



WIND CAVE NATIONAL PARK 2016 RESOURCE BRIEF

BAT ACOUSTIC MONITORING

Overview

National Park Service Inventory & Monitoring scientists are using acoustic recorders to collect data on bat populations and bat diversity at Wind Cave National Park. A rapidly expanding fungal disease called white-nose syndrome is threatening bat populations in North America. Scientists are working hard to slow the spread of this disease and baseline data on bats at the park will help to conserve bat species in the face of this dire threat that has not yet arrived at Wind Cave National Park.

White-Nose Syndrome

White-nose syndrome has been associated with more than seven million bat deaths in the last decade. A white covering of fungus forms on the bats' muzzles when they have this disease. The fungus seems to prefer cool, damp conditions, so it strikes bats when they

are hibernating causing them to wake frequently. This depletes their fat reserves and they starve to death. First identified in a cave in New York in 2006, white-nose syndrome has since spread southward and westward with detections as far as Iowa, Wisconsin, and Oklahoma.

White-nose syndrome is believed to spread from bat to bat and by humans who carry nearly invisible fungal spores on their shoes and clothing from one cave to another.

Monitoring

The Northern Great Plains Inventory and Monitoring Program and the Midwest Regional Wildlife Biologist deployed stationary acoustic bat recorders at Wind Cave National Park in June 2014 and July 2015. Recorders were also used to conduct surveys along roads.

Acoustic recorders pick up the ultrasonic calls that bats use for echolocation.

The calls bounce off objects and return to the bat's ears allowing bats to navigate across the landscape while avoiding obstacles as well as to locate prey. Since bats have relatively unique call patterns, these calls can often be identified to species by scientists using specialized software. These recordings are providing researchers with data on bat populations at Wind Cave National Park.



Above: The little brown myotis (*Myotis lucifugus*) is abundant in Wind Cave National Park. NPS Photo.

There are more than 950 species of bats in the world; they account for nearly one quarter of all mammals. Bats are ecologically important. They play a major role in the food web by regulating night flying insect populations and distributing nutrients across the landscape.



Tri-colored bat at Wind Cave National Park. NPS Photo.



Highlights

- 2014 and 2015 classification rates were very similar at stationary points and on the road surveys (Figure 1). This suggests that white-nose syndrome has not yet impacted the park's bat populations.
- Silver-haired bats and big brown bats accounted for about 1/3 and 1/4 of all station point detections respectively (Figure 2). These species have very similar calls so the relative difference should be viewed cautiously. Hoary and little brown bat each accounted for about 1/8 of the detections, but the latter has a similar call to other myotis species.
- The SW stationary point near the park's sewage pond (largest body of permanent surface water in the park) had the most bat activity. The NE stationary point on a bluff over Beaver Creek had the second highest activity. The road survey had the most detections on the stretch of Highway 87 through the forested area known as Reeves Gulch.
- The data collected at Wind Cave NP will also be used in the North American Bat (NABat) Program, an effort to monitor bat populations across all of North America.
- The sites will be revisited in future years under an agreement with the University of Wyoming.

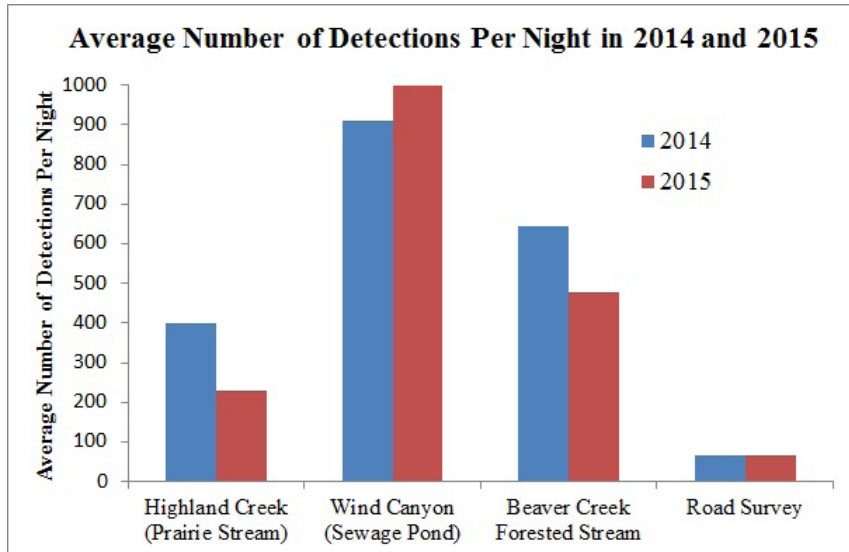


Figure 1. Average number of detections per night in 2014 and 2015 at stationary sites and during road surveys in Wind Cave National Park.

