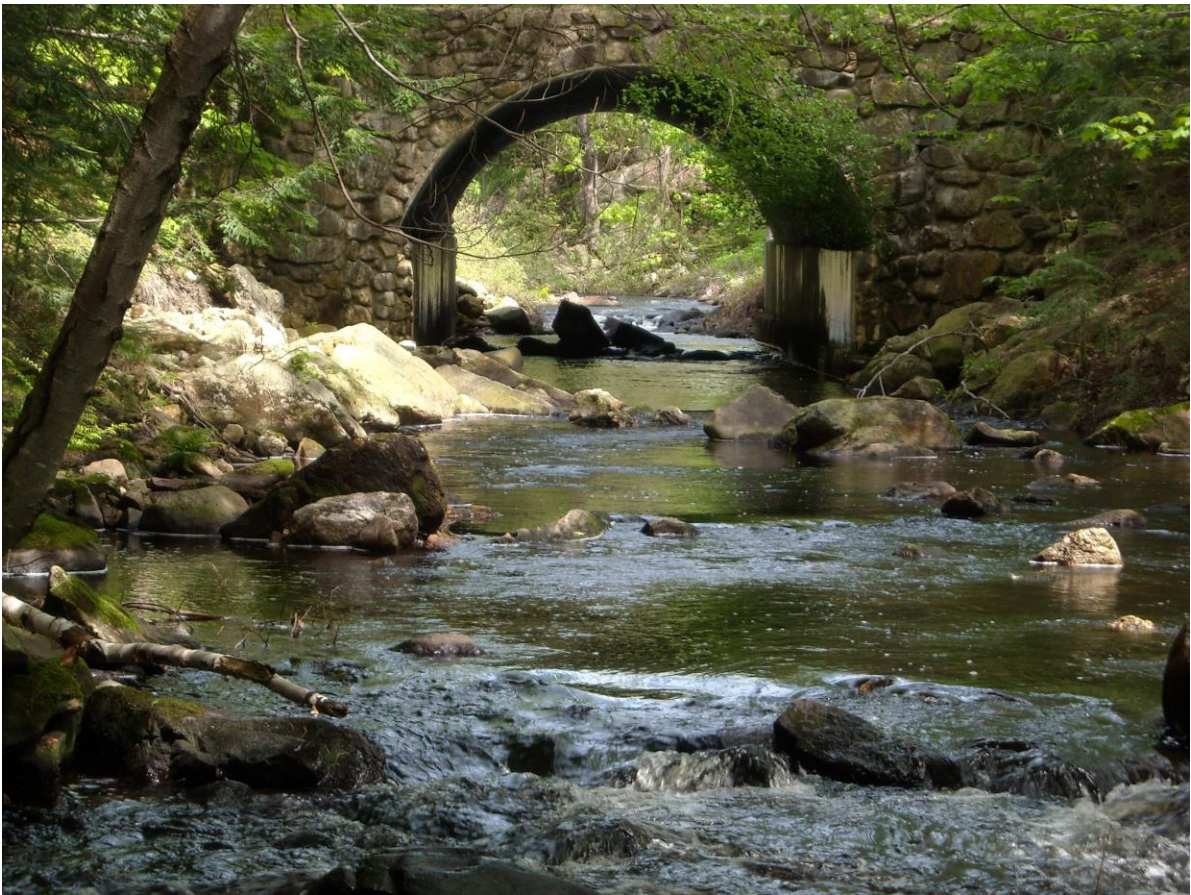


2013 Lamprey Rivers Management Plan

Updated and Expanded from 2007 Edition

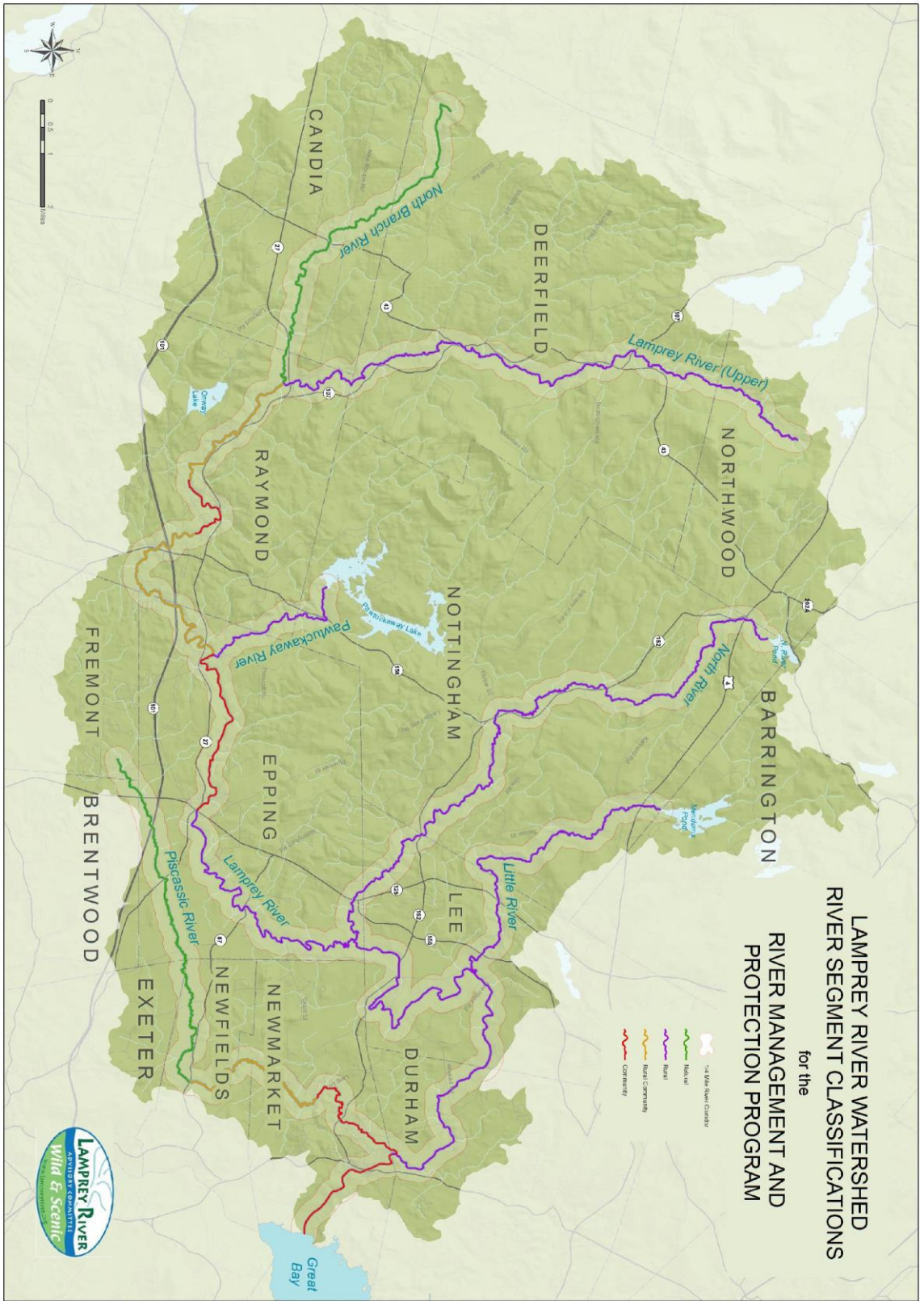
FINAL DRAFT



Deerfield Bridge over the Lamprey River, photo by Dawn Genes.

Prepared by

the Lamprey Rivers Advisory Committee



Statement of Management Philosophy

The Lamprey River and its major tributaries (Little, North, North Branch, Pawtuckaway, and Piscassic rivers) have been recognized as significant ecological, historic, recreational, and water supply resources by the New Hampshire Rivers Management and Protection Program. In addition, the lower 23 miles of the main stem Lamprey River have been designated under the federal Wild and Scenic Rivers Program. Both programs require an advisory management plan to aid in protecting and managing the resources of the rivers. The Lamprey Rivers Management Plan must provide balance among its three main goals:

1. Protect the ecosystem and associated ecological services of the rivers and their corridors.
2. Promote responsible community use of the rivers and the surrounding land.
3. Respect the interests and rights of property owners while enlisting their support as guardians of the rivers' assets.

The population of the Greater Seacoast area is increasing. The rivers and the land surrounding them face increasing pressure from development and recreational use. As the natural landscape changes, maintaining and improving the current condition of the rivers will be more challenging.

The Lamprey River and its tributaries contribute a significant amount of water to Great Bay. The Great Bay Estuary and tidal portions of the Lamprey River are showing signs of decline and do not meet federal Clean Water Act criteria for several indicators. Special attention must be paid to mitigating the increase in nitrogen, sediment, and other pollutants that reach the waterways, as well addressing areas of low dissolved oxygen. Good planning must include climate change science to predict the adverse effects and proper response to severe storm events. The condition of the rivers and Great Bay reflects the actions of individuals, business and commercial interests, and communities that populate the land surrounding these bodies of water.

