BIODIVERSITY CAPSTONE PROJECT

MARLENA HAMMOND

Overview

Species Info

- The species_info.csv contains species data on type of **Species**, **Scientific Name**, **Common Name**, and **Conservation Status**.

- In this data set, there are **7** different species type: **Mammal**, **Bird**, **Reptile**, **Amphibian**, **Fish**, **Vascular Plant**, and **Nonvascular Plant**.

- Data has been collected for **5,541** different types of species.

- The different types of conservation status values are **NaN**, **Species of Concern**, **Endangered**, **Threatened**, and **In Recovery**.

- The majority of species didn't have a value for their conservation status. I renamed NaN values as **No Intervention** because I can interpret the NaN as a null value, which means the species doesn't need protection. By inserting this value, I can accurately analyze the conservation species data.

Graph

Conservation Status by Species
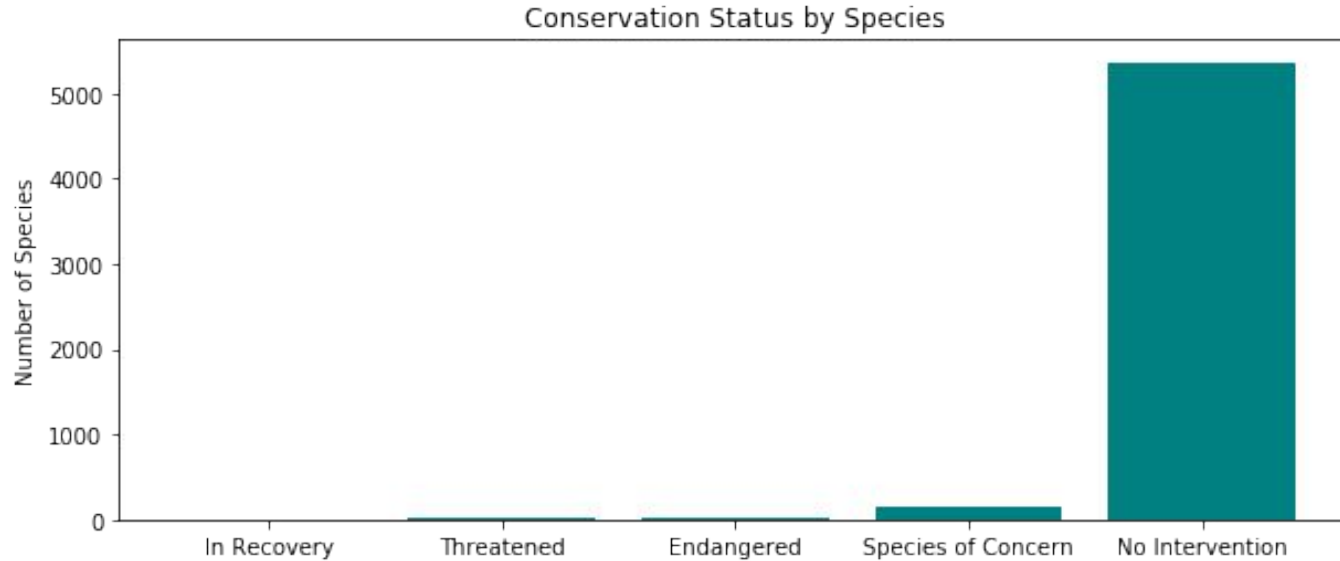
In Recovery - 4 | Endangered - 15 | Threatened- 10 | Species of Concern - 151 | No Intervention - 5363

Endangered Species Calculations

- From the data, I wanted to calculate if certain types of species were more likely to be endangered.

- Previously, I calculated the conservation status of each species. Using a pivot function, I rearranged based on type of species and if the species is protected or not for the data to be more readable.

- From the pivoted data, I calculated the percentage of the species that is protect with simple math.
  - (**# of Protected Species Type \ Total Number of Species Type**)

- Now that we have the percentages of protected species type, I wanted to compare species types and see if certain species were more likely to be endangered.

