

# Bats, agaves, and people: Collaborative conservation to protect endangered pollinating bats

By Kristen Lear

*Mexican long-nosed bats (*Leptonycteris nivalis*) are listed as endangered in the United States and by the International Union for the Conservation of Nature. Populations have declined by approximately 50% in 15 years, a decline expected to continue without immediate conservation action. Each spring, pregnant females migrate from central Mexico to give birth to and raise their pups in northeast Mexico and the U.S. Southwest. During this journey, they rely on the nectar of agave plants for food, and in turn provide critical pollination services for agaves. However, these foraging resources are under threat from destruction of natural habitat, climate change, and the harvest of agaves by people for numerous economic and cultural uses. Current conservation efforts include agave restoration initiatives to increase foraging habitat for the bats during their migration. My research aims to fill critical knowledge gaps and to directly inform the implementation of these restoration efforts, particularly around two important roosting caves in Nuevo León and Coahuila in northeast Mexico.*

## RESEARCH APPROACH

The goal of my work is to provide a better understanding of how to design restoration and conservation efforts that are both ecologically and socially feasible and effective. I adopt an interdisciplinary research approach that integrates methods and analyses from the natural and social sciences.

In order to design appropriate habitat restoration programs, it is imperative first to understand the animal's foraging requirements. This entails a deeper analysis of what constitutes a high quality foraging area - the characteristics of the agaves and the surrounding landscape that attract foraging bats. To help answer these questions, I used infrared cameras to monitor and record the bats' nightly feeding visits to flowering agaves. Additionally, I conducted agave surveys to measure key characteristics of the landscape and the flowering agaves in the monitoring sites. I will subsequently employ statistical modeling tools that will shed light on resource and landscape preferences of pollinating bats.

Appreciating that the issue of bat conservation is a subset of a larger socio-ecological system, I have also focused on

## Significance

### Contribution to conservation practice:

This research will contribute to on-the-ground conservation efforts for an endangered pollinating bat, including ongoing agave restoration initiatives in the U.S. and Mexico.

**Strategic communication:** Collaborative work with local conservation partners in Mexico has focused on increasing awareness of bats and their ecological and economic importance and encouraging participation in bat conservation efforts.

**Strengthening international collaborations:** I have sought to strengthen U.S.-Mexico relations through my contribution to a bi-national bat conservation network and partnerships with Mexican organizations.

