Biodiversity Capstone Project

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Initial Species Data

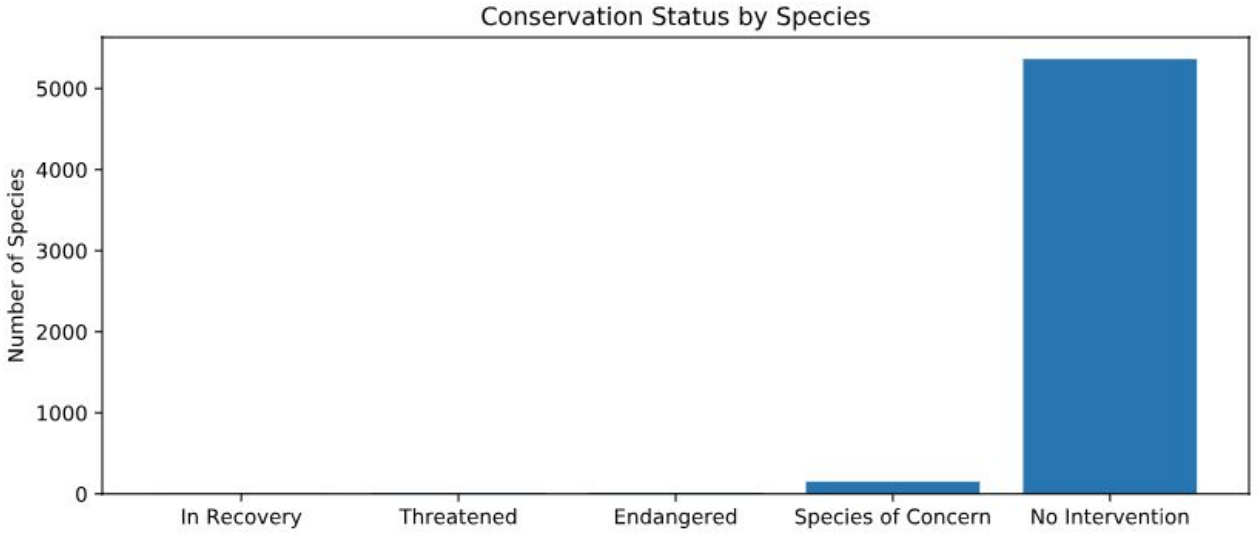
We started with over 5500 species made up of Amphibians, Birds, Fish, Mammals, Reptiles, Vascular Plants, and Nonvascular plants.

Each species came with a conservation status, including Species of Concern, Threatened, Endangered, In Recovery, or a blank status, indicating No Intervention.

While this data is a helpful starting point, we wanted to find out what types of species are currently the most vulnerable, with significance, so we can focus our efforts on preserving those species.

What We Learned: The Good

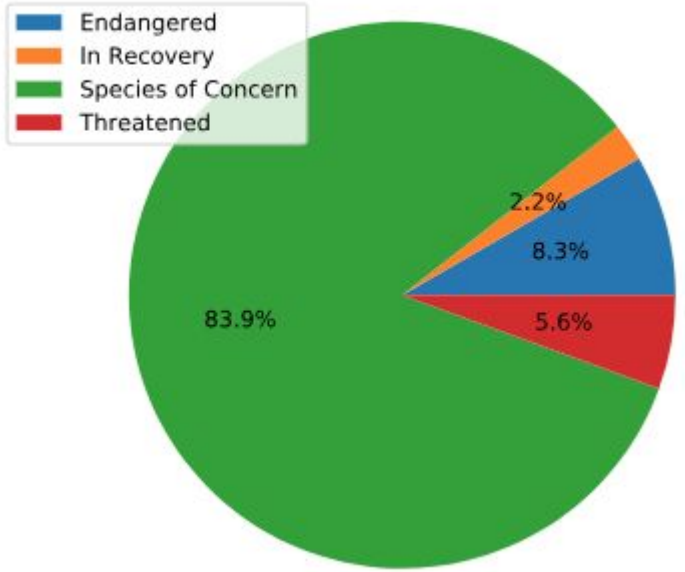
While we do have 180 species with some level of concern, or in recovery, the overwhelming majority (97%) of species are not threatened.



What We Learned: The Good

Even within the 180 species of concern, roughly 84% is at the lowest level of concern: “Species of Concern”

Species of Concern is defined as “declining population or appears to be in need of conservation.”



