An Analysis of Biodiversity for the National Parks

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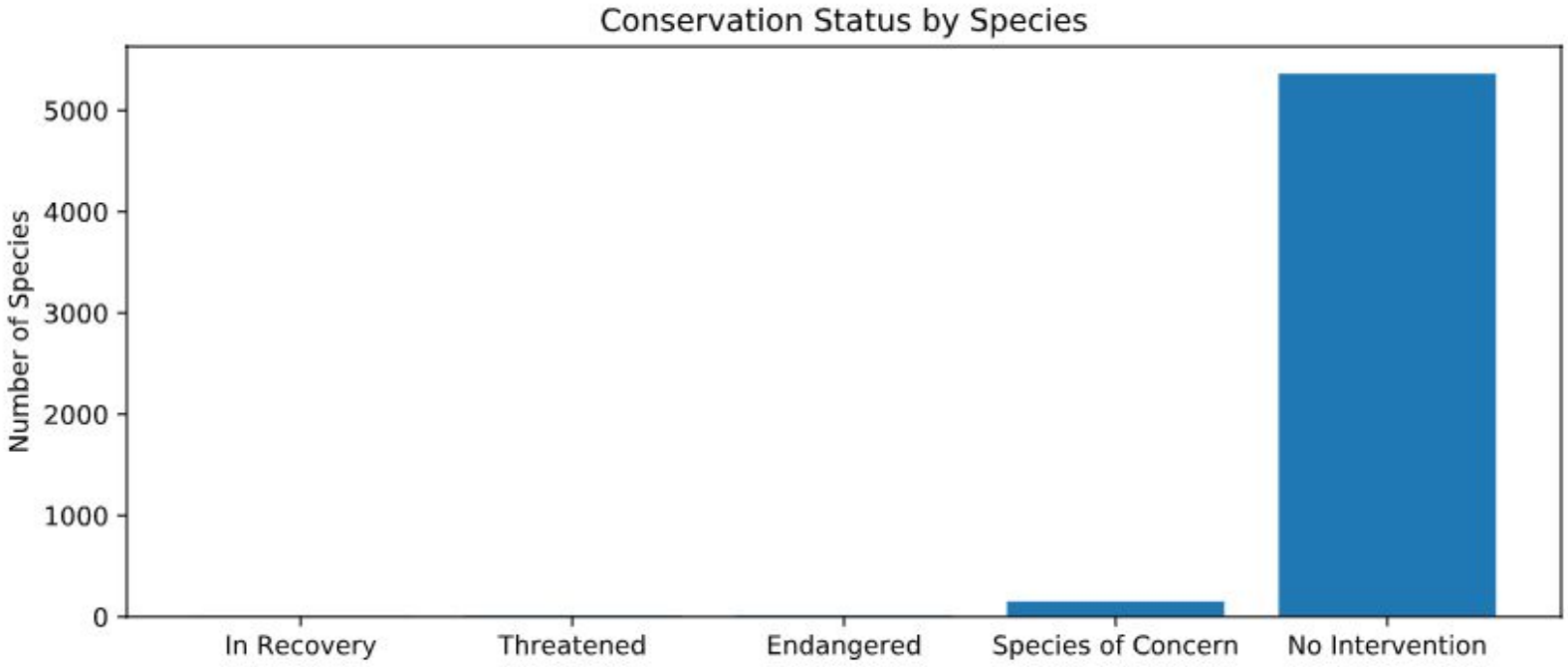
Key information from the data provided by the National Parks

- **The data includes the species type, their scientific name, their common name(s), and their conservation status.**
- **There are 5541 different species in the DataFrame.**
- **The various categories of species are mammal, bird, reptile, amphibian, fish, vascular plant, and nonvascular plant.**
- **Listed within the DataFrame are 15 endangered species, 4 species in recovery, 151 species of concern, 10 threatened species, and 5363 species that require no intervention.**


Conservation Status by Species
Number of Species
0
1000
2000
3000
4000
5000
In Recovery
Threatened
Endangered
Species of Concern
No Intervention

Significance calculations for endangered status between different categories of species

According to my calculations, the percentage of species per category that require intervention are:

- **8.9% of Amphibians**
- **15% of Birds**
- **8.7% of Fish**
- **17% of Mammals**
- **6.4% of Reptiles**
- **1.5% of Nonvascular Plants**
- **1.2% of Vascular Plants**

These results indicate that mammals are more likely to be endangered than birds, that nonvascular and vascular plants have a low percentage of species that require intervention, and that reptiles are less likely to be endangered than mammals. Are these differences significant? Let's find out.

