



Hatchery Planning & Partial Water Reuse System Design

*White River National Fish Hatchery
(Bethel, VT)*

2005 Carl V. Anderson Award of Merit Project –Association of Conservation Engineers

SUMMARY: White River NFH participates in the stock mitigation and reestablishment of Atlantic salmon in the Connecticut River watershed. An engineering review, evaluation, and planning study was completed at the hatchery in 2002 to identify priority needs and develop detailed conceptual recommendations for facility improvements. The construction of two partial water reuse systems for the hatchery was completed in 2005 following the recommendation that was made in the planning study.

CHALLENGE: The hatchery was designed to raise Atlantic salmon smolts using 10,000 gpm of water from the nearby White River; however, this has never been realized due to lower than expected flows, poor water quality, and disease problems in the river. As a result, the hatchery had to cut back its production and obtain most of its water supply from wells, leaving a facility that was designed to produce a relatively high biomass with significantly under-utilized physical facility capacity.

SOLUTION: Implementation of partial water reuse technology was recommended for the hatchery to augment its limited water supply. Two partial water reuse systems were designed to accommodate the biological parameters of Atlantic salmon smolt production. Eight existing 30-ft diameter concrete fish tanks were retrofitted and refinished with fiber-reinforced plastic (FRP) coating, and a new building with water treatment equipment for both systems was designed.

RESULTS: Construction of the partial water reuse systems was completed in 2005. The systems allow the hatchery to utilize existing infrastructure and raise upwards of 200,000 Atlantic salmon smolts on just 640 gpm of well water. The new technologies reduce labor requirements by employing self-cleaning tank hydraulics, concentrate waste into a small effluent flow, and provide a major portion of the programmatic capacity the facility was originally intended to have.

SERVICES PROVIDED:

- Infrastructure Planning
- Production Modeling
- Conceptual Design
- Final Design
- Operational Assistance
- Field Testing