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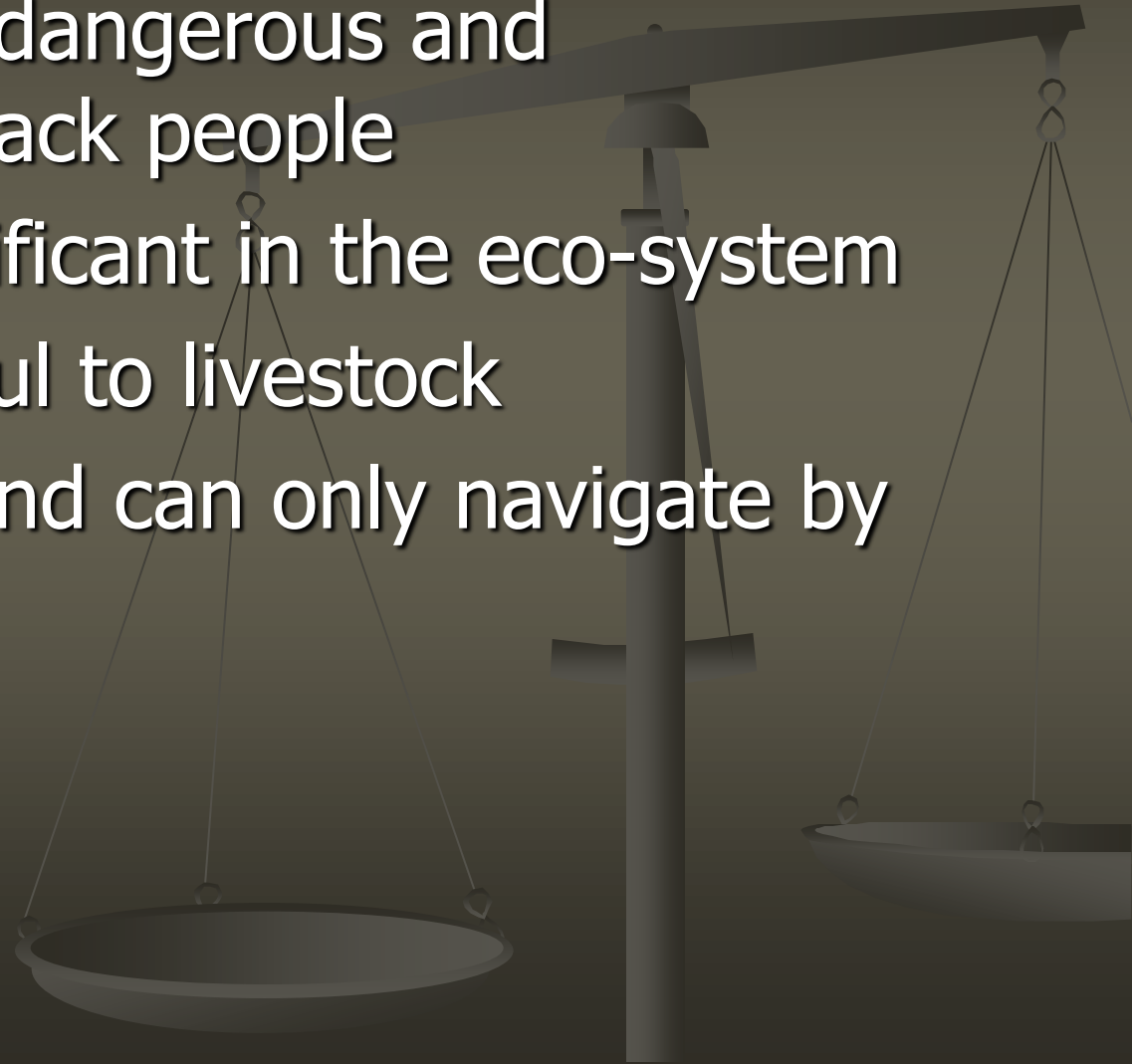


