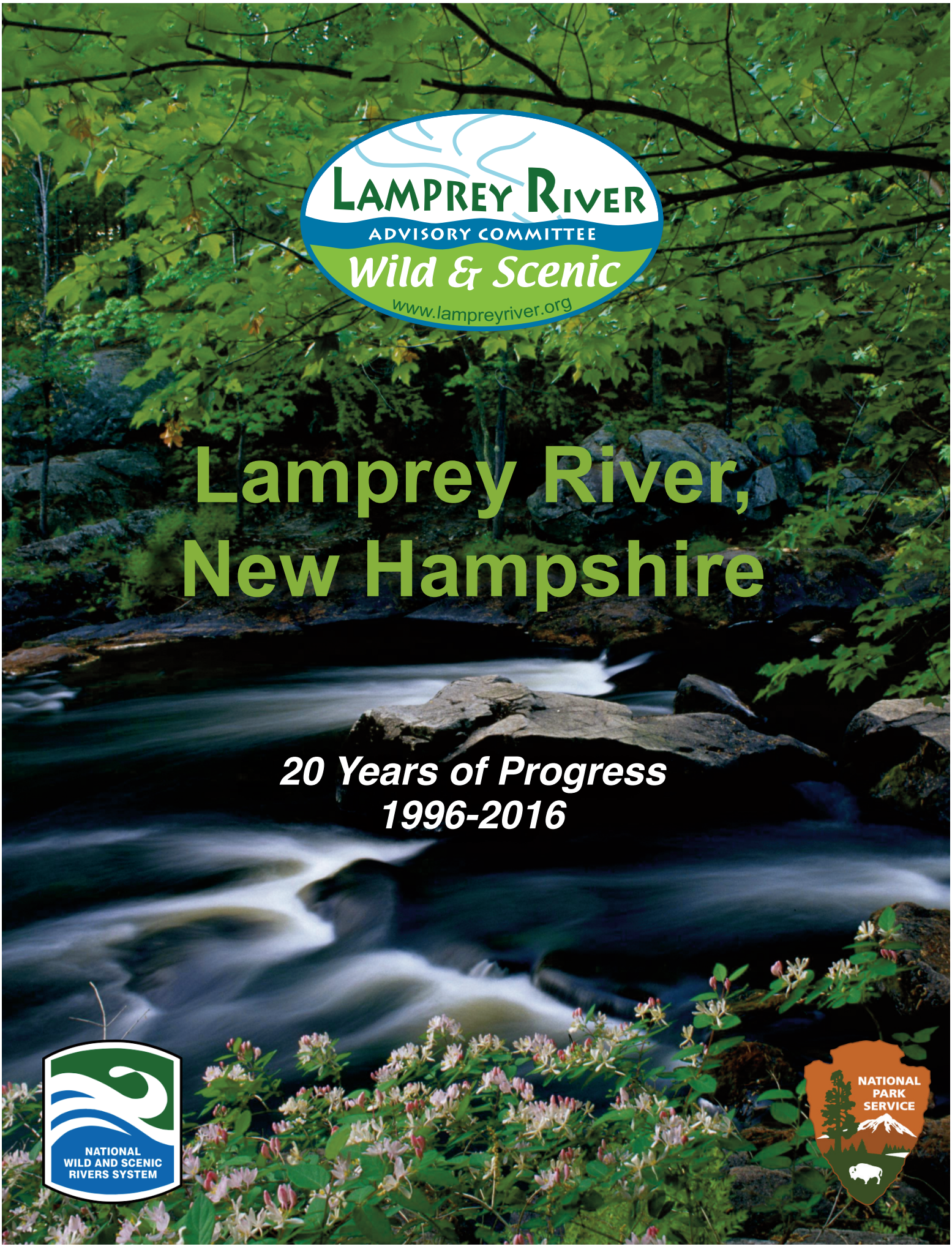
LAMPREY RIVER
ADVISORY COMMITTEE
Wild & Scenic
www.lampreyriver.org
Lamprey River,
New Hampshire
20 Years of Progress
1996-2016
NATIONAL
WILD AND SCENIC
RIVERS SYSTEM
NATIONAL
PARK
SERVICE

This report was prepared by the Lamprey Rivers Advisory Committee in cooperation with the US Department of the Interior, National Park Service, Northeast Region, Wild and Scenic Rivers Program, to assess the status of progress of the Lamprey River Management Plan twenty years after the designation of the Lamprey as a National Wild and Scenic River on November 12, 1996.

Further, this report serves the following purposes:

- Recognize and celebrate the accomplishments of individuals and stakeholders who participated in the Lamprey River Wild and Scenic Study, helped to develop and implement the (1995) *Lamprey River Management Plan* (and subsequent updates), and supported the Lamprey's designation into the National Wild and Scenic Rivers System.

- Provide a history of the factors leading to the Lamprey River Wild and Scenic Study, development of the (1995) *Lamprey River Management Plan*, national designation, and subsequent achievements.

- Remind advisory committee members, federal, state, and municipal officials, non-governmental organizations, and the public at large that protection of the Lamprey River and implementation of the actions identified in the Plan require long-term diligence and cooperation.

- Explain the potential benefits of participating in the Lamprey Wild and Scenic River as a representative, partner, cooperator, advisor, or friend.

This report was funded by a National Park Service outreach and education grant under CFDA 15:954—Lamprey Wild and Scenic River Assistance.

National Park Service
Northeast Region
15 State Street
Boston, MA 02109-3572
www.nps.gov/orgs/1912/Partnership-Wild-and-Scenic-Rivers.htm
www.lampreyriver.org (Lamprey Rivers Advisory Committee)

March, 2017

Front cover photo – Jerry Monkman, Ecophotography
Back cover photo – Dick Lord

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Lamprey River watershed towns:

Barrington	Brentwood	Candia
Deerfield	Durham	Epping
Exeter	Fremont	Lee
Newfields	Newmarket	Northwood
Nottingham	Raymond	

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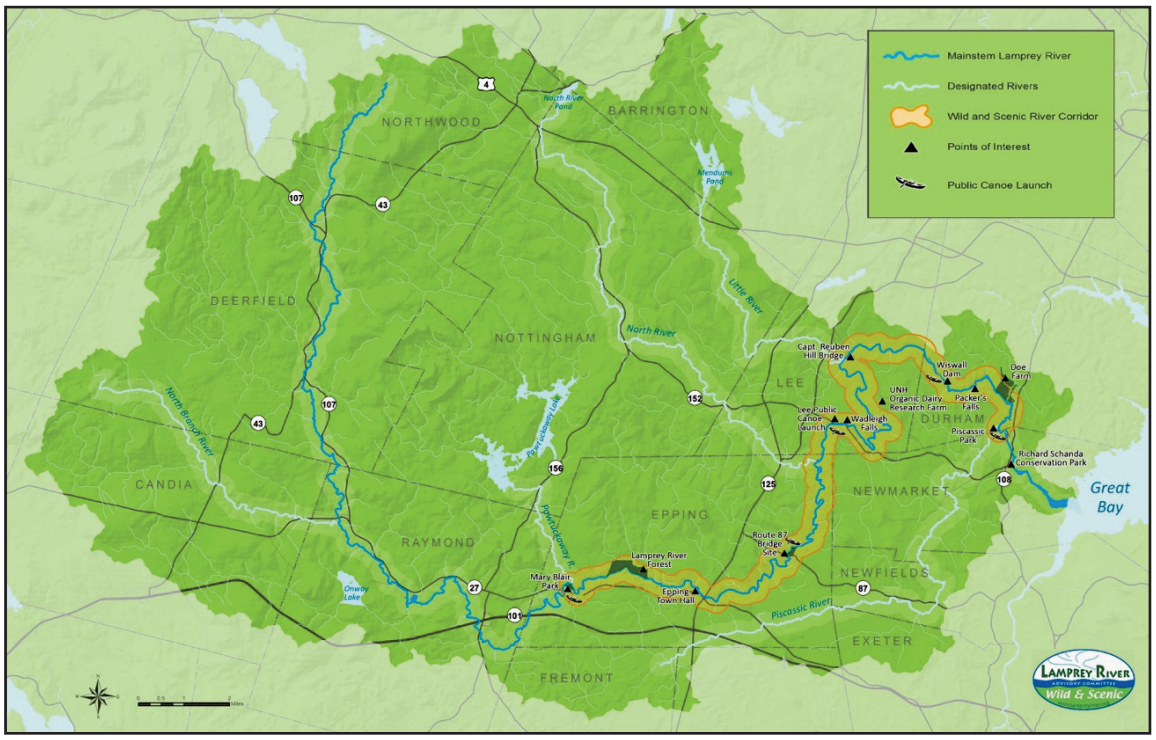

Towns of the Lamprey Wild and Scenic River:

	NH designation	Wild and Scenic designation
Durham	1990	1996
Epping	2011	2000
Lee	1990	1996
Newmarket	2011	1996

The Wild and Scenic segment begins at the former Bunker Pond Dam in Epping and ends at the confluence of the Piscassic River near the Durham-Newmarket town line, for a total distance of 23.5 miles.

Towns of the Lamprey River Watershed:
(designated 2011 into NH Rivers Management and Protection Program)

Barrington	Fremont
Brentwood	Newfields
Candia	Northwood
Deerfield	Nottingham
Exeter	Raymond

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Executive Summary

For one hundred years, the National Park Service (NPS) has been about preserving what is best about America for the future. The inclusion of Wild *and* Scenic Rivers as part of that heritage did not happen as quickly as it did for wild land areas and historic monuments, but rivers, too, are a resource that all Americans value and share and want to protect. The US Congress acknowledged this truth with the passage of the *Wild and Scenic Rivers Act*, October 2, 1968.

As part of the 100th anniversary of the NPS, the Wild and Scenic Lamprey River in southeast New Hampshire was selected to share its history and accomplishments as a model of river protection and management that employs a partnership among the NPS, the State of New Hampshire, municipalities, and citizen volunteers. Even before the Lamprey River's designation by the US Congress as a Wild and Scenic River on November 12, 1996, citizens recognized the outstanding resources of the river and worked hard to ensure its future. This hard work has continued and the partnership management team has adapted to new challenges as they arose.

This *Twenty Years of Progress on the Wild and Scenic Lamprey River* tells the story of how the people who care most about the Lamprey River successfully beat the odds and prevented the construction of a hydroelectric power facility during a time when hydroelectric power was viewed as a national energy policy priority. It recounts the history of dedicated volunteers who used their skills and time to create and implement a river management plan. It celebrates the many accomplishments of these people to protect and manage the river for the future:

- permanent protection of ecologically significant lands along the river
- improving access to the river for passive recreation
- engaging researchers to tease out the details of critical habitats, species of concern, water quality, and history
- outreach and education to inform children and adults about the river
- review of proposed development projects that could adversely affect the river and its resources

This report was written with many audiences in mind with the hope of inspiring continued action and support for "our" Wild and Scenic Lamprey River, America's Wild and Scenic Lamprey River, and for future Wild and Scenic Rivers. The process of designating a river as Wild and Scenic requires time and commitment, but the process of actually managing and protecting that river requires even more time and commitment. When and where governmental entities lack the personnel and time to protect recognized resources, such as a Wild and Scenic River, citizens often willingly donate their talents and time to meet that need. Protection of a shared resource benefits the common good. Those citizens who undertake this task should be provided with basic tools and support to get the job done. This, too, is about preserving what is best about America for the future.

Chairman's Message

Wadleigh Falls, Lee *Photo by S. Petersen*

For twenty years the Lamprey Rivers Advisory Committee has taken care of this Wild and Scenic River. We have had many volunteers donating many dedicated hours. We have been engaged in outreach and education about the Lamprey in our communities. Our land protection efforts have been very successful; we were able to add almost 537 acres and 5300 feet of main stem Lamprey River frontage in 2016, resulting in a 20 year total of almost 3500 acres and 16.1 miles of permanently conserved land on the river. We have completed a major analysis of water quality data over a 23 year time frame that encompassed not only the Wild and Scenic portion of the river but the entire main stem. We have continued to engage in projects studying the wildlife and habitat in the river corridor and we have recently undertaken an archaeological study of an old mill site dating back to the 1700s.

I expect that the future efforts of the Lamprey Rivers Wild and Scenic Advisory Subcommittee will continue with much the same emphasis as above. I anticipate that funding will continue to be a challenge as we are almost solely dependent upon the National Park Service. We are taking aggressive action to pursue new revenue sources to reduce our dependency on the National Park Service and to expand the scope of our projects on the river. While we hope that land conservation will remain a priority, our funds are dwindling and securing outside funding sources is challenging. As a result, our level of involvement in land protection will be scaled down.

Future projects will include efforts to enhance recreational use of the river and explore increasing public access to conserved lands in a responsible way. We hope to demonstrate to the communities the value of the Lamprey as an asset to our way of life and to the New Hampshire values that many of our residents value highly. Because of our efforts over the past twenty years, and with help from the National Park Service, much of the shoreland on the river remains undeveloped and "wild." It represents what we are trying to pass on as a legacy to succeeding generations.

Joseph Foley, Lamprey Rivers Wild and Scenic Advisory Subcommittee chair

Partnership Wild and Scenic Rivers

> *"It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dams and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes."*
>
> *—Wild and Scenic Rivers Act, October 2, 1968*

National Wild and Scenic Rivers are designated by the US Congress or the secretary of the Department of the Interior based on their "outstandingly remarkable resources" such as scenic, recreational, natural, or similar river-related values. The river and its outstanding values are to be preserved and enhanced for the enjoyment of present and future generations.

National Wild and Scenic Rivers are classified into three categories:

Wild River Areas – Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic River Areas – Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational River Areas – Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

A subset of the National Wild and Scenic Rivers – *Partnership* Wild and Scenic Rivers – predominantly flow through private, municipal, or state land, with little or no federal management. Partnership Wild and Scenic Rivers are administered by the secretary of the US Department of the Interior through the National Park Service (NPS) in partnership with local governments, councils, and non-governmental organizations. Local communities protect their Partnership Wild and Scenic Rivers and outstanding river-related resources through a collaborative approach, often supported financially by cooperative agreements with the NPS.

