
Protecting Wildlife: An Analysis

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Table of Content

Endangered Status Analysis

Objective

Dataset

Observations and Statistical Analysis

Significance Test Results

Recommendations

Foot & Mouth Disease Study

Observations Data

Overview

Sample Size

Length of Observation



Endangered Status between Species Categories



Objective

To find out whether certain species are more likely to be endangered than others.



Dataset: Species_info.csv

1

Contains information on **5541** different wildlife species that lives in our National Parks.

2

Basic information to better identify and analyze each species by their *scientific names, common names, and conservation status.*

3

The species are divided into different 7 categories: '**Mammal**', '**Bird**', '**Reptile**', '**Amphibian**', '**Fish**', '**Vascular Plant**', '**Nonvascular Plant**'.

4

Conservation status: **No Intervention***, **Species of Concern**, **Endangered**, **Threatened**, **In Recovery**.

*(previously 'Null', could also mean lack of data.)

Conservation Status

In order to pinpoint the types of species that are endangered and to detect any possible patterns, each species will be grouped by their conservation statuses.

We then counted how many species fall in each conservation criterias.

In Recovery

Threatened

Endangered

Species of
Concern

No Intervention

Was previously
“Endangered” but is no
longer in danger of
extinction.

Population level is at a
critical level which may
lead to endangerment.

In serious danger of
extinction, must be
protected.

Declining population,
conservation plan may
be useful to prevent
further decline.

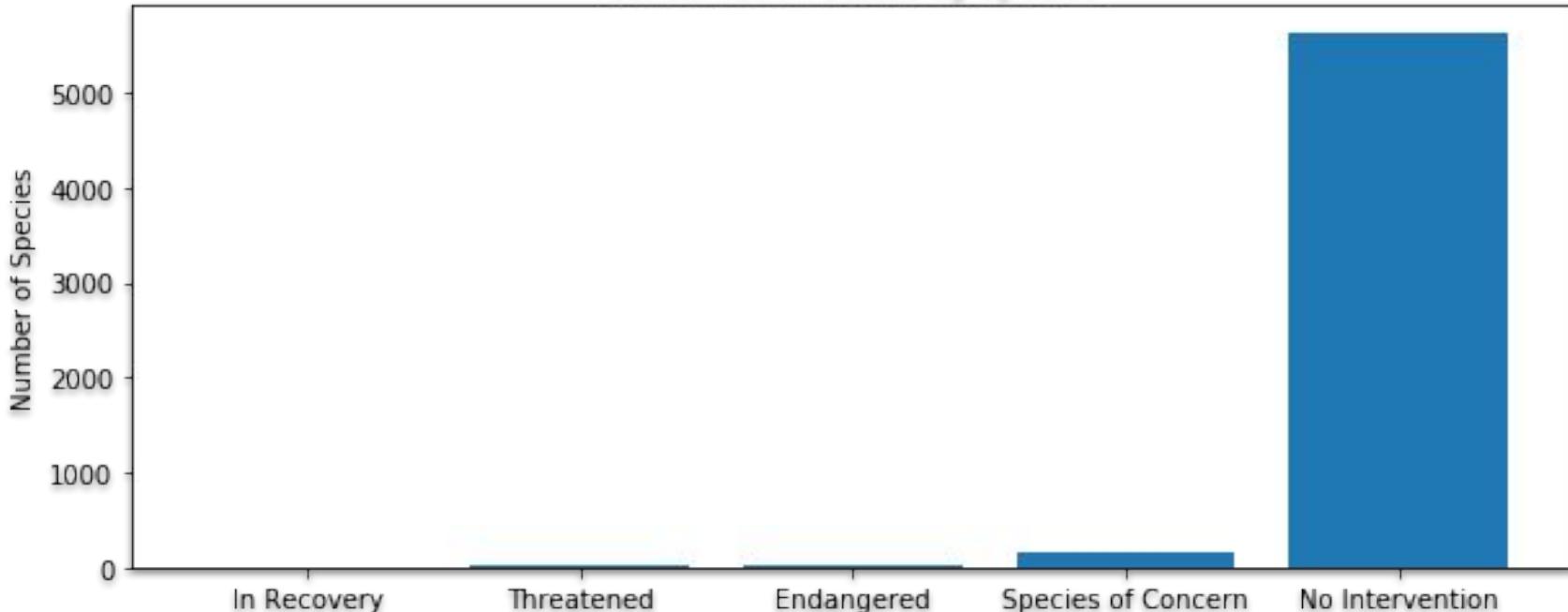
Does not require any
protection as of
currently.



