National Park Service
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# Wild and Scenic River Reconnaissance Survey of the Nashua River

*Prepared by: National Park Service Northeast Region 2013*

Photo: Martha Morgan

Front and Back Covers: Joyce Kennedy Raymes

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Photo: Joyce Kennedy Raymes

# I. Summary

## A. Brief History

A reconnaissance survey of the Nashua River was conducted by the Northeast Region of the National Park Service (NPS) at the request of Representative Niki Tsongas (MA-3). Representative Tsongas requested that 14-miles of the Nashua River, 10-miles of the Squannacook River and 3.5-miles of the Nissitissit River be evaluated as a candidate for a potential Wild and Scenic River designation and as a step toward a full Wild and Scenic River Study. These river segments run through the towns of Ayer, Dunstable, Groton, Harvard, Lancaster, Pepperell, Shirley, Bolton and Townsend in Massachusetts. The river segment that runs through the Town of Bolton is entirely part of the Bolton Flats Wildlife Management Area. The river also runs through the Devens Regional Enterprise Zone, site of the former Fort Devens and comprised of portions of the communities of Ayer, Harvard, and Shirley.

The reconnaissance survey provides a preliminary assessment of the eligibility and suitability of the Nashua River as a candidate for a Wild and Scenic designation according to criteria established under the Wild and Scenic Rivers Act (WSRA). Included in the preliminary eligibility assessment is the identification of potentially significant natural, cultural and recreational resources that may be determined to be Outstandingly Remarkable Values (ORVs) as defined by the WSRA. The overall objective is to determine whether Congressional authorization for a Wild and Scenic River Study is warranted, and to make an initial determination on whether Wild and Scenic designation is an appropriate technique for river protection.

There are no public documents prepared for this reconnaissance survey nor does it trigger NEPA (National Environmental Policy Act) since NPS is not taking a major federal action significantly affecting the human environment. The survey determines only whether a full Wild and Scenic Study is warranted. Although the reconnaissance survey does not involve the public, consultation with key stakeholders was vital to this process. The NEPA process and full public involvement would be part of a Wild and Scenic Rivers Study should it be authorized by Congress. The survey began in January, 2013 and was completed in September, 2013 by staff of the Northeast Regional Office.

Since 2009, the locally-based Nashua River Watershed Association including residents, town leaders, and others interested in river conservation has been leading an exploratory effort to determine whether the Wild and Scenic River designation might be an appropriate way to recognize and protect the Nashua River and its associated resources. The group gathered letters in support of a Study from the eight towns. Specifically, local interest has been expressed in pursuing a “Partnership Wild and Scenic River Study,” based on river management models such as the Concord, Assabet and Sudbury Rivers in Massachusetts and the Lamprey River in New Hampshire. As such, this reconnaissance survey addresses some of the particular features and requirements of the Partnership Wild and Scenic River (PWSR) model as a part of the preliminary evaluation process.

The Nashua Wild and Scenic River Study Bill (Study Bill) was introduced in the House by Representatives by Niki Tsongas in January, 2013. The bill (H.R. 412) was reported out of the House Committee on Natural Resources by unanimous consent in June, 2013. The Study Bill would amend the Wild and Scenic Rivers Act to designate segments of the mainstem of the Nashua River and its tributaries for study for potential inclusion in the National Wild and Scenic Rivers System.

## B. Preliminary Findings

The NPS reconnaissance survey team has determined, based on readily available information, that segments of the Nashua River exhibit free-flowing character and noteworthy natural, cultural and recreational resource values likely to meet eligibility criteria for inclusion in the National Wild and Scenic Rivers System (System). In addition, the presence of very strong community and interest group support for a Wild and Scenic River Study, together with a demonstrated track record of natural and cultural resource protection, supports key elements of suitability for inclusion in the System, and provides a strong indication that a Wild and Scenic River Study would be appropriate and productive.

The Wild and Scenic Rivers Act provides for three possible classifications of eligible river segments: “wild”, ”scenic” and ”recreational.” The criteria distinguishing these classifications are based on the degree of human modification of the river and its adjacent shorelines. Based upon the applicable criteria, the Nashua River will not meet the “wild” river area criteria. However, a more in-depth analysis would be required to determine whether a “scenic” or “recreational” classification is appropriate for river segments likely to meet the eligibility criteria.

Photo: Joyce Kennedy Raymes

# II. Overview: National Wild and Scenic Rivers

### Background

The National Wild and Scenic Rivers System was established by Congress in 1968 through the Wild and Scenic Rivers Act (WSRA) to protect outstanding rivers from harmful effects of new federally assisted projects such as dams and hydroelectric facilities. To be considered eligible for inclusion in the System, a river or river segment must be free-flowing and exhibit/support at least one Outstandingly Remarkable Value (ORV). The ORV must be natural, cultural or recreational in character, river-dependent, and have unique, rare or exemplary qualities on a regional or national scale. The most common way for an eligible river to be added to the System is through federal legislation. Each river that is designated into the national system receives permanent protection from development of federal water resource projects that would have an adverse effect on its free-flowing condition, water quality, and ORVs. In addition, the Federal Energy Regulatory Commission (FERC) may not license the construction of any dam or associated project works on a designated segment of river.

### A. Congressionally Authorized Wild and Scenic River Studies

To determine whether a river is both eligible and suitable to be included in the National Wild and Scenic Rivers System, a Wild and Scenic River Study (Study) is conducted. Congress authorizes studies based on Section 5(a) of the WSRA. Eligibility is based on the presence of a free-flowing river condition and the presence of at least one ORV.

A Study assesses the potential ORVs through objective analysis of known data by resource experts using professional judgment. The Study process provides ample time for extensive education and broad participation in the process. This extensive public process is critical to ultimate determination of suitability for inclusion in the System. Congress generally directs that Wild and Scenic River Studies be concluded within three years from the initial funding of the Study.

According to Section 5(c) of the WSRA, the Study should be pursued in close cooperation with the appropriate agencies of the state or its political subdivisions and shall include a determination of the degree to which the state might participate in the preservation and administration of the river should it be proposed for inclusion in the National Wild and Scenic Rivers System.

### B. Eligibility and Suitability Criteria

*Eligibility*

To be eligible for designation, a river must be free-flowing and possess at least one river-dependent Outstandingly Remarkable Value (ORV). Free-flowing is defined by the Wild and Scenic Rivers Act (WSRA) Section 16(b) as, "existing or flowing in a natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway. The existence, however, of low dams, diversion works and other minor structures at the time any river is proposed for inclusion in the national wild and scenic rivers system shall not automatically bar its consideration for such inclusion: Provided, That this shall not be construed to authorize, intend, or encourage future construction of such structures in components of the national wild and scenic rivers system."

