



An Educator's Resource to Texas Mammal Skulls and Skins

*for use in 4-H Wildlife Programs and FFA Wildlife
Career Development Events*

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**"A special thanks to the Biodiversity Research and Teaching Collections
at Texas A&M University for providing access to their specimens."**

Introduction

Texas youth that participate in wildlife programs may be asked to identify a skull, skin, scat, tracks, etc. of an animal. Usually, educators must find this information and assemble pictures of skulls and skins from various sources. They also must ensure that what they find is relevant and accurate. Buying skulls and skins to represent all Texas mammals is costly. Most educators cannot afford them, and if they can, maintaining these collections over time is problematic.

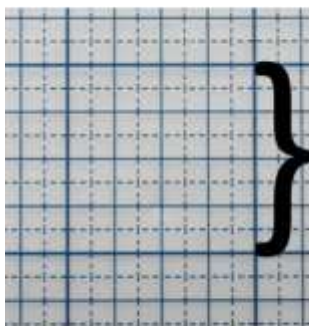
This study resource will reduce the time teachers across the state need to spend searching for information and allow them more time for presenting the material to their students. This identification guide gives teachers and students easy access to information that is accurate and valuable for learning to identify Texas mammals.

The skulls and skins presented in this guide are from furbearers, game animals, and unprotected non-game animals as found in the Texas Parks and Wildlife Outdoor Annual (2015-2016). Animals that are protected in the state of Texas are not presented. The list associated with the FFA Wildlife CDE program overlaps with several 4-H Wildlife programs, including: Wildlife Habitat Education Project, Wildlife Challenge, and the Outdoor Challenge. This resource does not include of all mammals a student may see in these programs. Educators often add or subtract animals based on the location of their programs.

The mammals are organized according to larger taxonomic groups as shown in the table of contents. They are grouped according to their Order Artiodactyla, Carnivora, Cingulata, Didelphimorphia, Lagomorpha, and Rodentia. Each order is then split into Families, then the species are listed in alphabetical order according to their Genus, and species name. Many of the skulls may have numbers on them that are correlated to their cataloguing in the Texas A&M Biodiversity Research and Teaching Collection at College Station. These numbers are not pertinent to identification.

Each mammal skull is presented with six different views: Lateral (side), Anterior (front), Posterior (back), Lateral Teeth View, Dorsal (top), and Ventral (bottom).

Because size is often a distinguishing feature, the skulls are photographed on a mat with gridlines. The bold lines on the grid represent 1-inch squares to aid in referencing the size of the skulls. All specimens are adults and give a general representation of skull size for each species.



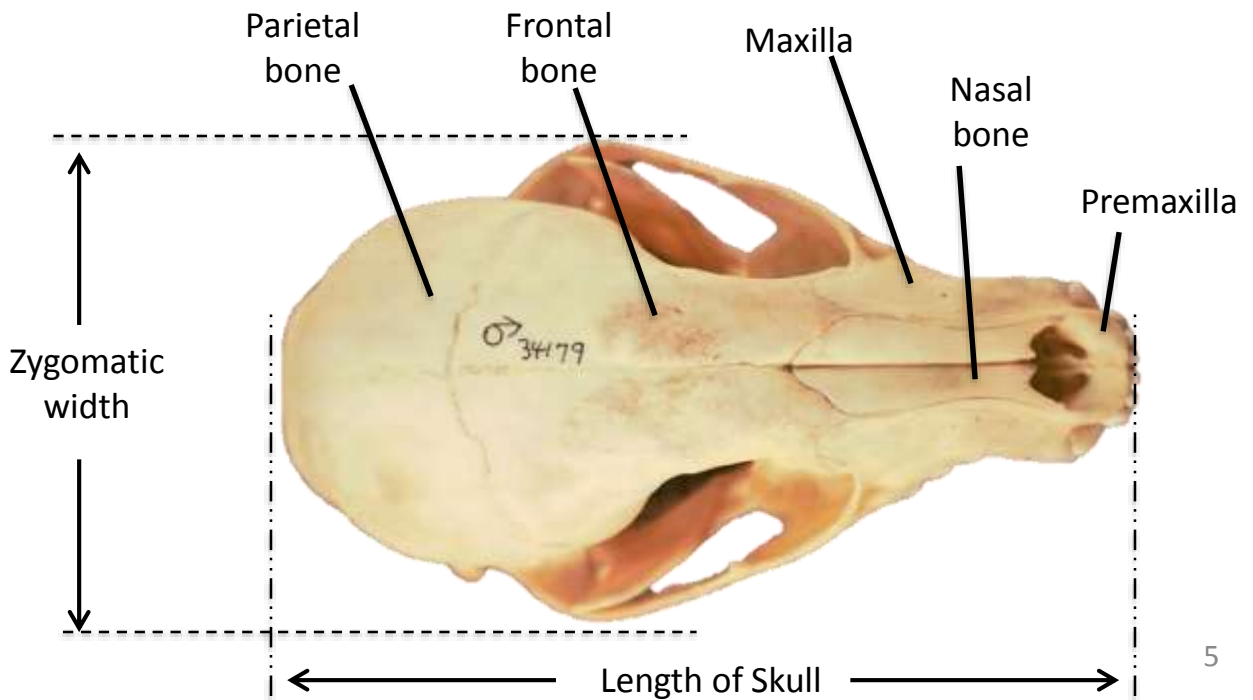
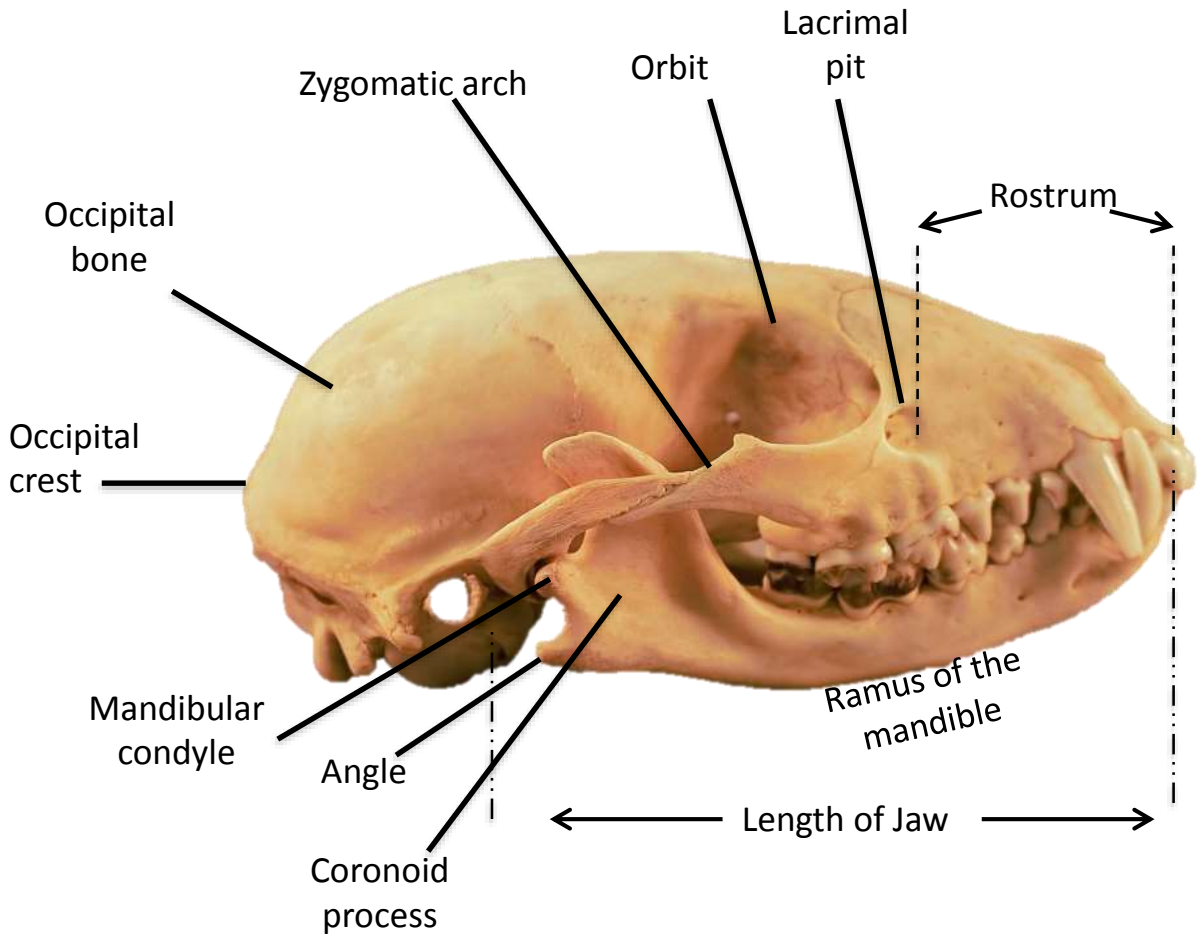
The bold lines on the grid represent 1 square inch, and contain lines indicating 1/4" and 1/8"

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General Skull Characteristics



Artiodactyla

Cervidae

- *Antilocapra americana*: Pronghorn
- *Odocoileus hemionus*: Mule Deer
- *Odocoileus virginianus*: White-tailed Deer

Suidae

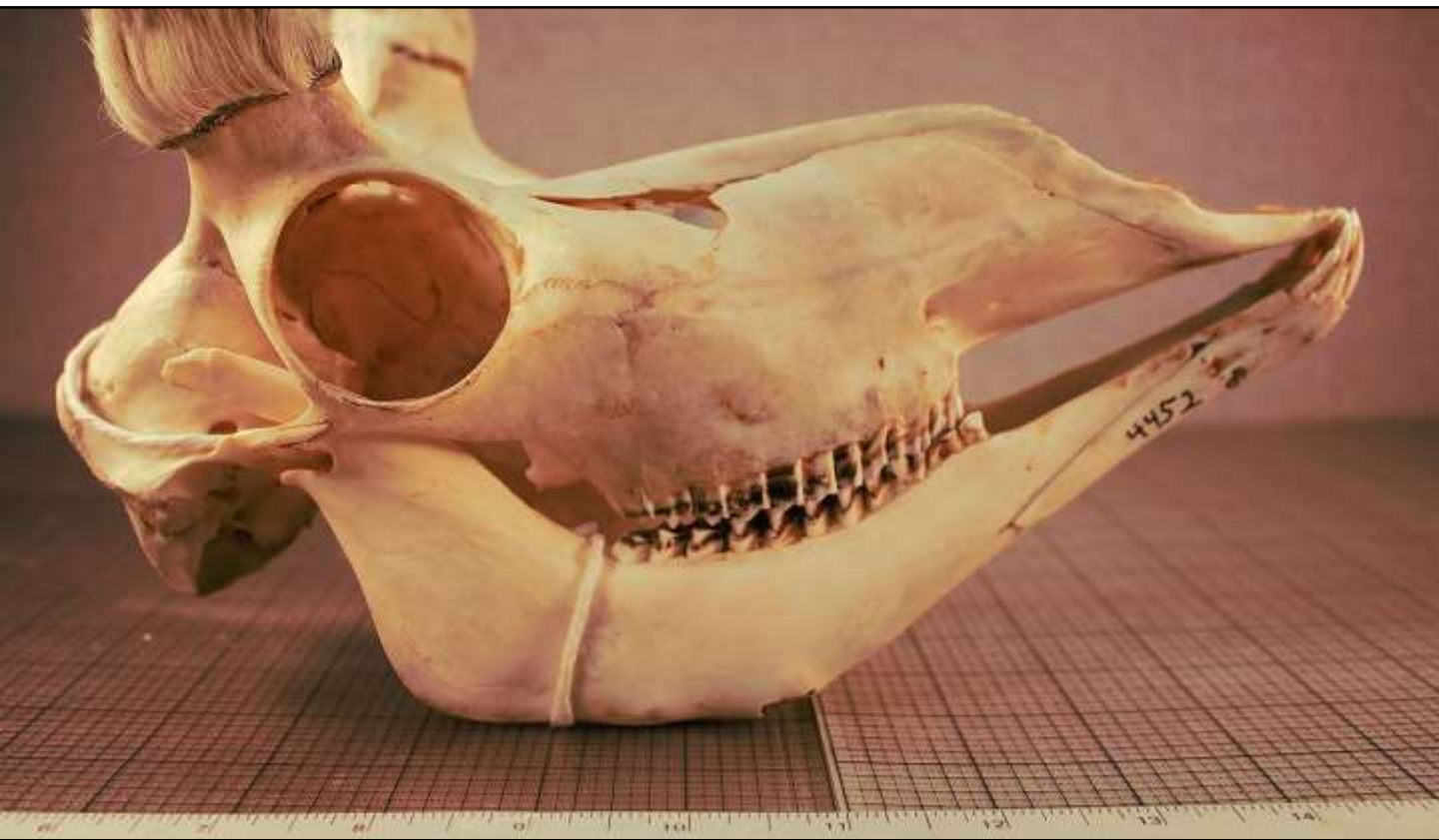
- *Sus scrofa*: Feral Hog (Wild Pig)