Engaging the public and working together to attain the management plan goals are critical to our shared future. Central to this work will be encouraging the public and various partners to view the rivers as important and worthy of the collective efforts that will be needed for protection now and into the future. The future of the rivers and Great Bay as community assets rests squarely on the willingness of individuals, commercial interests, and towns along the river to be knowledgeable and careful stewards. We must all learn to “tread lightly” in the watershed if we are to meet this challenge successfully.

Lamprey Rivers Management Plan 2013 Update

Prepared by the Lamprey Rivers Advisory Committee

Barrington: vacant

Brentwood: vacant

Candia: Al Hall Dick Snow

Deerfield: Harriet Cady

Durham: Anne Lightbody Dick Lord

Rachel Stevens Ann Welsh

Epping: Joe Foley Jenn Rowden

Exeter: Todd Piskovitz

Fremont: Pat deBeer Fred Lindahl

Lee: Jere Beckman Sharon Meeker

Kitty Miller Preston Samuel

Newfields: Alison Watts

Newmarket: Michelle Daley Peter Wellenberger

Northwood: vacant

Nottingham: Mike Russo

Raymond: Kathleen Hoelzel Ted Janusz

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Programs & Abbreviations

GIS – Geographic Information System, a computer support system for mapping and mapping-related data.

LRAC – Lamprey Rivers Advisory Committee

LRWA – Lamprey River Watershed Association

MS4 – Municipal Separate Storm Sewer Systems

NERR – National Estuarine Research Reserve

NHDES – New Hampshire Department of Environmental Services

NPS – National Park Service

NRCS – Natural Resource Conservation Service

PREP – Piscataqua Region Estuaries Partnership

RMPP – New Hampshire Rivers Management and Protection Program

UNH – University of New Hampshire

USGS – US Geologic Survey

VRAP – New Hampshire Volunteer River Assessment Program

Wild and Scenic River – national system of outstanding rivers into which individual rivers are designated by US Congressional action

401 Water Quality Permit – permit allowing the discharge of water into a waterbody, under Section 401 of the federal Clean Water Act

Executive Summary

In 1990, the main stem of the Lamprey River in Durham and Lee was designated into the New Hampshire Rivers Management and Protection Program. In 1996, this section was designated as a federal Wild and Scenic River. In 2000, the Wild and Scenic section was expanded to include much of the main stem Lamprey in Newmarket and Epping. In 2011, the entire Lamprey River and five of its major tributaries (Little, North, North Branch, Pawtuckaway, and Piscassic rivers) were designated into the NH Rivers Management and Protection Program.

The State of New Hampshire has formally recognized that water does not respect town boundaries. What happens in one town, in one neighborhood, on one parcel, affects others around it. The 2011 designation marked the first time an entire watershed system was effectively protected as a single unit by the State. The fourteen towns with a connection to the Lamprey were unanimous in seeking this designation. The Lamprey Rivers Advisory Committee (LRAC or the Committee) is the State appointed local advisory body and includes representatives from Barrington, Brentwood, Candia, Deerfield, Durham, Epping, Exeter, Fremont, Lee, Newfields, Newmarket, Nottingham, Northwood, and Raymond.

The Lamprey and its tributaries have outstanding ecological, historical, and recreational value. The main stem of the Lamprey is also a public water supply. These resources contribute greatly to the area's economy. One of the main duties of the Committee is to craft an advisory management plan to protect those qualities that earned inclusion of the rivers in the state rivers program. This plan is intended to guide the Committee's own work, recommend actions for municipalities, highlight opportunities to work with other groups concerned with river issues, and provide information for concerned citizens. Cooperation among concerned parties will result in better outcomes toward watershed-related goals than any one entity alone can realize.

This management plan builds on the work from the original management plan from 1995 and the revision from 2007. The Committee will continue to address issues identified in the past:

- water impairments, loss of wildlife habitat, and negative impacts on the natural and scenic qualities of the rivers that result from development of river corridors and adjacent areas
- getting buy-in from landowners to engage in good land stewardship practices that protect the rivers and associated habitats
- keeping the public informed and engaged about the rivers through educational programs and materials and recreational access
- promoting the ecological health of the rivers through support of wildlife research and municipal or state policies that result in enough clean water for aquatic and riparian life

In addition to issues previously identified, this revision seeks to address several major issues that have arisen in the watershed in the past several years, including the following:

- many new residences built or planned in Lamprey River towns leading to an increased demand for public water
- a significant increase in the amount of paved and other impervious surfaces ¹
- the paradox of droughts that challenged public water suppliers and river habitats and severe floods that caused significant damage
- state listing of sections of Great Bay and the Lamprey River as “not meeting” water standards for fishing, recreation, and aquatic life
- increased need for LRAC to identify and employ various lines and methods of communication with town officials and developers in all fourteen Lamprey River towns

¹ Since 1990, the amount of impervious surfaces in the Great Bay watershed has increased by 120% and the population has grown by 19%, PREP, 2013 State of the Estuaries Report.

Background

The Lamprey River and its five major tributaries (Little, North, North Branch, Pawtuckaway, and Piscassic rivers) drain an area of approximately 212 square miles and include fourteen towns. (See map on Page 2.) Together, the Lamprey rivers make the largest contribution of fresh water to the Great Bay Estuary. These rivers provide significant ecological, historic, recreational, fisheries, and community resources that have been recognized as needing protection and careful management at the federal, state, and local levels.

Designations

The Lamprey rivers have been designated for special protection by the State of New Hampshire (the State) through the NH Rivers Management and Protection Program (RMPP). The total distance of rivers protected under the RMPP is 87.7 miles. In addition, the 23 mile section of the main stem Lamprey River from the former Bunker Pond Dam in West Epping to the confluence with the Piscassic River in Newmarket has been designated for protection by the US Congress under the National Wild and Scenic Rivers System.

These designations and subsequent protection resulted from the efforts of local citizens who documented the Lamprey's outstanding natural and cultural resources and encouraged the unanimous support of the fourteen towns. In addition to the recognition already achieved at the state level, preliminary interest has been expressed by some to extend Wild and Scenic designation to upstream towns. With sufficient public support and the assistance of the Lamprey River Watershed Association, the Lamprey Rivers Advisory Committee, and other interested stakeholders, these initiatives can be explored.

1. New Hampshire Rivers Management and Protection Program

The New Hampshire Rivers Management and Protection Program (RMPP) was enacted in 1988 as RSA 483 (<http://www.gencourt.state.nh.us/rsa/html/NHTOC/NHTOC-L-483.htm>) to protect the state's most significant rivers or river segments. In 1990, the section of the Lamprey River that runs through Lee and Durham was among the first rivers nominated into the RMPP. In 2011, the entire Lamprey and five of its major tributaries were designated. The RMPP provides for the establishment of a local advisory committee on each designated river or segment to implement river management and protection policies at the local level.

The Lamprey Rivers Advisory Committee (LRAC, the Committee) serves as the local advisory committee for the Lamprey and the tributaries. The Committee is responsible for four main duties per RSA 483:

- Advise the NH Dept. of Environmental Services (NHDES) commissioner,

the NH Rivers Management Advisory Committee, the municipalities through which the designated river or segment flows, and the municipalities within tributary drainage areas on matters pertaining to the management of the river or segment and tributary drainage areas.

- 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.
- Develop or assist in the development and adoption of local river corridor management plans. Local planning boards may adopt such plans as an adjunct to their local master plan.
- Report biennially to the NH Rivers Management Advisory Committee and the commissioner, and annually to municipalities on the status of compliance with federal and state laws and regulations, local ordinances, and plans relevant to the designated river or segment, its corridor, and tributary drainage areas.

The State offers the Committee technical assistance in developing and implementing the management plan and provides several protections for the Lamprey. According to RSA 483, rivers can be classified as natural, rural, rural-community, or community. The Lamprey rivers contains all four of these river classifications. For each river classification, State law establishes specific protection measures which pertain to structures and activities within and along the river. These include dams, hydroelectric energy facilities, channel alterations, maintenance of fishable and swimmable waters, protected instream flows, inter-basin water transfers, and recreational uses of those river segments classified as “natural.” The specific protection measures also include the siting of solid and hazardous waste facilities

Otherwise, the state program does not regulate local zoning or confer special regulatory powers to state agencies relative to protected rivers.