Observations & Statistical Analysis



Conservation Status by Species



About **96.8%** (5363) of species fall in the "**No Intervention**" conservation status, while **0.27%** (15 species) fall into the "**Endangered**" category.

	conservation_status	scientific_name
0	Endangered	15
1	In Recovery	4
2	No Intervention	5363
3	Species of Concern	151
4	Threatened	10

About **96.8%** (5363) of species fall in the “No Intervention” conservation status, while **0.27%** (15 species) fall into the “Endangered” category.

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

new column (percent_protected) indicates how many % of animals in each respective category is currently protected.

<10%

Of species group currently protected

All but two species fall into this category.



"Nonvascular Plant" and "Reptile" seem to be the least protected group out of the rest.

>10%

Of species group currently protected

Two categories that are mostly protected happen to be "Mammal" & "Bird".



This indicates that these species are more likely to be endangered, which is why more % of them are protected.

Significance Test

Chi-Squared Test

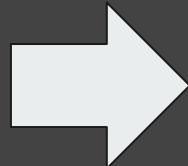


Based on previous table, some species does seem to be more likely to be endangered.



Significance Test

Chi-Squared Test



Null hypothesis: *The difference in percent protected between two species categories were a result of chance.*

Mammals vs Birds

Significance Test

Mammals and Birds are the two most protected species. However, Mammals are slightly more protected, does it mean that Mammals are more likely to be endangered than birds?

Results:

P-value = $0.688 > 0.05$, fail to reject null hypothesis.

The difference in the percent of protected Mammals and Birds **does not seem to be significant** enough, hence, the difference in % are simply the result of chance.. **We can say that Mammals are not more likely to be more endangered than birds.**



Mammals vs Reptiles

Significance Test

What about **Reptiles**? Reptiles doesn't seem to be in danger of extinction hence why it's not currently overly protected. How do they compare to Mammals?

Results:

P-value = $0.04 < 0.05$, reject null hypothesis.

There is a **significant difference** between the percentage protected of Mammals and Reptiles. There is evidence that **mammals are significantly more likely to be endangered than reptiles**, which is why more percent of mammals are protected.



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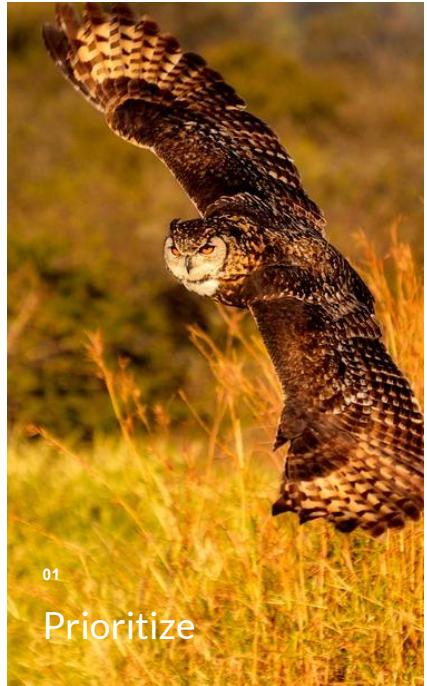
	category	not_endangered	endangered
0	Amphibian	78.0	1.0
1	Bird	484.0	4.0
2	Fish	122.0	3.0
3	Mammal	171.0	6.0
4	Nonvascular Plant	333.0	NaN
5	Reptile	78.0	NaN
6	Vascular Plant	4261.0	1.0

Conclusion

- Difference in our two most protected species (Mammals and Birds) was a result of chance (no significant difference).
- Difference between Mammals and Reptiles was significant.
- Some animal species **are more likely** to be endangered than others.

Recommendations

Some recommendations to improve the effectiveness of our current conservation programs based on results from significance calculations.



01

Prioritize

Problem: Some species are more likely to be endangered than others.

Species that are endangered and closer to extinction would require greater efforts for recovery.