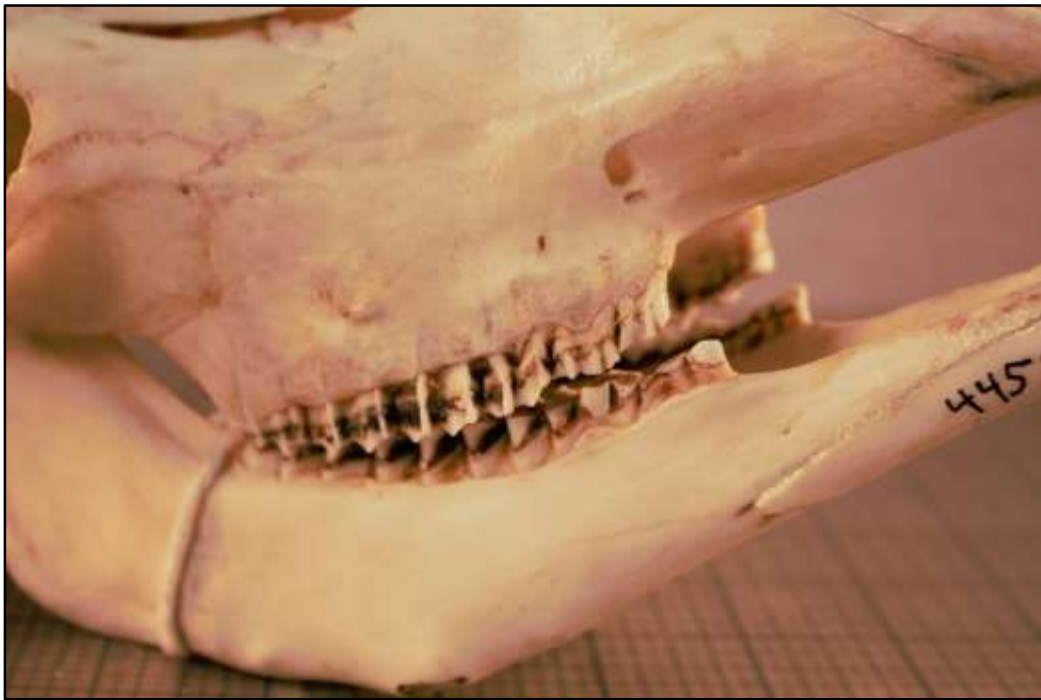
Tayasuida

- *Pecari tajacu*: Javelina (Collared Peccary)

Pronghorn

Antilocapra americana





Mule Deer

Odocoileus hemionus (Male underdeveloped antlers)





White-tailed Deer

Odocoileus virginianus (Female)

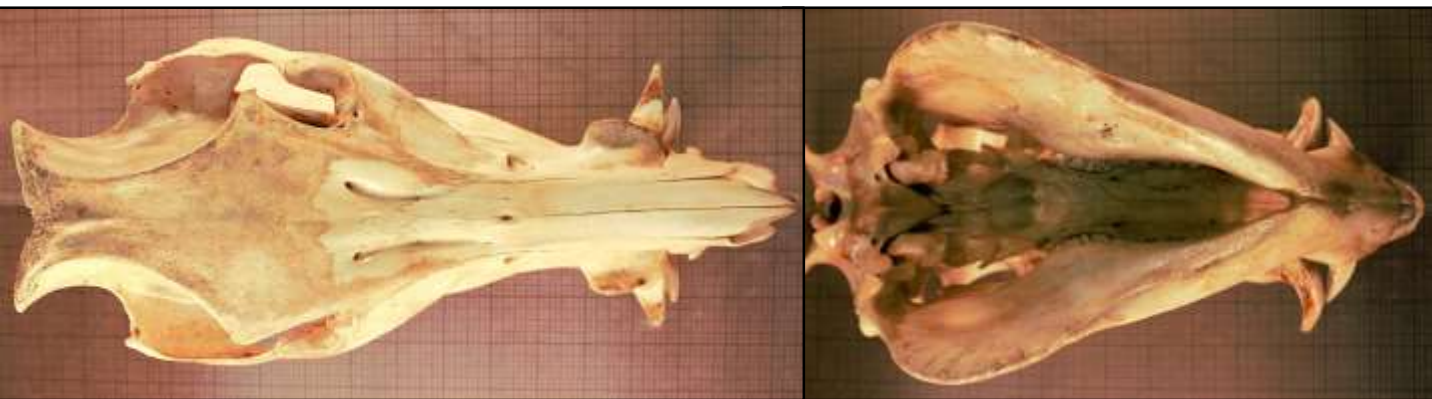




Feral Hog (Wild Pig)

Sus scrofa



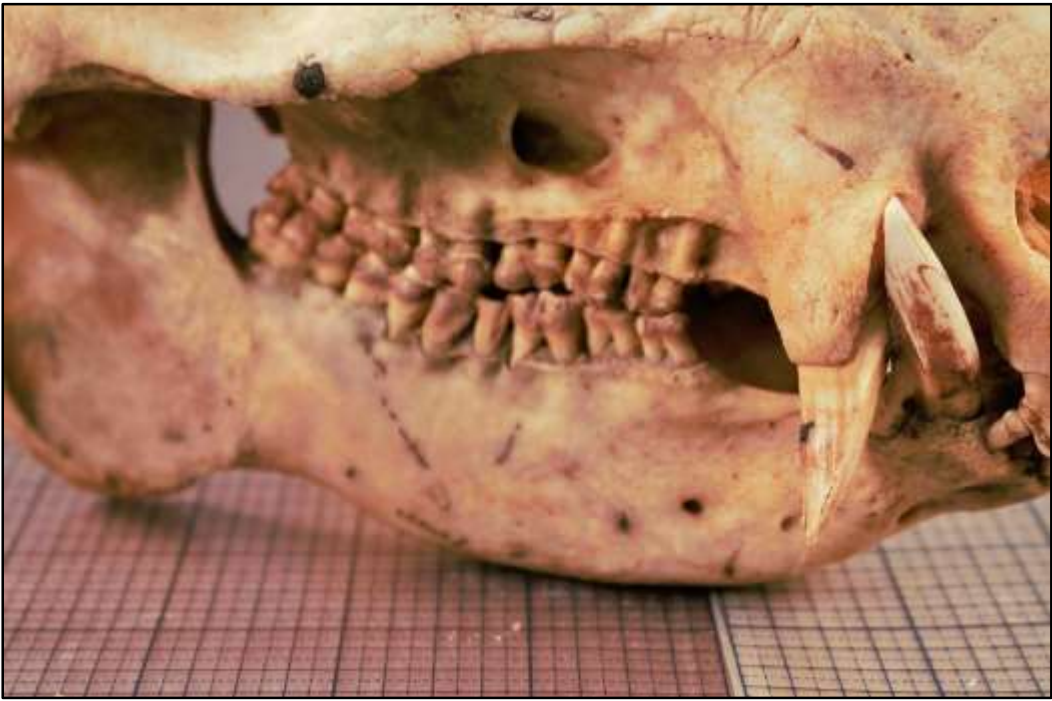


No skin available, can show any color variation found in the domestic pig.

Collared Peccary (Javalina)

Pecari tajacu





Carnivora

Canidae

- Canis latrans: Coyote
- Urocyon cinereoargenteus: Gray Fox
- Vulpes velox: Swift fox
- Vulpes vulpes: Red Fox

Felidae

- Lynx rufus: Bobcat
- Puma concolor: Mountain Lion

Mephitidae

- Mephitis mephitis: Striped Skunk
- Spilogale putorius: Spotted Skunk

Mustelidae

- Lontra canadensis: North American River Otter
- Neovison vison: American Mink
- Taxidea taxus: American Badger

