



How much do YOU
know about bats?

Quiz complements of Lawrence Hall of Science, University of California



Bats really are blind

True

False

FALSE. Though they do not see in color, they see better than we do at night! And many bats can “see” by sonar



The world's smallest bat weighs less than a penny

True

False

TRUE. It's the bumblebee bat of Thailand, the world's smallest mammal





Some bat's hearing is so keen they can hear the footsteps of an insect walking on the sand more than six feet away.

True

False

TRUE. Many bats find their way and locate prey using the sound of echoes



Bats are cruel by nature

True

False

FALSE. Some bats adopt orphans and will risk their lives to share food with less-fortunate bats



Vampire bats are the only mammals that feed on nothing but blood

True

False

TRUE. By the way, vampire bats live only in Latin America, where most people will never even see one



Is it true that vampire bats suck your blood?

- **No!**
- Contrary to popular belief, a vampire bat does not suck blood from its victim, but makes an incision and laps the blood up
- The blood doesn't clot because of anti-coagulants in the bat's saliva



Bats hang by their nose

True

False

FALSE. They hang by their toes, counterbalanced by their upside-down weight



Bats get tangled in your hair

True

False

FALSE. People may have thought this because bats fly over our heads hunting bugs. If a bat flies by you, it's probably chasing a mosquito



All bats live in attics and caves

True

False

FALSE. Some choose trees and other sites; tropical bats make homes everywhere from banana leaves to spider webs



Bats are vicious

True

False

FALSE. Bats pose little threat to people who leave them alone; they will bite in self-defense if mishandled



That completes our quiz
Lets learn more things about bats





Are bats featherless birds?

NO.

- Bats are mammals, just like people
- But bats are very special mammals - they are the only mammals that can fly





How do we know they are mammals?

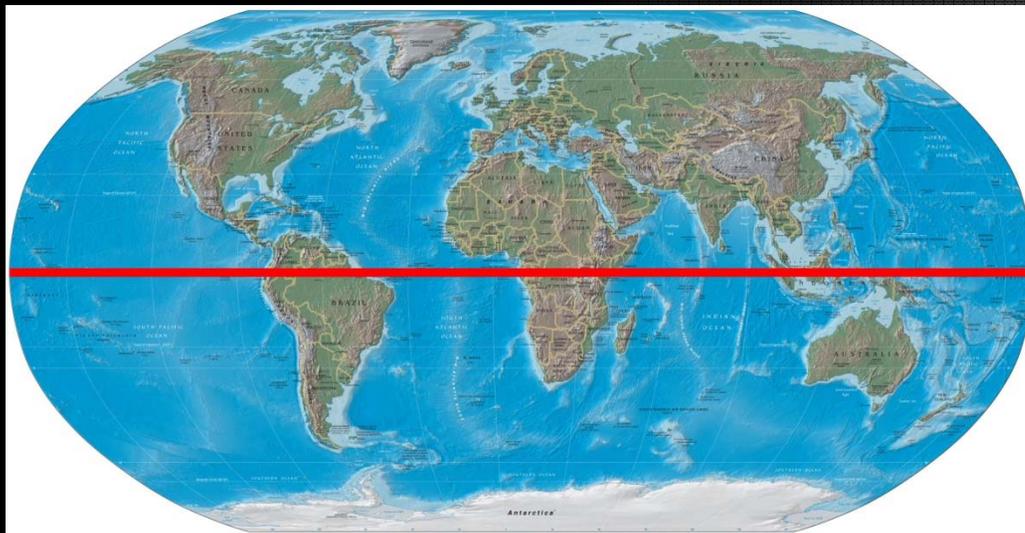
- Bats are warm blooded
- Bats nurse their babies with milk
- Bats have fur





Where in the world are bats found?

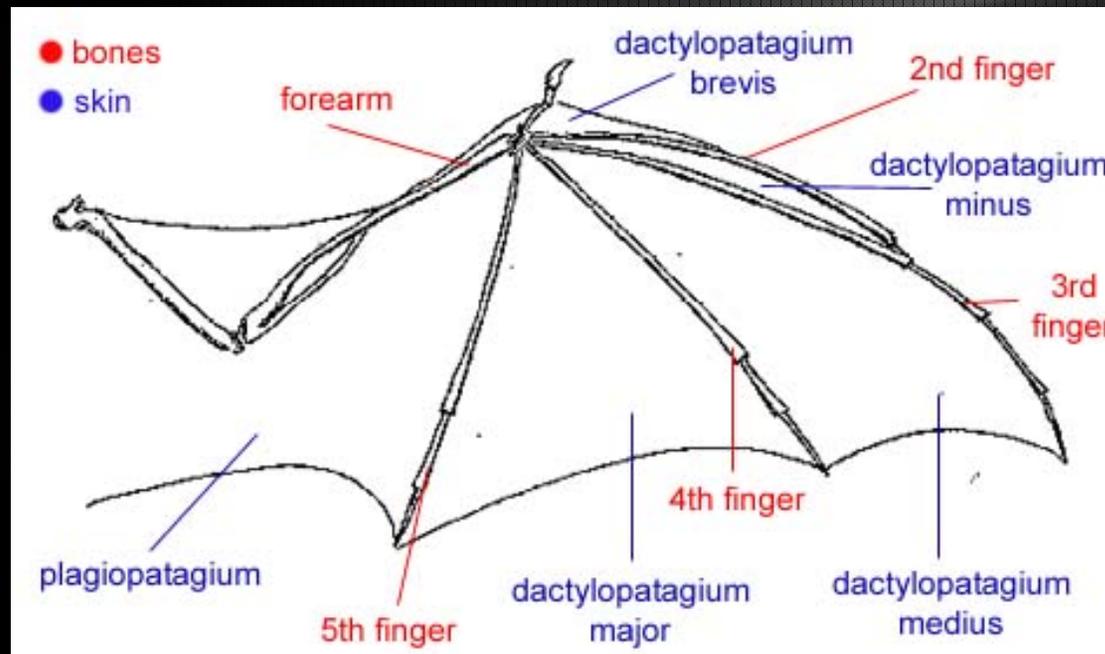
- Bats live on all continents except Antarctica
- However, there are many more bats and species of bats where the weather is warm, like near the equator or the southern United States





