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## **Environmental Contaminants**

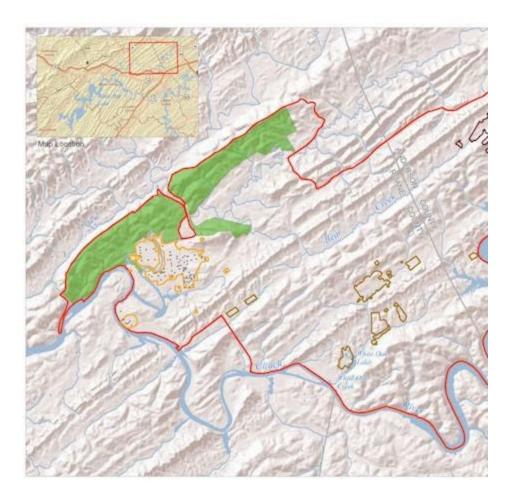
DOE Natural Resources Trustee Council Completes First Restoration Project



The Natural Resources Trustee Council for the Department of Energy (DOE) Oak Ridge Reservation (ORR) completed their first restoration project in 2010. The DOE, Department of Interior, as represented by the U.S. Fish and Wildlife Service (Service), Tennessee Valley Authority, and the state of Tennessee, as represented by the Tennessee Department of Environment and Conservation (TDEC), are Trustees for Natural Resources under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Trustees formed a Trustee Council in 1993 and later signed a Memorandum of Understanding in 1995 governing the ORR Trustee Councils' activities. In 1995, DOE, TDEC, and the U.S. Environmental Protection Agency (EPA) signed a Record of Decision (ROD)for the Lower Watts Bar Operable Unit (OU) in which a no action remedy was selected.

This remedy was selected because the PCB, heavy metal, and radiological contamination was buried at various depths in river sediments and any attempt to remove the contaminated sediment would likely cause further dispersion. Ecological risk decisions were deferred in the ROD. The ORR Trustee Council then authorized the completion of an order of magnitude estimate of natural resource damages to the Lower Watts Bar Reservoir. In 2000, PriceWaterhouseCoopers LLP issued a draft report that estimated lost recreational use damages at Lower Watts Bar reservoir ranging from \$4.8M - \$7.2M. The Lower Watts Bar Reservoir Remedial Investigation/Feasibility Study (RI/FS) estimated it would cost \$30 billion to remove the contaminated sediments.

An Agreement-in-Principle (AIP), finalized in 2002 between the State of Tennessee and DOE, outlined an approach for the establishment of a conservation easement on approximately 3,000 acres on the ORR. This conservation easement project area is known locally as Black Oak Ridge, and provides valuable nesting and foraging habitat for a variety of neo-tropical migratory birds, including the Cerulean warbler (Dendroica cerulea). The ORR also provides roosting and foraging habitat for the endangered gray bat (Myotis grisescens) and Indiana bat (Myotis sodalis). The ORR Trustee Council approved the AIP, and a draft management plan for the Black Oak Ridge Conservation Easement (BORCE) was prepared by TDEC, Tennessee Wildlife Resources Agency, and the Service. This management plan included an in-kind funding agreement between DOE and TDEC. An interagency agreement (IAG) between the Service and DOE was utilized to retain the services of Industrial Economics, Inc. (IEc). IEc assessed the damages/losses and quantified natural resource injuries resulting from the release of hazardous substances to the Lower Watts Bar Reservoir Operable Unit (OU).



Natural resource service losses due to the presence of toxic levels of contamination include the reduction of ecological services in aquatic habitats (e.g., reproductive impairment in fish), as well as a direct reduction of human use services (e.g., fishing). Using site-specific data, literature-based adverse effects thresholds, and habitat equivalency analysis (HEA), IEc quantified a range of approximately 148,000 to 181,500 present value acre-years of aquatic habitat services have been lost. Ecological (e.g., conservation of habitat for threatened and endangered species) and human use (e.g., hiking) services are expected to be provided by the BORCE. Using site-specific data and HEA, and accounting for regional, state and Federal policy and regulations, approximately 441,000 present value acre-years of ecological services will be provided as a result of the BORCE.

Economic data were re-evaluated in conjunction with the previous order of magnitude estimate for lost recreational use. IEc quantified recreational fishing losses of approximately \$6.6-\$10.0 million in 2006 dollars. In addition, commercial fishers may have experienced a loss of approximately \$198,700 due to a contaminant-driven closure instituted by TWRA in 2008. However, limited historical data, other restrictions on the fishery (e.g., equipment), and on-going litigation regarding the validity of the closure (Tennessee Commercial Roe Fishermen's Association, et al. v. Tennessee Wildlife Resources Agency, No. 08-1252-IV) introduce substantial uncertainty into the quantification of potential commercial fishing losses. Human use services provided by the BORCE, estimated using bioeconomic models, State recreation information, and benefits transfer, are forecast to be approximately \$6.6 million in 2006 dollars.

A comparison between the ecological and human use services lost due to Site-related contamination and the corresponding services provided by the BORCE indicates that both the acre-years of ecological habitat services and the dollar value of human use

services provided under the BORCE are sufficient to compensate for damages to natural resources in Watts Bar Reservoir. This takes into account the uncertainty inherent in the analyses of both losses and gains (e.g., the level of ecological services provided by contaminated resources and protected upland resources, and the nature and extent of potential development that may occur if the BORCE were not in place). Additional recreational fishing restoration projects for Watts Bar Reservoir (Tennessee River, Clinch River, and Emory River) were then developed and included in the final settlement. The Trustee Council completed their final report and conducted a public meeting in Oak Ridge in July 2009. The Trustee Council concurred on a final settlement for damages in the Lower Watts Bar OU and an agreed order-on-consent governing both CERCLA and NRDAR-related claims was signed by TDEC and DOE on October 6, 2010. Information or questions concerning the Environmental Contaminants Program in Tennessee can be obtained from Mr. Steve Alexander.