Species Conservation Status Findings & Disease Reduction Program Next Steps

A Study for The National Parks Service
(Codecademy Project)

Questions We'll Cover:

- **Part 1:** Are certain groups of species more likely to be endangered?
- **Part 2:** How many sheep will we need to test to determine whether our foot and mouth reduction program is working?

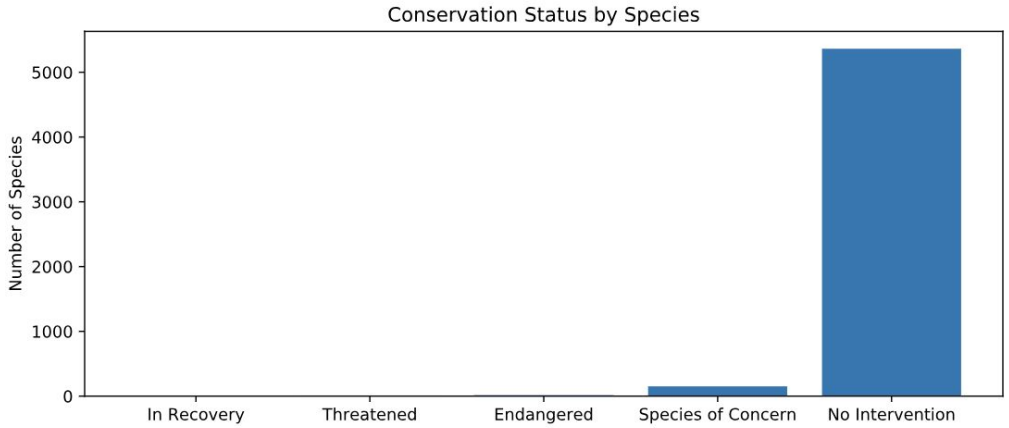
Part 1:

Are certain types of species more likely to be endangered?

Summary of Species Data:

- **Total Species Count:** 5,541
- **Species Categories:** Mammal, Bird, Reptile, Amphibian, Fish, Vascular Plant, Nonvascular Plant
- **Conservation Statuses:** Species of Concern, Endangered, Threatened, In Recovery, No Intervention

Conservation Statuses: Graph and Table



Conservation Status	# of Species Per Status Type
Endangered	15
In Recovery	4
No Intervention	5,363
Species of Concern	151
Threatened	10

Number of Protected vs. Not Protected Species by Category

First, let's break each species down into protected vs not-protected status. Not-protected means their status was "No Intervention" and protected means otherwise.

Category	Not Protected	Protected	% Protected
Amphibian	72	7	0.09
Bird	413	75	0.15
Fish	115	11	0.09
Mammal	146	30	0.17
Nonvascular Plant	328	5	0.02
Reptile	73	5	0.06
Vascular Plant	4216	46	0.01

Significance Test & Results:

Next, we'll do a Chi Squared significance test to see if differences across groups are significant or due to chance:

- **Mammals vs. birds** (our data implies that mammals are more likely to be endangered)
  - **P-value:** 0.688
    - **Result:** NOT significant (result of chance)
- **Reptiles vs. mammals** (our data implies that mammals are more likely to be endangered)
  - **P-value:** 0.038
    - **Result:** YES! Significant (not due to chance)

Findings & Recommendations:

- **Findings**: Certain types of species *are* more likely to be endangered than others.
- **Recommendations**: Now that we know this, our recommendation is to focus conservation efforts on at-risk categories as a whole versus focusing specifically on known endangered species.

Part 2:

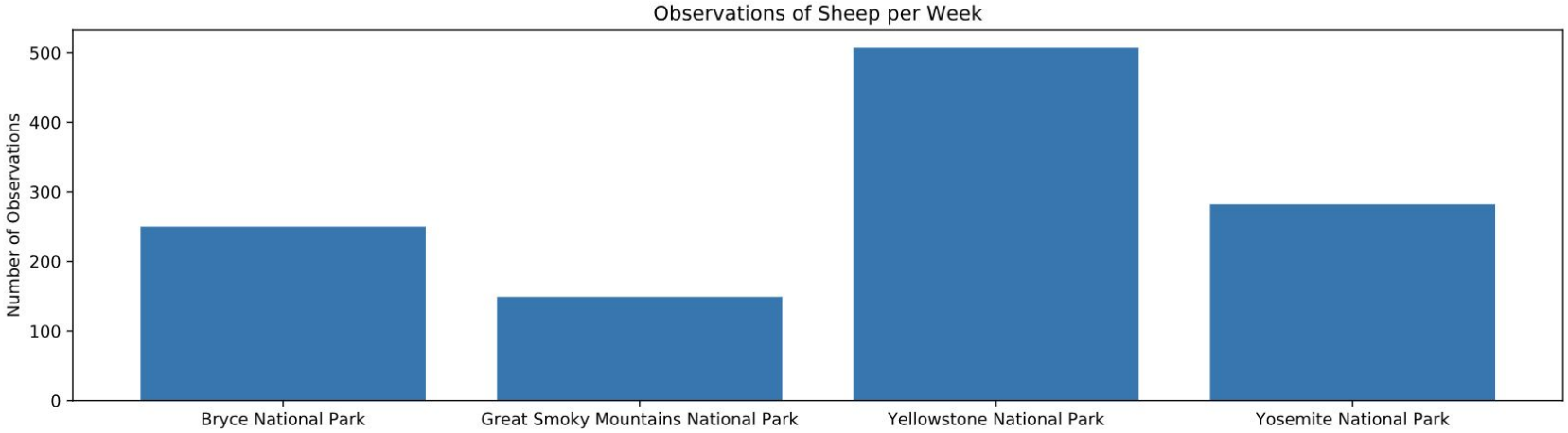
How many sheep will we need to test to determine whether our foot and mouth reduction program is working?

Existing Information to Determine Sample Size:

In order to evaluate whether the foot and mouth disease rates in sheep are declining across parks because of our program, we'll use the following information to determine how large of a sheep sample we need:

- We want to detect reductions of at least **5%**
- We know that **15%** of sheep at Bryce National Park have foot and mouth disease — we will use this as a baseline
- We want to be **90%** sure that the >5% drop in observed cases of foot and mouth disease in sheep across parks is significant and not due to chance
- We also know the number of sheep sighted in 4 national parks across 7 days (see next slide)

Sheep Sightings Across Parks



Sample Size & Time Investment Required to Proceed with Study

This means we will need a sample size of 890 sheep per park. When we divide that by the number of sightings per park, we get:

- **Yellowstone National Park:** 1.75 weeks
- **Bryce National Park:** 3.56 weeks
- **Great Smoky Mountains National Park:** 5.97 weeks
- **Yosemite National Park:** 3.16 weeks

In total, it will take just under 6 weeks to conclude this data collection across all 4 national parks.

Thank You!