

High-altitude Collision between an Airplane and a Hoary Bat, *Lasiurus cinereus*

Suzanne C. Peurach

U.S.G.S Patuxent Wildlife Research Center, Smithsonian Institution, P.O. Box 37012,
National Museum of Natural History, NHB 378, MRC 111, Washington, D.C. 20013-7012

On 9 October 2001, a U.S. Air Force T-37-B jet sustained a wildlife strike during a night flight (2030 hours) over Lawton, Oklahoma. The pilot and a student in the aircraft heard and felt the strike at an altitude of 2,438 meters (8,000 feet) above ground level and immediately recorded the time and location (U.S. Air Force strike number 50313). The strike occurred on the leading edge of the aircraft engine near the intake (B. S. Bowman, pers. comm.).

The remains of the animal were recovered from the outside of the aircraft upon landing and initially sent to the Smithsonian Institution, National Museum of Natural History, Division of Birds, for identification. The sample, which consisted of a large section of skin with attached fur, eventually was transferred to the U.S. Geological Survey, Patuxent Wildlife Research Center, Biological Survey Unit, Division of Mammals, for identification. The alternating banding pattern visible to the naked eye and the frosted tips of the hairs indicated that this bat was a species of *Lasiurus*, and most likely a hoary bat (*L. cinereus*).

To identify the sample to the level of species, I prepared a slide of the hair according to techniques described for feathers by Laybourne and Dove (1994) and compared the hairs with a reference collection housed in the Division of Mammals, National Museum of Natural History. Samples were examined at low (100-x), medium (200-x) and high (400-x) power on a Zeiss comparison light microscope. Measurements were taken using an ocular micrometer. The sample was compared macroscopically, as well as microscopically, with samples from species of *Lasiurus* that occur in Oklahoma (Choate and Jones 1998), including the hoary bat, red bat (*L. borealis*), and Seminole bat (*L. seminolus*). Comparisons of unknown hair samples can be difficult when the region of the body that a sample came from is unknown. For bats, however, the form and scale pattern of hairs sampled from different regions of the body, as well as from different sexes, have no marked differences, although color and size of hairs do vary (Benedict, 1957).

Under the microscope, scale patterns on hairs from the strike formed a spiral pattern along portions of the shaft, as described for *Lasiurus* and some species of *Myotis* and *Eptesicus* (Nason, 1948). The hairs from the strike showed a banding pattern (dark at the base, followed by a pale band, and then dark distally) that was characteristic of *L. cinereus*, as described by Moore and Braun (1983). The imbricate crenate scale pattern found at the widest portion of the hair shaft of the unknown sample was a character used by Nason (1948) to distinguish *L. cinereus* from *L. borealis* and *L. seminolus*.

The diameter at the widest portion of the hair shaft was reported to be greater than 12.5 microns for *L. cinereus* and less than 12.5 microns for *L. borealis* (Moore and Braun, 1983). The diameter of the widest portion of one of the hair shafts found in the wildlife strike was 19 microns. Hairs from voucher specimens of *L. seminolus* were examined under the microscope and compared to hairs from the strike. The diameter at the widest portion of the hair shaft of *L. seminolus* was found to be no larger than 12 microns. Hence, the hair sample from the aircraft strike over Oklahoma best matched *L. cinereus*, according to microscopic characters, macroscopic examination, and geographic distribution.

High-altitude flights have been documented for Brazilian free-tailed bats (*Tadarida brasiliensis*), using visual triangulation (Davis et al. 1962) and radar with associated helicopter visualization to identify the bats (Williams et al. 1973). The elevation of Lawton, Oklahoma, is approximately 462 meters and the highest altitude in the state is 1,516 meters at the peak of Black Mesa. Although no records for high-altitude flight were found in the literature for *L. cinereus*, this flight at 2,438 meters (8,000 feet) above ground level probably represents an altitudinal record for the species.

Acknowledgments

Special thanks go to Major B. S. Bowman, BASH Program Manager, Sheppard Air Force Base, for providing verification of the details of this strike. I would like to thank A. L. Gardner for permission to sample specimens from the U.S. National Museum for comparison. A. L. Gardner, C. J. Dove, D. E. Wilson, and L. Wolfe provided helpful comments on the manuscript. I also thank members of the U.S. Air Force HQ AFSC/SEFW BASH team, Kirtland Air Force Base, for their support and the opportunity to work on this event.

Literature Cited

- Benedict, F. A. 1957. Hair structure as a generic character in bats. University of California, Publications in Zoology, 598:285-548.
- Choate, L. L., and C. Jones. 1998. Annotated checklist of recent land mammals of Oklahoma. Texas Tech University, Occasional Papers of the Museum, 181:1-13.
- Davis, R. B., C. F. Herreid, II, and H. L. Short. 1962. Mexican free-tailed bats in Texas. Ecological Monographs, 32:311-346.
- Laybourne, R. C., and C. J. Dove. 1994. Preparation of birdstrike remains for identification. Pp. 531-534 *in* Proceedings and working papers of the Bird Strike Committee Meeting Europe 22, Vienna 1994.
- Moore, D. W., and J. K. Braun. 1983. Keys to the hairs of the families Soricidae, Vespertilionidae, and Muridae within Tennessee. Journal of the Tennessee Academy of Science, 58: 40-43.
- Nason, E. S. 1948. Morphology of hair of eastern North American bats. American Midland Naturalist, 39:345-361.
- Williams, T. C., L. C. Ireland, and J. M. Williams. 1973. High altitude flights of the free-tailed bat, *Tadarida brasiliensis*, observed with radar. Journal of Mammalogy, 54:807-821.