



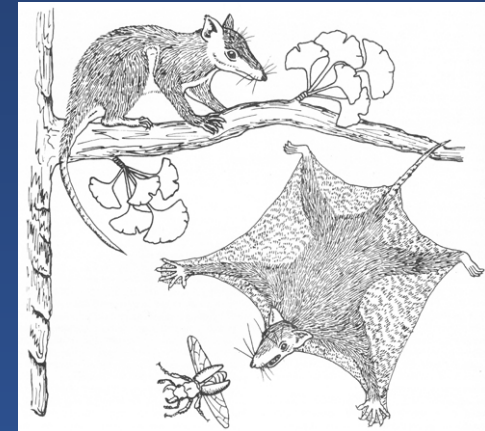
Bats of Montana

Dan Bachen Sr. Zoologist



Overview: Taxonomy/ Evolution

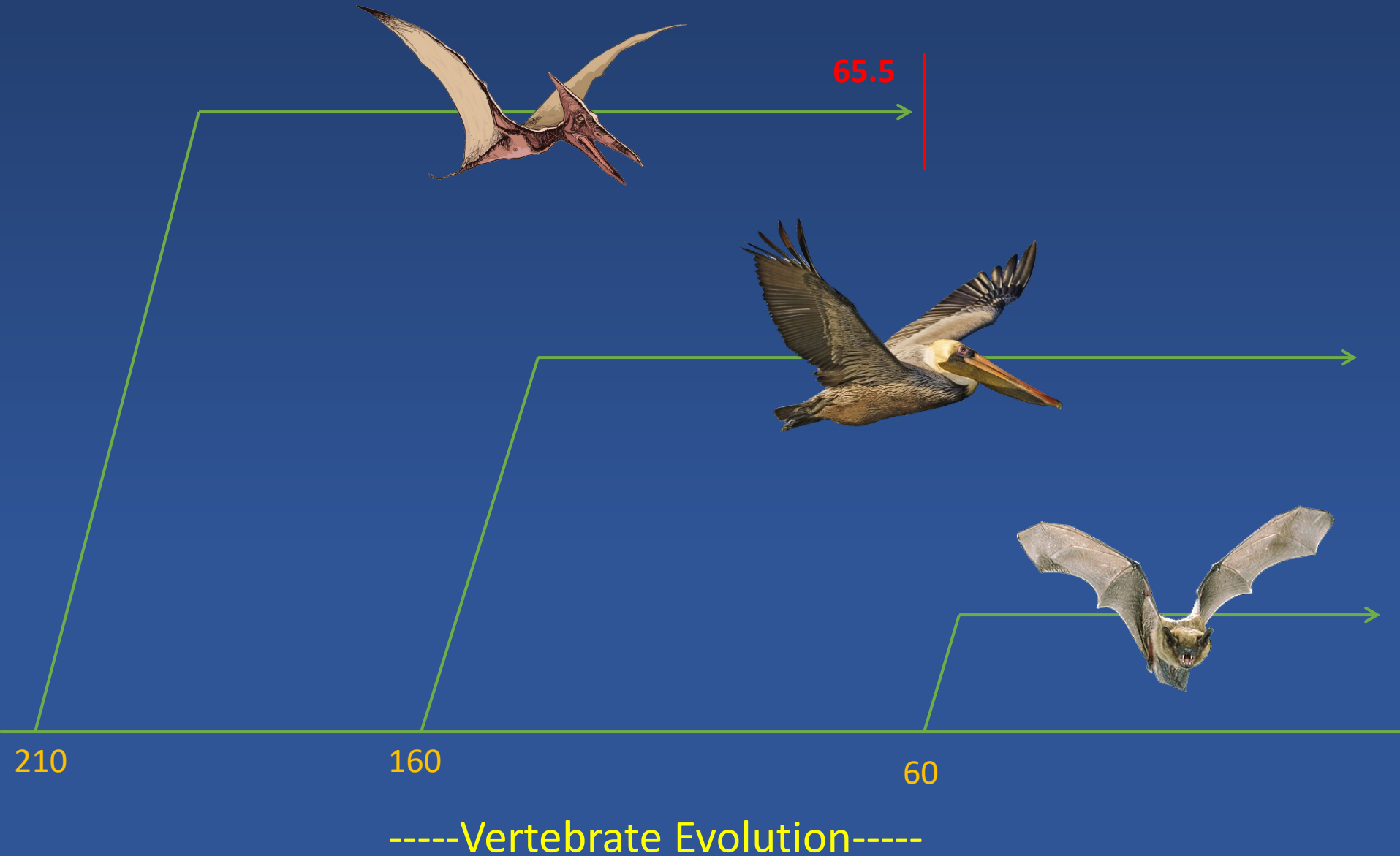
- Evolved ~50 million yrs. ago
- 2nd most diverse mammalian order
 - ~1,300 species
 - 20% of all mammal species
- Order: Chiroptera (handwing)
- Suborders:
 - Megachiroptera: Fruit bats
 - Microchiroptera: Insectivorous bats
 - Outdated classification.... But still useful