2. Designation under the federal Wild and Scenic Rivers Act

The broad purposes of national designation of a river as a Wild and Scenic River are to:

- Preserve the free flowing condition and “outstandingly remarkable values” for which the river was designated.
- Protect the river from the harmful effects of new federal projects such as dams and hydroelectric facilities.
- Protect and enhance the values which caused it to be designated through implementation of a river management plan

Most of the 203 rivers in the National Wild and Scenic Rivers System flow through federally-owned land and are managed by the federal agency that manages the land. In contrast, many of the designated rivers in the East flow

through private lands. These rivers, including the Lamprey, are called *Partnership Wild and Scenic Rivers*, because their management occurs through a partnership of the National Park Service and a local river management advisory committee. Partnership Wild and Scenic Rivers share the following characteristics:

- No lands are federally owned.
- Administration is accomplished through a broadly participatory committee.
- Management and use of lands adjacent to the river continue to be the responsibility of landowners, subject only to existing state and local regulations.
- The River Management Plan is written and implemented through a broadly participatory process.
- The National Park Service reviews federally funded, sponsored, or licensed projects to ensure federal consistency with the plan's river protection goals.
- The costs and responsibilities for managing and protecting the river's resources are shared among all of the partners—local, state, federal, and non-governmental.

On the Lamprey River, a 23.5 mile section is designated as a Wild and Scenic River, from the former Bunker Pond Dam in Epping to the confluence with the Piscassic River in Newmarket. The area of jurisdictional oversight is approximately one quarter mile on each side of the river.

The 1995 Lamprey River Management Plan was developed as a part of the National Wild and Scenic River Study of the Lamprey. The plan included specific provisions related to the Wild and Scenic designation, all of which were carried forward in the 2007 Update and this 2013 Plan. These provisions, together with the National Park Service's June 1995 Draft Report to Congress, and the text of federal legislation in 1996 and 2000 designating the portions of the Lamprey into the federal system, provide the full background and context for the national Wild and Scenic River designation of the Lamprey. (See Appendix A: Overview of Key Elements 1995 Management Plan.)

The Lamprey Rivers Advisory Committee

The Lamprey Rivers Advisory Committee (LRAC, the Committee) is mandated by both the New Hampshire Rivers Management and Protection Program and the federal Wild and Scenic Rivers Program to participate in the management of the Lamprey River and five of its main tributaries: Little, North, North Branch, Pawtuckaway, and Piscassic rivers. Each of the fourteen towns in the Lamprey River drainage area has at least one Committee member and is allowed up to four. For both programs, members are nominated by the governing bodies of their towns and then are appointed by the commissioner of the New Hampshire

Department of Environmental Services for a three year term. Members, serving as volunteers, represent the interests of local government, business, agriculture, natural resource conservation, recreation, and river landowners.

The Lamprey Rivers Advisory Committee is distinct from the Lamprey River Watershed Association (LRWA), a nonprofit membership group operating throughout the area. The two organizations often collaborate on efforts to enhance protection of the Lamprey.

Focus Areas and Working Groups of the Lamprey Rivers Advisory Committee (LRAC or the Committee)

The following synopses highlight the seven key focus areas of the management plan revision that are explained later in more detail:

Enough Clean Water (Refer to page 16 for more detail.)

The worth of a river to people and wildlife is largely defined by the amount of water that flows in the river and how clean the water is. Diligent monitoring and safeguarding of the water in the rivers will always be a priority. The Committee will continue its role as a watchdog, tracking the results of water tests being conducted by various groups and reviewing and commenting on development proposals to avoid or minimize degradation of the river. Although much of the water in the rivers is clean at present, problems do exist. Meeting the needs of wildlife, habitats, and people while addressing the growing human population and increasingly developed landscape will be challenging in the near future.

The main stem Lamprey is one of two rivers chosen by the NH Dept. of Environmental Services for a pilot instream flow management plan. The amount of water in the river has been studied extensively to meet the natural minimal needs of fish. A final, state-issued management plan whose goal is to assure at least minimal flows for wildlife needs will be released in the near future. Protecting clean water is more than protecting against pollution; it also involves ensuring an adequate flow. If fish can be assured of enough clean water, other creatures, including humans, will also have enough water to meet their needs.

History and Archaeology (Refer to page 22 for more detail.)

The Committee believes that a community's sense of place depends in part upon knowledge of its history. The Committee has worked hard to help residents connect with their rivers through videos, historical activities, and informational kiosks. The Committee will continue to conduct research and document the history of the rivers, including funding professional work and collecting and preserving important documents.

Land Protection and Conservation (Refer to page 25 for more detail.)

LRAC has partnered with towns, land trusts, and other organizations to permanently conserve about 2700 acres of land and more than 13 miles of river frontage using Wild and Scenic partnership funding. Land protection will continue to be a key focus of the Committee's work, especially in the Wild and Scenic River towns of Epping, Lee, Durham, and Newmarket. Because of ecological

research done in the past decade and the New Hampshire Wildlife Action Plan, LRAC now has an even better understanding of which lands are most critical for protecting wildlife on the Lamprey. In the next five years, LRAC will undertake new work with town conservation commissions and other organizations to support land conservation efforts, extending information to residents and riverfront landowners on why and how to protect the Lamprey River corridor for the future.

Outreach and Public Education (Refer to page 28 for more detail.)

The Committee strives to be “the local voice for the river” and to help others to become its advocates as well. In the past, this has included working with local schools, developing curricula, creating informational brochures and DVDs, posting signs at river crossings, conducting workshops, hosting educational events, and bringing displays to various public venues. The Committee’s recently revamped website, www.lampreyriver.org, serves as a hub of Lamprey River resources. In the coming years, LRAC’s important outreach work that promotes enjoyment and protection of the Lamprey rivers will continue.

Project Review (Refer to page 31 for more detail.)

The Committee is charged with reviewing all projects requiring a state or federal permit that could impact the Lamprey or its tributaries. With input from members from each of the fourteen towns, the Committee also closely follows river-related local issues such as proposed developments or changes in regulations. In many instances, comments from the Committee will lead to cooperative efforts among the town, the developer, and state and federal regulatory agencies that result in improvements to projects, making them more protective of the rivers and their corridors.

Recreation and Public Enjoyment (Refer to page 34 for more detail.)

To connect residents to their rivers, LRAC has helped to develop public access and parks at several sites along the Lamprey. The Committee plans to expand these efforts to include the tributaries. Increased recreation has many challenges that must be considered: some sections of the rivers are inaccessible, some are on private land, and others are overused. The Committee plans to proceed cautiously so recreational use will reflect its “tread lightly” philosophy toward providing for public enjoyment that does not degrade the rivers.

Wildlife and Ecology (Refer to page 37 for more detail.)

The Lamprey River and its tributaries have maintained most of the healthy, diverse habitat types that made them eligible for protection under both the state and federal river programs. In the next decade, LRAC will continue to work to maintain these unspoiled natural areas through research, land conservation, careful review of development proposals, measures to control invasive species, restoration of fish passage, and assuring adequate water levels in the river. The Committee will encourage Lamprey towns to establish standards that protect clean water and habitats of the rivers. Efforts to inform landowners how to maintain the ecological value of the rivers to a wide variety of plants and animals will continue.

The following seven sections comprise the details of the plan outlined above, including goals, accomplishments, and key future actions. The plan is deliberately ambitious, representing a full menu of initiatives seen as desirable, rather than a commitment to accomplishing all in the next decade. In many instances, successful collaboration will be essential to the accomplishment of the plan's identified goals and actions. The Committee often will play a supporting role to others who possess the necessary expertise, staff, authority, or resources to get a particular job done.

Enough Clean Water



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 Lamprey Rivers Advisory Committee's mission for the river corridors. In diverse ways, many of the efforts of the Lamprey Rivers Advisory Committee (LRAC or the Committee) are intended to maintain and/or improve water in the rivers. Since 1998, the Lamprey River Watershed Association has conducted summer water quality monitoring along the length of the Lamprey, often with financial support from LRAC. The data collected are then processed by the New Hampshire State Volunteer River Assessment Program (VRAP). Focused chemical analyses have been done by the University of New Hampshire (UNH) and the NH Dept. of Environmental Services (NHDES). 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 a pilot Instream Flow Management Plan for the Lamprey River. The Committee continues to have a role in on-going planning and refinements of this plan.

The Lamprey is legislatively classified as a Class B "fishable and swimmable" river and is thus managed by NHDES under the federal Clean Water Act to maintain these conditions. Most of the tributaries are similarly classified, while the Piscassic River meets a higher standard and is a Class A river. Maintaining clean water is helped by a significant amount of land protection, state and local

municipal zoning ordinances that protect shorelands, and good land management by property owners. The waste water treatment facility upgrade in Epping in 2000 also has contributed to improving the Lamprey's water. Since the Lamprey River is a source of municipal drinking water, clean water is critical to all who live in its vicinity.

Despite all the positive measures above, the Lamprey is not immune to human-caused water problems that are common locally and globally. The tidal section of the Lamprey had more than 80 dissolved oxygen violations in 2010 and 50 in 2011, significantly more than the other rivers of the Great Bay Estuary combined¹. In addition, the Lamprey also had the worst 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. Whether the Lamprey's problem is strictly human-caused or has a natural component is unknown. More site-specific studies should help to clarify these specific links in Great Bay.

