

Municipal Vulnerability Preparedness (MVP) Action Grant: Queensville Dam Removal Feasibility Study & Buttery Brook Watershed Enhancements

This Climate Resiliency Update brought to you by the Planning & Conservation Department



Queensville Dam at Titus Pond

The Town of South Hadley is the proud recipient of a Municipal Vulnerability Preparedness (MVP) Action Grant. This project is exploring the feasibility of removing the Queensville Dam at Titus Pond on Route 116/Newton Street. It also includes feasibility of restoration and ecological enhancement of the Titus Pond impoundment to increase flood storage capacity and habitat function; as well as downstream watershed improvements along Buttery Brook.

A 2018 Phase 1 Dam Inspection showed Queensville Dam to be in poor condition and in need of roughly \$175K in repairs to bring it to a safe condition. The impoundment, Titus Pond, is part of the underutilized Titus Pond Conservation Area that is impaired by significant algal blooms during much of the season. These conditions are expected to worsen as temperatures and precipitation-driven nutrient inputs increase with climate change. The Town is exploring options to better manage this infrastructure, including feasibility of dam removal and restoration of the surrounding ecosystem.

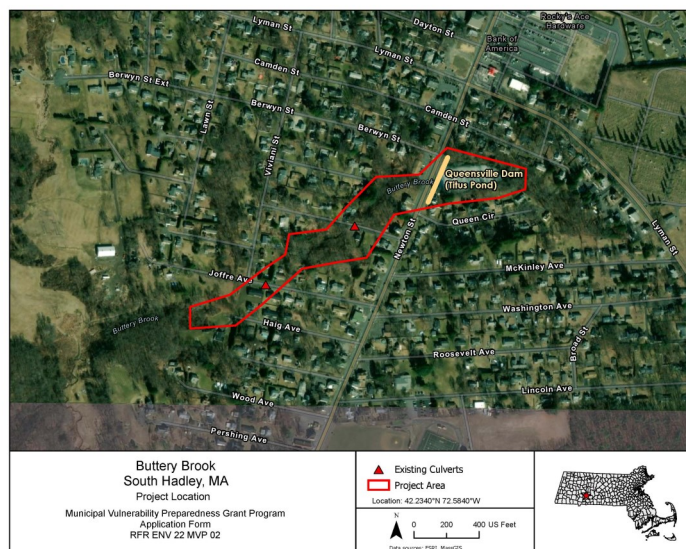
The Buttery Brook watershed is South Hadley's most heavily developed watershed, with a high degree of impervious area and several stretches where the stream runs through underground culverts. Titus Pond is the headwaters of the system, and therefore a natural place to begin work to improve conditions in the watershed and manage upstream stormwater contributions.

Located in Titus Pond Conservation Area, the pond itself is a 1.5 acre water body that is roughly 7 feet deep at its center.



Titus Pond & Buttery Brook make their way through the dense neighborhoods of the South Hadley Falls area before Buttery Brook converges with the Connecticut River.

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Wetland Delineation

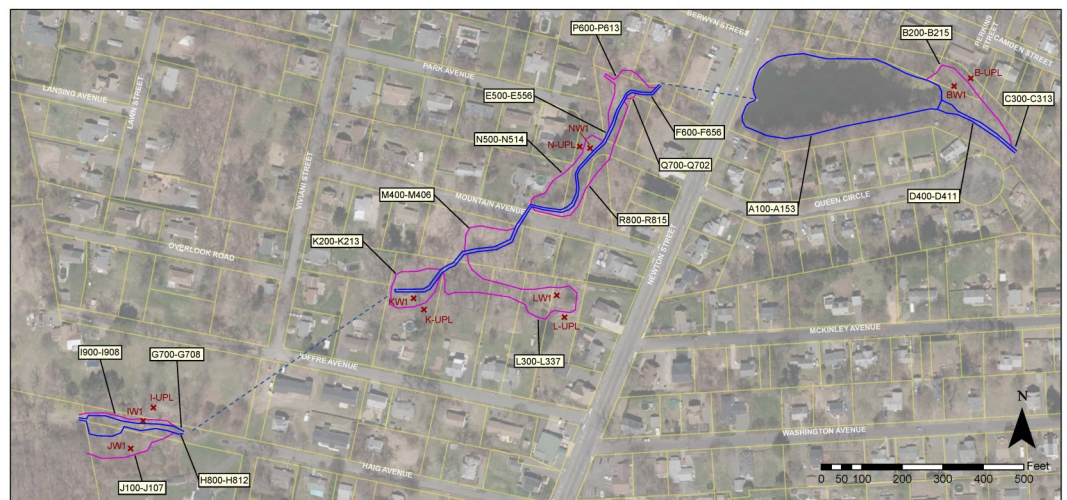
In October 2021, a wetland delineation of Titus Pond was completed, including the area of Buttery Brook below the Queensville Dam impoundment. Just downstream of Titus Pond, Buttery Brook is mapped as an intermittent stream area varying in width between 7' to 16'. Further downstream at the confluence with Judd Brook the stream is identified as perennial. In the project area two segments are buried: immediately downstream of Titus Pond (230') and under Joffre Ave (650'). An intermittent stream flows occasionally, while a perennial stream has constant flow.