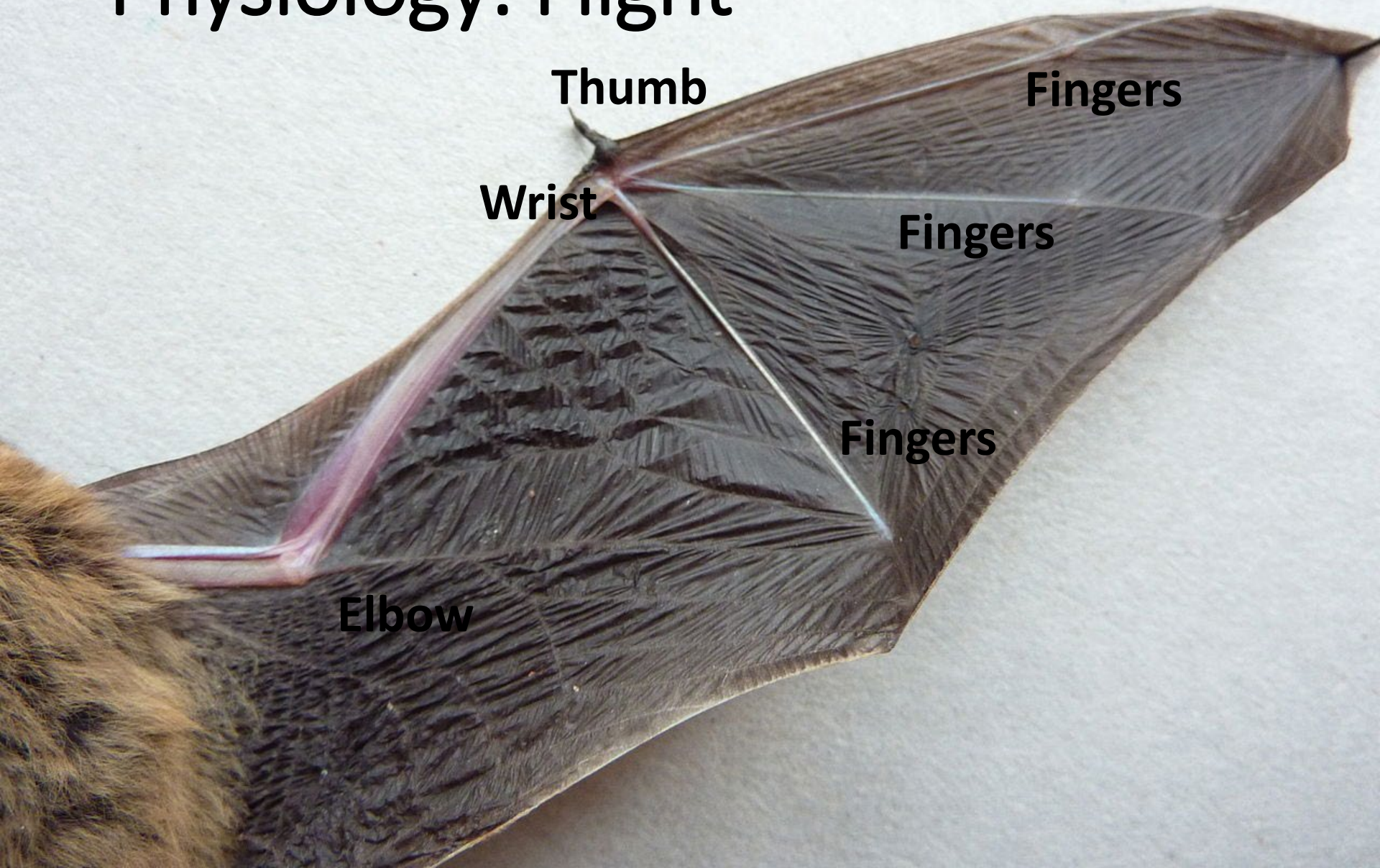
Why are bats cool?

