

Biodiversity in National Parks

Data Analysis on Endangered Species

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Objective

1

Analyze data of all species at various national parks

2

Investigate certain types of species that are more likely to be endangered

3

Describe the sample size determination for the foot and mouth disease study

1. Dataset Analysis

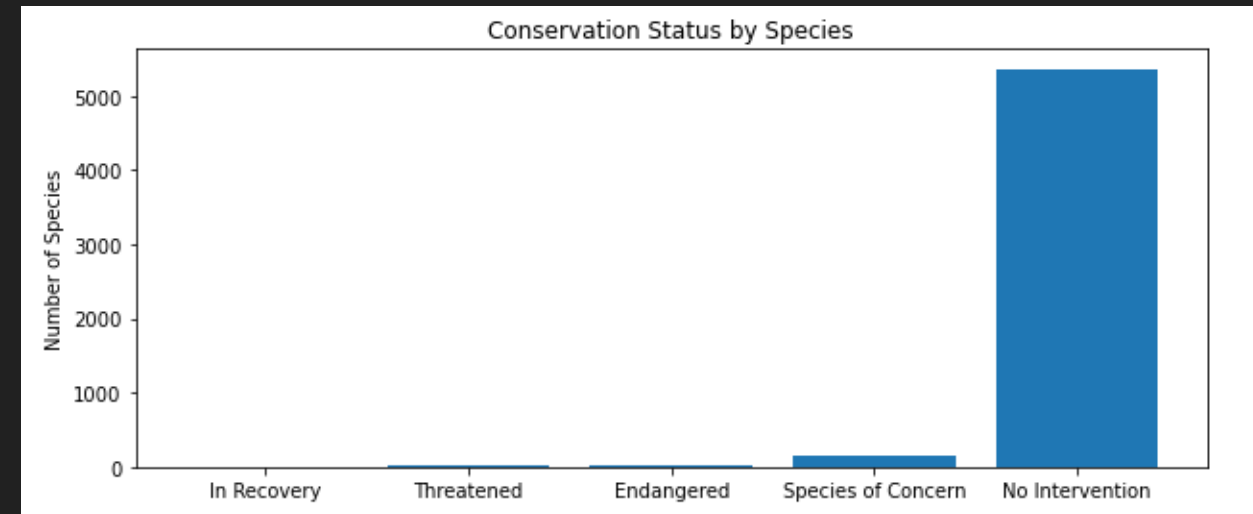
species_info.csv

There are **5,541 species** in all national parks

7 Categories : 5 Conservation Status:

Mammal
Bird
Reptile
Amphibian
Fish
Vascular Plant
Nonvascular Plant

Species of Concern
Endangered
Threatened
In Recovery
No Intervention



2. Endangered species of each category

	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

Species in the category **Mammal** are more likely to be endangered than species in **Bird**

*Species included in the protected category are species whose conservation status is other than 'No Intervention'.

Endangered species of each category

Significance test

	category	not_protected	protected	percent_protected
0	Amphibian	72	7	0.088608
1	Bird	413	75	0.153689
2	Fish	115	11	0.087302
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Bird & Mammal

Chi squared test

Result: p-value > 0.05
The difference isn't significant!

Meaning: Both Mammals and Birds are categorized as the most endangered species.

*Species included in the protected category are species whose conservation status is other than 'No Intervention'.

Endangered species of each category

Significance test

	category	not_protected	protected	percent_protected
0	Amphibian	72	7	0.088608
1	Bird	413	75	0.153689
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Reptile & Mammal

Chi squared test

Result: p-value < 0.05
There is a significant difference
between Reptile and Mammal

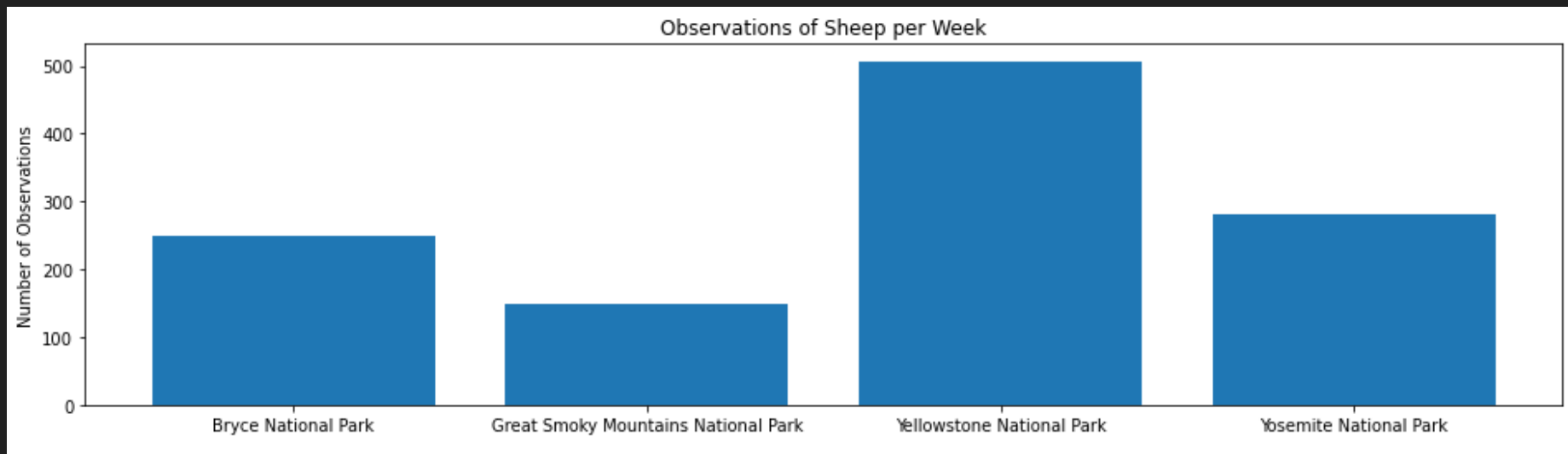
Meaning: Mammal is more likely to be
endangered than Reptile

Recommendations

- National parks need to take extra protection to Mammal and Bird as they are the most endangered species.

3. Sample size determination (food and mouth disease study)

- Some scientists are studying the number of sheep sightings at different national parks.
- These are the number of observations in each national park per week:



	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

3. Sample size determination (food and mouth disease study)

Program: Reducing foot and mouth disease rate Program (by Yellowstone National Park)

Goal: Reductions of at least 5 percentage points.

Information: 15% of sheep at Bryce National Park have foot and mouth disease.

10% of sheep in Yellowstone have foot and mouth disease.

Significance level = 90%

#Bryce National Park

Minimum detectable effect = $0.05/0.15 * 100 = 33.33$

Baseline = 15

Statistical significance = 90

Sample size = 870

Week to observe = $870/250 = 3.48$ weeks

#Yellowstone National Park

Minimum detectable effect = $0.05/0.10 * 100 = 50$

Baseline = 10

Statistical significance = 90

Sample size = 610

Week to observe = $610/507 = 1$ week

The scientists need 3.48 weeks to observe sheep at Bryce National Park and 1 week at Yellowstone National Park