Little Brown Bats and Forestry

Wildlife in Managed Forests: Reference Series

The little brown bat *(Myotis lucifugus)* is a member of the Myotis bat family and one of 15 native bat species found in Oregon. Adults have a wingspan of 8-11 inches in wingspan and weigh less than half an ounce. This species can be identified by their long, glossy dark brown fur and black wing membranes (see figure).

Little brown bats are insectivorous, eating mostly mosquitoes, moths, beetles, and spiders, acting as an incredible source for pest control in both agriculture and forestry. Contrary to popular belief, bats rarely carry diseases such as rabies; in fact, they help prevent a wide variety of diseases in humans (and pets and livestock) by helping keep insect populations in check. While bats have very good eyesight, they cannot see in the dark, and thus they rely on their echolocation to navigate at night and find prey. Bat guano (waste) is extremely high in nitrogen and makes an excellent fertilizer, contributing to forest health.

Little brown bats are currently classified as "under review" and are being considered for listing by the U.S. Fish and Wildlife Service. NatureServe designates little brown bats in Oregon as an S3-Vulnerable State Conservation Status species.

In Oregon little brown bats are found in the Blue Mountains, Northern Basin and Range, Columbia Basin, Coast Range, East Cascades, Klamath Mountains, West Cascades, and Willamette Valley ecoregions. While little brown bats are habitat generalists, it is more common to see them west of the Cascades compared to the rest of the state. They are also found throughout much of the United States, including Alaska.

The little brown bat may live up to 30 years, which is highly unusual for a small mammal. Females only take one year to reach sexual maturity, while males take two years. Breeding occurs in late summer and early autumn, but ovulation and pregnancy are delayed until spring. Once pregnant, females have a single pup after a 60-day gestation period. Pups undergo rapid growth and are weaned and flying within their first month of life. While female bats of some species may carry their pups while foraging during their first few weeks of life, little brown bats will leave their pups in the maternal colony.

The habitat of the little brown bat varies by season. Across their range, in the winter, little brown bats may migrate hundreds of miles to caves, mines or other human-made structures to roost. The bats choose winter roosts that provide stable temperatures for hibernation. Due to Oregon's temperate climate, the little brown bat is less likely to travel far for wintering habitat that provides stable temperatures. In the warmer seasons, they can be found roosting in trees, under bridges, in buildings, and under rocks and piles of wood. Little brown bats often require access to streams, ponds, lakes, or other bodies of water for foraging and drinking. This species is not territorial and may spend time in large groups with hundreds to thousands of individuals during hibernation or pup-rearing. Reproductive females form maternity colonies and live separately from non-reproductive females and males. This will eventually turn into a nursery colony that can range from a dozen individuals to more than 1,000 bats.

Little brown bat

Identifying features of little brown bat

Identifying features of little brown bat

Little brown bat maternity colony

Single little brown bat roosting

SEASONAL ACTIVITIES OF LITTLE BROWN BATS			
Winter (Nov.-Feb.)	**Spring (Mar.-Apr.)**	**Summer (May-Aug.)**	**Fall (Sep.-Oct.)**
Inactive season Little brown bats spend most of this time hibernating in caves, mines, and other human-made structures after migrating from their summer range. This is the time of year when female form maternity colonies and store the sperm from fall breeding.	**Fertilization** season As the little brown bats emerge from hibernation, fertilization occurs from the stored sperm, thus beginning pregnancy. Males and non-reproductive females remain in their own colonies during this time.	**Roosting** season Females produce 1 pup after a 50–60-day gestation period. The maternity colony will act as a nursery for all the new pups. In the first few days, the pups will cling to their mother's fur during foraging. However, they will remain in the roost as they get older. By 4 weeks, the pups are weaned and capable of flight. Males and non-reproductive females remain in their own colonies during this time.	**Breeding** season Males and females congregate to the same roost in caves or mines. This social behavior is referred to as "swarming" and this is where mating occurs.

WHAT ARE SOME THREATS TO LITTLE BROWN BATS?

- habitat loss, degradation, and fragmentation particularly from land use change
- loss of dead or dying trees that have developed cavities, loose bark or cracks
- loss of clean water sources and clean, abundant insect prey
- wind turbines, which cause rapid pressure changes as bats pass through disturbed air resulting in internal injuries and death
- harassment and mortality from pets, particularly from outdoor/free-roaming cats
- White Nose Syndrome (WNS) is a fungal disease that is responsible for greater than 90% mortality of little brown bats in fewer than 10 years. WNS infects bats when they are hibernating, which causes them to wake up early in the wintering months when temperatures get warm. This results in the bats using up their fat reserves and starving prior to spring arriving.
- altered temperature due to climate change, which can disrupt roosting patterns and expose the bats to heatwaves, droughts and wildfires