- They fly
- They “see” with sound
- They can almost freeze in the winter

Evolution of winged flight in vertebrates



Physiology: Flight



Thumb

Fingers

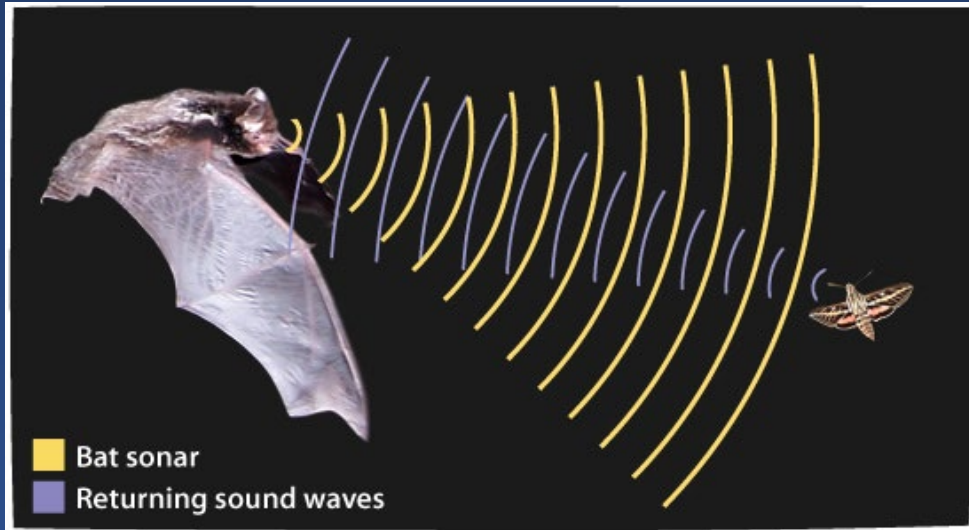
Wrist

Fingers

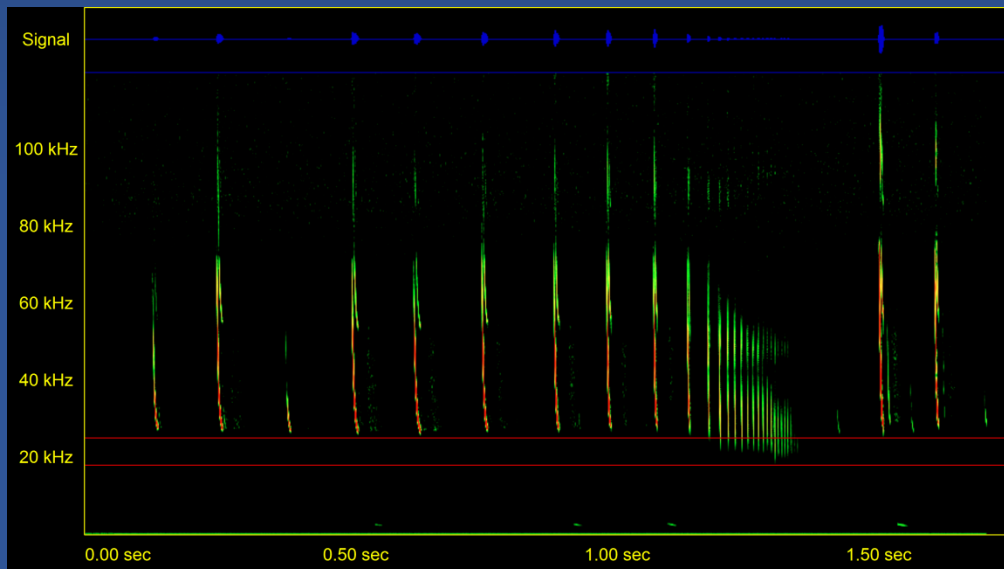
