



# Primates, Lagomorpha, & Rodentia



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Mammalogy 2019



# Expectations for Today

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- You will be expected to be able to:
  - Produce the common and scientific names of 43 species of Rodentia, Lagomorpha, and Primates when given samples (skeletons, skins, tracks, scat, etc.)
  - Describe some basic physiological, ecological, and management characteristics of those 43 species when given the name

# Taxonomy



All Other Mammals



Xenarthra



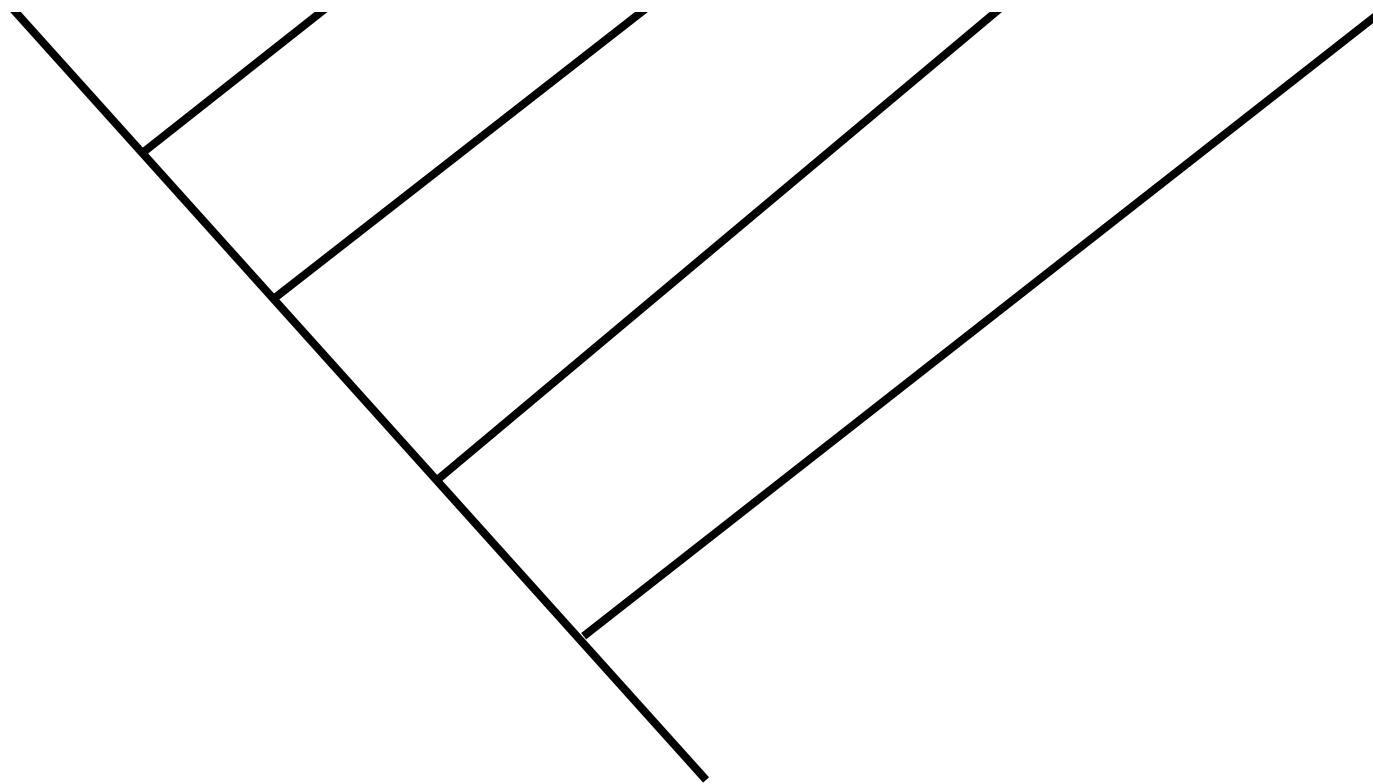
Afrotheria



Marsupiala



Monotremata



Monotremata, Marsupiala, Afrotheria, Xenarthra

