

Codecademy Capstone Project: Biodiversity for the National Parks



Source:

@YellowstoneNPS "A bighorn ram's horns can weigh up to 30 pounds. That's as much as the rest of the bones in their body!", *Twitter*, 19 May 2018, twitter.com/YellowstoneNPS/status/997856587086643200

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Discussion on Data

species_info.csv

- Contains data about different species in the National Parks.
- Columns
 - Category
 - Scientific Name
 - Common Names
 - Conservation Status

	category	scientific_name	common_names	conservation_status
0	Mammal	Clethrionomys gapperi gapperi	Gapper's Red-Backed Vole	NaN
1	Mammal	Bos bison	American Bison, Bison	NaN
2	Mammal	Bos taurus	Aurochs, Aurochs, Domestic Cattle (Feral), Dom...	NaN
3	Mammal	Ovis aries	Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral)	NaN
4	Mammal	Cervus elaphus	Wapiti Or Elk	NaN
5	Mammal	Odocoileus virginianus	White-Tailed Deer	NaN
6	Mammal	Sus scrofa	Feral Hog, Wild Pig	NaN
7	Mammal	Canis latrans	Coyote	Species of Concern
8	Mammal	Canis lupus	Gray Wolf	Endangered
9	Mammal	Canis rufus	Red Wolf	Endangered

Discussion on Data

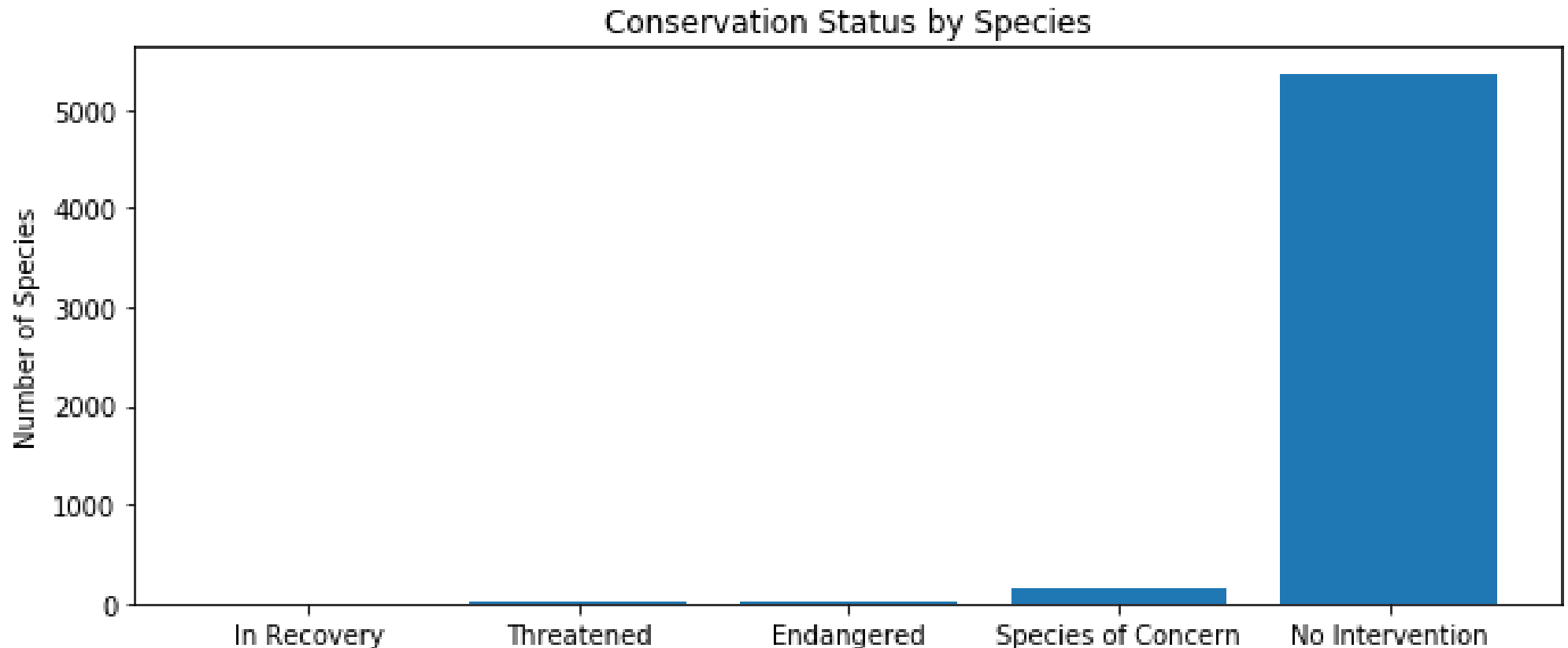
species_info.csv

- 5,541 unique species in the dataset
- Seven categories:
 - Mammal
 - Bird
 - Reptile
 - Amphibian
 - Fish
 - Vascular Plant
 - Nonvascular Plant

