

# GOING TO BATTLE FOR A SALAMANDER



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## The Black Warrior Waterdog

By Monica Stoops, Erik Keyster and Christopher DeChant

**A**mphibians are experiencing a global crisis. From loss of habitat to the emergence of deadly diseases, amphibians are facing extinction at higher rates than any other group of animals. Over a decade ago, scientists at the Center for Conservation and Research of Endangered Wildlife (CREW) at the Cincinnati Zoo responded to the crisis and initiated an amphibian research program to address captive breeding challenges in toads. Today, CREW scientists and Cincinnati Zoo Amphibian keepers have expanded the program to include one of the most endangered salamander species in the United States, the black warrior waterdog (*Necturus alabamensis*). The story of how and why CREW is going to battle for this warrior of a salamander serves as an example of how individuals and institutions can take a lead in developing new conservation programs for amphibian species in need.

In 2007, a workshop conducted at the Fort Worth Zoo in coordination with the Amphibian Taxon Advisory Group (ATAG) prioritized amphibian species from the U.S. and Canada for *ex-situ* conservation programs. The resulting document, entitled Action Plan for Ex-Situ Conservation in the AZA community, was intended to inspire and guide AZA institutions in their efforts to address the decline of amphibians in North America. In addition to determining which species could benefit from *ex-situ* programs, the workshop sought to identify personnel to serve as coordinators for priority species. These individuals were tasked with developing and implementing Taxon Management Action Plans. The prioritization process ranked the black warrior waterdog as a top priority species and the coordinator identified to lead this effort was the team leader of amphibians at the Cincinnati Zoo.

CREW has a long history of championing efforts to save rare endemic plant and animal species from extinction. Therefore, it took little time for CREW scientists and Cincinnati Zoo amphibian keepers to join forces in developing a comprehensive research and conservation plan for the black warrior waterdog. This large, gilled aquatic salamander gets its name by inhabiting the black warrior river basin in Alabama. The black warrior waterdog is listed as Endangered by the IUCN, a candidate for federal listing under the Endangered Species Act and is considered a 'Species of High Conservation Concern' in the state of Alabama. However, no federal or state law currently protects them. It is believed that *in-situ* populations of black warrior waterdogs have declined precipitously in the last ten years. However, no comprehensive population data exists for the species. The last regional surveys of black warrior waterdogs conducted sporadically from 1991-to-2001 yielded presence of the species at only 14 of 112 sites. Additionally, the recapture data generated during these surveys was too limited to calculate population size. Even more troubling is the fact that the cool, flowing water preferred by the black warrior waterdog has become exceedingly rare in its range and the biological integrity of these water sources continue to decline in extent and quality.

Through both the monetary support of a private donor passionate about the plight facing amphibians and the approval of the Alabama Department of Conservation and Natural Resources, we initiated a pilot study during 2008-2009. The goal was to estimate current population numbers and distribution range for black war-

rior waterdogs, based on historical data. Secondly, because this is an entirely aquatic species that displays patterns of seasonality, chemical and physical data were collected from the study sites (eg. temperature, river velocity, dissolved oxygen etc.). These data help us identify heightened activity patterns and may elucidate causative factors involved in the species decline. Finally, to facilitate future *ex-situ* conservation, comprehensive research into the life history of the species has begun. This includes maturation rate, age at breeding and breeding timing.

The search methodologies found to be most successful included overturning rocks and using dip nets to collect and sift through submersed leaf litter. Since the average January water temperature is around 40°F, this was one of the more challenging components of the study. Traditional GPS and morphometric data were taken for each captured individual and a sterile, unique identifier was implanted subcutaneously. By utilizing a mark recapture technique, we can better determine population size, study site recruitment and capture efficiency trends over time.

Results from our pilot study highlight the plight of a species occupying a restricted geographic range and narrow suitable habitat within it. The black warrior waterdog was found to be abundant at one site, making it exceedingly vulnerable to extirpation from a chance event; this river is the main local drainage and intersected by heavily used roads. While several other sites did have habitat deemed suitable for supporting our target species, and had done so in the past, we captured only non-target aquatic salamanders. One positive outcome for the *in-situ* black warrior waterdog population is that during both the 2008 and 2009 breeding seasons, several larval stage individuals were captured verifying successful reproduction. This finding is significant, given that Northwestern Alabama, in addition to much of the South Eastern U.S., has endured drought conditions.

By taking a methodical approach to understanding black warrior waterdogs *in-situ*, we've identified a path to establishing a successful *ex-situ* program within the AZA. The gathering of species specific data will enable the survival, breeding and rearing of this neotenic salamander when the next step in establishing an *ex-situ* population is taken or required. We, like so many others, are limited in our efforts by financial constraints, but see local/regional projects as an extremely cost effective way of getting results and testing the overarching methodologies proposed for conserving amphibians on a wider scale. With continued support, the black warrior waterdog conservation effort may some day become a model for saving salamanders in North America.

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