Biodiversity in Our Parks

An Analysis of Species Conservation

The Data - Structure

Species Set

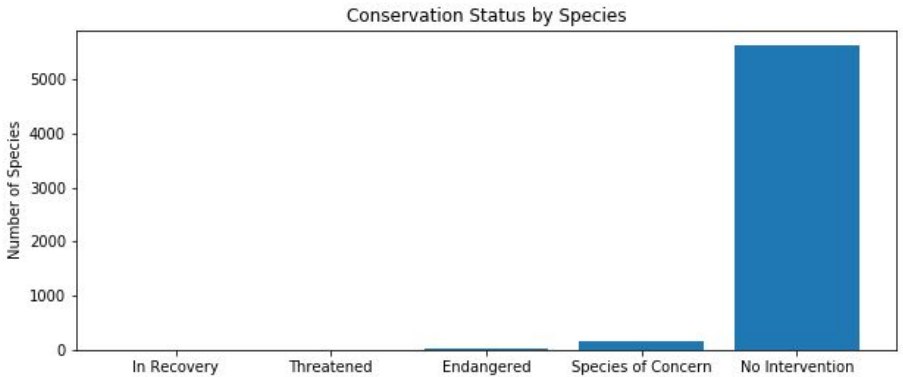
- A record of 5541 species found throughout our national parks containing:
  - Species Scientific Name
  - Species Common Names
  - Species Category (mammal, bird, etc)
  - Species Conservation Status

Observations Set

- A record of species sightings throughout the parks over a 7 day period containing:
  - Species Scientific Name
  - Park the sightings were made at
  - Number of sightings

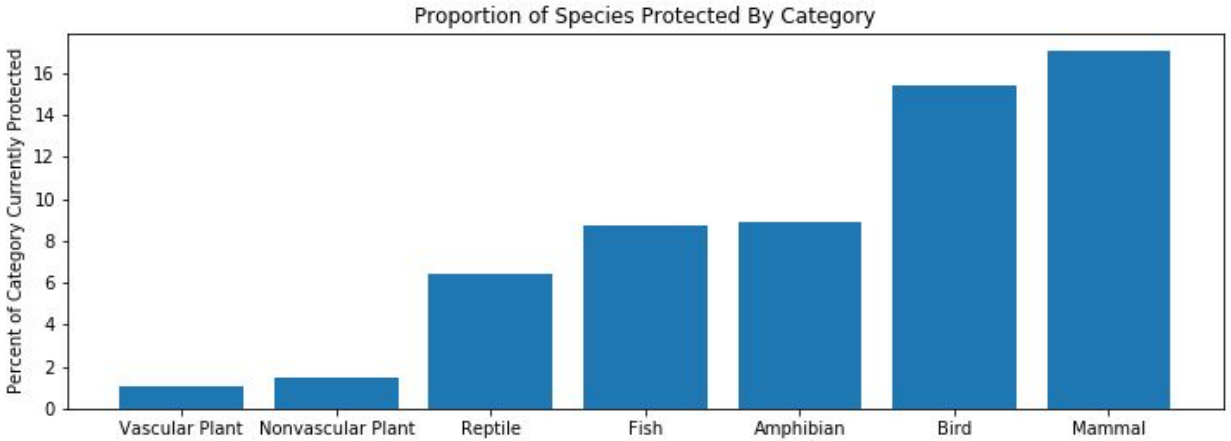
The Data - Species Set Insights

- Of the 5541 species tracked, only 180 (3.2%) are currently in need of conservation efforts
- Of this 180
  - 151 (83.9%) are defined as *Species of Concern*
  - 10 (5.6%) are defined as *Threatened*
  - 15 (8.3%) are defined as *Endangered*
  - 4 (2.2%) are defined as *In Recovery*



The Data - Species Set Insights

- Broke down the protected species by category and determined the proportion of each category currently protected



The Data - Species Set Insights

- Performed Chi Square testing on all category pairs to determine if proportion of protected species differed significantly ($p < 0.05$) between categories
- Results Showed
    - Both the vascular and non-vascular plant categories differed significantly from all non-plant categories. However, the difference between the vascular and non-vascular plant categories *was not* significant.
    - The only non-plant involved pair to show a significant difference was the Mammal - Reptile pair ($p = 0.04$).

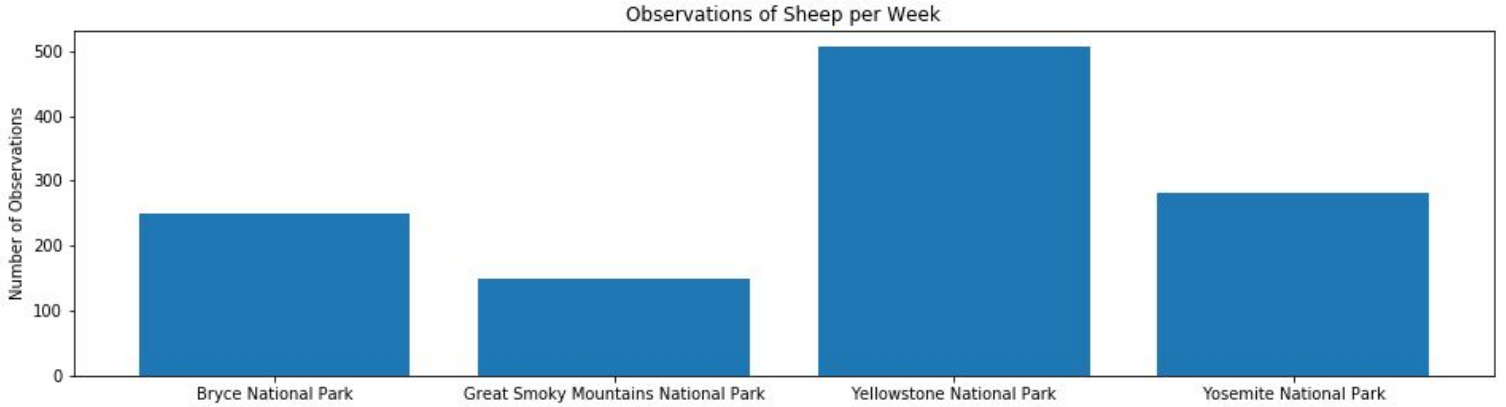
Based on these results we recommend that the park service focus conservation efforts on non-plant species and research possible causes of the observed difference in proportion of reptile and mammal species being conserved.

The Data - Sheep Study

- Objectives
  - Illustrate sheep distribution between parks
  - Provide a framework we can use to start planning a study of foot and mouth disease in the sheep of our parks

The Data - Sheep Study

Sheep Distribution Between Parks



The Data - Sheep Study

Foot and Mouth Disease Experiment - Structure

- We know that 15% of the sheep at Bryce National Park have foot and mouth disease.
- The park is running a program to reduce foot and mouth disease.
    - We want to look at the results of the program and detect, with confidence, at least a 5% decrease

The Data - Sheep Study

Foot and Mouth Disease Experiment - Sample Size Determination

- Minimum Detectable Effect = 33.33% (one third of 15% = 5%)
- Baseline Conversion Rate = 15%
- Level of Significance = 90%

This results in a required sample size of 510

- Based on what we know about sheep observations per week at the parks to achieve this sample size would take:
  - ~2 weeks at Bryce National Park
  - ~1 week at Yellowstone National Park