Maintaining clean, abundant water requires vigilance: widespread and frequent monitoring; review of and suggested mitigation measures for potentially problematic development on shore; education of landowners (both public and private); and a readiness to work with local, state, and federal regulators to prevent and address problems as they arise. Despite many strong efforts, the water in the rivers faces several threats, including the following:

1. Development in the river corridor has resulted in a significant increase in paved and other impervious surfaces. When rain water moves *across* surfaces rather than soaking *in*, several problems arise:

- Stormwater moving across unvegetated surfaces erodes soil and adds extra sediment to the river. Extra sediment in the river can make the water murky, clog gills, smother slow-moving wildlife such as mussels, add excessive nutrients, and change the physical flow of the water.
- Stormwater runoff carries lawn fertilizers, animal waste, and roadway pollutants such as salt and automotive fluids to waterways. These chemicals alter the natural condition of water, can cause significant harm to animals and humans who rely on clean water, and can be costly to mitigate.
- Stormwater runoff from roads, parking lots, and rooftops in summer can substantially increase water temperature in the rivers, thereby lowering the ability of certain fish species to survive.

¹ Piscataqua Region Estuaries Partnership, State of the Estuaries 2013. For a map of test sites see page 19, <http://www.stateofourestuaries.org>.

- Pavement and other altered surfaces prevent water from soaking into the ground properly. Much of the flow in rivers results from slow additions of water contributed by groundwater. When less water soaks into the ground, less water is available as ground water. Instead of getting a long-term, more moderate flow, the river becomes “flashy,” experiencing times of extreme flows during storms and extreme drought when rain is sparse.

Standard site development often focuses on channeling and diverting water from a site. Modern, low-impact development (LID) recognizes that many or most of the problems cited above can be lessened when water is allowed and encouraged to soak into naturally vegetated soils on site. Only two towns in the Lamprey’s drainage area (Durham and Exeter) must adhere to Municipal Separate Storm Sewer System (MS4) criteria for development in their urban areas. Other development is not required to conform to these practices. With this in mind, enhancing good stormwater management practices will continue to be a priority with LRAC’s efforts.

2. Streamside “buffers” are being lost. Buffers are areas of natural vegetation that act as areas of transition between land and water. They slow run-off and help to remove contaminants so they do not reach the river. The Lamprey and its tributaries are beautiful rivers and more people are building along them. Sadly, people sometimes build too close to the river or a wetland or clear a wide area to enhance their view. Removing or altering this natural buffer area has negative consequences for the water, the landowner on-site, and landowners and municipalities downstream:

- Lack of natural vegetation along the river and wetlands means soils are not stabilized or protected from the impact of rain or floods. Erosion of land and siltation of water result.
- Nutrients, in the form of soil, fertilizer, or animal waste, can be carried readily into the water, rather than being absorbed by plants. These excess nutrients cause a cascade of problems that include unsightly and odorous algae growth, murky water, and decreased dissolved oxygen.
- Natural shoreland vegetation shades the water, maintaining cooler temperatures critical to aquatic life. Natural shoreland vegetation also provides important habitat to animals that live in or near the water or that utilize the river corridor for migration.

Natural buffers need to be protected by state and local regulation and by good land management practices by informed landowners. The Committee seeks to work with governments to enhance protective shoreland buffer regulations and provide landowners with information about protecting both their land and the rivers.

3. An increasing population increases the demand for water. Many seacoast towns are facing a shortage of safe, reliable drinking water for their residential,

commercial, industrial, and community needs. Aquatic organisms are also facing a shortage of water.

- Groundwater extraction is increasing, resulting in less water reaching the rivers. As the largest freshwater river in the New Hampshire Seacoast region, the Lamprey is viewed by some area towns as a possible source to augment their existing water supplies.
- Low flows in the river, especially during extreme drought, result in concentrated nutrients and warmer water, sometimes causing excessive algae growth and endangering aquatic life. On occasion, this has caused dissolved oxygen levels in the main-stem Lamprey to drop below standards for a “fishable and swimmable” river. Also exacerbated by low flows are the concentrations of copper and zinc which have, on occasion and in certain locations, reached levels considered toxic to wildlife.
- The Lamprey is one of two rivers selected by NHDES for a pilot instream flow program as defined by the New Hampshire legislature. (Visit <http://des.nh.gov/organization/commissioner/pip/factsheets/rl/documents/rl-28.pdf> for a fact sheet.) Members of LRAC are engaged in work to help NHDES study, understand, and protect the Lamprey’s instream flows.

4. Septic systems are part of the problem and part of the solution. Most landowners along the Lamprey and its tributaries have private septic systems to treat household waste water, yet many do not even know they have a septic system or how it works. New landowners, especially those coming from urban areas with waste water treatment facilities, might not understand the difference. Failed septic systems can result in both excess nutrients and pathogens potentially reaching the river. While septic systems cannot remove all nutrients, septic systems that are well planned, placed, and maintained can play a role in keeping river water clean.

Goals

- Ensure that the Lamprey rivers meet or exceed standards for “fishable and swimmable” water for the health and enjoyment of all species.
- Maintain a viable 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.

Accomplishments

- Created brochures for landowners explaining why and how to manage riverfront lands to ensure clean water and protect wildlife habitat.
- Held a series of workshops on maintaining vegetated buffers to protect the river in partnership with the Oyster River Watershed Association, Strafford Regional Planning Commission, and Strafford County Conservation District.

- Reviewed and commented on proposed development projects to assure that water would not be degraded during and after construction.
- Testified at legislative hearings regarding changes to the state's shoreland/buffer protection statute.
- Held workshops that educated citizens about the connections between economics and ecological integrity.
- Sponsored a pilot outreach program for riverside landowners to understand and improve their septic systems.
- Participated in the state's instream flow pilot study by gathering data, identifying important river resources to protect, and reviewing draft documents. LRAC members served on the Technical Review Committee and the Watershed Management Planning Advisory Committee for the study.
- Co-sponsored "Your Water, Your Wallet, Your Watershed" workshop to encourage towns to work across municipal boundaries in addressing water issues.
- Sponsored research to assess and delineate floodplains along the main-stem Lamprey River.
- Co-sponsored a road salt reduction workshop entitled "The Road Less Salted" for public and private snow plow drivers.

Key Future Actions

- Study and track chemical and physical traits of river water in a consistent manner so that towns and other partners can protect the cleanest water and improve degraded water.
 - Identify what data are available for each river, each town, Pawtuckaway Lake, and Mendum's Pond.
 - Perform a trend analysis.
 - Identify what critical data are missing and recommend steps to address the gaps.
 - Compare data to New Hampshire benchmarks and identify which issues could be improved locally.
 - Gather and collate data from historic water testing in the Lamprey rivers for use in administration, project review, and education activities performed by LRAC. Make data available to the public.
 - Continue to support volunteer water testing efforts.
- Work with towns to protect and improve the "fishable and swimmable" water of the rivers.
 - Partner with towns or the Southeast Watershed Alliance to address trouble spots along the Lamprey as identified in UNH's 2012-2013 study of Great Bay Hot Spots.
 - Enlist local knowledge to identify at least one problem area per town that does not or would not appear on GIS maps and standard evaluations (such as broken pipes or undocumented erosion

- areas). Report these problems to town officials or agencies that might be able to provide help in correcting the problem.
- Work with towns to enact consistent and effective regulations for stormwater, zoning, buffers, and floodplains by 2022.
 - Encourage towns to reduce the amount of salt they apply to town roads. Recommend that all 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.
 - Provide towns with information on septic systems that can be distributed to residents as part of the towns' annual reports.
 - Assess and create an inventory of impaired stream crossings and prioritize the most significant or fixable problems.
 - In fulfilling LRAC's permit review responsibility, help towns to assess development proposals relative to their effects on clean, abundant water.
 - Plan river-based activities in each town to build awareness that all areas can have "fishable and swimmable" water.
 - Identify emerging issues that affect the water in the rivers and help towns to plan accordingly.
- Work with town residents to protect and improve the water:
 - Expand outreach efforts to landowners about septic system care and maintenance.
 - Encourage wide, naturally vegetated buffers and floodplains to minimize erosion and filter run-off. Work with the Lee Conservation Commission to promote native plant buffers and pervious pavement.
 - Encourage residents to minimize or discontinue the use of pesticides and fertilizers.
 - Formally recognize landowner efforts that protect clean water, both along the river and as part of the watershed.
 - Promote water conservation:
 - Support town efforts to develop long-range water use plans and encourage exploration of alternate sources or storage.
 - Encourage all towns to create a water conservation plan and/or consumptive use plan, including mandatory conservation measures during drought.
 - Encourage strategies and regulations for low-impact development or retro-fits so that water soaks *into* the soil and does not flow *across* it where soil conditions are appropriate.
 - Engage towns and residents to identify and correct sources of water loss (broken pipes, leaky faucets, etc.). Sponsor contests that identify and quantify water loss. Develop incentives to conserve water.

