

Conservation Biology



Riley and Amira

A little about us! -Riley

- Senior at the U of U
- Majoring in Biology
- Looking to help with conservation efforts in the Galapagos



A little about us! -Amira

- Senior at the University of Utah
- Majoring in Biology with an emphasis in Pre-Dental
- Aiming for internships at the zoo or in labs



What is biodiversity?



What is biodiversity?

- Biodiversity is the variety of life in a given area
- Higher biodiversity (more different kinds of life) generally means that an ecosystem is healthier!



Biodiversity

3 levels

- Species Diversity
 - All species
- Genetic Diversity
 - Geographical Separation
- Ecosystem Diversity
 - Biological communities



Why do we care?

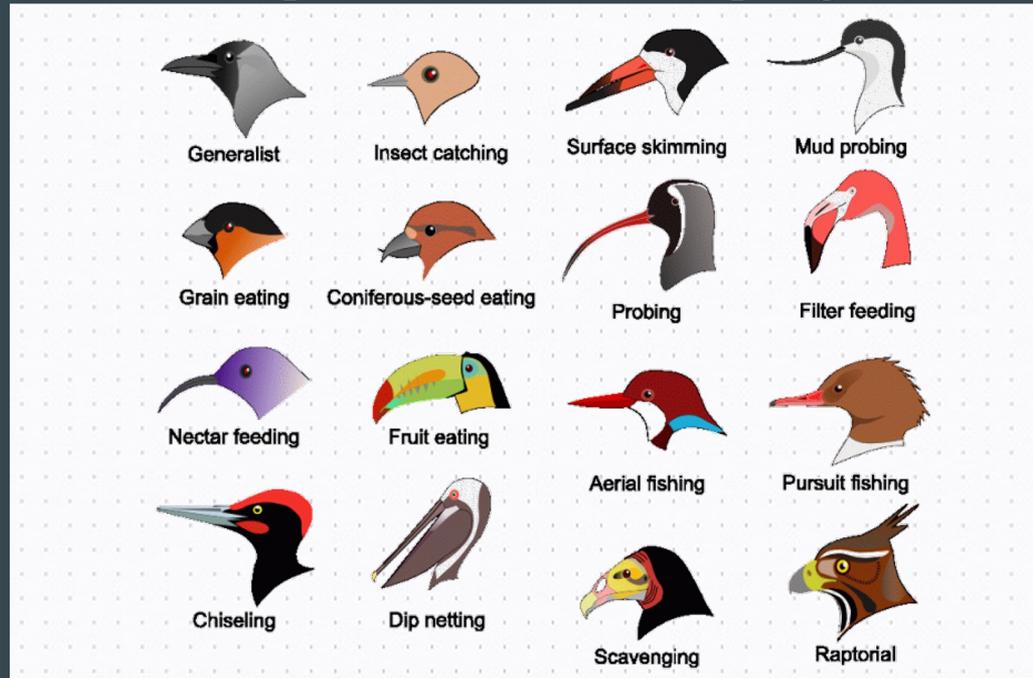
Think about a mown lawn in a park. What life can it sustain?

Now think about a forest. What life can it sustain?