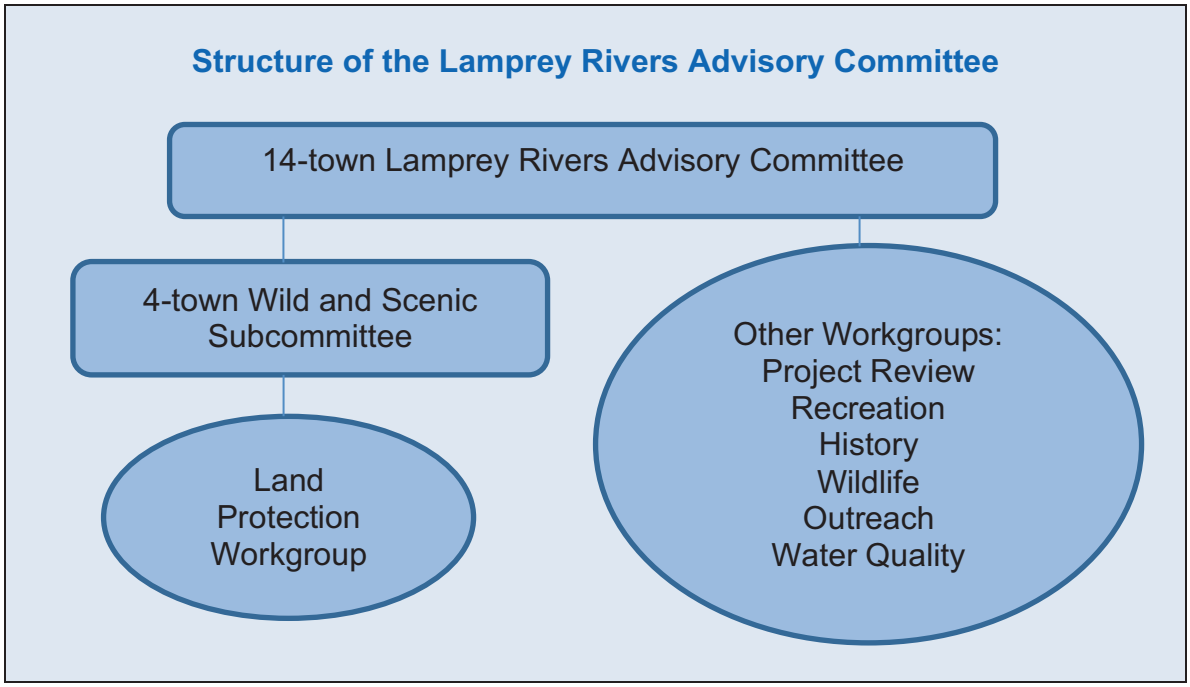
The Lamprey is a Partnership Wild and Scenic River administered under a locally approved management plan. The designated Wild and Scenic segment of the river flows through four towns: Epping, Lee, Durham, and Newmarket. The entire 23.5 mile segment from the former Bunker Pond Dam in Epping to the confluence of the Piscassic River in Newmarket is classified as a Recreational River Area. Very little of the land

along the river is under public ownership; almost all of it is privately owned. Because direct management by the NPS is not possible, management occurs through a partnership among the towns, the NPS, state agencies, and non-governmental organizations. With state and NPS assistance, the Lamprey communities are better able to protect their river and its outstanding river-related resources.

Lamprey Rivers Advisory Committee

The Lamprey Rivers Advisory Committee (LRAC) is the lead local body responsible for managing the Lamprey Wild and Scenic River. The LRAC also has advisory responsibilities for river segments designated under the New Hampshire Rivers Management and Protection Program. Each town in the Lamprey River watershed can have up to four representatives with various interests such as municipal officials, landowners, agriculture, business, conservation, and recreation. Within this fourteen town coalition, the four towns of the Wild and Scenic designation form an autonomous subcommittee. Although there is much overlap, the Wild and Scenic Subcommittee bears the sole responsibility and authority to determine how funding provided by cooperative agreements with the National Park Service is expended.

Committee members are volunteers nominated by their local municipal government and officially appointed for a three year term by the commissioner of the New Hampshire Department of Environmental Services. At the end of their terms, members may seek renomination and reappointment. The LRAC currently has three members who have served since the creation of the committee twenty years ago: Dick Lord, Sharon Meeker, and Kitty Miller.



The full committee and the Wild and Scenic Subcommittee generally meet ten times per year at municipal buildings that satisfy accessibility requirements. Announcements for these meetings are posted on-line and at town offices. All meetings are open to the public. Most workgroups generally meet monthly. Final meeting minutes are posted on-line and provided to all town clerks. Workgroup meeting notes are included as part of the full committee minutes.

The LRAC officially approved bylaws on October 14, 2008. These bylaws were amended January 26, 2012 to address expansion of the LRAC resulting from extension of the state-level designation from two to fourteen towns to encompass the entire watershed. Functions of the committee described in the bylaws and elsewhere include the following:

- Provide a forum for discussion of river-related issues;
- Monitor watershed activities and proposals that could affect the Lamprey River, its tributaries, and river-related resources;
- Advise the secretary of the US Department of the Interior through the NPS on the Wild and Scenic River designation, federal actions potentially affecting the Lamprey River, and implementation of the Lamprey River Management Plan;
- Advise the commissioner of the New Hampshire Department of Environmental Services on matters pertaining to the management of state-designated rivers;
- Promote protection and enhancement of the Lamprey Wild and Scenic River;
- Conduct education and outreach; and
- Prepare an annual report on the activities of the Committee, status of river protection and enhancement, and implementation of the most recent update of the Lamprey River Management Plan.

By the Numbers: Lamprey Rivers Advisory Committee

Item Description	Count
current Wild and Scenic communities represented	4
current other watershed communities represented	4
percent of local communities participating	57%
annual reports compiled and submitted	19
active appointed and associate members	14
Wild and Scenic Subcommittee meetings per year	~10
watershed-wide committee meetings per year	~10
workgroup meetings per year	≥60
volunteer hours performed by committee members per year	~1500

River Profiles

As a freshly hired staff member at the Southeast Land Trust of New Hampshire (SELT), I was nervous at my first meeting with LRAC, but I immediately recognized that the partnership among LRAC, NPS and the Land Trust was a strong one. The LRAC brought a lifetime of experience and local knowledge to the table and the membership was diverse — representing all of the Wild and Scenic towns and stakeholder groups. The NPS staff provided friendly and sound guidance while allowing the LRAC to determine its own course of action. The Land Trust provided the capacity and expertise to help implement the shared land protection goals.

During the drive home that evening I reflected on the meeting and was filled with inspiration. This diverse group of federal, regional, and local representatives was coming together around the kitchen table and working with one another to protect something they all had a stake in – the Wild and Scenic Lamprey River. To me, the partnership was a model of resource management that I had learned about in graduate school and I was excited to have the opportunity to be a part of a group that was successfully implementing it.

Eight years after that first meeting, the evening drive home is still as inspiring as the first – being able to look back at almost 3500 acres and 16 miles of conserved land along the river will do that! The partnership of LRAC, NPS and SELT is a testament to the great and lasting work this model of river management can achieve.

David Viale, Southeast Land Trust of New Hampshire

History of Lamprey River Management and Protection

Protection of the Lamprey River began in the late 1970s when two separate but related needs were identified: a river management plan and a group that could spearhead efforts to study and protect the river. A river management plan coalesces how to protect and manage key resources. Identifying those resources depends on motivated individuals who best know the river and experts who can build on that knowledge. A planner at Strafford Regional Planning Commission was able to secure a grant to create a river management plan. The group of river champions that emerged to coordinate the effort was the Lamprey River Watershed Association (LRWA), formally established in 1983. The LRWA today serves as the fiduciary agent for the Wild and Scenic Subcommittee and executes cooperative agreements on its behalf with the NPS.

LAMPREY RIVER WATERSHED ASSOCIATION

The goals of the Lamprey River Watershed Association are to promote the restoration, conservation, wise development and use of the natural resources of the Lamprey River watershed.

In the 1980s, as energy policy in the United States shifted to favoring alternatives to fossil fuel, the development of hydroelectric power became a major political and economic force. Significant funding and incentives were available to entities looking to expand this source of power. Hydroelectric power already existed at the Macallen Dam in Newmarket and a new proposal to establish a hydroelectric facility at Wiswall Dam in Durham was submitted to the Federal Energy Regulatory Commission (FERC) in 1982. After some local objections were aired but rejected, FERC issued a license in June of 1989 to the applicant for developing the site.

As local residents and municipalities raced to learn more about hydroelectric power and wrestled with the idea of a hydroelectric facility controlling water normally available for recreation and public water supply, objections to the project grew. Residents recognized, correctly, that FERC was an entity not easily stopped or dissuaded. American Rivers offered critical legal advice and a long-shot suggestion: convince local citizens, municipal officials, and federal representatives to support a Wild and Scenic study for the Lamprey River. In September 1989, selectmen in the towns of Lee and Durham passed resolutions in support of a Wild and Scenic study for the Lamprey River.

At approximately the same time, the New Hampshire General Court enacted legislation creating the Rivers Management and Protection Program to safeguard New Hampshire's best rivers. With little time to spare, the LRWA members generously gave their time, energy, and financial resources to document the resources in and along

the Lamprey to support the bid for nomination to the state program. The thinking was that if the river was considered an asset to New Hampshire and designated to the state rivers program, the argument that it was also an asset to the United States would be a logical next step.

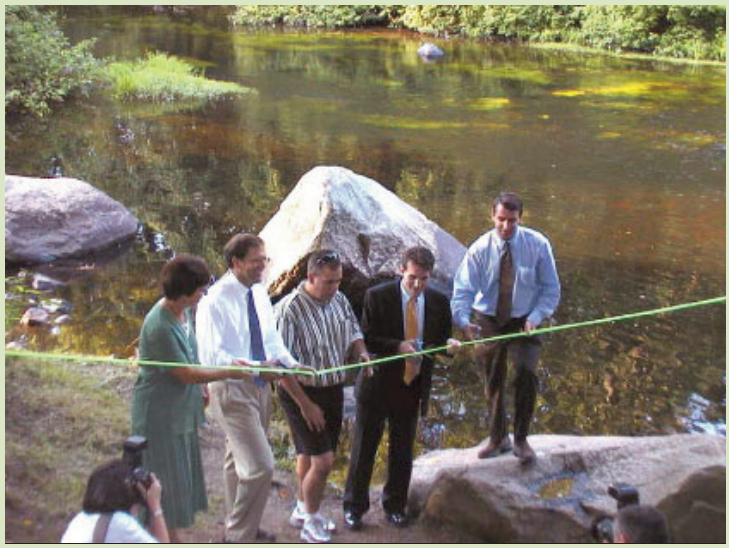
In 1990, the Lamprey River in the towns of Lee and Durham was successfully designated as one of the first five rivers in the state program. As a result of designation, the Lamprey River Advisory Committee (LRAC) was formed to effect enhanced river protection and management.

New Hampshire Rivers Management and Protection Program

More legal appeals against the hydroelectric license were submitted in 1990 and again FERC's position prevailed. In February of 1991, New Hampshire's freshman Congressman Bill Zeliff and senators Judd Gregg and Warren Rudman introduced bills in the US House of Representatives and the US Senate for a Wild and Scenic Study of the Lamprey River. In December, the bill was signed into law. In February of 1992, FERC ordered a stay of license for construction of the Wiswall hydroelectric facility pending the outcome of the Wild and Scenic River Study.

The effort to document the river-related resources of the Lamprey River culminated in 1994 with the publication of the *Lamprey River Resource Assessment*. This soon was followed by the publication of the *Lamprey River Management Plan* in January 1995. The NPS's *Lamprey Wild and Scenic River Study Draft Report* was published in June 1995. On November 12, 1996, the Lamprey River in Lee, Durham, and Newmarket was designated as a Wild and Scenic River by the US Congress (PL 104-333). That was the end of any discussion about a new hydroelectric facility on the river. In 2000, a section of the river in the town of Epping was added to the original designation (PL 106-192), resulting in a total of 23.5 miles of river protected.

The process of gathering details for the study and creating the management plan helped to turn many opponents into strong advocates for the Lamprey River. Citizens and municipalities learned that they shared a desire to protect a valued resource. Some initially hesitant town leaders came to understand that Wild and Scenic designation did not mean less local control; it brought significant, long-lasting benefits. The designation was a triumph of how the river community rallied to stop the unstoppable by overcoming wide-spread ignorance of the impacts of hydroelectric power, the true (versus predicted) energy potential of hydroelectric power, and the complexity of hydroelectric licensing, as well as how to build and win public support and lobby politicians. Perhaps most importantly, the community found the courage to do it.



In 2000, this ribbon-cutting marked the addition of the Epping segment of the Lamprey River to the Wild and Scenic River designation.

Photo by Richard H. Lord.

In a twist of irony, the grant secured in the early 1980s by the Strafford Regional Planning Commission to support the development of a river management plan came from a fund reserved for rivers with hydroelectric facilities. The hydroelectric plant in Newmarket, located outside the Wild and Scenic designated area, independently ceased operations. The financial resources ostensibly intended to increase hydroelectric power generation on the Lamprey River instead helped to ensure that the river's flow would not be altered in the future by new dams or hydroelectric facility construction.

Road signs like this can be seen along the river, serving as a strong reminder that the river connects the landscape, wildlife, and people.

In 2011, after more research and tireless work garnering unanimous support from the fourteen communities in the Lamprey River watershed, the entire Lamprey River and five of its major tributaries were designated under the New Hampshire Rivers Management and Protection Program. This was the first and, to date, only time an entire river watershed was afforded state protection. The *2013 Lamprey Rivers Management Plan* effectively integrates goals for the entire river for both the state and Wild and Scenic programs. From an unlikely start, the Lamprey has taken the lead. Stay tuned as the Lamprey and the people working hard to protect it forge ahead into the future.

For more about the people and efforts that protect the Lamprey, please visit **www.lampreyriver.org** and watch these two videos:

- *Connecting Lives on the Lamprey River* Part 1 and Part 2
- *Reflections on a River*

River Profiles

Photo by Breakaway Media

Twenty-five years ago, when my husband, Carl, and I led the initiative to make the Lamprey a National Wild and Scenic River, we were focused on protecting it from abuse by a hydroelectric facility. Now the many other benefits of the designation bring me a continuing sense of pride in the achievements of my fellow advocates who have done wondrous things with that program. Some of those accomplishments are in this document.

The one that seems most significant to me is the approximately eight miles of land along the river that are now permanently protected by conservation easements. With these easements are hundreds of acres of land valuable to the wildlife that depends on the river and its supporting landscape. When I was testifying before the US Congress, urging members to designate the river as a Wild and Scenic River, one of the points that was most effective was that this largely undeveloped river, with its clean water, natural beauty and recreational resources, was within shouting distance of a major metropolitan area. The work done to conserve land over the past two and a half decades has assured that this unique attribute of the Lamprey will last well into the time that development spreads into its watershed communities.

Sometimes we forget what having one of only two Wild and Scenic Rivers in New Hampshire means. When my daughter was in middle school, she was listening to some classmates boasting about how important their fathers were and the high powered careers they had. My daughter said nothing, but walked away proudly thinking, “That’s nothing. My mother got a river made into a National Wild and Scenic River.” When she told me about it years later, I was deeply touched that growing up on the Lamprey had given my daughter such fine values.