History and Archaeology



Historian documents the Wiswall Mill foundation in Durham prior to construction of the fish ladder, photo courtesy of NRCS.

Background

People have long recognized the valuable resources that the Lamprey 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 iron agricultural tools to supply local and regional needs. The largest mill on the Lamprey was the Newmarket Manufacturing Company founded in 1822. At one time, this mill housed the largest weaving room in the world. River valleys supplied brickyards with extensive deposits of glacio-marine clays that were left following the last Ice Age 11,000 years ago. Epping still sits atop a vast deposit of such clay.

The historic resources of the Lamprey were recognized by both the State of New Hampshire and the US Congress as reasons for designating the Lamprey for protection. The National Park Service's 1995 Draft Report to Congress cited the "outstandingly remarkable" archaeological resources of the Lamprey, 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.

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 be expected to assist in protecting the rivers, especially as newcomers settle in the communities along the river.

Goal

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.

Accomplishments

- River Story: The History of the Lamprey River Through Time VHS (1997) has been upgraded to DVD and distributed (2009).
- The Lamprey River Curriculum (1990) for both elementary and middle/high school students was updated (2011) and is now widely available through LRAC's website, www.lampreyriver.org.
- The Lamprey River Tour Map and Guide (2008) offers suggestions for visitors to see highlights of history in the lower four towns.
- The Lamprey River Tour: Mary Blair Park DVD (2009) documents both the history and present at Epping's Mary Blair Park.
- More than 100 dams and mill sites in the Lamprey River watershed area were documented and mapped as part of a Small Grant (2009).
- Wiswall's Mill: A Short History DVD (2010) documents the history at Wiswall Falls in Durham.
- Three of four historic panels at the Wiswall Falls kiosk (2010 and 2012) have been completed and installed.
- A historic trail at Mary Blair Park/Folsom Mills in Epping has been completed as part of a Small Grant (2012).

Key Future Actions

- Assist towns to implement planned historic activities at river parks:
 - Work with Durham to create a fourth panel for the Wiswall Falls Park kiosk that highlights the contributions of John Hatch: artist, professor, and Lamprey River advocate.
 - Work with Epping to make natural interpretive trails a reality at Mary Blair Park.
 - Work with the Northwood Historical Society to map trails at the headwaters of the rivers.
- Partner with historical committees to help local citizens understand and appreciate the importance of the rivers in human history of the region.
 - Encourage schools to use the Lamprey River Curriculum as appropriate when studying local and state history.

- Add pictures and stories about at least one historical feature per town to the LRAC website.
- Partner with local historical societies to arrange visits to these sites for local people.
- Identify and encourage protection of historic and archaeological resources on a site-specific basis, using methods such as signage, barriers, or easements.
- Work with the recreation subcommittee to include historic features on the proposed middle/upper river map and guide.
- Expand the data base of existing dams created in 2012 to include past and potential future uses, such as fish passage and possibilities for tourism and recreation.
- Engage local residents in discovering local history to help promote a “sense of place”:
 - Create a “History Detectives” program with a local high school and record the show for You Tube, town television stations, etc..
 - Create a place on the LRAC website where people can report historic findings, ask questions, post stories, etc.. Include a list of local historic societies and contact information.
 - Invite local people to record comments and stories about the history of their river communities when they attend events or visit the LRAC information booth.
 - Help towns to identify and provide permanent protection of irreplaceable historical documents that pertain to the river, with originals kept locally and copies sent to the NH State Library.
- Seek funding for professional research on the archaeology and history of the rivers. Report findings on the website and in appropriate media, presentations, etc..
 - Study and document archaeological sites along the rivers in addition to those in the Wadleigh Falls area.
 - Research and map the route of the Oxway Road that once connected the McCallen Dam in Newmarket to Wadleigh Falls in Lee; develop information about the building of the road, maintenance, etc..
 - Document the brick industry in Epping. Use it as an example of the connection between human history and utilization of natural resources such as those that exist along the rivers.
 - Research and describe the development of railroads in the watershed. Note that railroads largely followed the course of the rivers and that towns often developed around access to the centers of industry, tourism, and agriculture.
 - Research programs and techniques for protecting valuable historic and cultural entities and apply them to at least one project every two years.

Land Protection/Conservation



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

Background

The land that affords protection to a river is often found along the river, but not always. The land that protects small headwater streams, wetlands, and groundwater recharge areas is also important to the overall condition of a river. Protecting the best and/or most sensitive land helps to protect the water and the overall environment that relies 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 are often minimal and subject to modification by town or state governance. Deed restrictions and covenants might seem to protect land, but they are impermanent, subject to interpretation and amendment, and difficult to enforce.

The most effective long-term strategy for protecting the water and ecological integrity of rivers, therefore, 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 Wild and Scenic portion of the main-stem Lamprey River flows from West Epping to the confluence with the Piscassic River in Newmarket. The quarter mile wide corridors that parallel the river in this section are eligible to receive funding from the National Park Service which may be used for land protection with willing sellers. The Committee's land protection policy is 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 environmental protection partners.

Thus far, all of LRAC's land protection efforts have been consistent with the criteria of the 1995 Lamprey River Management Plan (referenced in the federal designation of part of the Lamprey into the National Park Service Wild and Scenic Rivers Program, Appendix C). The Committee's funding is intended for the purchase of lands or conservation easements that protect or enhance the assets for which the river was designated (ecology, archaeology, and fisheries protection).

The act designating the Lamprey as Wild and Scenic precludes the National Park Service from owning or managing land within the Wild and Scenic portion of the river and does not allow condemnation of land along the river. Federal funds 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.

Because funds are limited, the Lamprey Rivers Advisory Committee's criteria for prioritizing lands for conservation easements are considered through a 3-tiered approach that identifies frontage on the river, significant acreage, key natural features, proximity to other conserved areas, wildlife habitat, and other ecological values. (See Appendix B for the Land Protection Priority Ranking Sheets.) Funding for land protection in the Wild and Scenic portion may also be received from other sources, but the provisions stated above still apply.

In addition to outright purchase or fee simple purchase of an easement, helping landowners understand the ecological value of their land and encouraging best management practices for conserving it are a priority. 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 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.

Accomplishments

- As of December 2012, LRAC had leveraged funding totaling \$9,547,210 to protect 2,771 acres. Every three dollars of National Park Service funding that was spent was matched by seven dollars from landowner donations of land value and matching funds from towns and conservation organizations.
- 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 rivers 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 rivers.
- Support broad outreach programs that foster stewardship of private lands by landowners and seek ways to reward those who are good stewards.

Outreach and Education



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

Background

For over 20 years, the Committee “that speaks for the Lamprey rivers” has created brochures, press releases, videos, public displays, an internet presence, educational curricula, and guides for teachers. Lamprey Rivers Advisory Committee (LRAC) members have given testimony and presented programs to the public to support legislation that protects the rivers.

Education and outreach activities are viewed by the Committee as vital underpinnings of resource conservation. The Committee’s efforts seek to engage the public to appreciate and protect the outstanding resources of the rivers: clean, abundant water, wildlife, scenic beauty, historic and archaeological features, and recreation. These resources depend on an informed and appreciative public. Enjoyment of the rivers in a manner that preserves the resources must be a part of the Committee’s efforts.

The segment of the main-stem Lamprey River from West Epping to Newmarket is designated as a federal Wild and Scenic River and receives funding through the National Park Service. Some residents of upstream communities have indicated an interest in achieving Wild and Scenic River status for their sections of the river. Educating the public about the rivers and the benefits of the Wild and Scenic Rivers Program will be essential in helping them achieve that goal.

Goal

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

Accomplishments

- Developed (1990) and updated (2012) The Lamprey River Curriculum for elementary, middle and high school students.
- Commissioned The Story of Peter Little Bear, A Lamprey River Adventure, a story that describes life along the Lamprey in the late 1600s through the eyes of a native boy (2004). 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.
- Created, updated, and continue to maintain the LRAC website: 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.
- Developed portable displays, brought them to local events, and used them as a platform for informing participants about LRAC and the resources of the rivers.
- Created a Small Grants Program that provides seed money for education and outreach projects that help implement management plan objectives.
- Contracted a specialist to assist with education and outreach efforts.

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.
 - Continue to inform the public, town governments, and state and federal partners about LRAC goals and achievements through written annual reports.
 - Distribute quarterly newsletters to all towns. Include town halls, libraries, and schools.
 - Update all brochures to include the entire river and the tributaries.
 - 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 high schools to offer vernal pool science trips.
- Offer information and programs to a wider audience.

