Applying knowledge to improve water quality
National
Water Program
A Partnership of USDA CSREES
& Land Grant Colleges and Universities

USDA-CSREES 2007 National Water Quality Conference

Developing reference models for water quantity regulations in New England

Many states in the northeastern U.S. currently face similar issues in river management that result from three centuries of industrial and urban development. Problems include hydrologic alteration, dramatic seasonal reductions in flow, and impaired aquatic communities. Despite considerable effort to mitigate the situation, some streams regularly experience extreme low flow or no-flow conditions as a consequence of water withdrawals. Densely populated, “water-rich” New England states may face a future, long-term crisis caused by the demand on water resources. Instream aquatic fauna are especially vulnerable to the impact of such a crisis. Policy documents from across New England express the need for better management and protection of running waters. One of the most critical aspects in developing sustainable water-use regulations is identifying reference conditions that would provide a baseline for assessing ecological status, and serve as guidance for setting management objectives. However, establishing a reference is difficult in a landscape with centuries of anthropogenic modifications. An initial biological and physical survey of the Eightmile River in southern Connecticut was performed as a component of the ongoing Wild and Scenic River study conducted by the National Park Service (NPS). The watershed of this fourth order river is largely undeveloped in an otherwise densely populated portion of the country. Fish and freshwater mussel habitat in the Eightmile were evaluated for the potential to serve as reference benchmarks for similar rivers in the state. The survey determined the indicator fish species for the river and an Instream Habitat Simulation Model has been developed to identify the hydrological patterns that would sustain the aquatic community. The model allows for simulation of future river management scenarios that would provide scientific justification for future flow regulation standards. Ultimately, standards identified in this and similar projects could dictate planned water use regulations for four New England states.

Author: Diana Walden
University Affliation: University of Massachusetts
Co-Author(s): Roland Deblois and Piotr Parasiewicz