The WSRA defines an ORV as a scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar value. An ORV must be a river-related unique, rare or exemplary feature on a regional or national scale of comparison.[1]

*Suitability*

Suitability is an assessment of factors to provide the basis for determining whether to recommend a river for addition to the National Wild and Scenic Rivers System. The Interagency

1 http://www.nps.gov/ncrc/programs/rtca/nri/eligb.html

Wild and Scenic Rivers Coordinating Council (IWSRCC) developed the following questions that can assist with the determination:

1) Should the river's free-flowing character, water quality and ORVs be protected, or are one or more other uses important enough to warrant doing otherwise?
2) Will the river's free-flowing character, water quality, and ORVs be protected through designation? Is it the best method for protecting the river corridor? In answering these questions, the benefits and impacts of Wild and Scenic River designation must be evaluated, and alternative protection methods considered.
3) Is there a demonstrated commitment to protect the river by non-federal entities that may be partially responsible for implementing the management plan?

Determining a river's suitability for a Wild and Scenic designation is uniquely based on the specific characteristics and conditions of an individual river. The Study Team is responsible for making this determination based on a wide range of considerations including evaluating any potential threats to the free-flowing condition or resources in a region with high development pressure.

### C. Partnership Wild and Scenic Rivers Model

The Partnership Wild and Scenic River model was developed in response to the need for a Wild and Scenic River designation model tailored to rivers that meet the Wild and Scenic River criteria and that are characterized by community-based settings, extensive private land ownership along the river, non-federal lands, and well-established traditions of local governance. This model has a proven track record of effectively creating river protection strategies that bring communities together in protecting, enhancing and managing local river resources, while focusing federal involvement on technical assistance rather than direct land or resource management. With the exception of the Allagash River in Maine and the Westfield River in Massachusetts, all of the other Wild and Scenic Rivers in New England have been designated through the Partnership Wild and Scenic River model.

For more than 20 years, the NPS has taken advantage of this direction when conducting Studies of rivers bordered by predominantly private and non-federal lands by encouraging formation of informal Study Committees based around state and local representation. Such Study Committees have become an integral part of the Study approach, and ensure active local participation in the process. Local and state knowledge is often critical to effective and efficient research regarding potential ORVs of the Study area, and is absolutely essential to the development of local and state-based management strategies for protection of such values. Since it is a central tenet of such studies that land-based resource protection must be primarily accomplished through local, state, and non-governmental action, it is therefore a central task of the Study committee to develop a locally-based management plan (Plan) to protect the important river values being researched and documented throughout a Study. Adoption of the plan by state and local governments prior to designation provides evidence of local commitment to protecting Wild and Scenic River values without the need for direct federal management, a major factor in determining whether the Partnership model is suitable for the river under study. This Plan can serve the river, local communities, state agencies and other stakeholders regardless of whether Wild and Scenic River status is achieved as a result of the Study.

During a Partnership Wild and Scenic Rivers Study the suitability determination is based on factors such as:

1) Public support and evidence of commitment by non-federal entities that will be partially responsible for implementing a plan for protection;
2) Evidence of existing resource protection to meet the requirements of Section 6(c)[2] of the WSRA; and
3) Lasting protection measures set forth in a non-regulatory, locally-developed comprehensive management plan as required under Section 3(d)(1)[3] of the WSRA.

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2 Section 6(c) states that federal condemnation of lands to achieve WSR protection goals cannot be used in towns that have zoning ordinances in force that are consistent with the purposes of the WSRA.

3 Section 3(d)(1) requires that a comprehensive management plan address resource protection, development of lands and facilities, user capacities, and other management practices necessary or desirable to achieve the purposes of the WSRA.

# III. Description of Survey Area

The Nashua River watershed is located in north central Massachusetts and southeastern New Hampshire within 32 communities. It flows north and joins the Merrimack River in Nashua, NH. The watershed in total covers 538 square miles and supplies drinking water to over two-million people. It is highly forested, abundant in water resources and open spaces, with thousands of acres of lands protected. According to the Nashua River Watershed Association the lands are comprised of approximately 62 percent forested land, 13 percent residential lands and 12 percent agricultural lands. The watershed area within Massachusetts is still rather rural, but is under constant threat of development due to its proximity to the greater Boston area. Some towns within the region have seen significant growth resulting in loss of open space.

This reconnaissance survey focuses on the river segments identified in the proposed Nashua River Study Bill, all within the State of Massachusetts, that include the mainstem of the Nashua River from the confluence of the North and South Nashua Rivers in Lancaster, MA, north to the MA/NH state line; and its tributaries, the Squannacook River from its headwaters at Ash Swamp to the confluence with the Nashua River in Shirley/Ayer, MA; and the Nissitissit River from the MA/NH state line to its confluence with the Nashua River in Pepperell, MA.

Besides the Squannacook and Nissitissit Rivers, the other major tributaries to the mainstem Nashua include the Quinapoxet River, the Stillwater River and the North and South Nashua Rivers. "The Nashua River mainstem forms the core of the Bolton Flats Wildlife Management Area and the Oxbow National Wildlife Refuge in Lancaster, Bolton, and Harvard where it winds north through marshy areas and former agricultural fields."[4] The river segment that runs through the Town of Bolton is entirely part of the Bolton Flats Wildlife Management Area that is managed by the Massachusetts Division of Fisheries and Wildlife. The river also runs through Devens Regional Enterprise Zone, site of the former Fort Devens and comprised of portions of the communities of Ayer, Harvard, and Shirley.

