives of the Narragansett and Pequot tribes to share information on their relationship with the rivers. Also work with historical societies, as well as other entities as appropriate, to undertake further research into the historical relationship between the adjacent communities and the rivers.
- 2. Emphasize our connection with the rivers** - Develop materials and public programming to highlight the connection between the communities and the rivers and to foster increased appreciation.
- 3. Consider economic benefits of historical-cultural focused tourism** - Consider doing an "economic benefits" analysis of historical-cultural focused tourism in the subject region, possibly in cooperation with Freedoms Way Heritage Association and regional planning commissions or others.
- 4. Consider maintenance and restoration of sites** - Consider maintenance and restoration of historical and cultural sites.
- 5. Protect historical and cultural character** - Raise awareness so that new development along the river corridors is compatible with the historical and cultural character of the surroundings and fully reflects the need to protect those amenities, including mill redevelopment.
- 6. Protect traditional landscapes** - Protect traditional New England visual resources and landscape patterns typified by colonial mills along rivers. Support resource-based economic activities or "working landscapes" including sustainable farming, forestry, and ecotourism, in any way possible.
- 7. Nominate historic sites** - Develop documentation leading to the nomination of historic sites as National Historic Landmarks, or for other state or local recognition.
- 8. Protect prehistoric resources** - Work with the Narragansett and Mashantucket Pequot tribes to investigate and protect all major prehistoric resources.
- 9. Consider interpretive signage** - Pursue suggestions in regards to interpretive signage of prehistoric and historic resources.

- 10. Develop compatibly** - For any new development along the river corridors that towns have accepted, encourage compatibility with existing historic development.
- 11. Address structural needs of dams** – Pursue opportunities for comment and input on structural issues surrounding dams.

B. Preserve and protect agriculture

- 1. Preserve agricultural soil** - Protect prime agricultural soils in the large floodplains along the banks of the rivers, which were historically significant to the founding of the first colonial towns and are still utilized to this day.
- 2. Preserve working farms** – Provide viable alternatives to farmers to keep their land in agricultural use. Payments for conservation easements on farmland encourage the continued use of agricultural practices while providing some much needed funding for the farmer.
- 3. Encourage farming best management practices** – Provide educational opportunities and economic incentives to farmers to learn about and follow best management practices.
- 4. Support alternative incomes for farming** such as farm stands, farmers markets, and events.
- 5. Encourage a new generation of farmers** – Provide better access to information about grant programs, assistance and business development.
- 6. Encourage the use of federal programs** –
 - a. Environmental Quality Incentive Program: This program provides technical and financial assistance to landowners and operators of crop or livestock farms for planning and designing best management practices that protect the soil, air and water, increase soil productivity, enable care for farm animals, and manage waste produced on the farm.
 - b. Wildlife Habitat Incentive Program: Technical and financial assistance is provided through this program for landowners who want to voluntarily improve wildlife habitat or restore ecosystems on their property.
 - c. Wetland Reserve Program: This program provides assistance for the purchase of temporary or permanent easements on farmed wetlands for water supply protection and wildlife habitat and helps to restore farmed wetlands for wildlife habitat.

Scenic and Recreation

The Wood-Pawcatuck Watershed lies within an easy drive between the greater Boston metropolis region (population 4.7 million) and New York metropolis region (population 8.5 million). In Rhode Island alone, the watershed is an hour or less drive for over 1 million residents. Because the watershed is seventy percent forested, it creates a green oasis for urban dwellers to unwind and reconnect with nature. This makes the river-related recreational pursuits greatly valued throughout southern New England.

Scenic and Recreation Action Plan

A. Ensure healthy ecosystems to support recreational fisheries.

- 1. Protect riparian land** - Keep riparian forests contiguous, so that their shade helps keep water temperature cool, allowing the water to hold more dissolved oxygen than warm water. Support and promote impervious surface reduction strategies within watersheds (narrower roads, porous pavements and surfaces that absorb runoff) to reduce stormwater runoff and water temperatures. Promote education and awareness, and changing of local subdivision and development codes.
- 2. Protect water flow** - Maintain, protect, and enhance water flow regimes that support the habitat requirements of native river fauna, while accommodating demands for water supply, waste assimilation, commercial, industrial, and agricultural uses.
- 3. Support native fish** - Work with local, state and federal partners to keep healthy populations of native brook trout and other native sport fish for recreational fishing.
- 4. Support fish passage at dams** - Work with town, state, and federal agencies to identify appropriate projects that promote fish passage as well as working for the local communities.
- 5. Balance multiple uses** - Promote dialogue regarding balancing multiple uses and avoidance of over-use resulting from increased public exposure on all the rivers in order to reduce potential conflicts. Continue to work with RI DEM, CT DEEP, and the Trail Advisory Committee and CT Greenways Council.
- 6. Promote responsible angling** - Educate and encourage anglers about proper disposal of lures, weights and other fishing equipment including monofilament line.

