

Dams of the Lower Lamprey River Watershed

in the towns of Newmarket, Durham, Lee and Epping



Macallen Dam, Newmarket, NH

Small Grant Project Completed by the
Lamprey River Watershed Association

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Project: Dams of the Lower Lamprey River Watershed
Newmarket, Durham, Lee and Epping

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Project Purpose

The importance of free flowing rivers has been well documented and has been promoted in New Hampshire and nationwide for many years. The State of New Hampshire removed the Bunker Dam in West Epping in 2011 to restore the Lamprey River in that section to a free flowing river and to avoid maintenance and repair costs. In early 2012, the Wiswall Dam in Durham had a newly constructed fish ladder allowing river herring to pass for the first time since a dam was constructed on this site over 250 years ago. What other dams could be removed or modified to allow for fish passage into additional miles of river for extended habitat of fresh water fish and for the migration of diadromous fish?

The State of New Hampshire's Dam Bureau maintains a list of all dams in the state. According to the list that Lamprey River Watershed Association has available from several years ago, approximately 38 dams are located in the four towns of the Wild and Scenic section of the Lamprey River watershed. They range in height from 2 feet to 27 feet. Some are in ruins, some are active, and most are privately owned. Would the owners be receptive to changes in their dams to allow for greater fish migration? What modifications would be required for some of the dams to allow for fish passage? Where are these dams and how does one get to them? All of these are questions were answered by this project conducted by the LRWA.

This project provides additional information about the dams in the four town area beyond what is available from the NH Dam Bureau spreadsheet. The additional information gathered is intended to provide the Lamprey Rivers Advisory Committee and the Lamprey River Watershed Association with a better understanding of the potential for additional miles of fresh water habitat that is or could be available for fish migration in the Lamprey River system.

Procedure

- Obtain a current list of dams as listed by the State of New Hampshire Dams Bureau.
- Develop a field assessment sheet to prepare to gather information about each dam on the NH Dam Bureau list in the towns of Newmarket, Durham, Lee and Epping.
- Use the latitude and longitude data provided by the state, develop maps of each dam to enable a site visit, and assess topographic surroundings.
- Seek permission of dam owners when necessary.
- Visit, photograph, and assess each of the 38 dams on the list were for restoration potential.
- Prepare an information sheet for each of the dams.