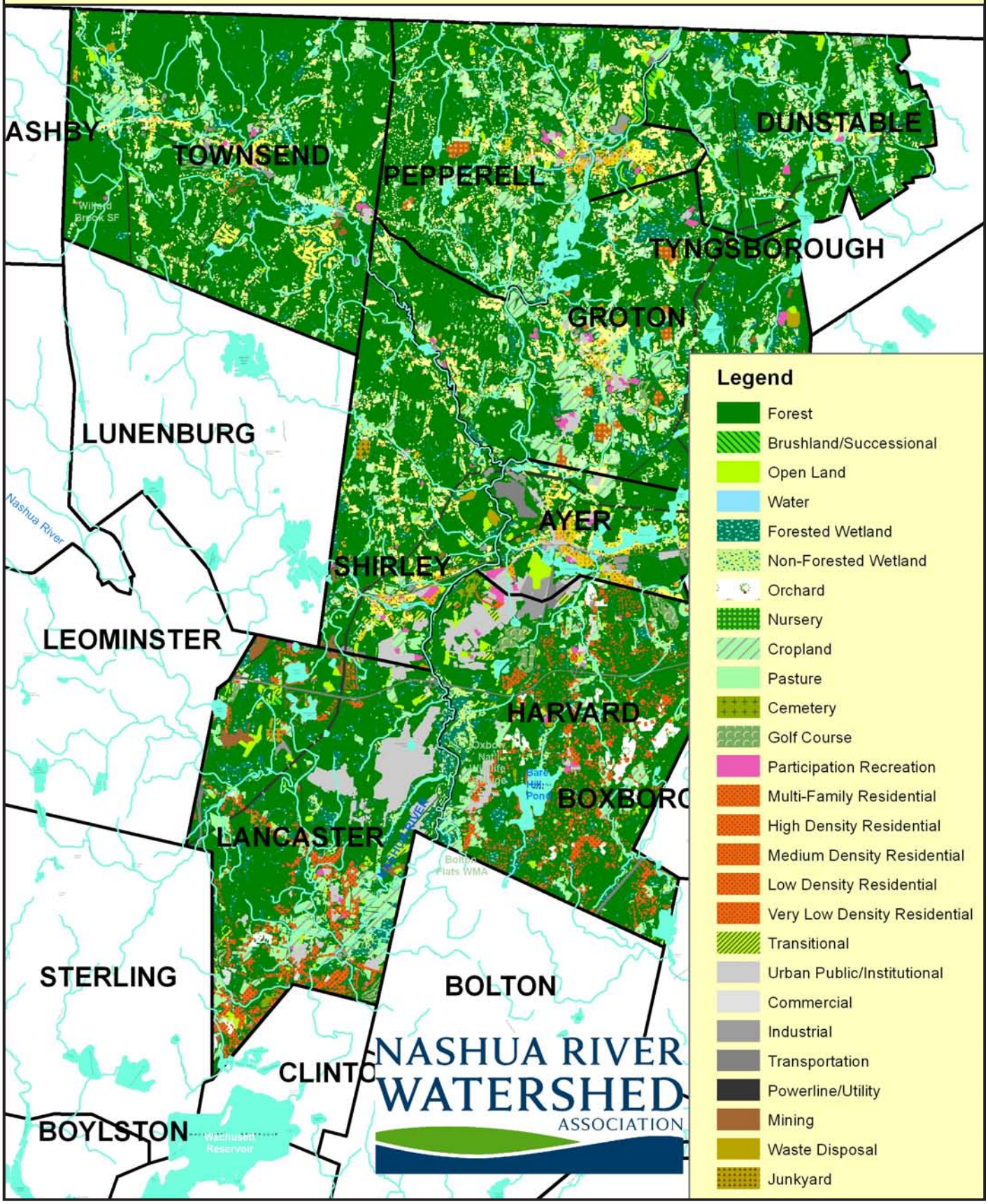
The three river segments that are excluded from the proposed Wild and Scenic Study are:

1. the New Hampshire Nashua River segment because it is urbanized;
2. the Wachusett Reservoir, located in the southern portion of the watershed because it is not riverine in character; and
3. the 4.8-mile segment of the mainstem Nashua River, from the Route 119 bridge in Groton, MA, downstream to the confluence with Nissitissit River in Pepperell because the Pepperell Hydro Company is seeking a FERC license for its operation at the Pepperell Hydro Company Dam, and hydro projects are most often not compatible with Wild and Scenic River designation.

4 http://www.nashuariverwatershed.org/our-watershed/our-rivers-and-streams.html

## LAND USE – POTENTIAL WILD AND SCENIC STUDY RIVERS

## NASHUA, NISSITISSIT AND SQUANNACOOK IN MASS.



# IV. Preliminary Evaluation of Eligibility

A reconnaissance survey does not catalog all of the potential Outstandingly Remarkable Values (ORVs) within the Study area. The goal is to identify representative resources that reflect the natural, cultural and recreational values that may meet the eligibility threshold of being unique, rare or exemplary on a regional or national scale of reference and be river-related or dependent. The interdisciplinary Study team would be tasked with making the final determinations on river-dependent resources that meet the eligibility criteria of "… being a unique, rare or exemplary feature that is significant at a comparative regional or national scale."[5]

### A. Potential Outstandingly Remarkable Values (ORVs)

The Nashua River, its tributaries and watershed lands have gained recognition through a series of special designations and protected areas that reflect important resources and resource areas with status at the national, state and local level. There is likelihood that there are potential ORVs associated with these designated and protected areas. Each of these designations and protected areas could be explored during a possible Wild and Scenic Study to make this determination. Information about some of these are referenced within the overview of resources section of this report below.

Of particular note are the three Areas of Critical Environmental Concern (ACEC). The Commonwealth of Massachusetts's Areas of Critical Environmental Concern (ACEC) "…receive special recognition because of the quality, uniqueness and significance of their natural and cultural resources. These areas are identified and nominated at the community level and are reviewed and designated by the state's Secretary of Environmental Affairs. ACEC designation creates a framework for local and regional stewardship of critical resources and ecosystems."[6] The ACEC areas within the potential Study area include the Central Nashua River Valley ACEC, the Squannassit ACEC, and Petapawag ACEC. The ACEC designation reports give a brief overview of the resources related to surface waters, wetlands, habitat, species, particular land uses, water supply, historical/archaeological, recreation and scenery and would therefore be an excellent source of information during a possible Wild and Scenic Study.

#### *1. Overview of Natural Resources*

Each of the ACEC reports highlight Nashua River natural resources that meet this type of designation standard. A Study would determine if those resources meet the Wild and Scenic Study eligibility standard. For instance the Petapawag ACEC is important for the diversity of wildlife and rare species. The Natural Heritage database indicates that there are 16 state-listed rare species and one federally-listed threatened species. Also, there are nine areas that have potential as "herp reserves" due to the "presence of multiple rare herptile species, relative lack of habitat fragmentation, and diversity of wetland types..."[7]

Within the Squannassit ACEC there are "…rare species habitats described by the Commonwealth's Natural Heritage & Endangered Species Program (NHESP) as Priority Habitats and Estimated Habitats for Rare Wildlife, Core Habitat and Supporting Natural Landscape areas, Rare Reptile and Amphibian Reserves, and Potential and Certified Vernal Pools. The NHESP also indicates that there are 23 state-listed rare species.[8]

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5 Jackie Diedrich, Cassie Thomas, U.S. Forest Service and National Park Service, *The Wild & Scenic River Study Process*, (Portland, Oregon, and Anchorage, Alaska, 1999), 12.

6 http://www.mass.gov/eea/agencies/dcr/conservation/acec/

7 Designation Report of the Petapawag Area of Critical Environmental Concern, 2002, 7.

8 Designation of the Squannassit Area of Critical Environmental Concern, signed by Bob Durand, Secretary of Environmental Affairs, 2002.

The Central Nashua River Valley ACEC includes many acres of protected lands including the Oxbow National Wildlife Refuge, the Bolton Flats Wildlife Management Area and more than 1,000 acres of other state, municipal and privately owned lands and "… is characterized by extensive floodplains, brushy swamps, oxbows and sedge marshes…"[9] The extent of unique habitats within these undeveloped and protected lands provides an important corridor for wildlife, and linkages to and between important wildlife areas. According to the NHESP there are 19 state-listed species and "…a very significant population (possibly the largest in New England) of Blanding's Turtle, a Threatened species that inhabits the South Post [Devens], Oxbow National Wildlife Refuge, and the adjoining Bolton Flats Wildlife Management Area."[10]

A protected natural area of note is the Oxbow National Wildlife Refuge, comprised of 1700 acres and eight river miles within the towns of Ayer, Shirley, Harvard and Lancaster. A visitor station is near completion on the banks of the Nashua River in Devens. The refuge was created to support the national migratory bird management program.