Discussion on Data

species_info.csv

- Conservation Status has five levels (number of species for given level in parenthesis):
 - In recovery (4)
 - Threatened (10)
 - Endangered (15)
 - Species of Concern (151)
 - No Intervention (5,363)



Discussion on Data

species_info.csv

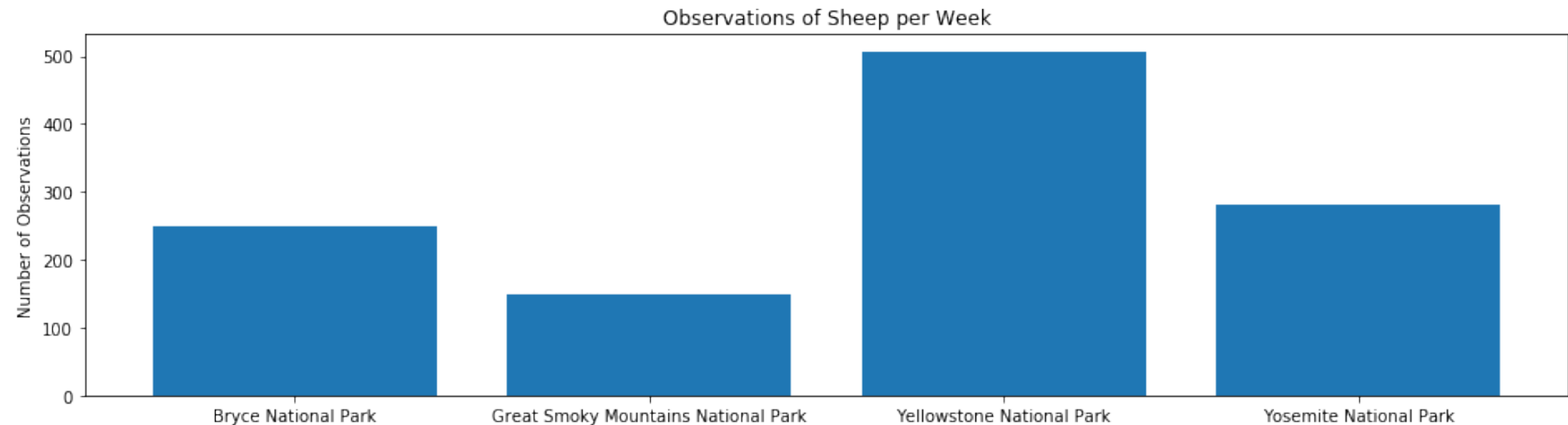
- The dataset contains three species of sheep where the category is “Mammal”
- One is Endangered, one is a Species of Concern, one is No Intervention

	category	scientific_name	common_names	conservation_status	is_protected	is_sheep
3	Mammal	Ovis aries	Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral)	No Intervention	False	True
3014	Mammal	Ovis canadensis	Bighorn Sheep, Bighorn Sheep	Species of Concern	True	True
4446	Mammal	Ovis canadensis sierrae	Sierra Nevada Bighorn Sheep	Endangered	True	True

Discussion on Data

species_info.csv

- There are four national parks in the dataset.
- Interested in the total number of observations of sheep (from prior slide) per week at each National Park.



Endangered Status Significance Calculations

- Interested in knowing whether there is a significant difference in the rate of protected status (e.g. percent of species that are not deemed “No Intervention”) between different categories.
- Categorical data, so a Chi Square test with a 5% p-value threshold is appropriate.
- It appears certain species are more likely to protected than others.
- Significant difference in the rate of protected status between Mammals and Reptiles (p-value = 3.8%)
- No significant difference in the rate of protected status between Mammals and Birds (p-value = 68.8%)

	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

Recommendation

- Scientists should conduct additional studies to better understand why the Percent Protected varies from category to category.

Foot and Mouth Disease Sample Size Determination

- Scientists know that 15% of sheep at Bryce National Park have Foot-and-Mouth disease.
- Scientists want to test whether or not a program aimed at reducing the disease is working. They want to detect reductions of at least 5%.
- Our baseline is 15%
- Our minimum detectable effect is 33.3%
- Our level of significance is 90%
- Minimum sample size is 510
- To meet this sample size, we would need to observe sheep for approximately 2 weeks at Bryce National Park and approximately 1 week at Yellowstone National Park.