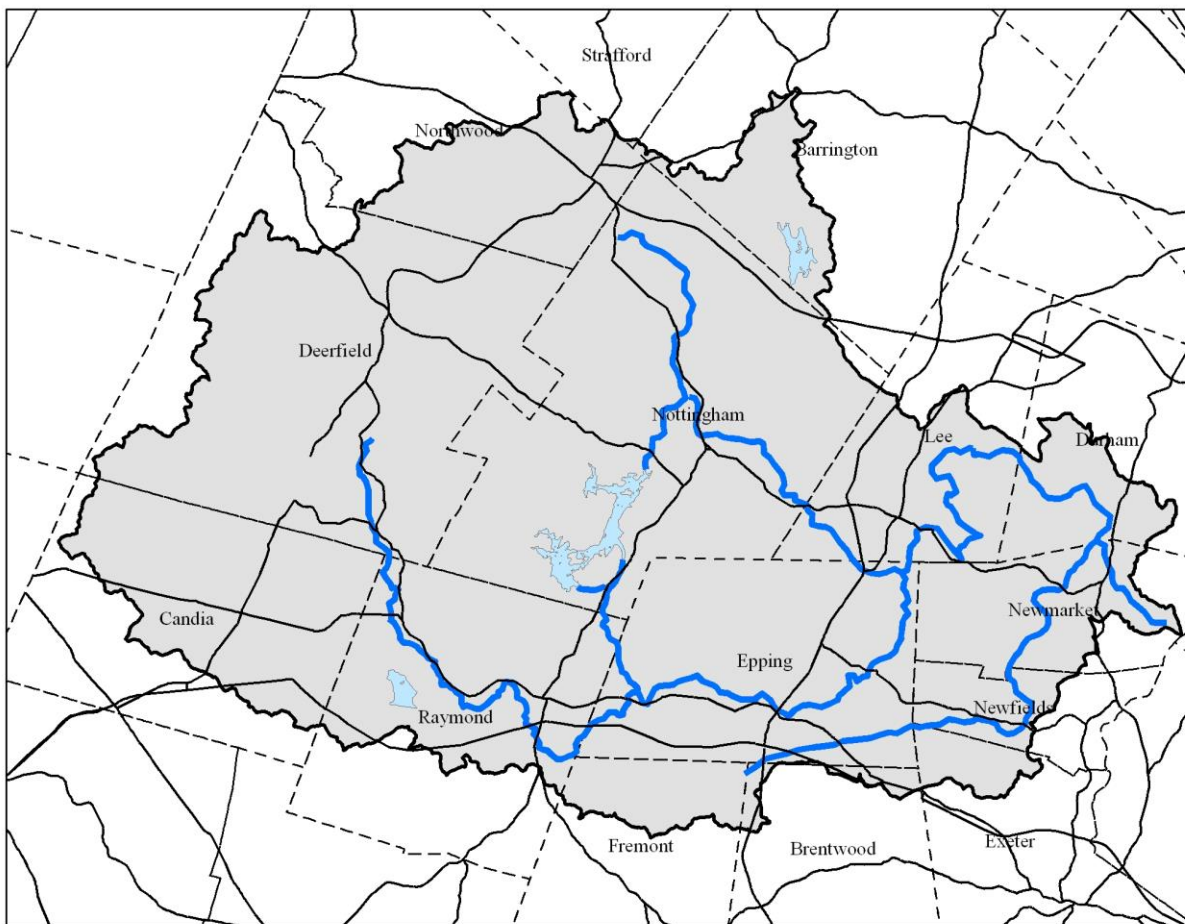
Limits of This Project

The purpose of this project was to identify the potential for one or more dams to be removed or modified to provide wildlife benefits. This project does not speculate on the structural integrity of the dams visited or any recommended changes to the hazard class. This project does recommend some changes to the "Status" of some dams visited. This project did not attempt to verify dam ownership or seek decisions at this time by dam owners whether to remove or alter a dam or not. The potential sites identified will require further investigation. Future projects will engage a wider variety of partners and provide an opportunity for public participation to promote the project and create awareness.

Restoration Potential for Dams of the Towns of Newmarket, Durham, Lee and Epping

The opening of the fish passage at Wiswall Dam in Durham has sparked greater interest in opening up more of the Lamprey River watershed to fish habitat. The increasing returns of river herring in the Lamprey River while other rivers continue to see decline gives hope that the waters of the Lamprey River are of higher quality and that there is suitable habitat. The year 2012 saw record returns of river herring with over 90,000 passing through the fish ladder at the Macallen Dam in Newmarket. American eel can be found throughout the watershed but their abundance is largely below the Wiswall Dam.

Using the list provided by the State of New Hampshire Dam Bureau, the 38 dams listed would seem to present major barriers to migrating fish in the lower Lamprey River watershed. However, through site visits and studying the river and stream systems where these dams are found, few are actually impeding the migration and habitat extent for most fish species – at least in the lower four towns of the watershed.



This project focused on the dams in Newmarket, Durham, Lee and Epping.

Lower Lamprey River – Macallen Dam in Newmarket to Wadleigh Falls in Lee

The lower portion of the Lamprey River has long stretches of slow moving waters in wide, deep river habitat and occasional ledge and short rapids. The lower gradient, slower flowing sections tend to support sunfish species, golden shiners, largemouth bass, and other warmwater species that avoid faster flowing water. The higher gradient riffle habitat with cobble and boulder substrate contains species such as longnose dace, fallfish, margined madtom and juvenile white suckers according to NH Fish and Game. Diadromous fish are most abundant in this lower-most section of the river.