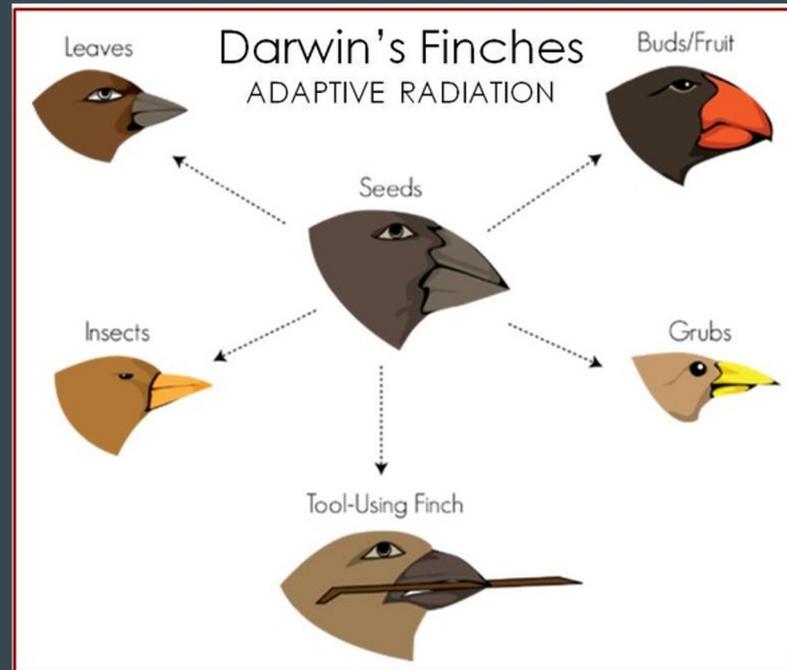
Some Vocab!

Adaptation: A change an organism goes through to become a better fit for its environment, and that can be passed on to their offspring.

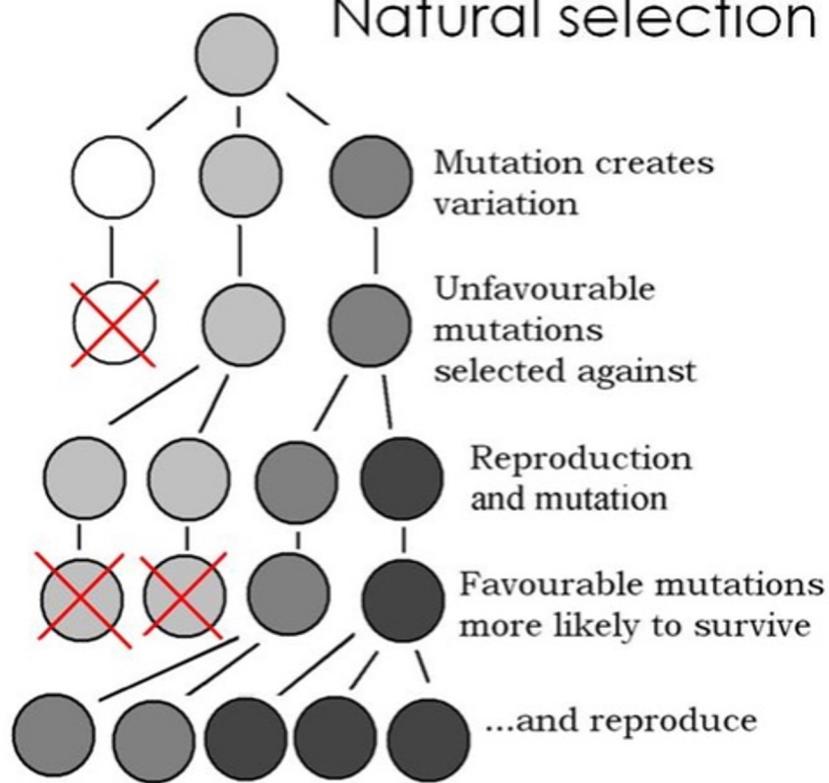


Vocab cont.

Natural Selection: Organisms that are better adapted to their environment tend to survive better and have more offspring.