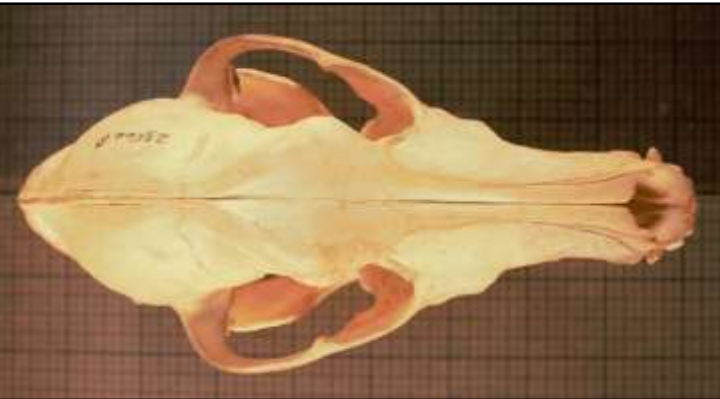
Procyonidae

- Bassariscus astutus: Ring-tailed Cat
- Procyon lotor: Raccoon

Coyote

Canis latrans





Gray Fox

Urocyon cinereoargenteus

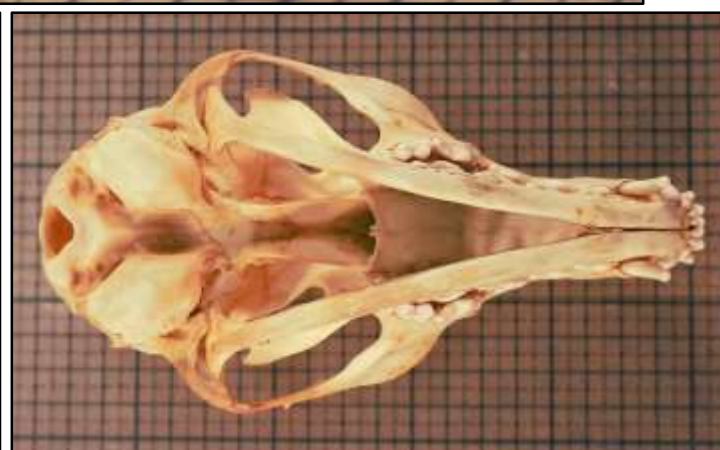




Swift Fox

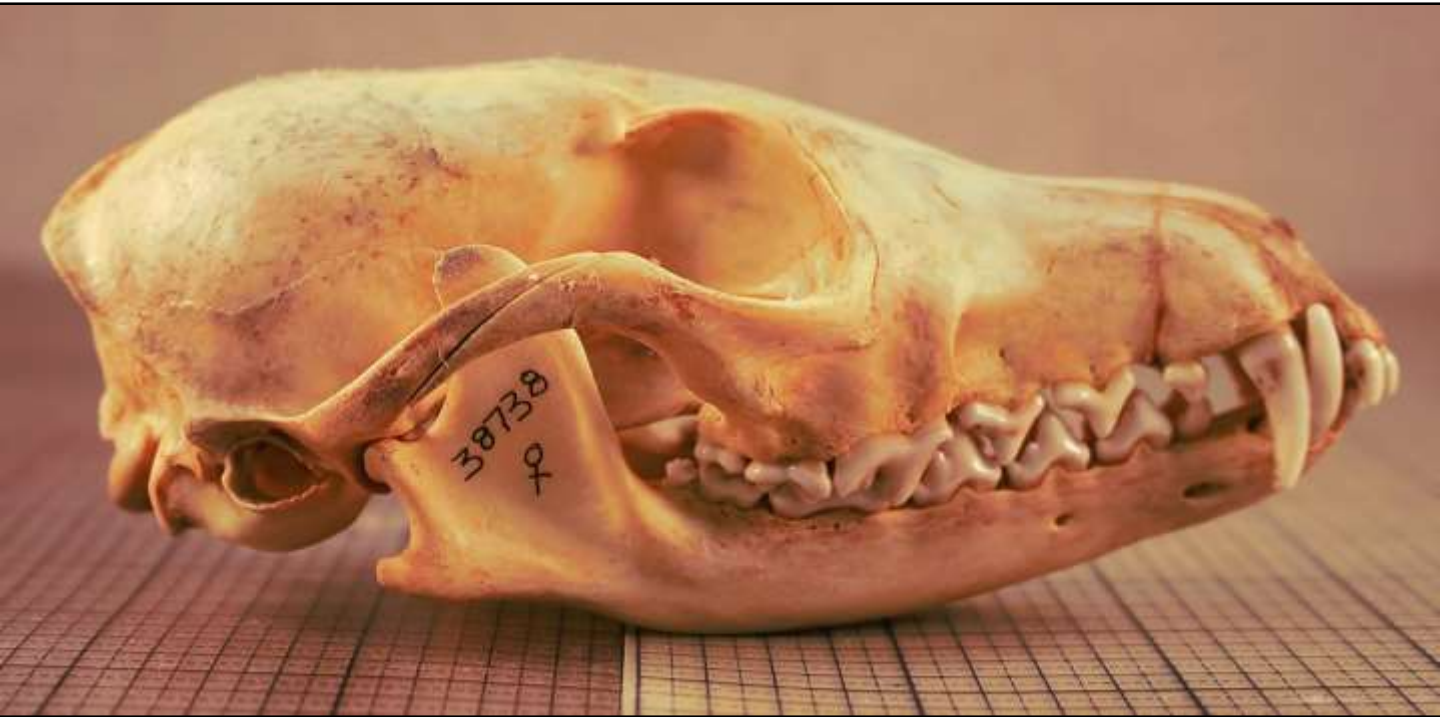
Vulpes velox

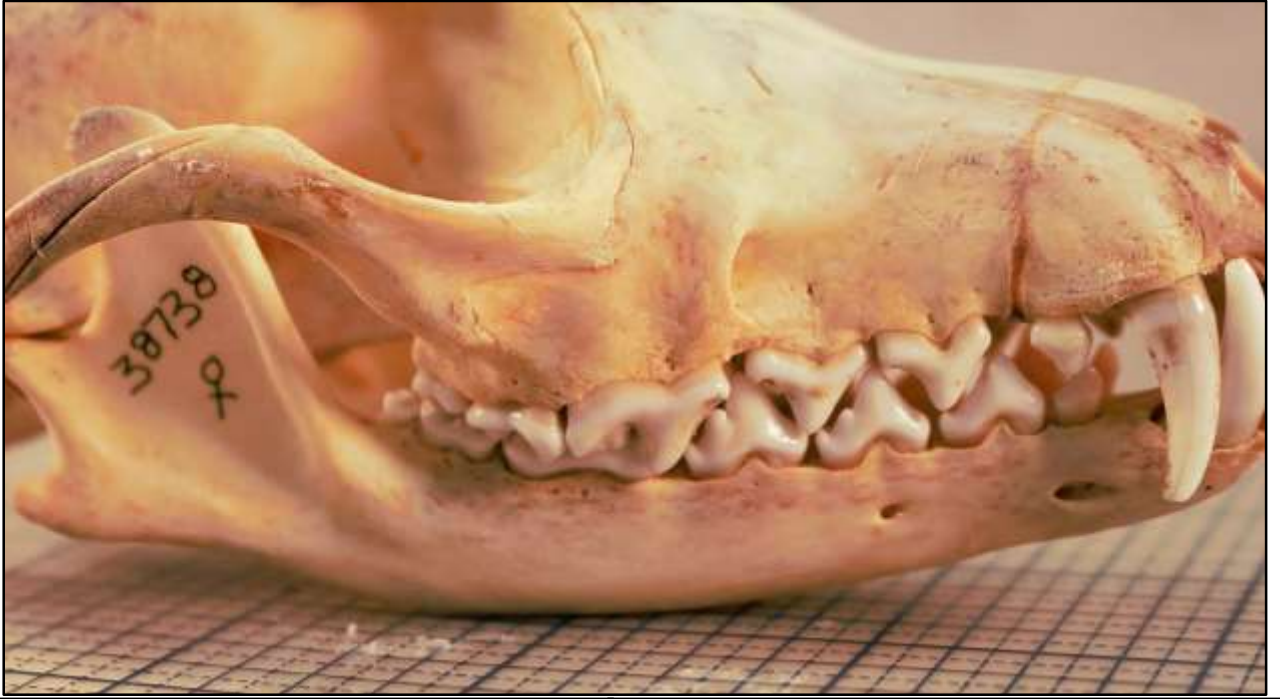




Red Fox

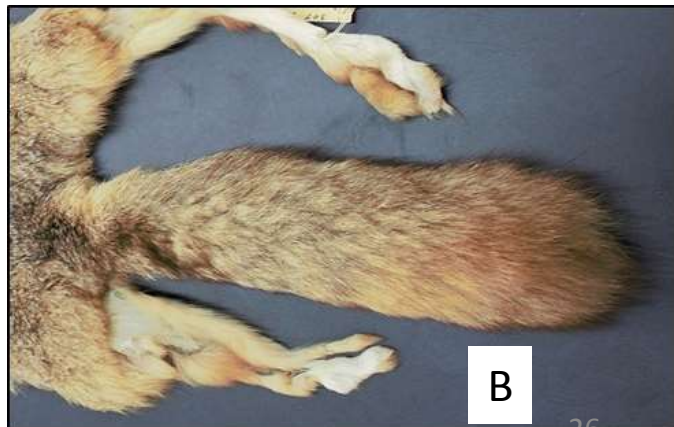
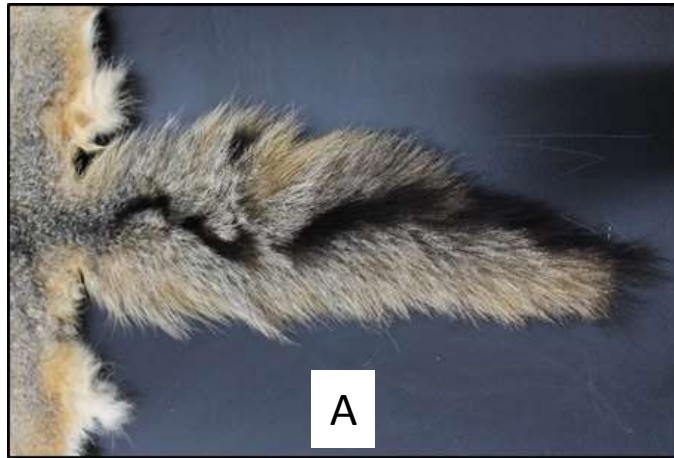
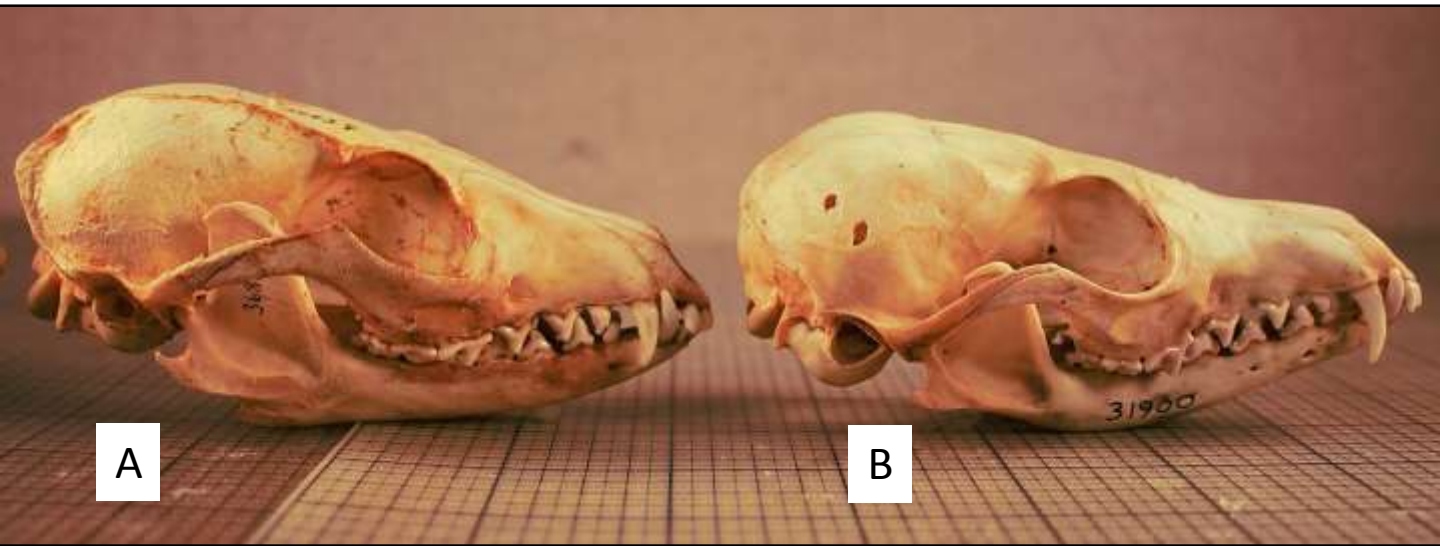
Vulpes vulpes





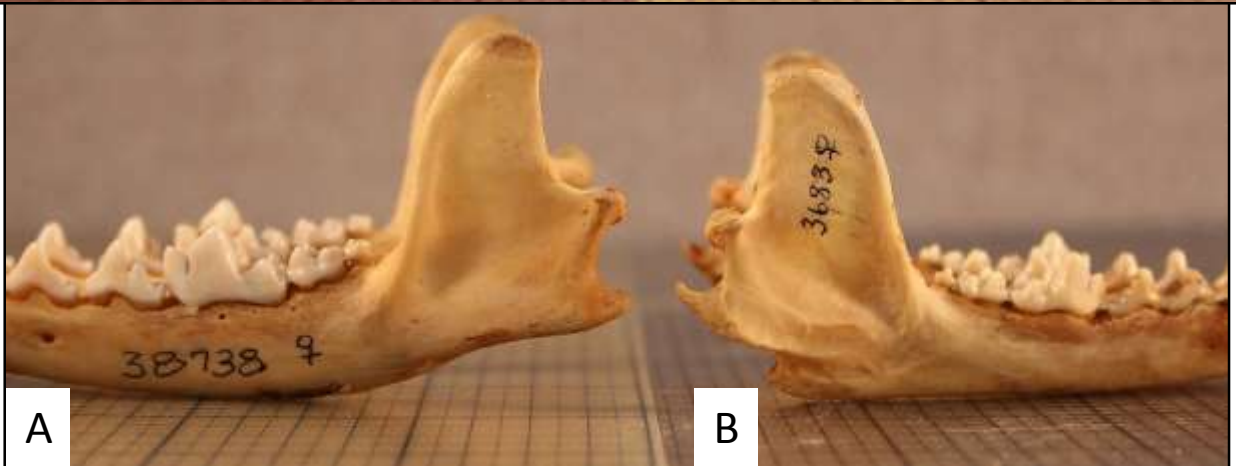
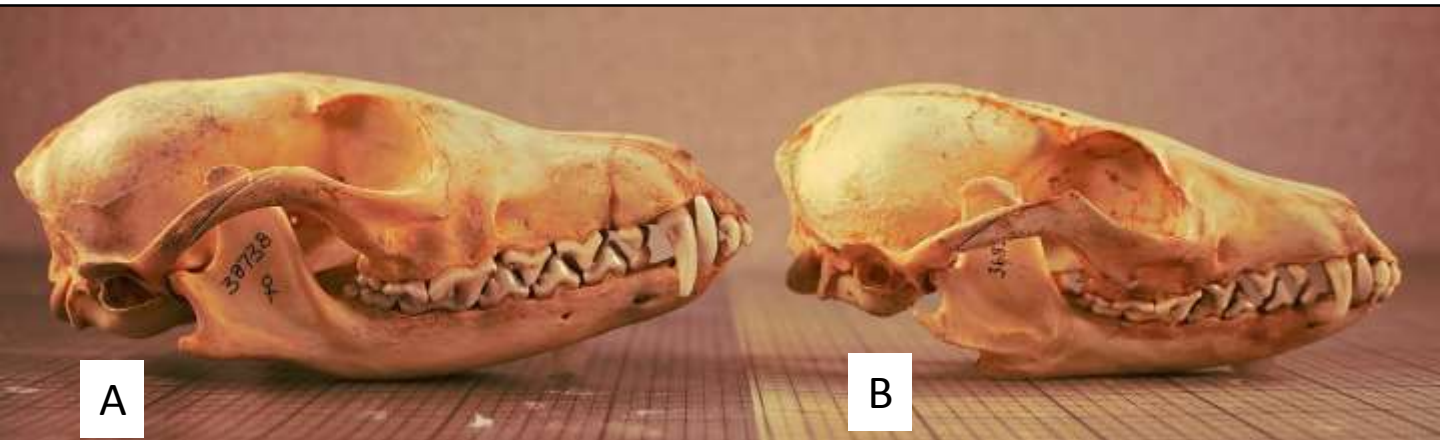
Comparisons

Gray Fox (A) and Swift Fox (B)



Comparisons

Red Fox (A) and Gray Fox (B)



Comparisons

Red Fox (A), Gray Fox (B), and Swift Fox (C)



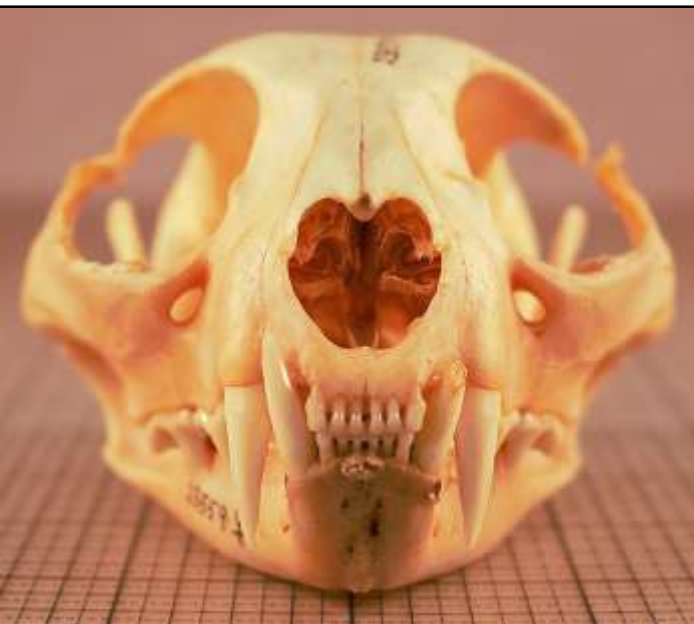
Comparisons

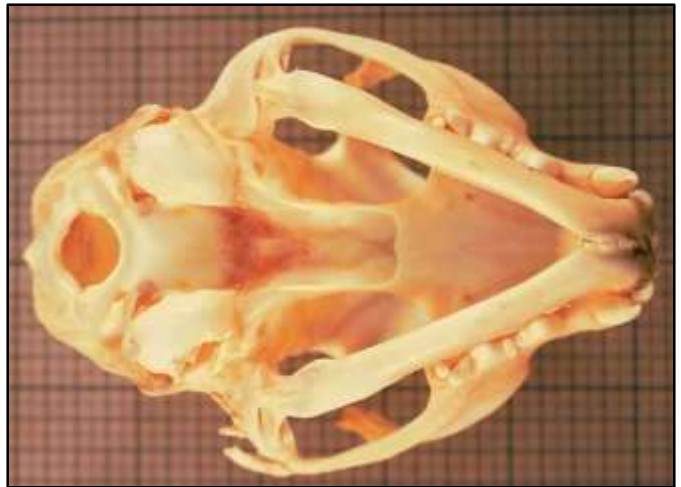
Red Fox (A), Gray Fox (B), and Swift Fox (C)