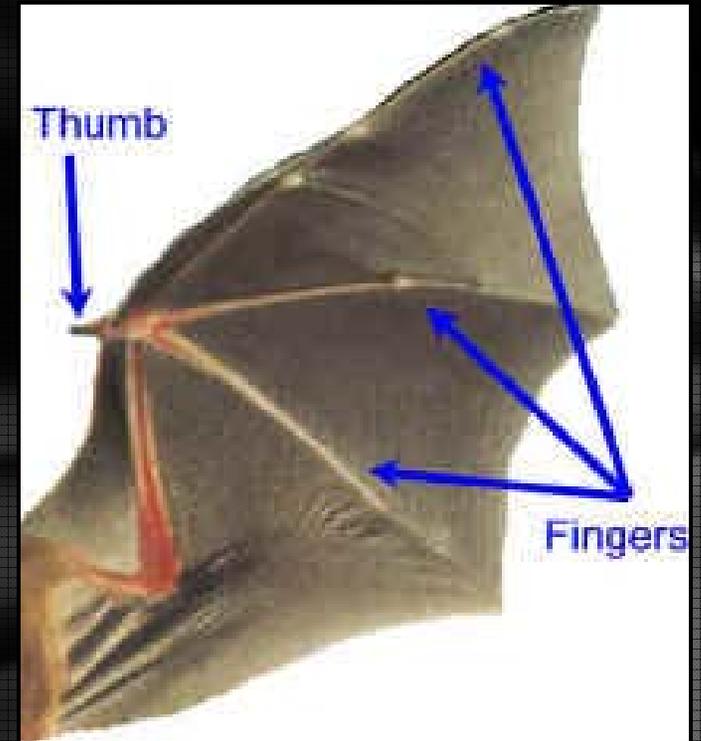
Bats are in the order Chiroptera

That means "hand-wing"





Bat Wings



Bat wings are made of two thin layers of skin stretched over the bat's arm and fingers. Bats have a thumb and fingers, just like people

Bats use their wings for more than just flying, they can wrap their wings around fruit or an insect when eating



Species of bats

- The world's smallest mammal is the bumblebee bat, weighing about as much as a penny
- The Flying Fox, with a wingspan of 78 inches, is the world's largest bat
- There are over 1100 different species of bats – they make up one fifth of the world's mammals
- 47 Species of bat in the United States
- 13 species of bat in Idaho
- Bats are grouped into two main groups: megabats and microbats



Megabats

- Megabats are large fruit eating bats, also known as flying foxes
- Live in tropical regions of the world
- Excellent eyesight
- Do not echolocate
- Helpful to people... (wait and see)





Microbats

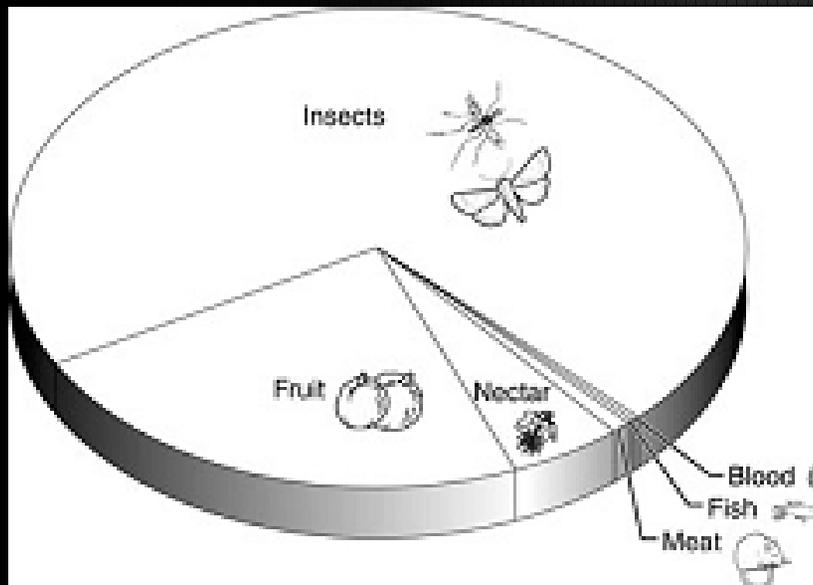
- Microbats are small bats with varied diets
- Good eyesight
- Microbats can echolocate
- Most bats worldwide are microbats
- All bats in the US are microbats





