Biodiversity in the National Parks Service

Conservation status of several categories.

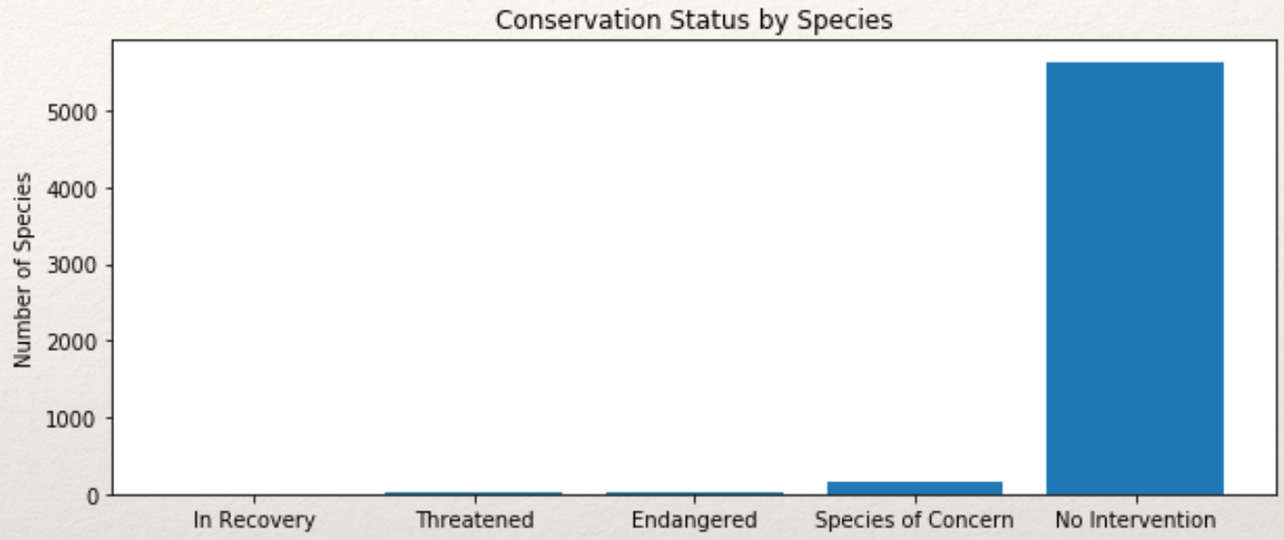
Observations of Sheep in 4 National Parks

Species Information

- We will be looking at a dataset from the National Parks Service presented in a .csv file. The specific file we are looking at is called species_info.csv which contains the general category of the species, the scientific name, the common name and the conservation status of the species.
- There are 5541 individual species in the dataset.
- There are 7 separate categories including mammal, bird, reptile, amphibian, fish, vascular plant, and nonvascular plant.
- There are 5 different options with conservation status. These include a null entry, “Species of Concern”, “Endangered”, “Threatened”, and “In Recovery”.
- Of the entire dataset, there were 15 species in “Endangered”, 4 in “In Recovery”, 151 in “Species of Concern” and 10 in “Threatened”. The remaining 5363 were a null entry (empty).
- We converted the null entry to instead have an entry of “No Intervention”

Species Information 2

- We created a bar chart to show the conservation status of the entire dataset.



- We defined the species as “Protected” as those that were not defined as “No Intervention”.
- Mammals had the highest percentage that were “Protected” at 17% of 176 individual species followed by Birds at 15.3% of 488 species, Amphibians at 8.8% of 79 species, Fishes at 8.7% of 126 species, Reptiles at 6.4% of 78 species, Nonvascular Plants at 1.5% of 333 species and Vascular plants at 1% of 4262 species.

Calculations for Endangered Status between different categories of species

- We noticed that Mammals seemed to be more endangered than the Birds. We wanted to see if that hypothesis was significant.
- We ran a Chi-Squared test between the Mammals and Birds to determine if there's significance and with a p-value of 0.688 we found there to be no significance and thus can be attributed to chance.
- We also saw that Mammals seemed to be more endangered than Reptiles as well. We wanted to find whether that was significant or not.
- We once again ran the same Chi-Squared test between Mammals and Reptiles and found a p-value of 0.038 so there is significance in the dataset and from this dataset, Mammals are more likely to be endangered than the Reptiles.

Recommendation for conservationists based on calculations

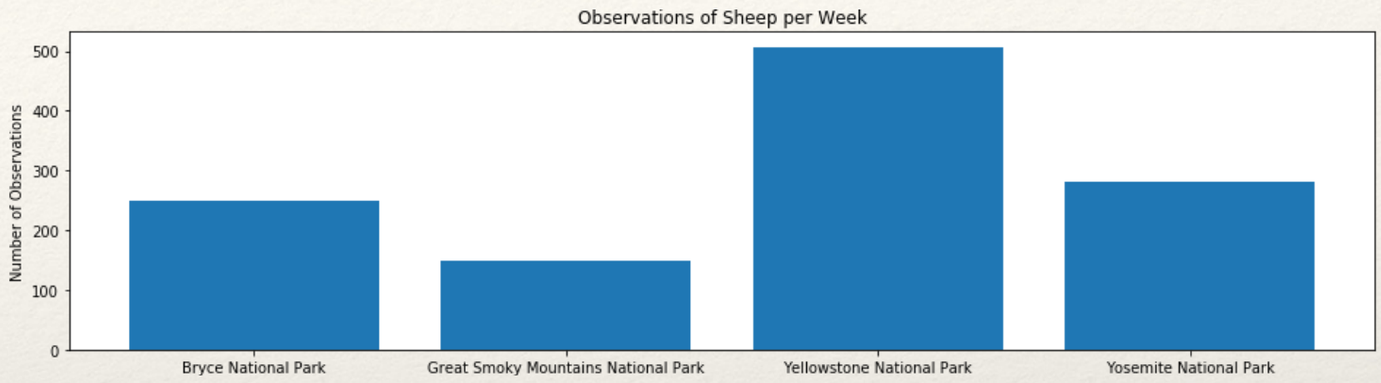
- The only feasible recommendation we could give conservationists is to devote more time and resources into coming up with conservation tactics and strategies to help reduce the amount of Mammals and Birds that are endangered.
- We would need much more input from other specialties from biologists and environmental scientists and such to determine feasible solutions.
- But the need to help Mammals and Birds can clearly be show by the data analysis we've done with this dataset.

Sample size determination for foot & mouth disease in sheep in 4 National Parks

- We had an additional dataset provided by the National Park Service that counted the individual sightings of different species at several National Parks named observations.csv
- This dataset included the “Scientific Name” of the species, the National Park where the species was observed and numbers that were observed in the National Park.
- We correlated the “Scientific Name” with the previous dataset of species_info.csv to come up with the species’ “Common Name”.
- Using the “Common Name”, we found several species that had the word “sheep” in their common name but we only wanted the “Mammals”. So filtering for just the “Mammals” we found 3 species in observations.

Sample size determination for foot & mouth disease in sheep in 4 National Parks 2

- We created another Bar Chart for sheep in the 4 different National Parks where they were observed.



- We know that 15% of sheep in Bryce National Park have foot and mouth disease, Park rangers at Yellowstone National Park want to know how many weeks they have to observe the sheep in their park to determine whether their program to reduce the infection rate of 10% of their sheep by 5% points.
- With a 90% significance rate and using a sample size calculator we determine it would take slightly over 1.5 weeks of observations at Yellowstone National Park and approximately 3.5 weeks at Bryce National Park