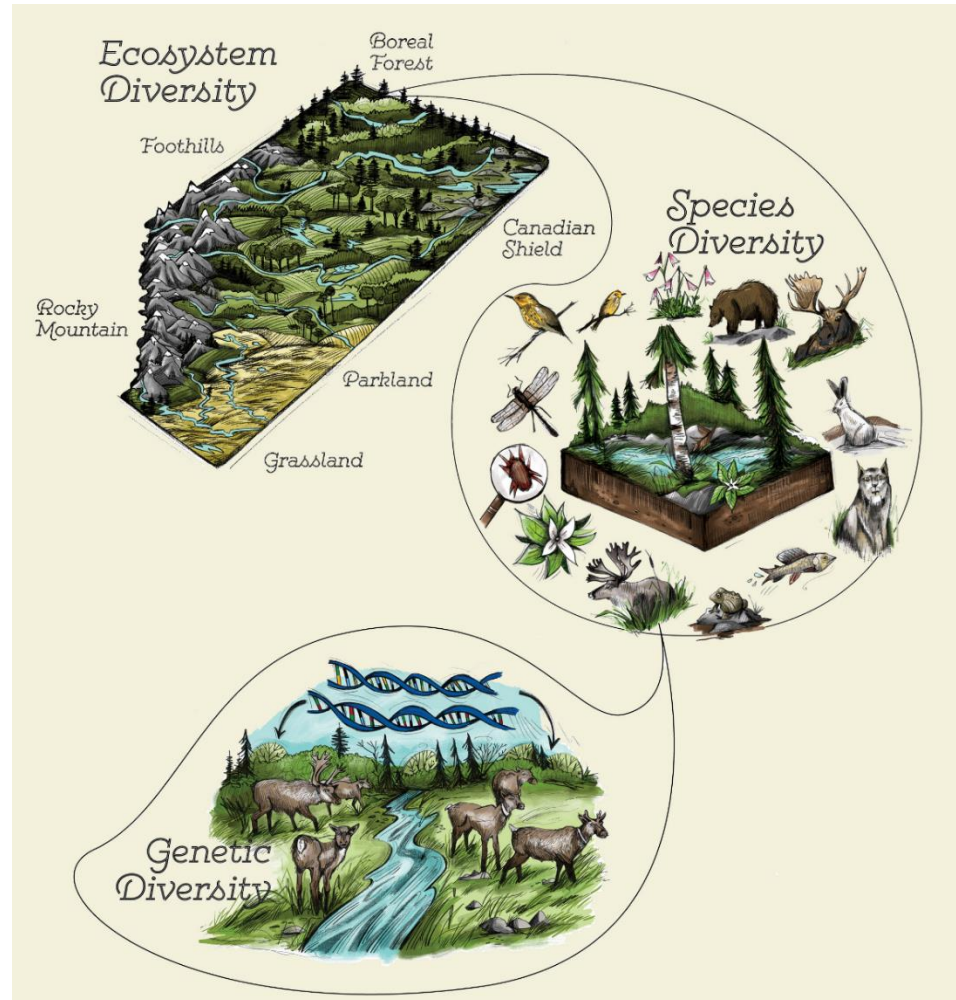


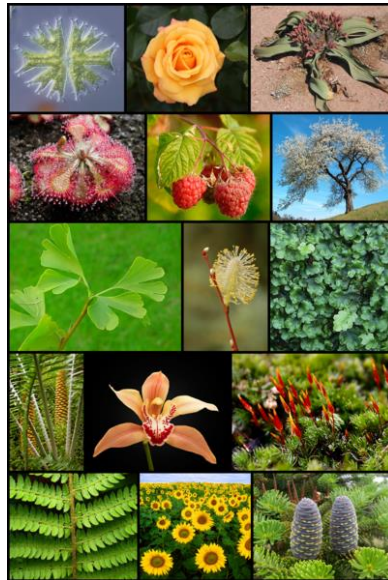
# Biodiversity Intro

## Unit 8



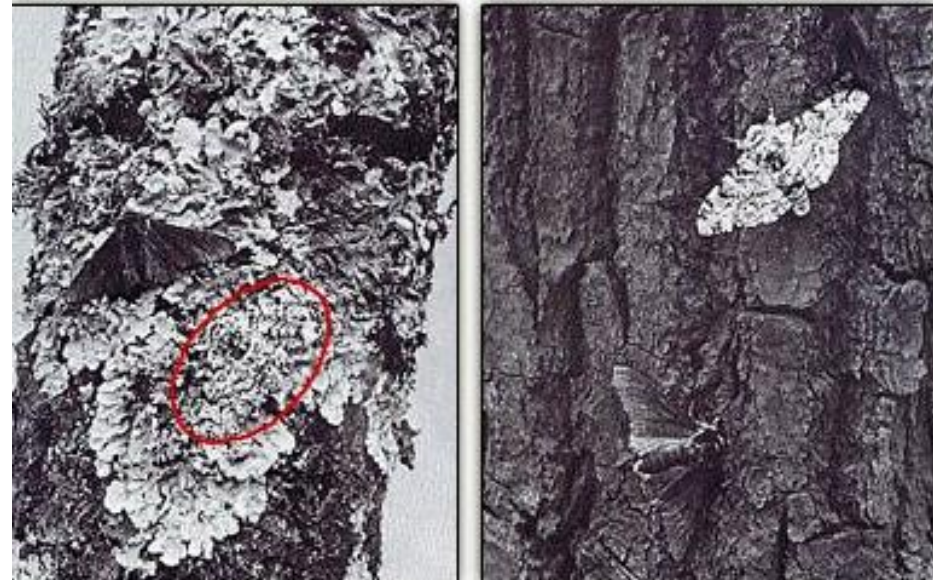
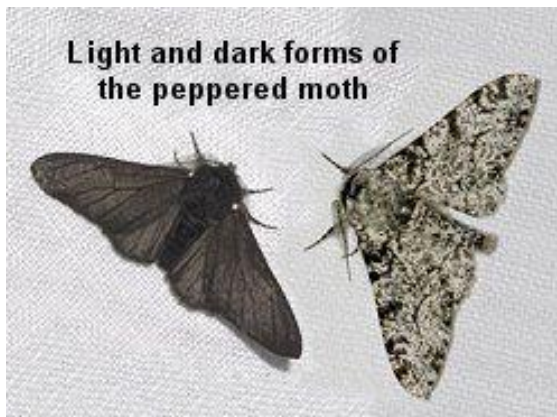
# Biodiversity

- **DEF:** *Variety of life* within a species, ecosystem, or biome
  - *Greater* biodiversity = *Greater resiliency* (able to survive *disturbances*)
- **Two types of biodiversity:**
  - *Genetic Diversity*
  - *Species Richness*
- **Disturbances can include:**
  - *Fire*
  - *Drought*
  - *Disease*
  - *Hurricane*
  - *Climate Changes*



# Genetic Diversity

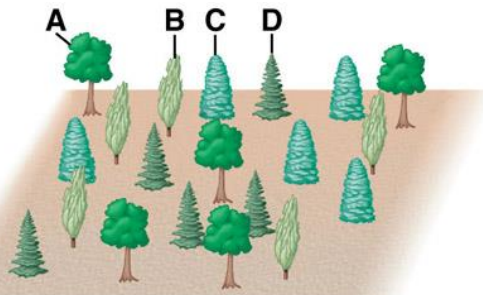
- DEF: *Variety* of **genes/traits** within a **single population** (of a single species)
  - **Reduces** chance of entire population dying after environmental **changes**
  - **Greater** variety of genes = **greater chance** that **some** members of a population will be **suited** to new environment
  - **Ex: Peppered Moths**





