

# Project Title

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Capstone Project 2  
4/10/2018

# Flora & Fauna Data

- The catalogue of data includes 5541 distinct species with information on common and scientific names as well as conservation status.
- Species are categorized as mammal, bird, reptile, amphibian, fish, vascular or plant.
- Subjects fall into one of four conservation classifications: *Species of Concern, Endangered, Threatened, In Recovery*.
  - Any excluded species were not considered at risk.
- Figure 1 includes a count by category of species that are protected and not protected
- As shown in the Figure 2, more than 96% of species are not at risk.

| 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             |
| Nonvascula... | 328           | 5         | 1.5               |
| Reptile       | 73            | 5         | 6.41              |
| Vascular P... | 4216          | 46        | 1.08              |

Figure 1

# Distribution of At Risk Species By Status

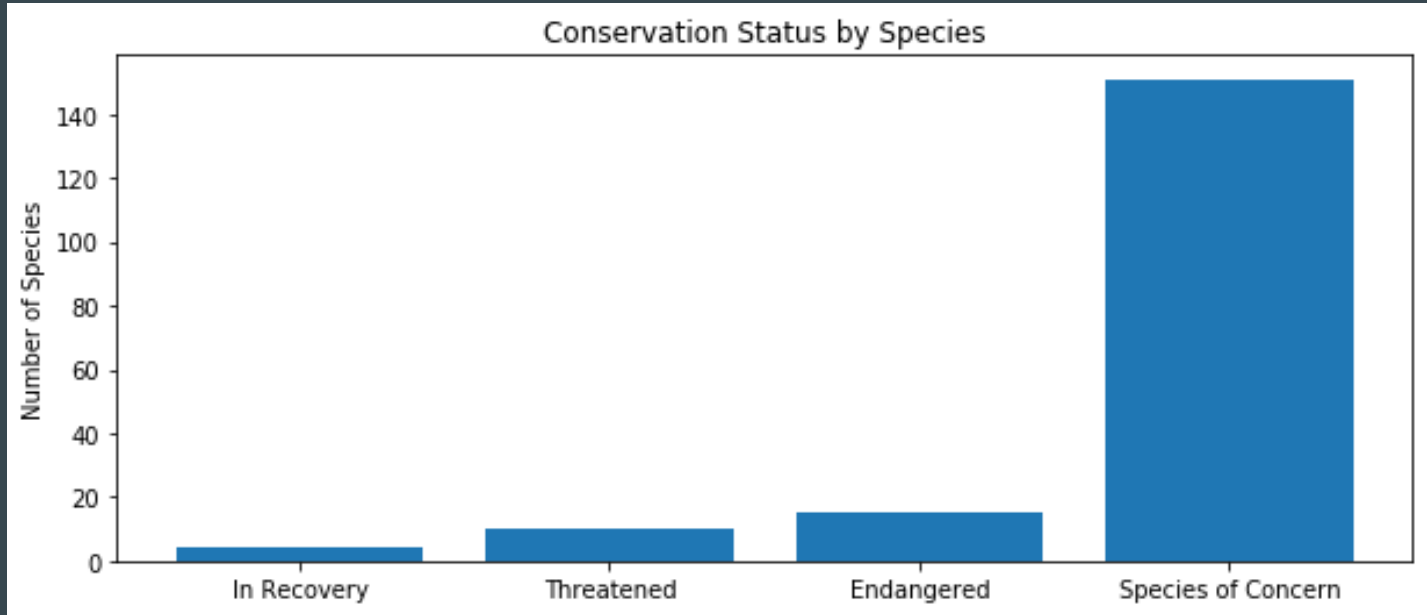


Figure 2

# Analysis Findings

Mammals, reptiles and birds had the highest instances of at-risk populations by percentage. We performed significance testing these groups to see if any were more likely to be in need of intervention.

- At first glance, mammals appeared to be more likely to be endangered than birds, however, our chi squared test revealed no significant difference between groups.
- Instead, a chi squared test of mammals against reptiles indicated a statistically meaningful difference of .038 - a low likelihood that the difference in total at risk groups is due to statistical noise or error. Mammals appear over represented in direct comparison.
- Based on these factors, we would recommend a closer examination of environmental risks to mammal species in the parks.

# Foot & Mouth Disease Treatment

Based on weekly observations, sheep have a significant presence at the parks. During the course of our analysis, we became aware that park rangers are running a program at Yellowstone National Park to curb foot and mouth disease in the sheep population. Figure 3 includes total sightings per week at each park

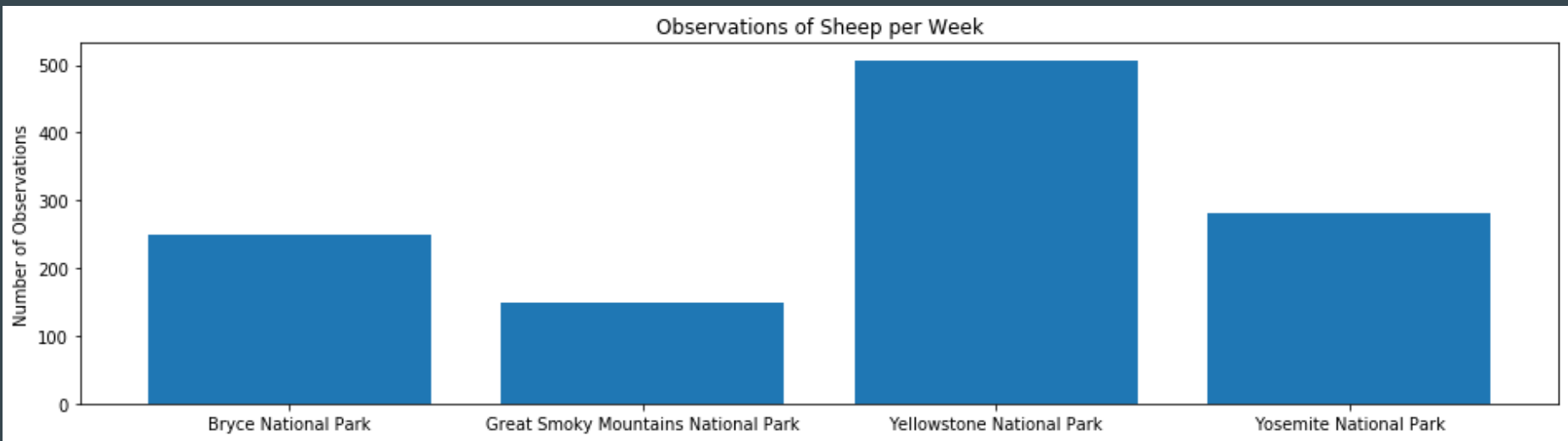


Figure  
3

# Foot & Mouth Disease Treatment Cont.

We can take the opportunity to do a direct comparison between Yellowstone and Bryce National Park based on a week's worth of animal sightings to compare between the two.

- Based on historical data, we know that 15% of the sheep at Bryce have foot and mouth.
- With this in mind, we can design a test that will detect whether there has been a 5% reduction at Yellowstone.
- The test requires a sample of 520 observations per park.
- At the current rate of observations, we believe the study will take:
  - Yellowstone National Park - about 2 weeks to complete
  - Bryce National Park - about 1 week to complete