Bobcat

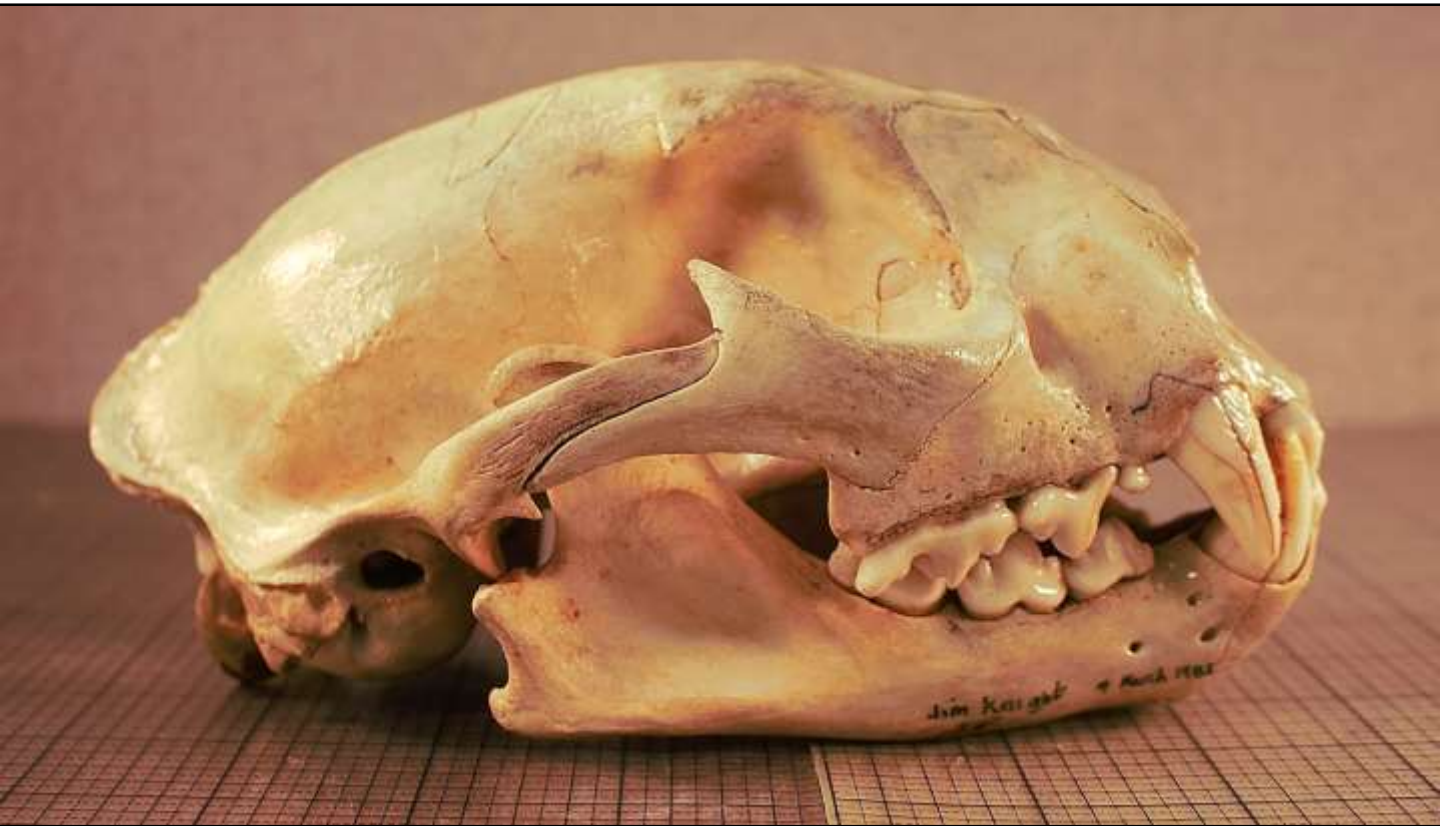
Lynx rufus

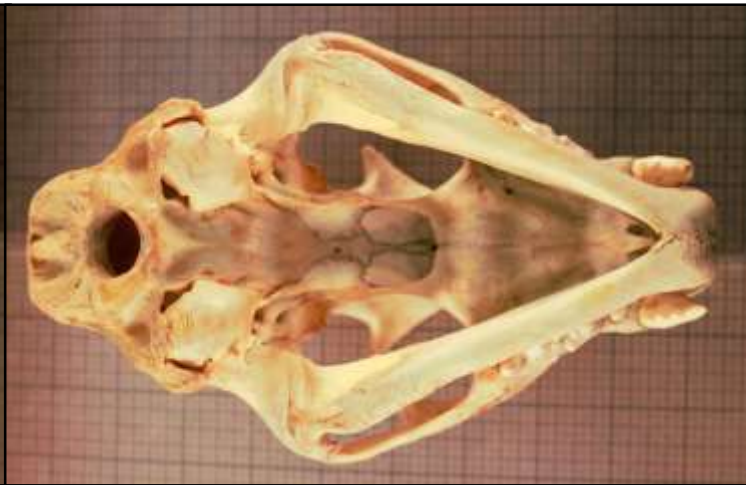
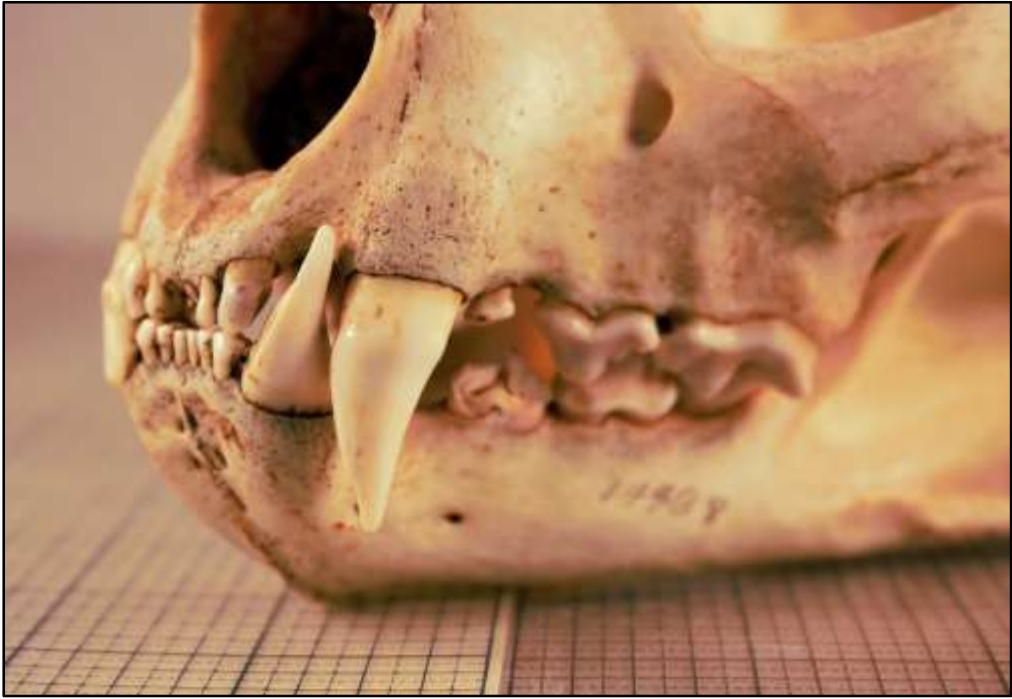




Mountain Lion

Puma concolor





Comparisons

Mountain Lion (A) and Bobcat (B)

(Broken canine on Mountain Lion Not Typical)

A

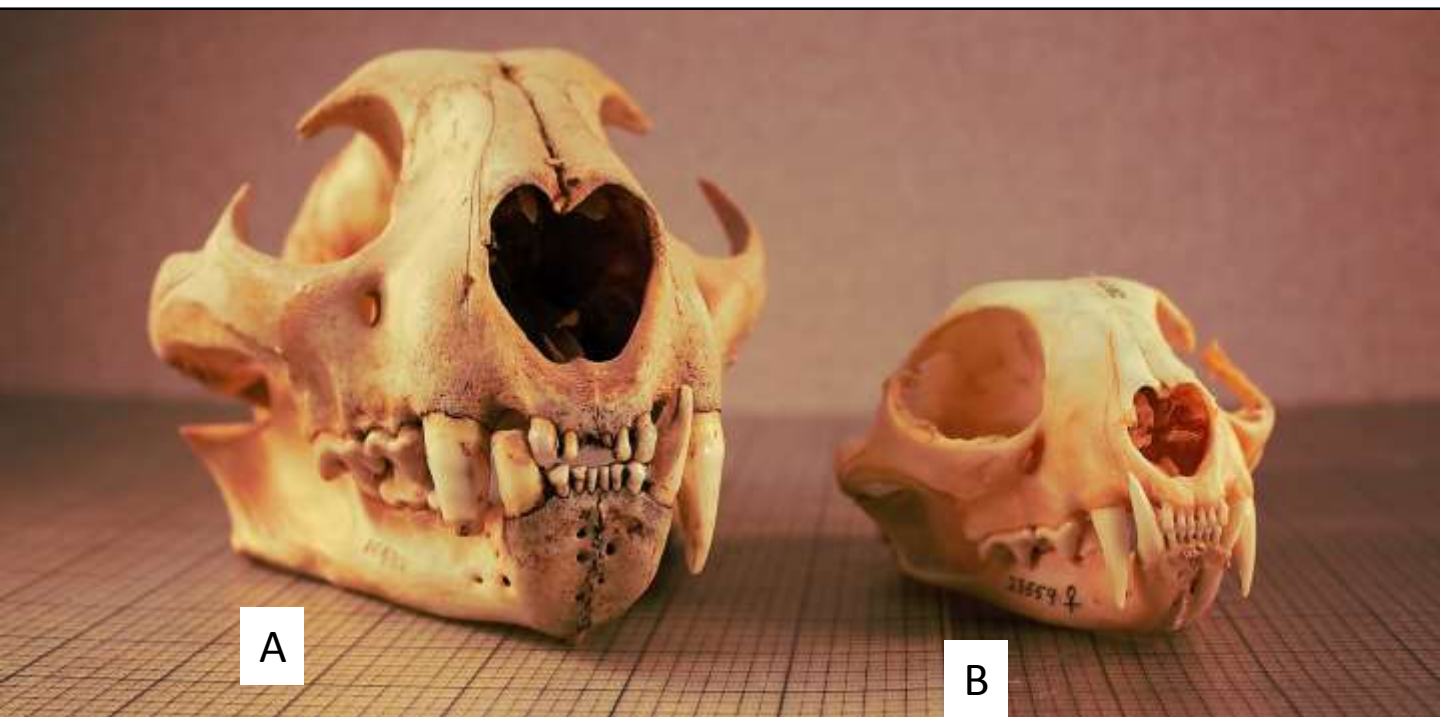
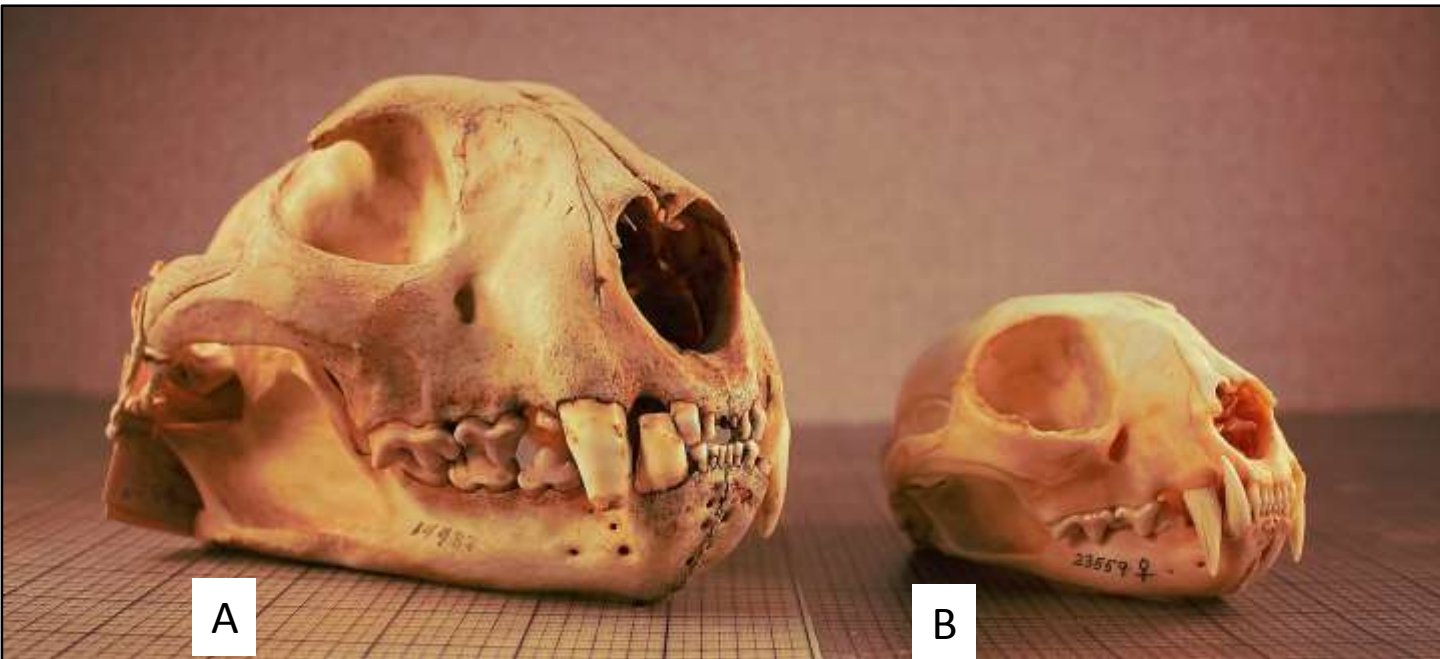


B



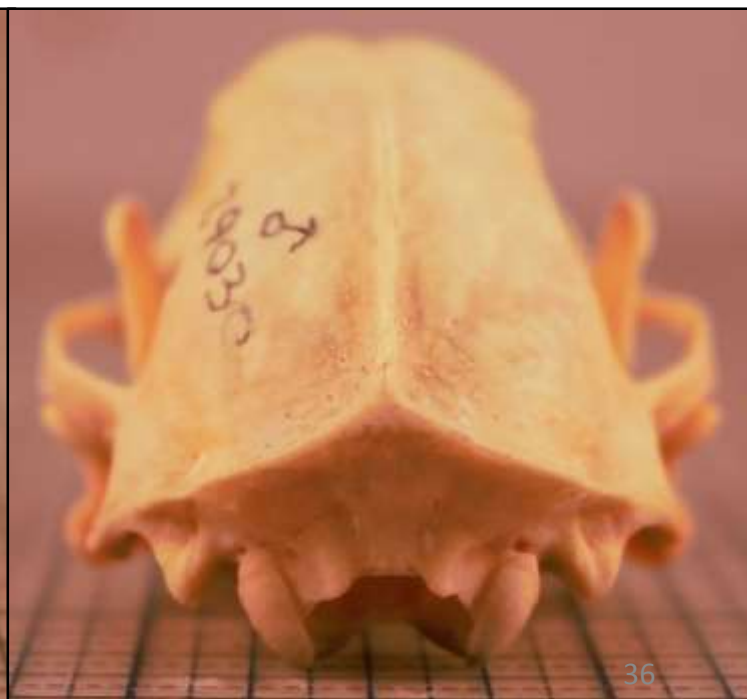
Comparisons

Mountain Lion (A) and Bobcat (B)



