Biodiversity in National Parks

Quantifying categories of species and identifying at-risk populations

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Data Description

Species Data

- 5,541 unique species
- Mammal, Bird, Reptile, Amphibian, Fish, Vascular and Nonvascular Plants
- Conservation Status (No endangerment to threatened, in recovery)

Observation Data

- 7 days of species observations
- 4 different National parks

Calculations of endangered species

Quantification of conservation

- Species table used to calculate the current status in conservation effort
- These were grouped by the status, and enumerated by species

Calculations of endangered species

To make all data visible, the y-axis was modified to a log scale.

- The majority do not require intervention
- Concern -> Threat -> Endang
  - There is a higher number of endangered, compared to threatened
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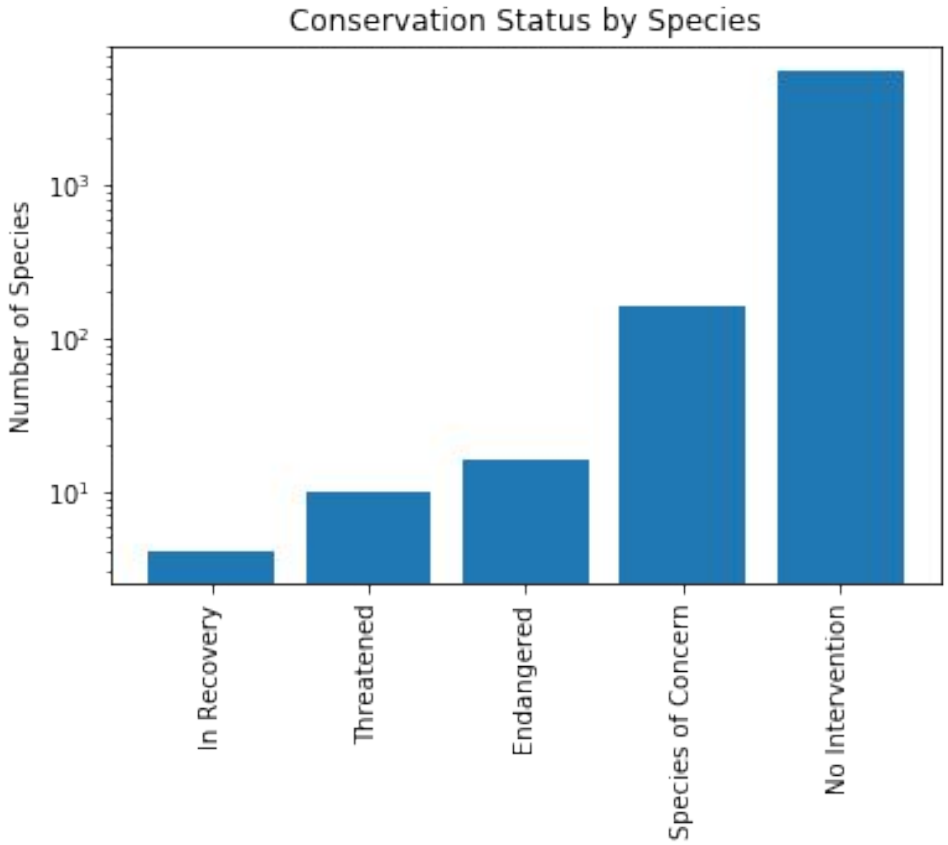
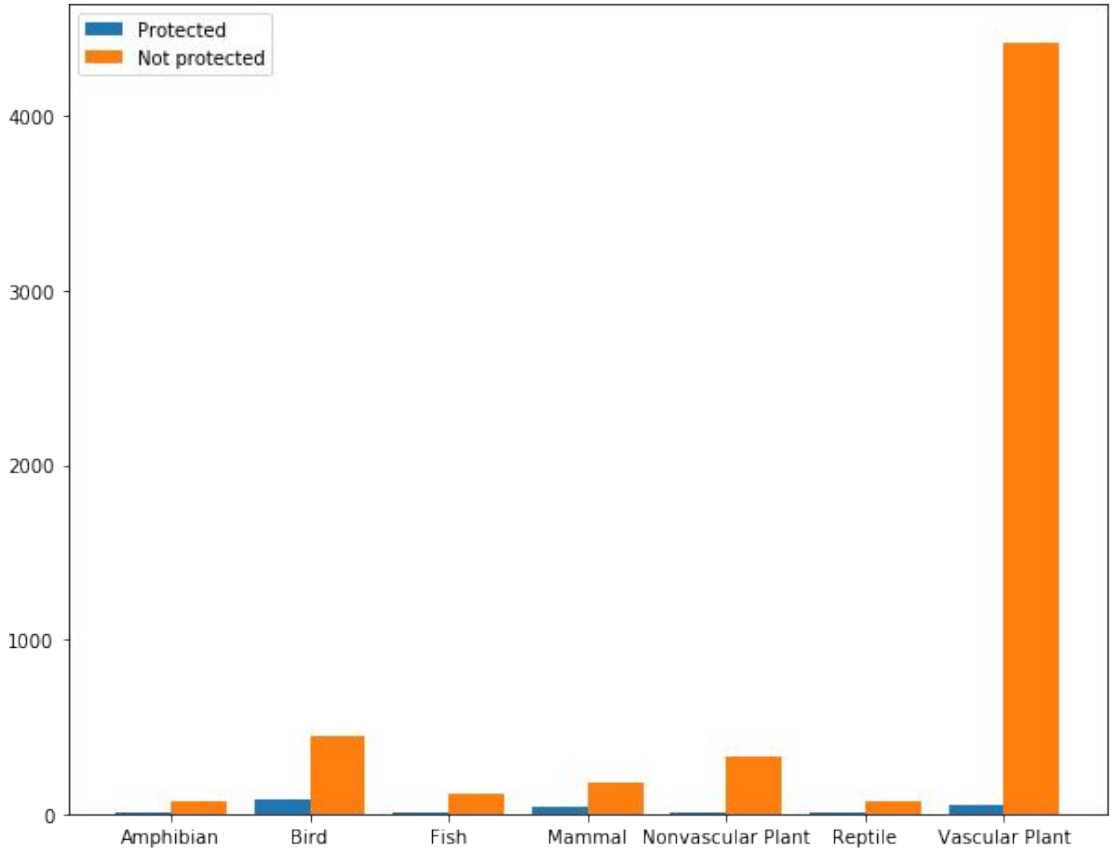


