

New oxygenation system to improve fish habitat at Thurmond Lake

Underwater injection system boosts striped bass habitat and allows operation of pump back turbines at Russell Dam

After a decade in the making, the Savannah District reached an historic milestone in April with the delivery of two 20,000-gallon liquid oxygen tanks, bringing it closer to completion of an underwater oxygenation system for the J. Strom Thurmond Lake. The project, near Modoc, S.C., is one of 126 federally-funded construction projects in the district made possible by the American Recovery and Reinvestment Act (ARRA) supporting economic growth with funding initiatives totaling \$224 million.

This \$9.1 million ARRA project supports the completion of the Richard B. Russell Pump Back Project, located on the Savannah River, near Augusta, Ga. Although the total \$12.6 million project, which includes \$3.5 million in general construction funds, will immediately benefit fish and fishermen, the oxygen system is part of a broader plan for wiser use of Thurmond and Richard B. Russell Lakes' sometimes sparse water supplies and ability to generate more electricity.

The tanks, part of an environmental mitigation program for the power plant at the Richard B. Russell Dam, will ultimately supply pure oxygen to a series of underwater tubes in Thurmond Lake. The oxygen injection system will allow full operation year round of the four pump back units at Russell Dam. Currently, no more than two pump back units may be operated during summer months. The pump back turbines at Russell Dam generate power normally during daytime peak demand hours, then reverse direction at night to pull water back into Russell Lake for reuse the next day, thus providing power even during drought. When combined with the four conventional units there, Russell Dam will have a capacity of 648 megawatts of clean, renewable energy, making it the largest Corps of Engineers power plant in the eastern United States.

Construction began during the summer of 2009 on a cryogenic oxygen storage facility that will pump 20 to 100 tons per day of liquid oxygen through seven miles of perforated pipes submerged 80 to 90 feet below the lake's surface. The idea is to add oxygen to the lower lake during hot weather, when falling oxygen levels force fish to swim upstream.

Corps experts developed a series of measures to offset any negative impacts to the fish habitat during the pump back turbines' operation. One of those included



Liquid oxygen will be stored in the \$2.8 million ARRA-funded above-ground tanks recently installed by ABUCK, Inc., of Mableton, Ga. Small business firms received contracts for all three construction phases of the \$12.6 million project. The cryogenic system is slated for completion in Sept. 2011. (USACE photo)

an oxygenation system to improve striped bass habitat in Thurmond Lake. The oxygenation system, located five miles upstream from Thurmond Dam creates new habitat for large striped and hybrid bass whose conditions for survival are very stringent.

"Currently, this portion of Thurmond Lake experiences thermal stratification and oxygen depletion in water depths greater than 40 ft. during the summer," said Jamie Sykes, Savannah District fisheries biologist. "The deeper water contains the appropriate water temperature for striped bass habitat, but doesn't contain sufficient oxygen," Sykes said. The system will add oxygen to these deeper layers to provide both cool and oxygenated water.

The completed facility is expected to go online by September 2011.

Although the project will be almost invisible to visitors, its impact will come in the form of highly oxygenated water that will lure and hold sport fish during the hot summer months. Once operational, it is expected to increase dissolved oxygen levels by up to three parts per million along a five mile-swath from Modoc downstream to the face of Thurmond Dam, where oxygen levels fall to less than one part per million during warm weather.

"The resulting good from this project is our ability to fully utilize the 320 megawatts of additional power generating capacity at the Russell Dam, while protecting the world-class striped bass fishery resource in Thurmond Lake, with an annual estimated value of almost a million dollars," Sykes said. 

By Jeanne Hodge, Corporate Communications Office