B. Provide and maintain public boating access.

1. **Maintain existing access for boaters** - Maintain and, where possible, improve the current appropriate public access sites for boaters. This includes access points just for canoes and kayaks, as well as trailer launches for motor boats where appropriate.
2. **Support new access points** - Support creation of additional appropriate public access sites for canoe and kayak users, as well as trailer launches for motor boats where appropriate.
3. **Support handicapped access** - Support development of appropriate handicapped accessible sites.
4. **Consider boat access as part of road projects** - Consider requiring provision for appropriate public access when bridges or culverts (especially on state roads) are upgraded.
5. **Support water-based recreation planning** - Encourage the planning of water-based recreational opportunities. Encourage "blue trails" (waterway trails) and their canoe access sites, in connection with the Rhode Island Blueways Alliance and the Appalachian Mount Club chapters in Connecticut and Rhode Island.
6. **Improve parking and signage** - Encourage adequate parking and signage at existing and new sites. Work with state agencies and local communities to provide bathroom facilities at select public launches.
7. **Improve boating passage** - Improve rivers for safe boating passage by having regular maintenance to remove obstructions such as large woody material while maintaining habitat quality.
8. **Maintain stream flows** - Maintain or modify stream flows to maintain or enhance recreational and scenic qualities, while accommodating demands for water supply, waste assimilation, commercial, industrial, and agricultural uses.
9. **Encourage clean boating** - Educate boaters to make sure boat hulls are clean before putting in as a way to limit the spread of aquatic invasive "hitchhikers".
10. **Publicize paddle guides** - Publicize the Wood and Pawcatuck River Routes Guide to encourage boaters to select trips compatible with their skill level. Update as appropriate. Consider developing a smartphone app of this guide, which could eventually include other rivers in the watershed.
11. **Work with paddling groups** - Coordinate with regional paddling groups such as the Narragansett Chapter of the Appalachian Mountain Club (AMC), Rhode Island Canoe and Kayak Association, Southern New England Paddlers,

and local land trust groups, which organize numerous trips on rivers in the Wood-Pawcatuck Watershed.

C. Provide opportunities for hikers and walkers along the rivers.

- 1. Practice trail stewardship** - Increase monitoring and maintenance of trails and river access areas. Minimize littering, parking problems, all-terrain vehicle abuses, vandalism, and trespassing on adjacent private lands. Encourage "Adopt-a-Trail"-style projects.
- 2. Work with volunteer groups** - Maintain access to existing trails and provide information for trail users via coordination with local trail committees.
- 3. Teach multi-use principles** - Help users of the various hiking trails learn how to safely navigate multiple types of concurrent use, for example horses, pedestrians, and cyclists simultaneously using the trails. Help users identify trails appropriate to their form of recreation.
- 4. Publish trail guides** - Consider developing riverside trail guide books or maps, both print and online, to encourage use of hiking trails in the watershed and assist in exploration of such trails.
- 5. Support regional trail groups** - Encourage the work of regional trail groups such as AMC Narragansett Chapter.
- 6. Encourage universal accessibility** - Encourage Americans with Disabilities Act accessible trails and wildlife viewing areas where feasible.

D. Inform the public and be informed.

- 1. Publicize the Wild and Scenic River program** - Provide Wild and Scenic River program information at community events, fairs, canoe races, fishing events and other public gatherings.
- 2. Host a Wild and Scenic River event** - Consider developing a signature event, which would annually help further inform the public on the value of the rivers, their outstanding resources, the value of their designation as Wild and Scenic Rivers, and opportunities to engage in stewardship activities.
- 3. Formalize pet policies** - Clarify appropriate recreational areas for dog owners. Reinforce or create pet waste ordinances (pooper-scooper laws) and restrictions on illegal dumping, or otherwise secure and maintain pet waste disposal containers.
- 4. Engage public in nature-focused wildlife viewing and events** - Encourage continued public support and participation in a variety of active and passive learning programs involving the rivers.
- 5. Be responsive to an existing and evolving variety of recreational interests** - Track new types of recreational activities and equipment that are

not foreseen today, to make sure they are compatible with managing and protecting our rivers' ORVs. For example, a decade ago the emergence of drone aircraft was not foreseen, but is a consideration today.

- 6. Study economic benefits of recreation** - Consider analyzing the economic benefits of recreation in the proposed designated area, possibly in partnership with state and local tourism bureaus.

E. Recognize the importance of views from the rivers and help preserve them.

- 1. Protect viewshed** - Encourage protection of traditional New England landscape patterns and scenic visual resources. This may include, for example, concerns regarding steep slopes, building heights, and outdoor lighting. Protect traditional New England landscape patterns and visual resources by supporting resource-based economic activities—"working landscapes"—including sustainable farming, forestry, and ecotourism.
- 2. Assess exceptional views** - Consider conducting a formal scenic assessment of exceptional views (such as National Park Service's "Visual Resource Inventory") to identify resources in need of protection that also include views from on the rivers toward undeveloped shoreline banks. The forested corridor or greenway is a much appreciated aesthetic resource.
- 3. Consider aesthetics in management plans** - Pay special attention to aesthetics, in addition to forest health, when first drafting Forest Management Plans along the rivers. The natural, "wild" appearance of open space is a key component of the special enjoyment the public derives on these rivers.
- 4. Consider adopting scenic river provisions** - Protect the scenic and environmental integrity of the river by requiring structures to be integrated into the existing landscape to minimize its scenic and environmental impact.