Striped Skunk

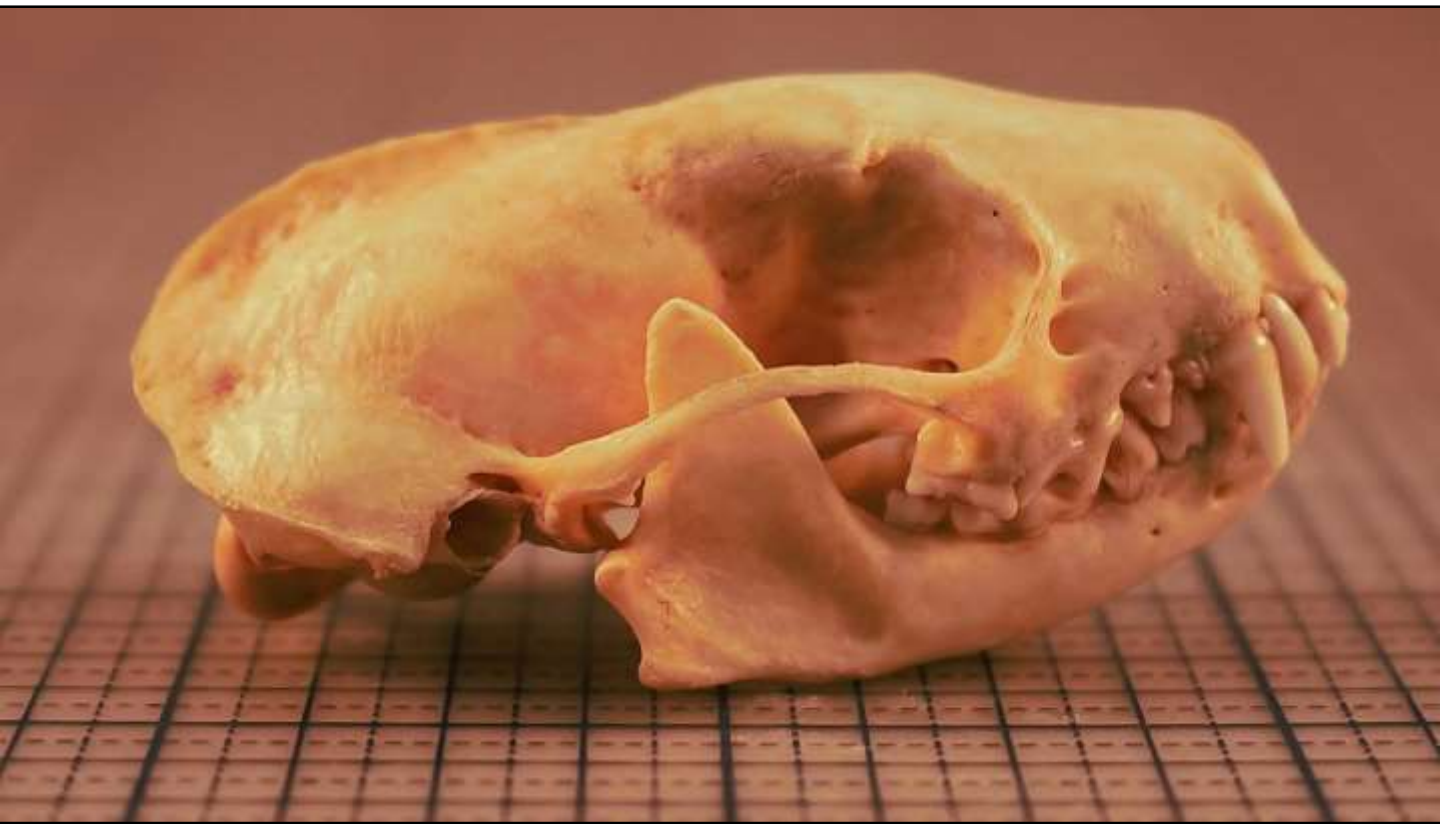
Mephitis mephitis

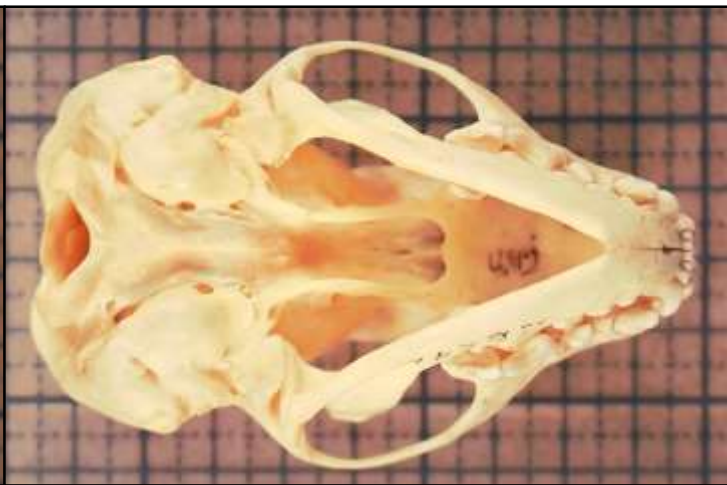




Spotted Skunk

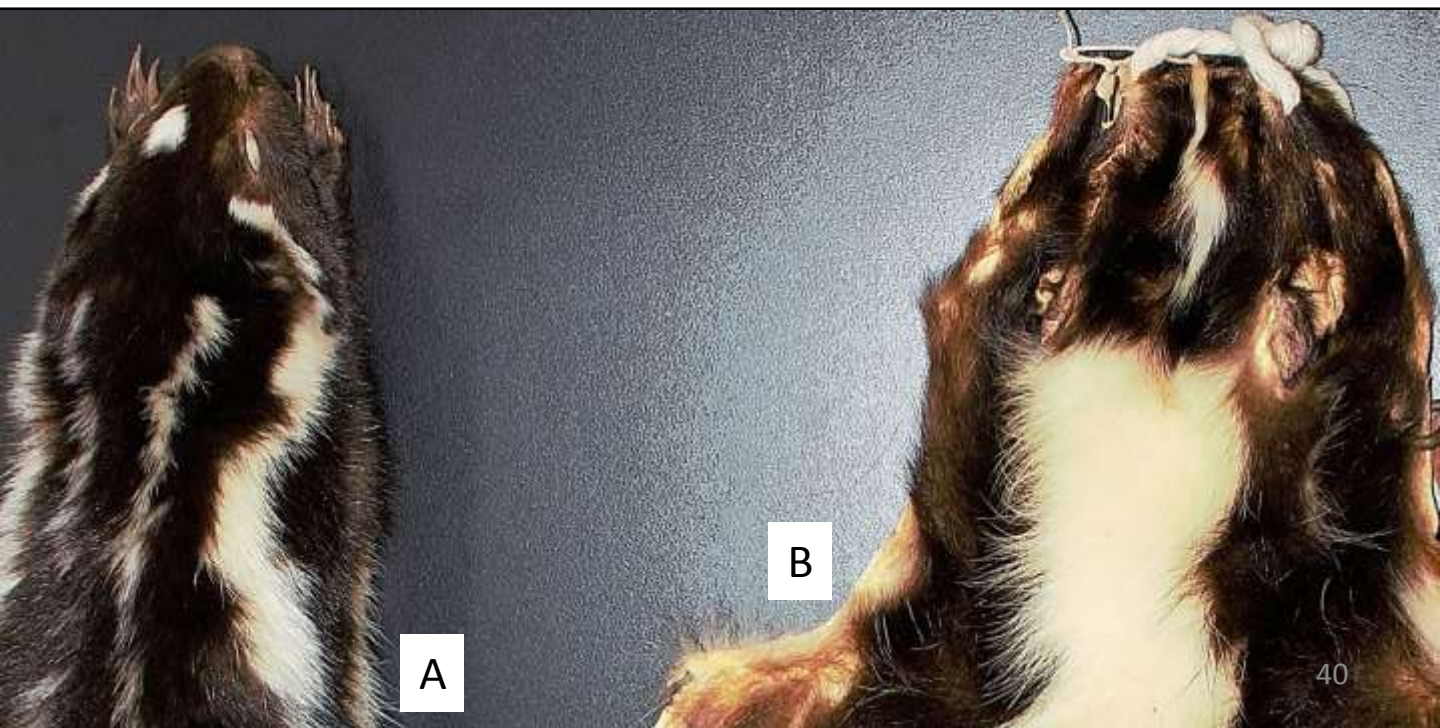
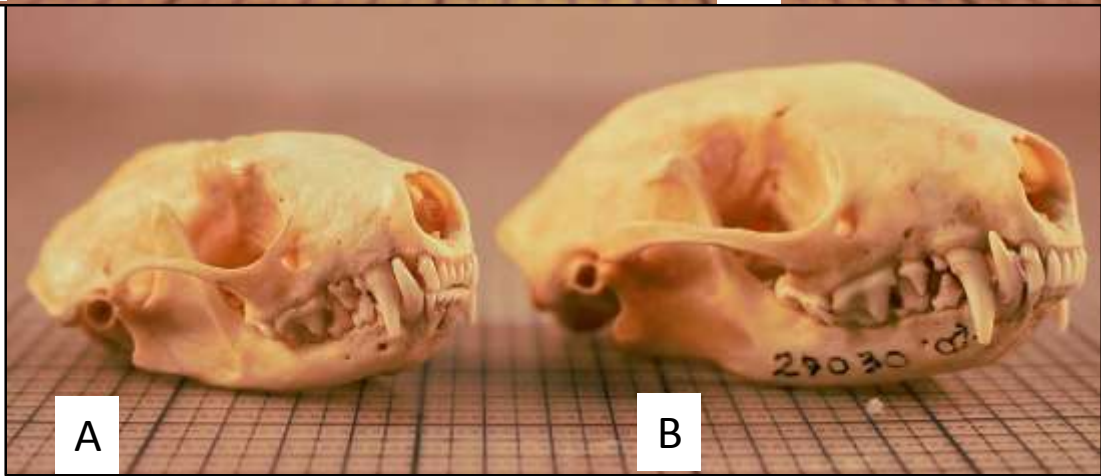
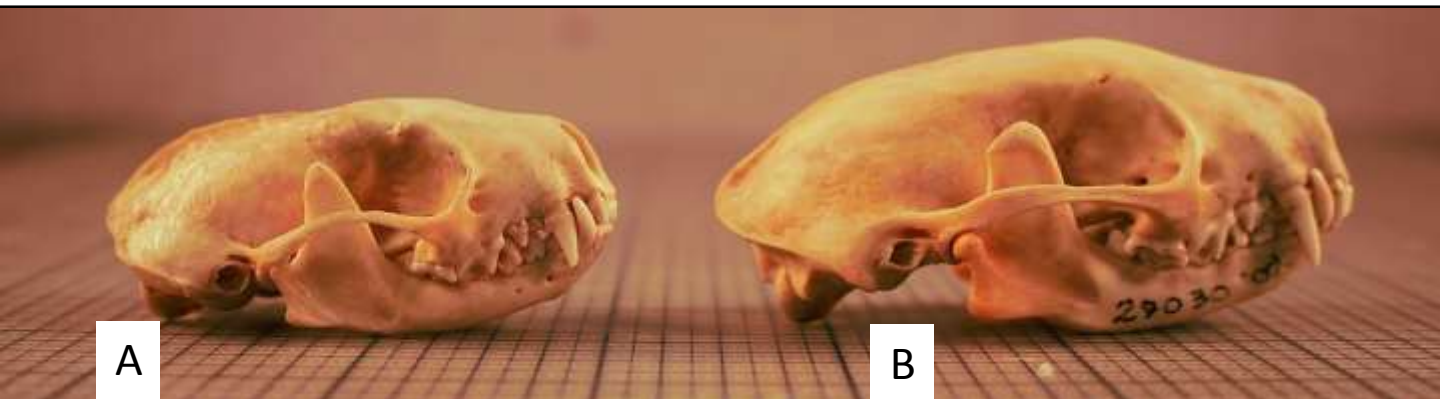
Spilogale putorius





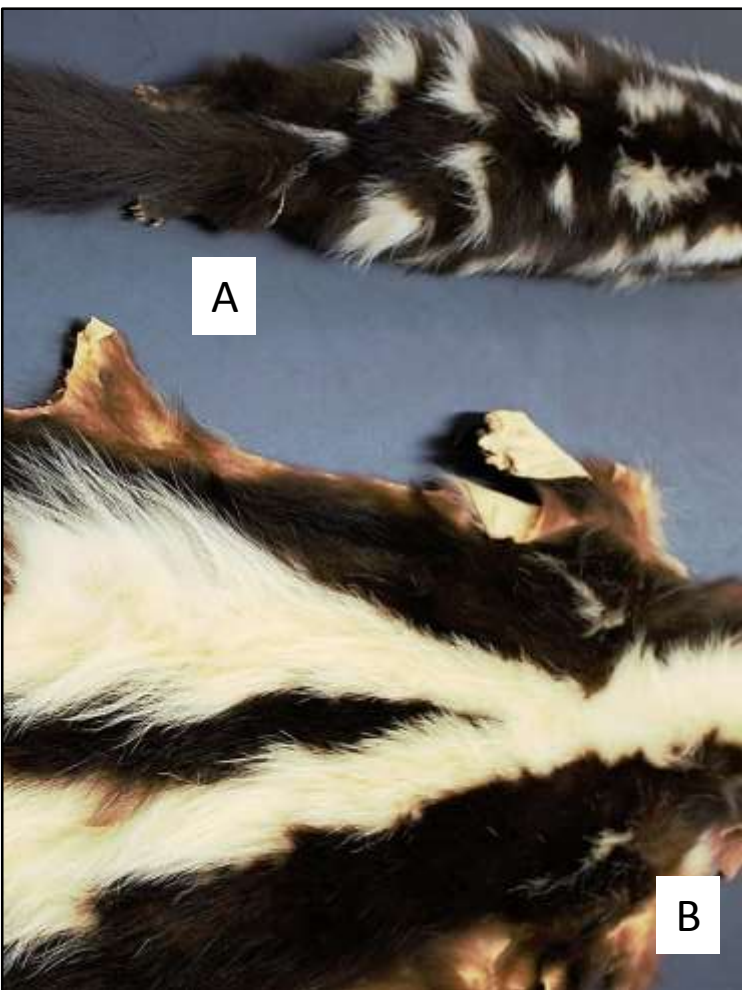
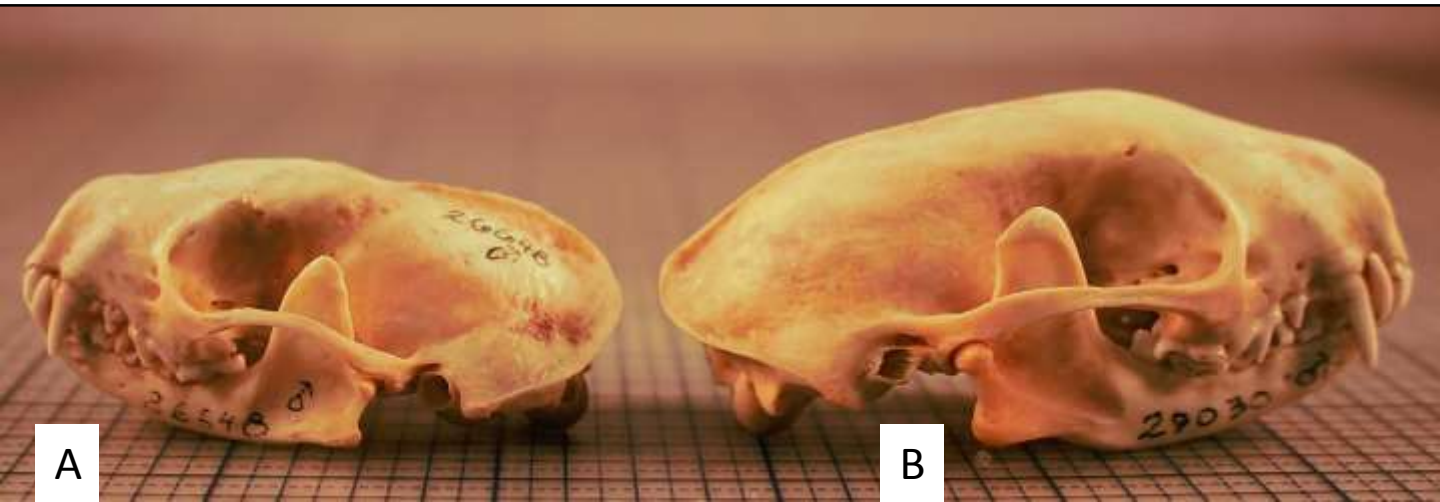
Comparisons

