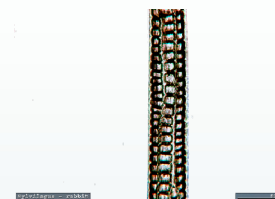


# Hair Identification: Applications and Cooperative Efforts

**Suzanne C. Peurach**  
 USGS Patuxent Wildlife Research Center  
 Biological Survey Unit  
 National Museum of Natural History  
 Washington DC



- The identification of mammal hair has many applications within the scientific community, the military, and in commerce. The USGS Biological Survey Unit, stationed within the Smithsonian Institution, National Museum of Natural History, performs identifications of mammalian remains, including the microscopic identification of hair.
- Collections are invaluable for providing known identity reference materials for comparison with samples submitted from around the globe, making it possible to identify a few hairs from an aircraft strike from Qatar, Korea, Uzbekistan, or Turkey.
- The National Museum of Natural History, Division of Mammals, houses the largest collection of mammal study specimens in the world.



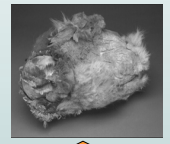
Suzanne Peurach standing within the collections of the Smithsonian Institution, National Museum of Natural History.

## Smithsonian Institution, Department of Anthropology

Hair from anthropological artifacts provides information about the distribution and diversity of mammals at different time periods as well as cultural practices of the people at those times.



Ermine (*Mustela erminea*) was used as trim on the top edge of this Alaskan mask.



Infant mummy bundle wrapped in bird and mammal skins from Kagamil Island, Alaska. This bundle was wrapped in bear and fox skins, along with several bird species.



Hair samples from these pants from Canada revealed that they were constructed from baby seal pelts (*Phoca sp.*).



Microscopic examination of hair from this Greenlandic parka revealed Artic Fox (*Alopex lagopus*) trimmed with Polar Bear (*Ursus maritimus*).

## US Air Force, Federal Aviation Administration, US Navy, US Department of Agriculture/APHIS

Hair examination wasn't necessary to determine what this aircraft struck

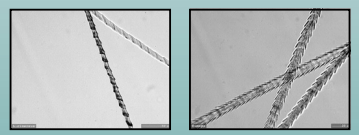


But usually all that is found is a bit of skin or even just a few hairs



Samples can be compared to museum specimens of known identification either by the naked eye, or under magnification

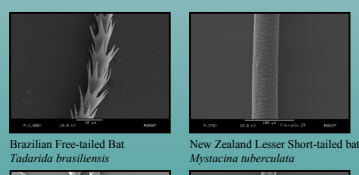
Light microscopy provides a view of the internal characteristics of the hairs shaft



Hoary bat  
*Lasiurus cinereus*

Western mastiff bat  
*Eumops perotis*

Scanning electron microscopy can be used to visualize the exterior of the hair shaft.



Brazilian Free-tailed Bat  
*Tadarida brasiliensis*

New Zealand Lesser Short-tailed Bat  
*Mystacina tuberculata*



Pallas' Mastiff Bat  
*Molossus molossus*

Townsend's Big-eared Bat  
*Corynorhinus townsendii*

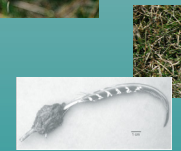
## Smithsonian Institution, National Zoo; National Food Processors Association; and researchers from colleges and universities worldwide



Hair found at the National Zoo identified the murderer of a bald eagle – a Red Fox, *Vulpes vulpes*.



Hair and skin was examined to identify contaminants found in commercial food products for the National Food Processors Association



Hair has also been positively identified from scat samples and stomach contents, and owl pellets from a variety of organisms for many researchers from colleges and universities.

Publications resulting from this research:

- Woodman, N., C. J. Dove, and S. C. Peurach. 2005. A curious pellet from a Great Horned Owl (*Bubo virginianus*). *Northeastern Naturalist*, 12(2):127-132.
- Peurach, S. 2004. Bat strike! *Flying Safety Magazine*, 60(9):18-19.
- Peurach, S. C. 2003. High-altitude collision between an airplane and a hoary bat, *Lasiurus cinereus*. *Bat Research News*, 44(1):2-3.
- Dove, C. J., and S. C. Peurach. 2002. Microscopic Analysis of Feather and Hair Fragments Associated with Human Mummified Remains from Kagamil Island, Alaska. Pp 51-62 *In*: B. Frohlich, A. B. Harper, and R. Gilberg, editors. *To the Aleutians and Beyond - The Anthropology of William S. Laughlin*. Publications of the National Museum, Ethnographical Series, The National Museum of Denmark, Volume 20, Copenhagen, 382 pp.
- Dove, C. J. and S. C. Peurach. 2001. The use of microscopic hair characters to aid in identification of a bat involved in a damaging aircraft strike. *Bat Research News*, 42(1):10-11.