> *The refuge's interspersion of wetland, forested upland and old field habitats is ideally suited for this purpose. The refuge supports a diverse mix of migratory birds including waterfowl, wading birds, raptors, shorebirds, passerines, as well as resident mammals, reptiles, amphibians, fish and invertebrates. The extensive and regionally significant wetlands occurring on and adjacent to the Oxbow Refuge, including their associated tributary drainages and headwaters, have been listed as a priority for protection under both the North American Waterfowl Management Plan and the Emergency Wetlands Resources Act of 1986. The portion of the Oxbow NWR south of Route 2 lies within the 12,900-acre Area of Critical Environmental Concern (ACEC) designated by the Massachusetts Secretary of Environmental Affairs, and the portions of the Refuge north of Route 2 are included in the proposed Squannassit ACEC due to the unique environmental characteristics and values of these wildlife habitats.*[11]

The Nashua River and tributaries are designated as part of the North American Waterfowl Management Plan and the Emergency Wetlands Resources Act of 1986 – recognizing the importance of waterfowl and wetlands. The wetlands are recorded in the EPA's Priority Wetlands of New England. As well, nearly the entire Nashua River watershed has been included as a Forest Legacy Area under the Forestry Legacy Program administered by the United States Forest Service in partnership with MA DEM's Bureau of Forestry.[12]

### *2. Overview of Geological Resources*

In a 1999 Technical Report of the Interagency Wild and Scenic Rivers Coordinating Council, eligibility criteria based on geologic resources is described as the river, or the area within the river corridor, containing one or more examples of a geologic feature, process or phenomenon that is unique or rare within the region of comparison. The feature(s) may be in an unusually active stage of development, represent a "textbook" example, and/or represent a unique or rare combination of geologic features (erosional, volcanic, glacial or other geologic structures).

The glacial history of this watershed has resulted in a diverse mixture of habitat types, an unspoiled scenic landscape and extensive water resources. Glacial features include: dry kettleholes, wet kettlehole ponds with fluctuating water levels, spruce bogs, kame terraces and eskers, and a sandy outwash soil.[13]

Glacial Lake Nashua was the largest of its kind east of the Connecticut River Valley and the Nashua River flows north due to the retreat of the glaciers at the end of the Pleistocene Era,

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9 Designation of the Central Nashua River Valley Area of Critical Environmental Concern, signed by Trudy Cox, Secretary of Environmental Affairs, 1996.

10 Designation of the Central Nashua River Valley Area of Critical Environmental Concern, signed by Trudy Cox, Secretary of Environmental Affairs, 1996.

11 http://www.fws.gov/northeast/oxbow/wildlife.html

12 Designation of the Squannassit Area of Critical Environmental Concern, signed by Bob Durand, Secretary of Environmental Affairs, 2002.

13 Designation of the Central Nashua River Valley Area of Critical Environmental Concern, signed by Trudy Coxe, Secretary of Environmental Affairs, 1996, 3.

Photo: Joyce Kennedy Raymes

and the resulting draining of Lake Nashua. Tributaries flow northwest to southeast and join the Nashua at a sharp angle, indicating that the original flow was also southward.[14] There are some exceptional examples of glacial features such as outwash plains, kettle ponds and glacial deposition of the late Ice Age.

*3. Overview of Cultural and Historical Resources*

The Wild and Scenic Rivers Coordinating Council (IWSRCC), provides guidance on eligibility criteria for prehistory and history values. Native American sites must have unique or rare characteristics or exceptional human interest value. Sites may have other attributes such as national or regional significance for interpreting prehistory. Historical values related to a river could be associated with a significant event, an important person or a rare cultural event. Such prehistory or historic sites or features could be also listed on the National Register of Historic Places. Cultural or historical resources that have local significance may not meet the criteria on a regional or national level. The reconnaissance survey has identified resources that may or may not fully meet the ORV criteria, and it would be expected that a Study Team would determine which features merit this status based on the significance of the resource and if the resource is river-related.

One historical/cultural aspect of the Nashua that has garnered significant regional and national attention is the account of the River's restoration. The renewal is remarkable in that it had been identified in the 1960s as one of the nation's top ten most polluted rivers in the nation. The account has received significant national attention via a 1992 award-winning children's book, "A River Ran Wild: An Environmental History" by Lynne Cherry; a 1993 National Geographic article, "The Promise of Restoration: New Ideas, New Understanding, New Hope", and a 2010 National Geographic collection of essays, "Written in Water: Messages of Hope for Earth's most Precious Resource." The National Geographic book included an essay by Marion Stoddart,

14 http://www.nashuariverwatershed.org/our-watershed/our-natural-history.html

the leader of the Nashua clean-up effort. With the support of numerous citizens, she gained the attention and support of Massachusetts Governor Volpe and other influential politicians. Their efforts resulted in passage of the Massachusetts Clean Waters Act, making it the first state to pass such a bill. This was precedent setting legislation, and by the late 1970s the water quality was greatly improved. Stoddart was later recognized by the United Nations for her work. Her story is the basis for an award-winning film "Work of 1000" that documents her vision of positive change and action.

The Nashua River Watershed Association (NRWA) has continued to promote this vision for clean water through an environmental education program that includes River Classroom® that has received the Secretary's Award for Excellence in Environmental Education, presented by the Commonwealth of Massachusetts Executive Office of Environmental Affairs.[15]

Photo: Al Futterman

The NRWA has identified the Freedom's Way National Heritage Area as important due to "…a series of historic events that influenced democratic forms of governance and intellectual tradition that underpin concepts of American freedom, democracy, conservation, and social justice." NRWA also noted three important cultural/historical sites in the area:[16]

- Fruitlands Museum abuts Oxbow National Wildlife Refuge in Harvard — a Massachusetts and National Historic Landmark on site of former Transcendentalist utopian community.
- Shaker Village, along Nashua River in Shirley – Existed from the late 1700s to the early 1900s.
- Historic Districts, along the Squannacook River in Townsend – The Townsend Harbor was known as a "safe harbor" due to the local Abolitionists who participated within the Underground Railroad network.

Based on this initial investigation it is not clear if these sites are potential ORVs and it is therefore recommended that a Study Team conduct an in-depth investigation during a potential Study.

Due to the presence of prime agricultural soils in the large floodplains along the banks of the river, there is a long-term agricultural history. Agrarian history dates back to the Late Woodland Period (Prehistory).[17] In 1653, the first grant to buy lands for a town [18](Lancaster) was along the Nashua from the Nipmuck Tribe, known as the "fresh water people." This tribe was associated with the Nashua, or the Nashaway, the "river with the beautiful pebbled bottom."[19] Originally it was "first begun for love of the Indians' trade, but since the fertility of the soil and pleasantness of the river hath invited many more."[20] By 1771, Lancaster was the wealthiest agricultural town in the area, as a result of the productive lands of the "Nashua intervale."[21]

Based on this brief survey of historical and cultural resources, it appears that the Nashua River has some significant cultural and historical resources. A more detailed review of the resources that are river-related is recommended to be undertaken during a possible Study. It is anticipated that Wild and Scenic interdisciplinary Study team experts will make a determination as to whether these resources have a significant historic or cultural relationship with the river.

