Biodiversity at National Parks

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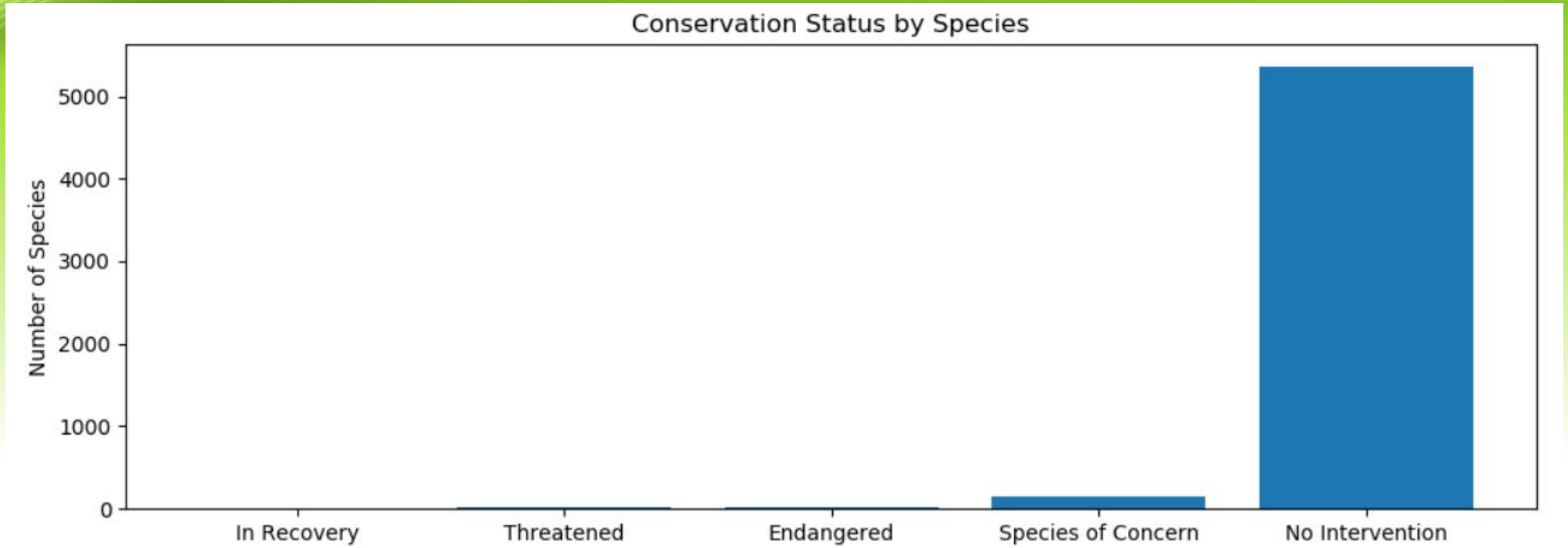
species_info.csv

	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), Domesticated Cattle	nan
3	Mammal	Ovis aries	Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral)	nan
4	Mammal	Cervus elaphus	Wapiti Or Elk	nan

- The dataframe species_info.csv contained basic animal classification information used to interpret the actual observations we found in our National Parks.
- Originally, 'conservation_status' had no information for species that were not in danger. We updated those species so that we could examine them in context with in-danger species.



- Luckily, the above chart produced from the data shows that the vast majority of species in these National Parks are not under threat.

Significance of Endangered Status

Category	Percent Protected (%)
Amphibian	8.86
Bird	15.37
Fish	8.73
Mammal	17.05
Nonvascular Plant	1.50
Reptile	6.41
Vascular Plant	1.08

- We determined that Mammals were the category of species with the highest percentage of protected species.
- Next, it was important to perform a Chi-Squared Test to see whether the percentage was significant versus other categories of species.

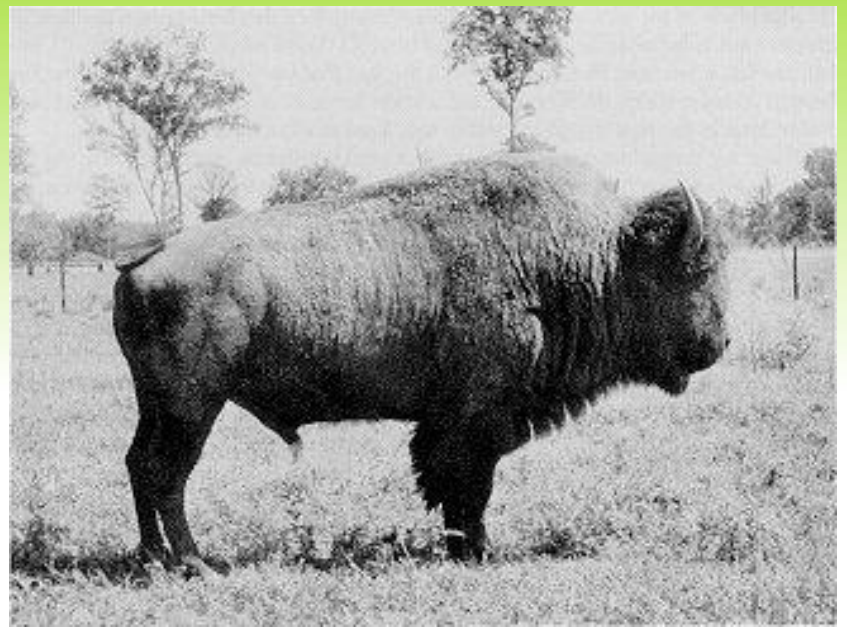
Significance of Endangered Status

```
#Step 8: Chi-Squared Test for Significance
contingency = [[30, 146], [75, 413]]
chi2, pval, dof, expected = chi2_contingency(contingency)
print(pval)
contingency_rp = [[5, 73], [30, 146]]
chi2_rp, pval_reptile_mammal, dof_rp, expected_rp = chi2_contingency(contingency_rp)
print(pval_reptile_mammal)
```