Chi-Squared Test

- After performing the chi-squared test between the data from mammals and the data from birds, it appears that the difference between the percentages of those species that require intervention isn't significant. This means that the difference in the calculated percentages could be the result of random chance.
- Conversely, the chi-squared test performed between the reptile and mammal data indicated that there is a significant difference between the percentages calculated and that the difference is unlikely to be the result of random chance.
- The chi-squared test indicates that mammals are significantly more likely to be endangered than reptiles are.

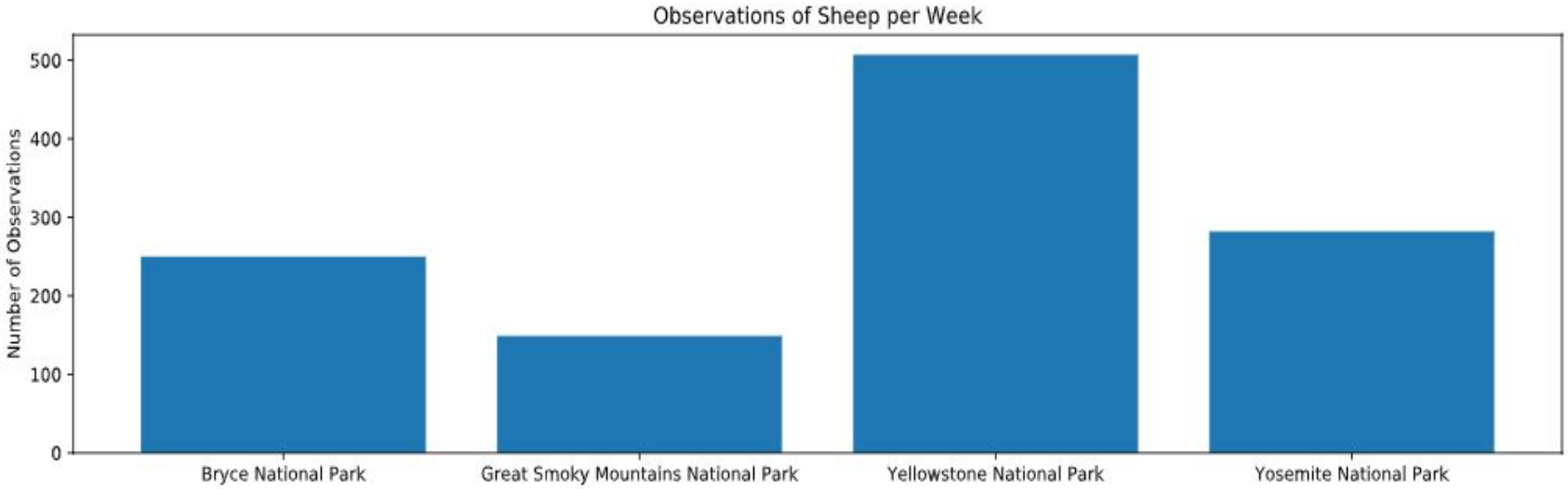
A Recommendation for Conservationists Concerned about Endangered Species, based on Significance Calculations

SInce the chi-squared test indicated that mammals are significantly more likely to be endangered than reptiles are, I would recommend that resources and efforts be focused on protecting the species that are more vulnerable, such mammal species, instead of focusing efforts on less vulnerable species, such as reptiles and vascular and nonvascular plants.

Sample Size Determination for the Foot and Mouth Disease Study

Sheep observations across four of the National Parks:

- **507 sheep observed in Yellowstone National Park**
- **282 sheep observed in Yosemite National Park**
- **250 sheep observed in Bryce National Park**
- **149 sheep observed in Great Smoky Mountains National Park**


Observations of Sheep per Week
Number of Observations
0
100
200
300
400
500
Bryce National Park
Great Smoky Mountains National Park
Yellowstone National Park
Yosemite National Park

Sample Size Determination for the Foot and Mouth Disease Study

Park Rangers at Yellowstone National Park have employed a program aimed at decreasing foot and mouth disease and inquired about how well their program was working.

Knowing that 15% of sheep at Bryce National Park have foot and mouth disease and that Park Rangers wanted to be able to measure reductions of the disease of at least 5%, I determined the needed sample size for the study.

The number of sheep that they would need to observe from each park to make sure their foot and mouth percentages are significant is 870.

In order to observe enough sleep at each location, scientists would need to spend 1.72 weeks at Yellowstone National Park, 5 weeks at Great Smoky Mountains National Park, 3 weeks at Yosemite National Park, and 3.48 weeks at Bryce National Park.

Thank you for watching my presentation!

Have a wonderful day!