Bat Food

- insects
- fruit
- nectar
- small mammals
- fish
- blood





Bat Food

- Bats eat about $\frac{1}{3}$ their body weight a night
(pregnant and lactating females eat up to their body weight)

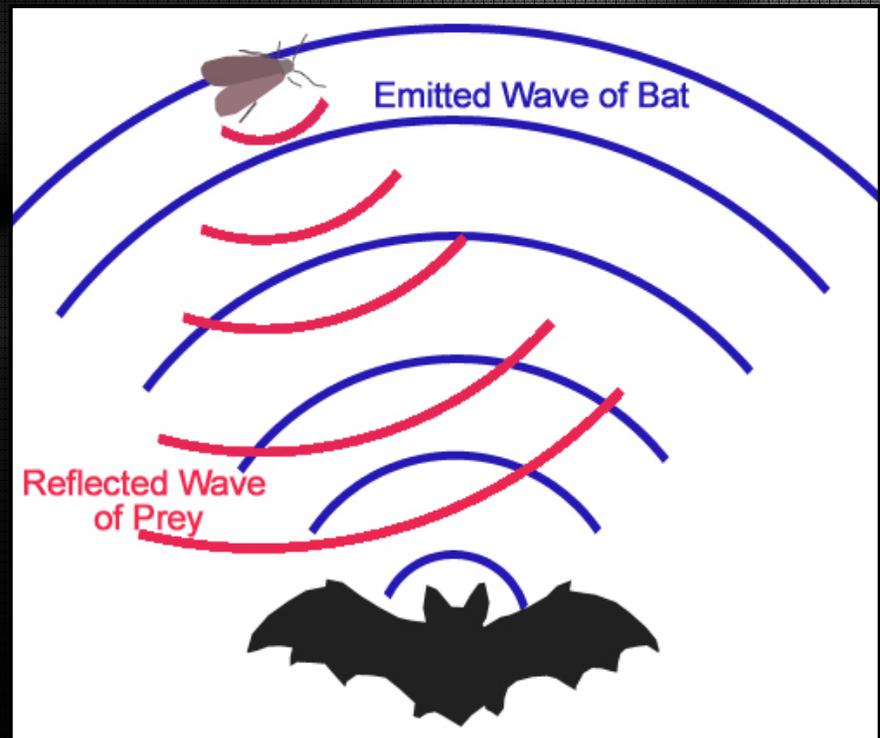
How many McDonald's BigMacs would you have to eat to match that rate?