Spotted Skunk (A) and Striped Skunk (B)



Comparisons

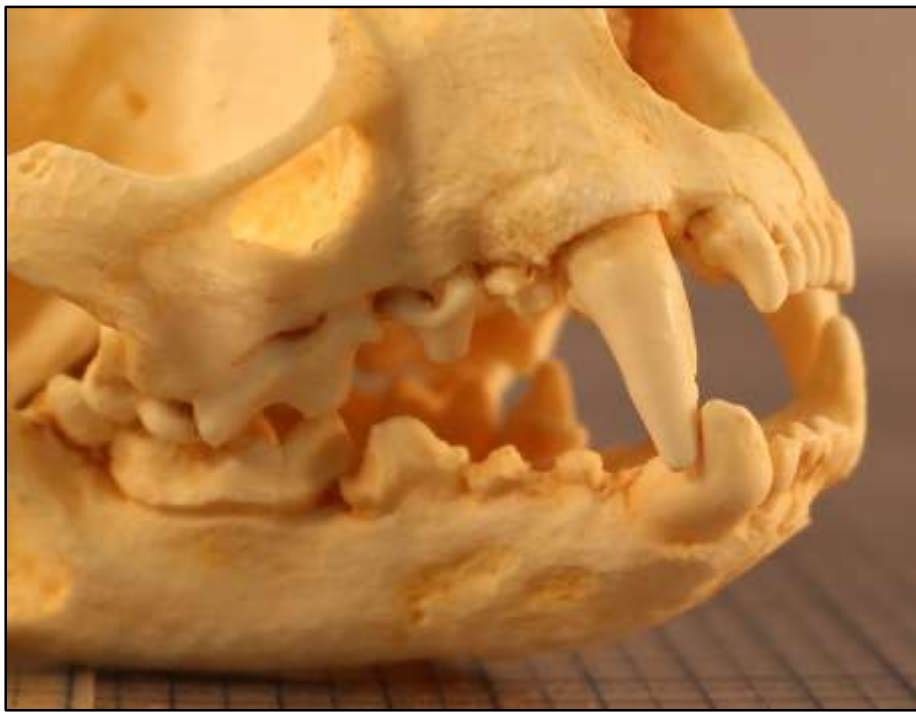
Spotted Skunk (A) and Striped Skunk (B)