- By using the **Chi-Square Test** to calculate the significant difference between **Mammals** vs **Birds** and **Mammals** vs **Reptiles**, I have concluded that with a p-value of **0.688 Birds** are **NOT** more likely to be endangered than mammals, but with a p-value of **0.038 Reptiles** are **MORE LIKELY** to be endangered.

Conservation Recommendation

- Based on my calculations, **Vascular Plants** are more likely to be endangered as only **1.1%** are protected and **Mammals** being more likely to be protected at **17%**.

- I would recommend devoting more resources to protecting **Vascular Plants** as the highest priority as they are the least protected species type.

- The species needing protection in the order of importance: **Vascular Plants**, **Nonvascular Plants**, **Reptiles**, **Fish**, **Amphibians**, **Birds**, and **Mammals**.

Foot & Mouth Disease Study

- Last year, **15%** of sheep at Bryce National Park had the Foot and Mouth Disease. I used **15%** as my baseline. The scientists wanted to see if their program reduced the disease by at least **5%**.

- I obtained the **Minimum Detectable Effect** (**MDE**) by taking the minimum reduction rate scientist are looking for, dividing it by the baseline, and multiplying that number by **100** to get a whole number. (**5%**/**15%** * **100** = **33.33**)

- Now that I have the **Baseline** (**15%**), **MDE** (**33.33**), and **Statistical Significance** (**90%**), I determined the sample size using the sample size calculator provided.

- To see reduction of the Disease, scientist would need to observe a **Sample Size** of **870** sheep.

- Now that scientists know the sample size, we can determine the # of weeks it would take to see a reduction at each National Park. (**Sample Size** / **# of Sheep observed per week per National Park**)

Graph
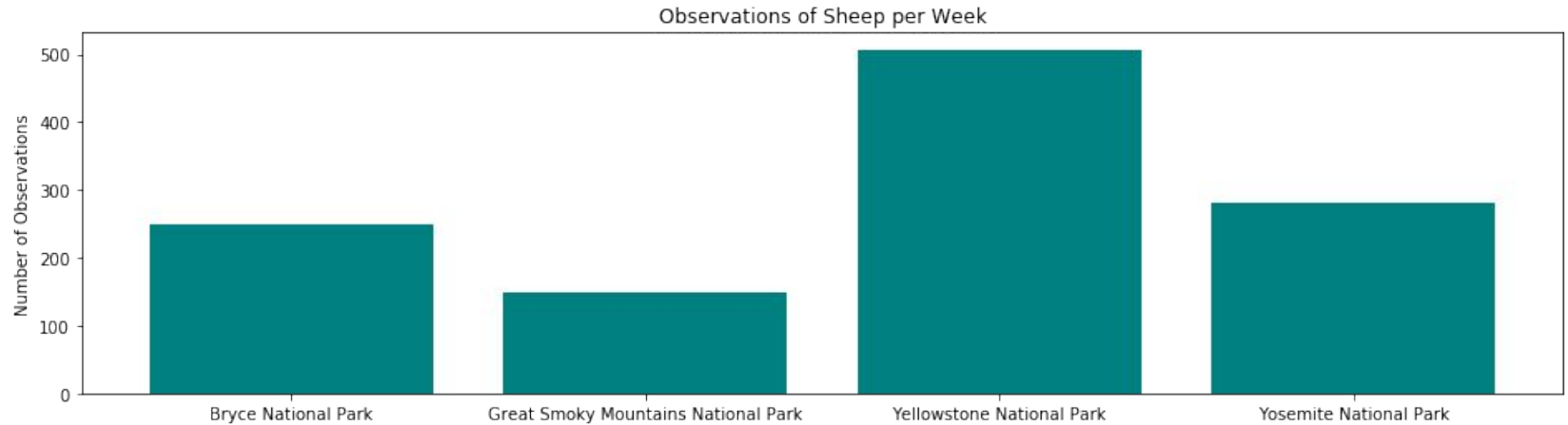
Bryce National Park - 250 | Great Smoky Mountains National Park - 149 |
Yellowstone National Park - 507 | Yosemite National Park - 282