if you weigh 100 pounds, you should eat
64 BigMacs



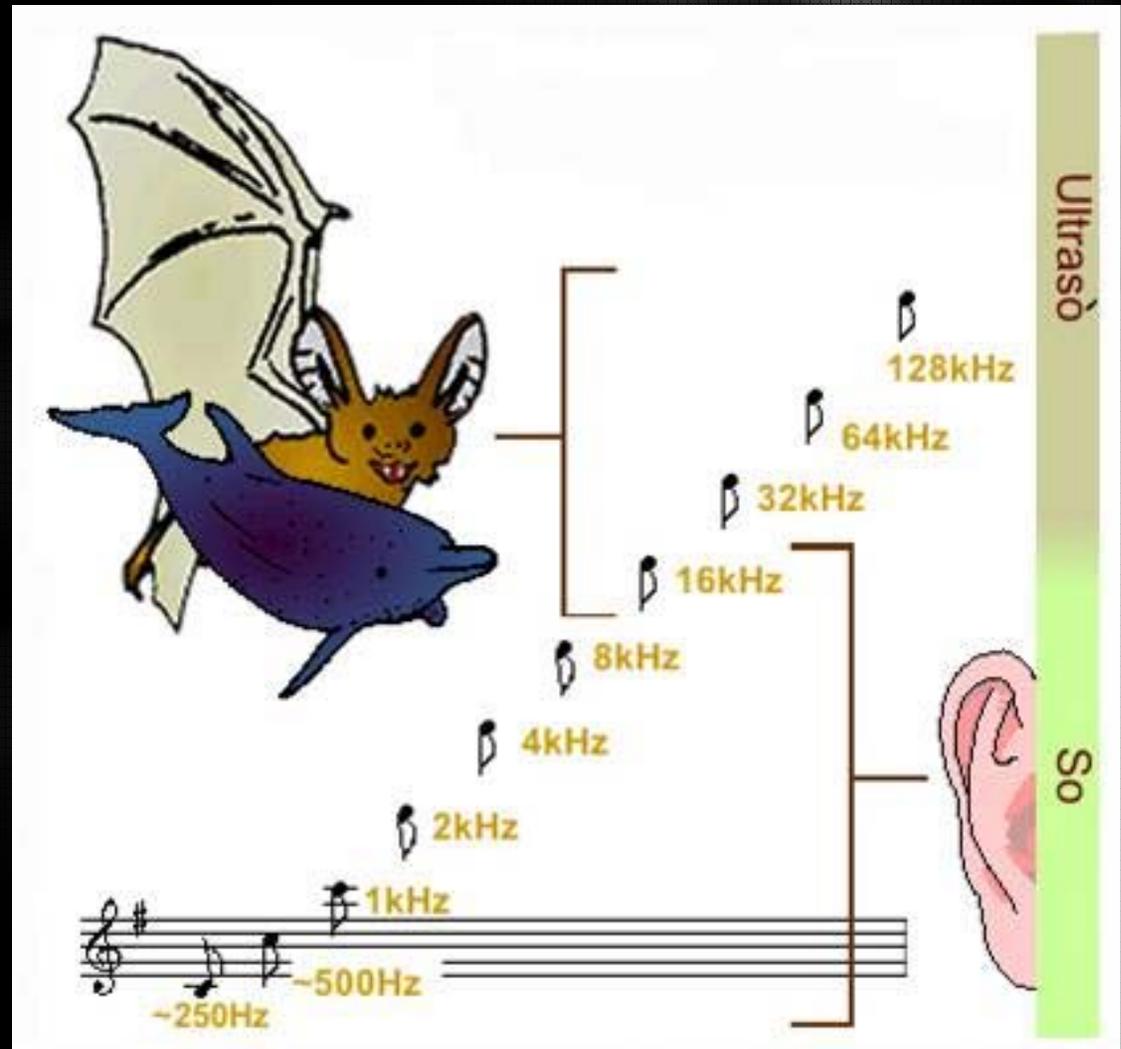
Echolocation

- Bats don't use their sense of sight to fly and find food at night
- Bats make rapid high-pitched squeaks called "ultrasounds"
- These sounds are too high for most people to hear





and good thing their calls are ultrasonic!





bat calls are
VERY LOUD!



as loud as your smoke
detector

no wonder they have to eat so much...

– how would you like to walk around
shouting all day??!



- echolocation video...



Bat behavior

- Bats hunt and eat at night and sleep during the day...

....Therefore, bats are called....

NOCTURNAL!





How do bats sleep?

- If you said upside down, give yourself a pat on the back!
- Some species are very sociable, as they usually sleep together in large groups





Where do bats roost?

- Some bats roost in old mines
- In NA, other use tree cavities, under loose bark, or rock crevices
- Tiny woolly bats of West Africa live in the large webs of spiders.
- The Honduran white bat cuts large leaves to make "tents" that protect its colonies from jungle rains.





What is one place
we are forgetting??

- Some caves may be home to thousands of bats.
- The largest bat colony in the world is in Bracken Cave, Texas. During the summer, this cave is home to as many as 20 MILLION Mexican free-tailed bats.
- These bats eat 250 tons of insects every night.

Bat Caves!!!





City Bats?

- Bats can be adaptable. Some live in man made structures in the city, instead of caves
- The largest urban colony, under the Congress Avenue Bridge in Austin, Texas, is home to about 1.5 million bats!





Bat Babies

- After hibernation, the female bats have babies. Do you know what the babies are called?

pups!

- Bats usually only have one baby at a time, but sometimes they have twins.
- The pups are tiny when born, but can usually fly a month after birth



Bat baby?

NO!

Bat Pups



© Luke Marsden/Newspix / Rex Features



Bat Babies

- The pups are born with strong legs and claws because they have to hang on to the mother when she's roosting and to the cave when she's not there
- If the pup loses its grip and falls, it will die
- Some species form large nursery colonies, where nursing mothers gather to raise their pups





Bats Are Special

- For their size, bats are the slowest reproducing mammal on earth
- They have the longest life span compared to their size.
 - Average 15 to 20 years
 - One lived 41 years in wild
 - Compare to mice - live 3 or 4 years



Where do Bats Spend the Winter?

In temperate areas (like eastern Washington), cold winters mean bats must **HIBERNATE** or **MIGRATE**

HIBERNATE:

- Large groups in caves or mines
- Some species can survive short exposure to freezing temperatures, and might hibernate in cliff faces or outer walls of buildings

MIGRATE:

- Travel long distances, from Canada to the Gulf States or Mexico



Bat Enemies

- Predators of bats include:
 - great horned owls
 - hawks and falcons
 - raccoons
 - house cats
 - snakes
- Humans, because they destroy bat habitat.





Benefits of Bats

- **Pest control** – pregnant or nursing mothers can consume their body weight in insects each night. Other season, by consume half their body weight per night. That's a LOT of bugs!
- **Fertilizer** – Guano (bat poop) is a rich fertilizer. Commercially mined in many countries today.



Benefits of Bats Cont.

- **Pollinators** - many bats eat nectar, spreading pollen between plants in the process
- If you like bananas, mangoes, or cashews, (plus many other fruits) thank a bat!
- **Seed dispersal** – fruit-eating bats in the rainforest spread seeds.
(you tell me how they do that!)