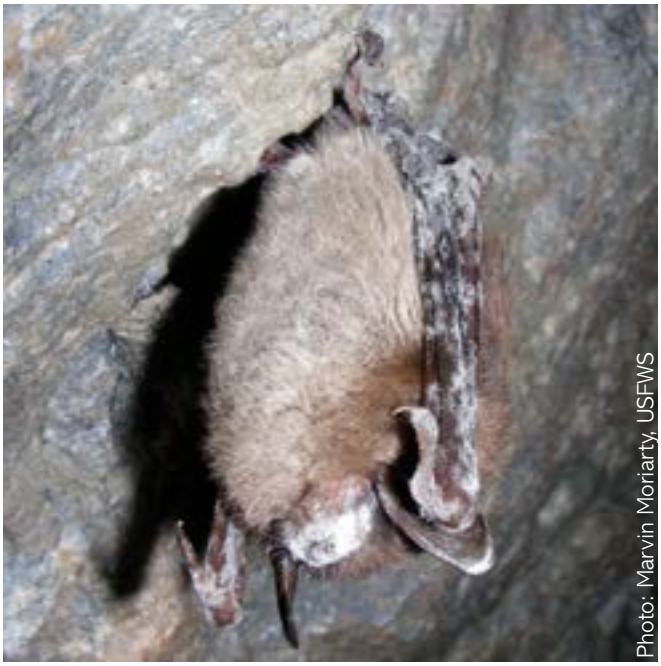
Photo: Marvin Moriarty, USFWS

Little brown bat with whitenose syndrome

HOW CAN YOU TELL LITTLE BROWN BATS APART FROM OTHER BATS?

The little brown bat looks very similar to other myotis bat species, such as the California myotis, the long-legged myotis and the western small-footed myotis. The only true way to tell these bat species apart is if they are captured, handled and measured by a qualified wildlife biologist.

An alternative, less invasive option is to set up recording devices in order to identify the echolocation sound wave patterns unique to each bat species. Organizations such as Vesper offer trainings and workshops, both online and in person, for setting up bioacoustics monitoring. Visit the Vesper website, batacousticsurveys.com, for more information about their services and trainings.

To learn more about the 15 bat species in Oregon, visit the Oregon Department of Fish and Wildlife's (ODFW) *Living with Wildlife: Bats* webpage: dfw.state.or.us/wildlife/living_with/bats.asp.

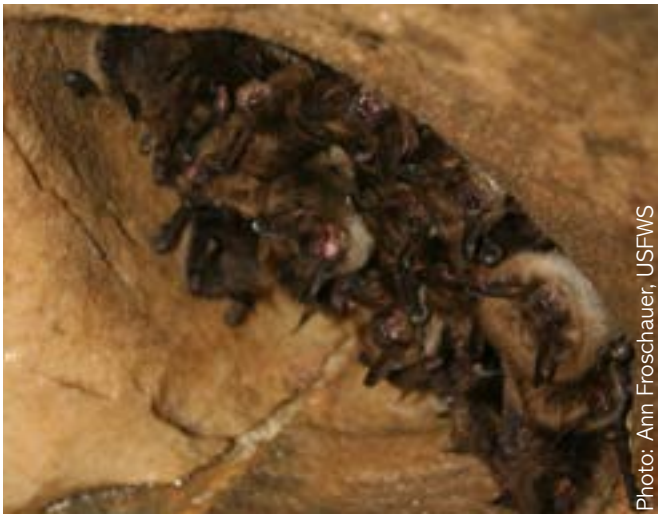
Photo: Ann Froschauer, USFWS

Little brown bat colony

BEST MANAGEMENT PRACTICES FOR LITTLE BROWN BATS

- Consider timing of forest management activities to avoid disturbing bats during critical periods such as summer roosting and breeding.
- Conduct timber management to benefit bat conservation. Many bats benefit from midstory reduction or removal because it allows foraging opportunities with a clear understory and improved roosting habitats.
- Retain existing snags, or create snags of various sizes, and retain down logs and rock piles. Bats prefer a wide variety of decay classes within the snags, including down logs, and often move between roosting sites in the spring and summer.
- Provide and maintain vegetated buffers composed of native plants around bodies of water and riparian areas. Foraging habitat around bodies of water is especially critical for maternity colonies in the summer to gain enough nutrients to nurse their young.
- Retain existing hardwood trees and other deciduous vegetation to increase the abundance and diversity of insect prey.
- Minimize use of pesticides and other chemicals.
- Avoid disturbance in and around entrances to caves and mines where there are known colonies. Cross-contamination is a major threat, as WNS is highly contagious amongst bats, and humans may play a part in transferring the fungus between colonies (remnants on clothing/shoes) if traveling between caves/mines. Being in caves also risks disturbing the bats while they are hibernating, when they are most vulnerable to disease, starvation and stress.

SOURCES & MORE INFORMATION

https://myodfw.com/wildlife-viewing/species/bats

https://www.fws.gov/species/little-brown-bat-myotis-lucifugus

https://wdfw.wa.gov/species-habitats/species/myotis-lucifugus#desc-range

https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100473/Myotis_lucifugus

https://woodlandfishandwildlife.com/wp-content/uploads/2019/07/BatsAndSmallWoodland.pdf

https://extension.oregonstate.edu/catalog/pub/em-9384-getting-know-oregons-bats

For more information on forest management techniques and introducing more artificial structures to your property that may potentially benefit bats, visit this USDA publication.

REMOVING BATS FROM HUMAN-MADE STRUCTURE

If bats are in an artificial structure on your property (i.e. buildings, bridges, dams) and you want them removed, contact an ODFW-licensed local bat eviction service for assistance. For more information, go to the ODFW's Wildlife Control Operator webpage to learn which wildlife control operators are in your area. Alternative options include building artificial roosting structures such as bat boxes can be introduced for smaller colonies. Moreover, adding simple and inexpensive modifications to bridges and culverts can directly benefit larger colonies.

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