# Taxonomy

## Euarchontoglires



Rodentia



Primates



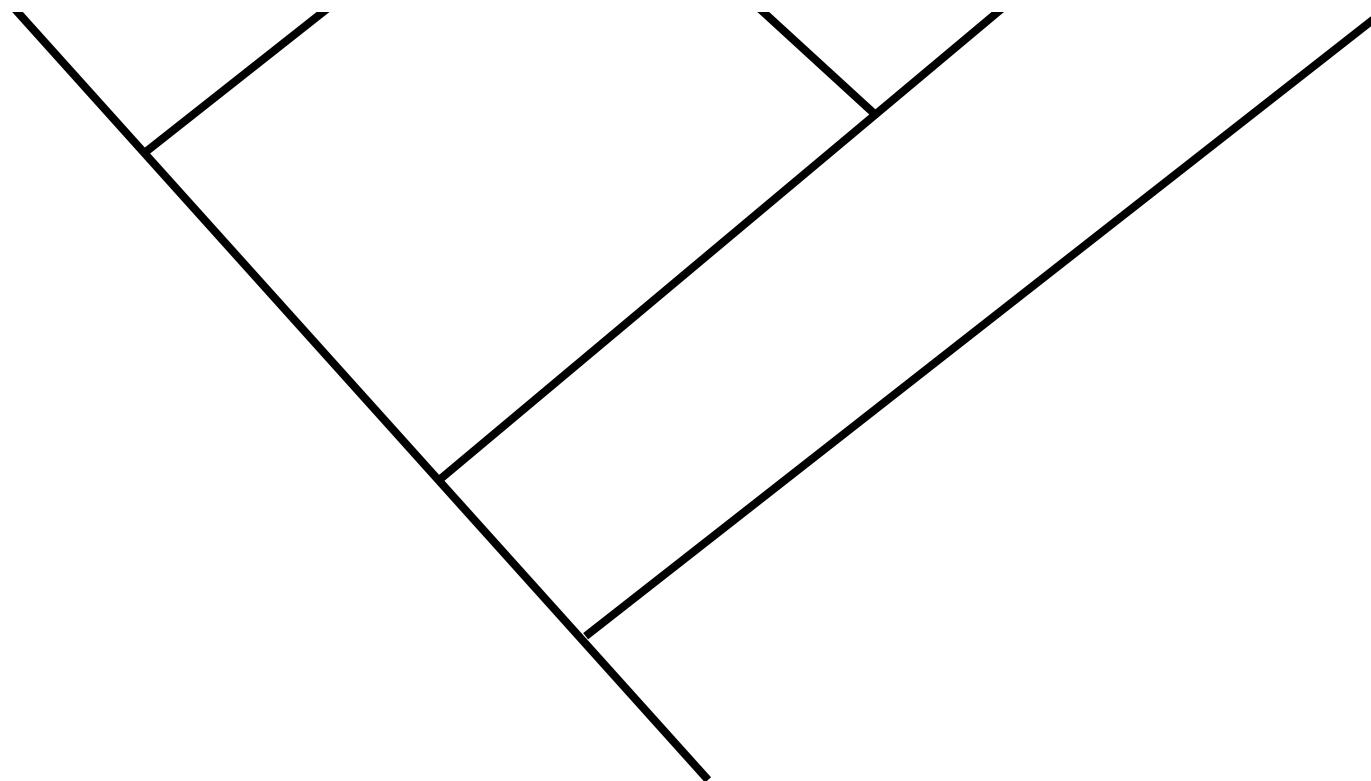
Artiodactyla



Carnivora



Xenarthra



# Euarchontoglires



Rodentia



Lagomorpha



Primates



Dermoptera



Scandentia

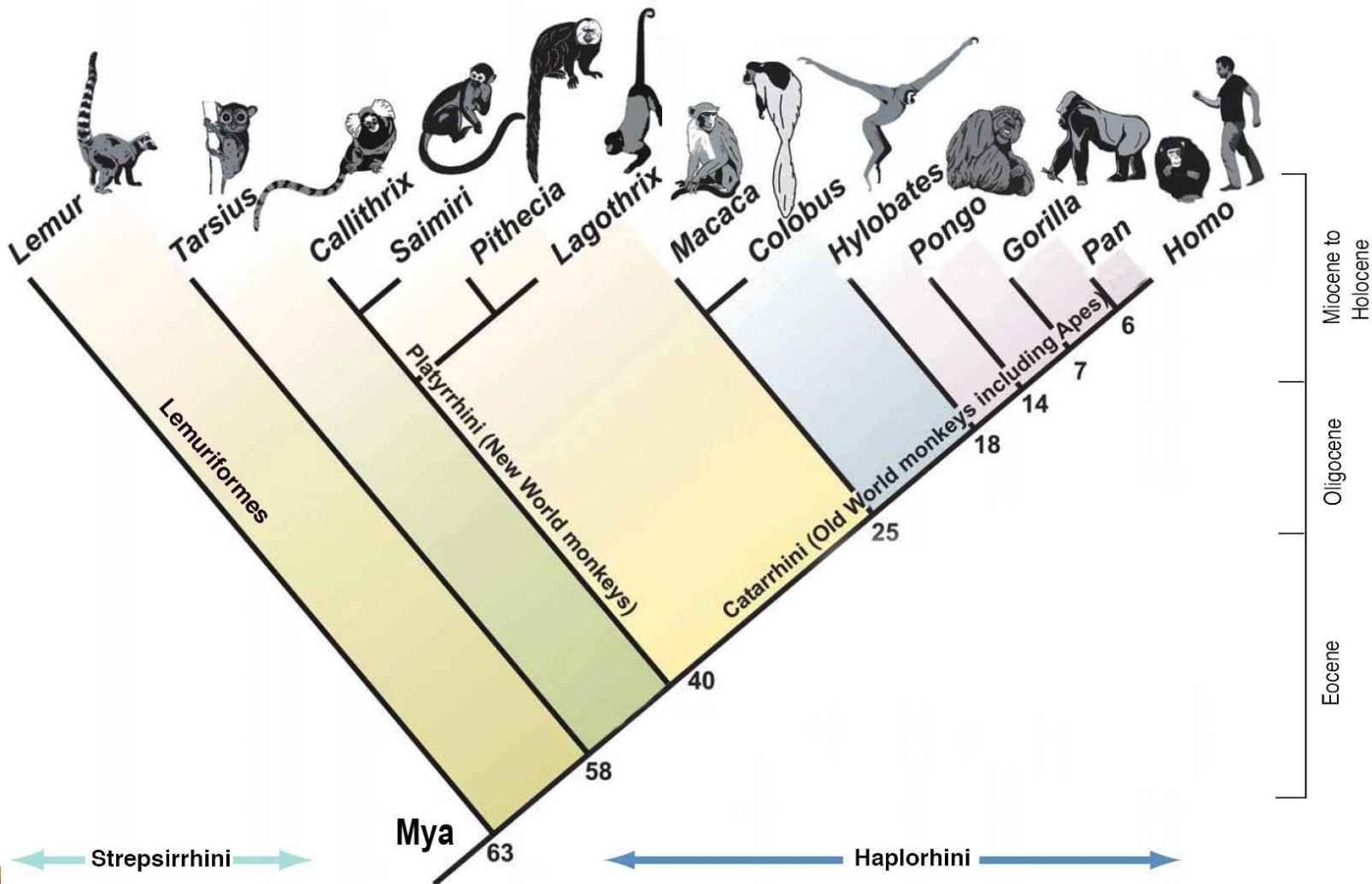


# Order: Primates

- Primus = “first rank”
- Range from <1lb to >400lbs
- Some are terrestrial while others are arboreal
- Highly social

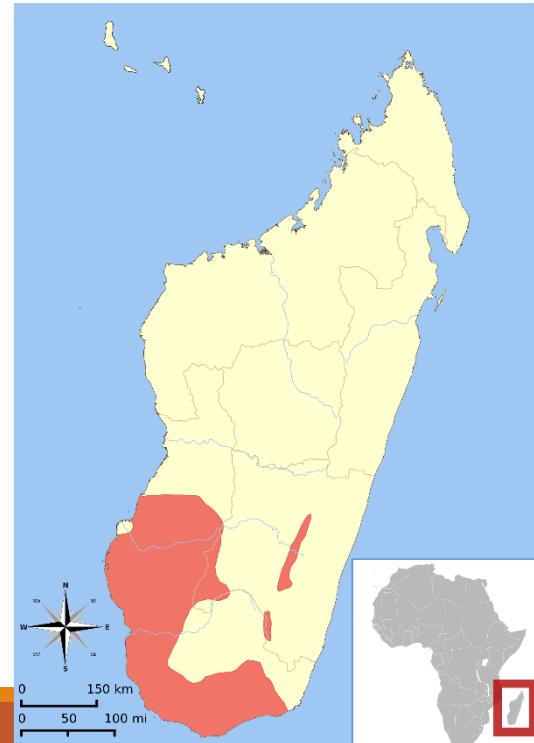


# Order: Primates



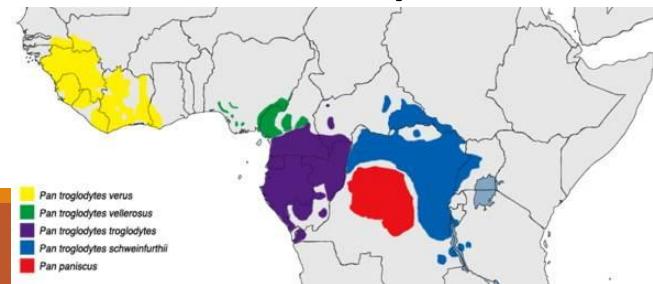
# *Lemur catta* ring-tailed lemur

- Diurnal
- Live in troops of up to 30
- Endangered due to habitat loss and exotic pet trade
- Breeds well in captivity and commonly found in zoos