What We Learned: The Not So Good

In our dataset, it shows that some species have a higher percentage chance of being protected than others.

Given this, what is the significance of these results?

Species	Percentage Protected
Amphibians	8.86%
Birds	15.37%
Fish	8.73%
Mammals	17.05%
Reptiles	6.41%
Vascular Plants	1.50%
Nonvascular Plants	1.08%

Significance Conclusions

While Mammals and Birds have the highest percentage of protected species, the difference was not significant and a result of chance.

However, given the results of Mammals and Reptiles, we can say with certainty that Mammals are more likely to protected than Reptiles.

Additionally, we can say with significant that Reptiles are more likely to protected than both Vascular and Nonvascular Plants.

Recommendation

Focus on what helps preserve Mammals - they have a high percentage of protected species and we can say for certain they are more likely to be protected than Reptiles

Focus on what helps protect Reptiles - Even though they are less likely to become protected than Mammals, we can say with certainty they are more likely to be protected than plants.

Don’t worry about Plants - Not only do they have a low percentage of protected species, we can say with significance that other species are in more need of protection.

Foot in Mouth Disease Analysis

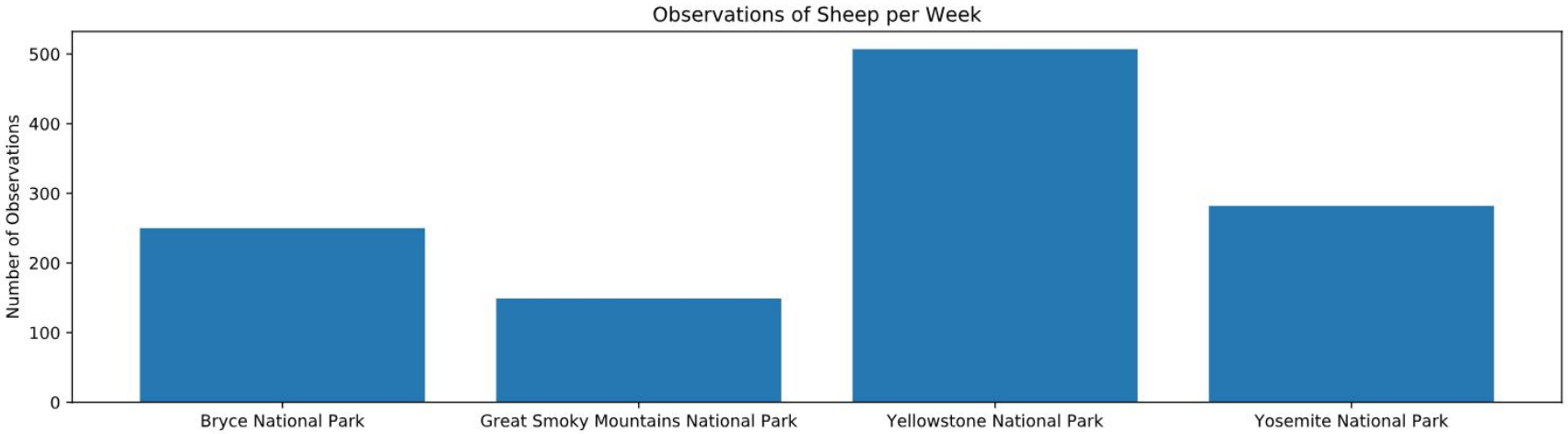
Foot in Mouth Disease at National Parks

Park Rangers have been observing the occurrence of Foot in Mouth Disease amongst sheep at 4 national parks: Yellowstone, Bryce National Park, Great Smoky Mountains, and Yosemite.

They recorded the scientific name of the species, the park they were observed at, and the total number of observations.

This data, combined with the species data we analyzed earlier, enabled us to pull out the observations for sheep across all these national parks.

Weekly Sheep Observations by Park



Reduction in Foot in Mouth Disease

Park Rangers now want to be able to know with statistical significance if they can trust a measured drop of 5% in Foot in Mouth Disease sheep observed.

Given data we have from Bryce National Park, we can use the following data to calculate the time it would take to verify this change with 90% certainty:

Baseline: 15%

Minimum Detectable Effect: 33.33%

Sample Size Per Variant: 510

With the observation counts from the last 7 days, it'd take about 1 week to get the number of observations necessary in Yellowstone, and a little over 2 for Bryce