According to a recent fish survey report by NH Fish and Game, the sites with the greatest number of fish were found in wide, shallow sections of the Lamprey River and its larger tributaries. Species including common shiner, fallfish, and longnose dace were extremely abundant in the shallow pools and riffles formed by boulders, cobble, and ledges. Three such sites, one below the Bunker Pond Dam in Epping before its removal, one downstream from Lee Hook Road, and one below the Wiswall Dam, accounted for over 30% of all fish counted in the survey. Most of the mainstem river in the middle and lower Lamprey River subwatersheds is too deep for electrofishing. Shallow, rocky sections of river provide important habitat for fish like longnose dace that prefer turbulent water and depend on spaces between rocks and boulders for shelter.

Dams in order from downstream to upstream (Tributary dams are indented.)

- 177.01 Macallen Dam, Newmarket
 - 071.34 Recreation Pond Dam, Durham
 - 071.37 Detention Pond, Durham
 - 071.36 Stagecoach Farm Pond Dam, Durham
- 071.05 Packers Falls Dam, Durham
 - 071.22 Farm Pond Dam, Durham
 - 071.21 Farm Pond Dam, Durham
 - 071.28 Samuels Dam, Durham
- 071.04 Wiswall Dam, Durham
 - 071.18 Wildlife Pond Dam, Durham
- 135.01 Lamprey River I Dam, Lee
 - 135.07 Recreation Pond, Lee
- 135.02 Wadleigh Falls Dam, Lee

Of the above dams, modification of Wadleigh Falls Dam would provide the greatest benefit to increasing fish passage. All of the others are either breached, in ruins, or are in side drainages that offer no or very little habitat above the dam and would, therefore, provide an insignificant benefit if removed.

Middle Lamprey River – above Wadleigh Falls to former Bunker Pond Dam

This section of the Lamprey is similar to the lower section in that it has slow moving waters interspersed with short rapids or riffles. The river is less wide and contains deep pockets and shallow sand bars and gravel substrate. Undercut banks, fallen trees, and overhanging shrubs provide cover for fish and other aquatic species. Many of the same species found in the lower Lamprey are also found in the middle Lamprey and include sunfish species, golden shiners, largemouth bass, longnose dace, fallfish, margined madtom, and juvenile white suckers.

The most significant tributary in this section of the river is Rum Brook which offers excellent cold water habitat for brook trout. There are no dams on Rum Brook.

Dams of the Middle Lamprey (Tributary dams are indented.)

- 078.03 Farm Pond Dam, Epping
- 078.05 Melling Glen Woodlands Detention Pond
- 078.09 Picard Detention Pond Dam, Epping
- 078.01 Lamprey River Town Dam, Epping
- 078.06 Bytne Dam, Epping
- 078.07 Hoar Pond, Epping
- 078.11 GCF Realty Trust Detention Pond Dam, Epping
- 078.10 GCF Realty Trust Pond Dam, Epping

The only dam on the main stem of the Lamprey is the Lamprey River Town Dam in downtown Epping. The rest are on side streams, many that are intermittent and unnamed. These dams are either in ruins, breached, or offer no additional miles of upstream habitat if removed. Melling Glen Woodlands Detention Pond and Picard Detention Pond are serving a stormwater function.

North River – Lee, Nottingham, Epping

The North River and some of its small tributaries offer some of the best brook trout habitat in the watershed. This river system offers small streams with multiple wetlands, relatively undisturbed land areas, and intermittent streams. Beaver activity is abundant. Banded sunfish and redbfin pickerel use this habitat.