# *Pan troglodytes* chimpanzee

- Closest extant relative to humans
- Weigh 60-130lbs
- Offspring maintain close relationships with mothers for many years
- Are known to use tools and solve problems
- Often used in research
- Live in large territorial troops



# *Homo sapiens*

## human

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# Order: Lagomorpha

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- Lagomorph = “rabbit look”
- Includes: hares, rabbits, and pikas
- Have 4 incisors compared to rodents, which have 2
- Often reproduce many times a year



# *Lepus californicus* black-tailed jackrabbit

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- Live in elevations from 0-10,000ft
- Grow up to 6lbs
- Moms abandon offspring as soon as they're done nursing



# *Lepus townsendii*

## white-tailed jackrabbit

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- Prefer open prairies or scrublands
- Grow up to 10lbs and change fur pattern seasonally
- Are larger than black-tailed jackrabbit (why?)



morpha

# *Sylvilagus audubonii* desert cottontail



- Primarily nocturnal
- Reproduce many times annually with few young surviving due to predation
- Larger ears than eastern cottontail
- Makes use of burrows abandoned by other species



# *Sylvilagus floridanus* eastern cottontail

- Primarily crepuscular
- Reproduce many times annually with a peak during spring when temperatures first warm
- Evades predators by running in a zigzag pattern
- Prefer edge habitats with a mix of dense cover and open fields



# Order: Rodentia

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- Divided into five increasingly derived clades:
- Hystricomorpha (gundis, porcupines, and guinea pigs)
- Sciuroomorpha (mountain beavers, squirrels, and chipmunks)
- Castorimorpha (beavers, pocket gophers, and kangaroo rats)
- Muridea (mice and rats)
- Dipodoidea (jumping mice)

