BIODIVERSITY IN THE NATIONAL PARKS

Capstone Project

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OBJECTIVE

- As a data analyst for the National Park Service, I have been helping to analyze data on endangered species from several different parks.
- I have conducted some data analysis on the conservation statuses of these species and investigated if there are any patterns or themes to the types of species that become endangered.

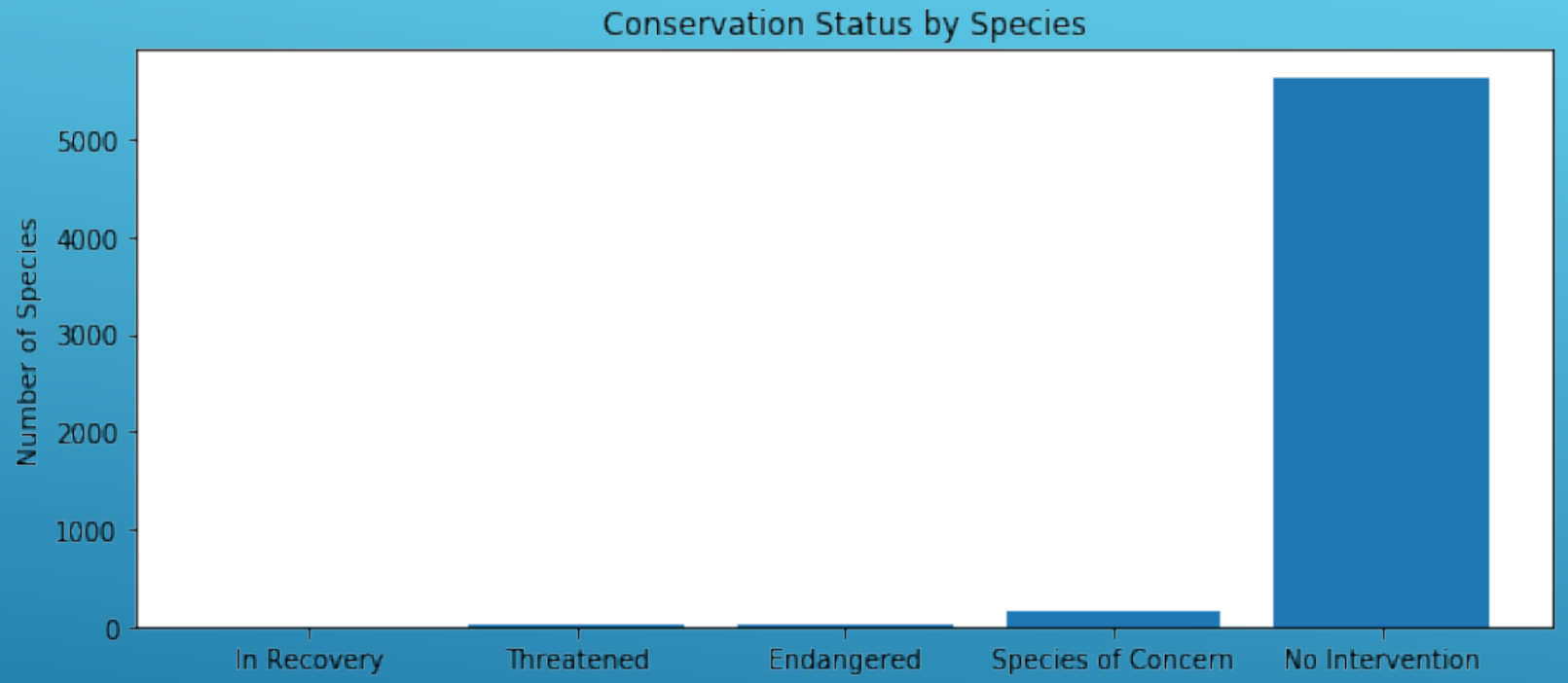
OBSERVATIONS FROM DATA

- The four main variables in the National Park Service species dataset are:
  - category
  - scientific name of each species
  - common names of each species
  - species conservation status

- Based on the scientific name of each species, there are **5541** species found across the National Parks!