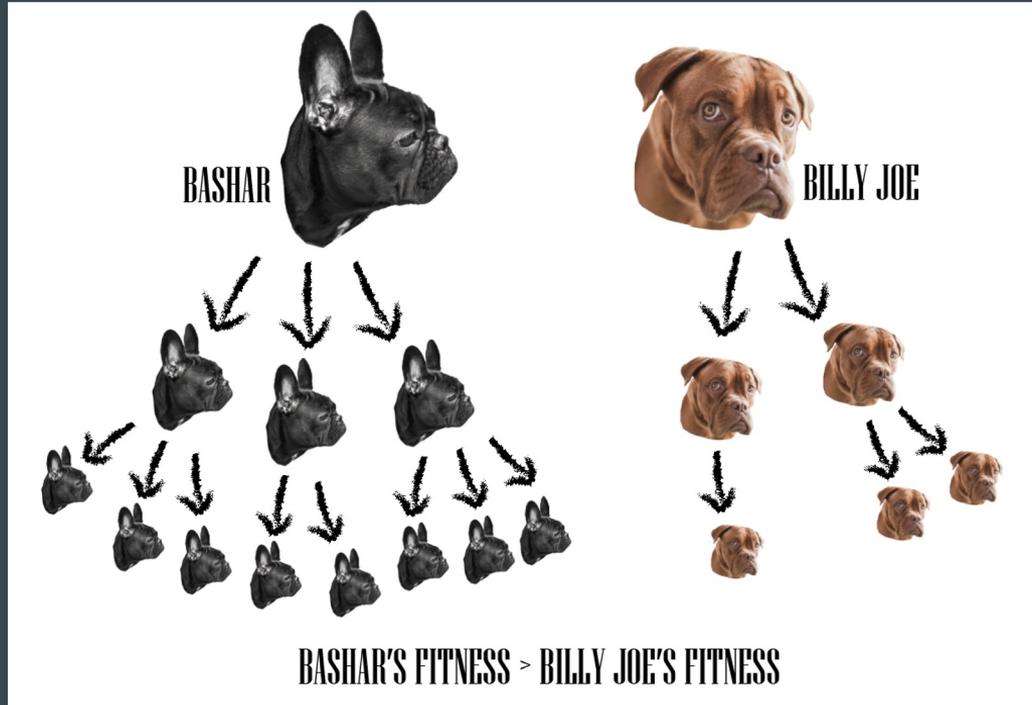


Natural selection



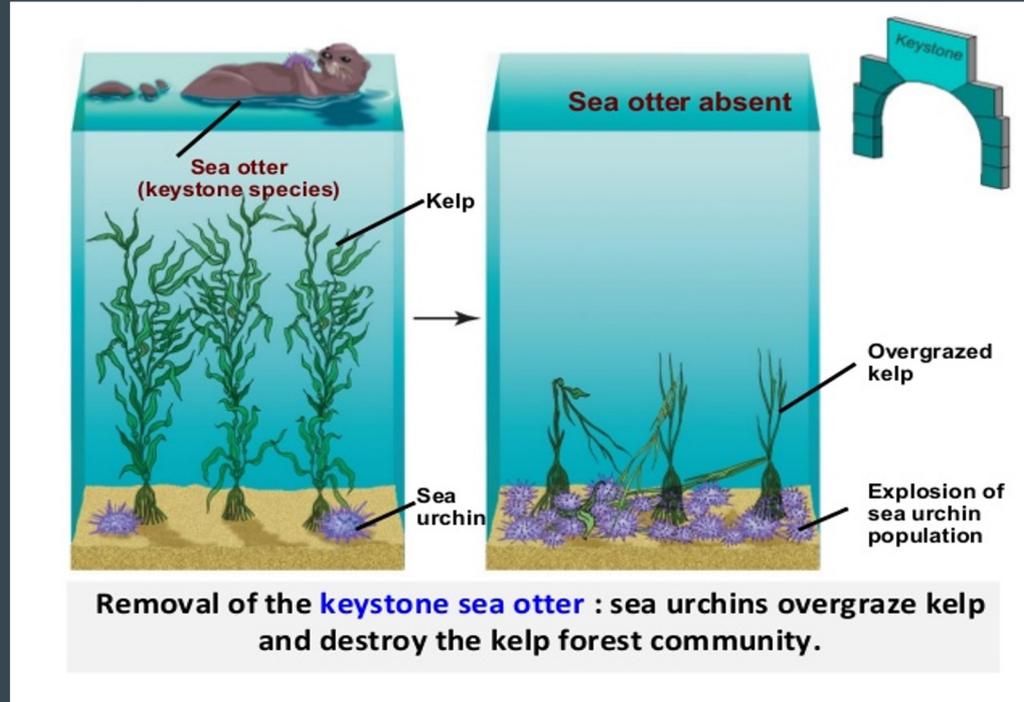
Vocab cont.

