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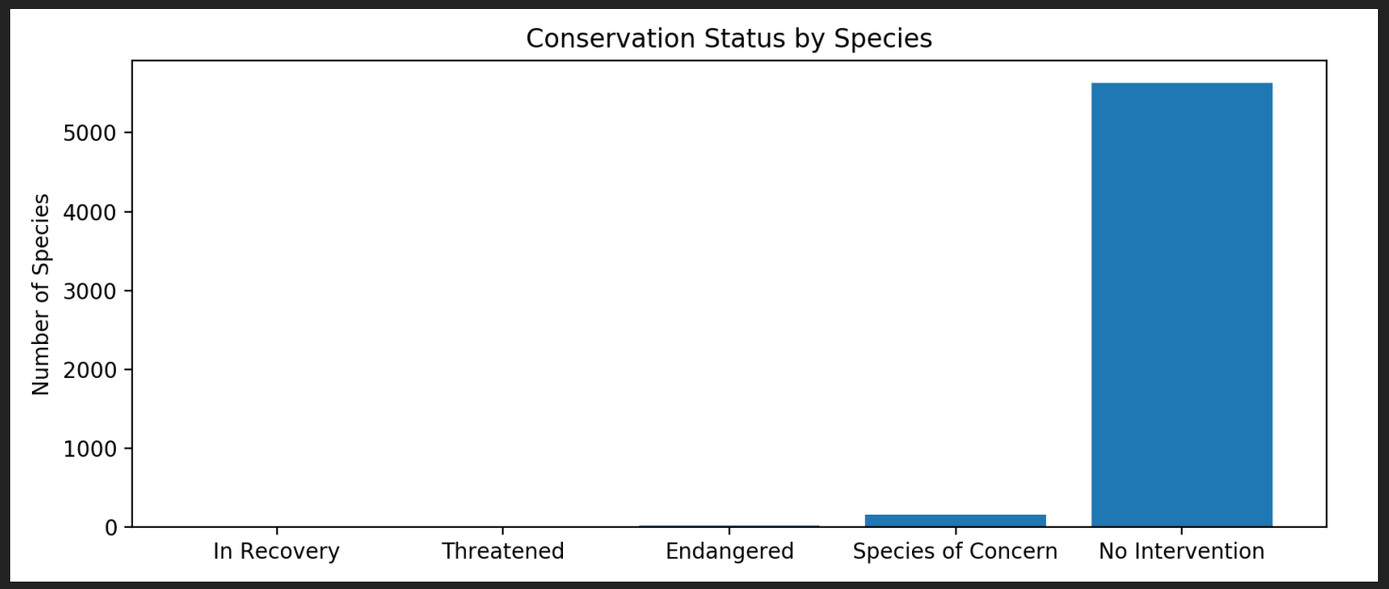
SYNOPSIS OF DATA

	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

- Data file (***species_info.csv***) consists of the following fields relating to various species observed within national parks:



- **Category of species**: Mammal, Bird, Reptile, Amphibian, Fish, Vascular Plant, Nonvascular Plant
- **Scientific name (SN) of species** (5,541 unique) - Bos bison, Ovis aries, etc.
- **Common name of species** - American bison, Domestic sheep, etc.
- **Conservation status**: Species of Concern (151 SNs), Threatened (10 SNs), Endangered (15 SNs), In Recovery (4 SNs), NaN (5363 SNs, subsequently mapped to 'No Intervention')

COMPARISON OF CONSERVATION STATUS

- Dataset was sorted by species and tabulated according to protection status and percent protected.

	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

- This allowed for construction of contingency tables required for χ^2 test.

	protected	not protected
Mammal	?	?
Bird	?	?

