Biodiversity for the National Parks

A presentation by Raihana Quayyum

Objective

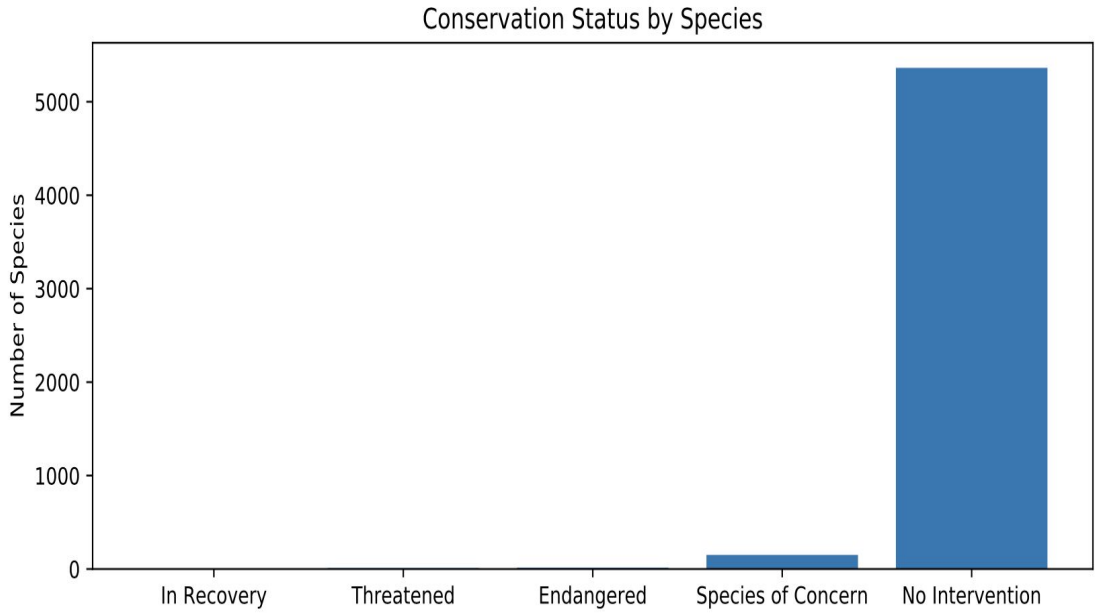
This project was undertaken to analyze the conservation statuses of endangered species in several different National parks across the country, as well as evaluating the effectiveness of a Foot and Mouth disease reduction program.

Primary Findings

- A total of 5542 wildlife species were categorized into 7 distinct groups comprising:
  - Mammal
  - Bird
  - Reptile
  - Amphibian
  - Fish
  - Vascular Plant
  - Nonvascular Plant

- These species were further classified into 5 unique categories depending on their conservation statuses:
  - Endangered: 15
  - In recovery: 4
  - No intervention: 5363
  - Species of concern: 151
  - Threatened: 10

Primary Findings (contd.)



- Data extracted on the species exhibit that an alarmingly large number of them did not receive any form of intervention in order to conserve their status, and were at risk of facing extinction.

Extinction Significance

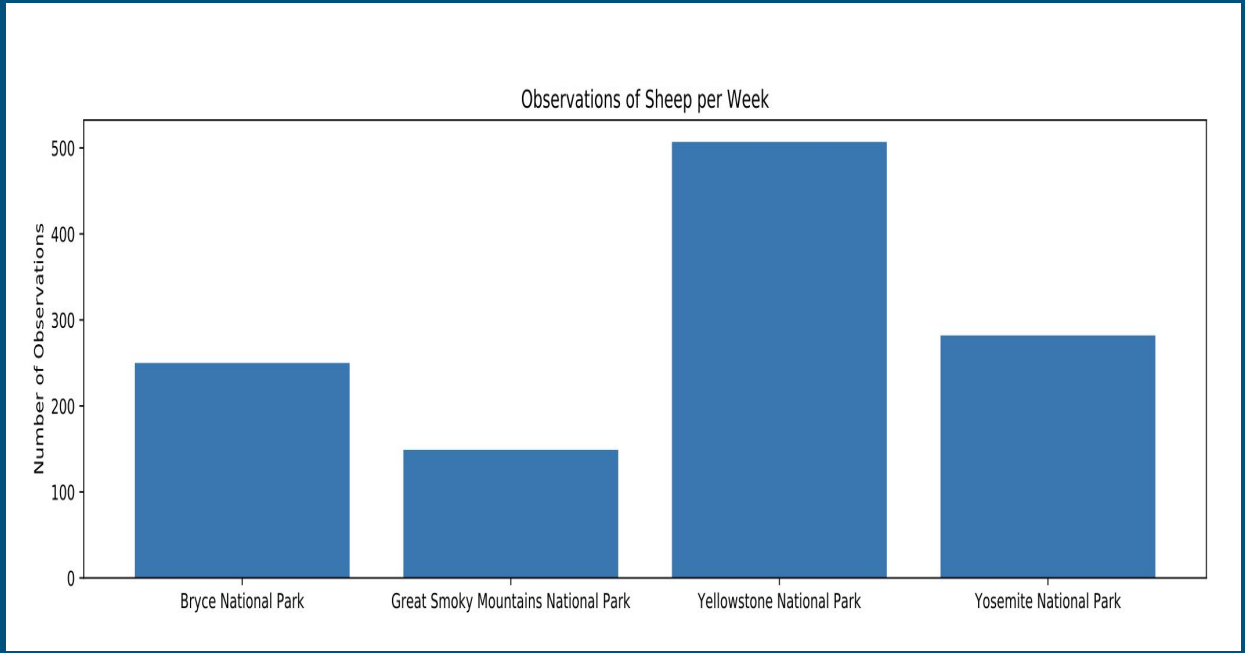
	category	not_protected	protected	percent_protected
0	Amphibian	72	7	0.088608
1	Bird	413	75	0.153689
2	Fish	115	11	0.087302
3	Mammal	146	30	0.170455
4	Nonvascular Plant	328	5	0.015015
5	Reptile	73	5	0.064103
6	Vascular Plant	4216	46	0.010793