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15 http://www.nashuariverwatershed.org/what-we-do/provide-education/for-schools-and-groups/river-classroom.html

16 Testimony on HR 412, Elizabeth Ainsley Campbell, Nashua River Watershed Association, 2013.

17 http://www.sec.state.ma.us/mhc/mhcpdf/regionalreports/CentralMA.pdf

18 http://www.sec.state.ma.us/mhc/mhcpdf/regionalreports/CentralMA.pdf. 62.

19 http://www.mass.gov/eea/docs/dcr/stewardship/acec/acecs/cnr-des.pdf. 7.

20 http://www.sec.state.ma.us/mhc/mhcpdf/regionalreports/CentralMA.pdf. 62.

21 http://www.sec.state.ma.us/mhc/mhcpdf/regionalreports/CentralMA.pdf. 89.

Photos: Joyce Kennedy Raymes

*4. Overview of Recreational and Scenic Resources*

A potential recreational resource is based on the popularity of the activity and the extent to which visitors are willing to travel to use the resources. In addition, interpretive opportunities may be significant and may potentially attract visitors from throughout the region and a river-related activity could be a setting for a national or regional event.[22] The guidance on scenery is that the elements of the landscape result in "notable or exemplary visual features and/or attractions."

River-related recreational pursuits are greatly valued in this region due to the significant recovery of the river. In the 1960s, foul smells kept recreationalists far from the river corridor. The high quality water resources now support water-based recreation as well as the enjoyment of the many greenways and trails along the banks of the river.

Important recreational areas along the river include the Oxbow National Wildlife Refuge, the Bolton Flats Management Area, the Squannacook River and Nissitissit River State Wildlife Management Areas, the J. Harry Rich and Townsend State Forests, the Groton Town Forest and the Nashua River Rail Trail. The Nashua River Rail Trail provides access to additional open space areas providing recreational linkage. Some of the most popular recreational activities within the Nashua River corridor include fishing, boating, walking/hiking and nature study.

The cold-water fisheries provide some of the best fly-fishing in the Greater Boston area, and draw in anglers from the region. "The Nashua River watershed is home to numerous prized cold-water streams that support native Eastern brook trout (Salvelinus fontinalis), which has been described as "the canary in the coal mine" with regard to water quality. In addition to native trout, MassWildlife stocks the Squannacook and Nissitissit Rivers, and other watershed streams, with brown, brook, and rainbow trout. The MA Division of Fisheries and Wildlife has been identifying cold-water fish resources (CFRs) based on fish samples collected by biologists. These CFRs are environmentally sensitive areas where brook, brown or rainbow trout reproduction has been identified."[23] The Squan-A-Tissit Chapter of Trout Unlimited has a strong presence in the watershed and there are several groups that sponsor bass fishing tournaments.

Paddling opportunities are readily available due in part to the locally-based Nashoba Paddlers LLC in West Groton. There are also a well-established series of boat access points.

A network of hundreds of miles of trails dotted with scenic views and opportunities to enjoy different habitats and wildlife species are found in this area. It is likely that there are significant scenic resources within the river corridor though this information was not readily available to be reported during this survey. Sources of important scenic resources or landscapes may possibly include the MA Statewide Scenic Landscape Inventory and the MA DCR Heritage Landscape Atlas.

### B. Nationwide Rivers Inventory

The Nationwide Rivers Inventory (NRI) is a registry, compiled by the NPS, of river segments that potentially qualify as national wild, scenic or recreational river areas. River segments included must have free-flowing conditions and at least one ORV. A segment of the Nashua for fish values, and two segments of the Nashua for geologic values were added to the NRI in 1982.

### C. Preliminary Free-Flow Analysis

Wild and Scenic designation preserves rivers in their free-flowing condition and protects them from the harmful effects of new federally assisted projects such as dams and hydroelectric

22 Jackie Diedrich, Cassie Thomas, U.S. Forest Service and National Park Service, *The Wild & Scenic River Study Process*, (Portland, Oregon, and Anchorage, Alaska, 1999), 13.

23 http://www.nashuariverwatershed.org/recreation/fishing.html

facilities. Rivers or river segments must be determined to be free-flowing to be eligible for designation. Section 16(b) of the WSRA defines "free-flowing" in part as "…existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway." "Free-flowing" refers to the flow within the designated river segment and is not the same as naturally flowing. For instance, Section 16(b) of the WSRA also states that the existence of "low dams, diversion works, and other minor structures" does not automatically bar its consideration for designation. The 1982 Interagency Guidelines define water flow sufficiency for a determination of eligibility stating that "Flows are sufficient if they sustain or complement the outstandingly remarkable values for which the river would be designated."[24]

The NRWA provided an inventory of ten dams that are situated on the Nashua, Squannacook, and Nissitissit Rivers. Based on this available information, two of the dams are on the Nashua River, two dams are on the Nissitissit River and five of the dams are on the Squannacook River and one dam is on Pearl Hill Brook. All are considered to be run-of-river dams, but should be field-examined during a Wild and Scenic Study to determine whether they meet the "free-flowing" criteria. For example, dams that create significant impoundments, along with their associated river segments, would result in the exclusion of the segments from the area found eligible for Wild and Scenic designation.

**Nashua Watershed Dams in the Potential Study Area**
Impoundment Inventory

| | Dam Name | Owner | Height | Comments |
|---|---|---|---|---|
| **Nashua River** | Ice House Dam | Nashua River Ice House Partners | 12' | FERC licensed |
| | Pepperell Dam | Pepperell Hydro Co. Inc. | 21' | Current filing for final FERC license |
| **Squannacook River** | Squannacook River Dam | Town of Groton Board of Selectmen | 30' | |
| | Hollingsworth & Vose Co. Dam | Hollingsworth & Vose Co. | | |
| | Townsend Harbor Dam | Hollingsworth & Vose Co. | 8' | Harbor Pond |
| | Adams Dam | Town of Townsend Municipal | | |
| | Mason Road Dam | Private Owner | | |
| **Nissitissit River** | Turner Dam | Private Owner | 10' | MA Dept. of Ecological Restoration Priority Project; slated for removal |
| | Guarnottas Dam | Private Owner | | Breached |
| **Pearl Hill Brook** | VFW Dam | Commonwealth of Massachusetts | | |

24 "Department of the Interior and Agriculture Interagency Guidelines for Eligibility, Classification and Management of River Areas," published in the *Federal Register* (Vol. 47, No. 173; September 7, 1982, pp. 39454-39461).

River segments within this survey area that include dams, impounded waters and large road crossings would require special examination during a possible Study to determine the impacts on free-flowing condition and potential eligibility for Wild and Scenic River designation. In addition, significant streambank development and alterations to the bed and banks of the waterways such that the segments lack ORVs and/or free-flowing conditions would deem a river segment ineligible. Such factors would result in exclusion of a river segment from consideration for further study. Conducting a free-flow assessment at the outset of any future study, including an inventory of infrastructure such as dams, concrete bridge piers, riprap, etc., would allow Study participants to focus their ORV identification and suitability assessment work on segments know to be free-flowing.