- Focus more of our resources to preserve those species who appear to be in need of a more strict conservation program (e.g. Mammals).



02

Improve

Problem: Are our conservation programs effective and have the mechanisms to facilitate recovery?

Species specific programs with a clear goal (e.g. species recovery).

Flexible plans frequent revisions to ensure that it is still applicable.

- Costly? should cost less than having a plan that is simply ineffective and outdated.
- Further analysis of our current conservation programs would be beneficial .



03

Expand

Increase volunteering opportunities to aid with our conservation programs.

By allowing park guests, the government and private groups we will be able to increase awareness of the issue, especially among common people .





Sheep Foot & Mouth Disease Study





Observations Data

7 days

Of recorded sightings.

4 parks

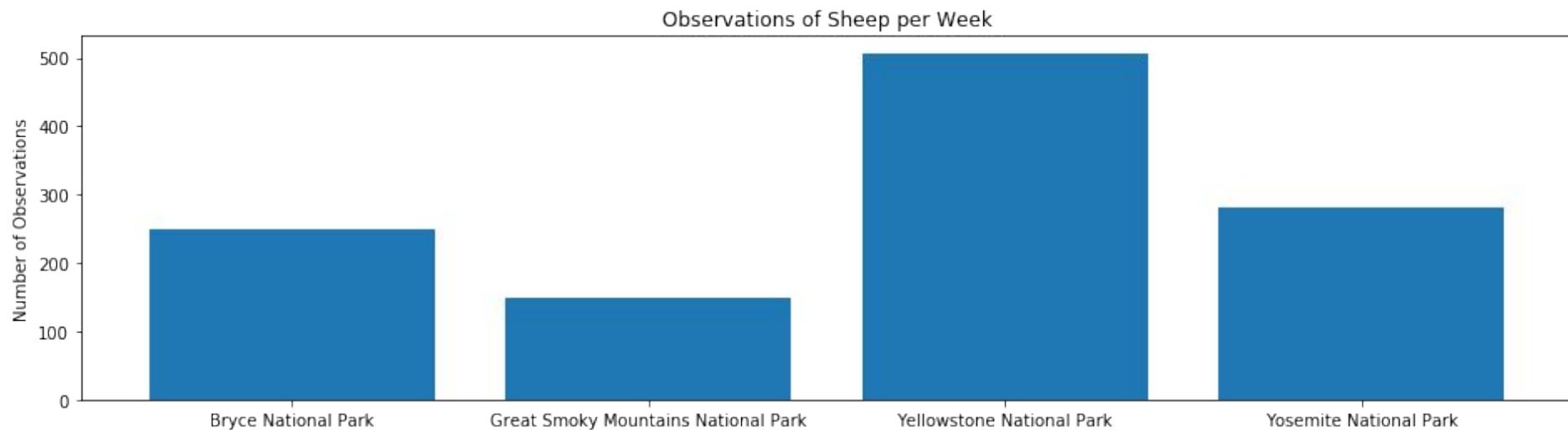
Observations were made in 4 different national parks.

Bryce, Great Smoky Mountains, Yellowstone and Yosemite National Parks.

3 species

There are 3 different sheep species observed.

Total sheep sightings at each national park (7 days)



Overview



Goal

Reduction of at least 5% rate of foot & mouth disease.



Program to reduce its rate

Park rangers in the Yellowstone National Park are running a program in an attempt to reduce the rate of the disease.



Current Information

We only have information that last year, 15% of sheep at Bryce National Park had foot & mouth disease.

Sample Size

Using *Optimizely* (sample size calculator) to determine the sample size needed for each park.

- Given an initial estimate (baseline) of 15% of foot & mouth disease rate in Bryce National Park.
- A 5% drop of disease rate would be the minimum desirable effect.
- Significance level used would be 90%

Sample size = 520 sheeps



Length of Observation

How many weeks do we need to observe enough sheep at Bryce and Yellowstone National Park?

(weekly observations at each park is based on the dataset/table)

Sample size = 520

Yellowstone | 507 total observations / 520 (sample size) = 1.03

It would take approximately **1 week** of observing.

Bryce | 250 total observations / 520 (sample size) = 2.08

It would take approximately **2 weeks** of observing.





Thank you.