Fingers

Elbow

Bat Echolocation

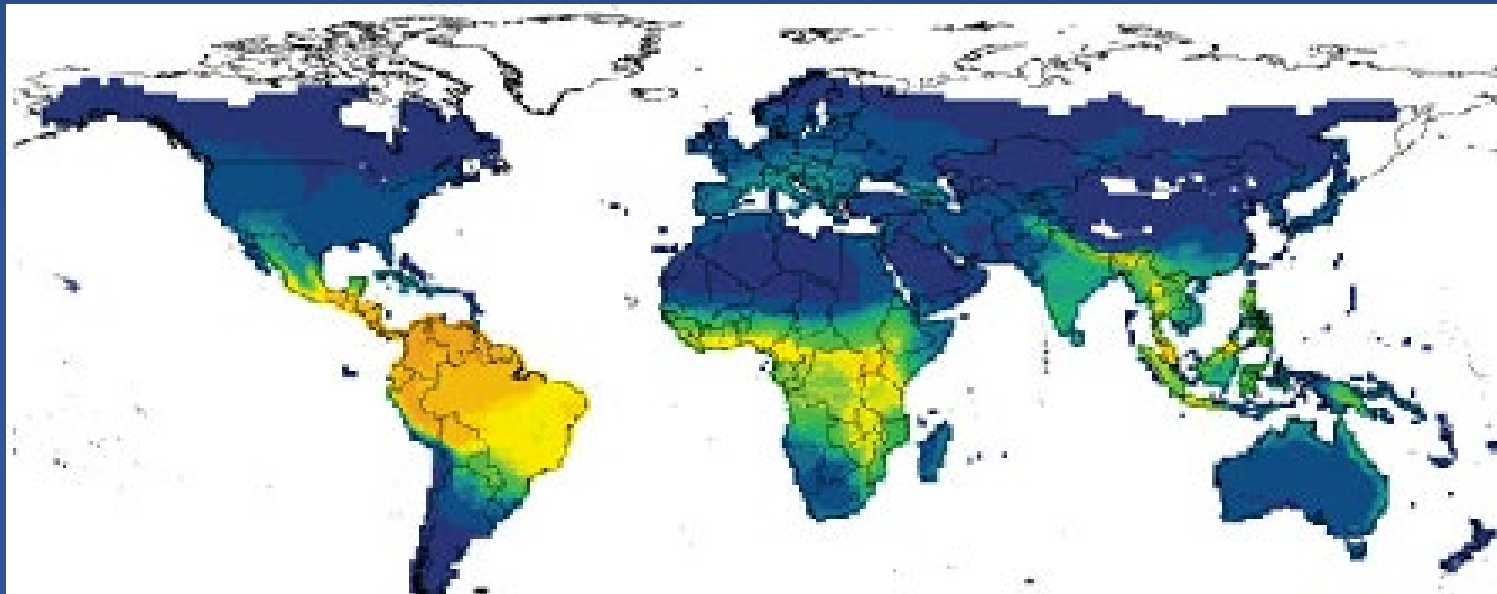


- Produced in the throat, exits through open mouth or nose
- Navigation, Foraging
- 8 kHz – 140 kHz
- Recorded calls can be used for species identification

