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TVA Kingston Fly Ash Release: Environmental Studies in Progress

Abstract Title:

An overview of ecological studies on wildlife potentially impacted by the Kingston ash spill

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Abstract:

The Tennessee Valley Authority (TVA) is a multi-purpose federal agency that on 22 December, 2008 suffered a retaining wall failure at the TVA Kingston Fossil Plant in Roane County, Tennessee. This event resulted in the release of approximately 5.4 million cubic yards of ash into the Emory River. TVA is performing studies to assess impacts from the spill to wildlife resources in the area. The objective of these initial studies is to document whether exposure to trace elements from the ash has occurred in numerous species of wildlife. Groups of wildlife included in these studies include piscivorous, insectivorous, and herbivorous birds; spring breeding amphibians; aquatic reptiles; and terrestrial and semi-aquatic mammals. Initial results from studies of piscivorous birds and amphibians will be presented. A total of 19 eggs from piscivorous birds, osprey (*Pandion haliaetus*; N = 9) and great blue heron (*Ardea herodias*; N = 10), were sampled from nests at the spill and along a downstream gradient from the spill. The contents of eggs were analyzed for trace element concentrations. Initial results suggest that levels of trace elements differ little from a reference site located on the Tennessee River, upstream from the spill zone. Seventy-six amphibians (*Pseudacris crucifer*, *P. feriarum*, and *Bufo americanus*) were collected from four sites at the spill and one reference site. Whole body tissues were analyzed for trace element concentrations. Results from these analyses show differing levels of trace elements among spill sites, overall, concentrations were low. Additional studies underway include initial assessments of trace element concentrations in blood from aquatic reptiles (*Chelydra serpentina* and *Sternotherous odoratus*); eggs and nestlings in herbivorous (*Branta canadensis*), and insectivorous birds (*Tachycineta bicolor*); and blood and tissues in mammals (*Procyon lotor* and *Ondatra zibethicus*). These studies will serve as the foundation for upcoming work that will determine whether key ecological receptors have experienced any adverse biological effects (e.g., reproductive abnormalities) from exposure to trace elements.