Newsletter Spring 2023

Herring Aid Is Back!

alewife *Alosa psuedoharengus*

Herring Aid will return this spring when the river herring head back from the ocean to their birth places upstream to spawn the next generation. In 2022, over 77,000 fish came back to the Lamprey River.

How many will we see this year?

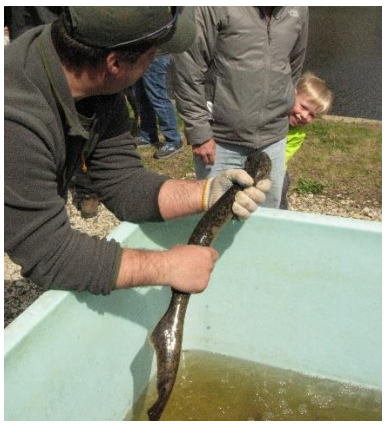
- Witness first-hand the great annual migration of the river herring.
- Ask the biologists all your fishy questions.
- See recently-completed engineered improvements at Macallen Dam, such as the new flood gate, reinforced sidewalls on the south bank, and a spruced-up yard at the NH Fish and Game staging area.
- If you dare… handle the river herring.
- If you are *really* daring, hold a sea lamprey or let baby American eels swim around your fingers.

This event is free and will occur rain or shine.

Date: Saturday, May 20, 10-noon

Location: Macallen Dam, Newmarket, NH

Free parking is available along Route 108 and behind the Newmarket Public Library. Follow the fish signs to the top of the fish ladder.



Scary(?) sea lamprey
Photo by J. Martin

See you there!

Winter Water Woes

While most of the water in the Lamprey River and its tributaries meets Federal Clean Water Act criteria that make it safe for fishing and swimming, we are sad to report that the Lamprey River has faced three serious water issues in the past few months. One has been resolved, but two are on-going.

The first was an oil spill of 250 gallons of home heating fuel in Newmarket harbor. An oil slick was detected in January and the NH Department of Environmental Services (NHDES) quickly deployed oil absorbing mats to contain and remove the oil. The cause was a rupture of an older oil tank in a private home. The oil went down a cellar floor drain and straight to the river. This serves as a reminder to owners of older homes to keep an eye on oil tanks and to ensure that (now illegal) floor drains are sealed. For more information about floor drains, please see this NHDES fact sheet WD-DWGB 22-9 Protecting Groundwater (nh.gov).

The second issue is with the Epping Wastewater Treatment Facility. Recent upgrades to treatment did not work and have resulted in the release of partially treated sewage. ("Partially treated" means that solids are removed, chlorine is added to kill pathological bacteria, and then the water is dechlorinated so that it does not impair the river ecology downstream. Partially treated effluent can still have unacceptably high fecal bacteria.) At the time of installation, the technology behind the upgrades seemed to be good, but the real-world effects of a New Hampshire winter greatly hinder effective treatment. The facility is currently under the control of NHDES personnel. Whenever a release of partially treated effluent is anticipated, the Town of Durham is notified so it can curtail using the Lamprey River as a source of public drinking water. Epping is working to come into compliance with its wastewater permit, including ordering new filters and building a temporary shelter to cover the sewage lagoons to keep them warmer against the cold. In the meantime, NHDES is managing the situation. When temperatures rise as we enter spring, we hope sewage treatment will return to safer levels. If we hear additional news, we will share it.

The third issue is one we have noted before, that water from Moonlight Brook entering the Lamprey River at Schanda Park in Newmarket is heavily contaminated by human fecal bacteria. The cause seems to be a leak in a sewer line that runs under downtown Newmarket. Newmarket and NHDES are aware of the situation. The LRAC will continue funding monthly bacteria tests this summer and will start testing sites upstream to help isolate the source of the contamination.

Remember, while most of the Lamprey River is safe for fishing and swimming, it is not drinking water. Do not drink untreated water. If you get untreated water in your mouth, do not swallow; spit it out and then rinse with fresh water. If you have open sores on your skin, avoid contact with untreated water. Click for more tips on staying safe with water recreation.

Japanese Knotweed and River Bank Erosion

Typical patch of knotweed along a river.
Photo by Lauren Kaehler

In 2021, the LRAC provided funding to Lauren Kaehler who was working on her master's degree thesis in hydrology at UNH. Lauren suspected that Japanese knotweed might be contributing to river bank erosion and wanted to look at this scientifically.

Erosion is a natural process which drives structural change in river systems. It can damage human structures and ecosystems by moving lots of sediment. Large amounts of sediment that are removed can leave an area vulnerable to more erosion, and deposition of large amounts of sediment can bury otherwise productive mussel beds or fish nurseries. Sediment carried by river currents can make the water cloudy and clog fish gills.

Lauren chose to study 26 patches of knotweed along 26 km of the Lamprey River, mostly focused around the urban area of Epping, NH and 50 patches along 21 km of the Sugar River, focused around urban areas of Claremont and Newport, NH. The vegetation type and density were similar between native vegetation patches and knotweed patches. Soil properties and erosional stressors were mostly similar between native and knotweed patches. The rate at which bank sediments become dislodged and carried away by river currents (entrainment) was not the dominant mechanism of bank erosion taking place at the study sites.

Despite the many similarities among the study sites, she did determine that more erosion was recorded on average at knotweed patches than at native patches. Exactly why this is so is not fully understood yet. A possible explanation for the difference between native vegetation and knotweed might be the greater extent of knotweed dieback in winter, which leaves more soil exposed. Where more soil is exposed near a river, knotweed fragments can be dislodged and carried downstream, resulting in even more knotweed.