# Order: Rodentia



Dipodoidea



Muroidea



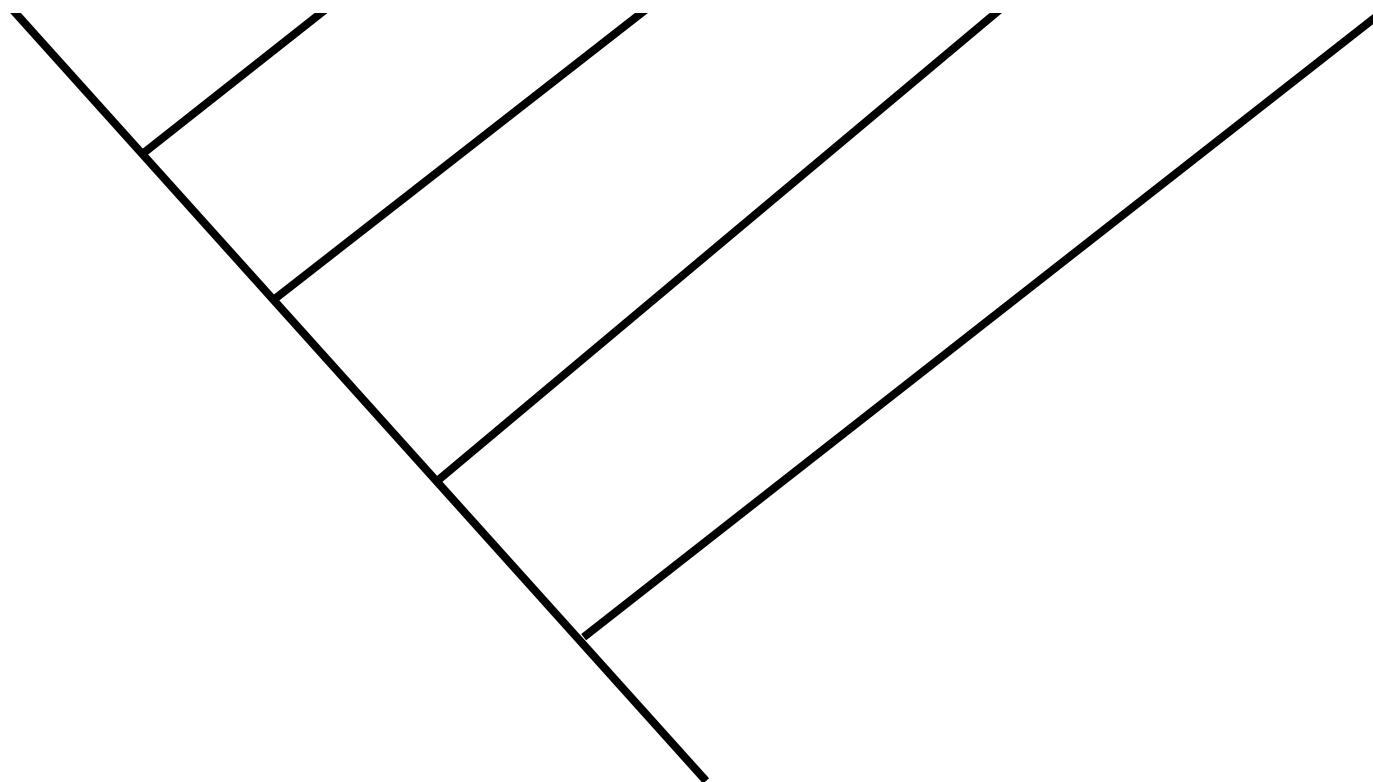
Castorimorpha



Sciuroidea



Hystricomorpha



# Order: Rodentia

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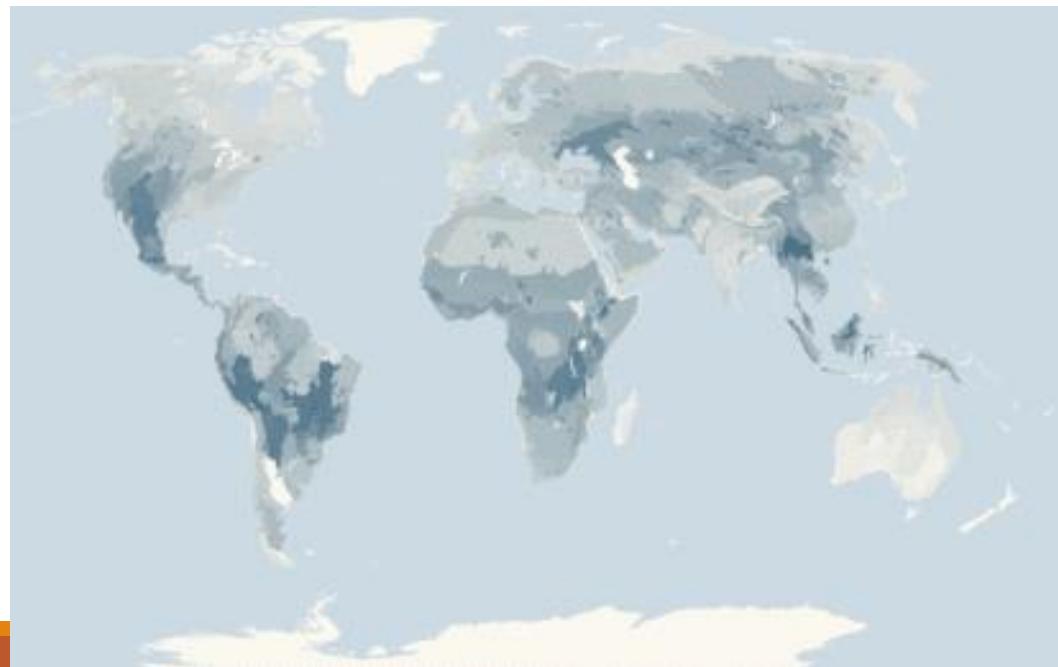


- Rodere = “gnaw”
- Highly diverse including >2,000 species
- Terrestrial, fossorial, arboreal, semi-aquatic
- Often well-adapted to human modified environments
- Social systems range from prairie dog colonies to solitary pocket gophers
- Often used in research due to their intelligence and high rate of reproduction

# Order: Rodentia



- Almost exclusively herbivorous
  - (but we'll talk about the exceptions)
- Teeth have enamel only on the front with dentine on the back creating a chisel
- No canine teeth



# Order: Rodentia



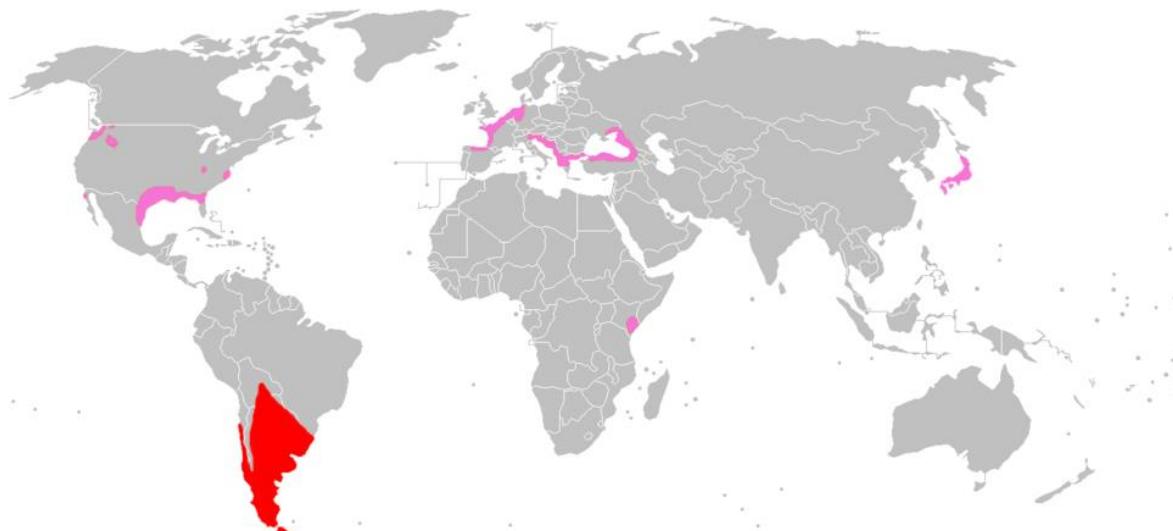
- Rodent research is often done in labs or through direct observation
- Because of their small home ranges, we can create habitats large enough for rodents in controlled closed settings
- We can also observe rodents within most of their home range to watch their behaviors (as we did with squirrels last week)
- We use small traps to live catch wild rodents and transfer them to labs
- The same is true of many lagomorphs

# *Myocastor coypus* nutria

- Semi-aquatic
- Up to 20-40lbs
- They are invasive in the US where they significantly reduce vegetation quantity and compete with beaver/muskrat



Photo by Jules Xénard



# *Erethizon dorsatum* porcupine



- Have sharp quills and a musky odor to protect themselves from predators
- Fishers specialize in hunting porcupines
- Weigh up to 35lbs
- Often strip bark from trees to eat
- Go through winter lethargy leaving large volumes of scat at the base of trees
- Originated in South America and moved during the Great American Interchange

# *Erethizon dorsatum* porcupine



# *Cynomys ludovicianus* black-tailed prairie-dog



- Famous for their huge prairie dog towns
- Impacted by habitat destruction largely by agriculture
- Diurnal
- Coterries are composed of 1 adult male and 3-4 females which breed all summer increasing the coterie size
- Offspring then disperse in May the year after birth
- The holes they dig show obvious signs of their presence

# *Cynomys ludovicianus* black-tailed prairie-dog



# *Glaucomys volans*

## southern flying squirrel

- Nocturnal
- Specialize in fruits and nuts
- Glide rather than truly flying
- Wings also called “patagium”
- Prefer deciduous or mixed forests
- Build dreys like other tree squirrels



# *Ictidomys tridecemlineatus* thirteen-lined ground squirrel

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- Omnivorous (grass, seeds, insects, mice/shrews)
- Diurnal preferring warm days
- Hibernates earlier than many similar species



# *Marmota monax*

## groundhog

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- Largest of the Sciuridae, weigh up to 15lbs
- Dig hidden burrows that can ruin building foundation
- Prefer edge habitats with close access to cover/den sites
- Can actually climb trees to escape predators
- True hibernation
- Mostly eat grasses



# *Poliocitellus franklinii*

## Franklin's ground squirrel

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- Known for its musky scent
- Has numerous glands along its back to scent mark its tunnels
- Hibernates
- Diurnal



# *Sciurus carolinensis* eastern grey squirrel



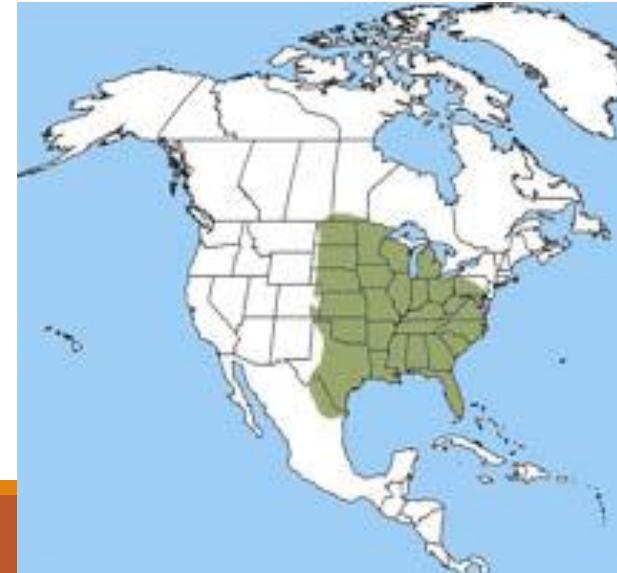
- Prominent in forests east of the Mississippi River
- Important dispersers of seeds because they bury them for later use
- Are born hairless
- Well adapted to humans
- Build dreys to nest in
- Shelled nuts are a good indicator sign