Submitted by Judith Spang,
former LRAC representative and committee chair

Community Partners

The Lamprey River is located in an area of active scientific research and environmental concern. As the most significant source of fresh water to the Great Bay Estuary, the condition of the river is clearly connected to the health of the bay. Sadly, Great Bay is experiencing several problems that have earned it a place on the federal list of impaired waters. Many entities, including the University of New Hampshire (UNH), municipalities, federal and state regulatory agencies, and volunteer groups, are conducting multiple studies to ascertain the exact cause(s) of these impairments and developing plans to address the impairments. Several other rivers also drain to Great Bay, but the Lamprey River has been the subject of the most research. For eight years, such research has been presented in the annual day-long Lamprey River Science Symposium hosted by UNH. Researchers from a wide range of disciplines present their findings to a large, engaged crowd that includes other researchers, public officials, and concerned citizens.

The Lamprey is in an area of active land conservation. Of the key indicators identified in the *Piscataqua Region Estuaries Partnership (PREP) Management Plan*, the goal of putting twenty percent of the area under permanent conservation by the year 2020 is one that seems likely to be attained, at least along the Lamprey River. As of 2011, nine Lamprey River watershed towns had conserved more than fifteen percent of their land area and three had conserved ten to fifteen percent. The LRAC has played a significant role in that success. Working with several land conservation partners and towns, the LRAC has used $4.9 million to leverage almost $21 million for the permanent protection of 3500 acres of critical habitat and important riparian lands along the Lamprey River.

Partnerships between the LRAC and towns in the watershed have always been strong and new relationships are being developed. The four Wild and Scenic towns have long benefited from LRAC expertise and financial assistance. All four towns have been partners in land protection projects, recreational enhancements, historical documentation, and various outreach and educational activities. Assistance from the LRAC is currently being extended to upriver towns to improve recreation and the general public's understanding of local environmental resources and issues.

The LRAC has a strong relationship with the non-profit Lamprey River Watershed Association (LRWA). Since 1998, LRWA volunteers have conducted water quality tests along the main stem of the Lamprey River. The State of New Hampshire provides some funding for this work, but financial support from the LRAC has provided equipment and coordination that other New Hampshire rivers have been unable to secure. During economic downturns and the resultant loss of state funding, LRAC support ensured that years of data were not interrupted. In addition to support for water quality testing, the LRAC has awarded several grants to the LRWA to study issues that warrant careful investigation or highlight work along the Lamprey. Advice and financial support from the LRAC ensured these projects were given proper attention. Below are a few examples:

- evaluating large woody material in the context of paddling access
- documenting dams and making recommendations that might improve fish passage

- exploring the potential for helping towns install demonstration stormwater reduction projects
- creating three DVDs that identify river issues and celebrate river heroes

River Profiles

Photo courtesy of UNH

Undergraduate and graduate students, as well as academic scientists, are increasingly expected to apply their knowledge to the real world. My participation as an LRAC member from 2012 to present has provided me with local and relevant examples of the application of scientific knowledge in successful watershed management that have intrigued students in my hydrology classes at the University of New Hampshire. These students are quite motivated to maintain the quality and quantity of the campus drinking water supply. The related complex technical, social, and legal issues have inspired several to pursue additional coursework and rethink career choices.

Expertise, capacity, and funding from LRAC have enabled several of my undergraduate students to develop thesis projects that address real-world knowledge gaps, projects that have ranged from a field study examining controls of high turbidity levels in a small tributary to a retrospective analysis of watershed-wide water quality over the last 20 years. Science in the Lamprey River watershed benefits not only from world-class monitoring and analysis led by scientists at USGS, NOAA, UNH, and NHEPSCoR, but also from the knowledgeable and dedicated citizens who serve on LRAC and are intimately familiar with the history, management, and concerns facing the watershed.

submitted by Anne Lightbody, PhD, LRAC representative

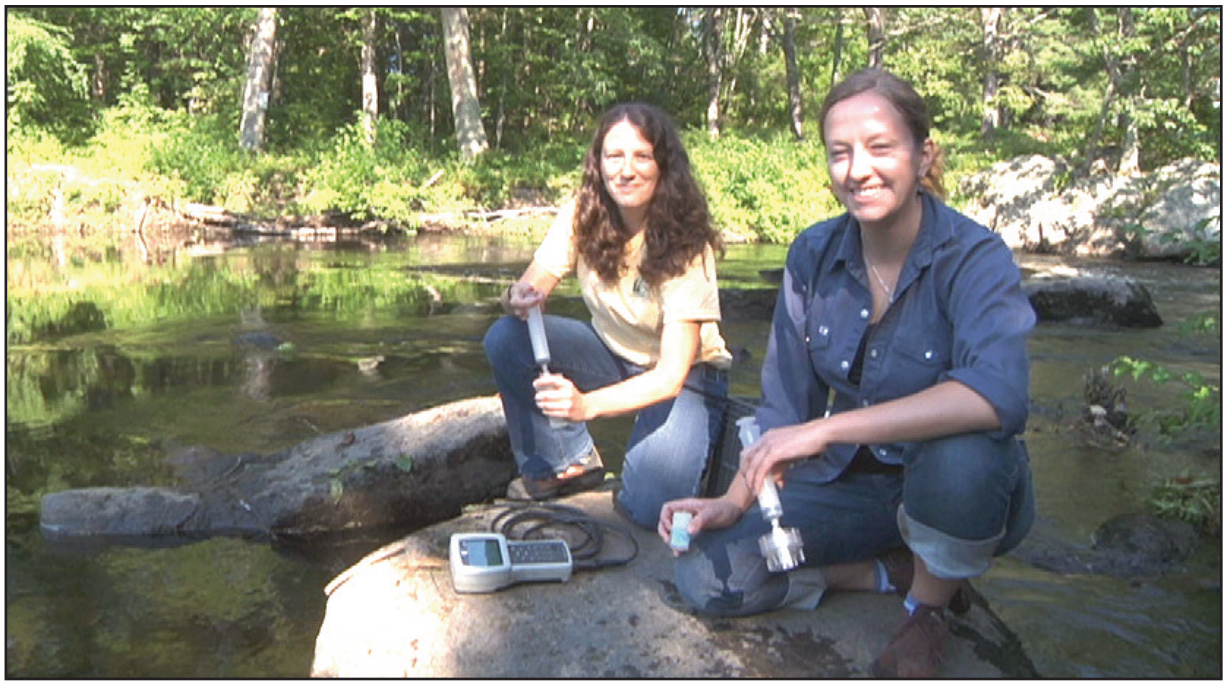
By the Numbers: Community Partners

Item Description	Count
Wild and Scenic communities participating	4
other watershed communities participating	10
partner agencies and organizations	~25

Photo by RH Lord

Intermittently for the past few years, a mysterious flow of fine sediment has been clouding Woodman Brook as it enters the Lamprey River. In an interesting partnership with LRAC and under the guidance of LRAC representative Anne Lightbody, UNH student Jake Poirier investigated the issue and came to some initial conclusions, summarized in his poster, available at http://www.lampreyriver.org/about-the-river-current-research-woodman-brook

Water Quality and Flow



Scientists test the water. Photo by Breakaway Media.

Background

Clean, abundant water in the Lamprey River and its tributaries (Little, North, North Branch, Pawtuckaway, and Piscassic) is central to the LRAC's mission. In diverse ways, many of the efforts of the LRAC are intended to maintain and/or improve water in the rivers. Since 1998, the Lamprey River Watershed Association (LRWA) has conducted summer water quality monitoring along the length of the Lamprey River, often with financial support from LRAC. The data collected are then processed by the State of New Hampshire's Volunteer River Assessment Program (VRAP). Focused chemical analyses have been done by the University of New Hampshire (UNH) and the New Hampshire Department of Environmental Services (NHDES).

The Lamprey River is legislatively classified as Class B "fishable and swimmable" and managed by NHDES under the federal Clean Water Act to meet this water quality standard. Most of the tributaries are similarly classified, while the Piscassic River is classified at the higher standard of Class A. Maintaining clean water is supported by the significant amount of riparian land protection, state law and municipal zoning ordinances that protect shorelands, and good land management by property owners. The Epping Wastewater Treatment Facility upgrade in 2000 also has contributed to improving the Lamprey's water quality. Since the Lamprey River is a source of municipal water supply, clean water is critical to all who get some or all of their drinking water from the river.

River Profiles

Lamprey River water quality volunteers

When New Hampshire began a Volunteer River Assessment Program (VRAP) in 1998, the Lamprey River was one of the first watersheds to participate. Each year, volunteers have gathered data about the river from designated locations per the protocol established by NHDES. Lamprey River volunteers have collected temperature, pH, turbidity, specific conductance and *E. coli* information. It takes a patient, detailed oriented person to love this work and the instruments can be a bit temperamental. But getting watershed residents involved in the collection of valuable information about the river water quality is priceless.

One of the most common questions residents have about the river is if it is safe for swimming. Thanks to well documented water quality data, the answer is a resounding "yes." Having good data also encouraged one of the watershed towns to reopen a beach area along the river.

Dozens of citizens have participated in data collection over the years. They have benefitted from learning how important this information is to the State of New Hampshire and the watershed has benefitted from the data collected. This is a win for everyone!

submitted by Dawn Genes

Dawn Genes

Photo by Paul Gasowski

Dawn Genes is a true champion of clean water. After many years with USDA Natural Resources Conservation Service, she took on the role of executive director for the Lamprey River Watershed Association in 2004. Dawn oversees the annual summer water quality testing volunteers and equipment. She initiated a "Stream Walk" to assess issues along the main stem Lamprey, documenting invasive weeds, inadequate stream crossings, storm drain pipes, etc.. She surveyed all 38 dams along the Wild and Scenic section of the river and made recommendations for improving fish passage. Through her combined loves of water and recreation, she led an initiative to study and improve paddling conditions on a particularly woody section of the river. She investigated working with towns to install stormwater treatment retrofits. She leads annual litter clean-up efforts. She encourages citizens and local governments to be involved in river issues. In her spare time, she also is the director of the NH Audubon Massabesic Center.

Despite the corrective and protective water quality measures mentioned above, the Lamprey River is not immune to common human-caused water quality problems. The tidal section of the Lamprey River --which is located downstream of the Wild and Scenic section-- had more than 80 dissolved oxygen violations of federal Clean Water Act criteria in 2010 and 50 in 2011, significantly more than all other rivers of the Great Bay Estuary combined[1]. In addition to the number of violations, the Lamprey River also had the lowest dissolved oxygen readings. Without sufficient dissolved oxygen, fisheries and

shellfisheries are severely strained. This impairment represents a major threat to the health of the river.

Low dissolved oxygen is often correlated with excessive nutrients and algae. In the tidal portion of the Lamprey River, the dissolved oxygen problem is partially due to discharges of treated sewage from the Newmarket wastewater treatment facility. To address these problems, Newmarket's most recent wastewater treatment permit significantly limits the amount of nitrogen that can be discharged to the Lamprey River. Reduction of nutrients from other non-point sources (fertilizers, septic systems, and stormwater runoff) throughout the Lamprey River watershed will also help improve the water quality in the Lamprey River. Addressing the causes of this non-point source pollution will take time and a concerted effort by all.

Flows in the main stem Lamprey River have been the subject of intense study by NHDES. Based on data collected and the needs of aquatic organisms, NHDES has created an Instream Flow Management Plan for the Lamprey River that seeks to mimic seasonal natural flow patterns. Active management occurs when flows are below certain rates for specified periods of time. When these thresholds are reached, registered water users are required to cease operations, communities enact voluntary water conservation measures, and NHDES releases a 48 hour "relief pulse" of water from one of two dams in the river's headwaters to ensure that critical life support needs of aquatic organisms are met.

Maintaining clean, abundant water requires vigilance: widespread and frequent monitoring; review of proposed land development; education of landowners; and a readiness to work with local, state, and federal regulators to prevent and address problems as they arise. In addition, the Lamprey River and its tributaries have several known issues, including the following:

- **Septic systems are part of the problem and part of the solution.** Most landowners along the Lamprey River and its tributaries have private septic systems to treat household wastewater, yet outreach has shown that many homeowners do not even know they have a septic system or how it works. Failed and poorly maintained septic systems potentially can result in both excess nutrients and pathogens reaching the river. While septic systems cannot remove all nutrients, septic systems that are well designed, sited, and maintained can play an important role in keeping river water clean. The LRAC was instrumental in developing successful septic system outreach programs that have been replicated regionally.

[1] PREP, State of our Estuaries 2013; http://prep.unh.edu/resources/pdf/2013%20SOOE/SOOE_2013_FA2.pdf

- **The population of the Lamprey River watershed increased by approximately 303% between 1960 and 2000. The amount of new development and impervious surface during that time increased by approximately 310%.**

These trends are expected to continue. More impervious surface means corresponding increases in the amount of road salt, sediment, nutrients, heat, and toxic chemicals that are carried to streams and rivers. The LRAC sponsored a road salt reduction workshop, sought partnerships to install stormwater retrofits, and keeps stream health in mind during all development project reviews.