# Species Richness

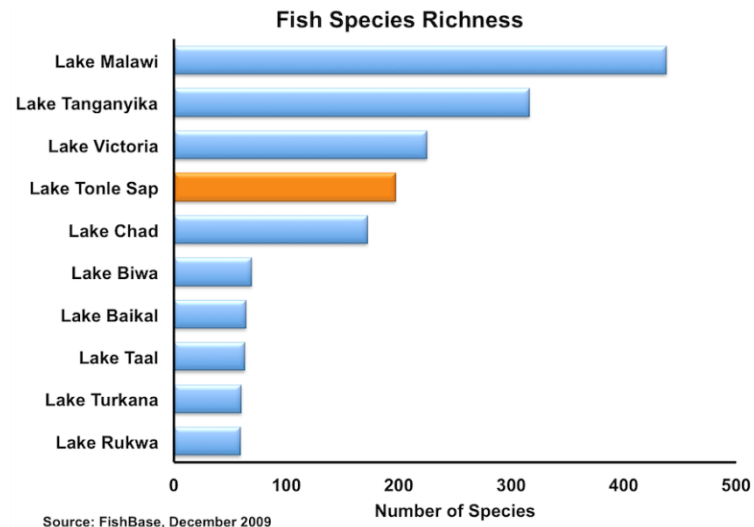
- DEF: **Number** (relative abundance) of **species** within a **single ecosystem**
  - **Stabilizes** the ecosystem as a whole
    - One species dies off, another is able to fill its role (**niche**) rather than entire ecosystem collapsing
  - **Ex: Dutch Elm Disease** (*invasive species*)



Community 1  
A: 25% B: 25% C: 25% D: 25%



Community 2  
A: 80% B: 5% C: 5% D: 10%



# Reintroduction of Native Species

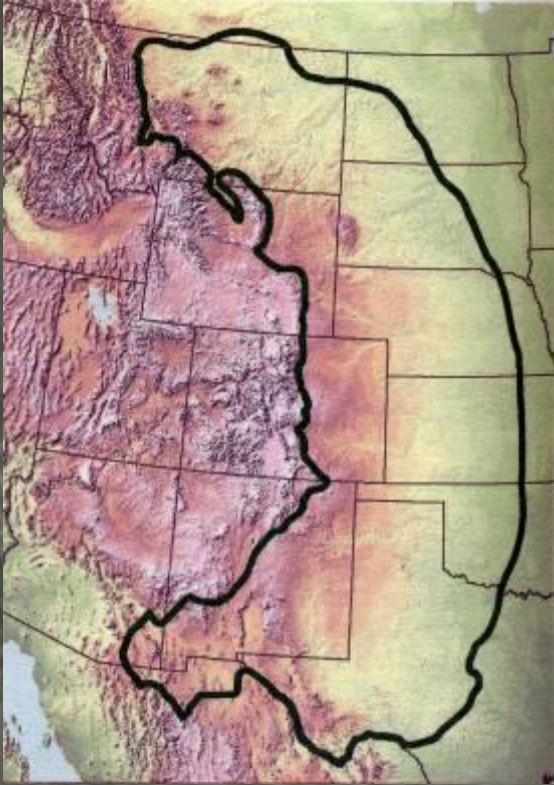
- **DEF:** *Deliberate* release of a species back into the wild, from *captivity* or *relocated* from other areas where the species survives



The ferret is in a large family of mammals whose members include the skunk, badger, wolverine, otter, and mink.







**Black-footed ferrets were once found in Canada, throughout the Great Plains of the United States, and northern Mexico. These locations are ideal for another mammal, the prairie dog.**

**Prairie dogs comprise over 90% of ferrets' food source. An adult ferret can consume over 100 prairie dogs in one year.**





**Black-footed ferrets use prairie dog burrows for their homes.**



**Prairie dog towns are the best ecosystems to support populations of black-footed ferrets. Prairie dog colonies are essential to ferrets in the wild.**



