

Status of Amphibians in Arizona

By Cecil R. Schwalbe

As in many other parts of the world, Arizona has seen declines in populations of some of its amphibians. And as Andy Blaustein indicates, lack of long-term data makes it difficult to differentiate human-induced causes from natural population cycles. Native ranid frogs [specifically the Tarahumara frog (*Rana tarahumarae*), northern leopard (*R. pipiens*), and Chiricahua leopard (*R. chiricahuensis*) frogs] seem to have suffered greater declines than other frog and toad species (Hale and Jarchow 1988, Clarkson and Rorabaugh 1989).

The last Tarhumara frogs seen in the United States were found dead in the Santa Rita Mountains in 1983. Populations of Chiricahua and lowland (*R. vavapaiensis*) leopard frogs cohabiting with Tarahumara frogs also declined but were not extirpated; canyon tree frogs (*Hyla arenicolor*) and red-spotted toads (*Bufo punctatus*) living there seemed unaffected by whatever caused the ranid reductions (Hale and Jarchow 1988).

While there is concern that the numbers of individuals in some breeding aggregations of desert anurans such as Sonoran green (*Bufo retiformis*), Sonoran Desert (*B. alvarius*), and Great Plains (*B. cognatus*) toads, burrowing tree frogs (*Pternohyla fodiens*), and desert spadefoots (*Scaphiopus couchi*) have declined, large numbers of local extirpations have not been documented. Long-term monitoring programs are needed, for both anurans and tiger salamanders, Arizona's only tailed amphibian.

Wetland habitat loss and degradation probably are responsible for most declines and extirpations of historical anuran populations in Arizona; however, conclusive data are lacking. Declines in some frog populations have been correlated with the introduction of exotic predators such as game fish, bullfrogs, and crayfish (Hayes and Jennings 1986, Schwalbe and Rosen 1988, Schwalbe and Rosen unpublished data). We also are testing the interaction of pathogens and ultraviolet light on some anurans, (suspected causes in the extirpation of the Tarahumara frog from the U.S.). Our preliminary data indicate that the true frogs (family Ranidae) may prove to be the most sensitive vertebrate indicators of air quality.

Because of the scarcity and fragility of wetlands in the desert Southwest, resource managers here are concerned about the health

of these wetland ecosystems. The AZ Game and Fish Dept., AZ Nature Conservancy, NPS, USFWS, and USFS are conducting surveys of and working to establish monitoring programs for wetland biota, including amphibians, in Arizona. Cooperative research and management programs also are being pursued between agencies and institutions in the U.S. and in Mexico for sensitive wetlands and their components. Long-term studies of populations, coupled with directed experimental research, are necessary if we are to separate out human-induced causes of declines from normal population fluctuations.

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Literature Cited

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Sonoran Desert Tortoise. (Photo by Cecil Schwalbe)