In the recent past, knotweed was deliberately planted along some river banks to help *prevent* erosion. Knotweed has an extensive root system and it readily spreads, both by seeds and fragmentation. Compared to bare soil, knotweed might, indeed, help to reduce erosion. But compared to native river bank vegetation, knotweed is a poor substitute. We now know that knotweed is a highly invasive, undesirable plant along our

rivers and roadways. It not only out-competes native plants, but it has no value to local wildlife. Once it becomes established, it is nearly impossible to eradicate. Knotweed thrives on disturbed soil. Going forward, we must all be diligent to give native vegetation the opportunity and conditions to thrive and to keep knotweed away.

Click here to view slides of Lauren's results.

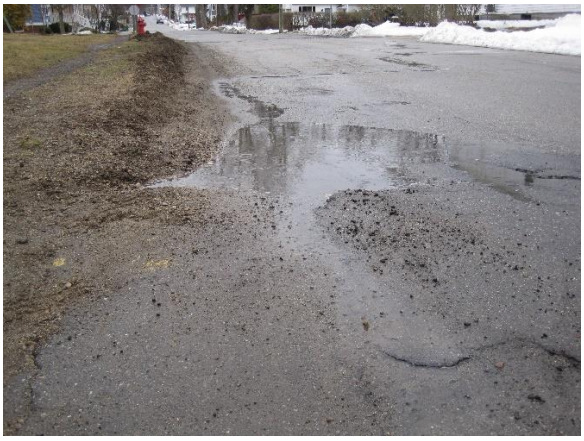
> Don't it always seem to go, that you don't know what you've got 'til it's gone…
> --Joni Mitchell

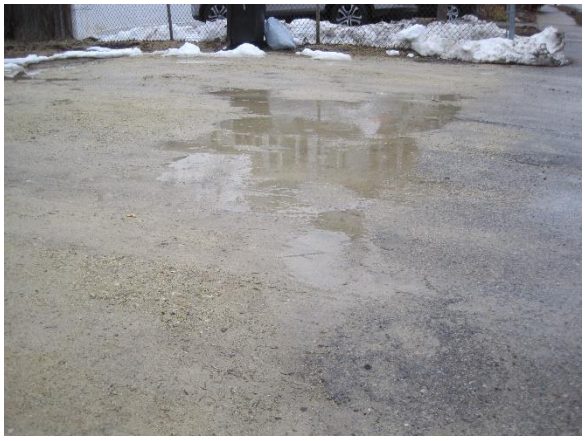
Impervious to Stormwater

One definition of "impervious: not allowing entrance or passage; impenetrable. (Merriam-Webster's Collegiate Dictionary)

In everyday use, "impervious" seems simple enough. "The shed roof looks grungy, but it is impervious to the worst rain and still keeps the equipment nice and dry." "The teacher remained impervious to the children's pleas and assigned a book report that was due on Monday."

Among environmental professionals, impervious has a more refined meaning. It refers to a surface's ability or inability to allow rain or snow to soak into the underlying soil. When local planners talk about the impervious surface area of a housing or commercial development or even a whole town, they are referring to the total area of roofs, sidewalks, and streets and parking areas. These areas do not let rain soak into the ground. Some people might be surprised by this, but even dirt and gravel roads or brick sidewalks essentially do not let rainwater soak in. When rain hits any of these impervious surfaces, puddles begin to develop almost immediately and the rain flows across until it reaches a storm drain or adjacent lawn or natural area.





Streets and dirt driveways do not let rain soak in.

Impervious surfaces not only prevent rainwater from soaking in, they also collect all sorts of undesirable stuff that comes from the sky (sulfur and nitrogen oxides from combustion), vehicles (lubricants, gasoline, anti-freeze, metal dust), pets (poop), and people (cigarette butts, litter, food). When rain hits these particles, they get carried where the water goes. Water that is directed to a storm drain often ends up going to a stream or pond, completely untreated. The stream or pond gets a fast influx of water along with all the nasty stuff that got picked up off the street or sidewalk or roof.

Areas with a high amount of impervious surface/ impervious cover tend to have dirty streams and ponds. Areas with a low amount of impervious surface tend to have cleaner streams and ponds. A 2003 report from the Center for Watershed Protection offered the following general guidelines to city planners and environmental professionals:

- Up to 10% impervious cover, water quality is good, sensitive aquatic species are supported.
- 10-25% cover, water quality declines from good to fair and water is considered impacted.
- 25-60% water quality declines from fair to poor, water is considered non-supporting for aquatic life.
- 60-100% cover, totally non-supporting, poor water quality/ polluted water

The best way to keep water clean when land is developed for human purposes is to build in ways to minimize impervious cover and/or reduce the negative effects of impervious cover. This might mean directing stormwater to areas where it can soak into the soil, such as through a bioretention pond, a rain garden, or tree filter. In an area where heavy equipment won't travel, pervious pavement can be a good solution. (Pervious pavement or concrete looks like regular pavement, but it is porous. When water is poured on it, it soaks in immediately.) Roof water can be collected and directed to an area where the water can soak in. These engineered solutions to impervious cover help water to soak in, but they often do not clean the stormwater as well as a natural area. Furthermore, an infiltration system won't do any good if sediment and litter are allowed to accumulate, so they require regular maintenance. The best way to treat stormwater is to create as little impervious surface as possible and let nature do what is has always done well.

When creating impervious surface is essential, developers who wish to build expansive projects must now prove that they have planned to treat (clean) stormwater and assure state permitters that the amount of surface stormwater leaving the developed site will not exceed the amount of surface stormwater that was leaving the site prior to development. For smaller projects, local planning boards have the ability to make similar requirements for new projects as well as redevelopment of existing sites. Preventing pollution is always easier than cleaning up after a problem arises.