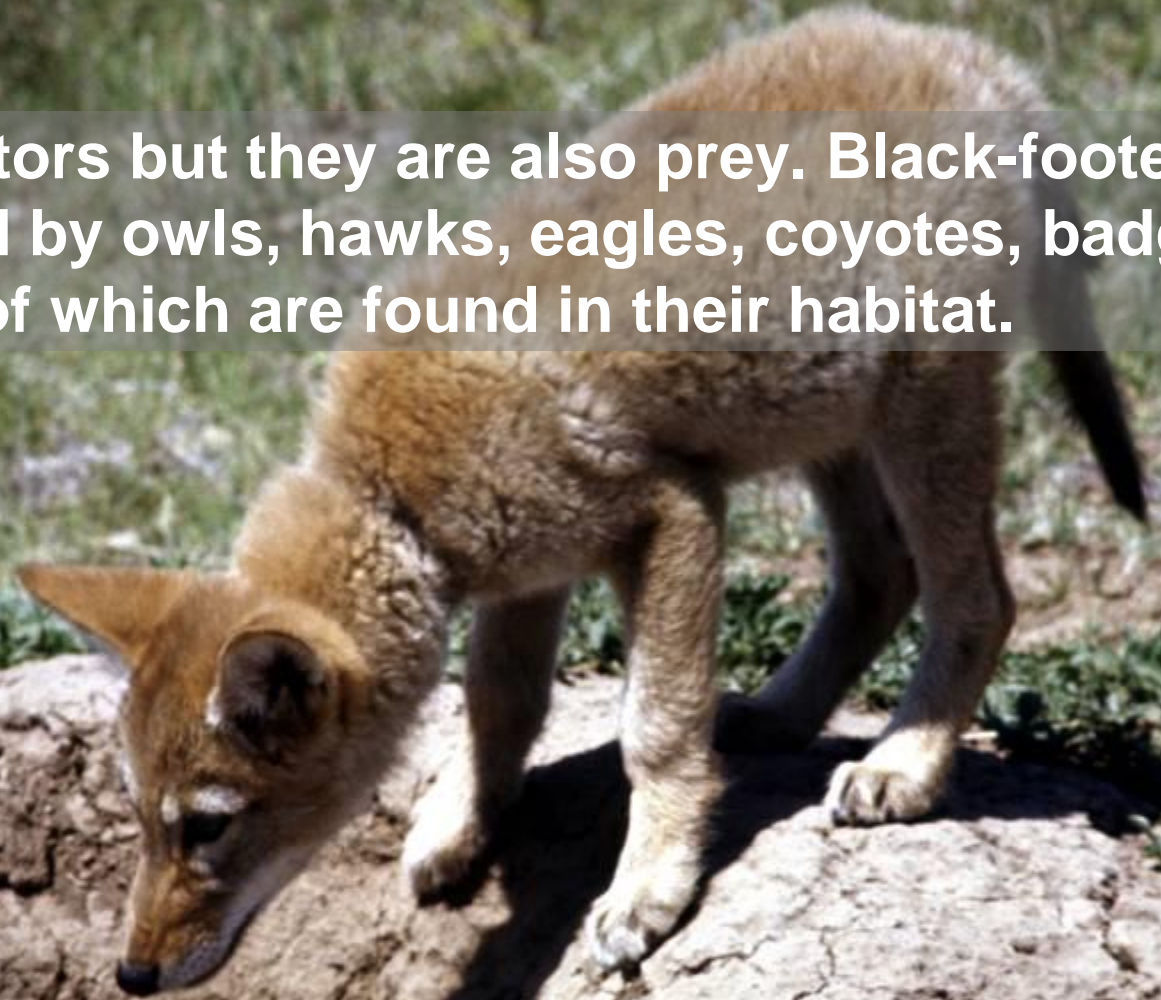


**Ferrets are long, slender, and flexible, which make them a perfect prairie dog predator. This body shape is ideal for moving through narrow tunnels. They have razor sharp teeth which they use to kill their prey.**





**Ferrets are predators but they are also prey. Black-footed ferrets are hunted by owls, hawks, eagles, coyotes, badgers, and bobcats; all of which are found in their habitat.**







**The conversion of prairie dog towns into land for agricultural use, prompted a decline in prairie dog populations. Diseases like sylvatic plague and canine distemper also killed ferrets.**





**In 1967 the black-footed ferret was listed as an endangered species. In 1974 the last known ferret population that was located in southwestern South Dakota vanished.**





**A park naturalist observed a ferret at Wind Cave National Park in July 1977. This was the third sighting at the park after ferret was listed endangered and it was the last documented park sighting.**





In 1981 a ranch dog killed a black-footed ferret near Meeteetse, Wyoming. This led to the discovery of approximately 130 ferrets in that area. These ferrets were studied but an outbreak of sylvatic plague and canine distemper decimated the population.







