

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 NH Water Resources Research Center at 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. Using Federal Clean Water Act criteria, 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 to the number of violations, the Lamprey also had the worst dissolved oxygen readings. Without sufficient dissolved oxygen, fisheries and shellfisheries are severely strained. This impairment represents a major threat to the health of the river.

Low dissolved oxygen is often correlated with excessive nutrients and algae. In the tidal portion of the Lamprey, the dissolved oxygen problem is partially due to discharges of treated sewage from the Newmarket waste water treatment facility. To address these problems, Newmarket's most recent waste water treatment permit significantly limits the amount of nutrients (nitrogen) that can be discharged to the river. Reduction of nutrients from other non-point sources (fertilizers, septic systems, and stormwater runoff) throughout the river's drainage area will also help improve the water in the Lamprey River.

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.

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

- 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.
- Road salt applied to roads and parking lots dissolves in water. This salty water runs off directly into streams and can also contaminate groundwater. Salt is toxic to fresh water animals and can be harmful to humans, especially those with high blood pressure. Salt is not removed by any stormwater treatment system or by natural vegetation. Every effort should be made to reduce the amount of salt currently applied and to use only what is needed to ensure safe roads.
- 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.
- 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.

Conventional 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. While some towns or sections of towns 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 draining to Great Bay, 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 centralized waste water treatment facilities, might not understand the difference. Failed and poorly maintained 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 New Hampshire’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 to determine whether the water is improving or worsening over time.

- 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 nutrient pollution sources, particularly in any “hot spots” along the Lamprey Rivers that may be identified in the Great Bay Nitrogen Sources and Transport project (2010-2014).
 - 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 or leaking 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 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.