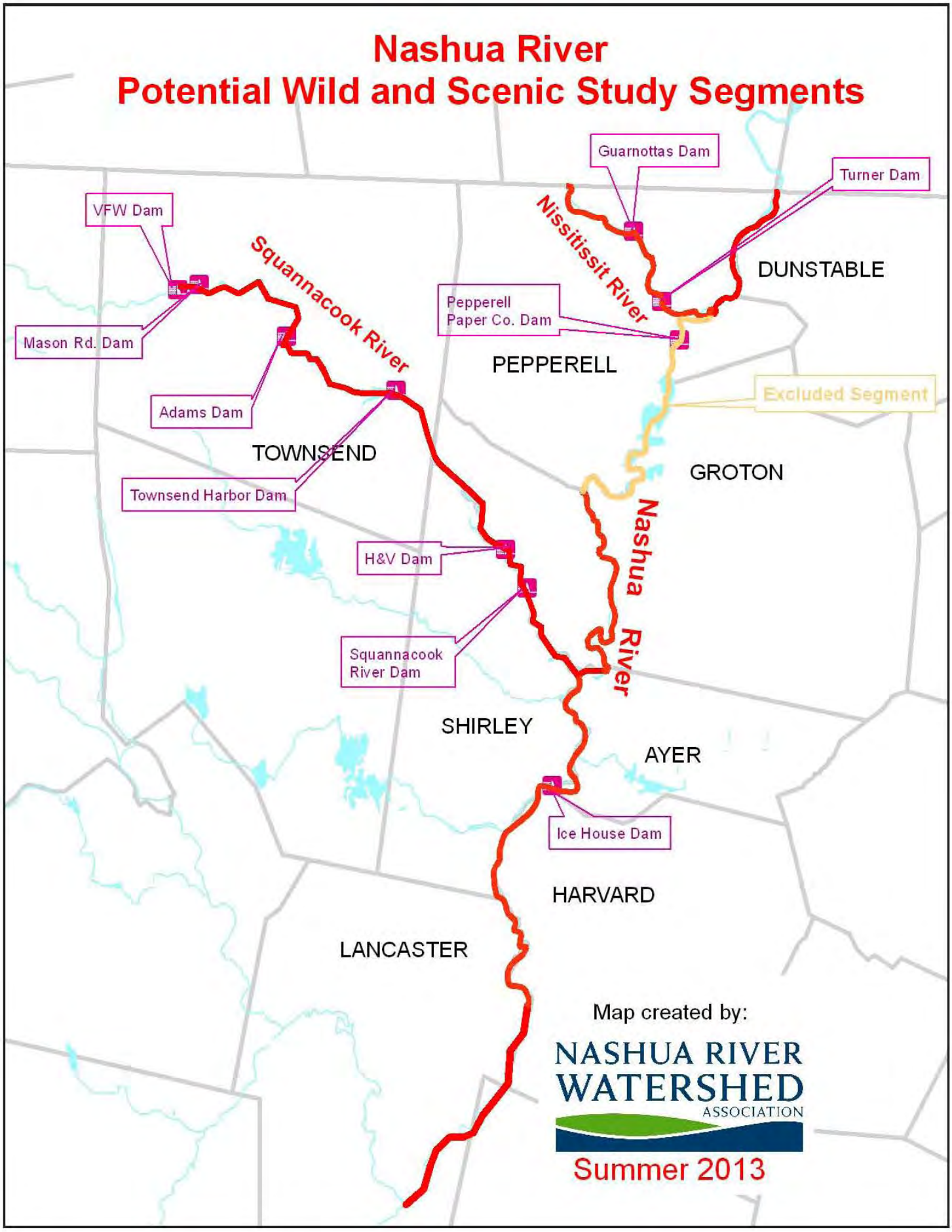
### D. Existing Water Quality

The Wild and Scenic Rivers Act provides some general direction on protecting water quality for Wild and Scenic Rivers. Also, the 1982 Interagency Guidelines refer to consistency with the Federal Clean Water Act and require water quality to be maintained and "where necessary, improved to levels which meet Federal criteria or federally approved state standards for aesthetics and fish and wildlife propagation." In addition, the Guidelines emphasize the importance of developing strategies for managing water quality and collecting "baseline data during river studies and development of comprehensive river management plans."

The protected open spaces, forested lands and high quality wetlands in the proposed Study area corridor offer protection of water quality in the Nashua, Squannacook and Nissitissit Rivers. Some example indicators of the high water quality include the large diversity of habitat, including a cold-water river habitat that supports aquatic life and native breeding trout. The more urban portions of the watershed are not included in the potential Study area.

Photo: NRWA

Photo: Joyce Kennedy Raymes


Nashua River
Potential Wild and Scenic Study Segments
Guarnottas Dam
Turner Dam
VFW Dam
Nissitissit River
Squannacook River
DUNSTABLE
Pepperell
Paper Co. Dam
Mason Rd. Dam
PEPPERELL
Excluded Segment
Adams Dam
TOWNSEND
GROTON
Townsend Harbor Dam
Nashua River
H&V Dam
Squannacook
River Dam
SHIRLEY
AYER
Ice House Dam
HARVARD
LANCASTER
Map created by:
NASHUA RIVER
WATERSHED
ASSOCIATION
Summer 2013

The Nashua River Watershed Association (NRWA) has a water quality monitoring program in place and long-term data that indicates that the Squannacook and Nissitissit Rivers have "excellent to good water quality meeting state bacteria standards for swimming and boating almost all of the time. The Nashua River segment proposed for Wild and Scenic Study meets boating standards most of the time and swimming standards many times."

Therese Beaudoin, MADEP Watershed Coordinator, states that "the MA DEP has studied water quality in the Nashua Watershed since the late 1960s. The Squannacook River has provided an ideal location for establishing least impacted conditions for the water quality and flow, and has served as a reference river for decades. A long-term monitoring station was established here in 1998, with sampling conducted every two months; available data show that water quality and aesthetics in the Squannacook River have been consistently among the cleanest in Central MA."

According to the 2006 MA DEP Surface Water Quality Standards, the Nashua River is a Class B warm-water fishery. "These waters are designated as a habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth and other critical function, and for primary and secondary contact recreation." NPDES permits on the Nashua include wastewater treatment plants in Ayer, Pepperell and at the Groton School. The Squannacook River is Class B. The upper Squannacook, from the confluence of Mason and Willard Brook through Harbor Pond Dam is a cold-water fishery, and lower segment of the Squannacook is a warm-water fishery. "Hollingsworth and Vose Company, a paper manufacturer, holds the only surface water discharge permit to the Squannacook River."[25] The Nissitissit River is a Class B cold-water fishery. There are no NPDES permits on the Nissitissit.

Though dramatically improved since the 1960s, the NRWA reports that the "Nashua River is currently on the 303(d) "impaired waters" list and has had Total Daily Maximum Loads (TMDLs) developed for bacteria and phosphorus. The phosphorus TMDL noted that the primary cause of the impairment was attributed to discharges from wastewater treatment facilities. Treatment facilities along the Nashua River are correspondingly improving their infrastructure to improve water quality. Bacterial impairment is being addressed upstream of the proposed Study segment in the City of Fitchburg."

