

The Nebraska White-Nose Syndrome Project at the Happy Jack Chalk Mine

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BACKGROUND INFORMATION

White-nose Syndrome (WNS) is a novel fungal pathogen killing millions of hibernating bats in eastern North America.

WNS has been spreading westward in North America since its discovery in 2006. The fungus now is known from as close as eastern Iowa and western Missouri. WNS likely and unfortunately will reach Nebraska and spread westward, affecting millions of western bats.

WNS causes death to hibernating species when their natural immunity is suppressed during winter months.

Hibernating bats in North America are the primary predators of night-flying insects, consuming tons a year, including many crop pests.



Fig. 1. Hibernating tricolored bats (*Pteromyotis subflavus*) at the Happy Jack Chalk Mine in April.

Note dew droplets on bats, demonstrating individuals do not awake much during winter. Not awaking much ultimately leads to their death when exposed to WNS.

The Happy Jack Chalk Mine houses a population of the Tricolored Bat throughout the year. Most individuals reside in the mine from September to April (about 70 individuals in 2013-2014 surveys) while they hibernate. During summer, a few males remain in the mine.

OBJECTIVES OF OUR COLLABORATIVE PROJECT

1. Identify location of mines, quarries, and caves that likely are used as hibernacula by bats.
2. Survey for WNS in Nebraska, including the Happy Jack Chalk Mine, to determine when the fungus reaches the state.
3. Monitor hibernating bat populations in the state before WNS reaches Nebraska (and after, if needed).
4. Gather natural history data on hibernating bats before WNS enters the state to better assist researchers and managers to protect hibernating bat populations in the future.

METHODS

We initiated this project in Spring 2014 throughout eastern Nebraska with funding from Nebraska Game and Parks Commission in collaboration with the US Fish and Wildlife Service. The Happy Jack Mine is one of our focal mines to monitor and the only mine with PIT tagged bats.

Fig. 2. Locating hibernating bats in April 2014 at the Happy Jack Chalk Mine.

(Hans Otto, Ken Geluso, and Cliff Lemen from left to right)
Photograph by NEBRASKALAND Magazine, Nebraska Game and Parks Commission (NGPC)



Fig. 3. Cody Dreier swabbing Tricolored Bat in April 2014 for WNS fungal spores.

Photograph by NGPC



Fig. 4. Researcher inserting small device under skin to record movements in and out of mine throughout the year.

Such tags are called "PIT" tags and are the same tags commonly inserted under the skin of pets to help identify them if lost.

Photograph by NGPC



Fig. 5. Keith Geluso acquiring mass of a Tricolored bat as Trish Freeman records this and other data in notes (e.g., sex of bat, length of forearm, and unique number of PIT tag) for each individual in the mine.

Photograph by NGPC



Figs. 6 & 7. Researchers have blocked off much of the two passageways in and out of the mine with plastic sheeting (pictured on left) to guide bats into open box.

The open-framed, wooden box has antennas, the black "garden-hose looking" tubes wrapped around the box (pictured on right), that will detect each bat as individuals fly through, sending data to a computer that records the time, date, and unique number of individual PIT tag.



Fig. 8. Researcher, Cliff Lemen, downloading some of the initial movement data of bats in and out of the mine in May 2014.

ACKNOWLEDGMENTS

We thank Betty Carlson and the Happy Jack staff for access in the mine to study bats. This study was approved by the Institutional Animal Care and Use Committee at UNK. We thank Eric Fowler for taking pictures (NEBRASKALAND Magazine, NGPC). Other photos were by Keith Geluso.



Fig. 9. White coveralls help prevent researchers from spreading WNS, if it does occur in the mine, to other sites in Nebraska. (Photograph by NGPC)

Standing left to right: Hans Otto, Cliff Lemen, Trish Freeman, Brett Andersen, and Mike Fritz. Kneeling left to right: Cody Dreier, Ken Geluso, Jeremy White, and Keith Geluso