

Utilizing Mine Water for Aquaculture

An Overview of Production Methods

Kenneth J. Semmens
West Virginia University
P.O. Box 6108
Morgantown, WV 26506-6108
Ken.Semmens@mail.wvu.edu

Daniel Miller
West Virginia University
Ag. Sci. Bldg. Rm.2026
Morgantown, WV 26506-6108,
dmille31@wvu.edu

Treated and untreated water originating from coal mines in Appalachia have been utilized to produce harvestable size salmonids for the past decade. Abundant sources of well oxygenated water with a pH between 6.5 and 8.5, and stable water temperatures between 40 and 70 F are required. Stability of water temperature between 55 and 60 F year round allows the grower to feed all year long, something not possible in surface waters. Suitable infrastructure (seed stock, feed, processing plant, market demand) exists to support continued growth of this industry. Rainbow Trout are the predominant species cultured, but brown trout, and arctic char are also grown. It is estimated that nearly 4 million pounds can be produced if 30 % of available mine water is utilized for this purpose (Jenkins et. al. 1995). This poster features information on production systems at five locations utilizing treated and untreated mine water.

Acid mine water, found in the northern part of West Virginia (WV), is usually treated with aeration, lime, and flocculants, before passing through a polishing pond. Infrastructure created in this process effectively reduces the investment costs for salmonid production. Net pens have been used successfully by the Maryland Department of Natural Resources at the Mettiki AMD treatment plant near Oakland, Maryland for the past decade. In 2002, Duquesne Light Co. installed net pens in a polishing pond at their Warwick AMD treatment plant near Point Marion, Pennsylvania. In the same year, West Virginia University installed a modular composite raceway near Morgantown, WV for research. It utilizes effluent from the polishing pond at Consol Energy's Dogwood AMD treatment plant.

In southern WV, groundwater flowing from coal mines does not require treatment to remove metals and acidity. Two production facilities which rely on gravity flow of aerated mine water to grow food size rainbow trout have been operating near Sophia, WV for about 6 years. High Appalachia, Inc. produces about 200,000 lb of rainbow trout at these facilities for its processing plant near Sophia, WV. West Virginia Aqua, Inc. has two facilities devoted to the production of Arctic Char in southwestern West Virginia which began marketing product in 2002. The capacity of their production facility is estimated to be 500,000 lb and features a design with approximately 80% reuse.

Utilization of mine water at these facilities has significantly increased aquaculture production in WV. In 2001, the National Agriculture Statistics Service reported the value of cultured fish produced in WV grew by 35%. The processing plant near Sophia continues to be limited by production rather than market.