# *Sciurus niger*

## eastern fox squirrel

- Build dreys and shell nuts
- Largest North American squirrel
- Prefer wooded habitats with minimal understory
- Have darker fur patterns through the Appalachian Mts



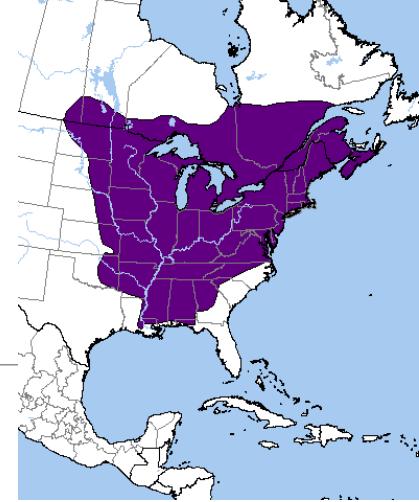
# *Tamias minimus* least chipmunk



- Smallest Sciuridae species
- Are adaptable to environments with both large hardwoods or scrub
- Mark areas without food with urine to improve foraging
- Cache food to survive winter



# *Tamias striatus* eastern chipmunk



- Diurnal
- Prefers deciduous forest habitats with dense understory
- Burrows in ground and carries food cheek pouches to cache



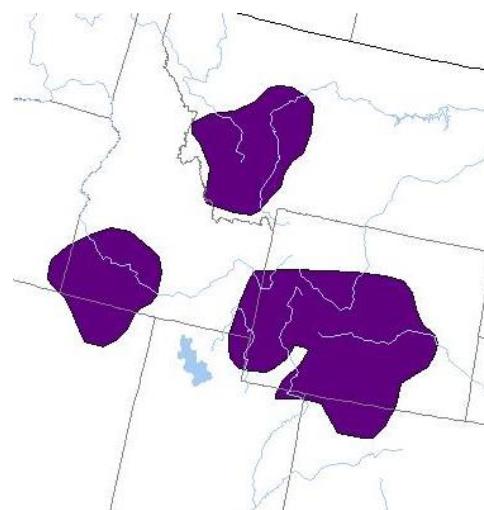
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# *Urocitellus elegans*

## Wyoming ground squirrel

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- Endemic to the U.S.
- It is facing threats due to habitat loss



# *Xerospermophilus spilosoma* spotted ground squirrel

- Caches food to eat during winter lethargy
- Digs its own small burrows
- Unique spotted pelage



# *Castor canadensis*

## American beaver

- Known for building dams and lodges
- Considered ecosystem engineers
- Use their adapted tail to pack mud onto wooden structures
- Only live near water, but will disperse over dryer terrain
- Prominent food source for large predators
- Historically more prominent prior to human hunting for pelts



# *Castor canadensis*

## American beaver



# pocket gophers

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- Have external pouches (“pockets”) on their cheeks to store food
- Fossorial feeding off roots and rarely coming aboveground
- Tunnels can be several feet deep into the ground
- Adapted to low oxygen and water underground
- Known for large front claws for digging

# *Geomys bursarius* plains pocket gopher



# *Thomomys talpoides* northern pocket gopher

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# *Chaetodipus hispidus* hispid pocket mouse

- Solitary; granivorous
- Dig individual burrows and plug the entrances
- Prefers short grass habitats



# *Dipodomys ordii*

## Ord's kangaroo rat



- Nocturnal
- Dig shallow burrows to rest during daytime
- Prefer sandy habitats with open gaps between vegetation
- Long tail



# *Perognathus fasciatus* olive-backed pocket mouse

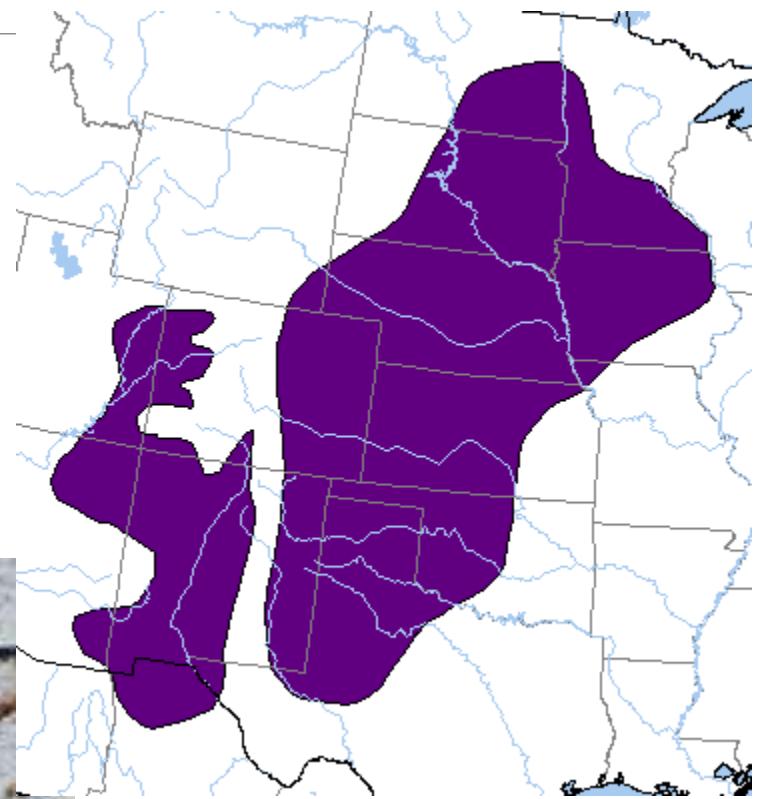
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- Nocturnal
- Dig extensive underground tunnels relative to body size
- Prefers grassland habitats