- Publish wildlife articles in media with wide public appeal and distribution.
- Add at least one outreach component per year in conjunction with the working groups that are engaged in land protection, recreation, history and archaeology, and water resources.
- Offer guided support for The Lamprey River Curriculum to be used by at least two schools each year and provide support to teachers to continue to offer it in subsequent years.
- 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 invasive, non-native species that threaten wildlife and habitats, particularly Japanese knotweed.

Project Review and Comment



The subcommittee reviews plans, photo by S. Petersen.

Background

According to NH RSA 483:8-a iii b, (<http://www.gencourt.state.nh.us/rsa/html/L/483/483-8-a.htm>), 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 designated river. The Lamprey Rivers Advisory Committee (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 National Park Service relative to the federal Wild and Scenic River designation, with a goal of protecting and enhancing the lower river (covering the main-stem Lamprey River from West Epping to the confluence of the Piscassic River in Newmarket) where federal permits or projects are concerned. The Committee 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 LRAC are advisory and are considered by the New Hampshire Dept. of Environmental Services (NHDES), but 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 the designated rivers. In this capacity, the Committee 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 subcommittee 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 maintenance plans. Special attention is given to the presence of 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. (See Appendix C for the Project Review Process Worksheet.)

Goal

Ensure that river protection goals are adequately considered during project review at local, state, and federal levels.

Accomplishments

The Committee began reviewing and commenting on projects in 1990 when Durham and Lee were first nominated into the NH Rivers Management and Protection Program. Later, Newmarket and Epping projects were added through Wild and Scenic Rivers designation. 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 make sure turtles would not become entrapped in the fish ladder.)
- improvements to the Newmarket boat launch
- 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 power boat speeds on the lower Lamprey River
- reconstruction of Route 87 bridge in Epping. (Comments resulted in NH DOT's hiring 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.)
- commercial development at routes 101 and 125 in Epping
- Durham's proposed shoreland and wetland ordinances
- a large Epping subdivision (LRAC and the National Park Service 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.)
- replacement of a bridge over the North River in Nottingham
- conversion of a small riverfront business to a complex of businesses and condominiums in Newmarket
- revisions to the New Hampshire Shoreland Water Quality Protection Act
- various house lot projects along the river

Key Future Actions

- Review and comment on all 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. (See LRAC Project Review Subcommittee Process Worksheet in Appendix B.)
- 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.
 - Send annual reminders to town managers and zoning boards that permits for the quarter mile corridors are required to be reviewed by LRAC.
 - 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 subcommittee to include proposed legislation affecting the rivers or create a separate subcommittee to perform this function.

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 the rivers and their corridors, they form a connection to the rivers and are inspired to protect them. Long-term enjoyment of the rivers is dependent on being able to access the rivers and enjoy them appropriately through low-impact activities. The recreational resources along the rivers were recognized by the State of New Hampshire in designating the rivers into its river protection program. The National Park Service and the US Congress also recognized the recreational resources in designating the lower Lamprey into the National Wild and Scenic Rivers System.

Goal

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

Accomplishments

- Created a popular Lamprey River Tour Map and Guide for river-based recreational opportunities in the Wild and Scenic River towns of Epping, Lee, Durham, and Newmarket.
- Partnered with the Durham Historical Association to offer a tour of the Doe Farm conservation area, showcasing its historic and ecological values.
- Worked with Durham to develop the park at historic Wiswall Falls in Durham. Headed the Wiswall Historic Interpretative Committee to create three panels of a four-panel exhibit. Developed a plan for a parking lot, canoe launch, and a fenced picnic area.
- Provided a Small Grant to the Town of Deerfield to develop the Deerfield Community Trail network and map.
- Purchased land in Lee, gave it to the town, and constructed a launch for non-motorized boats on Highway 152 near Wadleigh Falls.
- Partnered with the Town of Epping to present a “Family Fun Day” at Mary Blair Park. Awarded two Small Grants to the Epping Recreation Department and the Epping Historical Society to plan trails and other activity areas in the park.
- Partnered with Raymond Recreation and the Lamprey River Watershed Association to offer the “Raymond Regatta and Family Fun Day” at the Lamprey River Elementary School in Raymond.

Key Future Actions

- Expand and enhance plans for recreation and public enjoyment activities that include the entire Lamprey River and its five designated tributaries. Seek planning and financial assistance from the National Park Service and other similar organizations. Utilize their expertise to expand recreational opportunities for people with handicaps.
- Enhance or create additional recreational tour maps to include the towns in the middle and upper Lamprey River and the tributaries:
 - Make use of the proposed Robert Frost Scenic Byway trail developed by the Southern New Hampshire Planning Commission.
 - Gather information from town recreation departments, historical committees, local fishing and boating groups, landowners, and holders of conservation easements to document access points, historical and cultural sites, and/or scenic vistas in each town. List appropriate activities for each site. Label all sites as handicap accessible or not.
 - Seek funding and planning support from the National Park Service and other similar organizations to support additional Lamprey River tour map(s).
- Work with partners (including town recreation, conservation, and historical committees) to support at least one major event per year with some river-

based activities at riverside parks in a different town each year. Examples of activities include:

- road races that have obstacles that mimic conditions in the river such as dams, downed trees, trash, habitat for animals, endangered plants and animals, etc.
- “Bike It, Hike It, Like It” combination activities for specific audiences such as bicyclists, family groups, etc.
- Mary Blair Family Fun Day
- Raymond Regatta
- walks that introduce the public to the natural resource features of conserved properties or town forests (e.g., Doe Farm)
- winter fun days
- Work with towns to develop appropriate recreational areas:
 - Durham: Complete plans for the Wiswall Dam Park to include designing the fourth panel for the kiosk, addressing parking issues, building a canoe launch, and creating a handicap accessible picnic area.
 - Epping: Follow through on the Mary Blair Park plan to construct nature trails and signage for the natural playground.
 - Raymond: Investigate the plausibility of refurbishing and reopening the beach area at the Lamprey River Elementary School.
- Advocate for appropriate non-damaging use of river recreational resources.
 - Report erosion issues to towns and potential funding agencies.
 - Use maps and kiosks to inform the public on ways to reduce recreational erosion.
- Encourage riverside landowners to allow for public access along the river:
 - Study the feasibility and consequences of micro-easements that could encompass stand-alone or pooled properties.
 - Provide information on amendments to RSA 212:34 that limit landowner liability when the public uses private property.
 - Study the feasibility, legal ramifications, and consequences of public access if the landowner is compensated by the town through reduced taxes or other incentives to allow public access.

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, or watershed, of 212 square miles. This is the largest watershed of the Great Bay Estuary, a National Estuarine Research Reserve. Despite an increasing human population, this largely forested and relatively undeveloped area supports important floodplain forests, extensive shrub and emergent marsh wetlands, and scattered openings and fields among the forested uplands. The floodplains, backwaters, vernal pools, fields, and forests are home to a great diversity of wildlife including significant populations of Blanding's, spotted, and wood turtles, all species of conservation concern in New Hampshire.

The Lamprey is one of the state's most significant rivers for anadromous fish (fish that migrate between fresh and salt water) such as river herring and American shad, as well as many strictly freshwater fish. More than 150 species of birds use the river corridors to breed, over-winter, or stop during migration. Protection of natural habitat ensures ecosystem services such as low or no-cost maintenance of clean groundwater, river water, healthy soils, and flood protection. In addition, the Lamprey supports the ecosystem and ecosystem services of the Great Bay Estuary by providing fresh water and habitat for the many species found there.

Compared to other rivers in the region, the Lamprey River's headwaters, channel, floodplain, and adjacent wetlands are still relatively intact, making possible the wide variety of plants, fish, and other wildlife that live here. Undeveloped riverside areas (buffers) and associated wetlands help to protect the river from soil erosion and sediments, excessive nutrients, pollutants, and over-heating in summer sun, as well as slowing the flow of seasonal or storm flood waters. Wildlife and habitats depend on maintaining clean water, natural

flow patterns, riverside vegetation, and uplands that are developed in a sensitive manner and are not fragmented by haphazard development. Similarly, protecting and managing these natural areas is the most cost-effective way to ensure the services they provide to people, such as clean, abundant water, flood control, and quality of life.

The ecology of the Lamprey, as summarized above, was found by the National Park Service to represent an “outstandingly remarkable” resource worthy of recognition and protection through the Wild and Scenic Rivers System ([1995 Draft Report to Congress](#)). 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 being challenged by several issues: the human population increased 15% from 1990 to 2000 and more than tripled from 1960 to 2000 (<http://100yearfloods.org>); the landscape is rapidly being developed resulting in fragmented and lost habitat; invasive, non-native species are becoming more common; fish passage is obstructed by dams and numerous culverts; demand for public water is high; and stormwater runoff is carrying sediments and nutrients into the rivers.