Quick Facts

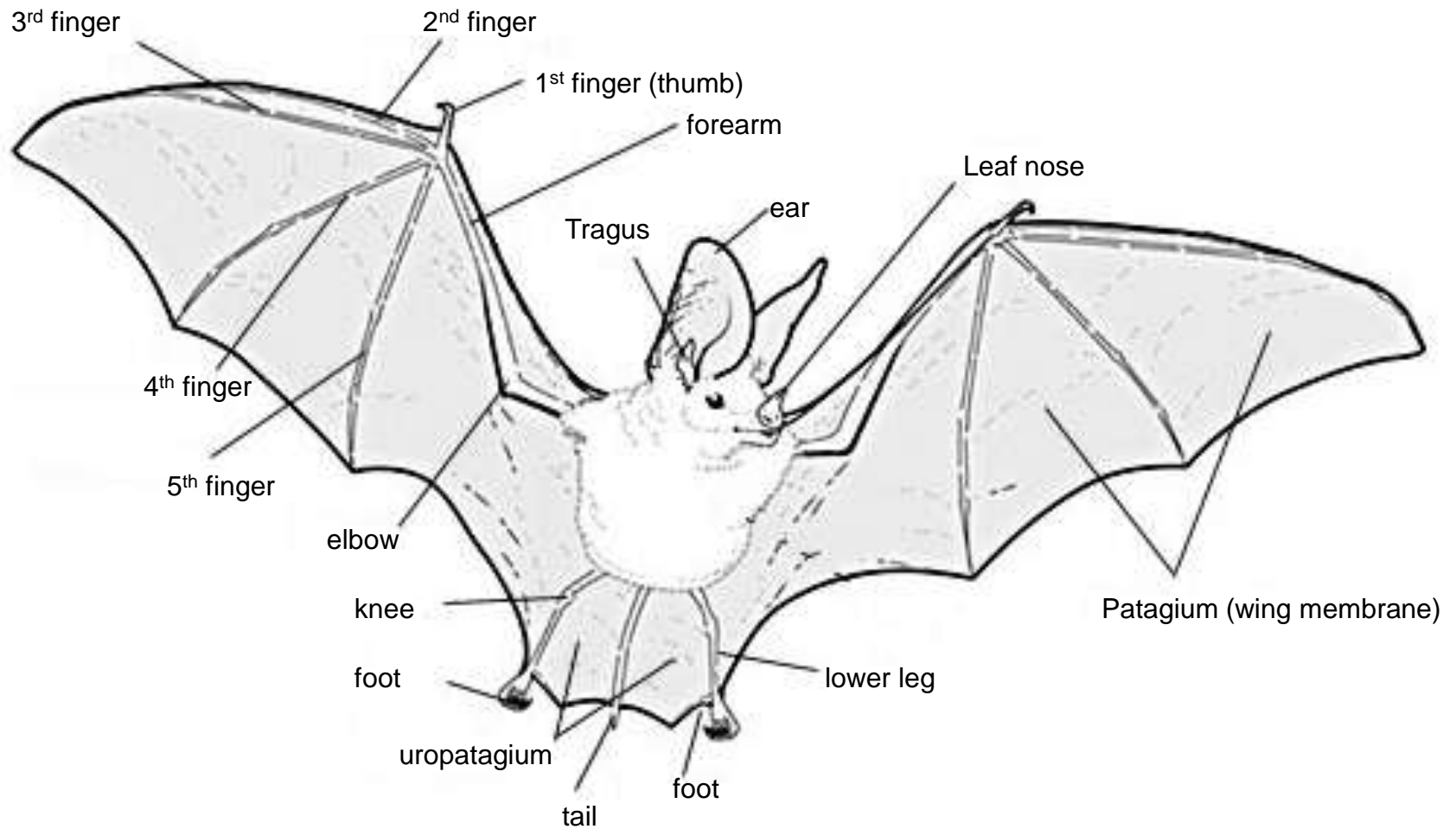
- Order Chiroptera: 2 suborders, 18 families
- 2nd most diverse order of mammals
- Range from tiny (<4 cm) to very large (1 m wingspan)
- Roost colonially in caves and hollow trees
- Native to all continents except Antarctica

Common Misconceptions

- Bats are highly dangerous and purposefully attack people
- They are insignificant in the eco-system
- They are harmful to livestock
- Bats are blind and can only navigate by echolocation



Bat Anatomy





Bat Behaviors

- Nocturnal
 - Sleep during the day and feed at night
- Poor eyesight
- Highly sensitive echolocation abilities-use sound to detect obstacles during flight
- Migrate seasonally based on food and roost availability
- Average litter size is (1)

Bat Roles in the Eco-System

- Pollinators of flowering plants
- Contributors to re-growth through fruit consumption and post-digestive seed dispersal
- Important arthropod (and small vertebrate) predators





Threats to Bats

- Farmers scared of rabies transmitted through vampire bats
- Habitat destruction
 - Deforestation
 - Global warming
- Pesticides/Insecticides
 - These can be on the plants that frugivores/nectarivores feed from and poison their system
- Small litter size + long weaning period

Nectarivores

- Feed on nectar from plants
 - Vanilla
- Morphological features: long muzzle, papillated tongue
- Crucial for pollination of certain plant species