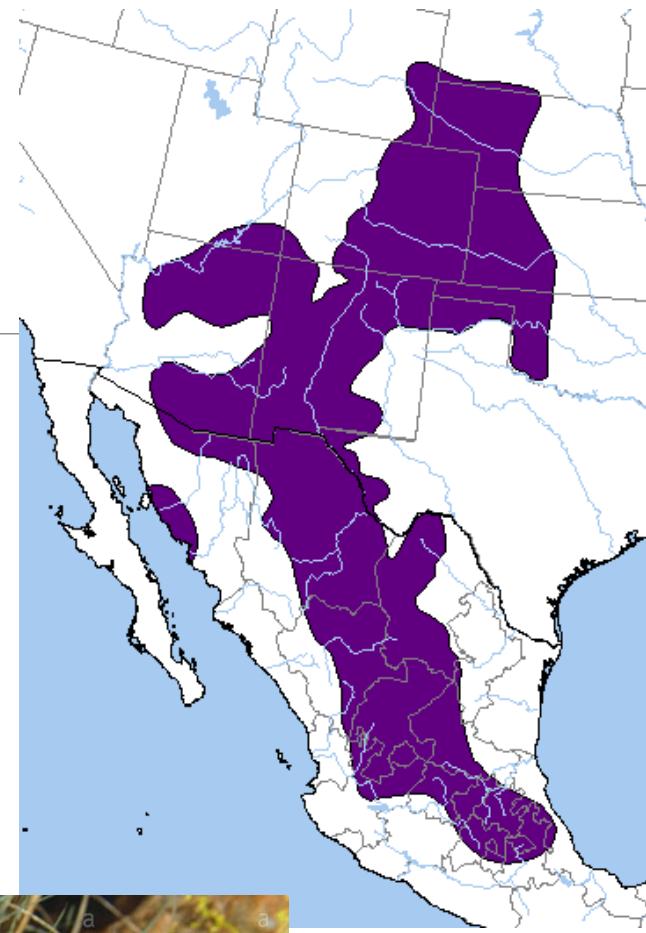
# *Perognathus flavescens* plains pocket mouse

- Prefer desert habitats
- Often live directly under cacti
- Can survive in sandy grasslands
- Eat mostly seeds and grasses



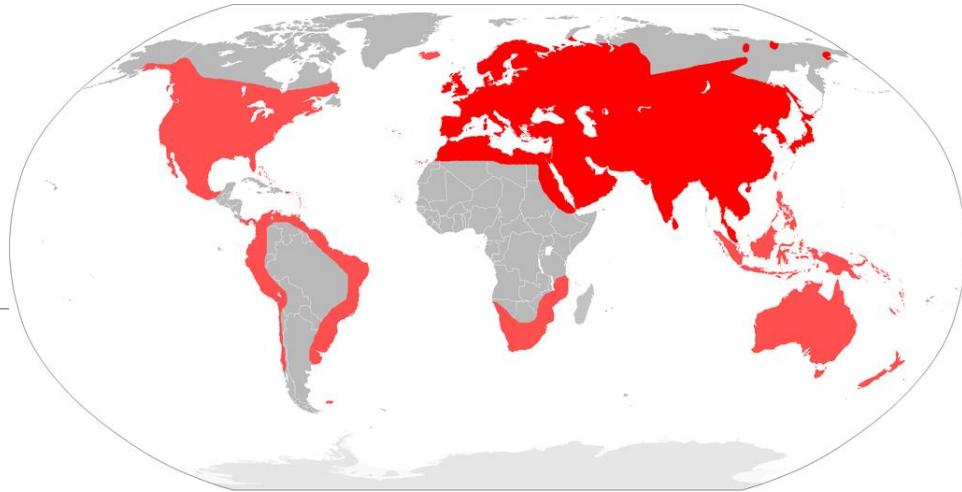
# *Perognathus flavus* silky pocket mouse

- Smallest pocket mouse species
- Nocturnal
- Caches food in burrows to eat during day
- Large aboveground home range relative to body size



# *Mus musculus* house mouse

- Well adapted to humans
- Used for research in labs
- Adapt social structure to meet environmental cues
- Considered invasive in many places they've been introduced
- Also considered a nuisance in homes/businesses
- Mouse scat is a common sign to find



# *Mus musculus*

## house mouse



© Kim A. Cabrera

Rodentia

# *Rattus norvegicus*

## Norway rat

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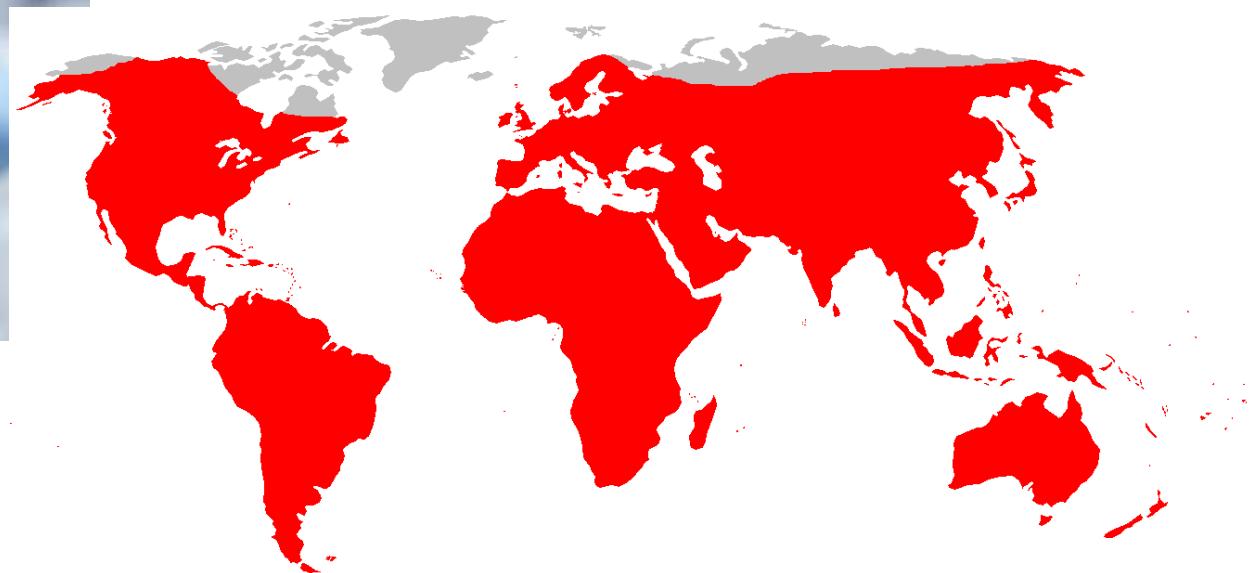
- Well adapted to humans
- Used for research in labs
- Most widespread of the mice
- Considered an invasive species and will eat bird eggs limiting their reproduction
- Burrow in habitats with available soil
- Live in large colonies



# *Rattus norvegicus*

## Norway rat

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# *Microtus ochrogaster* prairie vole

- Prefer dry grasslands
- Build runways under grasses and through snow
- Monogamous