Protection within categories

A side-by-side bar graph of categories comparing the protection of categories.

For statistical analysis, we will compare these numbers for different categories.



Protection by category

category	not_protected	protected	percent_protected
Amphibian	73	7	0.0875
Bird	442	79	0.151631478
Fish	116	11	0.086614173
Mammal	176	38	0.177570093
Nonvascular Plant	328	5	0.015015015
Reptile	74	5	0.063291139
Vascular Plant	4424	46	0.010290828

Recommendation based on Protection values

Comparing these protection values by category

*Using a Chi-square because this is categorical data

Mammals vs Birds: 0.4459 p-value

Mammals vs Reptiles: *0.02338* p-value

We recommend an effort for protecting mammals that are threatened because there is a statistical significance in the number of protected species, as compared to reptiles.

Sheep observations in 4 NP’s

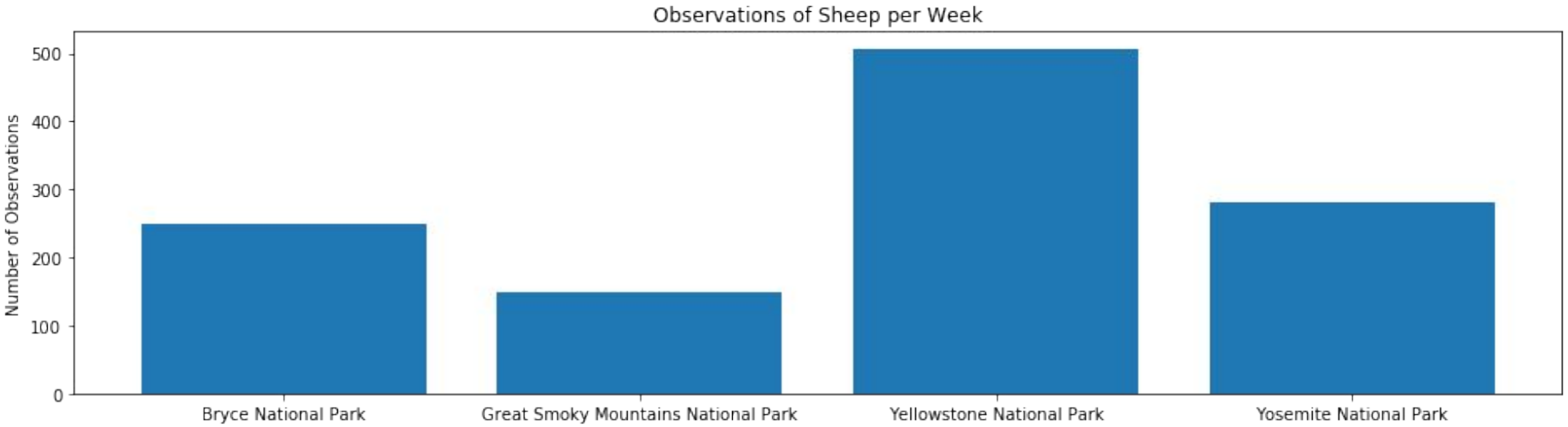
Background:

- Foot and Mouth disease is present in ~15% of the Sheep population.
- Rangers would like a reduction of 33% to 10% affected population.

Data analysis:

- Observations were processed to quantify species at different parks.
- Ranger request and observations combined for study design.

Sheep observations in 4 NP's



Sample size determination

#Baseline conversion rate = 0.15

#Minimum Detectable Effect = 15% -> 10% = 33% change

#Confidence Level = 0.90

Sample size = 520 observations of sheep per park

Sample size logistics

Based on this sample size, the weeks to observe are as follows:

park_name	observations	weeks_to_observe
Bryce National Park	250	2.08
Great Smoky Mountains National Park	149	3.489932886
Yellowstone National Park	507	1.025641026
Yosemite National Park	282	1.843971631