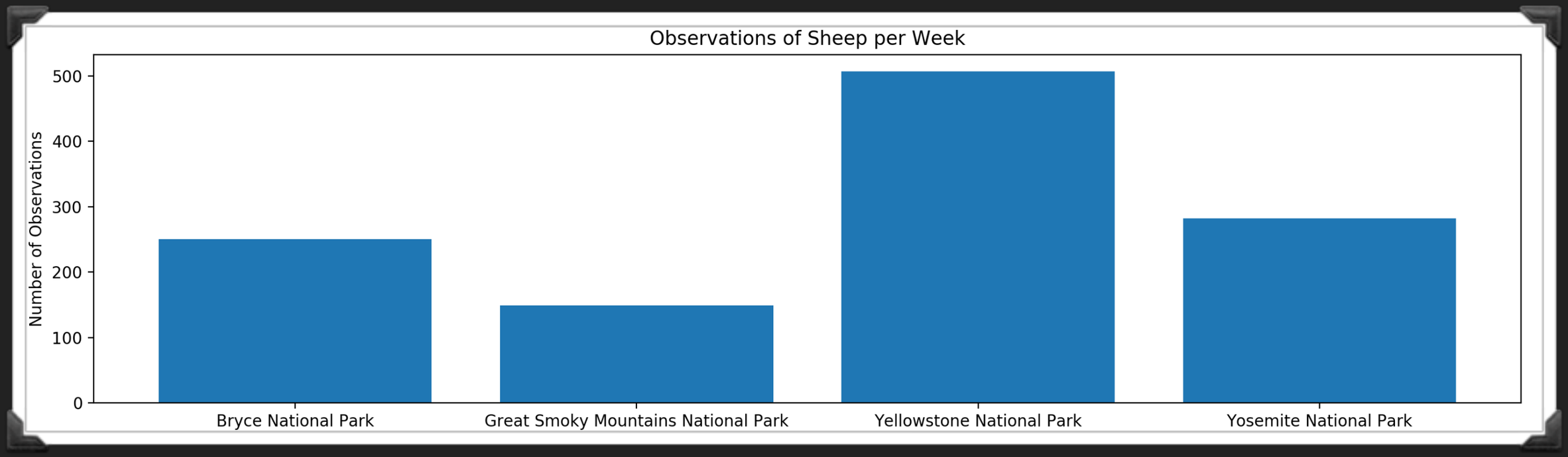
- χ^2 test was utilized to investigate significance of variation in percent of species protected (assuming $p>0.05$ indicates significance).

- Mammal vs Bird: $p \cong 0.69$ *Not Significant*
  Reptile vs Mammal: $p \cong 0.038$ ***Significant!***

Recommendation: *divert conservation efforts away from reptiles and focus on Mammals and Birds*

ANALYSIS OF SHEEP OBSERVATIONS

Merging the data in species_info.csv with the observations of sheep within Bryce, Great Smoky Mountains, Yellowstone, and Yosemite National Parks over 7 days yields the following:



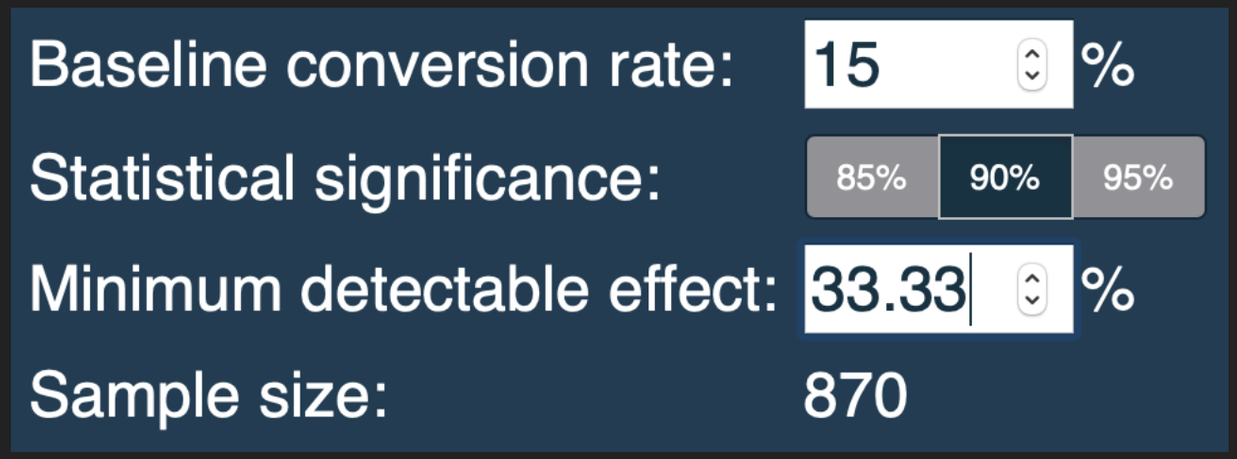
- *Yellowstone has more than 2x as many sheep observations over tis period than does Bryce.*

ANALYSIS OF REQUIRED SAMPLE SIZE

Based on the information provided:

Baseline conversion rate: 15%
Min detectable effect: 100 * (.05/.15) = 33.333
Statistical significance: 90%

and utilizing the provided sample size calculator yields:



Thus, based on the number of observations at each park per week:

- *Number of weeks to reach required sample size:*
  - ***Bryce: 870 sheep / 250 (sheep/wk) = 3.5 weeks***
  - ***Yellowstone: 810 sheep / 507 (sheep/wk)= 1.5 weeks***