



Fisherville Mill Canal Restoration Pilot



Interior of the greenhouse with aquatic cells on the left and the mycelial loop on the right

Background & Design

The Fisherville Mill was built in Grafton, Massachusetts in 1832 along the historic Blackstone River Corridor, the geographic heart of American manufacturing during the Industrial Revolution. This site was developed along an 1820's canal-way which connected Worcester, Massachusetts to Providence, Rhode Island. Cotton goods, fabrics, aluminum goods, metal parts and foam rubber were all manufactured at the mill during 170 years of continuous operation. The history of this site tells the history of American manufacturing. The canal's sediments and polluted waters also tell this story and reveal the legacy of 170 years of industrial use and contamination. In 1977, the EPA determined that heating oil from two underground storage tanks installed on site was leaking into the soil. During rain events oil was being flushed into the canal. In 1999, the mill building burned to the ground in a massive fire. The fire released dangerous plumes of airborne asbestos and a suite of pollutants, heavy metals and contaminants into the canal and groundwaters.

After the fire the site was purchased by Fisherville Redevelopment Corporation and underwent an extensive EPA cleanup effort. In May of 2012 the Town of Grafton received a grant from the EPA to install an Eco-Machine to pilot ongoing restoration of the canal. The system is designed to process legacy contaminants remaining within the canal and entering the canal from contaminated bank soils. The Canal Restoration Pilot is designed to provide a low cost, largely passive alternative to expensive and problematic hazard clean up solutions like the removal and disposal of contaminated material.



Treatment Process

The ecological treatment installation consists of four interlinking technologies: a greenhouse with solar aquatic tanks and a mycelial loop, a floating plant raft anchored in the canal and a sediment intake structure. Water passes in a continuous loop from the canal through the greenhouse and back into the canal. The system provides a large number of beneficial organisms to the canal on a year round basis. It functions as an ecological incubator and chemostat providing a sufficient density of life forms to digest oils and contaminants and transform the canal back into a healthier state. Since its installation in 2012 water quality has visually improved, amphibians have returned to the canal and turtles can be seen sunning themselves along the upstream oil booms. Since its commissioning in the summer of 2012 the Eco-Machine at Grafton has treated over 300,000 gallons of petroleum-contaminated waters and sediment.



The system's canal restorer in full bloom.

The JTED system demonstrated a “significant reduction of petroleum hydrocarbons in the contaminated canal waters passing through the Canal Restorer Eco-Machine... Downward trends in both storm-water nutrients and petroleum hydrocarbons were observed. The reduction of Total Petroleum Hydrocarbons in the Eco-Machine proved definitive, with over a 90% reduction throughout most of the test period.”ⁱ



Today JTED is eager to build on this success through working to refine these techniques and expand the project to restore impoundments and degraded water along the entire length of the Blackstone River and its adjoining canals. We are seeking partners and support to help in this mission and have begun joining with local universities to create an educational consortium capable of sustaining and learning from this important work.

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ⁱ (Todd, J., et al. *Grafton Canal Restorer Eco-Machine: Water Quality and Contaminated Sediment Biological Restoration Systems Final Report*).