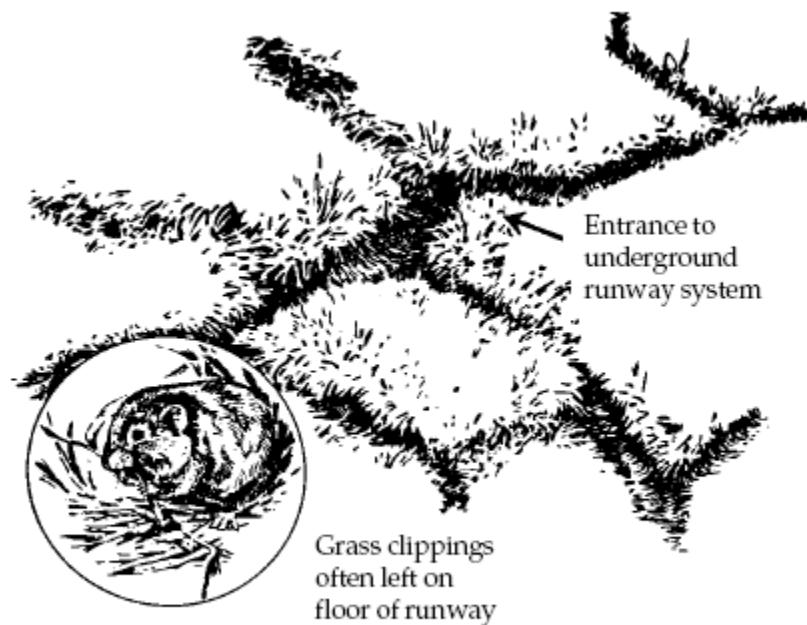


Fig. 6. Surface runway system of the prairie vole.

# *Microtus pennsylvanicus* meadow vole



- Prefer moist grasslands
- Build runways under grasses and through snow
- Fur slightly darker than prairie voles (why?)



# *Microtus pinetorum* woodland vole

- Prefer deciduous forests
- Live in social family groups
- Will climb trees for food
- Are particularly damaging to apple orchards



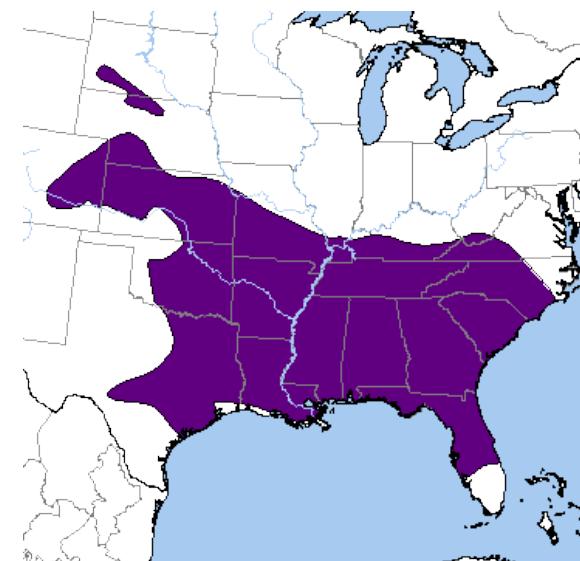
# *Neotoma cinerea* bushy-tailed woodrat

- a.k.a. packrats because they will drop whatever they're holding in exchange for shiny objects
- Cache food and shiny objects in dens
- Prefer boreal forest habitats
- Solitary; nocturnal; territorial
- males protect their territory from other males



# *Neotoma floridana* eastern woodrat

- Builds large dens called “middens” that are used by offspring through multiple generations
- Prefer warm moist forest habitats and often are attracted to houses/cabins
- Are threatened by feral/house cats

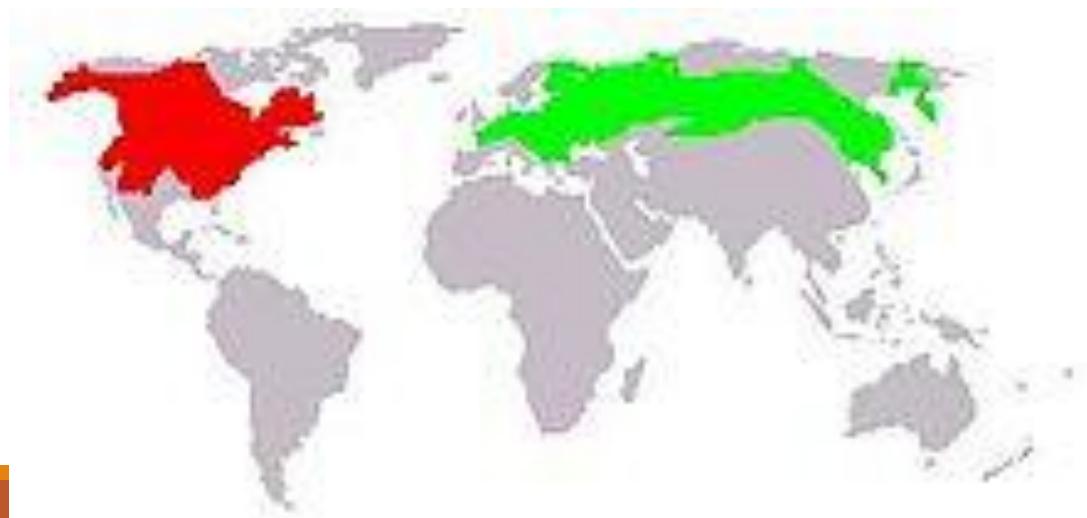


# *Ondatra zibethicus*

## muskrat

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- Semi-aquatic
- Build lodges using reeds and other wetland vegetation
- Hunted for their pelts
- Will also burrow into the sides of riverbanks and wetlands



