

## BIG BROWN BAT

*EPTESICUS FUSCUS* (BEAUVOIS, 1796)

NATURAL HISTORY SUMMARY BY KATE DUROST

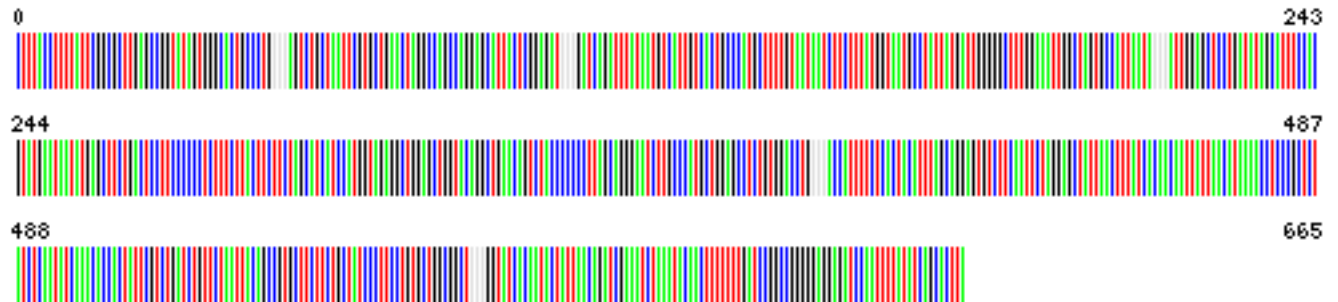


Figure 1. [Eptesicus fuscus DNA Barcode](#) – Barcode of Life Database – BOLD Systems (Ratnasingham and Hebert 2007)

### Classification

**Kingdom:** Animalia  
**Phylum:** Chordata  
**Class:** Mammalia  
**Order:** Chiroptera  
**Family:** Vespertilionidae  
**Genus:** *Eptesicus*  
**Species:** *E. fuscus*

### Description

The Big Brown Bat (*Eptesicus fuscus*) is mainly brown with the ventral portion lighter and an overall appearance of glossy or oily fur. The face, ears, and flight membranes are unfurred and black. Females tend to be larger than males. *Eptesicus fuscus* has been divided morphologically into 12 subspecies, differing primarily in size and shade of brown; molecular data suggest that this number of subspecies is likely due to their large range. In Washington, the subspecies most likely to be encountered is *E. f. bernardinus* (Burnett 1983; Engels 1936; Hartson 2002; Neubaum et al. 2007)

### Distribution

The Big Brown Bat has an extremely large range, from southern Canada, all over North America, most of Central America, all the way down to South America (Colombia and

Venezuela), and the Caribbean (Miller et al. 2016). *Eptesicus fuscus*' [range map](#) is available at Miller et al. 2016.

### **Diet**

The Big Brown Bat is an insectivore, selectively preying on beetles (Coleoptera) regardless of their relative abundance, but it also eats other flying insects. During the summer, when they are lactating, the females will broaden their diet to include stink bugs (*Halyomorpha halys*) which are high in calcium and which the beetles lack (Agosta et al. 2003).

### **Habitat and Ecology**

The Big Brown Bat can be found in cities, towns, rural areas, and occasionally in heavily forested regions. It tends to reside in human dwellings, barns, silos, and churches. Occasionally the Big Brown Bat will roost in storm sewers, expansion joint spaces in concrete athletic stadiums, and in copper mines. In the wild, it can be found in tree hollows, natural caves, or openings in rock ledges. In the winter, the Big Brown Bat hibernates in various structures, in either man-made or natural environments (Miller 2016).

### **Reproduction and Life Cycle**

The Big Brown Bat mates from November through March, or just before or during hibernation. The female holds the sperm in her reproductive tract until the beginning of April, when she will actually become pregnant. After about 60 days, she gives birth to one or two pups that grow very quickly, opening their eye after approximately one week. The female nurses her young until they are weaned in late June to early July. Females form maternity colonies ranging in size from 5 to 700 females. As a group, females pick maternity roosts for the whole colony to use. Males roost alone or in small groups, although sometimes they roost with the maternity colony for a few nights. Males do not participate in the rearing of the young. Males and females roost together, beginning in the late summer and during the subsequent hibernation (Nowak 1999). It is during their first winter that many of the Big Brown Bats die, due to insufficient storage of the body fat that is necessary for hibernation (Miller et al. 2016).