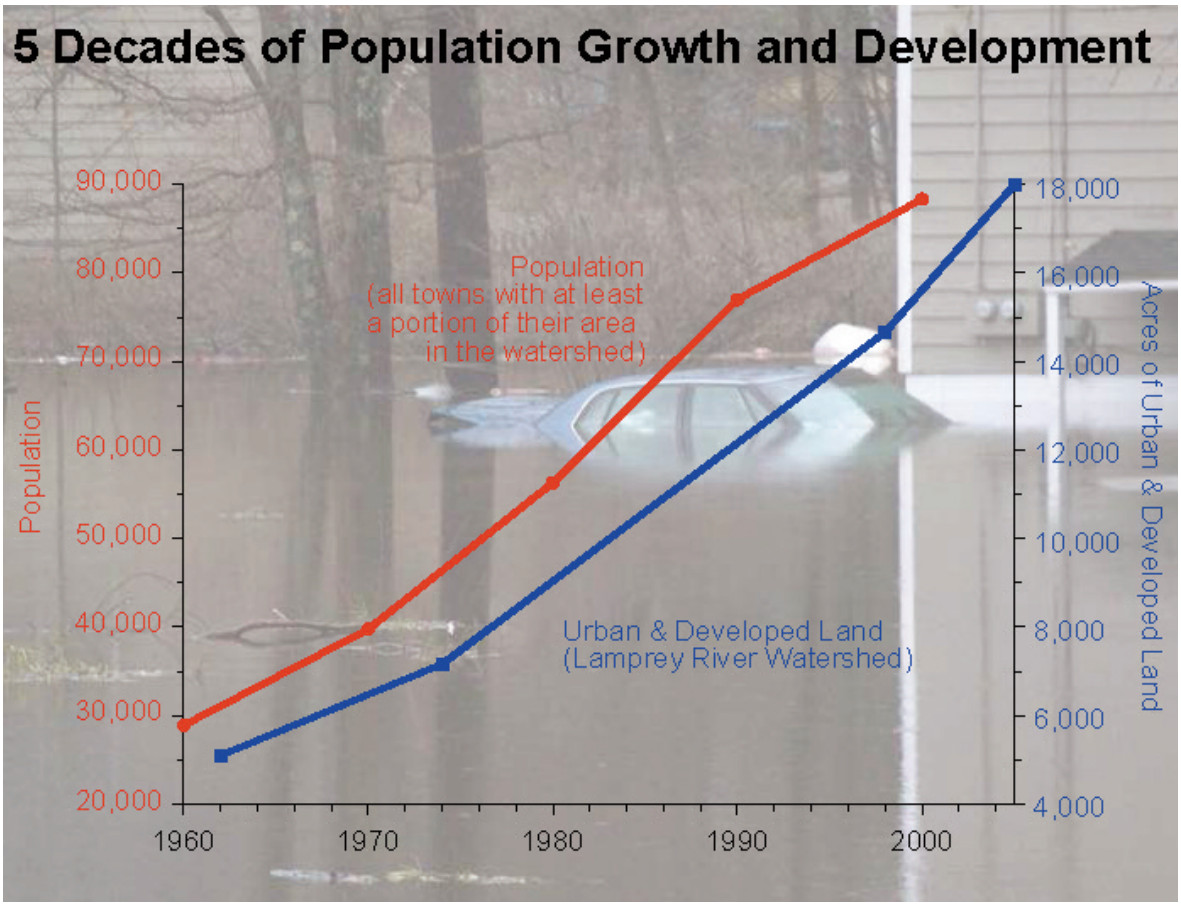


Chart by Cameron Wake, University of New Hampshire
https://www.plymouth.edu/center-for-the-environment/files/2012/02/120323_NHWaterConf_Wake-WakeMappingLegalImplications.pdf

- **An increasing population also increases the demand for water supply.** Many coastal New Hampshire towns are facing a shortage of reliable public water supply for their residential, commercial, industrial, and community needs. Adequate flows to support robust populations of aquatic organisms are also becoming less consistent. The *Lamprey River Instream Flow Management Plan* approved in 2013 affords some protection, but the full effect of these protective measures is not yet known. In the meantime, the LRAC has encouraged towns to diversify public water sources and to include water conservation in town planning.

From the local news…

Attendees from Durham, UNH, LRAC, and NHDES at the grand opening of the new Spruce Hole well in Durham.
Photo courtesy of Durham Friday Updates

Adapted from Durham Friday Updates November 13, 2015

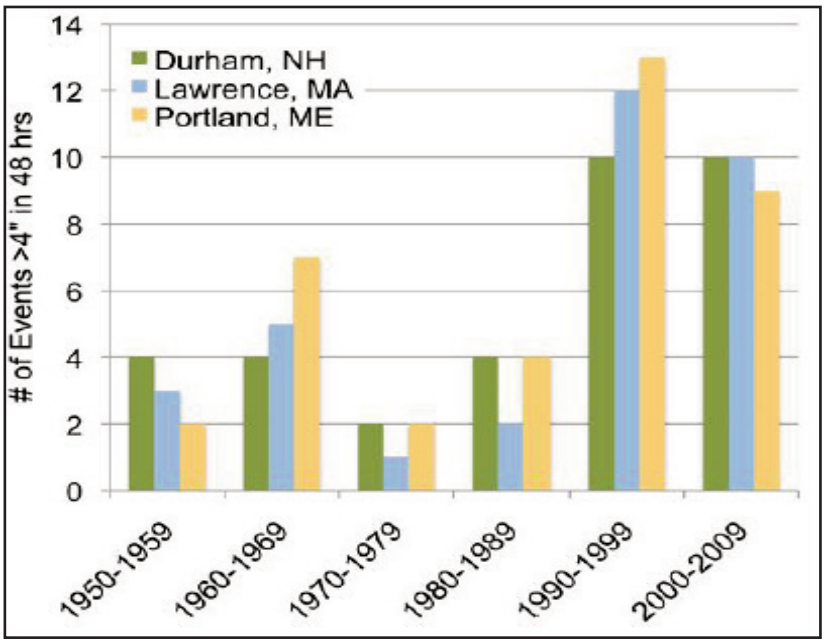
SPRUCE HOLE WELL GRAND OPENING TOOK PLACE TODAY

Durham, State, and University of New Hampshire (UNH) officials held a Spruce Hole Well/Artificial Recharge Basin grand opening event today at the Durham Gravel Pit. The new Spruce Hole Well is a cutting edge project involving artificial recharge of raw water from the Lamprey River during periods of plentiful flow for use by the Durham-UNH Water System during periods of low flow which often coincide with peak water demands during the fall semester at UNH. The project will ensure that Durham and UNH have enough water for the next 75-100 years.

Two artificial recharge basins will be used to enhance the production capacity of the well and to mitigate potential adverse pumping-induced impacts to existing water resources. The Groundwater Discharge Permit approved for the use of the artificial recharge for this project was the first issued in New Hampshire.

- **Streamside vegetated buffers are being lost.** The effects are particularly dangerous and destructive when coupled with the increased number and intensity of extreme storm events. From 1950 to 1989, rain gauges in Durham, New Hampshire registered four or fewer events with greater than 4 inches of rain in 48 hours. Between 1990 and 2009, ten events were recorded each decade.

Extreme Precipitation Events (>4") 1950-2009



www.climatesolutionsne.org/sites/climatesolutionsne.org/files/greatbayreport_online.pdf

Goals

- Ensure that the Lamprey River and its tributaries meet or exceed state and federal water quality standards for the health and enjoyment of all species.
- Maintain continuously a quantity of water in the main stem Lamprey River during all seasons sufficient to support and sustain aquatic habitats and wildlife, while considering the need for agricultural and municipal use.

Key Accomplishments

- Provided financial support for volunteer water quality data collection, enabling uninterrupted data beginning in 1990.
- Created brochures to promote clean water and protect wildlife habitat along riverfront lands.
- Co-sponsored a series of workshops on maintaining vegetated buffers to protect the river.
- Held workshops that educated citizens about the connections between economics and ecological integrity.
- Sponsored septic system outreach, including a pilot on-site program for riverside landowners to understand and improve their septic systems.
- Co-sponsored "Your Water, Your Wallet, Your Watershed" workshop to encourage towns to work across municipal boundaries in addressing water issues.

- Co-sponsored a road salt reduction workshop and DVD entitled “The Road Less Salted” for public and private snow plow drivers.
- Performed a trend analysis to determine whether water quality is improving or worsening over time.
- Reviewed proposed development projects within one quarter mile of the Lamprey River and its state-designated tributaries to assure that water will not be degraded during and after construction.

Key Future Actions

- Continue to study and track chemical and physical water quality parameters in a consistent manner so that towns and other partners can protect the cleanest water and improve degraded water.
  - o Identify what critical data are missing and recommend steps to address the gaps.
  - o Compare data to New Hampshire benchmarks and identify which issues could be improved locally.
- Work with towns to meet water quality standards consistently and improve overall water quality of the rivers.
  - o Work with towns to enact Southeast Watershed Alliance model regulations for stormwater and shoreland and floodplain zoning setbacks.
  - o Encourage municipalities to reduce the amount of salt they apply to town roads. Recommend that town public works departments enroll in classes such as NH SnoPros, UNH Technology Transfer Center, and Road Scholars. Encourage towns to adopt salt application standards for private snow plow drivers as part of commercial and subdivision planning.
  - o Provide towns with information on septic systems that can be distributed to residents as an insert in the town’s annual report.
  - o Assist towns through LRAC’s project review process to assess development proposals relative to their effects on clean, abundant water.
- Work with town residents to protect and improve the water:
  - o Expand outreach efforts to landowners about septic system care and maintenance.
  - o Encourage wide, naturally vegetated buffers and floodplains to minimize erosion and filter run-off.
  - o Encourage residents to minimize or discontinue the use of pesticides and fertilizers.
  - o Formally recognize landowner efforts along the river and elsewhere in the watershed that protect clean water.
- Promote water conservation:
  - o Support town efforts to develop long-range water supply plans and encourage exploration of alternate sources or storage.
  - o Encourage strategies and regulations for low-impact development or retro-fits where soil conditions allow so that water soaks *into* the soil and does not flow across it.

By the Numbers: Water Quality and Flow

Item Description	Count
volunteer monitors participating 2016	14
sampling locations 2016	10
sampling rounds per year	8
years of continuous water quality monitoring	26

Wildlife and Ecology

Blanding's turtle rests by a vernal pool. Photo by Jon Bromley.

Background

The Lamprey River and its tributaries drain a land area of 212 square miles. This is the largest watershed of the Great Bay Estuary, a National Estuarine Research Reserve. Compared to other rivers in the region, the Lamprey River watershed is still relatively intact. This largely forested and relatively undeveloped area supports important floodplain forests, remarkably natural shorelines, extensive shrub and emergent marsh wetlands, and scattered openings and fields among the forested uplands. These terrestrial and aquatic habitats are home to a great diversity of resident and migratory wildlife including significant populations of Blanding's, spotted, and wood turtles, each of which is a species of conservation concern in New Hampshire.

The ecology of the Lamprey, as summarized above, was found by the NPS to represent an "outstandingly remarkable value" worthy of recognition and protection through the National Wild and Scenic Rivers System (1995 *Lamprey Wild and Scenic River Study Draft Report*). In 2011, the NH Rivers Management and Protection Program designated the entire Lamprey River and its five major tributaries into the state's program, citing many of the same values.

The ecological integrity of the river corridor is challenged by several issues: the human population is increasing; the landscape is rapidly being developed resulting in fragmented or degraded habitat; invasive, non-native plant species are becoming more common; fish passage is obstructed by dams and numerous culverts; demand for public water supply is high; stormwater runoff is carrying sediments and nutrients into the rivers; and climate change is exacerbating many of these problems. Monitoring, conserving, and wisely managing diverse natural areas protect habitats that are critical to the indigenous plants and animals they support and provide a cost-effective way to ensure the services they provide to people, such as clean, abundant water, flood control, and quality of life.

Despite these significant challenges, diverse habitats remain and many threatened or endangered species are still present. Determining or estimating exact numbers for most species of animals and plants is difficult, but such information is essential to determine long-term population trends and assess overall ecological integrity. Since the *Lamprey River Resource Assessment* was published in 1994, the LRAC has funded research about freshwater mussels, tributary fish, and dragonflies. No concerns were noted for dragonflies. Studies of tributary fish have shown that most species, including naturally reproducing brook trout, are holding their own; however, the same study found that bridle shiners (New Hampshire species of concern) seem to have been extirpated from an area upstream of the Wild and Scenic section that appears to provide ideal habitat. (http://www.lampreyriver.org/about-river-studies-2) Additional surveys for the most vulnerable species need to be updated.

The freshwater mussel populations found in the Lamprey River are regionally significant; only one other river in New Hampshire supports a greater diversity of species; however, populations of several mussel species have plummeted since baseline studies were conducted by biologists in 1993-1994 and rare mussels are now the species of greatest concern to the LRAC. Recent studies found only older individuals, in very poor condition, and in areas far removed from other individuals. Although the exact cause is unclear, the mussels seem to have succumbed to displacement or burial by sediments transported by three large floods in the last decade, as well as potential acidic conditions that might have led to extremely fragile shells. Eastern eliptio mussels continue to be abundant and well distributed.
www.lampreyriver.org/UploadedFiles/Files/LRAC_Mussel_Report_Redacted_2015.pdf

The State of New Hampshire is actively engaged in surveying and protecting wildlife and habitats. The *New Hampshire Wildlife Action Plan*, most recently updated in 2015, offers guidance for conserving the Species of Greatest Conservation Need and their habitats in New Hampshire. This reference is used extensively by the LRAC in its land protection efforts, setting priorities for research, and informing development project reviews. The New Hampshire Fish and Game Department (NHFGD) recently conducted several Lamprey River studies, including several pertaining to river herring and barriers to fish passage. Trout Unlimited has begun work adding woody material to non-navigable sections of the river in an attempt to improve cold-water fish habitat.

River Profiles

Wildlife and Ecology Surveys

Photo by Ethan Nedeau

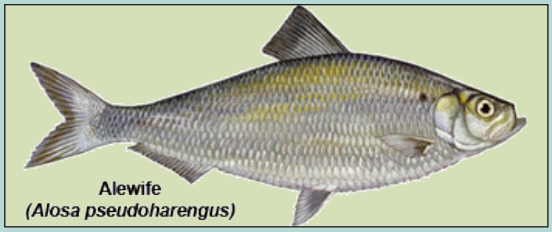
The LRAC Wildlife and Ecology Workgroup leads efforts to monitor and protect the indigenous plants and animals found in the Lamprey River watershed, and works closely with other LRAC workgroups to protect exemplary natural communities, migration corridors, and habitat for species of concern. The Workgroup also conducts periodic wildlife surveys, including long-term monitoring of freshwater mussels which can live more than fifty years and are among the most imperiled species found in the Lamprey River. Long-term studies can detect subtle population trends among these long-lived animals, and reveal valuable information about overall watershed health and ecological integrity.

Field surveys conducted in 1993-1994 found six freshwater mussel species, including the state-endangered brook floater (*Alasmidonta varicosa*), and established a baseline for comparison. Freshwater mussels were resurveyed in 2010-2011 and again in 2014. The good news is that biologists during both follow-up surveys found the same six species reported in the early 1990s as well as one additional species, the alewife floater (*Anodonta implicata*). The scientists also found that eastern elliptio (*Elliptio complanata*) occurredin high densities throughout the watershed. The bad news is that for most other species, biologists found low densities, limited distributions, or minimal/non-existent recruitment of offspring, and experts now are questioning the viability of these populations.

Why certain mussel populations in the Lamprey River are decreasing isn't known; some possibly already were in decline when baseline studies were conducted in the early 1990s. Similar trends are being observed among mussel populations in river systems throughout North America, likely due to diminished water quality, habitat degradation/fragmentation, or the loss of host fish species. It's uncertain whether efforts by the LRAC to conserve riparian lands, improve water quality, and reconnect/ restore critical habitats can create more favorable conditions for freshwater mussels and reverse apparent population trends. However, it is more certain that continuing these efforts will likely help to support the existing mussel populations until the causes of the observed declines are better understood.

