Monitoring Bats on the Fort Stanton – Snowy River Cave National Conservation Area

Debbie C. Buecher¹ and Diana E. Northup²

¹Buecher Biological Consulting, 7050 E Katchina Ct, Tucson, AZ, 85715-3323, US, dbuecher@comcast.net
²Biology Department, University of New Mexico, MSC03 2020, Albuquerque, NM, 87131

Resources that limit distribution of bats include: appropriate food resources, access to drinking water, and availability of roost sites with suitable temperatures and relative humidity. Fort Stanton – Snowy River Cave National Conservation Area (NCA) has invaluable habitat for bats. The Rio Bonito Creek, with its rich cottonwood gallery and herbaceous understory, threads through the NCA offering bats access to water and insect prey. The NCA has assorted roost sites including: caves and crevices; tree foliage and dead snags; and abandoned buildings. We have conducted mist netting along the Rio Bonito Creek since 2005 to develop a bat species list on the NCA, supplementing netting with acoustic monitoring. We have documented 12 bat species, although additional sampling might add species. NCA bat species are insectivorous and each bat will eat over ½ its body mass in insects nightly, making them the major predators of nocturnal insects.

Summer roosts chosen by reproductive female bats are generally warmer than typical caves and have higher relative humidity than the surface. These conditions ensure the rapid growth of young bats. The NCA has a summer maternity colony of Townsend’s big-eared bats (Townsends) along Rio Bonito Creek. We conducted numerous emergence counts outside the cave to monitor the colony health. We monitored roost conditions with programmable loggers showing that cave temperatures range from 12.4°C to 13.2°C. Despite the arid surface conditions, the cave RH varies between 78% and 85%.

Winter hibernacula, on the other hand, must be within species-specific cold temperatures and often nearly saturated air for bats to survive months in hibernation, while living off fat reserves accumulated in the fall. Fort Stanton Cave is a significant hibernaculum for Townsends. Winter census counts have been conducted since 1978. The lowest count was 371 bats in 1980 but recently the number of bats has been increasing and the 2022 census count was 1,113 Townsends. Surprisingly Townsends hibernate in a highly variable microclimate, which not all bat species can tolerate. The hibernaculum temperatures typically range between 1.0°C to 4.5°C and the RH varies between 50% and 100%.

Recently our work on the NCA has been monitoring for the presence of an invasive fungal pathogen responsible for the bat disease, white-nose syndrome (WNS). *Pseudogymnoascus destructans* (Pd) is a psychrophilic fungus that has caused the death of over 6 million hibernating bats in the U.S. and Canada. In 2012 we began swabbing NCA bats to determine the naturally occurring microbiomes across different species. We found a number of Actinobacteria on bats that inhibit the growth of *Pd*. Unfortunately, we have discovered from our microclimate analysis that Ft. Stanton’s hibernaculum has appropriate conditions for the growth of *Pd*, were it introduced into the cave. Because of concern for possible *Pd* in NCA caves, we swab bats immediately after hibernation to test for *Pd* spores and visually assess the bats for lesions on wings and tail membranes, resulting from *Pd* infection. To date, we have not detected *Pd* on NCA bats.


2022 New Mexico Geological Society Annual Spring Meeting & Ft. Stanton Cave Conference
April 7-9, 2022, Macey Center, Socorro, NM
Online ISSN: 2834-5800