## Conservation Status

In 2016, the Big Brown Bat's, *Eptesicus fuscus*, conservation status was listed as of "Least Concern" by the International Union for Conservation Nature (IUCN) Red List of Threatened Species (Miller et al. 2016). This was justified because of its wide distribution, the increase in population due to man-made roosting structures, the fact that it can be found in a number of protected areas, and because it can tolerate some degree of habitat modification (Miller et al. 2016).

## Cultural Significance

Since some of their prey are agricultural pests, Big Brown Bats are of economic and agricultural importance in North America. A single colony of Big Brown Bats can consume 1.3 million pest insects each year (Boyles et al. 2011). However, some of the Big Brown Bat populations have been adversely affected by two major threats: the "white-nose syndrome" fungus (probably *Geomyces destructans*) and wind turbines. Thus, several hundred metric tons of insects are no longer being eaten, causing an increase in crop damage (Boyles et al. 2011).

## Specimen Specific Detail

The Big Brown Bat (*E. fuscus*) specimen from the [Burton Ostenson Museum of Natural History](#) at Pacific Lutheran University (PLU) is a female, collected from Harstad Hall on November 7, 1967 by D. L. Pattie. Harstad Hall was one of the very first buildings at PLU and used to be an administrative building. On the same day that this specimen was collected, Lyndon B. Johnson signed a bill establishing the Corporation for Public Broadcasting and Surveyor 6 was launched for a soft landing on the Moon (OnThisDay.com).

## Literature Cited

- Agosta, S. J., D. Morton, and K. M. Kuhn. 2003. Feeding ecology of the bat *Eptesicus fuscus*: 'preferred' prey abundance as one factor influencing prey selection and diet breadth. *Journal of Zoology*, 260(2), 169–177. doi:10.1017/s0952836903003601
- Boyles, J. G., P. M. Cryan, G. F. McCracken, & T. H. Kunz. 2011. Economic Importance of Bats in Agriculture. *Science*. 332 (1):41-42. Available at [http://www.biologicaldiversity.org/campaigns/bat\\_crisis\\_white-nose\\_syndrome/pdfs/Boyles2011EconomicsofBats.pdf](http://www.biologicaldiversity.org/campaigns/bat_crisis_white-nose_syndrome/pdfs/Boyles2011EconomicsofBats.pdf). Accessed on June 23, 2017.

- Burnett, C. D. 1983. Geographic and Climatic Correlates of Morphological Variation in *Eptesicus fuscus*. *Journal of Mammalogy*, 64(3), 437–444. doi:10.2307/1380356
- Engels, W. L. 1936. Distribution of Races of the Brown Bat (*Eptesicus*) in Western North America.
- Hartson, T. 2002. *Mammals of Washington and Oregon*. Edmonton: Lone Pine Pub. Pg. 313.
- Historical Events in November 1967. OnThisDay.com. Available at <http://www.onthisday.com/events/date/1967/november>. Accessed on June 23, 2017.
- Miller, B., Reid, F., J. Arroyo-Cabrales, A. D. Cuarón, & P. C. de Grammont. 2016. *Eptesicus fuscus*. The IUCN Red List of Threatened Species 2016. e.T7928A22118197. Available at <http://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T7928A22118197.en>. Accessed on June 20, 2017.
- Neubaum, M. A., M. R. Douglas, M. E. Douglas, & T. J. Oshea. 2007. Molecular Ecology of the Big Brown Bat (*Eptesicus fuscus*): Genetic and Natural History Variation in a Hybrid Zone. *Journal of Mammalogy*, 88(5), 1230–1238. doi:10.1644/06-mamm-a-228r1.1
- Nowak, R.M. 1999. *Walker's Mammals of the World*. The Johns Hopkins University Press, Baltimore, USA and London, UK.
- Ratnasingham S. and P. D. N. Hebert. 2007. bold: The Barcode of Life Data System (<http://www.barcodinglife.org>). *Molecular Ecology Notes*. 2007;7(3):355-364. doi:10.1111/j.1471-8286.2007.01678.x.