Dams of the North River – Lee and Epping

- 135.03 North River Dam, Lee
- 078.04 Farm Pond Dam, Epping
- 135.15 Hoey Wildlife Pond Dam, Lee
- 078.08 Thomas Recreation Pond Dam, Epping

The North River Dam is in such ruins that detecting where the structure once existed is difficult. Fish are able to pass this rocky ledge section of the river. The three dams not directly on the North River lead to Rollins Brook which is one of the cold water streams identified by NH Fish and Game as habitat to protect. Farm Pond Dam is in a hayfield with no stream above it. The Hoey Wildlife Pond Dam also serves as the access over a wide wetlands area to the owner's house. The dam will not be removed. The Thomas Recreation Pond Dam creates a small pond used for scenic beauty by the landowner. The small granite spillway area is kept free of beaver activity and the pond has become more shallow and vegetated over time. The rocky approach to the small spillway might be passable by fish as it is. Removal would provide only minimal benefit.

Little River in Lee

The only dam on this list from the NH Dam Bureau is the Thompson Little River Dam located about ¾ mile upriver from the confluence with the Lamprey River off Tuttle Road in Lee. This dam has already been breached, although the state list still has it as active. Recent floods have caused the dam to give way and the river is once again open, providing free flowing habitat without any impoundment.

The major barrier to fish in the Little River is the Nottingham Dam, outside of the scope of this project. The Nottingham Dam on Mill Road in Nottingham was recently rebuilt as a large concrete structure without fish passage. As this was a major expense incurred by the dam owner, a modification is not likely at this time.

Dams of the Little River – in Lee

135.04 Thompson Little River Dam

Piscassic River in Newmarket

The Piscassic River provides some of the best habitat for fish and other wildlife of any tributary in southeastern New Hampshire. The water quality of the Piscassic River is excellent and considered to be “Class A.” Much of the river is inaccessible to people due to extensive wetlands area and few road crossings in the middle section of the river – the western side of Newfields. There is considerable development pressure on this river in the Rte. 125 corridor in Epping. Fish species in this river are similar to those found in the Lower Lamprey.

Dams in the Piscassic River watershed (Tributary dams are indented.)