Bats and Rabies

- Less than $\frac{1}{2}$ of 1% of bats carry rabies
- Fewer than 40 people in the United States are known to have contracted rabies from bats during the past 40 years
- Far more people are killed by dog attacks, bee stings, or lightning than rabies from bats



Bats and Rabies

BUT rabies is a serious disease!

- Spread by saliva (bites), NOT by guano
- Many mammals can carry it: skunks, foxes, raccoons, dogs
- Always fatal to humans
- Don't approach or handle sick or injured wildlife
- If bit by a wild animal (including bats), see a doctor for a vaccination!!



How do biologists study bats?

- Mist netting
- Counts at maternity colonies
- Counts at winter hibernacula
- acoustic methods





Acoustic Bat Inventory

- "eavesdrop on bats"
- Record echolocation calls
- Several technologies
- We use "full spectrum"



Acoustic Bat Detection

1.



2.



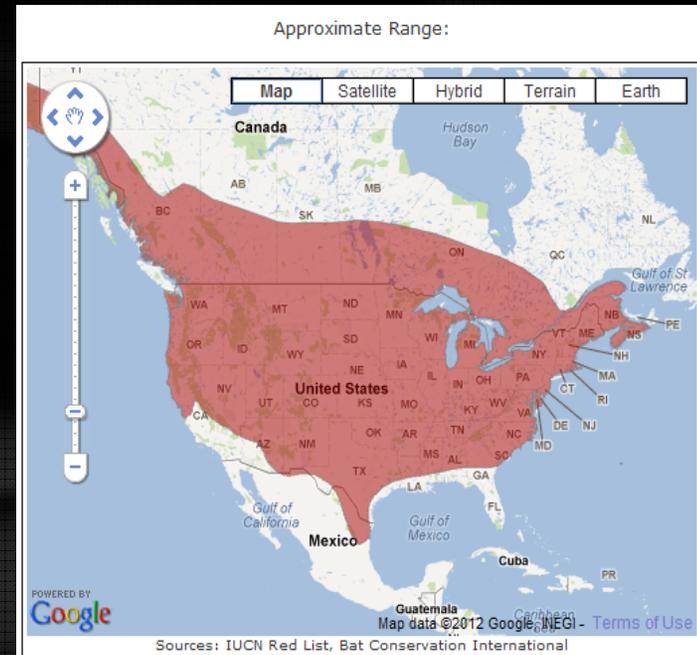


SonoBat Demonstration

Silver-haired Bat (*Lasionycteris noctivagans*)



Weighs 11.5 grams



Habitat: forest

Summer roosts: in snags and trees

Hibernacula: Northern populations migrate south to hibernate

under loose bark, small tree hollows, in buildings, rock crevices

Hoary Bat (*Lasiurus cinereus*)



Weights 28.6 grams



X 11.5

Habitat: forests

Summer roost: in tree foliage

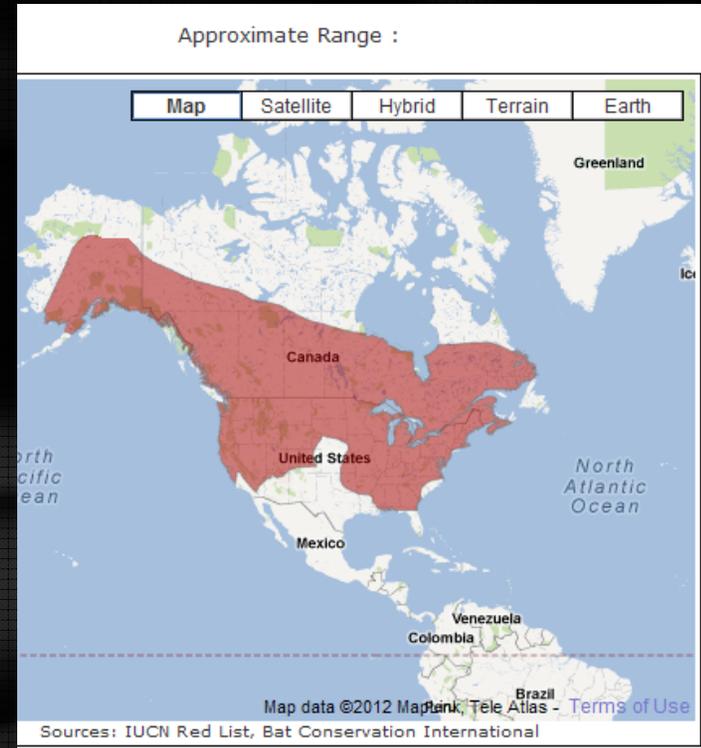
Hibernacula: Migrate to California and Mexico



Little Brown Myotis (*Myotis lucifugus*)



Weights 7.5 grams



Habitat: forests, usually near water

Summer roost: hollow trees, buildings, rock outcrops, mines, caves

Hibernacula: mines and caves

Big Brown Bat (*Eptesicus fuscus*)