Map of Bat Acoustic Monitoring sites at Wind Cave National Park. The yellow line is the park boundary. The black line is the mobile survey route. NPS Photo.

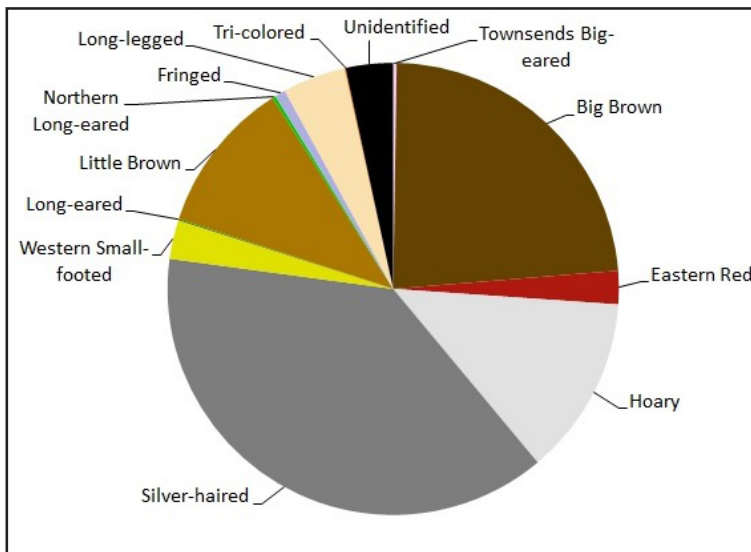
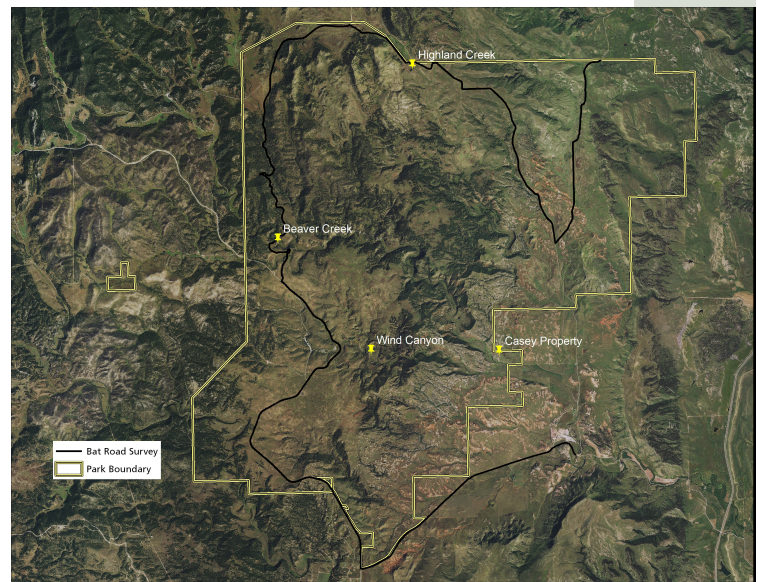
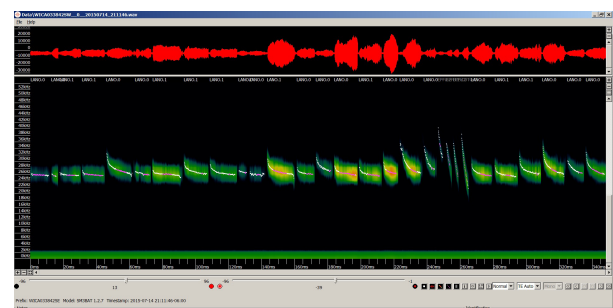


Figure 2. Species classifications as a fraction of all bat detections at Wind Cave National Park.



Spectrogram of a silver-haired bat at Wind Cave National Park. The vertical green signals (right side) might represent a feeding buzz.

