

Water Quantity & the Mill River Watershed

Like most river systems in the Northeast, water quantity is an issue in the Mill River watershed. Changes in land use affect water quantity, but in the Mill River watershed the major influence is the withdrawal of water from the four major reservoirs: Ryan Reservoir and West Whately Reservoir, which supply Northampton's water; Roaring Brook Reservoir, which meets South Deerfield's water needs; and the Hatfield Reservoir, which serves portions of Hatfield. At present more than 2 million gallons a day are taken from the Mill River watershed. What has the long-term impact been on the animals and plants living downstream? Although we all realize that people and businesses need water, it's important to look carefully at water use and ask ourselves--how can we reduce our water demands? What kinds of technological solutions are available that would decrease water consumption at commercial and industrial facilities? Can we implement conservation measures at residential properties and local schools? Are there leaky pipes in the water distribution system that can be fixed? Beyond asking the questions, we need to implement some of these ideas before additional water is allowed to be drawn from the reservoirs. Many conservation measures, like not washing your driveway or overwatering your lawn, are simple and inexpensive. And when people work together, these simple steps can drastically reduce water demands. And, less water demand means more water for the aquatic creatures that live downstream from the dams that form the reservoirs. In the Mill River, these creatures include not only common species, like pickerel and painted turtles, but also some species that are exceedingly rare, like the zebra clubtail dragonfly and dwarfwedge mussel. In some cases, our continuing demand for water may make these creatures more vulnerable to predation and threaten their long-term survival.

To try to look at this issue scientifically, in 2001 UMass Extension began a collaborative 3-year research project with The Nature Conservancy (MA Chapter), the University of Massachusetts, the New York Fish & Wildlife Cooperative Unit-Cornell University and the Executive Office of Environmental Affairs' Connecticut River Watershed Team. The project, which is being replicated on other small rivers in the Northeast, is gathering information that can be converted into a software program that will--with minimal fieldwork--predict and evaluate how a proposed water withdrawal from a public water supply well or reservoir will affect aquatic animals living downstream.

The 2001 Field Season

During 2001 volunteers (Sally Klingener, Carissa Sinclair, Joe Zewinski, Scott Jackson, Dave McLain, Hannah Laurin, Marianne Simon and Chris, Ian and Kaaren Gaitenby-Smith) gathered water level data at eight different points along the Mill River. What they found was that the height of the Mill River fluctuates dramatically and that a heavy storm



can change the water level overnight by over two feet. Aside from learning about rapid fluctuations, this information will be added to velocity information and used to calculate flow patterns.

While volunteers collected water level data, researcher Dave McLain was out in the Mill River, delineating different mesohabitats (e.g. riffle, run, pool) during low flow by characterizing depth, velocity, substrate, cover (woody debris, shallow margins, submerged vegetation, overhanging vegetation, canopy shading, etc.), and bank stability. Using an electro-shocker, he also recorded the kinds of species and their abundance found in each mesohabitat type. All told, McLain found 19 of the 26 fish species known in the watershed. The most common species in shallow runs and pools were juvenile fallfish (*Semotilus corporalis*), blacknose dace (*Rhinichthys atratulus*), juvenile white sucker (*Catostomus commersoni*), and tessellated darter (*Etheostoma olmstedi*). In deep pools, pond species such as bluegill (*Lepomis macrochirus*), yellow perch (*Perca flavescens*), golden shiner (*Notemigonus crysoleucus*), rock bass (*Ambloplites rupestris*), and largemouth bass (*Micropterus salmoides*), as well as adult fallfish and adult white sucker, were common.

During 2002 researchers intend to continue to survey different mesohabitats and start linking the potential impact of low-flow on selected species of freshwater mussels.