Based on this initial survey of available water quality data, there appears to be adequate baseline information to understand the condition of the water quality in the river. A more detailed review of the data is recommended to take place during a possible Study, and it may be that additional data would be beneficial to the assessment. In a technical report developed by the IWSRCC regarding "Water Quality and Quantity as Related to the Management of Wild and Scenic Rivers," it is advised that the water quality section of a Wild and Scenic Management Plan document baseline conditions, define water-related values to be protected, and identify potential threats and protection opportunities. Documenting baseline water quality is important because this establishes the threshold for meeting the WSRA mandate to protect and enhance this Wild and Scenic Rivers Value should the river be designated.

Photos: Al Futterman

25 http://www.nashuariverwatershed.org/our-watershed/our-rivers-and-streams.html

# V. Preliminary Evaluation of Suitability

For the purpose of this survey, a preliminary suitability analysis considers readily available information related to:

- Existing river protection measures;
- Existing support for a Wild and Scenic Study;
- Initial level of demonstrated commitment to protect river;
- Preliminary assessment of whether Wild and Scenic designation might be an appropriate scheme for river protection;
- Local interest in participating in the Partnership Wild and Scenic Rivers model; and
- Potential for water resources development.

### A. Existing River Protection

The IWSRCC offers guidance on evaluating the adequacy of river protection and the consistency with which designation matches other agency plans, programs or policies and in meeting regional objectives. An in-depth analysis is undertaken during a Wild and Scenic Study and includes an evaluation of:

- The adequacy of local zoning and other land use controls in protecting the Wild and Scenic River values[26] by preventing incompatible development. This evaluation may result in a finding that the local zoning, when combined with other forms of existing resource protection, fulfills Section 6(c) of the Wild and Scenic Rivers Act, which in turn preempts the federal government's ability to acquire land through eminent domain if the river is designated.
- The state/local government's ability to manage and protect the Wild and Scenic River values on non-federal lands.

The 1996 Massachusetts Rivers Protection Act creates a 200-foot riverfront buffer that extends on both sides of waterways/wetlands and prevents alterations without permitting. The state also prohibits the discharge of pollutants to surface waters within this buffer area. These regulations likely provide the single most important protection for the river.

The state has also established a Squannacook and Nissitissit Rivers Sanctuary to protect the waterways from any new discharge of sewage.

Based on a preliminary review of readily available information of some of the existing local river-related protections currently in place, it appears that the towns and local organizations have responded to the challenges of ongoing growth of the area by establishing a series of regulations, policies and programs to protect the watercourses and associated resources. The towns of Lancaster, Harvard, Groton and Pepperell have enacted stricter versions of the "Rivers Protection Act" to provide increased protection for resources such as vernal pools and wildlife. There are overlay districts for water resource protection in Groton and Pepperell, water supply and wellhead protection in Shirley, floodplain protection in Shirley and aquifer protection in Townsend. Also within some of the towns, there exist districts that protect water resources, groundwater, floodplain districts and historic districts. Lancaster, Ayer, Groton and Townsend have illicit discharge regulations designed to protect water resources and human safety by prohibiting illegal hook-ups to storm drains and discharge of non-stormwater materials. Ayer and Townsend have enacted NPDES Phase II Stormwater management bylaws. Also of note is Townsend's open space preservation development "… in order to provide for the public interest by the preservation of open space in perpetuity, variety in residential housing development

26 Wild and Scenic River values include free-flowing condition, water quality and Outstandingly Remarkable Values.

patterns which allow for development more harmonious with natural features and Town growth policies than traditional residential development, to promote the maximum possible protection of open space, visual quality and watershed protection…"[27]

The proposed Study segments of the Squannacook and Nissitissit Rivers are designated by the NHESP as "Living Water Core Areas" and the entire length of the Nashua, Nissitissit and Squannacook Rivers within Massachusetts as "BioMap2 Core Habitat." "The Living Waters area (with a focus on freshwater aquatic) and the BioMap2 area (with a focus on terrestrial) are roughly equivalent designations intended to guide strategic biodiversity conservation in the state over the next decade by focusing land protection and stewardship on the areas that are most critical for ensuring the long-term persistence of rare and other native species and their habitats, exemplary natural communities, and a diversity of ecosystems. These areas are also designed to include the habitats and species of conservation concern identified in the State's Wildlife Action Plan."[28]

The NRWA has developed a database of the "Resource Protection Bylaws, Ordinances and Regulation for the Nashua River Watershed" that includes a summary of the communities' environmentally relevant bylaws. It is recommended that this information be updated during a possible Study. In 2012 they also developed "An Introduction to Water Resource Protection in MA and NH" for municipal boards and citizens.

Photo: Joyce Kennedy Raymes

27 http://ecode360.com/9542264

28 Testimony on HR 412: "Nashua River Wild and Scenic River Study Act", Elizabeth Ainsley Campbell, 2013.

In addition to the NRWA, there exists an extensive network of local and regional organizations, and state and federal agencies, working to protect and preserve watershed resources. Important examples include:

- U.S. Fish & Wildlife Service — Oxbow National Wildlife Refuge
- Friends of Oxbow National Wildlife Refuge
- State of Massachusetts — Bolton Flats Wildlife Management Area
- Squan-A-Tissit Chapter of Trout Unlimited
- Ducks Unlimited, Inc.
- Mass Audubon
- Groton Conservation Trust
- Harvard Conservation Trust
- Lancaster Land Trust
- Nashoba Conservation Land Trust
- Nissitissit River Land Trust
- Beaver Brook Association

### B. Existing Support for Wild and Scenic Study

The locally-based Nashua River Watershed Association (NRWA) led the exploratory effort to determine the level of support for a Wild and Scenic Study. Representatives from the NRWA attended Board of Selectman meetings in the Massachusetts towns that could potentially be included in a Wild and Scenic Study. Votes of support for the potential study were obtained from the governing body of the towns of Ayer, Dunstable, Groton, Harvard, Lancaster, Pepperell, Shirley and Townsend.

***Organizations and agencies that provided letters of support for a Study include:***

Devens, A Community of MassDevelopment

U.S. Fish & Wildlife Service, Eastern Massachusetts National Wildlife Refuge Complex

Freedom's Way Heritage Association, Inc.

Massachusetts Audubon

The MA Division of Ecological Restoration has indicated that they would support a Wild and Scenic Study.

Stakeholders that would be represented on a potential Study Committee include the NRWA, the towns, the state, Devens, the National Fish & Wildlife Service, NPS, Nashoba Paddler, and representatives of other local and regional organizations previously listed.

### C. Partnership Wild and Scenic River Considerations

Based on available information there seems to be a willingness among local, state, federal and other partners to participate cooperatively in a Wild and Scenic River Study, including development of a river management plan to manage, protect and enhance the Wild and Scenic River values that include free-flowing condition, water quality and Outstandingly Remarkable Values (ORVs). Key local leaders have been working for over four years to educate the public and build support for federal Wild and Scenic Study authorization.

