Capstone Option 2: Biodiversity for the National Parks

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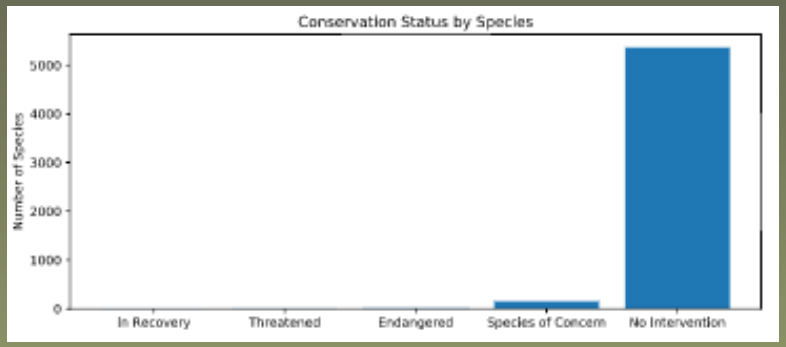
Conservation in the National Parks

- We began this study by looking at the conservation status of a 5541 different species of animals observed by the National park Service
- The different conservation statuses we observed for these species included:
  - **Species of Concern:** declining population or appears to be in need of conservation.
  - **Threatened:** vulnerable to endangerment in the near future.
  - **Endangered:** seriously at risk of extinction.
  - **In Recovery:** formerly Endangered, but currently not in danger of extinction throughout all or a significant portion of its inhabitable range.

Conservation in the National Parks

- When looking at a breakdown of the number of species in each conservation status, we observed the following numbers.
  - Endangered – 15
  - In Recovery – 4
  - No Intervention Necessary – 5,363
  - Species of Concern – 151
  - Threatened - 10



Investigating Endangered Species

- We used a Chi-Squared Test for Significance to determine if certain types of species are more likely to be endangered than others
- Our first Null Hypothesis is that although the numbers show that mammals are more likely to be endangered than birds, the difference is due to chance and therefore we cannot say that there is a significant enough different to say that this is in fact true
- Our second Null Hypothesis is that there is not a significant difference in the likelihood that reptiles and mammals are endangered

Investigating Endangered Species

- After running a chi-squared test between mammals and birds, we observed a p-value greater than 0.05 at 0.6875.
  - We can conclude that there is not a significant difference in the likelihood of endangerment between mammals and birds.
- After running a chi-squared test between reptiles and mammals, we observed a p-value less than 0.05 at 0.03835.
  - We can conclude that there are certain types of species that are more likely than be endangered than other species

Endangered Species Recommendations

- Based on the fact that there is a significant difference between the endangerment of reptiles and mammals. I would recommend that conservationists look closer at what might be causing this difference.
- A few different items that can be researched
  - Environment
  - Changes within the environment
    - Global Warming
    - Deforestation
  - Genetics

Foot and Mouth Reduction Effort in Sheep

- Park Rangers at Yellowstone National Park want to know whether the program they have been running to reduce the rate of foot and mouth disease is successful.
  - The baseline conversion rate for food and mouth disease is 15%
  - The minimum detectable effect is set at 33%
  - Based on a statistical significance of 90%, the number of sheep that need to be examined to determine if this program is successful would be 520 sheep.
  - It would take just over 1 week to find this sample size at Yellowstone National Park and it would take about 2 weeks to find this at Bryce National Park