

# PALGRAVE FISH HABITAT RESTORATION PROJECT



## PROJECT GOAL

An historic dam is situated on the Humber River in the community of Palgrave with the Mill Pond being formed upstream of the dam. Dams have an important historical value to the local communities that were built around them. Unfortunately, dams and the online ponds that they create can significantly degrade river ecosystems. The challenge then, is to balance the values placed on history, heritage, and recreation with those placed on conservation and restoring our natural environment.

The goal of this project was to mitigate the impacts of the Palgrave Dam on the Humber River's fishery. Improving the water quality and fish habitat in headwater areas will ultimately be reflected in the increased health of the fish community downstream.

## THE NEED

The Palgrave Dam is situated in the headwaters of the main Humber River. This area is a designated cold water stream and can support resident populations of Brook Trout and Brown Trout. The dam posed a threat to both upstream and downstream cold water fish habitat.

Water temperatures in the Mill Pond can rise above 28°C, which results in warming temperatures downstream of the pond as well. This dramatic

increase in water temperature can significantly affect the survival of cold water fish species. Brook Trout have an upper water temperature limit of around 20°C, while Rainbow Trout and Brown Trout have an upper limit of approximately 24°C. The warm pond water also has low dissolved oxygen, which is a problem because trout species thrive in conditions with high oxygen content. Another problem with the pond is that sediment becomes trapped as faster moving water upstream slows within the pond, allowing fine silt particles to settle out. River systems need to transport sediment, and this transport is being impeded by the dam. This results in increased erosion of the river and its floodplain downstream. Finally, the dam itself acts as a physical barrier to the movement of fish upstream. Species such as Brook Trout and Brown Trout need to migrate upstream to appropriate headwater habitat to successfully spawn each year.

## ACCOMPLISHMENTS

Background information was collected including: water temperature, water depth, fish community, invertebrates present, and stream flow data. Based on this information, options to reduce the negative effects of Palgrave Dam were identified and ranked in order of preference:

- dam removal with creation of an offline pond,
- a bottom draw conversion (cold water from the bottom of the pond flows over the dam instead of the warm surface water)
- construction of sediment bypass pipe,
- dam removal with creation of a meadow where the pond now exists,
- re-routing portion of stream by creating a bypass channel,
- construction of a fish ladder to allow for upstream fish passage,
- do nothing.

During the public consultation phase, the significant cultural and historical importance of the dam to the community was made clear so, a compromise was developed using public input. Ultimately, the Palgrave Dam and Mill Pond were left in place. A bypass channel was constructed around the dam itself

to allow for the upstream passage of fish. The online pond still exists today, and therefore, the water quality impacts are still felt downstream. The pond was dredged in the hopes that a deeper pond would have less of a temperature impact on the river, however, since that time additional sediment has continued to deposit in the pond.

The Toronto and Region Conservation Authority (TRCA) commissioned the design for the by pass channel from the consultant company Aquafor-Beech. The TRCA have also taken the lead on follow up monitoring to gauge the effectiveness of the by pass channel in allowing fish species to pass upstream.

## **PARTNERS**

This project was initiated by Ontario Streams, but represents the combined effort of many stakeholders, public interest groups, and government agencies including: the Ontario Ministry of Natural Resources and Forestry, Toronto and Region Conservation Authority, Environment Canada, Fisheries and Oceans Canada, Ontario Federation of Anglers and Hunters, TD Friends of the Environment, and the Izaak Walton Fly Fishing Club.