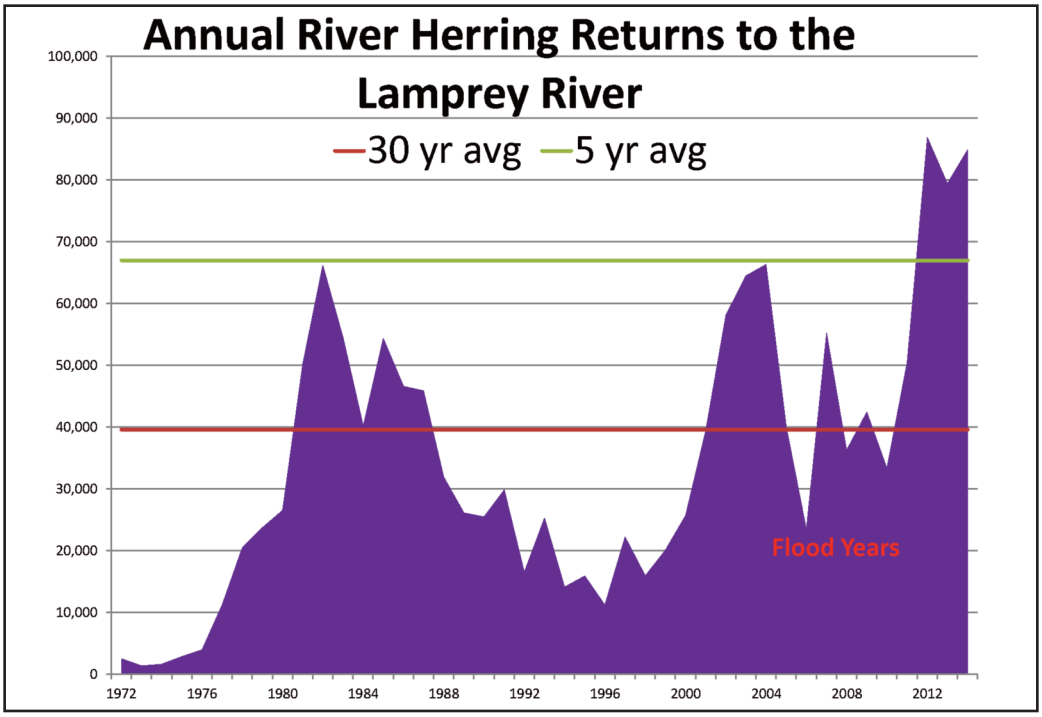
contributed by Jim MacCartney, National Park Service

The Lamprey is New Hampshire's most significant river for anadromous river herring. The abundance of these fish was noted as an outstandingly remarkable value in the Wild and Scenic River designation. River herring continue to thrive and historical spawning habitat was reopened to them with the installation of the Wiswall Dam fish ladder in 2011.



www.greateratlantic.fisheries.noaa.gov

The Lamprey currently has the strongest river herring run among the six rivers that feed Great Bay and currently serves as a source of river herring to rebuild populations in the nearby Merrimack River. The best run so far occurred in 2016 with over 92,000 alewife passing through the Macallen Dam fish ladder. (Runs regionally were low in 2006 due to the inability of river herring to pass fish ladders during high flows caused by a historic flood.)



Graph courtesy of Kevin Sullivan, NH Fish and Game Department

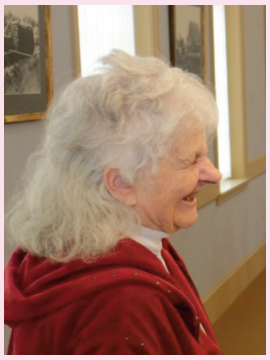
Shad and Atlantic salmon restoration programs were conducted by the New Hampshire Fish and Game Department beginning in the early 1970s (1994 *Lamprey River Resource Assessment*). Restocking efforts using fish eggs from other rivers yielded eight Atlantic salmon passing through the Macallen Dam fish ladder in 1992 and three in 1993. According to Mike Dionne at NHFGD, shad stocking efforts were discontinued in the Lamprey River in 1989 and Atlantic salmon stocking ended in 2003 due to low returns.

Goals

- Work with towns and landowners to expand existing wildlife habitat inventories and conservation plans for the Lamprey River watershed area.
- Protect, restore, and reconnect critical habitat and the ecological functions and resources of the Lamprey River that are important to wildlife and humans.

Key Accomplishments

- Worked with NHFGD and the US Fish and Wildlife Service to advocate for fish passage at the Wiswall Dam in Durham. In 2011, a fish ladder was installed and more than 30,000 river herring were able to travel past the dam and access breeding areas that had been unavailable to them for 200 or more years.
- Worked with partners to test methods for managing invasive Japanese knotweed.
- Worked with the Outreach Workgroup to fund a Small Grant that led to the creation of a lending library of tools to eradicate invasive plants in the Great Bay Estuary drainage area. As of 2016, the original tool inventory has been expanded and has been used on 136 restoration projects. The library is housed at the Great Bay Discovery Center in Greenland, NH.
- Worked with high school students to study vernal pools and produced *Spring into Vernal Pools* DVD to educate the public about these special ecological habitats.
- Offered "Herring Aid" events at the Macallen Dam fish ladder with NHFGD personnel to inform the public about river herring, sea lampreys, and American eels.
- Commissioned the following wildlife or ecological research:
  - *Mussel Survey 2010*
  - *Tributary Fish Survey 2010-2011*
  - *Dragonfly and Damselfly Inventory 2011*
  - *Dams of the Lower Lamprey 2013:* highlighting opportunities to improve fish passage
  - *Rothwell Reserve Bioinventory and Management Plan 2014*
  - *Mussel Survey 2015*



Wildlife biologist Kitty Miller has been with the LRAC since its inception. Her work on the 1994 *Lamprey River Resource Assessment* was essential to the Lamprey's Wild and Scenic designation as well as state designation. Her passion for protecting wildlife and habitats is legendary and unwavering. She has led the Wildlife and Ecology Workgroup for years and also imparts her knowledge on land protection projects and development project reviews.

Photo by Richard H. Lord

Key Future Actions

- Encourage sustained ecological integrity in the watershed.
  - o Support research to discern why bridle shiners are missing from otherwise suitable habitat as identified in Lamprey River Watershed Fish Surveys from 2012.
  - o Seek out and conserve land that increases the degree of connectedness for aquatic organism and wildlife passage within the watershed.
  - o Work with partners to conduct programs that inform riverfront landowners about wildlife needs on their property.
  - o Promote wide riverfront buffers as important to wildlife and water quality.
  - o Work with towns to enact riparian buffer protection regulations.
  - o Help people to understand their connection to nature and wildlife: how to maintain wildlife habitat and how to safeguard soil and clean water.
  - o Protect headwater streams and beaver dams.
- Provide outreach that encourages the public to appreciate the importance of wildlife and ecology.
- Identify projects and funding sources for research and restoration projects.
- Work with partners to create a pocket park near Macallen Dam in Newmarket that includes a kiosk highlighting river herring and ecological issues associated with dams.

By the Numbers: Wildlife and Ecology

Item Description	Count
wildlife surveys or ecological research commissioned	6

Land Protection and Conservation

Future land steward enjoys the floodplain on conserved land in Lee.
Photo by Breakaway Media.

Background

The health and integrity of a river is determined by more than what happens within its riverbanks. Rivers are defined and protected by the land along the river, but also by the land that surrounds small headwater streams, wetlands, and groundwater recharge areas. Protecting the best and/or most sensitive land helps to protect the water and the ecosystems that rely on that water.

Non-binding, voluntary land stewardship practices are helpful, but are not permanent. Often they vary from one landowner to the next. Regulations such as shoreland protection rules often set minimum standards and are subject to modification by town or state governance. Deed restrictions and covenants might seem to protect land, but they are subject to interpretation and amendment, difficult to enforce, and can be changed (with concurrence of the person who first imposed the restriction).

The most effective long-term strategy for protecting the water and ecological integrity of rivers is voluntary land protection, either through a conservation easement with landowners or land acquisition by a municipality, conservation group, or agency. A conservation easement is a legal agreement between a landowner and a conservation organization or agency in the form of a deed that permanently protects the land from development. Conservation easements are granted in perpetuity and apply to the land regardless of who might own it in the future. Land under easement often remains

privately owned and managed. Typically, such land is used for agriculture, forestry, wildlife habitat, watershed protection, recreation, and education. The landowner may continue to live on and use the land as long as the terms of the easement are not violated. One of the key strengths of conservation easements is that the land trust, municipality, or agency that holds the easement is obligated to monitor the land annually and seek enforcement of its terms if necessary.

The LRAC's Land Protection Workgroup seeks to prioritize, preserve, and connect important riverfront properties that support the resources for which the river was designated, notably ecological, historical, and anadromous fishery protection. Highest priority is given to properties that include exemplary natural communities, species of concern, natural corridors that provide essential cover for animal movement across the landscape, archaeological resources, or opportunities for access to the river for recreation. The Workgroup collaborates with willing landowners to permanently protect these priority properties through donation of land, fee simple purchase, or acquisition of conservation easements.

Funding from the NPS or funds that the LRAC receives from other sources can be conveyed to land trusts and local communities for land acquisition. The LRAC seeks to match or leverage these funds with those of other conservation groups, town conservation commissions, state grants, federal programs, foundations, offsets paid by developers, and private donations of land or money. Combining funding from multiple sources helps to further the collective conservation goals of communities, landowners, and conservation partners.

The Act of Congress (PL 104-333) designating the Lamprey River as Wild and Scenic prohibits federal acquisition of lands by condemnation and limits acquisition to donation or with the consent of the owner. Criteria in the 1995 *Lamprey River Management Plan* (page 39) further guide land use management and land acquisition: NPS will not own or manage and lands along the river and there is no authority for NPS to manage, regulate, zone, or otherwise restrict the use of nonfederal lands. In addition, federal funds intended for land protection are subject to the following conditions:

- The acquisition is from willing sellers only.
- Local municipal authorities approve the acquisition.
- An appropriate local, state, or nonprofit entity, and not the National Park Service, holds the title and management responsibility for any purchased land or easements.

The LRAC's guidelines for land protection projects prioritize properties through a 3-tiered approach that considers frontage on the river, significant acreage, key natural features, proximity to other conserved areas, wildlife habitat, and other ecological values (Appendix B for the Land Protection Priority Ranking Sheets).

The highest ranked properties are those with important river-related resources and significant frontage along the main stem of the Lamprey River. Parcels with frontage of tributaries or located within a quarter mile of the main stem may also be considered.

In addition to fee simple purchase or purchase of a conservation easement, helping landowners understand the ecological value of their land and encouraging best management practices for conserving it are priorities. Recognition of the positive efforts of landowners should be a part of any land conservation program.

Goals

- Protect lands that support the ecological health and recreational uses of the Lamprey River and its surrounding landscape.
- Continue to work with landowners and municipalities to foster interest and action in permanent conservation of lands associated with the rivers.

River Profiles

Over the ten years I have actively worked in land protection for the Town of Lee and the Lamprey River Advisory Committee, the dominant theme of the process has been partnership. Some projects are relatively simple, such as the donation of a conservation easement or property by a single generous landowner to a single land trust organization. There can also be the complexity of a single project that encompasses multiple properties, landowners, land trusts, state agencies, and all the accompanying transaction personnel (banks, lawyers, surveyors, and appraisers).

The most important partnership in land protection work is with the landowner. It is a daunting task for a farmer or forester to commit to a permanent legal restriction over family land. For some people, a conservation easement can be a logical decision for a life spent in active environmental conservation. For other projects, the decision is much more difficult: are the owners ready to trust the legal system, town, state, or federal government to understand how to wisely manage the farm to which they have devoted their lives? Positive, trustworthy relationships are important at every stage. The bottom line for the success of these projects is that all the entities involved are working cooperatively toward the common goal of protecting the forests, fields, and rivers of our neighborhood for the long term benefit of our future generations. I am proud to have played a role in helping LRAC with 21 projects that protected almost 900 acres.

contributed by Laurel Cox, LRAC land protection administrator

LRAC Partners in Land Protection

Center for Land Conservation Assistance
Great Bay Resource Protection Partnership
Land and Water Conservation Fund
landowner donations
National Park Service
Natural Resources Conservation Service
The Nature Conservancy
New England Grassroots Environmental Fund
New Hampshire Cooperative Extension Service
New Hampshire Department of Environmental Services
New Hampshire Division of Historical Resources
New Hampshire Fish and Game Department
New Hampshire Estuaries Project
New Hampshire Land and Community Heritage Investment Program
Piscataqua Region Estuaries Partnership
private donations
Society for the Protection of New Hampshire Forests
Southeast Land Trust of New Hampshire
Strafford County Conservation District
Strafford Regional Planning Commission
Strafford Rivers Conservancy
Town of Durham
Town of Epping
Town of Lee

Accomplishments

- As of October 2016, LRAC had invested funding totaling $4,915,781 to protect 3,497.09 acres and 15.9 miles of river frontage. For every dollar LRAC provided, more than two dollars from other sources such as landowner donations of land value and matching funds from towns and conservation organizations were used. (See Appendix A: Conserved Land along Wild and Scenic Lamprey River)
- The LRAC presented stewardship workshops and provided notebooks detailing land conservation practices in partnership with the Strafford Regional Planning Commission.

Key Future Actions

- Identify individual properties that are located in areas identified by the State of New Hampshire as high priorities for permanent protection. Inform landowners about their property's special features that make them priorities for permanent protection. Inform them of conservation options and offer support with the process of protecting their land.

- Continue to support research on the resources of the Lamprey River, its tributaries, and their corridors to identify additional key lands to protect. This includes inventories of rare wildlife and plants, important agricultural soils, sensitive or otherwise important habitats, and recreation and cultural assets. Other topics to study include how climate change could impact river flow dynamics or the degree to which wildlife can connect with the critical resources they need while identifying the barriers that prevent these animals from reaching these resources.
- Seek out funding opportunities and partnerships that support permanent land protection efforts in the landscape of all the Lamprey River and its tributaries.
- Support broad outreach programs that foster stewardship of private lands by landowners and seek ways to reward those who are good stewards.

Sample of LRAC's Land Protection

Mast Road Natural Area, Epping, NH Photo courtesy of Southeast Land Trust

Excerpted and adapted from http://seltnh.org/gallery/mast-road-forest/

The Southeast Land Trust acquired over 525 acres of forestland and wetlands along the federally-designated Wild and Scenic Lamprey River in early 2011. These lands, subject to a conservation easement held by the Natural Resources Conservation Service (NRCS), represent the Land Trust's second largest ownership and the culmination of over two years of work.

