

Biodiversity: Investigating Protected Species

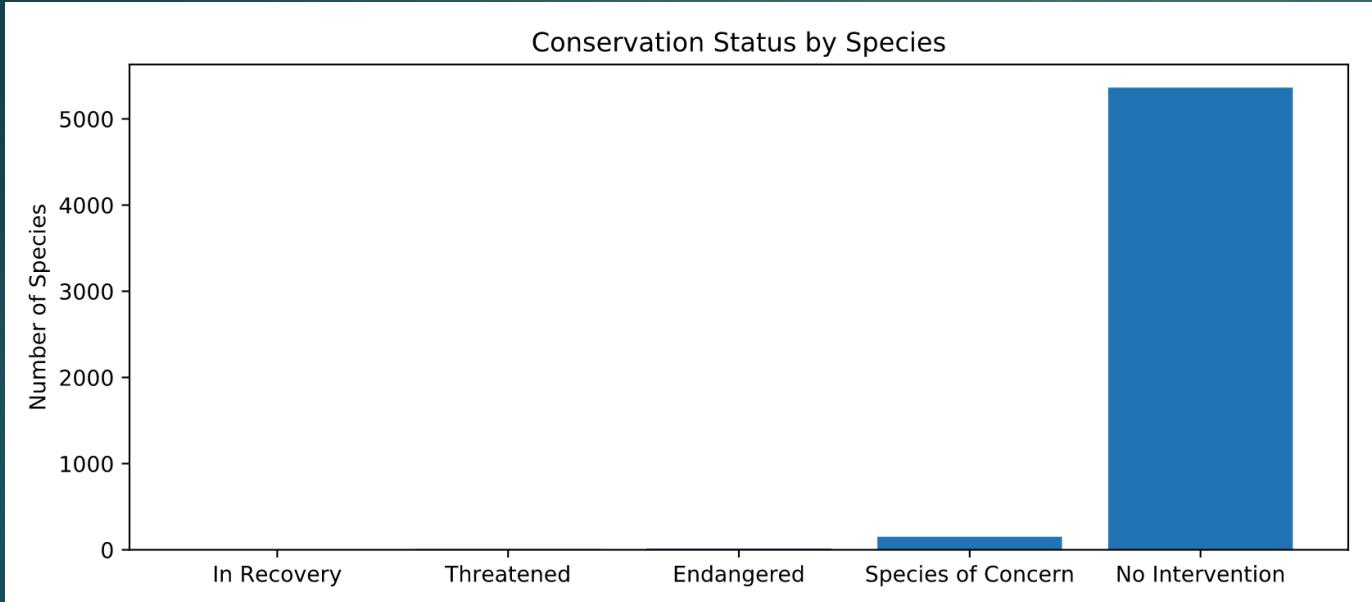
Capstone Project – Aaron Emas
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Objective

- ▶ National Parks are curious as to why certain species are becoming endangered
- ▶ We want to find out if there are any patterns and trends to help prevent the endangerment of various species

Observations from data



- ▶ What we know:
 - ▶ There are 4 species in recovery
 - ▶ 10 Threatened
 - ▶ 15 Endangered
 - ▶ 151 Species of Concern
 - ▶ 5363 No Intervention

Results from Statistical Analysis

	category	not_protected	protected	percent_protected
0	Amphibian	72	7	0.088608
1	Bird	413	75	0.153689
2	Fish	115	11	0.087302
3	Mammal	146	30	0.170455
4	Nonvascular Plant	328	5	0.015015
5	Reptile	73	5	0.064103
6	Vascular Plant	4216	46	0.010793

- ▶ By percentage, Mammals have the highest amount protected at 17%
- ▶ Birds are a close second at approx. 15%
- ▶ Vascular plants is the least affected species

Are some species more likely to be endangered?

Category	Protected	Not Protected
Mammal	30	146
Bird	75	413

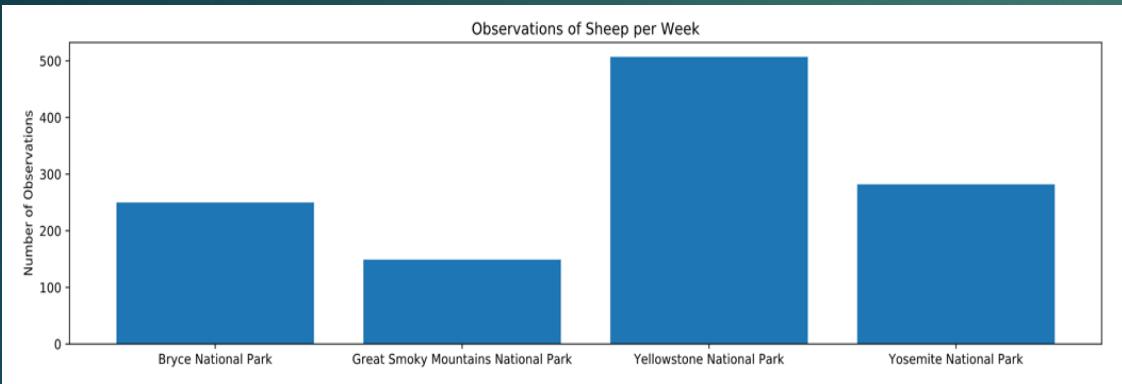
Category	Protected	Not Protected
Mammal	30	146
Reptile	5	73

- ▶ In order to test for significance, we needed to run a Chi-Squared test
 - ▶ Between mammals and birds we calculated a p-val of .687 which is not significant
 - ▶ But between mammals and reptiles we calculated a p-val .038 which is significant

Recommendation

- ▶ Based on our findings, we have come to realize that some species are more likely to become threatened versus other groups
- ▶ If the National Parks pivot their allocation of budget and time to species like mammals, which are more likely to be endangered, then The Parks may be able to keep more animals in the No Intervention category or move them out of the other threatening categories.
- ▶ Findings in bullet point

Case Study: Sheep



- ▶ Foot and Mouth disease is a rampant problem with sheep and we want to know how many sheep have it
- ▶ We sent Park Rangers to a sample size of four national parks to determine how many sheep they saw in one week
- ▶ Yellowstone had the most with 507
- ▶ Great Smoky Mountains had the least with 149

park_name	observations
0 Bryce National Park	250
1 Great Smoky Mountains National Park	149
2 Yellowstone National Park	507
3 Yosemite National Park	282

Sheep cont.

- ▶ There is a baseline 15% of sheep have the disease at Bryce National Park from 2017
- ▶ We found that if scientists want to make sure that there is a >5% drop in the disease with at least 90% significance at Yellowstone, then we would have to observe at least 510 sheep
- ▶ And because of the data we found in the previous slide, we can assume in normal conditions that this would take one week of observations



Thank You