Approximate range



Weights 16.5 grams

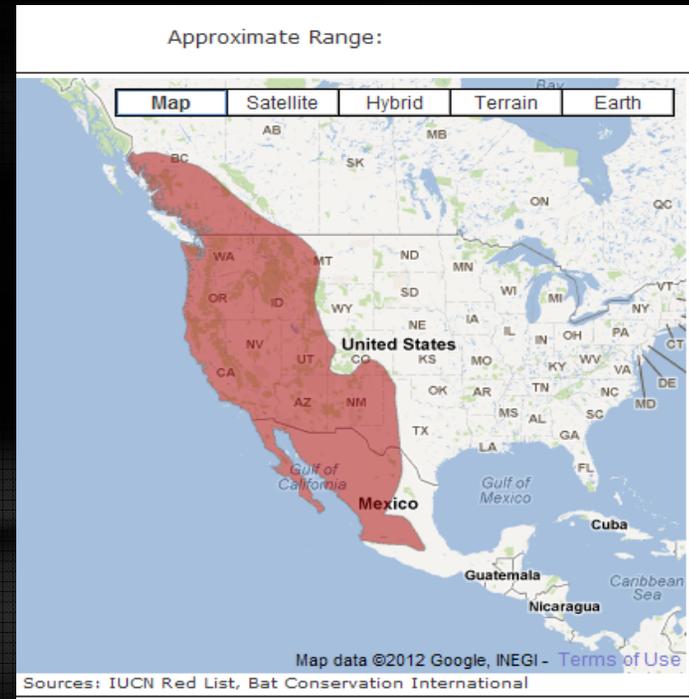


Habitat: generalists

Summer Roost: wide variety

Hibernacula: buildings, caves, mines,
rock crevices

Yuma Myotis (*Myotis yumanensis*)



Weights 6.4 grams



habitat: wide variety: from riparian, scrubland, desert, forest

Summer Roosts: bridges, buildings

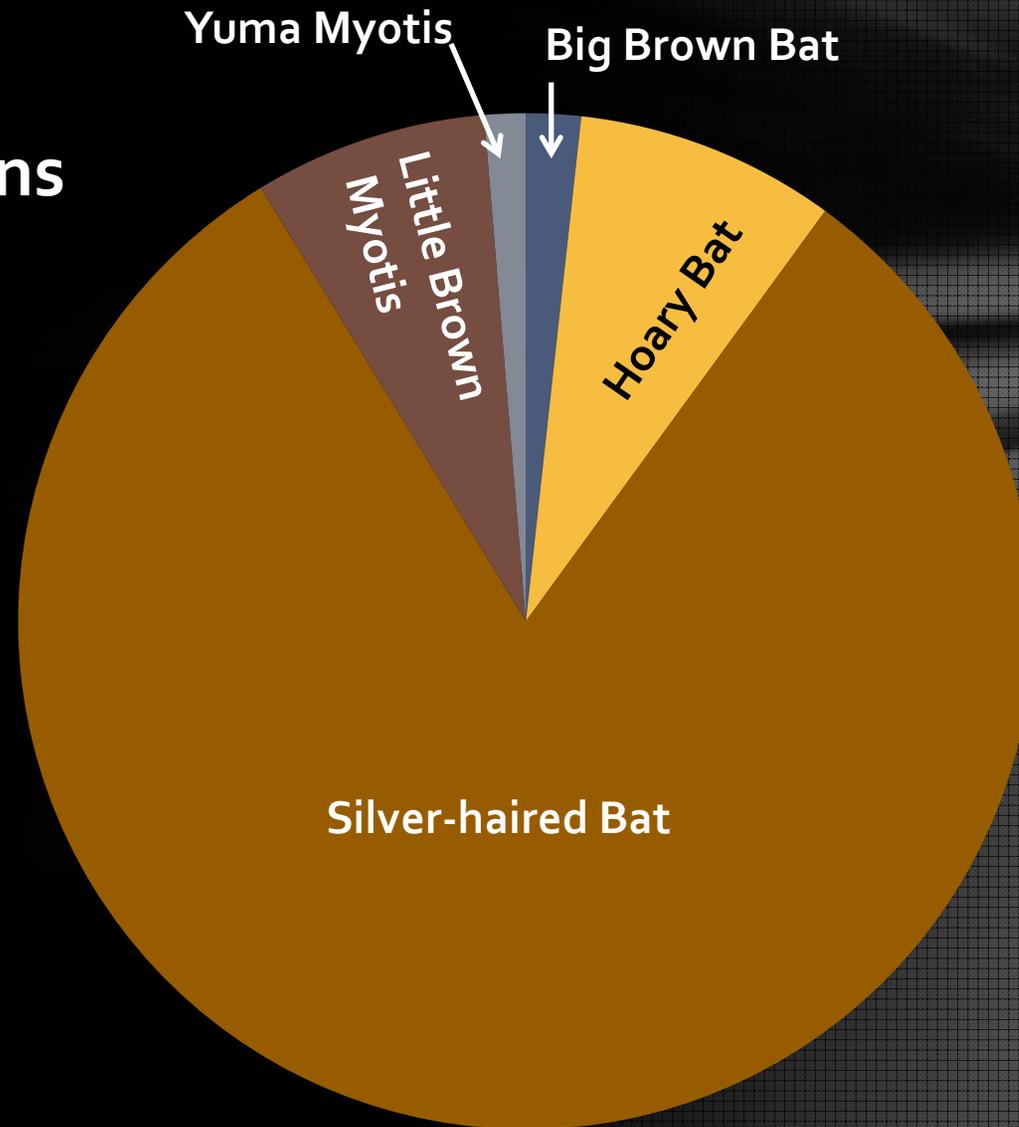
Hibernacula: poorly known, may include caves and lava tubes