Located in Epping, the land falls within a conservation focus area identified in 2005 by the Southeast Land Trust as a top priority for our work. The property represents the highest co-occurrence of natural resource values within the area, with significant wetland resources, including more than 350 acres of diverse wetlands that include streams, extensive vernal pools, red maple floodplain forest, black gum basin swamp, pitch pine-heath swamp, and over 3,200 feet of frontage on the Lamprey River. In addition, the acquisition includes over 150 acres of upland hemlock-hardwood-pine forest.

The property, previously owned by NH Public Golf Courses, Inc. was considered at one time as a potential site for an extensive golf course and related residential and commercial development. However, its location on the Lamprey River and proximity to thousands of acres of conservation land in Epping, Exeter, and Newfields conserved by the Great Bay Resource Protection Partnership, made its protection a top priority for local, regional, and state conservation organizations. Its protection will help connect a vast corridor of conservation land stretching to the Piscassic Ice Pond in Newfields. Where the soils and site conditions are appropriate, public access opportunities will be provided for passive outdoor recreation including hiking, skiing, fishing, and hunting.

"Because of the many public benefits, this land was a conservation priority both regionally and statewide," notes David Viale, land protection and stewardship specialist with the Land Trust. "Conserving this land will help protect the water quality of the Lamprey River, preserve critical wildlife habitat, and ensure that large blocks of open space will remain undeveloped and available for passive recreation and enjoyment by the public."

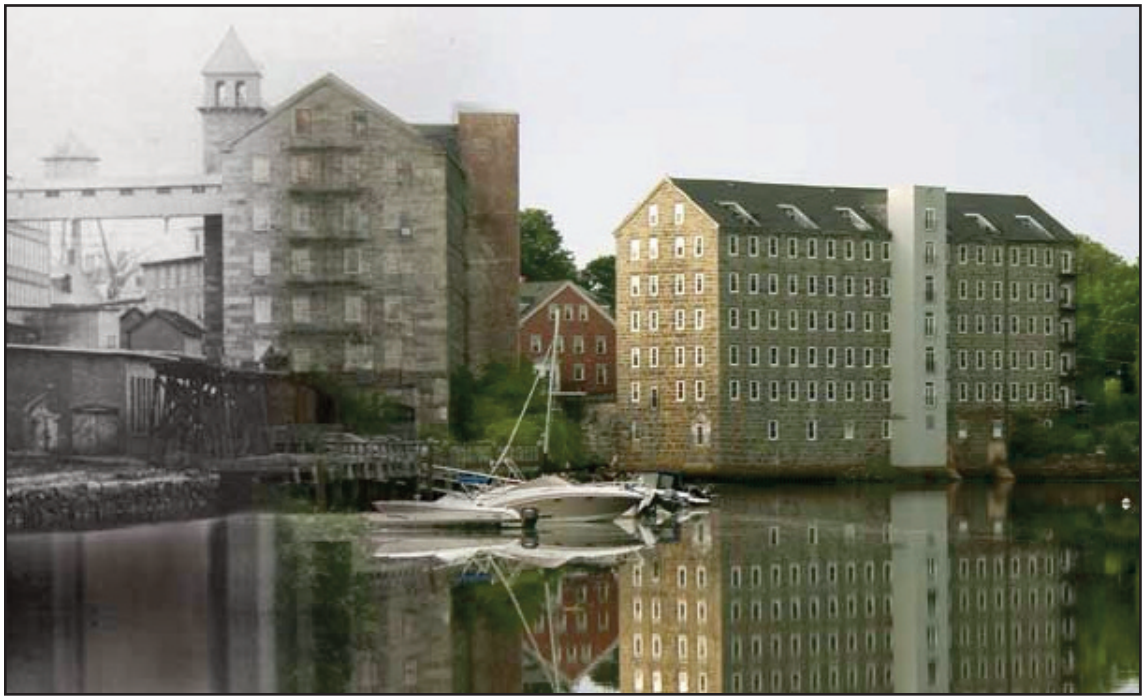
LRAC had long sought the protection of the NH Public Golf Course property, and agreed to provide key funding to match the WRP application and to support the long-term management of the property.

"This new property will continue to be a focus of the Land Trust for several years, as we work to restore the property's wetlands and reverse damage done by unauthorized users," explains Viale. Illegal off-road vehicle use has created new trails, rutted wetlands, and damaged sensitive habitat. In addition, Birch Road, an unmaintained dirt road in Epping, has been illegally widened onto the property by users, beyond the road right of way. The Land Trust will be working with the Town and NRCS to block illegal access points, retire inappropriate trails and woods roads, and restore wetlands functions to the property.

By the Numbers: Land Protection

Item Description	Count
dollars invested	$4,915,781
dollars leveraged	$15,880,067
leveraging ratio	>2:1
funding partners	>60
acres conserved	3,497.09
miles of riverfront land protected	15.9
stewardship workshops held	1

History and Archaeology



Newmarket Mills, from past to present *Photo courtesy of JoAnne Trahan*

Background

People have long recognized the valuable resources that the Lamprey River and its tributaries provide. Early native peoples left evidence of a campsite in Lee that University of New Hampshire archaeologists can date back at least 8,000 years. European settlers were drawn to the rivers as an energy source and they built mills there as early as the 1660s. Over the years, more than 100 mills processed timber, grain, cloth, paper, wallpaper, leather, shoes, and agricultural tools to supply local and regional needs. The largest mill on the Lamprey River was the Newmarket (textile) Manufacturing Company founded in 1822. River valleys supplied brickyards with extensive deposits of glacio-marine clays that were left following the retreat of the Laurentide Ice Sheet about 14,000 years ago. Epping still sits atop a vast deposit of such clay.

The historic resources of the Lamprey River were recognized by both the State of New Hampshire and the US Congress as reasons for designating the Lamprey River for protection. The NPS's *Lamprey Wild and Scenic River Study Draft Report* (1995) cited the "outstandingly remarkable" archaeological resources of the Lamprey River, thus warranting protection through the Wild and Scenic River designation. The *Lamprey River Resource Assessment* (1994) lists more than thirty historical sites, including two (Wiswall Dam area and the mill district of Newmarket) that are on the *National Register of Historic Places*. Other sites include hotels, camps, bridges, railroads, churches, and homesteads as indicated on maps and in several historical publications.

River Profiles

Photo by Dick Lord

"When I was in high school, I hated history," says Dick Lord, History Workgroup chair. Almost six decades later, Dick is very much involved in bringing local history to life. Among these efforts, he led a series of highly successful projects that brought the Federal Emergency Management Agency, the Natural Resource Conservation Service, the New Hampshire Division of Historic Resources, the Durham Historic Association, Durham officials, and community members together to create a four-panel kiosk that tells the story of Wiswall Falls — once the economic center of Durham, New Hampshire.

In the 1860s, Thomas Wiswall and fifteen employees used Lamprey River waterpower to make paper –-a ton of it each day-- for the thriving wallpaper industry. Two of the kiosk panels describe the mills, the community around them and the history of waterpower along the Lamprey River. A third panel describes efforts to preserve historic mill foundations during the repair of the dam and construction of the new fish ladder, which re-opened a significant portion of the river to river herring migration. The fourth panel dedicates the park to the late John Hatch, avid conservationist and founding member of the two groups that protect the Lamprey River: the Lamprey River Watershed Association and the Lamprey River Advisory Committee.

Hatch Park is one of several locations where the LRAC has been able to present the public with site-specific historic information. Additionally, Dick has ensured that historic research and education are woven throughout the fabric of the LRAC's efforts. With more than 36 years of involvement in the Lamprey River groups, Dick himself is becoming a part of the river's history.

Understanding the cultural history of the rivers can help landowners, newcomers, and the general public to develop an appreciation of the rivers. Exposure to river-related history can enhance a sense of place among local residents. Although many river resources have not changed significantly over time, the focus of *human use* has diversified over the years. Recognition of the historic uses is needed if people are to assist in protecting the rivers, especially as newcomers settle in the communities along the river.

Goals

Help local citizens understand the historic importance of the rivers in this region and encourage a deeper appreciation of their own sense of place in the on-going history of the rivers.

Key Accomplishments

- *River Story: The History of the Lamprey River Through Time* VHS (1997) and DVD (2009)
- *The Lamprey River Curriculum* (1990), social studies and science for elementary school children, updated and expanded in 2011 to include middle and high school students
- *The Story of Peter Little Bear* (2005), based on local history in the late 1600s
- *Explore the Lamprey River* map and guide (2008), including highlights of history in the lower four towns
- history kiosk at Mary Blair Park in Epping (2008)
- *The Lamprey River Tour: Mary Blair Park* DVD (2009), documenting both the history and present at Epping's Mary Blair Park
- more than 100 dams and mill sites in the Lamprey River watershed area documented and mapped as part of a Small Grant (2009)
- *Wiswall's Mill: A Short History* DVD (2010), documenting the history at Wiswall Falls in Durham
- four historic panels at the Wiswall Falls kiosk completed and installed
- Schanda Park kiosk panel in Newmarket designed and installed (2011)
- historic trail at Mary Blair Park featuring Folsom Mills in Epping completed as part of a Small Grant (2012)
- Hike it, Bike It, Like It (2013-), offers participants opportunities to learn about local history and nature through outdoor recreational activities
- Phase I archaeological assessment of Sullivan's Falls mill site in Durham (2016)
- *Chick and Dee-Dee's Lamprey River Adventure* storybook highlighting historical sites along the river (2016)

Key Future Actions

- Work with historical societies to map historic sites in the middle and upper watershed as part of a passive recreation map.
- Partner with historical committees to help local citizens understand and appreciate the importance of the rivers in human history of the region.
- Identify and encourage protection of historic and archaeological resources on a site-specific basis, using methods such as signage, barriers, or easements.
- Engage local residents in discovering local history to help promote a "sense of place."
- Seek funding for professional research on the archaeology and history of the rivers. Report findings on the website and in appropriate media, presentations, etc..

By the Numbers: History and Archaeology

Item Description	Count
Lamprey River Through Time VHS/DVD distributed/viewed on line	>50/>600
students participating in the *Lamprey River Curriculum*	~ 960
Peter Little Bear history story book distributed	~900
Lamprey River Tour: Mary Blair Park DVDs distributed/viewed on-line	>30/600
dam and mill sites documented and mapped	>100
historic kiosks created	3
Phase I archaeological assessments completed	1
Wiswall's Mills DVD distributed/viewed on-line	>30/>190
Chick and DeeDee history storybooks distributed	60

Recreation and Public Enjoyment

Visitors have a dog-gone good time on the river. Photo by Breakaway Media.

Background

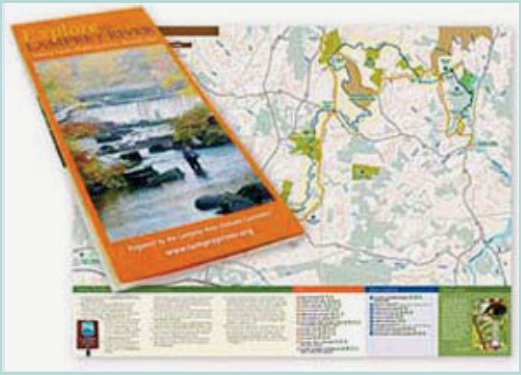
Because water is so essential to our survival, emotional well-being, and sense of beauty, people have a natural affinity for water; they seek to be near it and enjoy activities associated with it. These activities include walking, bird-watching, picnics, photography, fishing, boating, and swimming. When people can enjoy the natural and cultural assets of a river and its corridor, they form a connection to the river and are inspired to protect it. Long-term enjoyment of rivers is dependent on being able to access the rivers and enjoy them appropriately through low-impact activities. The recreational resources along the Lamprey River and its tributaries were recognized by the State of New Hampshire in designating the rivers into the Rivers Management and Protection Program. The importance of these resources was also recognized by their inclusion in the 1995 *Lamprey River Management Plan* created during the Lamprey River Wild and Scenic Study.

Goal

Improve and increase appropriate, non-motorized opportunities for public enjoyment along and in the Lamprey River and its state-designated tributaries (Little, North, North Branch, Pawtuckaway, and Piscassic rivers).

Kevin Martin next to a
(NH Big Tree Program)
champion black gum
he discovered while exploring
the Lamprey River

Photo by S. Petersen



River Profiles

Explore the Lamprey River map and tour guide was an accomplishment that I am most proud of in the more than 15 years that I served with the LRAC. We had worked hard to protect open land along the river and I thought it was important that people see and appreciate the newly conserved properties and other landmarks on the Lamprey. As chair of the Recreation Workgroup, I pushed the idea of a tour guide that directed people to important sites in the Wild and Scenic towns.

Others on the workgroup took up the challenge and we worked together to bring this to reality. Residents in the towns were consulted about the best sites for the public, pictures were chosen, and the LRAC Recreation Workgroup members wrote up descriptions of their towns and the sites in them. After much hard work with a graphic designer, the guide was edited, designed and printed with an online version included for the LRAC website.

Explore the Lamprey River map and tour guide brings people to special places along the river for hiking trails, paddling access, and historic sites and helps them appreciate this National Wild and Scenic River almost as much as I do.

Kevin Martin,
former LRAC representative and chair

Key Accomplishments

- Created the popular *Explore the Lamprey River* map and guide for passive, river-based recreational opportunities in the Wild and Scenic River towns of Epping, Lee, Durham, and Newmarket.
- Provided a Small Grant to the Town of Deerfield to develop the Deerfield Community Trail network and map, now widely used.
- Purchased land in Lee, gave it to the town, and constructed a launch for non-motorized boats with signage on Highway 152 near Wadleigh Falls.
- Partnered with town recreation departments and the Lamprey River Watershed Association to offer family fun days and paddling trips.
- Provided a Small Grant for the *Lamprey River Big Tree Tour*.
- Investigated the feasibility of creating a foot path along the Wild and Scenic segment of the river.
- Investigated the feasibility of improving canoe passage through selective relocation of large woody obstacles.
- Partnered with the Town of Raymond to install signage for a nature trail.
- Partnered with the Town of Newmarket to design a kiosk and install kayak racks at two river sites for town-owned kayaks.
- Partnered with the Newmarket Recreation Department to establish the annual "Lamprey River Splash and Dash" kayak race and boat parade.

Key Future Actions

- Identify grants that help towns improve their river-based recreational areas.
- Work with towns and landowners to incorporate access for a footpath that roughly parallels the Lamprey River along the Wild and scenic section based on findings from the 2015 feasibility study.
- Expand and enhance plans for recreation and public enjoyment activities that include the entire Lamprey River and its five designated tributaries.
- Expand recreational opportunities for people with handicaps.
- Create a recreational tour map and guide to include the towns along the middle and upper Lamprey River and the tributaries.
- Work with partners (including town recreation, conservation, and historical committees) to support events with river activities at riverside parks each year.
- Advocate for appropriate, ecologically sound use of river recreational resources, including canoe passage around or through downed trees.