Fitness: An organism's ability to survive and reproduce in a given area



Vocab cont.

Keystone Species- the central organisms of a given ecosystem. Most other species in the ecosystem depend on it in some way. (ex. Sea otter)

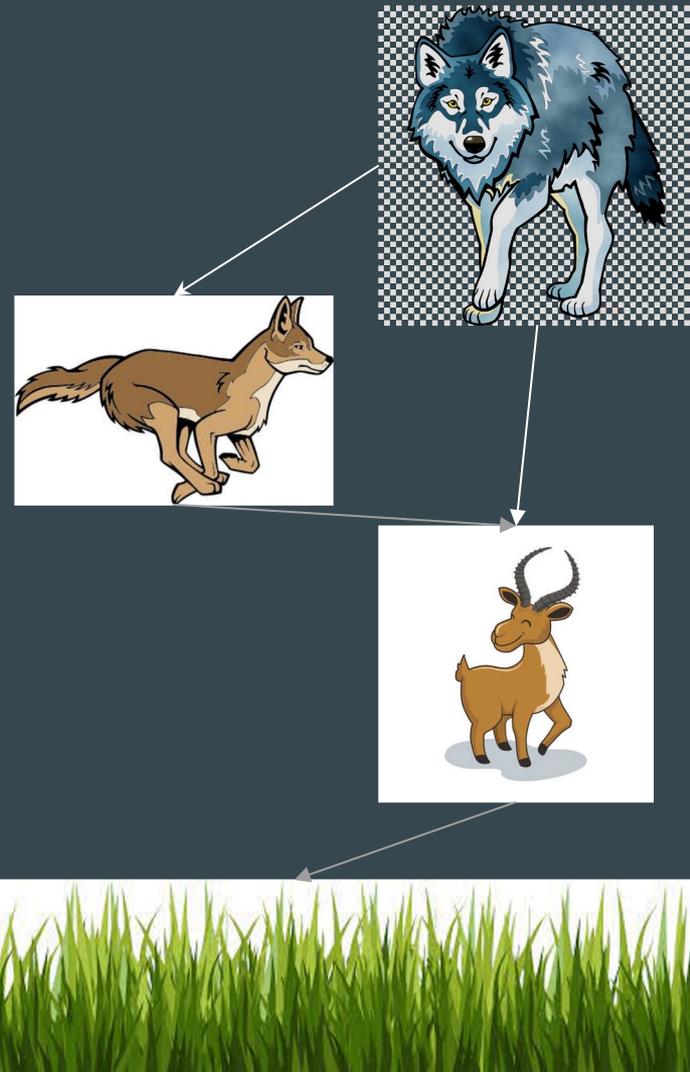


Vocab cont.

Predator- An animal that consumes another for energy

Simulator Game

Prey- An animal that is eaten for food by another species





Jelly Bean Time!

Materials:

- One cup per student
- Enough jelly beans for about 10 per student
- Plastic ice cream tub



Jelly Bean Time!

Instructions:

1. Separate the jelly beans into black and coloured ones.
2. Calculate the percentage of black jelly beans
3. Pick out only two of your favourites from these five
4. Return the remaining three jelly beans to the ice cream tub with the rest of the jelly beans.
5. Repeat this three times.