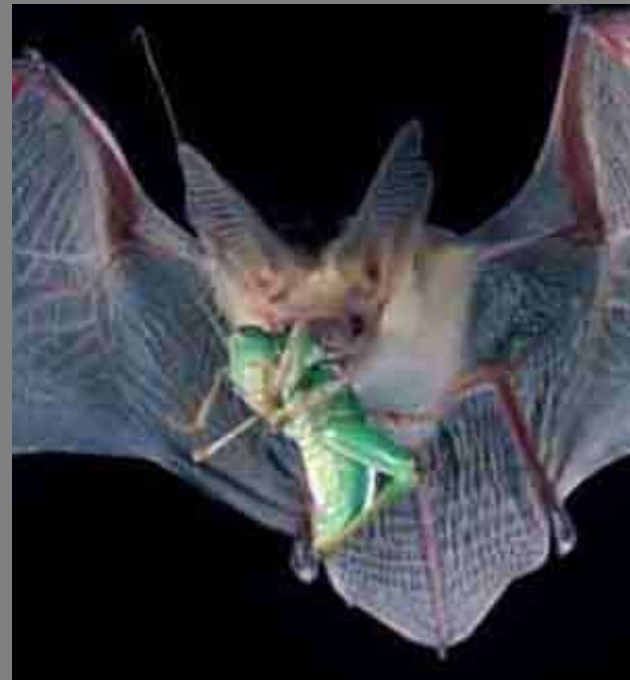
Frugivores

- Eat fruit
 - From Cecropia, Ficus, Piper, etc.
- Frequent migrators



Insectivores

- Eat insects
- $\frac{3}{4}$ of all bats are insectivores
- Excellent flyers
- Some feed partially or wholly on terrestrial insects and small vertebrates



Carnivores

- Feed on blood
- 3 species in this category
- Vampires feed on cattle, other 2 species feed on birds



Vertebrate-Feeders

- Small group of larger, specialized bats
- Some feed on variety, some highly specific
- Examples:

N. leporinus: Fishing Bat

Trachops cirrhosus: Frog-eating Bat



Omnivores

- Like variety-feed on plants and animals
 - Insects, fruits, etc.
- Example: Lesser spear-nosed bat, Tsumi bat



Classification

Kingdom: Animalia

Phylum: Chordata

Class: Mammalia

Order: Chiroptera

Family.....

Bats in Costa Rica

- Of the 200 mammal species in Costa Rica, 105 are bats
- Following families present:

| | |
|----------------------|-------------------|
| Emballonuridae | Molossidae |
| Furipteridae (1 sp.) | Natalidae (1 sp.) |
| Thyropteridae | Vespertilionidae |
| Mormoopidae | Noctilionidae |
| Phyllostomidae | |

Phyllostomidae

- Largest and most varied family of Costa Rican bats
- All feeding types
- Includes all leaf-nosed and vampire bats



Vespertilionidae

- Evening Bats/Vesper Bats
- Almost exclusively insectivores
- Tend to have large ears to aid in echolocation



Noctilionidae

- Fishing bats aka Bulldog Bats
- Large
- 2 species in Costa Rica: Greater and Lesser Fishing Bat



Emballonuridae

- Sac-winged bats
- Mostly tropical, mostly insectivores
- Include many of the smallest bat species



Field Work

- **Methodology**
 - **Appraise netting areas during the day and perform partial set up of the net**
 - Mist netting at night in open areas to interrupt bats' flight pattern
 - Photograph net contents for later identification
 - Catch and release



Bat 1...

Family: Vespertilionidae

Insectivore

Location: Caught on road in front of casita



Bat 2: Leaf-Nose



- Family: Phyllostomidae

Sub-Family: Carollinae (little fruit bats)

Carollia subrufa

- *Frugivore*
- Location: Open area near river and garden



Bat 3: Leaf-nose

- Family: Phyllostomidae

Sub-Family: Stenodermatinae (Yellow-shouldered bats)

Sturnira ludovici

- *Frugivore*
- Location: Open area near river and garden



Bat 4: Leaf-nose

Family: Phyllostomidae

Sub-Family: Phyllostominae

Species: ???

Insectivore

Location: Open area near river



Bat 5... Evening Bat

- Family: Vespertilionidae

Species: *Lasiurus cinereus*

- *Insectivore*

- Location: Road in front of kitchen



Difficulties

- Limitations of mist net...
- Trial and error with net set up: Location, rigidity of net
- Net Interference: Birds and bugs getting caught in net, chewing holes in net creating gaps for bats to get through
- Weather: Raindeterrent of bats?

Future Work...

- Sampling should be done throughout year to capture seasonal migrants
- Try netting at new locations (Gavilan, hectare)
- Marking to keep track of recaptures
- Bats of Costa Rica good resource for species accounts and general info.

Links for More Info

- [Build a Bat House!](#)
- [Monteverde Bat Jungle](#)
- [Bat Conservation International](#)
- [General Bat Information](#)

Final Comments

- Don't kill bats. Feed them and Love them.