

Chihuahuan Desert Network Reptile and Amphibian Inventory

Amistad National Recreation Area

Source: D. Prival and M. Goode, University of Arizona.

PROJECT SUMMARY



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Rio Grande leopard frog (*Rana berlandieri*) at Amistad National Recreation Area.

Introduction and Background

In 2003 and 2004, the University of Arizona conducted an inventory of reptiles and amphibians (herpetofauna) in six parks of the National Park Service's Chihuahuan Desert Network including Amistad National Recreation Area, located on the U.S.-Mexico border in southwest Texas. Prior to this inventory, little was known about reptiles and amphibians in the network parks, including species of special conservation concern. The primary objectives of this inventory were to document reptile and amphibian species, map the distribution of all species found, and determine a rough relative abundance for each species. The results from this may assist in future monitoring efforts. This summary presents information from the surveys at Amistad. Summaries of the surveys conducted at the other Chihuahuan Desert Network parks are available on the Learning Center of the Southwest website, www.southwestlearning.org.

Amistad is located in a transition zone between three major plant communities: the Chihuahuan Desert, Edwards Plateau, and Tamaulipan Shrubland. Three major rivers (Pecos, Devils River, and the Rio Grande) and the Amistad Reservoir occur in Amistad. These diverse terrestrial and aquatic systems contribute to Amistad's high level of biodiversity. Searches for reptiles and amphibians were primarily focused along the eastern shore of the reservoir. Areas where salt cedar or tamarisk had invaded were difficult to survey. The inventory took place from May to September 2003 and from June to September in 2004—134 person-days were spent surveying. During the May 2003 survey, Amistad was unusually dry. From June to September 2003, rainfall was about 30% above average. In spring 2004, rainfall was 85% above average and about 20% above average in June to September.

Methods

Several searching approaches were used to find reptiles and amphibians: foot surveys, incidental observations, pitfall traps, road cruising, and turtle traps. In 2004, the researchers

used different approaches than in 2003 to maximize the likelihood of finding different species. For each reptile or amphibian observed, the researchers recorded data such as location, time, weather, and species.

The majority of observations were recorded during *foot surveys*: 3,168 animals in 42 species. The searches were conducted at times when reptiles and amphibians were most likely to be active (morning around sunrise and evening around sunset). Searches were attempted in all habitat types in Amistad but also focused on areas such as canyons and riparian areas that were likely to support a high diversity of species or rare species. Most of the foot surveys were conducted off-trail. While on foot, the researchers looked under rocks and logs, and used mirrors and flashlights to illuminate crevices.

Incidental observations were recorded while the researchers were not conducting formalized searches (e.g., on days off or while driving to a search area). Incidental observations accounted for 532 animals in 26 reptile and amphibian species.

Pitfall traps were used to capture small reptiles and amphibians running or crawling across the ground. In 2003, three sets of pitfall traps were checked by Amistad staff and volunteers daily. Ninety-two reptiles and amphibians of nine species were caught in pitfall traps. The traps were checked 33 times over the course of the survey. The traps in Amistad were left in place for Amistad staff to use in future monitoring efforts.

Road cruising surveys, in which a crew drives at night to find amphibians and nocturnal snakes and lizards, were also used. In Amistad, 76 reptiles and amphibians were observed of five species in four road cruising surveys.

Turtle traps were used to document species of turtles living in the reservoir. Reservoir levels fluctuate quickly and the traps had to be moved often. Although the traps were checked daily, the water level rose rapidly enough in 2003 that four turtles drowned before the traps were checked. In total, seven turtles of three species were caught in the traps.

Voucher specimens were collected for nearly each species in Amistad to provide proof that the species actually occurred in Amistad during the inventory and to help confirm it was correctly identified in the field. A total of 42 voucher specimens representing 40 species were collected in Amistad. Voucher specimens provide important data about reproduction, diet, health, and morphology. DNA collected from voucher specimens can be used to examine population questions, and genetic relationships within and between species. Voucher specimens previously collected from parks are spread among many institutions. For this inventory, the voucher specimens from Amistad and four other parks are on permanent loan to and stored at Museum of Southwestern Biology, University of New Mexico, Albuquerque, and are freely available to researchers and managers.

Results

In total, 3,874 reptiles and amphibians were found at Amistad during this inventory, representing 45 species: nine frog and toad, 15 lizard, 17 snake, and four turtle species. The identification of one lizard, the southwestern fence lizard (*Sceloporus cowlesi*), described in 2002, is nearly identical to the eastern fence lizard (*Sceloporus undulatus*). Distinguishing these species is currently based on current range distribution due to lack of published genetic work. Although 14-person days of foot survey data were lost due to a computer crash, the researchers were able to reconstruct the snake data from memory, though many lizard and amphibian observations were lost. No data of new species to Amistad were lost.

Four species found in Amistad are listed at state threatened: Texas horned lizard (*Phrynosoma cornutum*), Texas indigo snake (*Drymarchon melanurus erebennus*), Trans-Pecos black-headed snake (*Tantilla cucullata*), and Berlandier's tortoise. The observation of Berlandier's tortoise (*Gopherus berlandieri*) is based on finding two small plates from a shell.

One nonnative species was found during the inventory, the Mediterranean house gecko (*Hemidactylus turcicus*). The species occurs widely in urban areas in the southern United States. It expanded its range into Amistad after 1977. Although this gecko is typically found on buildings near lights where it is attracted by insects, in Amistad it is found on cliff faces away from artificial light. Though it is invading natural areas of Amistad, it does not pose an obvious threat to other native species because the native Texas banded gecko (*Coleonyx*

brevis) typically feeds on the ground, not walls. However, the species may be competing in subtler ways.

Discussion

In order to determine what percentage of the total herpetofauna community known to occur within Amistad that was documented in this inventory, the results were compared to lists of species likely to occur in Amistad based on previous sightings, museum records, species range maps, and habitat preferences. It is estimated that there are nine snakes species and one lizard species that are likely to occur in Amistad that were not observed during the inventory, meaning this inventory may have documented 82% of the reptile and amphibian species in Amistad. However, the majority of Amistad consists of a narrow strip of land around reservoir and rivers, and it is likely that some of these "likely to occur" species only visit Amistad and do not inhabit it permanently.

Most of Amistad is altered by the reservoir and consists of heavily disturbed areas which may not be attractive habitat to some reptiles and amphibians. This and other factors combined with the lack of previous intensive surveys in Amistad gives little confidence in the total estimate of species that occur in Amistad.

The data from this inventory can be used as baseline data that may be useful to a monitoring program. Long-term monitoring and/or repeated inventories may help detect changes within reptile and amphibian communities caused by climate change, drought, invasion by nonnative species, wildland fire, or other factors. Reptile and amphibian populations can change dramatically between surveys in a given year due to the timing and amounts of precipitation. The researchers provided suggestions and evaluations of potential monitoring strategies such as monitoring species composition, monitoring species richness, monitoring species distribution, and monitoring relative abundance. Based on this study, the researchers concluded that weather has an important effect on the success of a given survey and it is important to survey each area multiple times within a season.

Literature Cited

Prival, D., and M. Goode. 2005. Chihuahuan Desert national parks reptile and amphibian inventory. Final report. University of Arizona.

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