Goals

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

Accomplishments

- Sponsored research on turtles, mussels, birds, plant and plant communities, floodplains, and dragonflies along the main-stem Lamprey River. Co-sponsored research on fish that rely on the main-stem and the tributaries. This body of research has been used to guide land protection and instream flow management priorities.
- Worked with NH Fish and Game 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 the Outreach Subcommittee to sponsor a Small Grant to research other opportunities at dams that might lead to improved fish passage along the lower Lamprey River.
- Worked with partners to test methods for managing invasive Japanese knotweed.
- Worked with the Outreach Subcommittee 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 2013, the tools have been used

on 65 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.

Key Future Actions

- Encourage sustained ecological integrity in the watershed.
 - Pick a few key indicator species to monitor over time.
 - Support research to discern why key fish species are missing from otherwise suitable habitat as identified in New Hampshire Fish and Game's Lamprey River Watershed Fish Surveys from 2012.
 - Seek out and conserve land that increases the degree of connectedness for aquatic organism and wildlife passage within the watershed.
 - Review the NH Wildlife Action Plan and the NH Climate Action Plan for guidance on research needs and best management practices.
 - Work with partners to conduct programs that inform riverside landowners about wildlife needs on their property.
 - Promote wide riverside buffers as important to wildlife and water quality. Work with towns to enact buffer protection regulations.
 - Help people to understand their connection to nature and wildlife: how to maintain wildlife habitat, how to safeguard soil and clean water.
 - Protect headwater streams and beaver dams.
 - Map stormwater outfalls to prioritize retrofit projects to ensure that the worst offending systems are dealt with first. Initially focus on mapping outfalls in towns that have seen a significant increase in impervious surfaces.
 - Conduct a comprehensive stream crossing survey to identify barriers to aquatic organisms and prioritize stream crossing replacement projects.
- Provide outreach that encourages the public to appreciate the importance of wildlife and ecology to clean, abundant water, public enjoyment, education, and land protection:
 - Continue to make wildlife and ecological considerations a priority in land protection efforts.
 - Identify key audiences and work with the outreach program to develop targeted materials.
 - Continue to grow the vernal pool program.
 - Continue to arrange opportunities for family dragonfly hunts.
 - Increase public awareness of wildlife and their habitats.
 - Address road salt and encourage towns to reduce it; study possible effects of extra road sand (from less salting) on wildlife.

- Tap into local knowledge: landowners, recreationists, conservation commissions, etc..
- Prioritize projects and find funding for research and restoration projects.

Glossary

class B waters – Of the second highest quality, these waters are considered acceptable for fishing, swimming, and other recreational purposes, and, after adequate treatment, for use as water supplies. NHDES has numeric and narrative criteria for these uses. Antidegradation provisions also apply (See [NH RSA 485-A:8](#)).

conservation easement – 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.

habitat fragmentation – The division of habitat into smaller and less productive pieces, usually by the construction of roads or other barriers to certain wildlife.

habitat loss – The destruction of natural areas through clearing of vegetation, filling in of wetlands, creation of impervious surfaces, flooding of uplands from dams, and extreme pollution.

impervious surface – Hard-covered surfaces such as pavement and roofs that do not allow water to soak into the soil. Compared to natural surfaces, water runs off more quickly and is usually dirtier. Many studies indicate that no more than 10% of a watershed should consist of impervious surface. (See Center for Watershed Protection, 2003.)

invasive species – Non-native plants or animals that are particularly aggressive in out-competing native species, thereby degrading habitat for resident species.

pervious surface – Land surfaces that allow precipitation to infiltrate into the soil, e.g., forests, fields, lawns, unpaved driveways, etc.. Certain pavement and concrete can be made to be pervious so that water infiltrates rather than running across the surface.

riparian – Relating to or located on or near the banks of a natural watercourse.

runoff – The portion of precipitation that does not infiltrate the soil but runs directly off the land into surface waters. Often contains eroded soil or pollutants picked up from paved or other impervious surfaces.

stormwater – Precipitation that does not infiltrate the soil, usually used in reference to runoff in developed areas.

watershed – The geographic area that drains water into a river, lake, or estuary directly or from tributaries or groundwater. The study of a watershed should include wildlife and human populations, the amount and kind of land development, and the ability of water to flow and of fish to migrate naturally.

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Reviewers

Prior to the adoption of this Management Plan 2013 Revision by the Lamprey Rivers Advisory Committee, it was distributed for review to the following parties:

Bear Paw Regional Greenways

Conservation Law Foundation

- Peter Wellenberger, Great Bay Estuary Bay Keeper

New Hampshire Department of Environmental Services:

- Jacquie Colburn, director NH Rivers Management and Protection Program
- Steve Couture, NH Coastal Program manager

Piscataqua Region Estuaries Partnership

Rockingham Planning Commission

Southern New Hampshire Planning Commission

Southeast Land Trust

Strafford County Planning Commission

Strafford Rivers Conservancy

The Nature Conservancy

Towns of Barrington, Brentwood, Candia, Deerfield, Durham, Epping, Exeter, Fremont, Lee, Newfields, Newmarket, Nottingham, Northwood, Raymond:

- town council
- planning board
- conservation commission

US Dept. of Interior, National Park Service:

- Jamie Fosburgh
- Jim MacCartney

Lamprey River Watershed Association

Appendix A: Overview of Key Elements 1995 Management Plan

This section summarizes the principal components and recommendations of the Lamprey River Management Plan.

Wild and Scenic River Designation The LRAC unanimously recommends designation of the Lamprey River as a component of the national Wild and Scenic Rivers System.

Designation would accomplish the following:

- 1) Protect the critical interests of the Town of Durham at the Wiswall Dam by preventing the conveyance of the dam and its water rights from the Town to a private hydroelectric develop.
- 2) Protect the interests of riverfront landowners and the aspects of the river's ecology that could be jeopardized by hydroelectric development.
- 3) Require all federal agencies to respect both existing state policies and local priorities, as outlined in this Management Plan.
- 4) Establish a permanent partnership with the National Park Service to assist local communities and the Committee in implementing this Plan and in meeting the future needs of the river.
- 5) Increase the likelihood of federal funding for desired projects, as well as increase the ability to compete for non-governmental grants for those projects.

"TREAD LIGHTLY" Throughout this Plan the LRAC has promoted an approach to river protection that emphasizes the importance of individual actions. Each of us who visits, lives by, or uses the Lamprey can minimize human impacts on the river and its corridor while continuing to enjoy them by acting thoughtfully and responsibly.

Water Quality Its relatively small size, low elevation, shallow depths, and extremely low summer flows combine to make the Lamprey particularly susceptible to water pollution threats.

The LRAC believes that the State/EPA coastal watershed initiative to control polluted runoff offers an important tool for protecting the Lamprey. The LRAC will work to secure the support of landowners, towns and the State for implementing this program effectively. The river's special protected status under both existing state and recommended federal river protection programs should help to leverage funding and focus attention on program implementation.

Water Conservation Growing awareness of the long-term potential for water shortages in this state and of the severe impact that low flows cause to water quality and river.

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V. Effects on Water Resources Management from Designation under the National Wild and Scenic Rivers Act

This section outlines the responsibilities of the National Park Service (as the representative of the federal government under the Wild and Scenic Rivers Act) should the Lamprey River be designated into the Wild and Scenic Rivers System.

Water Quality:

Standards and Permits Present water quality standards for the Lamprey would be unaffected by designation of the Lamprey into the Wild and Scenic Rivers System, and there would be no additional permits required as a result of Wild and Scenic designation.

The NH Department of Environmental Services would continue to have primary responsibility, as delegated by the US Environmental Protection Agency, for achieving and maintaining water quality standards.

The State and federal EPA would continue to administer grants and permits under the Clean Water Act. The National Park Service would review such activities to ensure that such permits and grants reflect the intent of this Management Plan. The National Park Service would continue to seek ways for the Town of Epping to upgrade its treatment facility, including support of requests for financial assistance.

Enhancing Water Quality The National Park Service would seek the cooperation of federal agencies, especially the EPA, to alleviate water quality problems. Emphasis would be placed on bolstering implementation of nonpoint source pollution programs in the watershed, resolving known water quality problems, and sponsoring research related to water quality issues.

Instream Flow:

Responsibilities The State of New Hampshire would continue to have primary responsibility for establishing and maintaining protective instream flow conditions as articulated in the NH Rivers Management and Protection Act. The National Park Service has no authority to supersede or otherwise overrule the State's jurisdiction in this regard.

The Park Service would review and comment on all water resource development projects on or affecting the designated segment that require federal funds or federal permits to ensure their compatibility with the maintenance of flows adequate to support the outstanding resources of the Lamprey. Such review would include permits issued by the Army Corps of Engineers for dredge and fill permitted under Section 404 of the Clean Water Act.