177.02 Piscassic River Dam, Newmarket

177.08 Conservation Pond, Newmarket

177.14 Fish Holding Pond Dam, Newmarket

177.18 Filion Enterprise Detention Pond Dam, Newmarket

177.09 Wildlife Pond Dam, Newmarket

177.10 Dug Pond Dam, Newmarket

177.12 Dug Pond Dam, Newmarket

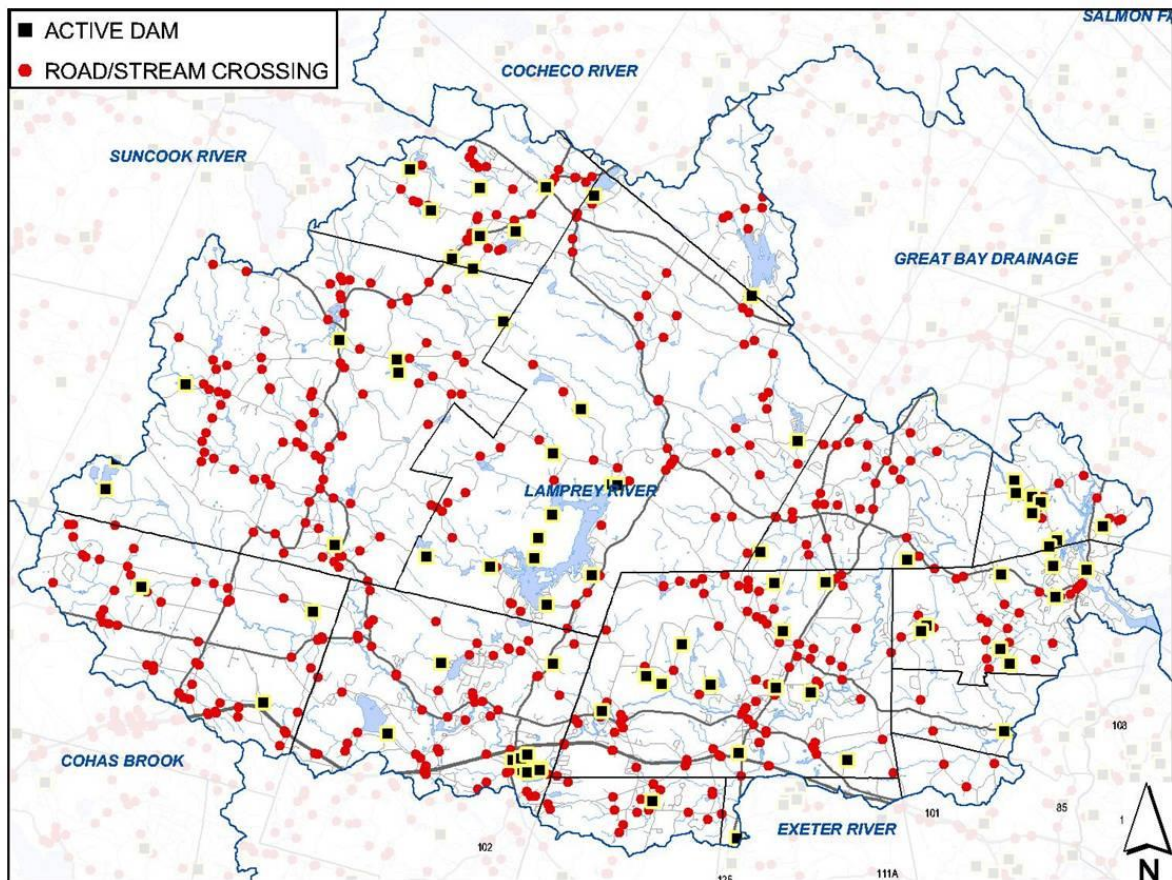
Located at the confluence with the Lamprey River, the Piscassic River Dam in Newmarket poses an immediate barrier for fish to the entire river. Water is held back by this nine foot wall of rock for the Newmarket Public Works and once served as a source of drinking water for the town. A few diadromous fish might be able to pass this dam and continue upstream, but only if the flow conditions are just right.

All of the other dams in Newmarket that lead to the Piscassic River are breached or are dug ponds that are not linked with the tributary network in a manner that is suitable for fish migration. Outlets to road ditches, PVC pipes, and undefined channels are common with these dams.

