

TROUT CULTURE AS A POST-MINING LAND USE IN WEST VIRGINIA – A CASE STUDY

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Abstract

A century of mining has left West Virginia with large underground reservoirs of water that flooded vacant coal mines. Mining permit regulations in West Virginia require that the land be returned to a level of productivity at least as productive as before the mining operation began. Consequently, most mine sites are reclaimed to forest or pastureland. For the first time in West Virginia, aquaculture has been written into the post-mining reclamation process, and approved by the federal regulatory agencies. This paper will describe the process and initial results utilizing a unique and inexpensive (20% of concrete costs) material for serial use raceways.

In 2001 Eastern Coal Company requested assistance from West Virginia University concerning the reclamation at their Robinhood #9 mine site. After over twenty years of mining, which ended in 2000, the reclamation process was scheduled to begin. Water analysis indicated no treatment was necessary for trout production. Facilities included two buildings with office space, locker rooms, and a large garage for heavy machinery. The water discharge from the mine was located about 25 meters above a one acre polishing pond with an 8% slope leading to the pond.

A simple bioassay conducted in 2002 demonstrated good survival and growth of rainbow trout. Water flow was the only fluctuating parameter. Temperatures were stable at 13°C and pH was in the low 7's. Low flows measured during the drought of 2002 helped determine the volume of the raceways, which were built for 150-350 gpm. With approval from the Office of Surface Mining, the coal company installed eight thirty-five foot-long plastic raceways. This commercial product is marketed as chambers for storing storm water runoff under parking lots. The 7' module sections are 51" wide and 30" deep. They were placed in an excavated leveled trench. Liners were placed in each tank to eliminate leaks and facilitate the collection of solids in the quiescent zone. Water flowed by gravity through all eight tanks, and solid waste from each quiescent zone was diverted to an existing polishing pond of approximately one surface acre.

950 four inch trout were stocked in each of the 35' long tanks in March 2004. An electrified 6' chain-link fence was installed to exclude black bears and poachers from the production area. Growth rates averaged 2.53gm./day during the 233 production days. Harvest weights averaged 590 grams with a survival of 80%. Reclamation savings at this mine site have amounted to nearly \$450,000.