# *Ondatra zibethicus* muskrat

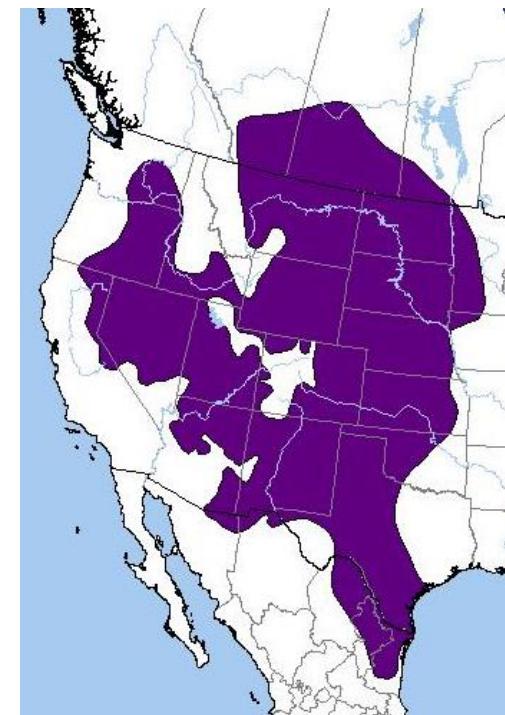


© Mer



# *Onychomys leucogaster* northern grasshopper mouse

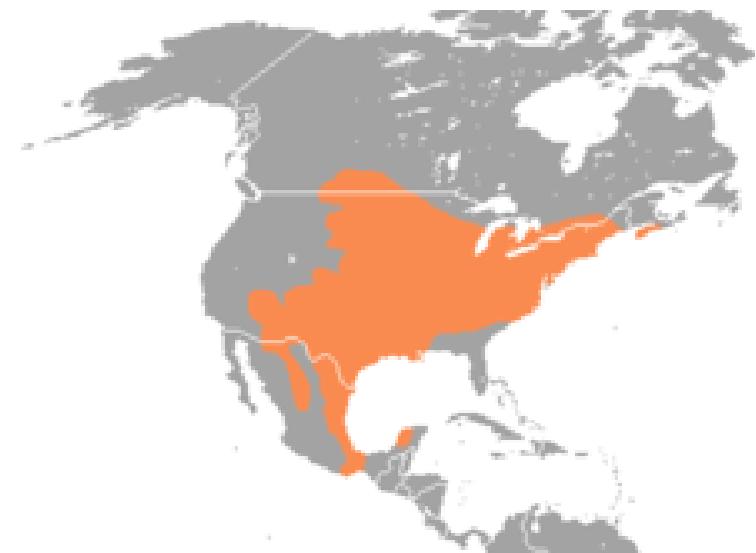
- Carnivorous (other mice) / insectivorous (especially scorpions)
- Prefer deserts and dry grasslands



# *Peromyscus leucopus* white-footed deer mouse

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- Primarily insectivorous; nocturnal
- Adapt well to various habitats, but need tree cover

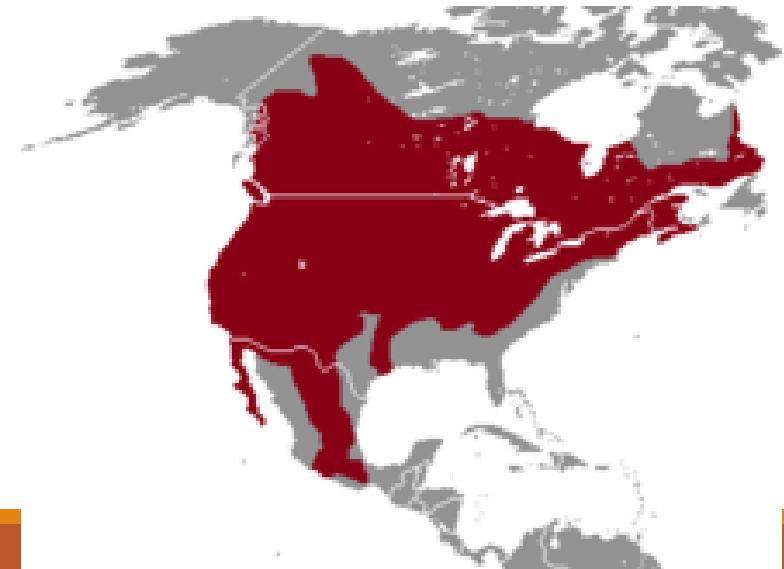


# *Peromyscus maniculatus*

## North American deermouse

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- So similar to white-footed deermouse that you have to use a blood test to tell the difference
- North America's most abundant, widespread mammal
- Known to carry Lyme disease



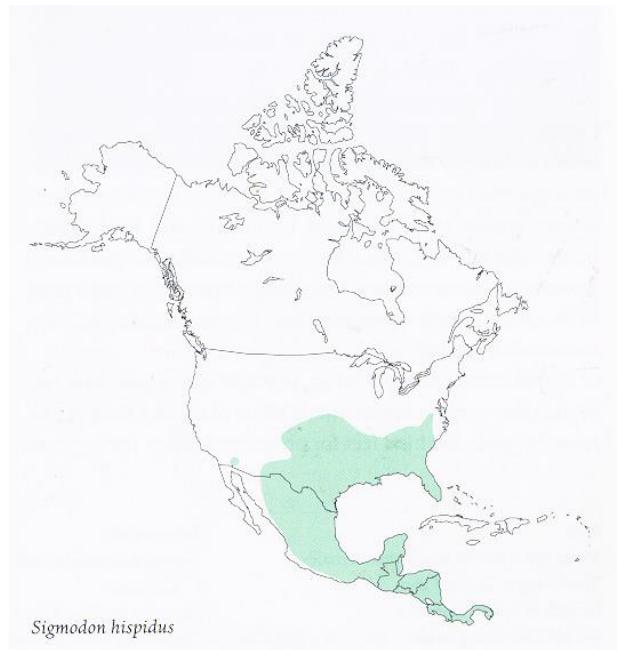
# *Reithrodontomys megalotis* western harvest mouse

- Nocturnal; herbivorous
- Weave nests of grass on ground or in shrubs
- At risk due to predation from feral/house cats



# *Sigmodon hispidus* hispid cotton rat

- Omnivorous
- Habitat generalists
- No distinct circadian pattern  
(always active)



*Sigmodon hispidus*

# *Synaptomys cooperi* southern bog lemming

- Prefer mixed forest habitats, but expand into grasslands in the absence of prairie/meadow voles
- Build runways like voles in and out of edge habitat



# *Zapus hudsonius* meadow jumping mouse

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- Prefer moist habitats with lots of water
- Saltatorial and can jump 6-8ft (72-96x its body length)
- True hibernation
- Despite similarities, not closely related to kangaroo rats



# Specimens in the Lab

- *Castor canadensis*
  - (skin, skull, scat)
- *Chaetodipus hispidus*
  - (skin)
- *Cynomys ludovicianus*
  - (skin, skull)
- *Erethizon dorsatum*
  - (skin, scat)
- *Geomys bursarius*
  - (skin)
- *Homo sapiens*
  - (skull)
- *Ictidomys tridecemlineatus*
  - (skin)
- *Lepus californicus*
  - (skin)
- *Marmota monax*
  - (skin)
- *Microtus ochrogaster*
  - (skin)
- *Microtus pennsylvanicus*
  - (skin)
- *Mus musculus*
  - (skin)
- *Myocastor coypus*
  - (skull)
- *Ondatra zibethicus*
  - (skin, skull, scat)
- *Onychomys leucogaster*
  - (skin)
- *Pan troglodytes*
  - (skull)
- *Peromyscus maniculatus*
  - (skin)
- *Poliocitellus franklinii*
  - (skin)
- *Rattus norvegicus*
  - (skin, skull, preserved)
- *Reithrodontomys megalotis*
  - (skin)
- *Sciurus niger*
  - (skin)
- *Sylvilagus floridanus*
  - (skin, skull, scat, tracks)
- *Tamias minimus*
  - (skin)
- *Tamia striatus*
  - (skin)