**Scientists captured the last 18 known ferrets from Meeteetse by the end of 1987. These animals were transported to a facility in Wyoming where a captive breeding program began.**

**In 1991 the first black-footed ferret reintroduction site selected was Shirley Basin in central Wyoming. Forty-two juvenile ferrets were released.**







**Wind Cave National Park is one of the few remaining plague-free locations with a large enough population of black-tailed prairie dogs to attempt a reintroduction effort.**



**Starting in 2000, national park resource management staff began working on a plan to reintroduce black-footed ferrets at Wind Cave National Park. This process included completing an environmental assessment study, prairie dog management plan, and applying for a special permit to reintroduce an endangered species.**



**On July 4, 2007  
the first 8 ferrets  
were reintroduced  
to Wind Cave  
National Park.  
Between July and  
November a total  
of 49 ferrets were  
released.**

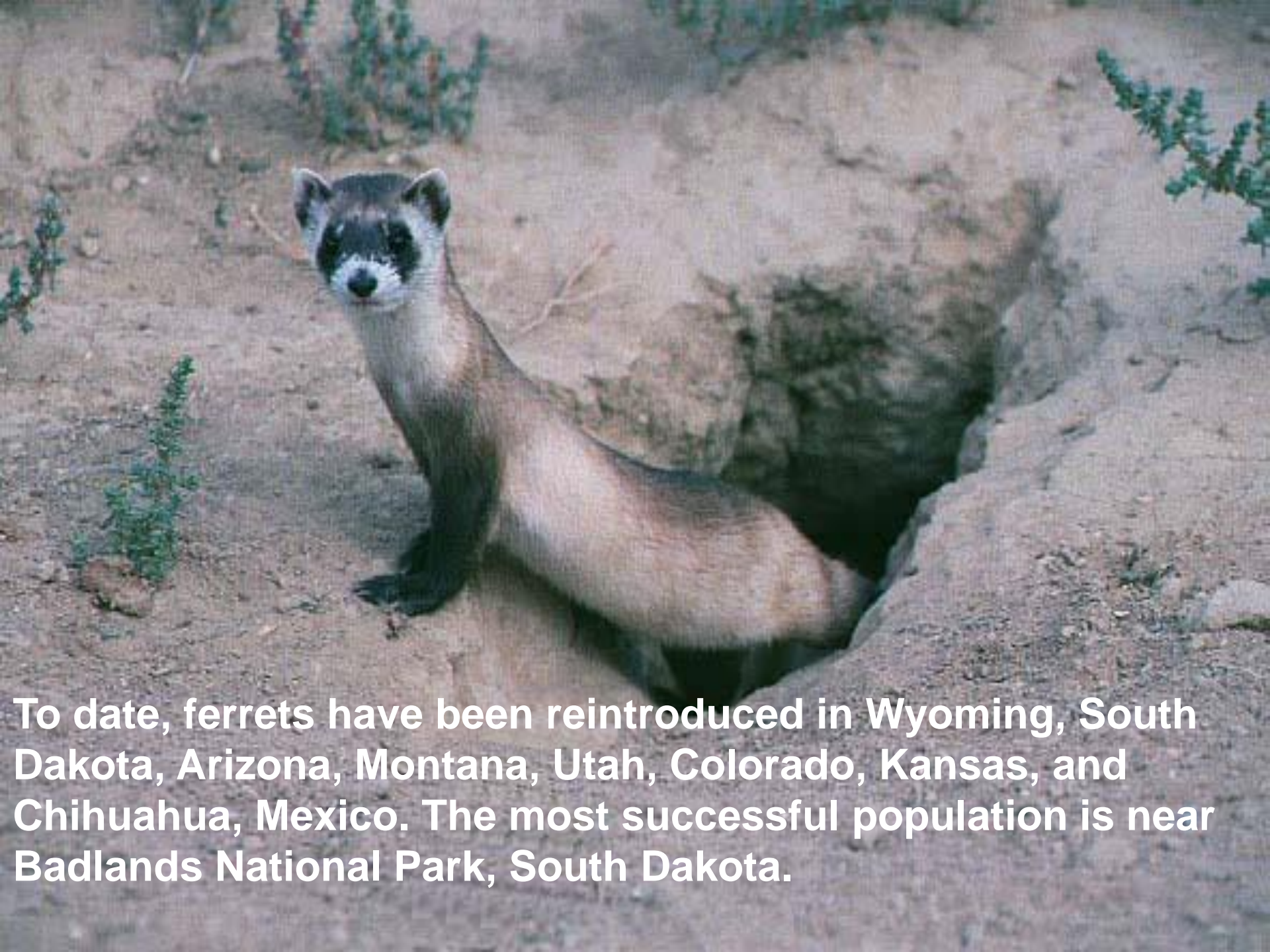




**The National Park Service and the U.S. Fish and Wildlife Service are working together on the reintroduction project at Wind Cave National Park. Current plans are to reintroduce ferrets for the next 3-5 years.**







To date, ferrets have been reintroduced in Wyoming, South Dakota, Arizona, Montana, Utah, Colorado, Kansas, and Chihuahua, Mexico. The most successful population is near Badlands National Park, South Dakota.



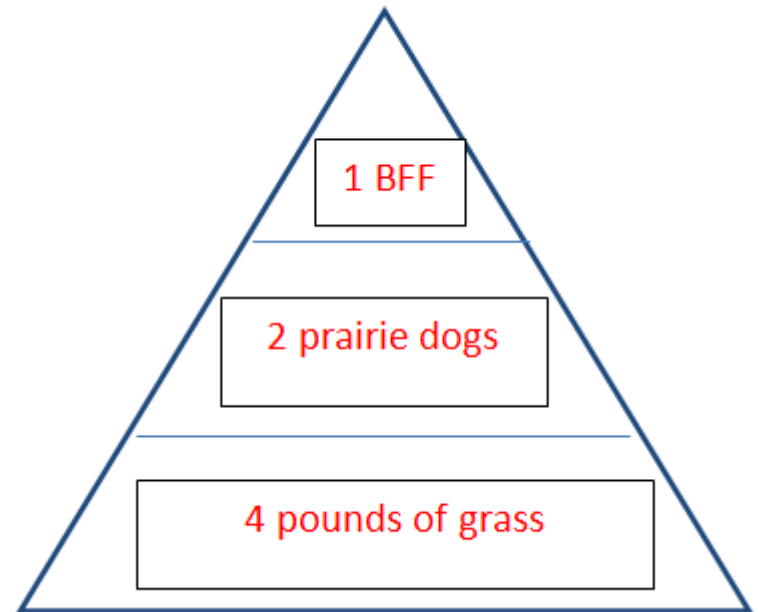


