

**TVA KINGSTON ASH RECOVERY PROJECT
ROANE COUNTY EDUCATION INITIATIVE**

“FISH SAMPLING”

Abstract: Scientists are conducting several studies to determine whether the ash spill has impacted the number and variety of fish in the area and to evaluate possible effects of fly ash exposure on the levels of metals in fish. Species of fish representing different trophic levels were selected in order to assess exposure to coal ash. In combination with investigations of other organisms such as aquatic invertebrates, birds, and other wildlife, the fish results will provide information on potential transfer of ash-related contaminants through the food chain.

There will be a brief discussion about several components of the fish studies and students will be provided some “hands on” and observational activities.

Fish Sampling

Scientists are using two common methods; boat electrofishing and gill netting, to collect fish for the various on-going studies at Kingston (see larval fish study described below). Electrofishing involves passing an electric current through the water to temporarily stun fish so they can be caught with a dip net. Gill nets are monofilament mesh. The nets are stretched out across the river bottom and have a floating line and a sinking line that allows them to stand upright in the water column, similar to a tennis net or volleyball net. Gill nets are called passive sampling gear because the nets are stationary and fish only become entangled if they swim into them.

A poster of sampling photos will be on display along with some typical sampling equipment (e.g., “shocker box”, gill nets, field computers, measuring boards, and weighing scales) used to conduct the various studies at Kingston.



Electrofishing



Gill netting

Fish Population Studies

For years, TVA has conducted sampling throughout the Tennessee River system, including the Clinch and lower Emory Rivers, to evaluate changes in fish populations. Since the ash spill, this sampling has continued and additional sampling locations were added in the Emory River. In the fall, TVA uses electrofishing and gill nets to collect fish from a variety of habitat types to determine the number and

variety of fish present (termed Reservoir Fish Community Survey). In the spring, TVA only uses electrofishing and focuses primarily on largemouth bass populations (termed the Spring Sport Fish Survey); bass are one of the most sought-after game fish in the Valley.



Student will be asked to guess how many different species of fish TVA has collected in the vicinity of Kingston.

Students will be provided characteristics that are used to distinguish among species of fish and asked to identify photos with common species such as black bass (largemouth, spotted, and smallmouth) and catfish (blue, channel, and flathead) as well as some less common species that exist in the area.

What is that!

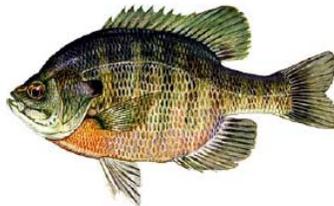
Fish Bioaccumulation Studies

For years, TVA and other state and federal agencies have collaborated in investigations of contaminants in fish throughout the region. In the past, those investigations focused on contaminants in fillets of popular game fish as a measure of potential human exposure. Since the ash spill, additional stations have been added in the vicinity of Kingston and species of fish representing different trophic levels were selected to assess ecological effects of exposure to coal ash. Species selected include largemouth bass, channel catfish, white crappie, bluegill, redear sunfish, and gizzard shad. Studies include analyses of contaminants (e.g., metals) levels in fillets, whole fish, livers, ovaries, and gut contents

Students will be provided a brief overview of the different feeding habitats and life cycles of the species of fish targeted for study and why it is important to analyze the different types of tissue.

Bluegill

- mid trophic level/omnivore
- restricted home range



Largemouth bass

- upper trophic level/predator
- intermediate home range



Channel catfish

- bottom feeder/omnivore
- large home range



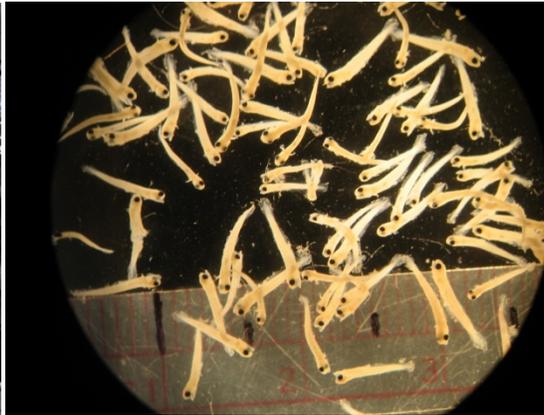
Larval Fish Collections

TVA collected larval fish (immature fish) from the Clinch and Emory Rivers to evaluate reproductive success of native fishes and to document incidence of deformities. Fish species selected for study were bass, bluegill, and crappie. The field collection method involved towing a half-meter square net through the water column for 10 minutes to collect larval fish that are only about two to ten days old and typically only 4 to 10 millimeters long. The fish in each sample were sorted by species, counted, and measured; and the number and type of anomalies were documented.

A larval fish net and flow meter will be displayed. Students will be able to observe an actual sample of larval fish that was collected in one 10-minute tow. They will be asked to estimate the number of fish in the sample.



Larval Fish Net



Larval fish about 4 to 5 millimeters in length

Display Items:

Large map with sampling locations
Large display of fish photos and sampling

“Shocker Box”

Gill Net

Dip Net

Larval Fish Net (Ichthyoplankton Net)

Flow meter

Digital Scale

Measuring Board

Field Computer(s)

Larval Fish Sample