Wiswall Dam The responsibility for operation of the Wiswall Dam to maintain flow

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conditions would remain with the Town of Durham. Since it is an existing facility, the National Park Service would have no review authority over the operation of the Town's water system or intake structure. Further, the National Park Service would recognize the municipal withdrawals from the Lamprey, together with the continued maintenance and operation of the dam and appurtenant facilities in their present capacities, size, and location, as compatible with designation into the Wild and Scenic Rivers System. It is the responsibility of the State and Town to make sure that the operation of the dam maintains adequate flows downstream of the dam.

As recommended in this Plan, the NPS in cooperation with State and private partners, would seek funding for a fish ladder at the dam as a river enhancement initiative associated with designation. Any such initiative would require the Town of Durham's cooperation, and the Town would be under no financial obligation. The National Park Service and its partners would assume responsibility for funding a fish ladder initiated as a result of designation.

Federal Water Resource Development Projects:

Any water resource development project funded, permitted, undertaken, or otherwise assisted by a federal agency would be subject to review by the National Park Service to ensure no direct and adverse effect on the designated segment of the Lamprey River or its outstanding natural and cultural values. The establishment of such a long-term water resources policy for all federal agencies is central to the purposes of the Wild and Scenic Rivers Act.

The NPS review of such projects would be conducted in consultation with affected communities, the State, and the Lamprey River Advisory Committee.

Hydroelectric Development:

On the Designated Segment Hydroelectric development projects on the designated river segment, including the pending project at the Wiswall Dam in Durham, would be prohibited under the terms of the federal Wild and Scenic

Rivers Act. This prohibition would serve to protect the Town of Durham's water rights at the Wiswall Dam.

Above or Below the Designated Segment New hydroelectric projects above or below the segment would need to comply with the general provisions for federally assisted water resource development projects, namely, that they create no direct and adverse effect on the designated segment or its outstanding natural and cultural features.

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IX. Effects on Ecological, Historic, and Recreational Resources Management from Designation under the Wild and Scenic Rivers Act

This section outlines the support available from the National Park Service (as the representative of the federal government under the Wild and Scenic Rivers Act) if designation of the Lamprey River into the Wild and Scenic Rivers System occurs.

General:

The National Park Service would seek to utilize the national designation to ensure that federal agency actions related to the river were consistent with the goals and objectives of this Plan.

The technical planning resources and financial assistance of the National Park Service would be available for conservation and enhancement projects related to the natural, cultural, and recreational resources highlighted in this Plan, subject to Congressional appropriations and other budgetary constraints. The National Park Service would consider requests for such assistance in coordination with the Lamprey River Advisory Committee.

Ecological Integrity:

The objective of the LRAC is to protect and enhance the ecological integrity of the Lamprey River by promoting research, education, and voluntary land protection to complement enforcement of existing regulations. The National Park Service supports this approach, and would cooperate with all relevant parties in its promotion.

The NPS would support the LRAC's voluntary land protection program as an integral aspect of conserving the Lamprey's special ecological values.

The NPS, in conjunction with the LRAC, the NH Natural Heritage Inventory, and The Nature Conservancy, would explore avenues for continuing ecological research and monitoring conducted through the Wild and Scenic River study.

Historical and Archaeological Resources:

The National Park Service would support the efforts of the LRAC to research, protect, and interpret the historical and archaeological aspects of the Lamprey River. The NPS has substantial expertise and experience in such areas, and would consider requests for technical and other assistance.

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Public Enjoyment:

The National Park Service supports the LRAC's goals for recreational use and development as articulated in this Plan. The NPS would not promote recreational use of the Lamprey which exceeds the scope of this Plan, and would work to ensure that uses are compatible with and sensitive to the river's outstanding natural and cultural resources and to the river's inherent limitations for recreational use.

All recreational uses of the river area, including hunting, fishing, trapping, snowmobiling, boating, and other such uses would be unaffected by national designation, and would continue to be managed according to existing state and local authorities.

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B. Designation under the National Wild and Scenic Rivers Act

Purposes The broad purposes of national designation on the Lamprey are to 1) establish federal policies for the watercourse which ensure that federal actions are consistent with the river protection goals of this Plan and 2) provide for financial and technical assistance of the National Park Service in implementing this Lamprey River Management Plan.

Administrative Structure The existing structure established through State designation of the Lamprey River under the RMPP satisfies the requirements of the national program for administering the designated river segment. The National Park Service would coordinate its responsibility to ensure federal agency consistency with the Lamprey River Advisory Committee. The LRAC would be the focal point for communication and coordination among local communities, the State, and the National Park Service, effectively continuing the cooperative approach established over the past several years.

Designation Process The Congressional designation process requires enactment of a designation bill specific to each new river segment. This bill is an amendment to the broader Wild and Scenic Rivers Act and contains provisions tailored to the river segment in question. For the Lamprey, the bill would identify this Plan as the management plan for the river and would establish the LRAC as the official advisory body to the NPS.

In the event that local communities express a desire to move forward with a national designation based on the principles laid out in this Management Plan, the National Park Service will work with the LRAC, community officials, and the NH Congressional delegation to draft an amendment to the Wild and Scenic Rivers Act designating the Lamprey. No designation will proceed without the express approval of town officials for the provisions of the designation bill and Management Plan.

National Park Service Role The National Park Service would have two distinct roles under the federal designation: 1) to review "federally assisted water resources projects on or directly affecting" the designated river segment to ensure their compatibility with this Management Plan and 2) to provide technical planning and financial assistance for implementation of the Plan and its recommendations.

National Park Service authority for the review of federally assisted water resource projects derives from Section 7 of the Wild and Scenic Rivers Act, which states:

No department or agency of the United States shall assist by loan, grant, license, or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary [of the Interior] charged with its administration.

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Section 7 is the only Section which confers "regulatory" oversight to the National Park Service, which serves as the representative of the Secretary of the Interior under this Act.

Limitations of National Designation:

Land Use Management The Wild and Scenic Rivers Act confers no authority to the National Park Service to manage, regulate, zone, or otherwise restrict the use of nonfederal lands. Management and use of lands adjacent to the river would continue to be the responsibility of landowners subject to existing state and local regulations.

Land Acquisition The National Park Service would not own or manage any lands along the river and would not support condemnation of land along the river. Federal funds could be made available to land trusts and local communities through designation for the purchase of lands or conservation easements that advance the purposes for which the river was designated (particularly ecological, archaeological, fisheries protection). The NPS would consider providing funds subject to the following conditions:

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

Permits No new state or federal permits would be required as a result of national designation. Local permitting processes would be unaffected.

Appendix B: Land Protection Priority Ranking Sheets

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
 - NH Coastal Watershed
 - NH Wildlife Action Plan
 - town master plan
 - 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
 - scenic value
 - wildlife habitat
 - natural communities or rare, threatened, or endangered species
 - cultural, archaeological, or historical features
 - 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 Project Review Subcommittee Process Worksheet

project name _____

town _____

DES # _____

summary _____

date notice rec'd _____ date complete package rec'd _____

date comments are due (generally, DES receipt date + 40 days, but other times might apply) _____

applicant name _____

address _____

phone _____ e-mail _____

permits being applied for:

_____ alteration of terrain

_____ wetlands

_____ shoreland protection

_____ dredge and fill

_____ other _____

application package completeness:

_____ cover letter to DES including DES #

_____ DES application and checklist

_____ site plans

_____ operation and maintenance plans

_____ stormwater plans

site questions (check if yes, explain if no)

_____ distance from river _____

_____ elevation above river _____

_____ lot area _____

_____ area to be developed _____

_____ Within source water protection area? _____

_____ Public access? _____

_____ Consistent with nearby development? _____

_____ Steep slopes near project? _____

wildlife and ecology

List threatened species potentially impacted and how. _____

Does the site appear on high value wildlife protection area map? yes no

Explain _____

Does site provide significant wildlife movement? _____

wetlands (Check if yes, explain if no.)

_____ Prime wetlands on site?

_____ Planned buffers for wetlands? Distance? _____

_____ Does buffer meet town regulations? Distance? _____

How are wetlands protected during construction? _____

How are wetlands protected post-construction? _____

water quality

What erosion control measures will exist during construction? _____

What erosion control measures will exist post-construction? _____

If project will not be on town sewer, is septic system design adequate? _____

Will run-off be the same pre-construction and post-construction? _____

How will infiltration be enhanced? _____

Do catch basins have "T" or "elbow" orifices to trap debris and oils? _____

What if any measures will be taken to reduce impervious surface? _____

How many storm drains will empty directly to a river or wetland? _____

historic, scenic, and recreational resources:

Describe any significant historical resources nearby. _____

Describe recreational resources and how they might be affected. _____

How will project affect scenic or other special features of the area? _____

other

date letter sent _____

list recipients of letter: DES _____ conservation com _____ planning bd. _____

developer (engineer) _____ NHRMPP coordinator _____