(L-R) Dick Lord, Preston Samuel, Kevin Martin, Jake Poirier
Photo by Dick Lord

Sign of the Times

Nov. 2014

Travelers on Route 152 near Wadleigh Falls will notice a new sign marking Lee's only public canoe access. The site and ramp, donated to the Town of Lee by the LRAC, has been open since 2011. LRAC representatives Dick Lord, Preston Samuel, and Sharon Meeker led the effort to create the sign. Kevin Martin designed and built the framework. UNH student Jake Poirier helped with the installation. All costs were generously covered by the LRAC. Although winter is not paddling season, the sign will be a strong reminder that the river is ours to enjoy and protect.

By the Numbers: Recreation and Public Enjoyment

Item Description	Count
Explore the Lamprey River Map and Guide distributed	~ 3000
miles of Deerfield Community Trail investigated or mapped	20
river access sites acquired, developed or improved	3
family fun days, paddling trips or activities offered per year	> 2
passive recreation grants awarded	2

Project Review

Plans being reviewed by committee representatives Jen Rowden, Sharon Meeker, Dick Snow, Preston Samuel, and Todd Piskovitz Photo by S. Petersen.

Background

According to NH RSA 483:8-a iii b, local river advisory committees shall have the opportunity and responsibility to consider and comment on any federal, state, or local governmental plans to approve, license, fund, or construct facilities that would alter the resources and characteristics for which the river or segment is designated in the NH Rivers Management and Protection Program. This jurisdiction covers the quarter mile corridor on both sides of a state-designated river. The LRAC is responsible for reviewing projects along the Lamprey, Little, North, North Branch, Pawtuckaway, and Piscassic rivers. Similarly, the Wild and Scenic Subcommittee is advisory to the NPS relative to the National Wild and Scenic River designation, with a goal of protecting and enhancing the designated river segment (covering the main stem Lamprey River from the site of the former Bunker Pond Dam in West Epping to the confluence of the Piscassic River in Newmarket) where federal permits or projects are concerned. The LRAC is "the local voice of the river" in these processes, with state and federal legislative charters to back that voice and ensure that it is heard. Comments generated by the LRAC are advisory and are considered by the New Hampshire Department of Environmental Services (NHDES) and the NPS; however, the LRAC does not have the authority to grant or deny permits.

In addition to review of proposed projects, NH RSA 483 also directs the Committee to advise the NHDES commissioner on matters that pertain to the management of state-designated rivers. In this capacity, the LRAC makes advisory comments to NHDES and others concerning proposed changes to legislation (e.g., land protection funding by towns and town conservation commissions, shoreland protection, and change-of-use tax revenue) or issues of concern that might impact the rivers.

In order to perform this important advisory duty, the Project Review Workgroup is comprised of members who have a variety of backgrounds and skills. When possible, a representative from the town in which the project is proposed contributes to the review. The members look at local and state regulations and best management practices that pertain to riverside buffers, stormwater management, construction practices, and post-construction operation and maintenance plans. Special attention is given to rare or threatened wildlife species or habitats, steep slopes, public access, public water supply areas, changes to infiltration into the soil, and cultural/historic features.

Goals

Ensure that river protection goals are adequately considered during project review at local, state, and federal levels. The Workgroup strives to review development projects of all sorts with an eye toward making each project a compromise among interests: local government, business, conservation, recreation, agriculture, and riparian landowners.

Accomplishments

The LRAC began reviewing and commenting on projects in 1990 when Durham and Lee were first designated into the NH Rivers Management and Protection Program. Later, Newmarket and Epping projects were added when the Wild and Scenic Rivers designation occurred. In 2011, the rest of the main stem Lamprey River and five tributaries (Little, North, North Branch, Pawtuckaway, and Piscassic) were added. The following are some of the projects that the committee has reviewed:

- a major golf course proposed for 2.5 miles of riverfront in Durham (Comments focused on protection of a riparian buffer, minimizing wetland and floodplain degradation, and water quality monitoring. Proposal was withdrawn.)
- a potential hydroelectric facility in Newmarket (Proposal was withdrawn.)
- improvements to Packer's Falls Bridge (Wild and Scenic LRAC contributed $15,000 towards the bridge reconstruction which replaced massive concrete railings with metal railings that allow views of the river and increase safety.)
- Wiswall Dam fish passage (Comments helped to prevent turtles from becoming entrapped in the fish ladder.)
- the Lamprey River water transmission main line (Resulted in a Clean Water Act, Section 401 permit to allow the Town of Durham increased municipal water usage while protecting Lamprey River habitat and flows.)
- a system for monitoring and controlling boat speeds on the lower Lamprey River

- reconstruction of the Route 87 bridge in Epping (Comments resulted in NH Department of Transportation's hiring of a soil bioengineering firm to design state-of-the-art stream bank stabilization, a wildlife underpass, and access improvements. The site was also put under a floodplain conservation easement.)
- Durham's proposed shoreland and wetland ordinances
- a large Epping subdivision (LRAC and the NPS brought local, state and federal reviewers together to re-design the project in an "open space" design. Led to adoption of Epping's Open Space Subdivision ordinance.)
- expansion of parking lot at the Walmart Distribution Center in Raymond (Comments focused on situating additional pavement away from wetlands.)
- revisions to the New Hampshire Shoreland Water Quality Protection Act
- upgrades to electric transmission lines
- Lamprey River Instream Flow Management Plan
- Northern Pass Electric Transmission Project (Line running from Quebec to NH-Massachusetts border, comments focused on requiring the proponent to install gates to prevent ATVs from accessing wetland areas along the entire corridor.)
- commercial subdivision in Epping (Comments focused on not degrading exceptional turtle breeding area.)

River Profiles

Beginning in 1823, a large complex of textile mills was constructed at the "first falls" of the Lamprey River in Newmarket. The Newmarket Manufacturing Company soon outgrew the river's natural ability to power the mills through the summer's dry months, so several dams, including the Mendum's Pond Dam, were constructed at various locations in the drainage basin to store spring runoff. Water was later released to keep the flow at the first falls at a steady rate throughout the year.

In the summer of 2015, the New Hampshire Department of Environmental Services, which now owns the Mendum's Pond Dam, determined a need to upgrade it to meet current safety standards. Under state law, our Projects Review Workgroup had the responsibility "to consider and comment on any federal, state, or local governmental plans to approve, license, fund or construct facilities that would alter the resource values and characteristics for which the river or segment is designated." Under this authority, we were able to advise the engineering team of impacts to natural resources as well as the historical significance of the dam. Our recommendations, which were accepted by the designers, included

1) photo-documenting the original features of the dam and filing the photographs at the New Hampshire Historical Museum in Concord,
2) modifying the design of a proposed downstream earthen buttress to leave the very top of the original dam's stone containment wall exposed, and
3) placing a historic marker describing the significance of the dam and Mendum's Pond in the greater story of the Newmarket Manufacturing Company.

submitted by Preston Samuel, Project Review Workgroup chair

Key Future Actions

- Review and comment on local, state, and federal permits and projects within LRAC's jurisdiction that have the potential to affect the quality and quantity of water, stream flow, ecology, and other river resources.
- Continue to improve the communications process among the towns, state, federal agencies, and LRAC to provide for timely notification of permit applications for local projects.
  - o Send annual reminders to town managers and zoning boards that permits for the quarter mile corridors are required to be reviewed by LRAC.
  - o Track how comments were used by applicants, towns, and NHDES.
- Participate when possible in preliminary project design meetings, studies, and similar processes that could help streamline and optimize planning for beneficial actions, projects, or permits related to the river and its resources. Communicating about projects early in the planning process can help to reduce conflict later in the process.
- Expand review responsibilities of the workgroup to include proposed legislation affecting the rivers or create a separate workgroup to perform this function.

By the Numbers: Project Review

Item Description	Count
major projects reviewed	10
average number of projects reviewed per year	16

Outreach and Education

What can dragonflies teach us about the river? Photo by RC Grimsley.

Background

For over 20 years, the LRAC has tried to "speak for the Lamprey River and its tributaries" and has created brochures, press releases, videos, public displays, a website, books, educational curricula, and guides for teachers. The LRAC representatives have presented programs to the public and provided testimony to support legislation that protects the Lamprey River and its watershed.

Education and outreach activities are viewed as vital underpinnings of resource conservation. The LRAC's efforts seek to engage the public in appreciating and protecting the river-related resources: clean, abundant water, wildlife, scenic beauty, historic and archaeological features, and recreation. These resources depend on an informed and appreciative public.

Goal

Engage people of all ages to appreciate and protect the resources and services provided by the Lamprey River and its tributaries and the surrounding landscape using a variety of educational media and experiences.

River Profiles

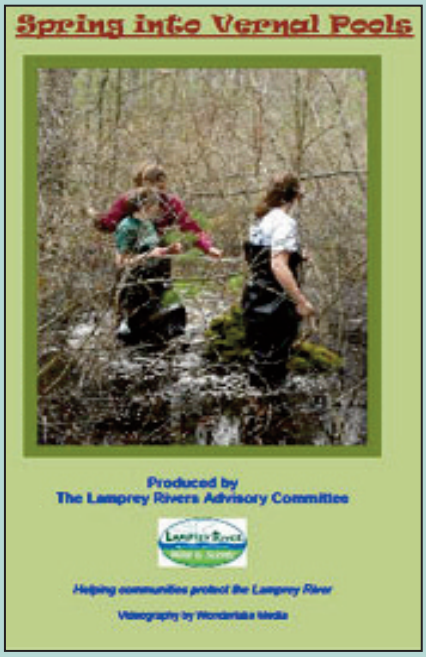
Photo by Southeast Land Trust

How can educators excite children and other teachers to learn more about the natural environment and how people have always used it to advance their culture? I have always believed that an effective way is to provide a framework that includes exploring that environment through in-class study buoyed up by guided local field experiences. Elementary school teachers often receive only one course in science education and very little in terms of local history. I wanted to experiment with the idea that the local environment and history of development could act as a "living laboratory" for study of a watershed.

Back in 2000, I secured a grant and found two fourth grade teachers who were willing to develop a curriculum for that grade level. Debbie McNelly and Doug Hoff used their expertise as teachers to develop 7 mini-units that explored local history and water quality monitoring of the Lamprey River. Members of the Lamprey River Advisory Committee shared their knowledge of local history and geography and guided teachers and students in learning river water sampling techniques using simple equipment. Students were encouraged to do research on chiefs of the local Native American tribes, settlers who came to New Hampshire mainly to reap the economic benefits derived from the natural resources, local people who built mills and factories, and other notables. The teachers encouraged the children to make drawings of individuals and inventions, posters urging protection of the river, and poetry. Many were printed as examples in the curriculum. A video on the history of the watershed was also an integral part of the curriculum. A field trip was the crowning activity. By the end of the field trip, children, parents and teachers were becoming interested in further exploration of the Lamprey River watershed.

Sixteen years and a few revisions later, it is still exciting to me to welcome children, parents and teachers each year to discover their "sense of place" along the Lamprey. Participants leave my history walk with an appreciation of the "gifts" of the Lamprey River's natural resources, such as rushing water used for power and wood and clay for building a new nation. They also better understand the legacy of Native Americans, colonists, and more recent residents who made the watershed what it is today.

Sharon Meeker, Outreach and Education Workgroup chair



vernal pool DVD

Oyster River High School
vernal pool scientists.
Photo by Jon Bromley

Key Accomplishments

- Developed (1990) and updated (2012) The *Lamprey River Curriculum* for elementary, middle and high school students. Actively assisted schools with field trips.
- Published the *Lamprey River Watershed Guide* as a means to introduce the river to the public and encourage a "Tread Lightly" ethic. (1990)
- Worked with community members to write and publish *The Story of Peter Little Bear, A Lamprey River Adventure* (2004), a story that describes life along the Lamprey in the late 1600s through the eyes of an Abenaki boy. It can be used to supplement the curriculum or as a stand-alone book.
- Produced seven professional-quality videos and made them available to local libraries and town cable channels, the LRAC website, and You Tube:
- *River Story: The Lamprey River Through History* Part 1, 2, and 3
  - o *Streamwalk*
  - o *Wiswall's Mills: A Short History* Part 1 and Part 2
  - o *The Lamprey River Tour: Mary Blair Park*
  - o *Spring into Vernal Pools*
  - o *Connecting Lives on the Lamprey* Part 1 and Part 2
  - o *Reflections on a River*
- Created, updated, and continue to maintain **www.lampreyriver.org**.
- Partnered with regional planning commissions, land trusts, and other organizations to provide documents and workshops promoting stewardship, land protection, sport fishing, and public enjoyment.

- Contracted a specialist to bolster education and outreach efforts.
- Partnered with New Hampshire Fish and Game Department to host “Herring Aid” events during the spring run.
- Published *Chick and Dee Dee’s Lamprey River Adventure* to introduce children and their families to the river’s history and ecology.
- Sponsored “Hike It, Bike It, Like It” recreational series to engage residents about history and ecology of the river.
- Partnered with towns to create and install five informational kiosks at riverside areas.
- Developed a Lamprey Rivers Junior Ranger program and guide book.
- Created a Small Grants Program that provides seed money for education and outreach projects that help implement management plan objectives:

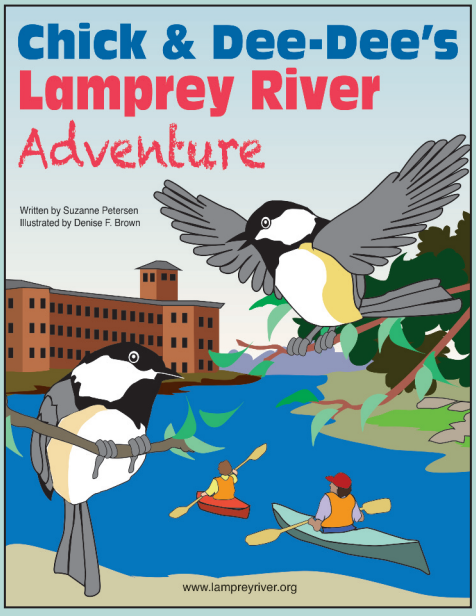
year	Small Grant title or goal
2009	Conservation Outreach to Landowners Wiswall’s Mill: A Short History DVD Mary Blair Park and Streamwalk DVDs Mapping of Historic Mills
2010	Nitrogen Pollution Outreach and Making Rain Barrels Library of Invasive Weed Removal Tools Deerfield Community Trails Development
2011	Pilot Project for On-site Septic System Outreach Connecting Lives on the Lamprey River DVD Revision of The Lamprey River Curriculum
2012	Identifying Dams to Improve Fish Passage Planning for Mary Blair Park History Trail Planning for Mary Blair Park Natural Playground
2013	The Lamprey River Big Tree Tour Brochure “Stream of Conscience” Art Installation Reflections on a River DVD
2014	Bio-inventory and Stewardship Plan for the Rothwell Reserve
2015	Improving Canoe Access Study Watershed-wide Stream Clean-up Removal of Invasive Weeds at Rothwell Reserve Identifying Stormwater Retrofits pilot program
2016	Rain Garden Demonstration Lamprey River Splash and Dash kayak race and boat parade

Key Future Actions

- Create a continuing education program for committee members and extend it to the public when appropriate.
- Expand, whenever appropriate, outreach and education efforts to all Lamprey River towns.
  - o Continue to inform the public, town governments, and state and federal partners about LRAC activities and achievements through written annual reports, newsletters, and events.

