



GUADALUPE MOUNTAINS

Chihuahuan Desert Network Reptile and Amphibian Inventory

Guadalupe Mountains National Park

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

PROJECT SUMMARY



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Long-nosed leopard lizard (*Gambelia wislizenii*) in Guadalupe Mountains National Park.

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 Guadalupe Mountains National Park (NP), located in southwestern 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 Guadalupe Mountains NP. 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.

Guadalupe Mountains NP is located in the Chihuahuan Desert and is highly diverse in habitats, and plants and animals. The park includes the highest point in Texas (8,749 ft), reliable springs, sand dunes, and forests. This inventory focused primarily on McKittrick Canyon, a highly diverse riparian area, and the Salt Basin Dunes area, characterized by creosote flats, gypsum and quartz dunes. A previous survey of McKittrick Canyon found a high diversity of reptile and amphibians, so the researchers focused on this area to maximize the number of reptiles and amphibian species that may be discovered. The Salt Basin Dunes area was surveyed to find new species characteristic of habitat found only in this section of the park and to document species composition and distribution in this area which had not been previously surveyed. In 2003, surveying was conducted from May to August and in 2004 from June to August in a total of 153 person-days. In 2003, the precipitation was not heavy enough or long enough to induce seasonal amphibian calls and aggregation at seasonal ponds. The 2004 survey season was much wetter, but did not seem to influence the activities of reptiles and amphibians in the park. Most park

staff reported seeing fewer snakes in 2004 than in previous years, and the researchers only heard one species of amphibians calling in the park.

Methods

Several searching approaches were used to find reptiles and amphibians: foot surveys, incidental observations, pitfall traps, and road cruising. 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*: 1,580 animals in 46 species. The searches were conducted at times when reptiles and amphibians were most likely to be active (morning around sunrise and evening around sunset). 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 249 animals in 26 reptiles and amphibian species.

Pitfall traps were used to capture small reptiles and amphibians running or crawling across the ground. In 2003, two sets

of pitfall traps were checked by park staff and volunteers daily (125 times). 64 reptiles and amphibians of 11 species were caught in pitfall traps. The traps in Guadalupe Mountains NP were dismantled after completion of surveys.

Road cruising surveys, in which a crew drives at night to find amphibians and nocturnal snakes and lizards, were also used. In Guadalupe Mountains NP, 38 reptiles and amphibians were observed comprising six species in 16 road cruising surveys by the researchers.

Voucher specimens were collected for nearly each species found in the park. Voucher specimens provide proof that the species actually occurred in the park during the inventory and help to confirm it was correctly identified in the field. A total of 51 voucher specimens representing 46 species were collected in Guadalupe Mountains NP. 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 in the parks are spread among many institutions. For this inventory, the voucher specimens from Guadalupe Mountains NP 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, 1,931 reptiles and amphibians were found at Guadalupe Mountains NP by the researchers and park partners during this inventory, representing 48 species: seven frogs and toads, 18 lizards, 21 snakes, and two turtles.

Two species found in Guadalupe Mountains NP were listed as state endangered by Texas, the Texas horned lizard (*Phrynosoma cornutum*) and Hernandez's short-horned lizard (*Phrynosoma hernandesi hernandesi*). No nonnative reptile or amphibian species were found during this inventory.

Discussion

In order to determine what percentage of the total herpetofauna community known to occur within Guadalupe Mountains NP that was documented in this inventory, the results were compared to lists of species likely to occur in the park based on previous lists and sighting information. The researchers attempted to document as many species as they could. It is estimated that there are probably seven species that are likely to occur in Guadalupe Mountains NP that were not observed during the inventory (one toad, one salamander, one lizard, and four snakes), meaning this inventory may have documented 87% of the reptile and amphibian species in the park.



Desert box turtle (*Terrapene ornata luteola*) in Big Bend National Park.

The researchers found nine species that were not previously documented in the park. Eight of these species were likely to occur in the park based on the habitat available. One of the species found in the Salt Basin Dunes area, the Trans-Pecos threadsnake (*Leptotyphlops humilis segregus*), appears to have significantly extended its range. The individual found in this inventory appeared to be the only voucher record of this species within at least 50 miles.

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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