Endangered Species Act

1973

3 main parts:

1. Allows for the listing of species as threatened or endangered

Endangered Species Act

1973

2. Designing conservation efforts to aid in the recovery of the species and protecting them during their recovery

Endangered Species Act

1973

3. Restoring healthy populations, with the ultimate goal being removal from the threatened/endangered list

Species Classifications:

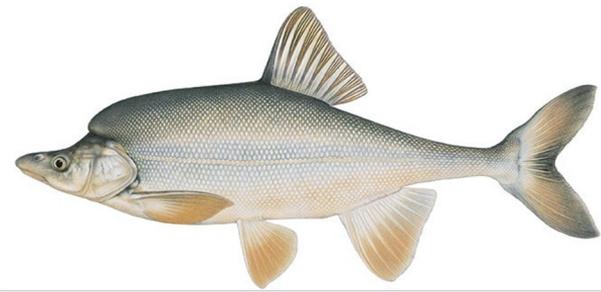
Rare- uncommon either naturally or due to human causes, no action



Graham's Beardtongue

- Restricted to soils with chalky calcium and soft/fine mud of the Green River Formation
- Soil restriction it can only grow in Vernal, UT, Price, UT, Rangely, CO

Species Classification:



Endangered- A species that is threatened by extinction within the foreseeable future

Humpback Chub

- Species in Utah that has a decreasing population due to aquifers and predation competition

Species Classification:

Threatened- A species that is likely to become endangered in the near future

Sage-Grouse

- Found in northeastern California, ranging from the Oregon border along the east side of the Cascade Range and Sierra Nevada to northern Inyo County
- Fire, invasive species, predation, conifer encroachment, recreation, energy development and the removal of sagebrush



Species Classification:

Petitioned- organization requests that a species be placed under threatened or endangered

American Pikas

- Found at high altitudes in talus
- Studies have suggested that global warming



Species Classification:

Listed- If species is reviewed and found to have positive findings then the species will be listed and considered a candidate

Species listed under the Endangered Species Act (as of August 2016) [hide]								
Type	United States			Foreign			Total listings (U.S. and foreign)	U.S. listings with active recovery plans
	Endangered	Threatened	Total listings	Endangered	Threatened	Total listings		
Animal	494	201	695	586	84	670	1,365	481
Plant	732	166	898	1	2	3	901	676
Total	1,226	367	1,593	587	86	673	2,266	1,157

Source: U.S. Fish and Wildlife Service, "Summary of Listed Species, Listed Populations and Recovery Plans," accessed August 31, 2016 [↗](#)

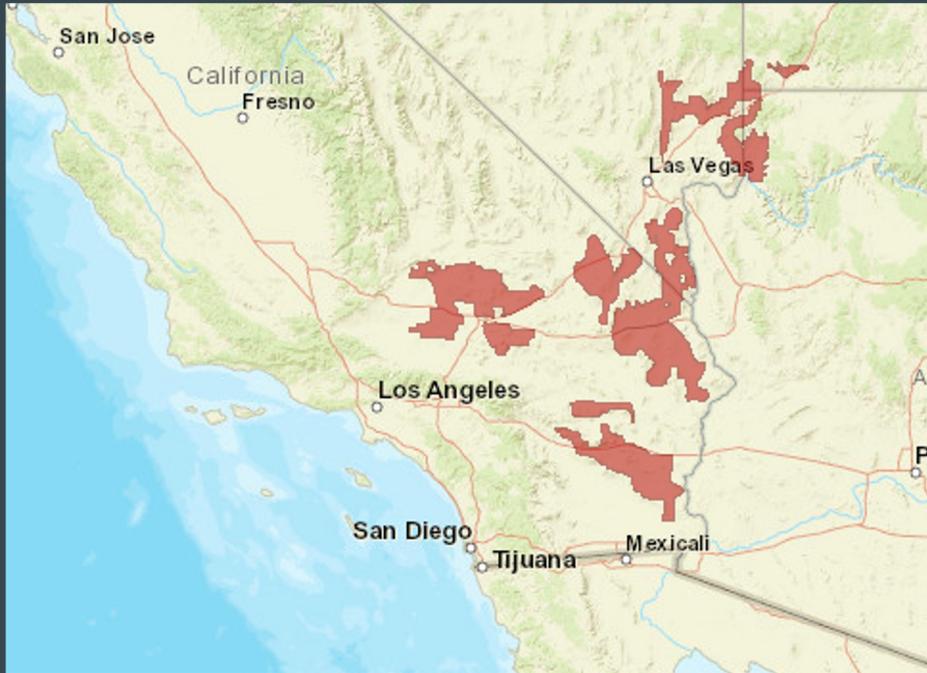
Why is conservation important?