- Chi-squared hypothesis tests were run in order to determine if certain categories of species were more likely to be endangered than others based on the percentage that were protected.
- The p-value for each of the chi-squared tests were calculated to be as follows:
  - Mammals vs Birds = 0.0688
  - Mammals vs Reptiles = 0.0383

Results & Conclusion

- The difference between the percentages of protected birds vs mammals were not significant due to their p-value being larger than 0.05.
    - This states that the differences in percentage of protected species were merely due to chance.
- However, when the test was run using data from mammals vs reptiles, there was a significant difference noted, with the p-value being less than 0.05.
- Therefore, it can be stated that some specific categories of species are indeed more likely to be endangered when compared to others, and measures need to be taken in order to preserve the statuses of the endangered groups.

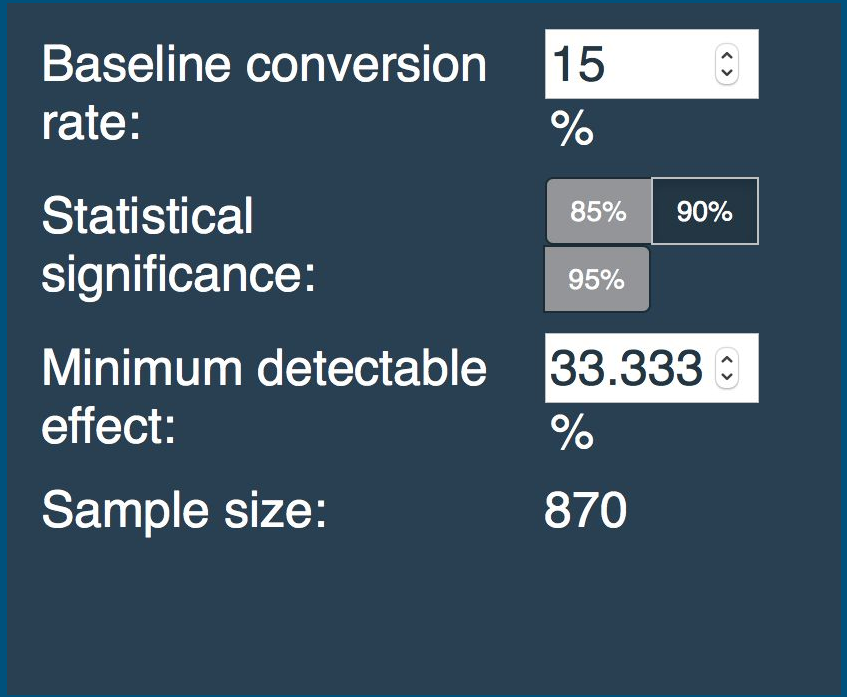
Foot and Mouth Disease Program



- The bar chart displays the number of sheeps sighted at 4 separate National Parks by scientists over the course of a week for researching whether a program aimed at reducing foot and mouth disease in species had been successful or not by detecting reductions of at least 5%.

Sample Size Determination

- Data from the preceding year had recorded that 15% of sheep at the Bryce National Park had Foot and Mouth disease (F&M).
- In order to determine if the percentage of F&M disease is significant, a minimum number of sheep observations need to be made.
- Using a sample size calculator, the sample size was determined to be 870.
    - This states that scientists would have to observe at least 870 sheeps in order to make sure that the 5% drop in cases of F&M disease is significant.



Results

Using the data from the bar chart on sheep observations and the obtained sample size, it was determined that the scientists would need approximately:

- 1 week of observations at the Yellowstone National Park; OR
- 3 weeks of observations at the Bryce National Park

In order to observe a sample size of 870 sheeps.