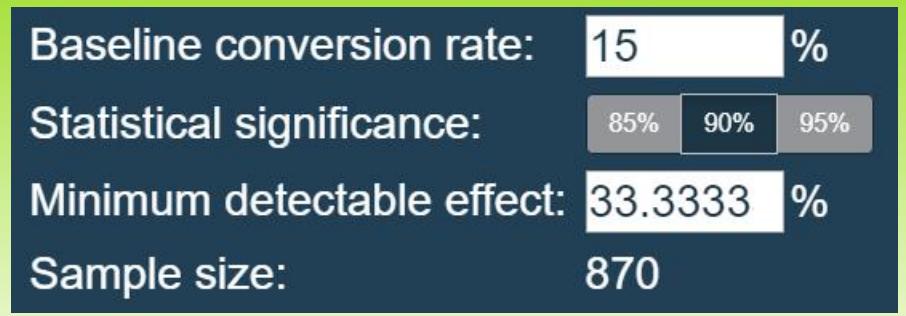
- **Birds:** The significance between Mammals and Birds was 0.6876 which means the relationship is not significant.
- **Reptiles:** The significance between Mammals and Reptiles was 0.0384 which means the relationship between the two is significant at the 5% level.

Conservationist Recommendation

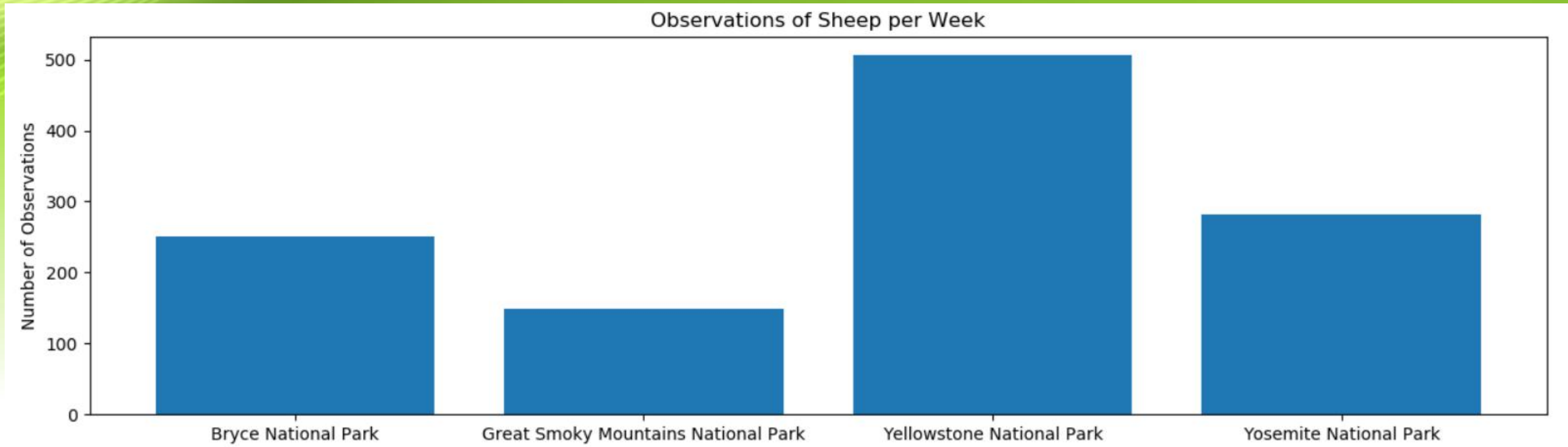
- It appears that Mammal species are most at risk and efforts made for their conservation may also benefit Reptile species at risk.
- Many Bird species are also fairly at risk. It also appears that different efforts will be required to protect Bird species than Mammals and Reptiles.



Sample Size Determination



- Our second effort focused on foot and mouth disease study for Sheep in National Parks.
- Bryce National Park was the park we used to determine our *Baseline Conversion Rate* where 15% of observed sheep had foot and mouth disease.
- We wanted to see how large of a sample would be needed to notice a change of 5%. Thus our *Minimum Detectable Effect* was 33.33% (5%/15%).
- With a *Statistical Significance* level of 90%, we came to a sample size of 870.



- We isolated all Mammal species that had “Sheep” listed in their common_name and organized them by National Park.
- With this information, we can then determine how many weeks of observation would be needed to fulfill our sample size.