North American River Otter

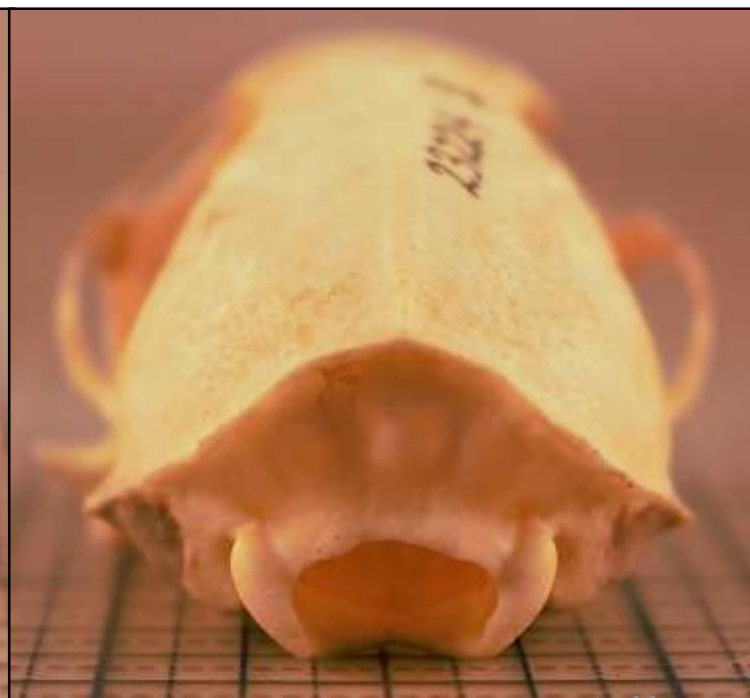
Lontra canadensis





American Mink

Neovison vison

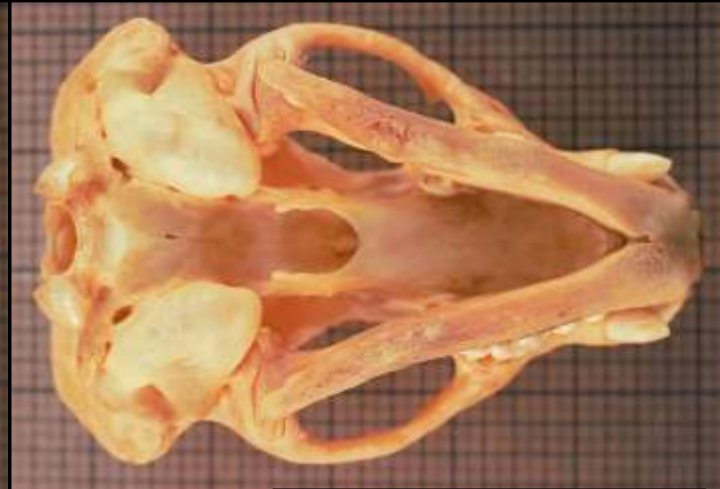




American Badger

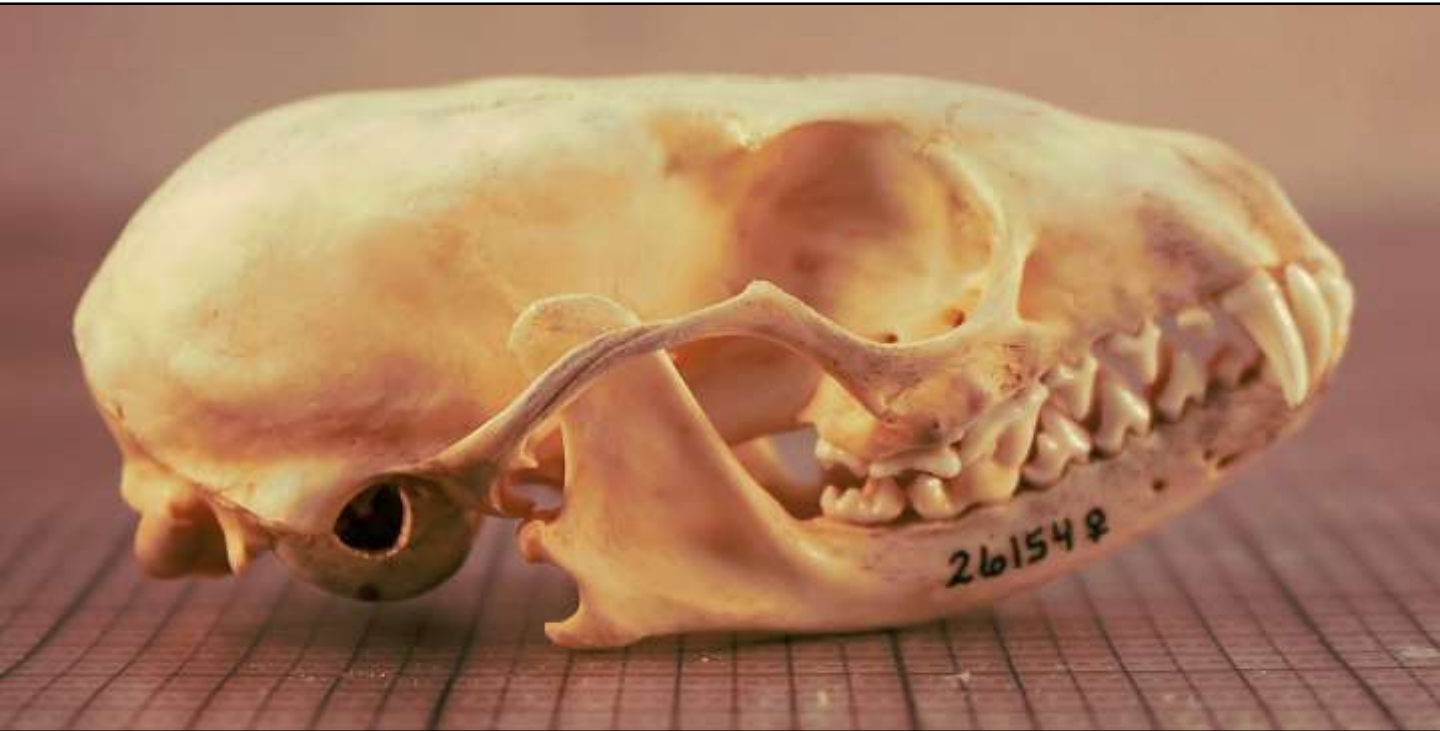
Taxidea taxus

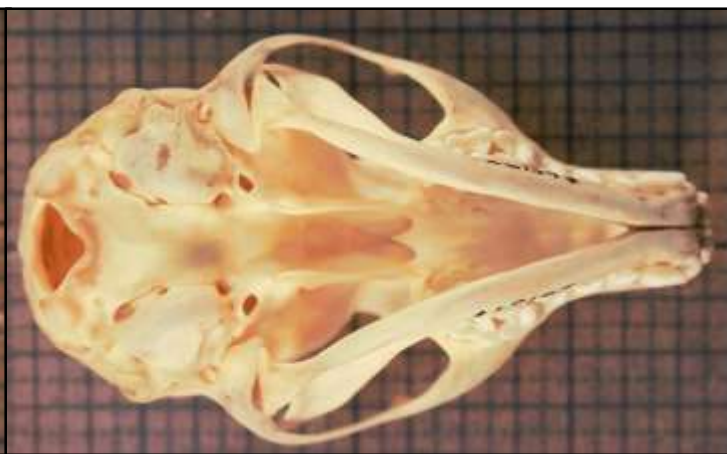




Ring-tailed Cat

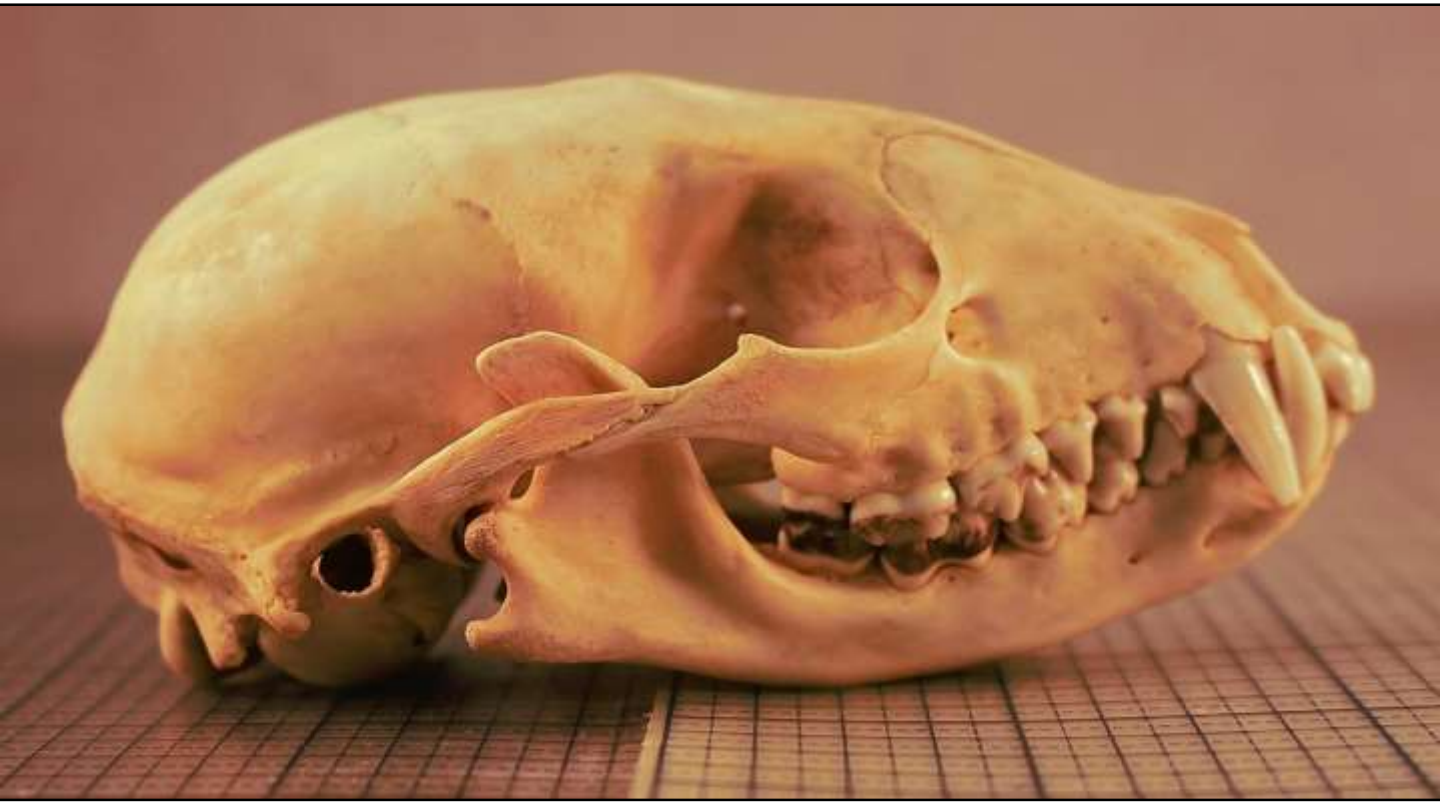
Bassariscus astutus

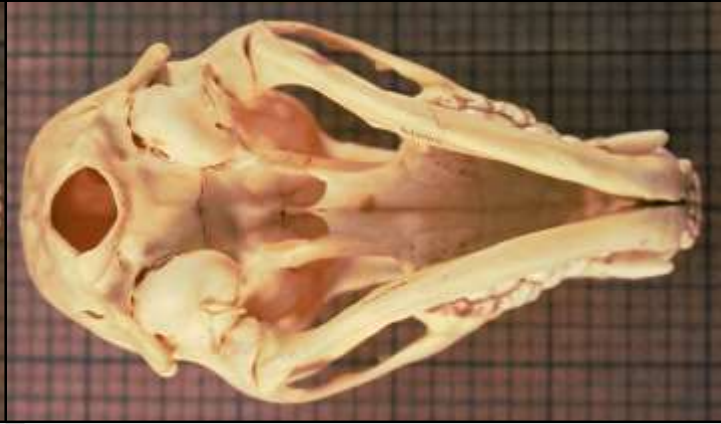




Raccoon

Procyon lotor





Cingulata

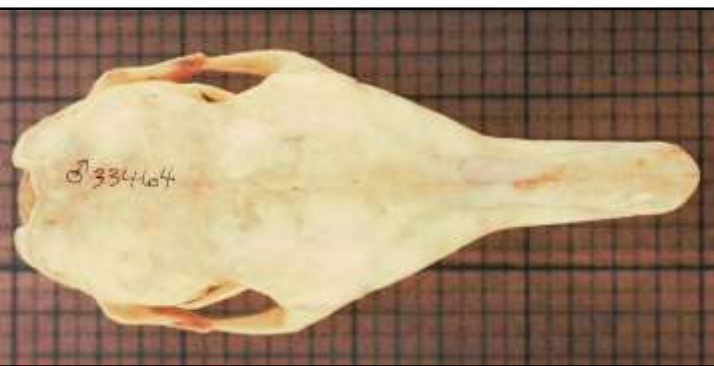
Dasypodidae

– *Dasypus novemcinctus*: Armadillo

Armadillo

Dasyurus novemcinctus





Didelphimorphia

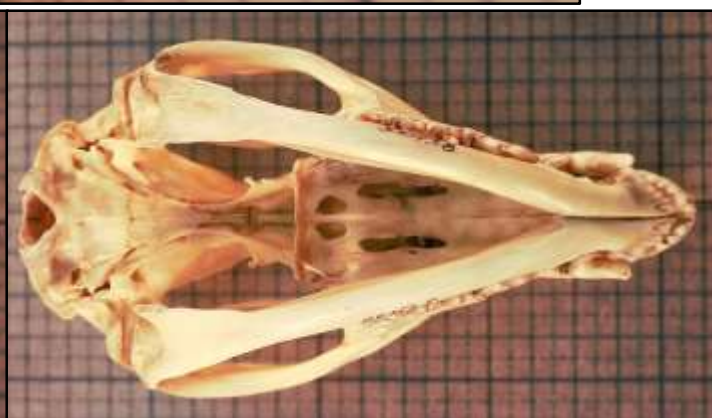
Didelphidae

– *Didelphis virginiana*: Opossum

Opossum

Didelphis virginiana





Lagomorpha

Leporidae

- *Lepus californicus*: Black-tailed Jackrabbit
- *Sylvilagus audubonii*: Desert Cottontail (Audubon Cottontail)
- *Sylvilagus floridanus*: Eastern Cottontail

Black-tailed Jackrabbit

Lepus californicus





Desert Cottontail (Audubon Cottontail)

Sylvilagus audubonii





Eastern Cottontail

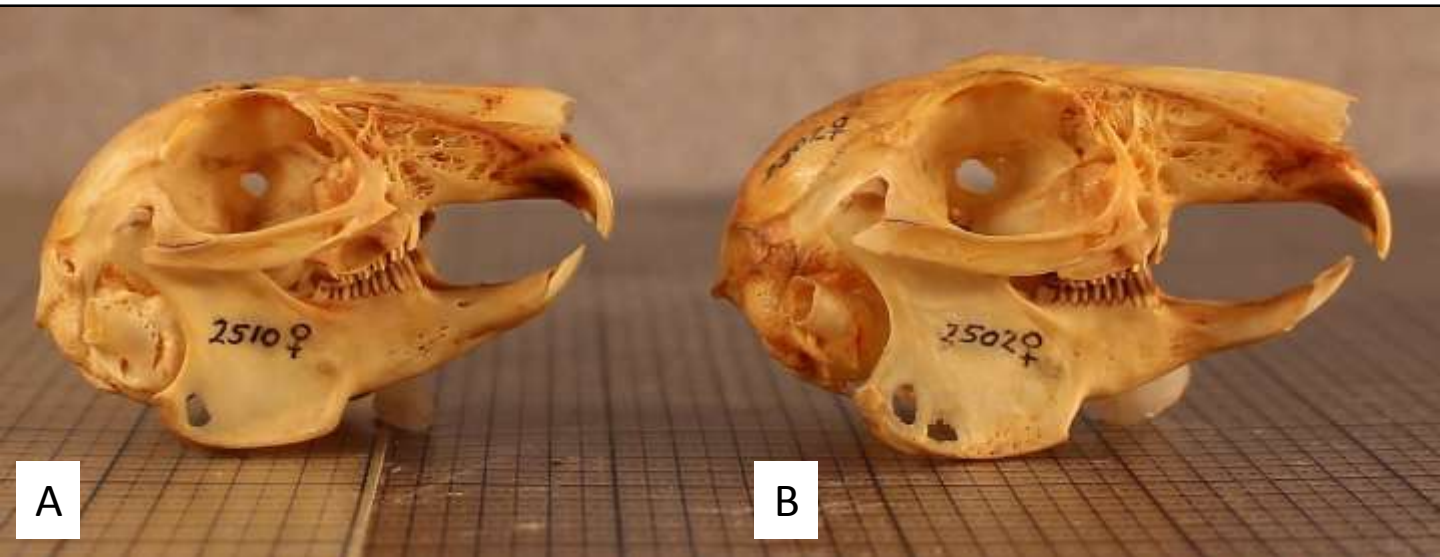
Sylvilagus floridanus





Comparisons

Desert Cottontail (A) and Eastern Cottontail (B)



A

B

A

B

A

A

65

Comparisons

Black-tailed (A), Desert (B), & Eastern Cottontail (C)



Rodentia

Castoridae

- Castor canadensis: Beaver

Cricetidae

- Ondatra zibethicus: Common Muskrat

Erethizontidae

- Erethizon dorsatus: North American Porcupine

Myocastoridae

- Myocastor coypus: Nutria

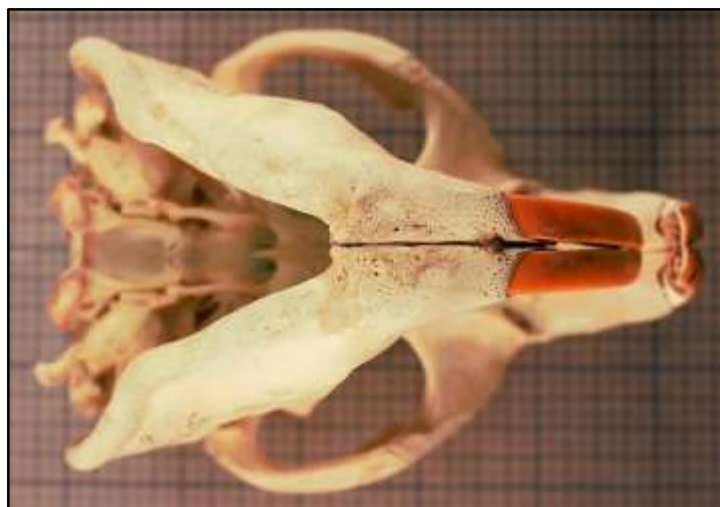
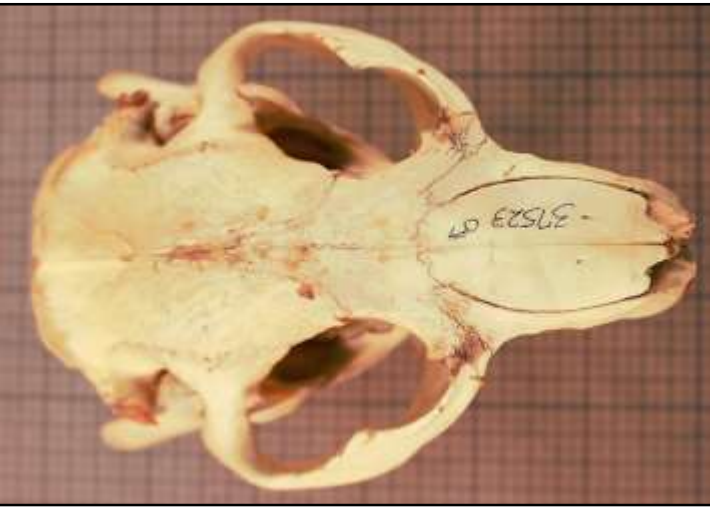
Sciuridae

- Glaucomys volans: Southern Flying Squirrel
- Sciurus carolinensis: Eastern Gray Squirrel
- Sciurus niger: Eastern Fox Squirrel
- Cynomys ludovicianus: Black-tailed Prairie Dog
- Ictidomys tridecemlineatus: Thirteen-lined Ground Squirrel