Bats on Deer Flat NWR

Summer 2012

Detections

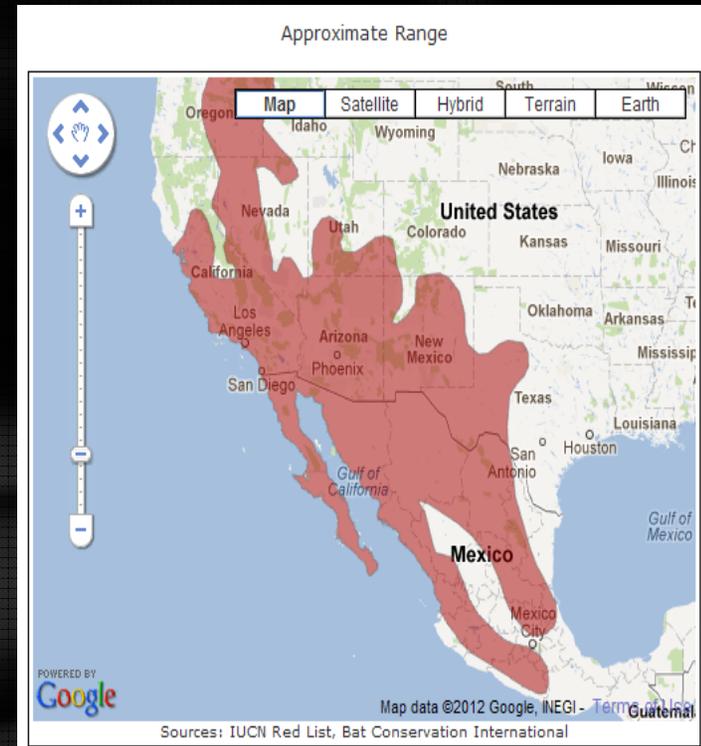




Other Bats Found in Idaho

30 kHz group

Canyon Bat (*Pipistrellus hesperus*)



Smallest bat in USA
Weighs 4 grams

Habitat: rocky areas and canyons, usually near water

Summer roosts: under loose rocks and in caves

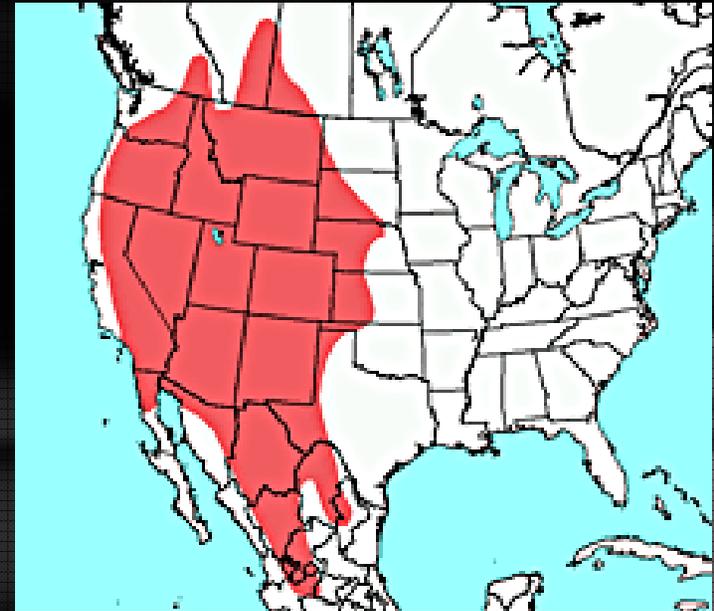
Hibernacula: mines, caves, rock crevices



Western Small-footed Myotis (*Myotis ciliolabrum*)



Approximate range



Weights 4.9 grams



Habitat: variety of drier habitats – usually near cliffs, rock outcrop, or talus

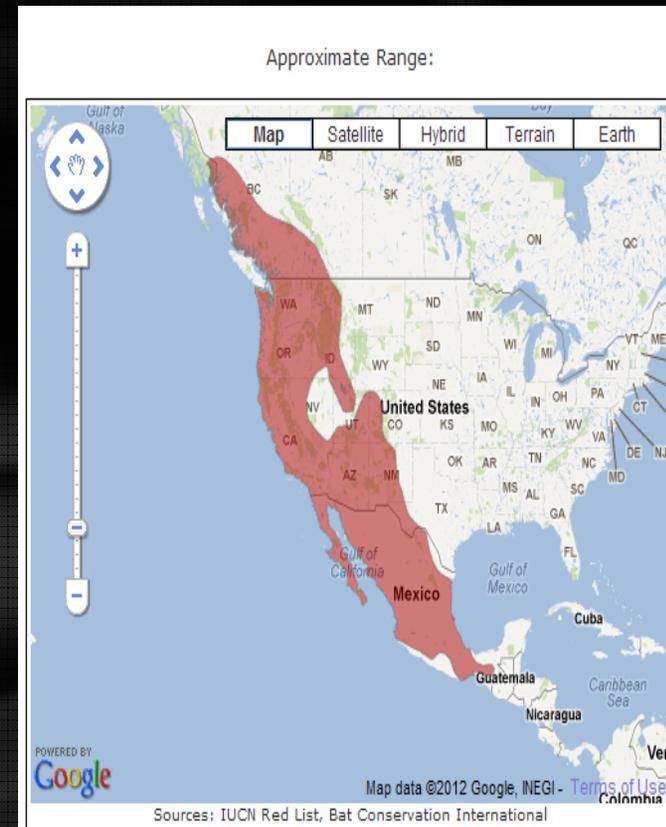
Summer roosts: rock crevices, under tree bark, or in buildings, caves, bridges