**The black-footed ferret recovery goal is to have at least 10 separate, self-sustaining, black-footed ferret populations.**



# Food Chain or Food Web?

- What is the biomass (food) available for the black footed ferret?
- Is this a food web or a food chain? (Prairie dogs eat grass)



- We're looking at how ***genetic diversity*** impacts the black-footed ferret.
- **QUESTION:** What is the genetic diversity required in the ecosystem for the black-footed ferret?



- You will be given some ***genetic*** information about a population of black-footed ferrets.
- Make a “***bar graph***” on your desk with your colored squares—***AND THEN*** copy it to the back of your lab sheet.
- If you have ***three or more*** of the same color square/characteristic, it is likely that this trait will be passed to offspring in your black-footed ferret population.

- **Genetic Characteristics Color Scheme:**
  - **Black:** precise vision
  - **Orange:** accurate smell
  - **Red:** large litter size (*healthy reproduction*)
  - **Pink:** strong claws/legs (forearm)
  - **White:** immunity to canine distemper
  - **Purple:** accurate hearing
  - **Green:** agility
  - **Yellow:** camouflage
  - **Dark Blue (B):** strong jaw and teeth
  - **Light Blue (b):** immunity to sylvatic plague



- You have some ***environmental situations*** on your paper. You need to decide whether your ferret population has a good chance or a poor chance of survival—based on its genetic characteristics (*colored squares*).
- What traits are strong in your population? How does that help you survive?
- Is this an example of biodiversity or genetic diversity?

# Black Footed Ferrets

- Play Video →
- Biodiversity Lab

