

by Bob Johnson

Recovery of the Puerto Rican Crested Toad



Photo by Miguel Canals

The Species Survival Plan (SSP) program was originally conceived to provide a blueprint for cooperative and efficient management of captive breeding programs within North America, although SSPs have been developed for many foreign species as well. More recently, the SSP concept has expanded to include field conservation efforts as an integral part of overall conservation and recovery efforts. While captive breeding is not to be considered the sole solution to the recovery of endangered species, conservation biologists have recognized the need for scientifically managed breeding programs in carefully selected cases for some time.

The Puerto Rican crested toad (*Peltophryne lemur*), once endemic to Puerto Rico and the nearby island of Virgin Gorda, is now only found on Puerto Rico where it occurs in two separate populations. It was the first amphibian to be considered for an AZA Species Survival Plan (SSP). The AZA and the Fish and Wildlife (FWS) have worked closely toward the recovery of the crested toad for over 15 years.

Significant variations in mitochondrial DNA between northern and southern populations suggest that the two populations have been separated for some time. None of the northern breeding sites are protected. Despite continuing searches, no adult toads have been seen in the north since 1988, and some biologists consider the northern population to be extirpated. In the south, there is a single breeding pond located in a former gravel parking area in Guanica State Forest. No more than 1,000 adult toads have ever been seen at this site. Over the past 15 years, the southern population has declined to about 200 adults, not all of which breeding. Breeding in the wild is stimulated by infrequent heavy rainfalls that provide enough water for the 18-21 days it takes for metamorphosis from tadpole to toadlet.

The long-term survival of *P. lemur* depends on protecting existing breeding sites and establishing additional wild populations. Captive breeding provides an additional source of tadpoles and a genetically diverse back-up population in the event of a disaster at the Guanica site. The release of tadpoles, rather than toadlets, is believed to increase the likelihood of imprinting on the natal pond habitat and allows natural

selection to occur at a stage in which large losses can be buffered by the relatively high numbers of released animals. To date, over 4,000 toadlets and 20,000 tadpoles have been released to the wild. The small size of released toadlets makes follow up on the success of introductions or releases difficult.

Captive breeding activities are complemented with field studies. For example, radiotracking post-reproductive toads determined that individuals moved an average of about 410 feet (125 meters) a night for the first 4 days and traveled a maximum distance of 3.2 miles (2 kilometers). After the initial period of intense movement, toads moved no more than about 32 feet (10 m) and often returned to the same hole even after several nights of foraging. Holes in limestone were preferred refuges, although deep crevices were used during the initial post-reproductive migration period. Other research efforts are focusing on nutritional and veterinary research in captive populations, as well as life history and habitat use.

Twenty zoos and aquariums in the United States and Canada participate in the Puerto Rican toad SSP. They provide resources, expertise, and funding for recovery as well as a genetically and demographically diverse back-up population in the event of a biological catastrophe at the natural breeding site. Funding for implementing the SSP has been provided by the FWS Caribbean Field Office, the AZA's Conservation Endowment Fund, the Canadian Museums Association and Canadian Departments of Foreign Affairs and International Trade. Other contributions have been received from the Toronto Zoo's Endangered Species fund, the

Philadelphia Zoo's "One With Nature" fund, the Columbus Zoo's Riverbanks Zoological Park and Botanical Garden Conservation Fund, the Detroit Zoo, Omaha's Henry Doorly Zoo, the Sedgwick County Zoo, the Saint Louis Zoo, the Toledo Zoo, and the Vancouver Aquarium.

In collaboration with the FWS Caribbean Field Office, the SSP working group recently drafted a proposal for an FWS, Puerto Rico Department of Natural Resources, and AZA conservation partnership in which the goals of the SSP are merged with recovery plan objectives. Our partnership focuses on five objectives: conservation education, pond construction for the release of captive bred toads, research related to captive breeding and release, field research on important habitat, and population and distribution surveys.

Education is of critical importance to the recovery of this amphibian species. The FWS and the AZA are working to prepare and distribute identification leaflets to schools and social centers within the toad's historical range. Additional materials include a field guide to tadpoles, toadlets, and toads; life-size models of toadlets and toads; posters that highlight the importance of the remaining breeding sites and surrounding karst habitat; a slide program; and a video to help people distinguish *P. lemur* from another toad, *Bufo marinus*. Bumper stickers, decals, refrigerator magnets, buttons designed and distributed by students, and a conservation activity book will also increase the profile of this species across the island. Community based conservation initiatives will focus on the only known breeding localities for this species. It is important to remember that very few people in Puerto Rico have seen this threatened species.

Live *P. lemur* are on display at the Mayaguez Zoo (with assistance from Mayaguez University) in Puerto Rico. The SSP team has provided equipment, life support systems for holding and breeding toads, and training so that a



captive breeding program can be established in Puerto Rico. Signs invites zoo visitors to visit the Guanica forest to experience the toad's habitat, and Guanica forest visitors will be invited to visit the Mayaguez Zoo to see the toad. Also, for the first time non-breeding toads are housed at the University of Puerto Rico in Rio Piedras. With public support and continued cooperation among agencies and AZA institutions, the chances for recovery of the Puerto Rican toad will improve.

Bob Johnson is the AZA Puerto Rican Crested Toad SSP Species Coordinator at the Toronto Zoo in Ontario, Canada.

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Usually a light brown, this adult male Puerto Rican crested toad exhibits brighter breeding colors

Photo © Bob Johnson

SSPs are cooperative breeding and conservation programs administered and managed by the American Zoo and Aquarium Association (AZA) and its member institutions. When it is established that a captive breeding program can aid in a species' recovery, an SSP is often developed. The SSP identifies appropriate mates for each breeding pair and determines the number of desired offspring to maintain genetic health within the managed population. At present there are SSPs for the following North American species; Attwater's prairie chicken, black-footed ferret, California condor, Guam rail, jaguar, Mexican wolf, Micronesian kingfisher, Puerto Rican crested toad, red wolf, thick-billed parrot, Virgin Island boa and Wyoming toad.