### D. Active Hydro Projects

The Ice House Dam is an active hydro facility that is currently FERC licensed and certified by the Low Impact Hydro Institute. Upstream eel passage was recently installed. It has been included within the proposed Study river segment because the operation does not appear to have any harmful effects to the free-flowing condition or to the ORVs of this river segment. A full examination of the dam and any potential impacts should be undertaken at the outset of a possible Wild and Scenic Study. The Study should also explicitly address the question of eligibility and suitability of the segment impacted by this project and its FERC project boundary.

The Pepperell Dam and associated reservoir of approximately four miles in length has been excluded from the proposed Study Area at this time. Local stakeholders have determined that the river segment that includes the Dam in Pepperell owned by the Pepperell Hydro Company should be excluded from a potential Study so that the recently filed final FERC hydropower license application can move forward. Settlements related to the FERC licensing procedure will likely call for up and downstream fish and eel passage, recreational improvements and a plan for management of aquatic invasive plants in the reservoir. NRWA and other stakeholders are providing input during the FERC licensing application process on such topics as fish passage, an invasives management plan for the impounded area, and a plan for recreational use. Such conditions could have positives outcomes for up and downstream river segments. In the event that the FERC licensing process fails, the local watershed organization has expressed interest in the Pepperell Dam and reservoir being included in the potential Wild and Scenic Study area or designated area.

Photo: Joyce Kennedy Raymes

The site of the former Pepperell Paper Mill directly downstream of this dam site has been proposed for exclusion as well due to the Town of Pepperell's active engagement in pursuing a re-development plan for this property, currently owned by Perry Videx Inc. of New Jersey.

It is recommended that as part of any eventual Study that special attention regarding eligibility and suitability be paid to the proposed exclusion area as well as to areas upstream and downstream. It is also recommended that exclusion boundaries be delineated early in a Study.

The Town of Shirley initially displayed some reticence for supporting a Study due to interest in learning if there are sites suitable for developing small-scale hydro facilities in the future. Though they ultimately voted in favor of supporting and participating in a Study, the NPS suggested that the town could pursue an investigation of possible hydro sites during a Study. In Townsend, the Townsend Historical Society is exploring what would be involved in renovating the site of a former Grist Mill so that it could generate a very small amount of electricity; the exploration is going forward concurrently with the potential Wild and Science Study. The Study should coordinate closely with this investigation, as a Wild and Scenic River designation that included this site would prohibit future FERC licensing.

### E. Information Gaps / Potential Research Studies

There is typically a study budget associated with an authorized Wild and Scenic Study. This allows for research and technical analysis of the resources, river flows, recreational use surveys etc. *These "studies within the study" help establish benchmarks for the protection of ORVs, and this information will generally result in enhanced river protection even if Wild and Scenic River designation is not achieved.*[29]

Under the Wild and Scenic Rivers Act, a comprehensive river management plan (CRMP) must be prepared that addresses, "resource protection, development of lands and facilities, user capacities…." The NPS recommends that the CRMP be prepared during Studies where there are extensive non-federal lands within the area, since federal land acquisition would not be one of the available tools to protect river resources. Developing a CRMP can support the suitability determination and establish the importance of multiple partners working for river protection. Beyond this responsibility, the Study team would make a determination as to what additional studies may be necessary to determine eligibility and suitability for designation. In collaboration

29 Jackie Diedrich, Cassie Thomas, U.S. Forest Service and National Park Service, The Wild & Scenic River Study Process, (Portland, Oregon, and Anchorage, Alaska, 1999), 11.

with the Study team, the NPS would screen prospective research studies to determine if they meet the following criteria:

- How essential is the study to the overall eligibility and suitability determinations?
- How much time would the study take (studies should take less than three years, from scoping through contracting to completion)?
- Would the potential study budget be adequate to cover costs, or if not, is there an alternate source of funding?

If there is funding available through the NPS, the following potential research study list is representative of the type of research needed to conduct a Study, and characterizes the types of research that could be necessary to document eligibility and suitability. It is important to note that this list of possible studies has not been finalized nor determined to be essential for determining eligibility and suitability. If a Study is authorized, the NPS would work with the local Study Team to prioritize the scope of research based on the criteria referenced above.

***GIS Mapping and Land Use:***

- Document existing conditions.
- Document and inventory protected lands within the watershed.
- Evaluate existing development and determine development potential of larger parcels within the river study corridor.
- Evaluate and analyze existing watershed-wide build-out analysis to determine trends in development expansion and resulting impact to the watershed.

***Water quality:***

- Inventory and prepare a database of existing water quality data to describe existing water quality and to determine trends. Identify location and types of impacts to surface water quality; consider additional sampling as needed.

***History and Archaeology:***

- Conduct historical documentation of significant river-related existing and former mill and/or factory sites.
- Document and locate significant river-related historic locations and/or events, and historical structures.
- Document and locate river-related structures and features currently registered or that have the potential to be listed on the National Historical Register.

***Recreation:***

- Evaluate current recreational uses and recreational resources related to the river.

***Dams, Ponds and Streambank Development:***

- Evaluate existing dams and remnant dams to determine whether they meet the free-flowing requirements of the WSRA.
- Document and evaluate existing riverfront development, docks, and structures to determine their impact on free-flow, natural features, fisheries, and habitat.

***Regulations, Plans, Programs and Policies:***

- Conduct an evaluation of existing and proposed local, state, and federal regulations and policies pertaining to land use, fisheries, and the natural, recreational, cultural and historical resources within the watershed.
- Determine adequacy and consistency of existing regulations, policies and permitting in achieving the purposes of the WSRA.
- Review local, regional, and state objectives for the preservation of protected lands and determine adequacy and consistency.
- Consider benefits of modeling potential climate impacts on the river system.

# VI. NPS Findings

Based on a preliminary analysis through this reconnaissance survey, the National Park Service (NPS) concludes that the Nashua, Squannacook and Nissitissit Rivers appear to be good candidates for a Wild and Scenic River Study. This conclusion is founded on preliminary evidence of free-flowing river conditions and the presence of multiple natural, cultural and recreational resources with potential to meet the Outstandingly Remarkable Values threshold as defined by the Wild and Scenic Rivers Act. There is demonstrated local and regional interest and support for a study, and existing river/watershed protection elements that would support the NPS framework for a Partnership Wild and Scenic River designation. In addition, local stakeholders have indicated an initial level of interest in developing the river management plan that would be developed as a part of the study process, and required as a part of the designation.

In sum, all of the elements for a successful Study process appear to be in place for the Nashua River. If a Study is authorized by Congress, the NPS believes that the use of the established Partnership Wild and Scenic River Study process, in close cooperation with the towns of Ayer, Dunstable, Groton, Harvard, Lancaster, Pepperell, Shirley and Townsend, the State of Massachusetts, and other local and regional stakeholders would be an effective approach.

Photo: Joyce Kennedy Raymes

National Park Service
U.S. Department of the Interior

# Wild and Scenic River Reconnaissance Survey of the Nashua River