

Recommendation to the Durham Town Council on the Mill Pond Dam

Durham Conservation Commission

January 4, 2021

During the December 28, 2020 meeting, the Durham Conservation Commission voted on the following motion:

The Conservation Commission recommends that the Town Council move forward with Alternative #5 for removal of the Mill Pond Dam as the alternative that will bring about the widest range of environmental benefits.

The motion passed unanimously, with one abstention.

In offering this recommendation, the Commission thanks Town Engineer April Talon and Peter Walker from VHB for providing a clear and concise briefing on the dam feasibility study. The Commission also commends VHB for producing a thorough and informative report on the study.

The study strongly concludes that, in addition to the fiscal, public safety, and other benefits, a number of important environmental benefits are expected to result from removal of the dam. These include, but are not limited to:

- Fish passage – Populations of anadromous or ‘sea-run’ herring (i.e., alewife and blueback herring) have fallen to less than 5% of the abundance seen as recently as the early 1990s. These fish serve a number of important ecological functions, especially as prey for a wide range of natural predators (marine mammals, cod, striped bass, ospreys, bald eagles, and more) and also as upstream vectors of carbon and energy from marine to freshwater ecosystems. They are listed as ‘species of concern’ by the National Marine Fisheries Service and in need of urgent restoration efforts across their range. Other sea-run species that could benefit from unobstructed passage include American eel, sea lamprey, and brook trout.
- Water quality – The Mill Pond dam adversely impacts water quality in several ways. By trapping and concentrating nutrients, the pond is prone to algal blooms. When the algae die off, bacterial decomposition uses up much of the dissolved oxygen in the water, resulting in anoxic or even hypoxic conditions. Impoundments like Mill Pond also contribute to thermal pollution given that water experiencing reduced flow in a shallow area with larger surface area warm more than naturally flowing river waters. This can create sub-optimal temperature conditions for resident species, promote growth of pond-dwelling invasive species, and exacerbate low oxygen conditions given that warm waters hold less dissolved oxygen than cooler waters.
- Sediment transport – An important function of rivers is to move sediment from the watershed to downstream areas, especially coastal marshes that provide habitat, buffer storm surge, and provide other important ecological functions. As effects of climate change increase, enabling marshes to keep pace with rising sea levels and stronger storms will be vital for coastal resilience. Restoring the ability for the river to move sediment will also help recover the natural river channel, for the benefit of resident wildlife and recreational activities.
- Wetland restoration – Wetland habitats are currently distributed in areas upstream of the dam, but many are not the types of wetlands that would naturally be found in the lower reaches of a coastal river. Tidally influenced wetland habitat has been lost by construction of the dam, but can be recovered by its removal. These habitats serve a wide variety of ecological functions, but

are vulnerable by virtue of the narrow range of conditions in which they can establish. Enabling tidal influence to reach further upstream will promote restoration of these vital habitats.

The Commission recognizes that removal of the dam represents a major change for the river and the community, but one with many positive benefits. Such positive changes have been witnessed in the myriad of other communities that have removed dams, including nearby Exeter.

However, removing the dam will not address all of the environmental stressors facing the Oyster River watershed and Great Bay. Therefore, the dam removal should serve as a springboard for expanded watershed-wide environmental stewardship activities. Building from important efforts to protect upstream open space along the river (College Woods, Oyster River Forest) and ongoing active restoration efforts (Japanese Knotweed Project, Wagon Hill Living Shoreline Project), the Town and partners should address a number of other issues. These include, but are not limited to:

- Nutrient inputs – Policies and practices by governments, residents, and other landowners should continually evolve to reduce nutrient inputs, especially from fertilizers, and better manage run-offs to minimize loading into the river.
- Tributary management – Watershed health will not be determined solely by activities along the mainstem of the Oyster River. Tributaries including College Brook, Hammel Brook, Pettee Brook, and others collectively represent significant additional stream habitat and influence the mainstem.
- Additional fish passage – Although the dam represents the first barrier and most significant bottleneck in the system, it is far from the only impediment to the free movement of sea-run and resident fishes. A high priority restoration target should be providing fish passage at the Oyster River Reservoir, at least through installation of a modern fish ladder engineered to contemporary precipitation and flow conditions. Additionally, other barriers (culverts, small dams, etc.) should be prioritized for removal or engineers to maximize habitat connectivity.

The Commission thanks the Town Council for considering our recommendations to improve the ecological health of the Oyster River. We welcome any questions about our position and continued discussion and collaboration moving forward.