- Continue to promote consideration of the Wild and Scenic Rivers program for the upstream towns.
- Continue to fund and guide the position of LRAC outreach and education specialist.
- Partner with schools to offer science-based field trips.

- Enlist the help of others to inform the public about the rivers and the committee's work.
  - Continue to develop close partnerships with regional planning commissions, land trusts, and conservation organizations by inviting members to speak to the committee on specific subjects and investigating projects that could be co-sponsored, e.g., public tours of conserved land, film festivals.
  - Continue to support Small Grant outreach projects that support management plan objectives.
  - Continue to inform the public about issues that threaten wildlife and habitats, such as invasive weeds and water quality impairments.



book cover

Junior Ranger patch

By the Numbers: Outreach and Education

Item Description	Count
students participating in the *Lamprey River Curriculum*	~ 960
The Story of Peter Little Bear books distributed	~ 900
professional-quality videos produced	7
website visits per month	~ 500
DVD viewings on-line	> 3,300
presentations or workshops per year	4 or 5
“Herring Aid” events co-hosted	3
“Hike It, Bike It, Like It” events per year	3
research reports published or shared per year	2 or 3
informational kiosks installed at riverside areas	5
Small Grants awarded	23
Small Grants awarded per year (average)	2.9
dollars awarded through Small Grants	$90,530
average amount awarded through Small Grants	$3,936
Chick and Dee-Dee’s Lamprey River Adventure books distributed	60
Lamprey River Junior Ranger badges awarded	25

References and Additional Information

The Lamprey River Nomination to New Hampshire Rivers Management and Protection Program (1990)

Lamprey River Resource Assessment (1994)

Lamprey River Management Plan (1995)

Lamprey River Management Plan (2007)

The Lamprey, North Branch, North, Little, Pawtuckaway and Piscassic Rivers: A Report to the General Court (2011)

2013 Lamprey Rivers Management Plan

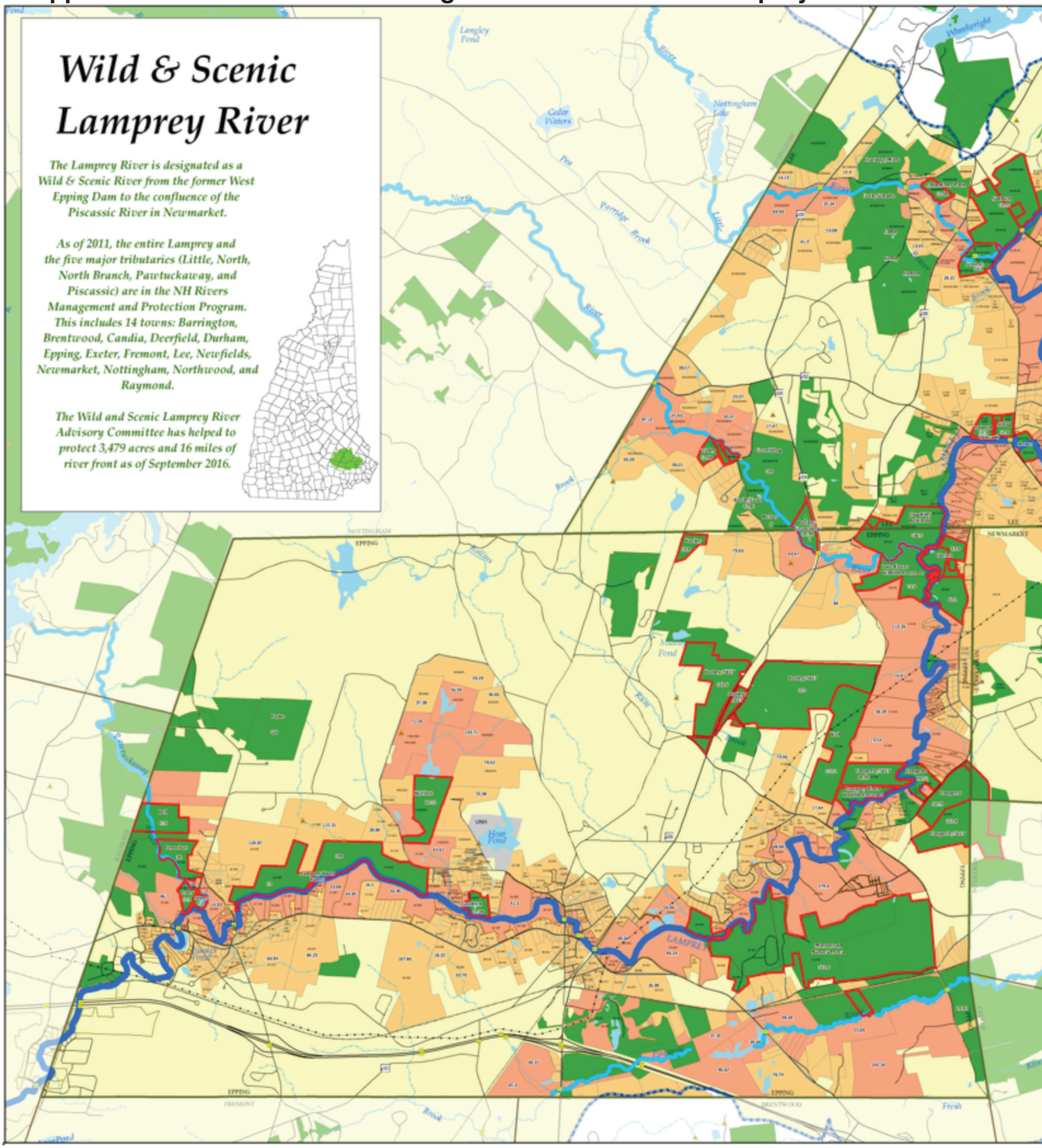
2015 Piscataqua Region Environmental Planning Assessment (PREPA)

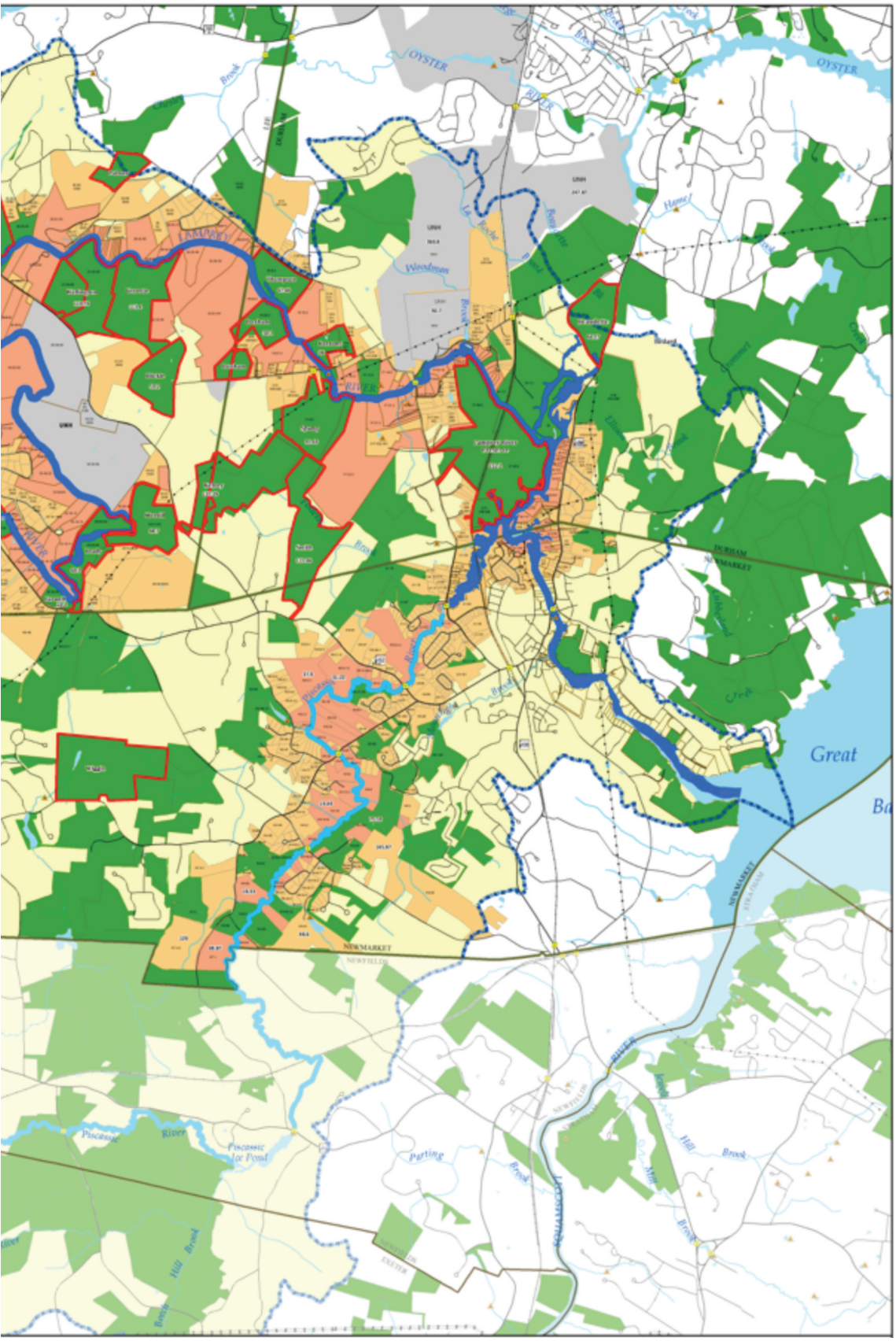
PREP, State of our Estuaries 2013

Lamprey River(s) Advisory Committee publications:

- Allan, David and Leslie Hamilton. The Story of Peter Little Bear, 2005
- *Explore the Lamprey River* map and guide, 2008
- McNelly, Deborah and Douglas Hoff. *The Lamprey River Curriculum,* 2011
- Roux, Emma and S. Petersen. *The Lamprey River Curriculum Supplement for Middle and High School Classes*, 2011
- *Lamprey Rivers Junior Ranger Study Guide and Activity Book*, 2014
- Petersen, Suzanne. *Chick and Dee-Dee's Lamprey River Adventure*, 2016

Appendix A: Conserved Land along the Wild and Scenic Lamprey River





Roads

Type

- State
- Local & Private

Miscellaneous

- Railroad
- Power Transmission Line

N

W E

S

0 0.125 0.25 0.5 0.75 1

Miles

0 2,500 5,000 7,500 10,000

Feet

1: 18,000

Data Sources:

Base Features (including Hydrography, Transmission Lines, Political Features) were automated from USGS Digital Line Graph data, 1:24,000, as archived in the NH GRANIT Database.

Digital data in NH GRANIT represent the efforts of the contributing agencies to record information from the cited source materials. Complex Systems Research Center, under contract to the NH Office of Energy and Planning, and in consultation with cooperating agencies, maintains a continuing program to identify and correct errors in these data. OEP, CSRC, and the cooperating agencies make no claim as to the validity or reliability or to any implied uses of these data.

Digital Parcel data are intended for planning purposes only. Data taken archived at SRPC.

Strafford Regional Planning Commission

Appendix B: Land Protection Priority Ranking Sheets
(From 2013 Lamprey Rivers Management Plan)

First priority:

- land with at least 1,000 feet frontage along the main stem Lamprey River or tributaries
- parcels with significant acreage _____acres
- properties ranked highly with a local, regional or statewide conservation plan such as
  - o NH Coastal Watershed
  - o NH Wildlife Action Plan
  - o town master plan
  - o other _____
- parcel adjacent to other conservation properties (combined acreage _____)
- parcel contained within a large, unfragmented block of undeveloped land (acreage of block _____)
- land with significant
  - o scenic value
  - o wildlife habitat
  - o natural communities or rare, threatened, or endangered species
  - o cultural, archaeological, or historical features
  - o recreational access to the river
- properties currently being used as productive open space, e.g. farming, forestry, etc.
- land with potential negative impacts on the river *(due to current activities or proposed activities)*

Second priority:

- land with at least 500 feet of frontage along the main stem or major tributary
- parcel in close proximity to a continuous block of protected land that has the potential to contribute to large unfragmented blocks of undeveloped land
- parcels without outstanding conservation attributes that are adjacent to other protected property
- river projects that would enhance the adjacent property's conservation attributes
- land with moderate scenic value, wildlife habitat, natural communities and/or cultural, archaeological, or historical features
- properties offering recreational opportunities

Third priority:

- land with less than 500 feet of frontage along the main stem of the Lamprey or a tributary
- parcels within a quarter mile of the main stem of the Lamprey River or a major tributary
- parcels deemed to have some degree of protection though not necessarily a conservation easement (steep slope, wetland)
- land without outstanding scenic value, wildlife habitat, natural communities and/or cultural, archaeological, or historic features
- properties without recreational opportunities

Appendix C: LRAC Sponsored or Affiliated Research

Year	Project Title or Topic
1998	New Hampshire fish community survey
2009	municipal land use decision making
2009	Wiswall's Mills: A Short History DVD
2010-2011	Tributary Fish Study
2010	Freshwater Mussel Survey
2010	historic mill mapping
2010	stormwater outlet mapping
2010	Deerfield community trails mapping
2011	Epping mussel survey
2011	septic system outreach project
2012	dams of the lower Lamprey River
2012	Mary Blair Park recreation plan
2012	Mary Blair Park history trail
2013	Big Tree Tour
2013	Reflections on a River: history of Watershed Association volunteer efforts
2013	Art for Water; examining attitudes about water
2014	Freshwater Mussel Survey
2014	Rothwell Reserve Bioinventory and Management Plan
2014	analysis of 23 years of water quality
2015	feasibility of stormwater pilot projects in two towns
2015	Foot Path Feasibility Study
2015	investigation of high turbidity in Woodman Brook
2016	feasibility of relocating large woody obstacles to improve canoe passage
2016	Phase I Archaeological Assessment of Sullivan's Falls

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