Biodiversity for the National Parks

Capstone Project

Introduction to Data Analysis Intensive Program

E. Reusi

ENDANGERED SPECIES

First things first…

5541 Different types of species

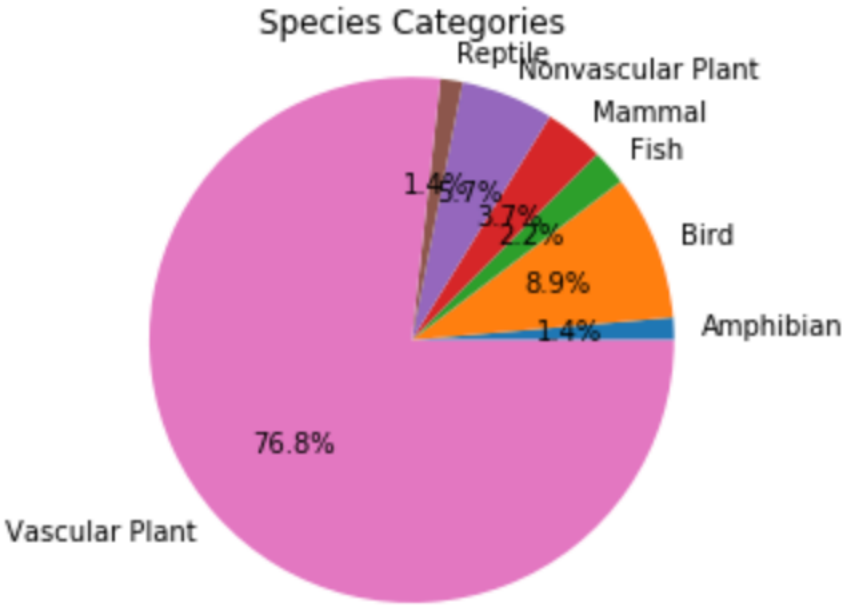
Categories of species

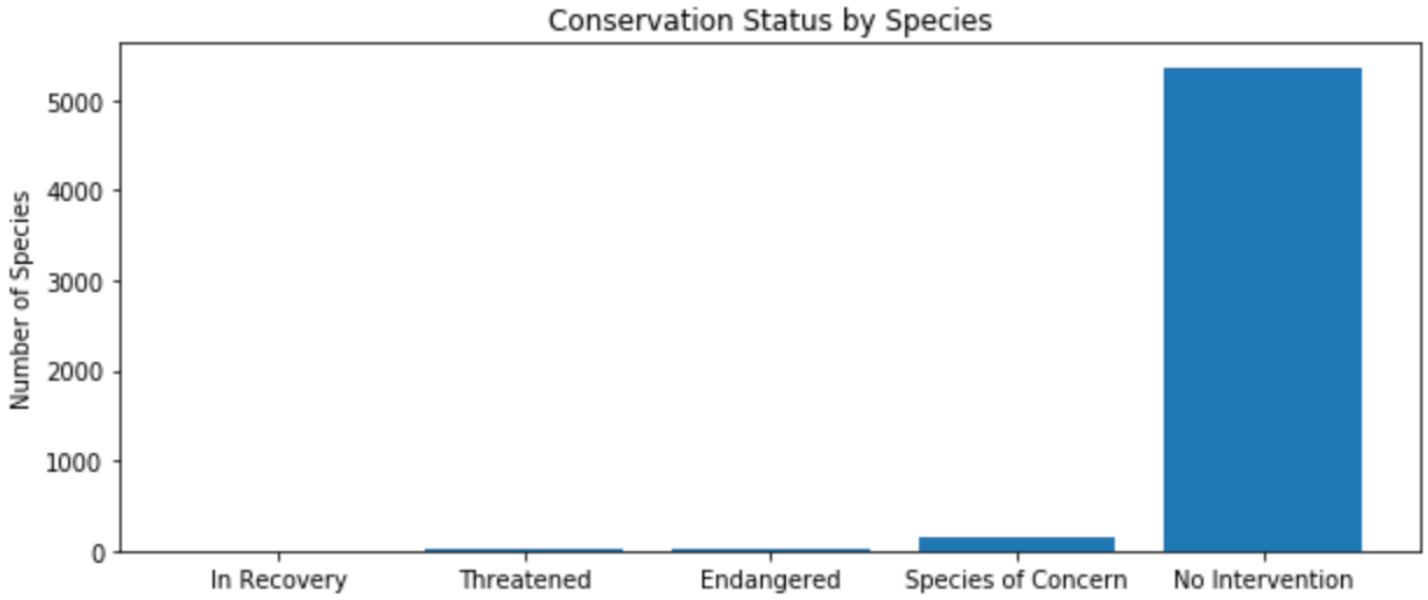
AMPHIBIAN
BIRD
FISH
MAMMAL
NONVASCULAR PLANT
REPTILE
VASCULAR PLANT

ENDANGERED
IN RECOVERY
NO INTERVENTION
SPECIES OF CONCERN
THREATENED

Conservation statuses

Categorization





> 76% of species in the park are vascular plants

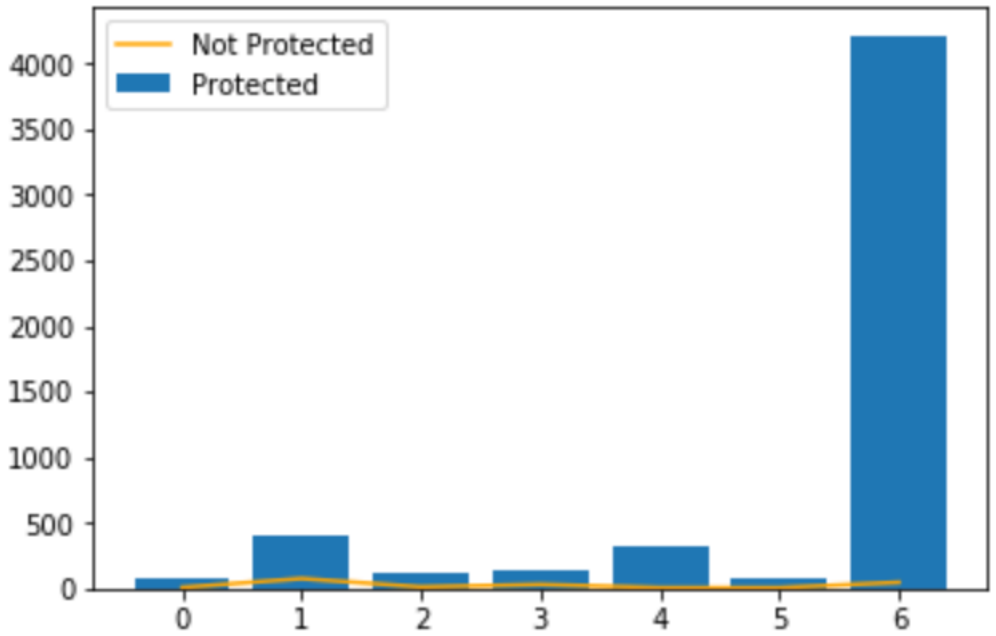
> 96% of species in the park requires no intervention

Protection by species

	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

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

*Data sorted by percent_protected



< 20% of each species are in need of protection

Relative to the number of species in each category, mammals have the highest protection percentage (most endangered), while vascular plants have the lowest.

Are certain types of species more likely to be endangered?

	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

Null hypothesis:
The difference in percentages is a result of chance.

If p-value > 0.05: accept null hypothesis, not significant, chance
If p-value < 0.05: reject null hypothesis, significant, not chance

Tested P-values:
Mammal vs Bird = 0.68759480966613362
Mammal vs Reptile = 0.038355590229698977
Bird vs Nonvascular Plant = 1.054630690497500 4e-10
Amphibian vs Fish = 0.8247942981524834
All = 5.5108280473137505e-89

Majority of the tested p-values generated by performing the chi-squared test are greater than 0.05.

The difference between the protection percentage of most species is not significant and is a result of chance.

Certain types of species are more likely to be endangered than others.