Beaver

Castor canadensis





Common Muskrat

Ondatra zibethicus





North American Porcupine

Erethizon dorsatus





Nutria

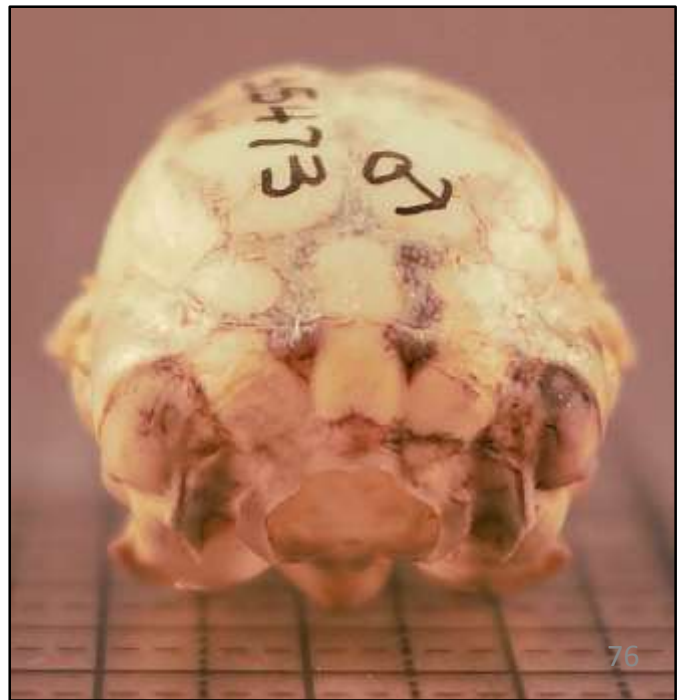
Myocastor coypus





Southern Flying Squirrel

Glaucomys volans

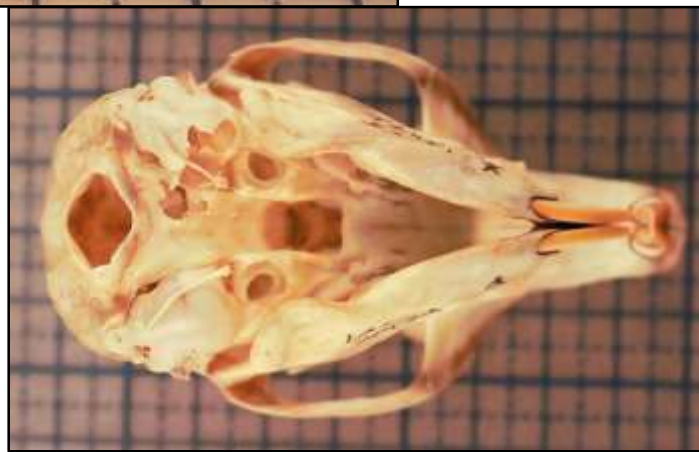




Eastern Gray Squirrel

Sciurus carolinensis

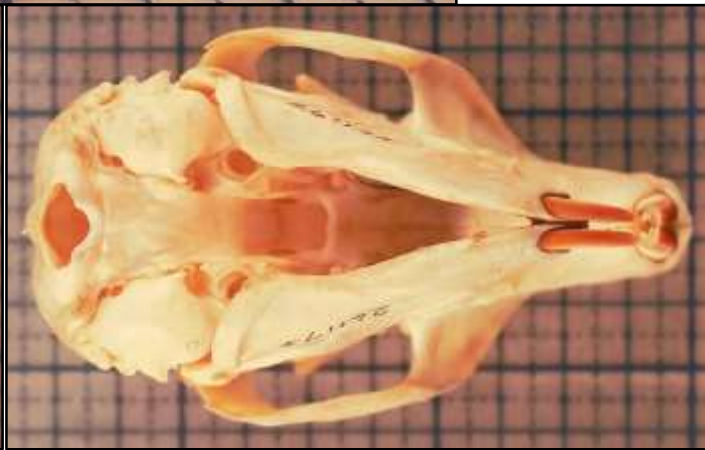




Eastern Fox Squirrel

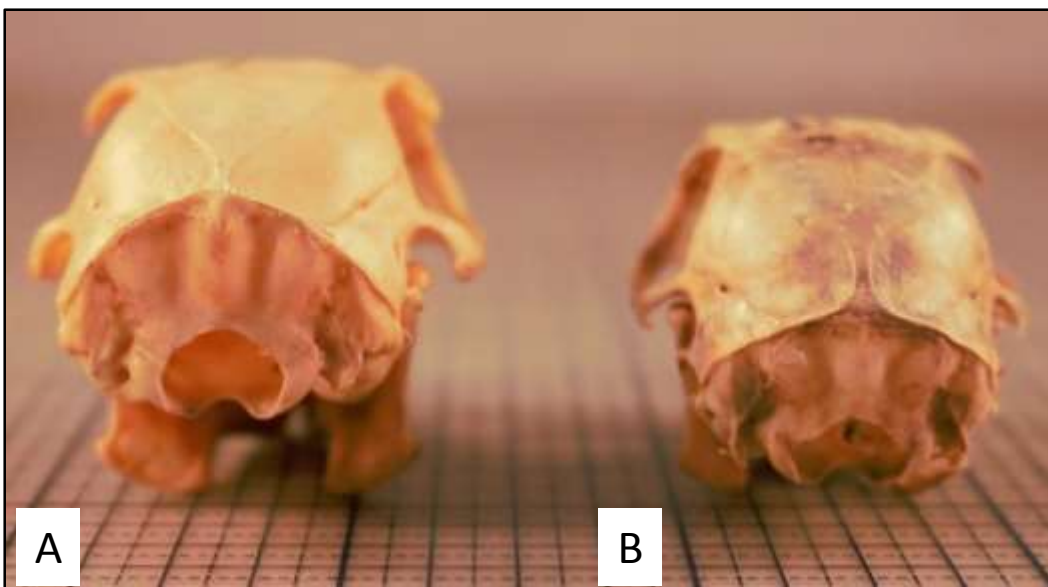
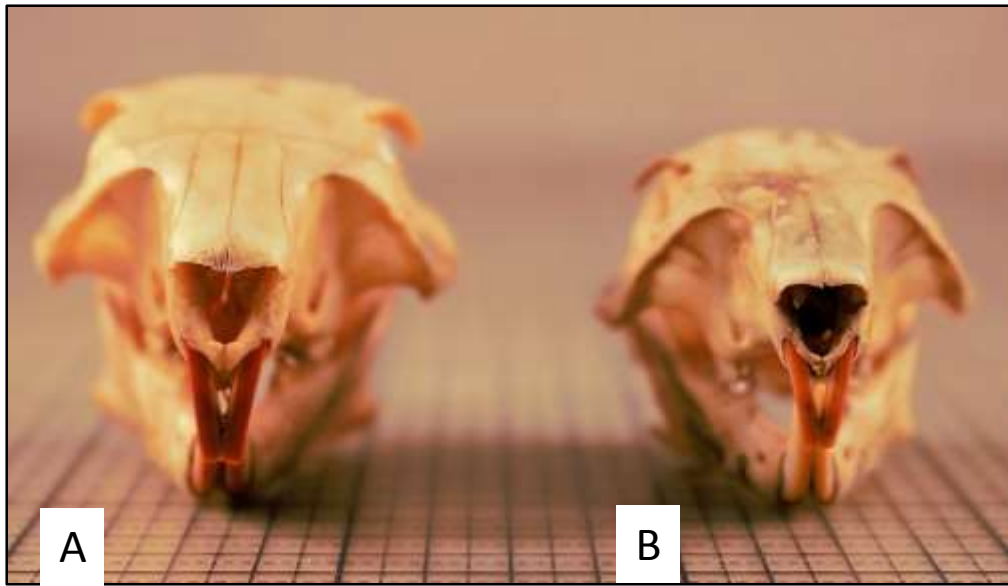
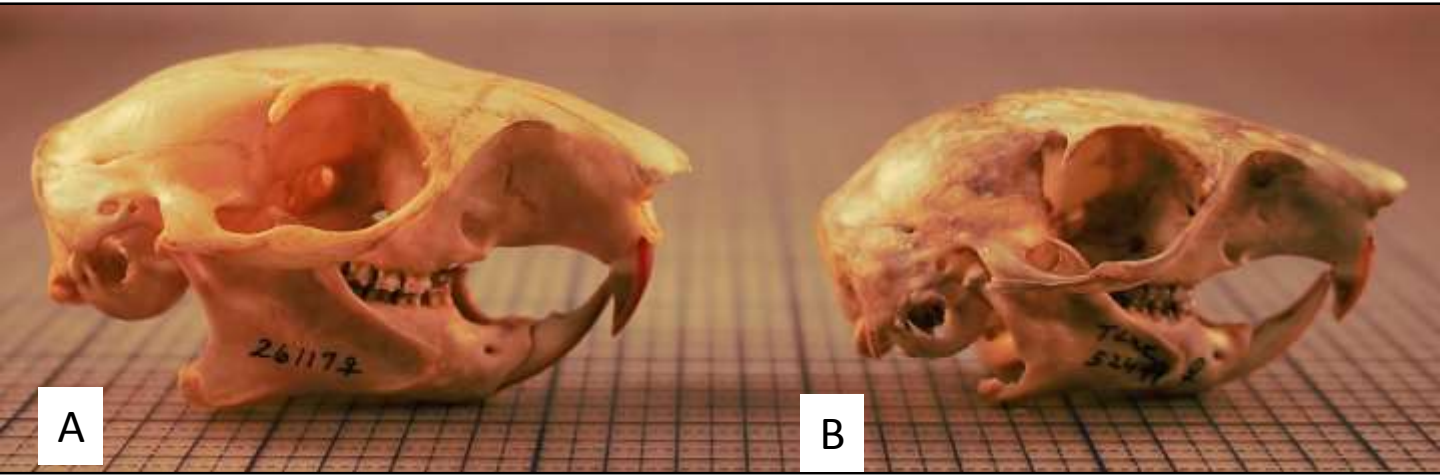
Sciurus niger





Comparisons

Eastern Fox (A) and Eastern Gray Squirrels (B)



Comparisons

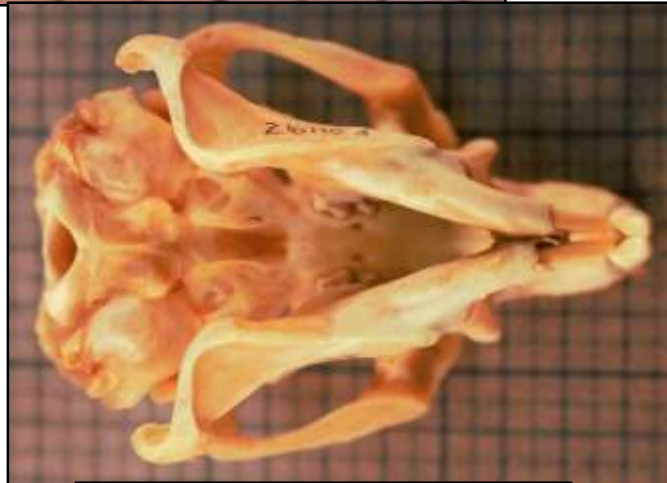
Eastern Fox (A) and Eastern Gray Squirrels (B)



Black-tailed Prairie Dog

Cynomys ludovicianus

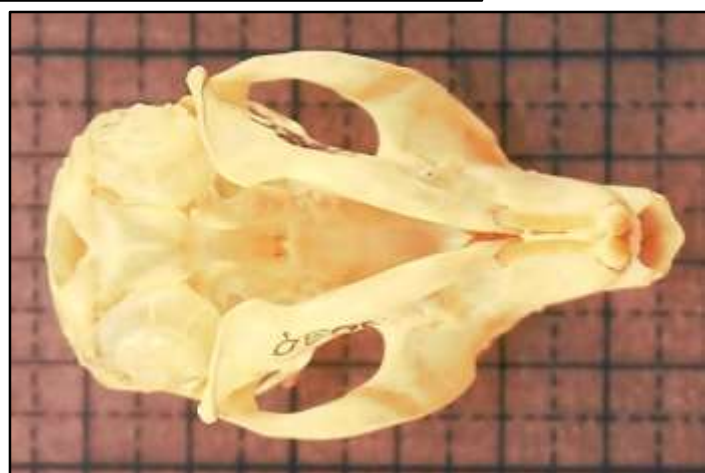




Thirteen-lined Ground Squirrel

Ictidomys tridecemlineatus





Glossary

Angle – the angle of the lower back corner of the mandible or bottom jaw.

Artiodactyla – even toed ungulates or hoofed mammals.

Carnivora – members of the mammalian order that are mostly carnivorous and have teeth adapted for eating meat.

Cingulata – order of mammals comprising of armadillos and extinct related families.

Coronoid process – the triangular part of the lower mandible that rises from the ramus, near the back cheek tooth and forms the top posterior portion of the lower jaw.

Didelphimorphia – order of opossums, characterized by having opposable digits on back foot with no claw.

Frontal bone – bone portions making up the forehead of an animal.

Lacrimal pit or fossa – a depression in the lacrimal bone for the lacrimal gland.

Lagomorpha – members of the mammalian order consisting of rabbits and hares.

Length of jaw – greatest length of the lower jaw, measured from the front of the incisors to the angle of the jaw.

Length of skull – the greatest length of the skull, measured from the most anterior part of the skull to the most posterior part of the skull

Mandibular condyle – the rounded projection of bone at the back of the lower jaw that meets a similar surface on the zygomatic arch to form a moveable joint.

Maxilla or upper jawbone – consists of two fused maxillary bones and the palate of the mouth, it supports the upper canines and cheek teeth.

Nasal bone – formed by two bones side by side that form the upper surface of the rostrum. The center line of these two bones forms the bridge of the nose.

Occipital bone – bone at the back and base of the skull that contains a hole, the foramen magnum, through which the brain connects to the spinal cord.

Occipital crest – ridge formed where the parietal bones join the occipital bone, across the top, back part of the braincase.

Orbit – the bony socket in which the eye sits.

Parietal bones – two bones that join to form the top and back portion of the braincase, behind the frontal bones and in front of the occipital bone.

Premaxilla – bones that form the front tip of the upper jaw, in front of the maxilla, they usually support incisor teeth.

Ramus of the mandible – the main horizontal portion of the lower jaw, which supports the lower cheek teeth.

Rodentia – order of rodents, characterized by a single pair of continuously growing incisors on both the upper and lower jaws.

Rostrum – part of the skull in front of the orbits; also referred to as the snout.

Zygomatic arch – bones forming an arch along the side of the skull below the eye orbit, extending from the maxilla to a point near the external opening of the ear canal.

Zygomatic width – the greatest distance across the zygomatic arches, also referred to as the width of the skull.

Biodiversity Teaching and Research Collection

Specimen Catalog Numbers

- **Artiodactyla Taxonomic List**

- Pronghorn: *Antilocapra americana* (Skull:4452 Skin:2563)
- Mule Deer: *Odocoileus hemionus* (Skull:8146 Skin:2546)
- White-tailed Deer: *Odocoileus virginianus* (Skull:28165 Skin:2550)
- Feral Hog (Wild Pig): *Sus scrofa* (Skull: TAMU AgriLife Extension Service)
- Collared Peccary (Javalina): *Pecari tajacu* (Skull:60809 Skin:1508)

- **Carnivora Taxonomic List**

- Coyote: *Canis latrans* (Skull:23566 Skin:1466)
- Gray Fox: *Urocyon cinereoargenteus* (Skull:3683 Skin:3683)
- Swift Fox: *Vulpes velox* (Skull:31900 Skin:20850)
- Red Fox: *Vulpes vulpes* (Skull:38738 Skin:5473)
- Bobcat: *Lynx rufus* (Skull:23559 Skin:2567)
- Mountain Lion: *Puma concolor* (Skull:1448 Skin: TAMU AgriLife Extension Service)
- Striped Skunk: *Mephitis mephitis* (Skull:29030 Skin:3672)
- Spotted Skunk: *Spilogale putorius* (Skull:26648 Skin:28754)
- North American River Otter: *Lontra canadensis* (Skull:2142 Skin:36582)
- American Mink: *Neovison vison* (Skull:23224 Skin:23224)
- American Badger: *Taxidea taxus* (Skull:23226 Skin:62529)
- Ring-tailed Cat: *Bassaricus astutus* (Skull:26154 Skin:26154)
- Raccoon: *Procyon lotor* (Skull:34179 Skin:25654)

- **Cingulata Taxonomic List**

- Armadillo: *Dasypus novemcinctus* (Skull:33464 Skin:33464)

- **Didelphimorphia Taxonomic List**

- Opossum: *Didelphis virginiana* (Skull:52438 Skin:52438)

- **Lagomorpha Taxonomic List**

- Black-tailed Jackrabbit: *Lepus californicus* (Skull:59412 Skin:4476)
- Desert Cottontail(Audubon cottontail): *Sylvilagus audubonii* (Skull:2510 Skin:2510)
- Eastern Cottontail: *Sylvilagus floridanus* (Skull:2502 Skin:2502)

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- **Rodentia Taxonomic List**

- Beaver: *Castor canadensis* (Skull:37523 Skin:23120)
- Common Muskrat: *Ondatra zibethicus* (Skull:21357 Skin:21357)
- North American Porcupine: *Erethizon dorsatus* (Skull:9450 Skin:9450)
- Nutria: *Myocastor coypus* (Skull:56551 Skin:56551)
- Southern Flying Squirrel: *Glaucomys volans* (Skull:35473 Skin:471)
- Eastern Gray Squirrel: *Sciurus carolinensis* (Skull:52449 Skin:52449)
- Eastern Fox Squirrel: *Sciurus niger* (Skull:26117 Skin:26117)
- Black-tailed Prairie Dog: *Cynomys ludovicianus* (Skull:26110 Skin:26110)
- Thirteen-lined Ground Squirrel: *Ictidomys tridecemlineatus* (Skull:3930 Skin:38206)

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