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**BAT SPECIES RICHNESS and ABUNDANCE at the CHIRICAHUA NATIONAL
MONUMENT and FORT BOWIE NATIONAL HISTORIC SITE
For 2004**



Photo by Karen Krebbs

Lay Report

Western National Parks Association and the National Park Service

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Prepared by:

**Karen Krebbs
Conservation Biologist
Arizona-Sonora Desert Museum
2021 N. Kinney Road
Tucson, Arizona 85743**

BACKGROUND

In Arizona, the Chiricahua and Dos Cabezas Mountains are “sky islands” in a sea of desert. Their nearness to the Sierra Madre range in Mexico results in a large variety of plant and animal life found nowhere else in the United States. Many of the plant and animal species of the Sierra Madre Occidental reach the northern extent of their range in these mountains. Twenty-three of the 44 species of bats that occur in the United States and Canada have been documented in these mountain ranges. An additional 20 species of bats that occur in Mexico could also be present in the Chiricahua and Dos Cabezas Mountains. The high diversity of bat species in these mountains is probably the result of a diversity of habitats and plants that make up these areas.

A ten-year inventory and monitoring program for bats was initiated in 2000 at the Chiricahua National Monument (CNM) and in 2001 for the Fort Bowie National Historic Site (FBNHS). Most of the bat studies in the past have taken place on the east side of the Chiricahua Mountains and have not included the CNM on the western side of this mountain range. A 1970 mammal study at the FBNHS was the last study carried out for bats in the Dos Cabezas Mountains. Both parks recognized the need for current bat inventory and monitoring studies in these areas. Long-term studies can illustrate trends and indicate how bats respond to extremes like drought or wet periods in these mountains. Results from bat species inventory and monitoring projects can help resource managers better manage their resources and the animals that depend upon these resources for their survival. It is also important for managers to know what species of bats occur in these areas for park interpretation to the public.

The primary objectives of this study were: 1) to carry out a total of ten nights of netting at the CNM and FBNHS in May, June, and August 2004, 2) compare the previous years' netting at the CNM (2000-2003) and FBNHS (2001-2003) to that of 2004, 3) make a presentation to the NPS staff and public about the inventory and monitoring project and describe how the information can be conveyed to the public, and 4) provide progress reports, a final report, and lay report on the project to the WNPS and NPS. We obtained all of our objectives for this project.

RESULTS

In 2004, we completed the fifth year (CNM) and the fourth year (FBNHS) for this ten-year bat study. We surveyed five different sites for bat species diversity at selected water sources within the two parks. All sites surveyed in the two parks were also monitored in the earlier netting attempts from 2000 to 2003. Bats were captured with standard mist nets. Three nets were set up at each site and one site monitored each evening. The nets were monitored from dusk until midnight. All bats were handled by experienced bat biologists. We collected data for weight, species, sex, reproductive condition, external parasites, and noted other physical traits for all bats captured. All data

collected was recorded on data sheets and later entered into a table for the final report. Bats were released at the site of capture after the data collection.

Chiricahua National Monument

We surveyed bats in May and August 2004 for a total of eight evenings of netting at four different sites within the CNM. All four sites contained water as in previous years. A total of 214 bats of 13 species were captured at the CNM in 2004. During the past five years, we have captured a total of 16 species and 814 bats at the four netting sites in the CNM. The month of May was hot and dry at the CNM. The amount of water at the four netting sites appeared lower than for the previous years. The amount of rainfall in this area has been below normal for the past five years or more. Bats utilize water sites for capturing insects and as a source of drinking water. Bats appear more numerous at water sites during drier periods than during wetter times. Bats have more options for water sources in wet years. The scarcity of water in the Chiricahua Mountains during the drier months could be a limiting factor for bats in this area. In August 2004, the bat netting attempts were interrupted by rain and weather extremes and bats were harder to capture on these evenings. Our netting attempts at the CNM have resulted in captures of unusual species like the red bat, the endangered lesser long-nosed bat, and numerous male silver-haired bats. The capture of these species in May reveals migratory patterns and movements through the Chiricahua Mountains at this time. We also netted two pregnant silver-haired bats in 2003 which is the first time pregnant females of this species has been captured in this mountain range. Large numbers of pregnant Townsend's big-eared bats captured indicates that a maternity roost exists in this area. Protecting maternity roosts is essential to the survival success of many species of bats in these areas.

Fort Bowie National Historic Site

We surveyed bats in June and August 2004 for a total of two evenings of netting at one site within the FBNHS. Our netting site at the FBNHS is a reliable, year-round spring, and we have not noticed a larger difference in the number of bats or species captured over the past four years. The vegetation around this netting site is thick and dense and we have not captured any species other than the smaller myotis bats. Larger bats may not be able to maneuver in this crowded space and may explain why larger species are not captured at this site. A total of nine bats of five species were captured at the FBNHS in 2004. Over the past four years, we have captured seven species and 31 bats at the FBNHS. In 2004, we captured a new species of myotis bat that has not been captured at this location over the past years.

Finding rare species or detecting population response to drought would not be possible in a short-term study. Shifting trends in seasonal migration patterns are also more likely captured in long-term studies. Our data provides a tool that resource managers and biologists can utilize to fill gaps of knowledge for bat species in the Chiricahua Mountains. Long-term inventory and monitoring projects allow us to

examine temporal and spatial population shifts in relation to environmental and climatic changes.

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