

# ASSESSING THE SENSITIVITY OF ENDANGERED AND THREATENED FISH SPECIES USING WET

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## Biographical Sketch of Authors

Jim Dwyer is a Contaminant Specialist with the U.S. Fish and Wildlife Service, Ecological Services, Missouri Field Office. He has more than 23 years of experience assessing the impacts of contaminants to fish and wildlife resources. In Missouri, he works on a number of contaminant issues to evaluate contaminant impacts to terrestrial, aquatic and groundwater resources. Over the past 10 years he has been part of a team of biologists determining the protection of threatened and endangered species using standard assessment techniques. Coauthors include Doug Hardesty, Chris Henke, Chris Ingersoll, Dave Whites (USGS), Foster Mayer (USEPA) and Tom Augspurger (USFWS).

## Abstract

Federal agencies need to assure that environmental programs comply with the Endangered Species Act and that these programs are protective of threatened and endangered (listed) species. Listed species may not be protected, or unnecessary, regulatory programs may be implemented, if the sensitivity of listed species to contaminant exposure is not evaluated. Toxicity tests using standard whole-effluent test procedures (WET) were conducted with *Ceriodaphnia dubia* and fathead minnow and six endangered fish species; bonytail chub (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucias*) razorback sucker (*Xyrauchen texanus*), Gila topminnow (*Poeciliopsis occidentalis*), spotfin chub (*Hybopsis monacha*) and Cape Fear shier (*Notropis mekistocholas*). In order to adequately evaluate comparability between species responses, 7-day WET procedures were followed using standardized water and known toxicants. Tests were conducted in ASTM hard water using; 1) carbaryl, 2) ammonia, and 3) a five chemical mixture of carbaryl, copper, 4-nonylphenol, pentachlorophenol, and permethrin. Survival and growth studies were conducted with embryo-larval fathead minnows and analogous exposures using the listed fish species. Survival and reproduction were also determined with *C. dubia*. The 25% Inhibition Concentration (IC25) was calculated for each species and chemical combination. As would be expected for the contaminants used in these tests, *C. dubia* was generally more sensitive than the fish species. Results from the fathead minnow 7-day test were often similar to the tested listed species. These studies and management implications of these results will be presented.