Let's look close to home:

- Desert Tortoise
 - *Gopherus agassizii*
- Species has lived in the same region for hundreds of years
- Classification: Threatened



Habitat of the Desert Tortoise



Map indicates critical habitat for the species



Map indicates current range for the species

Threats of the Desert Tortoise

- The vast majority of threats to the desert tortoise or its habitat are associated with human land uses
- Including:
 - urbanization
 - habitat invasion by non-native invasive plant species
 - wildfire

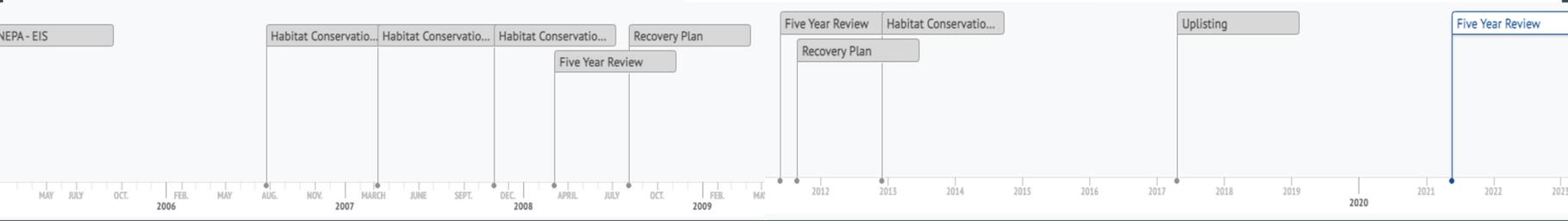
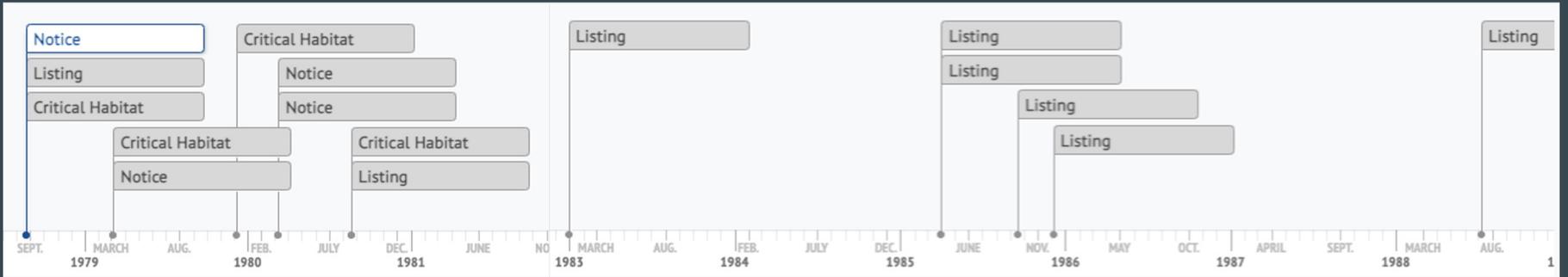


Fitness of the Desert Tortoise

- Requires 13 to 20 years to reach sexual maturity
- Low reproductive rates during a long period of reproductive potential
- Individuals experience relatively high mortality early in life



Conservation Map



What do we know that can help?

- High survivorship of adult desert tortoises is critical to the species' persistence
- Maintaining the genetic variability of the species is vital to allow tortoises to adapt to changes in the environment over time.
- Long-term preservation of habitats is essential for the survival of the species.



What can you do to help?

Group up with people that have the same endangered species and talk about some of the:

- Threats
- Regions
- Fitness
- Importance of your animal
- Then come up with ways you think scientists are conserving these species



Questions?