Hibernacula: tight crevices, caves, abandoned mines and rarely, buildings

California Myotis (*Myotis californicus*)



Weights 5.75 grams



Habitat: wide variety

Summer roost: caves, mines, buildings, under tree bark

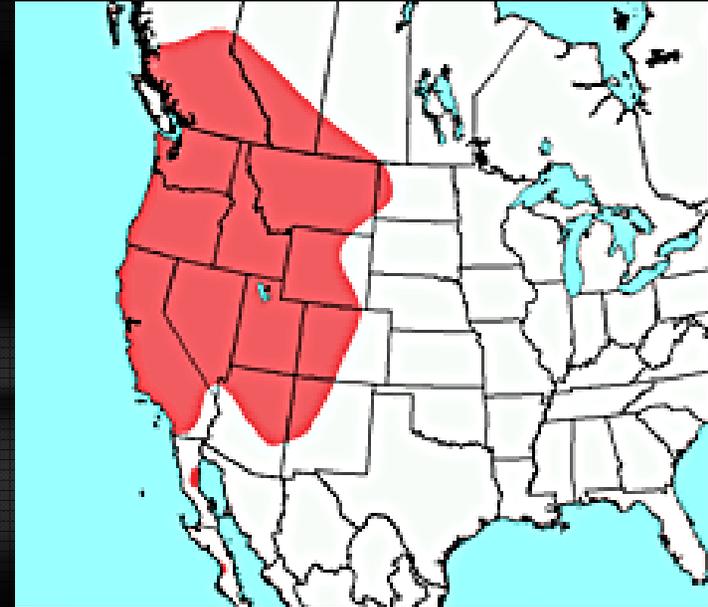
Hibernacula: caves, mines, and buildings

Western Long-eared Myotis (*Myotis evotis*)



©Merlin D. Tuttle, Bat Conservation International

Approximate range



Weights 6.5 grams



Habitat: Mostly conifer forests

Summer roost: tree cavities, loose bark, rock crevices and fallen logs. Often roost close to the ground

Hibernacula: caves, mines, possibly buildings

Pallid Bat (*Antrozous pallidus*)



Approximate range



Weights 20 grams



Habitat: arid regions, associated with rock outcrops, cliffs, and water sources

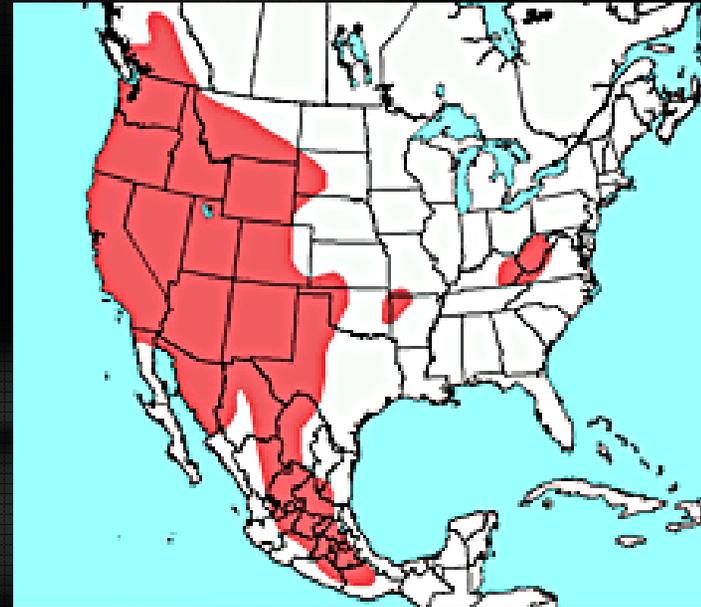
Summer roost: rock crevices, buildings, bridges

Hibernacula: buildings, rock crevices, caves, mines

Townsend's Big-eared Bat (*Corynorhinus townsendii*)



Approximate range



Weights 12.5 grams



Habitat: arid western desert scrub and pine forests

Summer roost: caves, lava tubes, mines, old buildings

Hibernacula: Caves and abandoned mines

Long-legged Myotis (*Myotis volans*)



Weights 7.5 grams

©Merlin D. Tuttle, Bat Conservation International



Fringed Myotis (*Myotis thysanodes*)



Weights 9 grams



Spotted Bat (*Euderma maculatum*)

Weights 15 grams