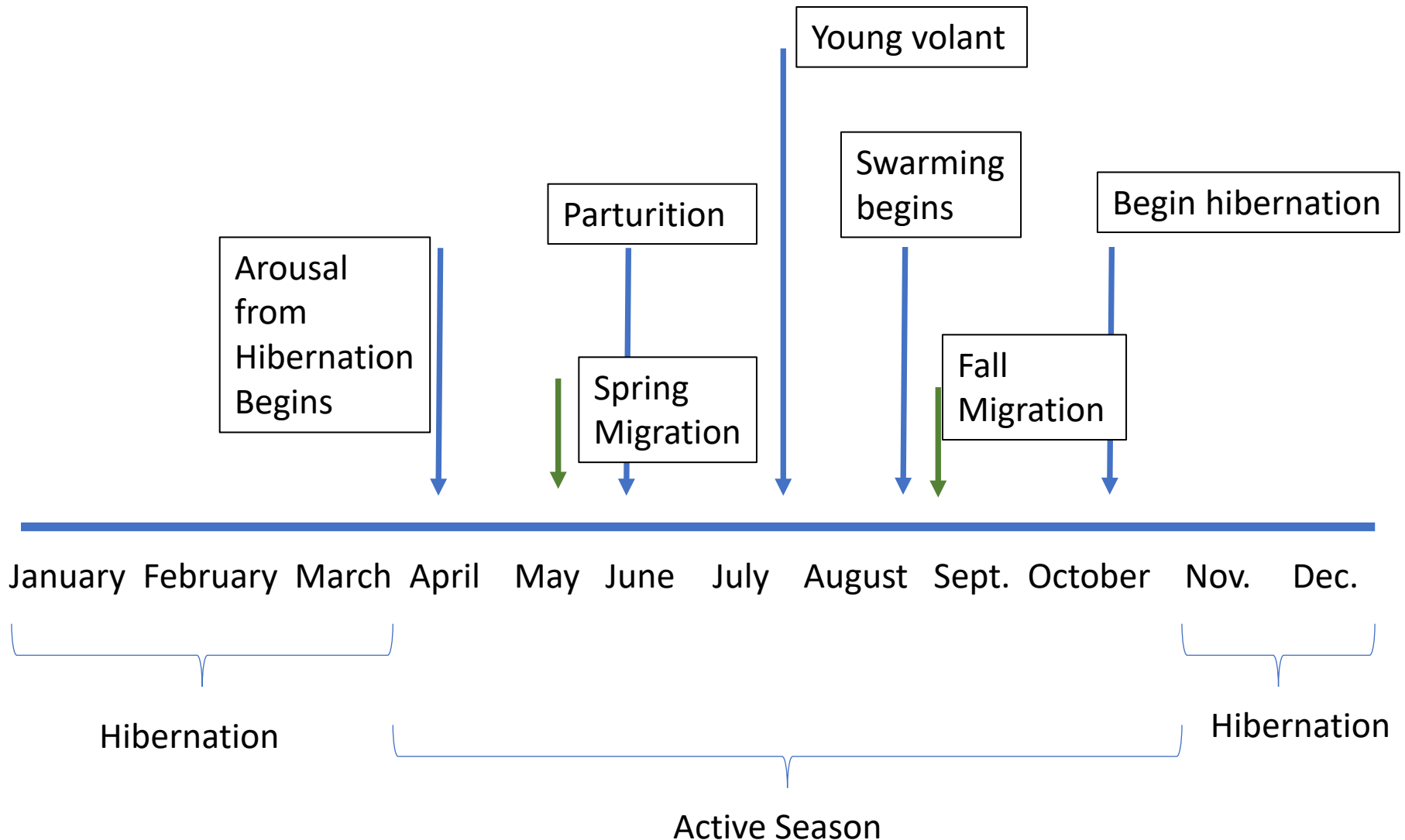


Strategies for surviving winter

- **Hibernation/torpor**
 - Reduced heartrate to 10bpm
 - Reduce energy costs by 98%
 - Temperature near freezing
- **Little knowledge of migration in NA**



Life history of northern bats



Bats of Montana



Pallid Bat
(*Antrozous pallidus*)



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



Big Brown Bat
(*Eptesicus fuscus*)



Spotted Bat
(*Euderma maculatum*)



Silver-haired Bat
(*Lasionycteris noctivagans*)



Eastern Red Bat
(*Lasiurus borealis*)



Hoary Bat
(*Lasiurus cinereus*)



California Myotis
(*Myotis californicus*)



Western Small-footed Myotis
(*Myotis ciliolabrum*)



Long-eared Myotis
(*Myotis evotis*)



Little Brown Myotis
(*Myotis lucifugus*)



Northern Myotis
(*Myotis septentrionalis*)



Fringed Myotis
(*Myotis thysanodes*)



Long-legged Myotis
(*Myotis volans*)



Yuma Myotis
(*Myotis yumanensis*)

Discover Montana's Wildlife
discover, preserve, protect

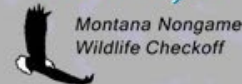


MONTANA
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For more information on all of Montana's native species visit the Montana Field Guide
<http://fieldguide.mt.gov>



Michael Durham/Hidden Pictures/Bat Conservation International



Montana Fish,
Wildlife & Parks



The University of
Montana

Thanks to the contributing photographers, editors, and sponsors that made this poster possible!

