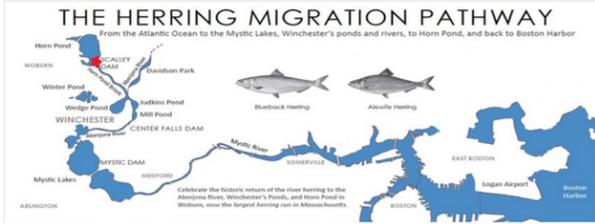


Adapting to Climate Change in Woburn

Restoration and Flood Control at Horn Pond Brook

Flooding is the most common and serious natural hazard in Woburn and is expected to worsen due to climate change. The roads and residences in the vicinity of Horn Pond Brook already experience flooding and building this neighborhood's resiliency is a top priority. Flooding in this area could also harm the local herring migration on the Mystic River, which is one of the largest in the Commonwealth. The City of Woburn is beginning a project to restore Horn Pond Brook, while at the same time aiming to reduce localized flooding and improve fish habitat.



Left: Horn Pond connects to the Mystic River, which are a critical spawning areas for New England Herring populations

Below: Current edge conditions of Horn Pond Brook show a narrow profile and considerable stream bank erosion.



RESTORATION DESIGN OPTIONS

Alternative 1: Limited Improvement

The theme of this alternative is to achieve the project goals while limiting impacts to private properties. The core element of this concept is the widening of the confined portion of Horn Pond Brook (brook) near the streamside apartment parking lot to more natural dimensions. A hybrid stacked stone and bioengineered (vegetation-based) retaining wall is proposed to increase stream width and retain most of the existing parking spaces. Such treatment will reduce flood elevations and in-channel velocities that may limit upstream fish passage.

Pros

- Limited impacts to surrounding private properties
- Lower associated costs of construction because a smaller area is being restored

Cons

- Relies on edge treatment and vegetation growth to reduce in-channel velocity
- Does not provide additional fill for protecting/raising parking lot
- Streambed not fully widened



Alternative 2: Targeted Improvement

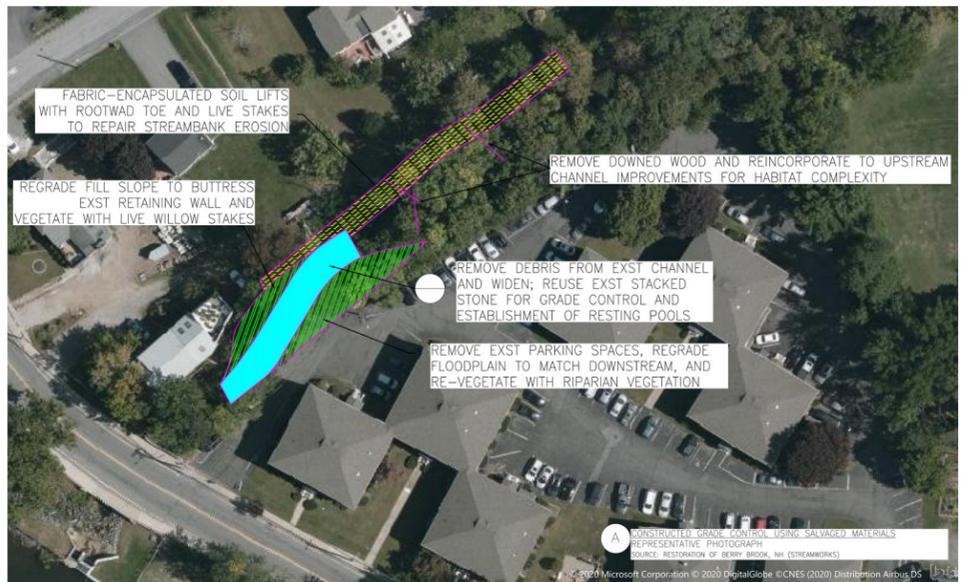
The theme of this alternative is to use nature-based techniques to improve the most impacted portions of the brook. This alternative includes the restoration of the brook to natural dimensions along the streamside apartment parking lot which would require removal of most parking spaces at this location. The widened brook would be stabilized with salvaged blocks that would be arranged to create resting pools for migrating herring.

Pros

- Restoring brook to natural dimensions helps reduce impacts from flooding, erosion, and lowers channel velocity
- Improves herring, fish habitat
- Fabric solution protects from streambank erosion along properties

Cons

- Regraded floodplain requires removing several parking spaces
- Provides near-term flood protection, but may need future retrofitting



Alternative 3: Brook Re-meandering

The theme of this alternative is to prioritize the long-term flood control and habitat benefits of the project; it would also entail the most short-term impacts and impacts to private property. The core element of the alternative includes the restoration of the brook to a natural width and sinuosity.

Pros

- Lowers floodplain reducing flood elevations and risks
- Promotes development of self-sustaining habitat complexity
- Increased connectivity and water quality improvement of watershed
- Provides fill for raising/protecting parking lot in near and long-term from flooding

Cons

- Regraded floodplain requires removing several parking spaces
- Most short-term impacts to private property due to increased restoration footprint
- Larger area of improvement increases construction cost



Partners include the City of Woburn, Weston and Sampson and the Mystic River Watershed Association. This project is funded by the state Municipal Vulnerability Preparedness (MVP) program.