Data Analysis Project

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Biodiversity for the National Parks

Species Analysis - Investigating Endangered Species

Object:

Data analysis on the conservation statuses of the species in the National Parks Services and to investigate if there are any patterns or themes to the types of species that become endangered.

Are certain types of species more likely to be endangered?

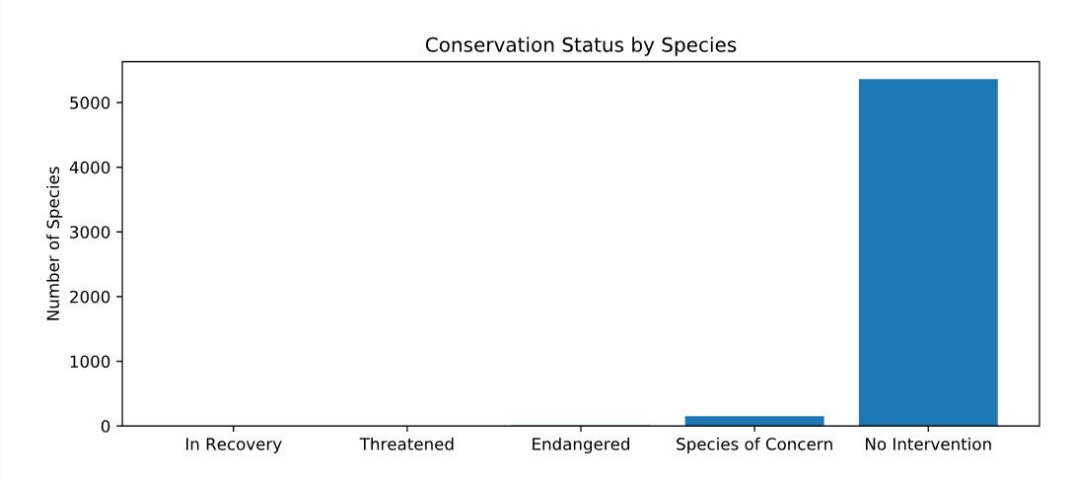
Species overview

- 5541 different species
- 7 different categories:
  - Mammal
  - Bird
  - Reptile
  - Amphibian
  - Fish
  - Vascular Plant
  - Nonvascular Plant
- 180 species need conservation

Photos are taken from www.nps.gov

Conservation Status by Species

- In Recovery - 4
- Threatened - 10
- Endangered - 15
- Species of Concern - 151
- No Intervention - 5363



Hypothesis Testing

Null hypothesis:

The difference that some species are more likely to be endangered is due to chance.

For hypothesis testing we answered the questions :

- Is the difference between Mammal and Birds significant?
- Is the difference between Reptile and Mammal significant?

Chi-Squared Test for Significance

Is the difference between Mammal and Birds significant?

- P-value = ~0.688
- P-value $>$ 0.05
- The difference between the percentages of protected birds and mammals **is not significant** and is a result of chance.

Is the difference between Reptile and Mammal significant?

- P-value = ~0.038
- P-value $<$ 0.05
- The difference between the percentages of protected reptile and mammals **is significant.**

Conclusion

Certain types of species are more likely to be endangered than others.

Observation of sheep locations

Tracking the movements of various species of sheep across different national parks