Pallid Bat



- <https://www.pbs.org/video/pallid-bats-vs-scorpions-mz6hkh/>

Spotted Bat



Townsend's Big-eared Bat



Lasiurus Bats

©Bryant Olsen



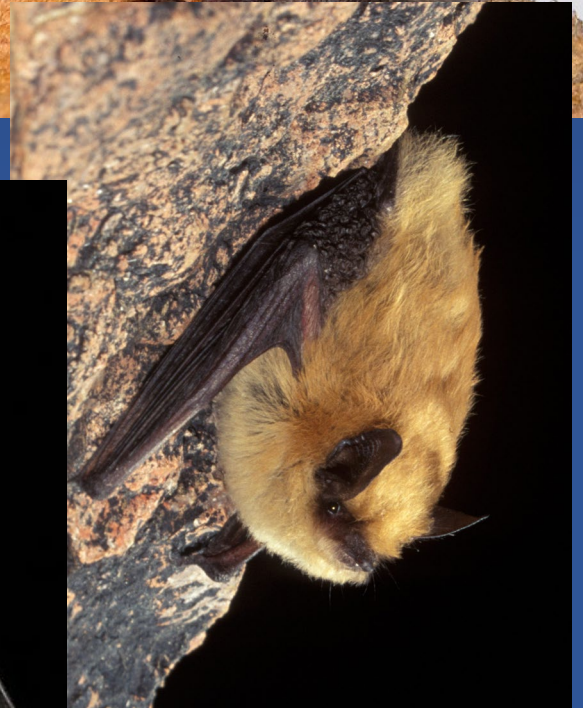
Silver-haired Bat



Myotis Bats



© ADAM MESSER



Ecological importance of bats



- Insect predators
- Pollinators
- Seed dispersal
- Nutrients in caves

Active season Roost types

- Temperature important
- Cracks/ crevices
- Types
 - Trees
 - Rock Outcrops
 - Structures
 - Buildings
 - Bridges
 - Caves/ Mines



Trees



Rock Outcrops



Structures



Hibernacula

- Caves/ Mines
- Rock outcrops
- Others?

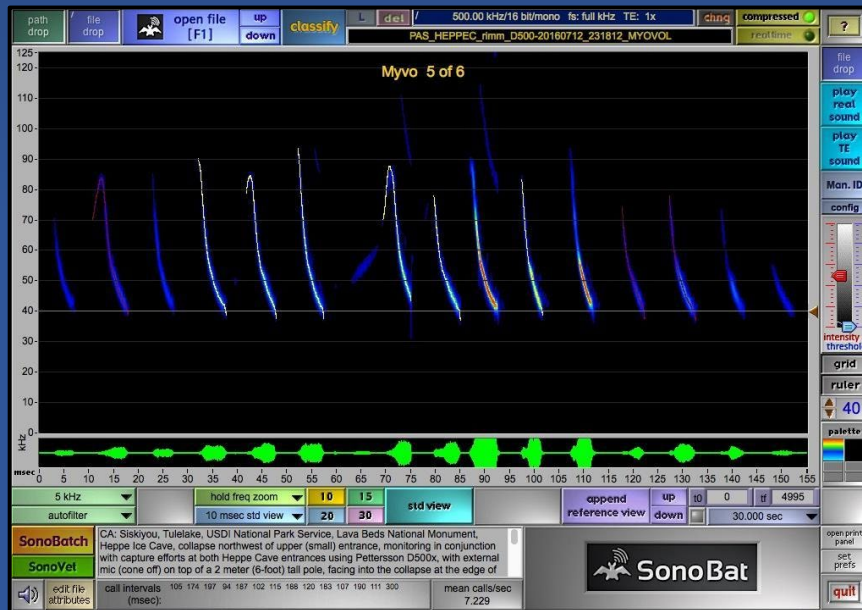


Study of Bats in Montana

- Active season
 - Mist netting
 - Structure surveys of roosts
 - Counts in caves
 - Radio telemetry
 - Acoustic surveys
- Hibernacula
 - Landscape acoustics
 - Counts in caves/ WNS swabbing

Acoustics

- Components
 - Ultrasonic microphone
 - Detector/ recorder
- Software to visualize/ identify call sequences to species



Mist netting

- Use nets to capture animals
- Placement
 - Over water
 - In flight paths
 - Get bats to <9ft and in the net!



Threats to bat populations

Wind Energy

White-Nose Syndrome



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