Biodiversity in the National Parks

Analysis by Courtnie Williams

Collected Information

- Species Types
- Scientific Name
- Common Name
- Conservation Status
- Is A Protected Species[+]
- Percent Protected[+]
- Is A Sheep[+]

[+] Indicates added column to species_info.csv

Species_info Breakdown by the Numbers:

7

Types of Species Studied:
Mammals, Vascular Plants, Nonvascular Plant, Amphibian, Bird, Reptile, Fish

5

Conservation Statuses:
No Intervention, Species of Concern, Threatened, Endangered, In Recovery

5,541

Unique Species Identified
(Scientific Names)

5,363

Species with No Intervention Needed

Conservation Status by Species

Are Certain Species More Likely to be Endangered?

The simple answer is ... **YES**

But first,

let’s look at how this determination was made.

Chi Squared Test

1. Select **two types of species** to compare.
2. Find the corresponding values for **protected vs not protected** of that species.
3. Create a **contingency table** of the values by species.
4. Calculate the **pval** and evaluate for significance.

If the pval is less than **0.05** this indicates a **significant difference**

The pvals:

0.68

Mammals vs Birds

Not significant

0.03

Mammals vs Reptiles

Significant difference!

This means that *Mammals are more likely than Reptiles* to be endangered. When it comes to comparing Mammals and Birds, there is **not** a significant difference to say that one is more likely than the other to be endangered.

Conservation Recommendations

- Mammals and Birds are the species to keep an eye on.
- Vascular and Nonvascular Plant species are at the lowest likelihoods of endangerment.

Additional Suggestions:

- Birds are *more likely* than Reptiles (pval = 0.053) ***and*** Nonvascular Plants (pval = 1.05 x 10^-10) to be endangered.
- Mammals are *more likely* than Nonvascular Plants (pval = 1.48 x 10^-10) to be endangered.

Now let’s dive into the

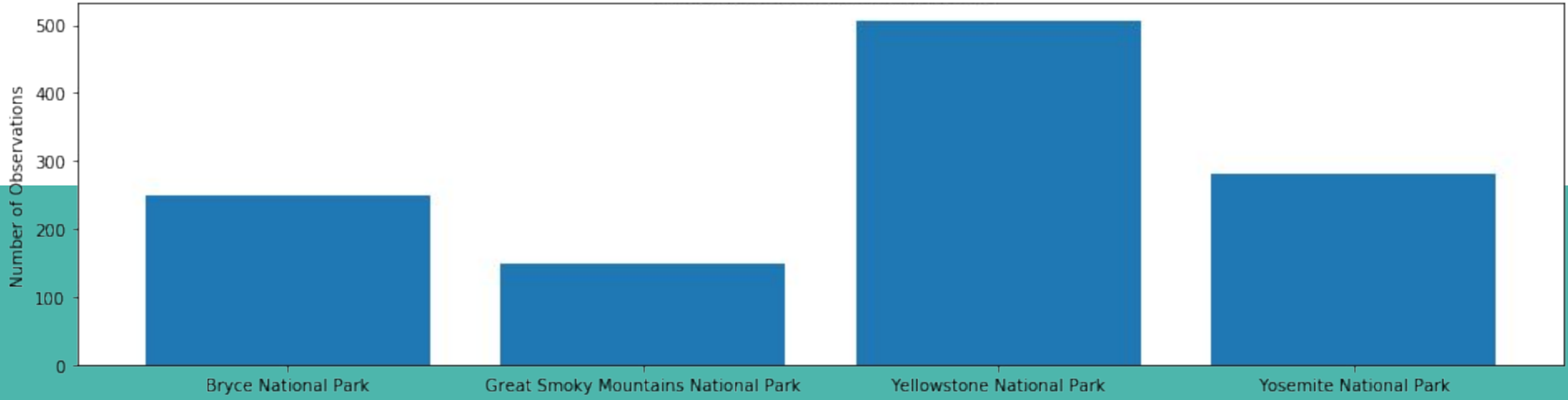
Foot and Mouth Disease Study of Sheep

Collected Information

- Scientific Name
- Park Name
- Observations (in a 7 day period)

This data was then merged with species_info.csv to give a more complete picture of the data.

Observations of Sheep per Week



So, How Long of an Observation Period Does Each Park Need for the Sheep Study?

First, let's talk

about how we calculate the sample size to observe and how long of an observation period is needed.

Sample Size Calculations:

1. Identify the **baseline conversion rate**.
2. Calculate the **minimum detectable effect**.
3. Select a percentage of **statistical significance**.
4. Input above values into a **sample size calculator**.

Baseline conversion rate =

15%

Minimum detectable effect = (100*5.0)/(baseline conversion rate *100) →

33.3%

Statistical significance =

90%

870

sample size needed to have confidence in the disease study results.

Observation Length Calculations:

Divide the **sample size** by the **number of observations** from the initial 7 day period.

Observation Length Needed for the Study:

**** Length is measured in weeks***

1.71

Yellowstone National Park

3.48

Bryce National Park

It’s been a pleasure!

Thank you for reading along.