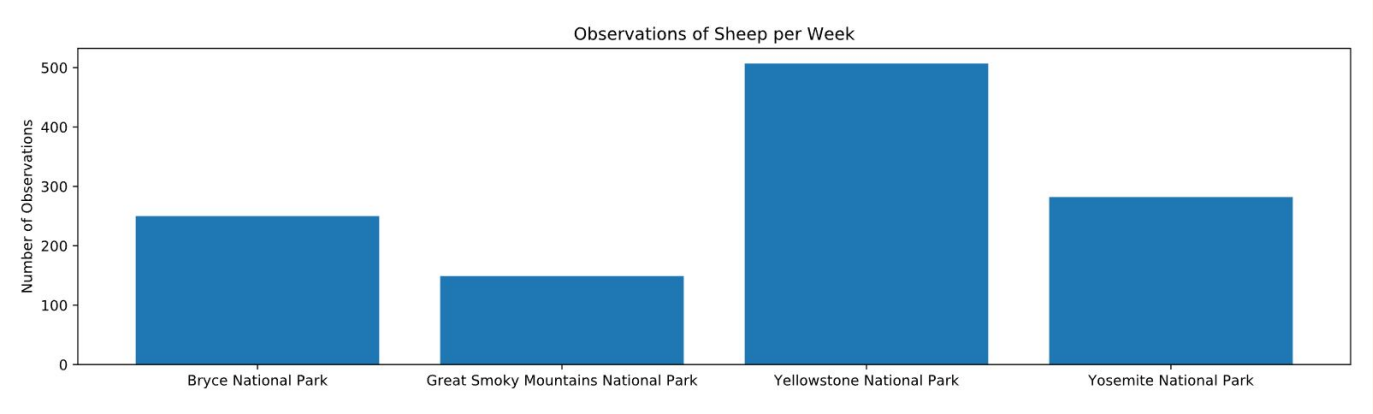
Sheeps observation

- Observed over one week
- In four national parks:
  - Bryce National Park
  - Great Smoky Mountains National Park
  - Yellowstone National Park
  - Yosemite National Park
- Observed three different species of sheep

Scientific name	Common names	Nr of Observations
Ovis canadensis	Bighorn Sheep, Bighorn Sheep	493
Ovis aries	Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral)	542
Ovis canadensis sierrae	Sierra Nevada Bighorn Sheep	153

Total number of sheep observed in each park over a week

- Bryce National Park - 250
- Great Smoky Mountains National Park - 149
- Yellowstone National Park - 507
- Yosemite National Park - 282



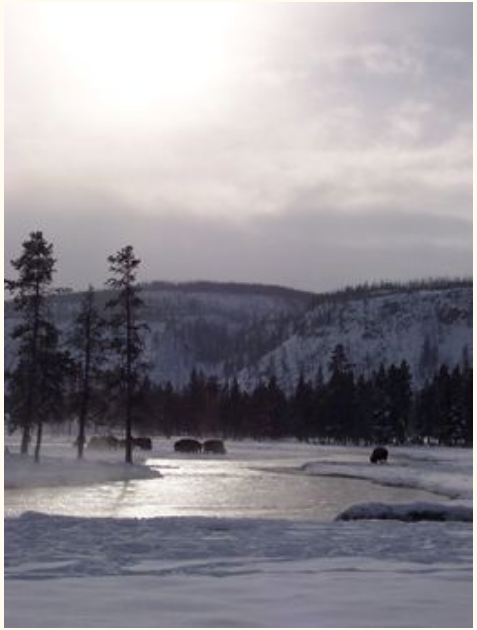
Foot and Mouth Disease Reduction Effort - Sample Size Determination

Object:

To calculate the number of sheep that are needed to observe from each park

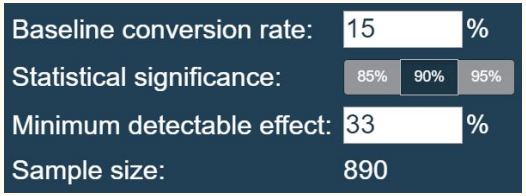
Foot and Mouth Disease in Yellowstone National Park

- It is a program to reduce the rate of foot and mouth disease at that park
- Reductions of the disease at least 5 percentage points
- Information that the scientists currently have is that last year it was recorded that 15% of sheep at Bryce National Park have foot and mouth disease.



Calculation of sample size

- Baseline of 15% occurrence of foot and mouth disease in sheep at Bryce National Park
- Scientists want to be sure that at least 5% drop in observed cases of foot and mouth disease in the sheep at Yellowstone was significant (level of significance 90%)



Conclusion

- At least **870 sheeps have to be observed**
- to observe that many sheeps this would take approximately:
  - **two weeks in Yellowstone National Park**
  - three and half weeks in Bryce National Park

Thank you