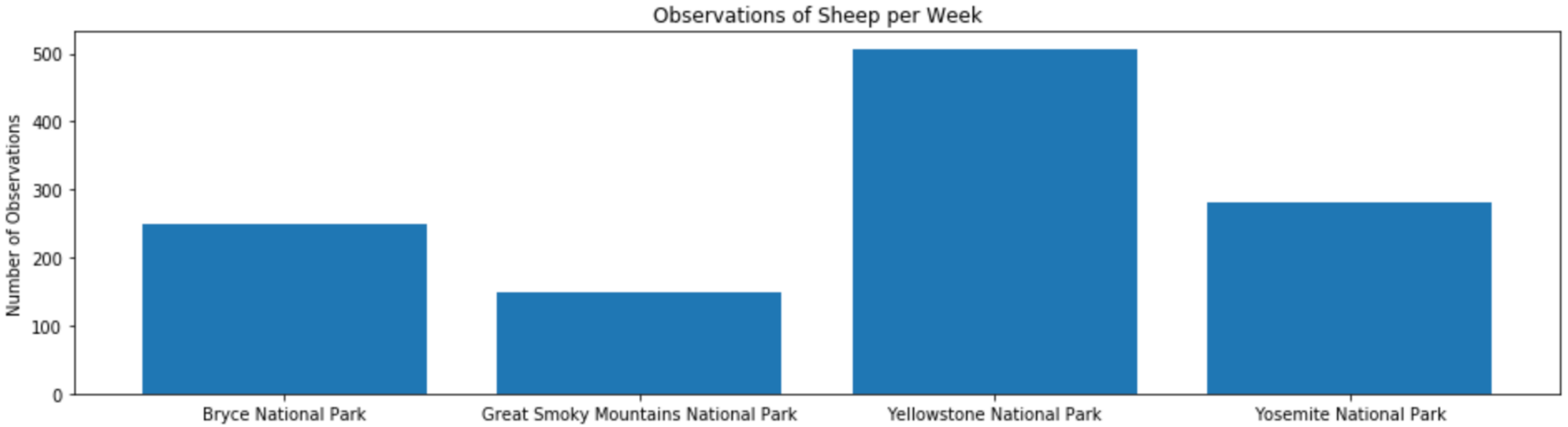
Recommendation

Although we found that the difference between the protection percentage of most species is not significant and is a result of chance, there are still certain types of species that are more likely to be endangered than others.

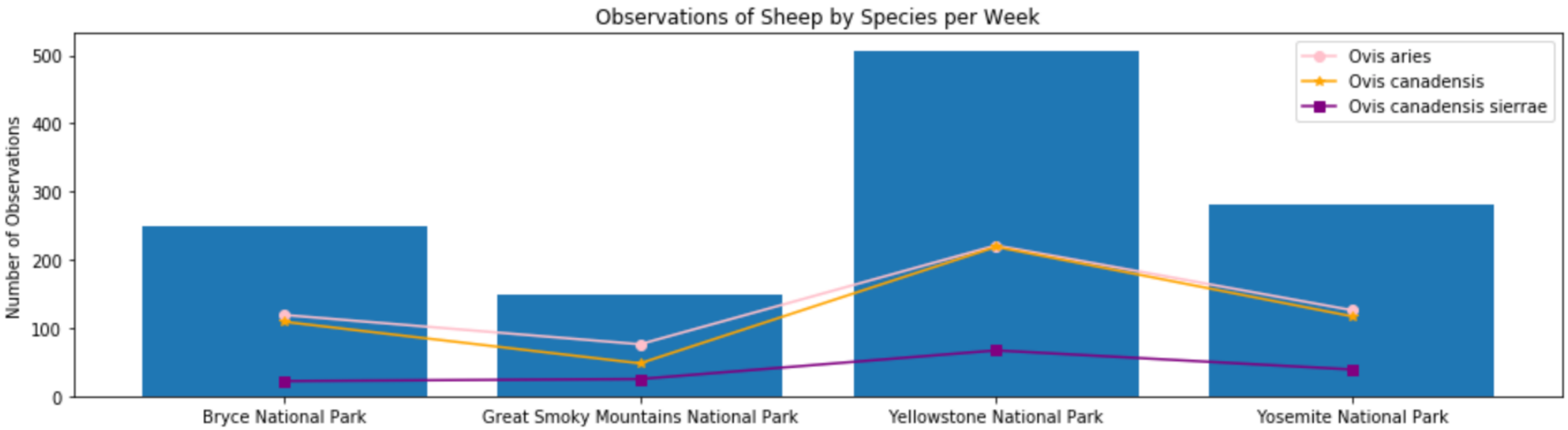
It is therefore recommended to give the protection of these species higher priority and monitor their conservation status more closely.

FOOT & MOUTH DISEASE STUDY

Observations of Sheep per Week



Observations of Sheep by Species per Week



Sample Size Determination

Given a 15% occurrence of foot and mouth disease at Bryce National Park, park rangers at Yellowstone National Park will need to observe 510 sheep for approximately 1 week to make sure that there will be at least a 5% drop in observed cases.

Park rangers running the same program at Bryce National Park will have to observe the same number of sheep for about 2 weeks.