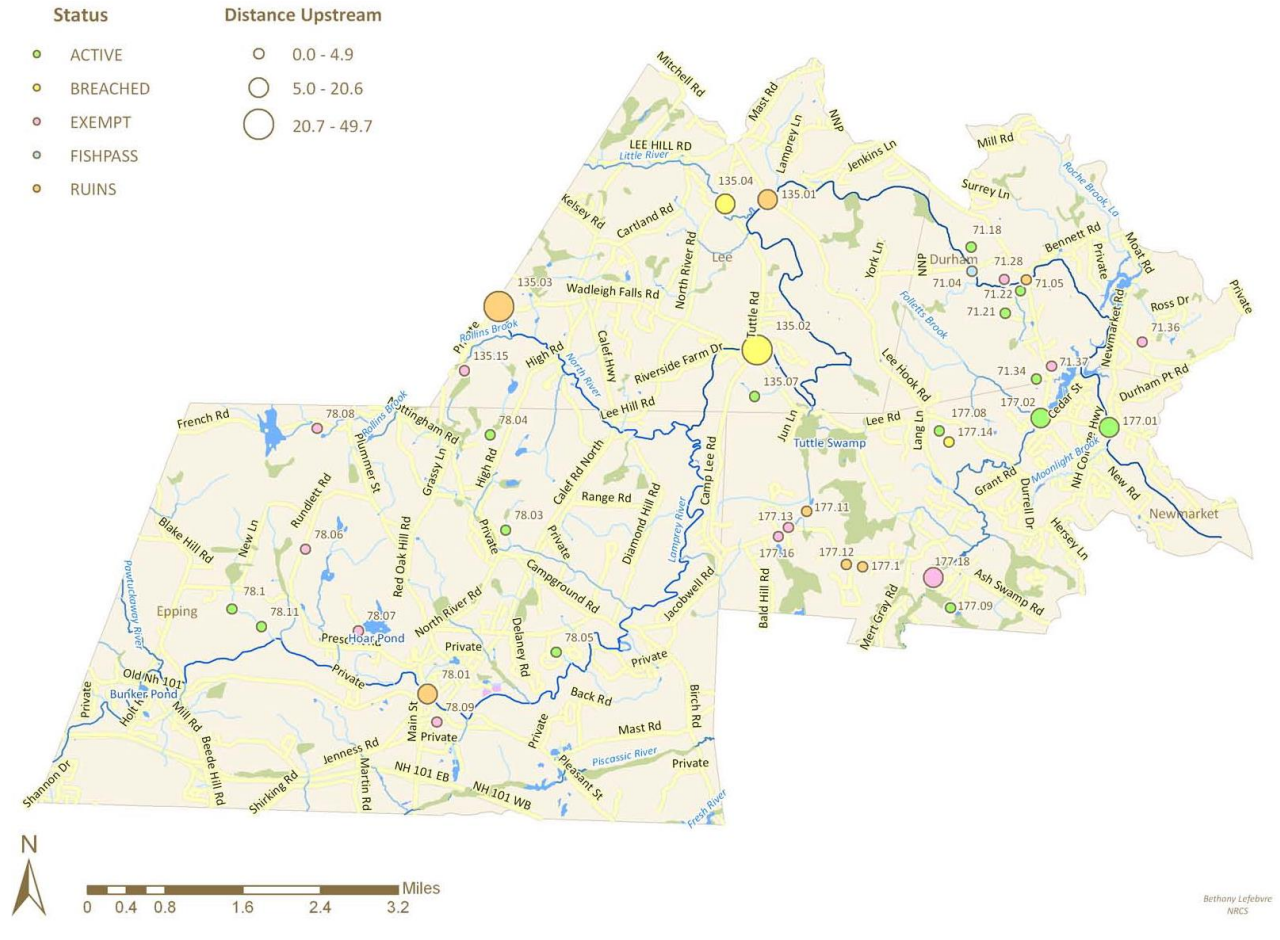
Summary and Recommendation

Many of the dams examined in Newmarket, Durham, Lee, and Epping are either already breached, considered ruins, have been removed, have no headwaters above them, already allow fish passage, or have a purpose for which the dam owner will not consider removal. Only Wadleigh Falls in Lee and the Piscassic Dam in Newmarket seem to be worthy of further investigation for modification to improve fish passage and habitat. Several agencies are already studying what modifications might be done at Wadleigh Falls to allow for more fish passage. Because of the rocks below the Piscassic River Dam, it might be possible to modify this dam to allow for greater passage without removal of the dam itself. Until the study of the Macallen Dam in Newmarket is completed, the town is unlikely to address changes necessary at the Piscassic River Dam.

The best next step for increasing fish habitat in the Lamprey River watershed should be to target road crossings that serve as barriers throughout the watershed and pursue land conservation efforts to protect cold water streams.



Lamprey River Watershed: Potential Dam Removal Sites



Lamprey River Management Plan goals addressed:

Wildlife and Ecology:

- Work with and build upon existing inventories and conservation plans that encompass the Lamprey River watershed
- Restore and protect the ecological functions and values of the lower Lamprey River watershed that are critical to wildlife and humans.

History and Archaeology:

- Continue to research and make accessible to the public the history of the Lamprey River to encourage a deeper appreciation of the river's sense of place.

Recreation:

- Improve and increase non-motorized recreational opportunities on and along the Lamprey River in the four LRAC towns.

Outreach and Education:

- Cultivate stewardship and appreciation for the river by informing and educating the public.