Composition of the brook substrate is primarily sand and silt. Flow is moderate to slow with few riffle-pool habitats. Through most of the project area the brook is vegetated, bordered by freshwater forested and scrub-shrub wetlands.

Culverts in this site are perched, clogged, or collapsing making aquatic passage impossible or very unlikely. The downstream road-stream crossings along Buttery Brook were assessed through the Town's FY21 Action Grant, and several of them were identified as high priority for redesign and replacement.



Buttery Brook is culverted in the area of Joffre Ave. This type of man-made influence on a natural water system can lead to flooding of roads, basements, damage to personal property and public utility systems.

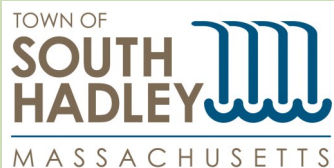


This project is funded by a grant from the Office of Energy and Environmental Affairs.

<p>SKETCH MAP OF INLAND RESOURCE AREAS Titus Pond and Buttery Brook</p> <p>South Hadley Massachusetts</p> <p>Project #: 20170390 v30 November 2021</p> <p> FUSSE & O'NEILL, 1550 Main Street, Suite 400, Springfield, MA 01103 413.452.0445 www.fando.com</p>	<p>LEGEND</p> <p>Flag series and related wetland resource area</p> <p>Bank: A100-A153, C300-C313, D400-D411, E500-E556, F600-F656, G700-G708, H800-H812</p> <p>BWW: I900-I908, J100-J107, K200-K213, L300-L313, M400-M406, N500-N514, P600-P613, Q700-Q702, R800-R815</p> <p>x Sampling plot location</p> <p>- - - Buried segment of Buttery Brook</p> <p><small>Wetland resource areas depicted in this sketch were identified and delineated in the field by Michael E. Soares, Wetlands Scientist (Fuss & O'Neill) on October 18 and 21, 2021</small></p>
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Sediment Quality and Depth Assessment

Soil borings were conducted in Fall 2021 to evaluate quality of the impounded sediments in Titus Pond that would potentially be mobilized as a result of dam removal and spread contaminants downstream.

Three soil borings were taken along Transect #1 across the middle of Titus Pond.



View of northern sediment core located at Transect 1.



View of center sediment core located at Transect 1.



View of southern sediment core located at Transect 1.

Three sediment boring samples were taken at north, center, and south points along one Transect. The general subsurface conditions as observed in the

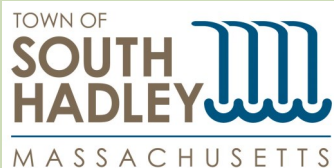


borings included organic silt which was observed to be underlain by a native horizon consisting of sandy silt and/or fine sands. The borings observed consisted of a shallow horizon of sediment of approximately a foot in thickness. Results were below thresholds of applicable sediment standards for contaminants. The full results are available in the "Sediment Quality Memo" on the Climate Change Resiliency & Preparedness webpage.

The scour potential of these sediments and the approximate volumes of scour prone sediments helps determine the most appropriate sediment management measure to be recommended for this project. Based upon current knowledge of sediment quality, if the dam was to be removed the recommendation is that any sediment that needs to be dredged and/or excavated based on the forthcoming scour analysis be reused as fill material in an upland portion of the site.

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“Buttery Brook Under Our Feet”

A temporary art installation in South Hadley Falls

The intent of this art installation (Spring 2022) to help bring awareness to the Buttery Brook Watershed and the efforts underway to restore it. The goal of the project is to help connect residents to our local waterways and to raise awareness about how the choices we make can impact the health of our waterways.

This temporary art installation will be a design painted on the road in the area of Buttery Brook on Main Street in South Hadley Falls where the brook is culverted through the historic heart of South Hadley. This installation will be temporary, to be installed along Main Street prior to an upcoming roadway improvement project.

It is envisioned to promote community engagement and discussion about watershed health and the feasibility of daylighting sections of Buttery Brook and removing the Queensville Dam at Titus Pond, particularly as they relate to the Town's ongoing efforts to revitalize South Hadley Falls.

A call to artists for project proposals was extended to the greater community this past fall. The artist selected is Simone Germain. She is a freelance artist who specializes in custom artwork, and has completed mural paintings in several communities. Actual design to be finalized before installation.



Artist: Simone Germain

This project is funded by a grant from the Office of Energy and Environmental Affairs.

Look for this street art later this spring!