- These species fall into 7 categories:
  - Mammal
  - Bird
  - Reptile
  - Amphibian
  - Fish
  - Vascular Plant
  - Nonvascular Plant

CONSERVATION STATUS OF SPECIES



Each species is assigned a conservation value, which indicates if they are :

- In Recovery: formerly Endangered (4)
- Threatened: vulnerable to endangerment in the near future (10)
- Endangered: seriously at risk of extinction (15)
- Species of Concern: declining or appear to be in need of conservation (151)
- No Intervention (5363)

PERCENT OF SPECIES PROTECTED

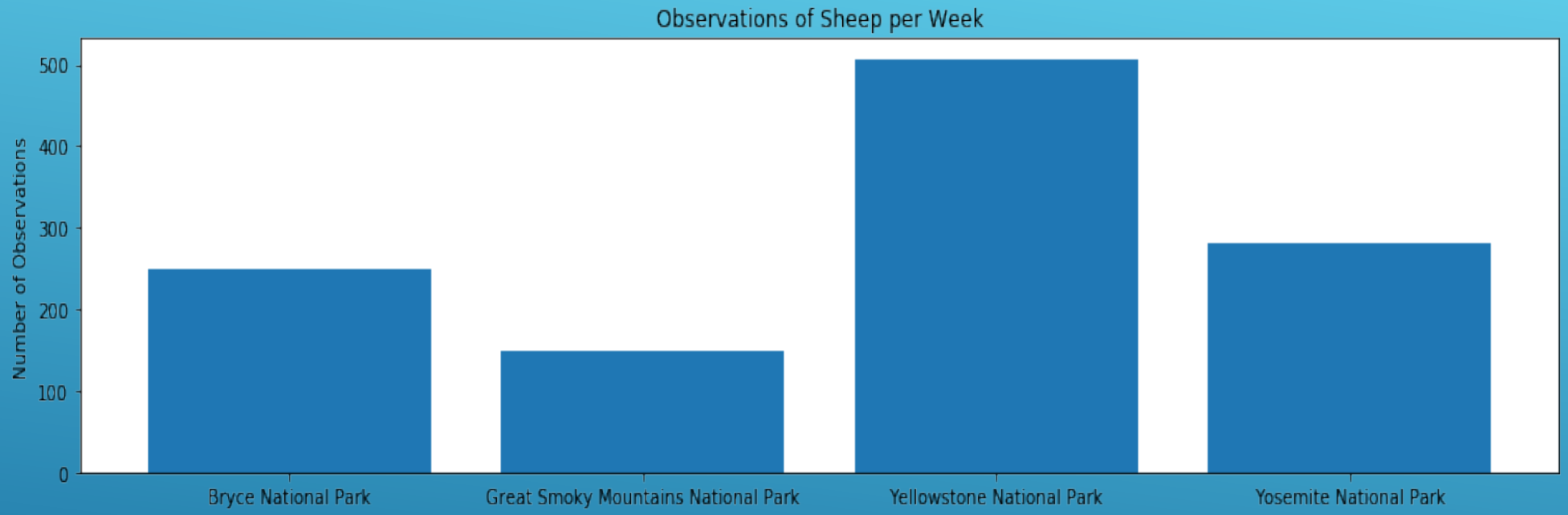
- This table shows the percent of each category of species that is protected.
- Using a chi squared test, we are able to understand the significance between the percent's protected.
- Although it looks like mammals are more likely to be endangered than birds, this finding is not significant (p value = 0.69).
- There is a significant difference (p value = 0.04) between reptiles and mammals.

Category	Not Protected	Protected	Percent Protected
Amphibian	72	7	8.86
Bird	413	75	15.37
Fish	115	11	8.73
Mammal	146	30	17.05
Nonvascular Plant	328	5	1.50
Reptile	73	5	6.41
Vascular Plant	4216	46	1.08

RECOMMENDATION

- Based on my calculations, it is important to understand when differences between endangered species are significant and when they are not.
- Only examining the percent numbers doesn't always show the whole picture. While it may seem that the higher number means a species is be more endangered, that may not always be the case – and may be due to chance.
- Thus, statistical tests are essential to understand the significance in any differences in values. This ensures conservationists are appropriately responding to endangered species issues.

SPECIES SIGHTINGS



- At a few National Parks, scientists have been studying sheep sightings. They have seen three different species: Ovis canadensis, Ovis canadensis sierrae and Ovis aries.
- The graph above shows that 250 sheep were spotted at Bryce Canyon, 149 at Great Smoky Mountains, 507 at Yellowstone and 282 at Yosemite.

FOOT & MOUTH DISEASE

Sample Size Calculations:

- Baseline conversion rate: 15
- Minimum Detectable Effect: 33.33
- Statistical Significance: 90%
- Sample Size: 510

- 15% of sheep at Bryce National Park have foot and mouth disease.
- Rangers at Yellowstone National Park have been running a program to reduce the rate of foot and mouth disease at that park. They want to test whether or not this program is working.

- Using the sample size calculator:
  - **510** sheep need to be observed
  - Rangers must observe sheep for **1 week** at Bryce Canyon
  - Rangers must observe sheep for **2 weeks** at Yellowstone

THANK YOU