BIODIVERSITY CAPSTONE PROJECT – INVESTIGATING PROTECTED SPECIES

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Agenda

- Species_Info.CSV
- Endangered Status Calculations
- Recommendation for Conservationists
- Foot & Mouth Disease Study
- Graphs

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- A title slide
- A section describing the data in **species_info.csv**. Be sure to include some (or all) of what you noticed while working through the notebook.
- A section describing the significance calculations that you did for endangered status between different categories of species.
- A recommendation for conservationists concerned about endangered species, based on your significance calculations
- A section describing the sample size determination that you did for the foot and mouth disease study
- All of the graphs that you created in the notebook

4 Species_Info.CSV

The initially loaded species_info.csv contained 5541 different species listed, with information on their category, scientific name, common name, and conservation status. The loaded csv was saved to the *species* dataframe.

	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

5 Species DF

Inspecting the DataFrame further showed some interesting results.

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['Mammal' 'Bird' 'Reptile' 'Amphibian' 'Fish'
'Vascular Plant'
 'Nonvascular Plant']
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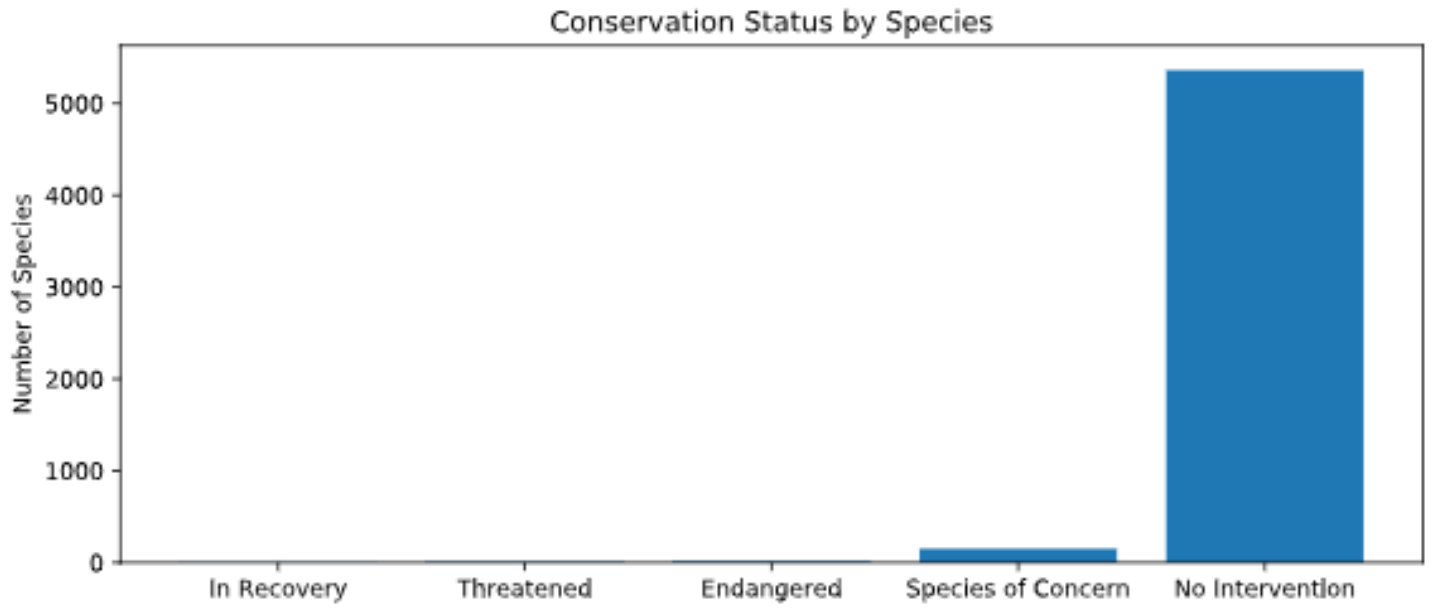
This is a list of all the unique categories

	conservation_status	scientific_name
0	Endangered	15
1	In Recovery	4
2	No Intervention	5363
3	Species of Concern	151
4	Threatened	10

This table represents the number of species for each conservation status *(i.e In the DataFrame there are 15 unique scientific names associated with the endangered conservation status)*

6 Species Graph



The distribution shown in this bar shows that most species are not listed as 'no intervention', meaning they are not protected species.

7 Endangered Species

Are Certain Types of Species More Likely to Be Endangered?

By using data analysis to calculate the number of protected and not protected species in each category, a new DataFrame was created.

A percent protected column was added to better represent differences between categories

	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

Chi-Squared Test for Significance

Null Hypothesis: The difference between percent protected of category X and category Y is due to chance.

Chi-Squared Contingency Test on Birds & Mammals Percent Protected	Chi-Squared Contingency Test on Reptiles & Mammals Percent Protected
P-Value = 0.688	P-Value = 0.038
There ***IS NOT*** a significant difference between the endangerment rates of mammals and birds	There ***IS*** a significant difference between the endangerment rates of mammals and reptiles

Conclusion: Certain types of species are more likely to be endangered than others.

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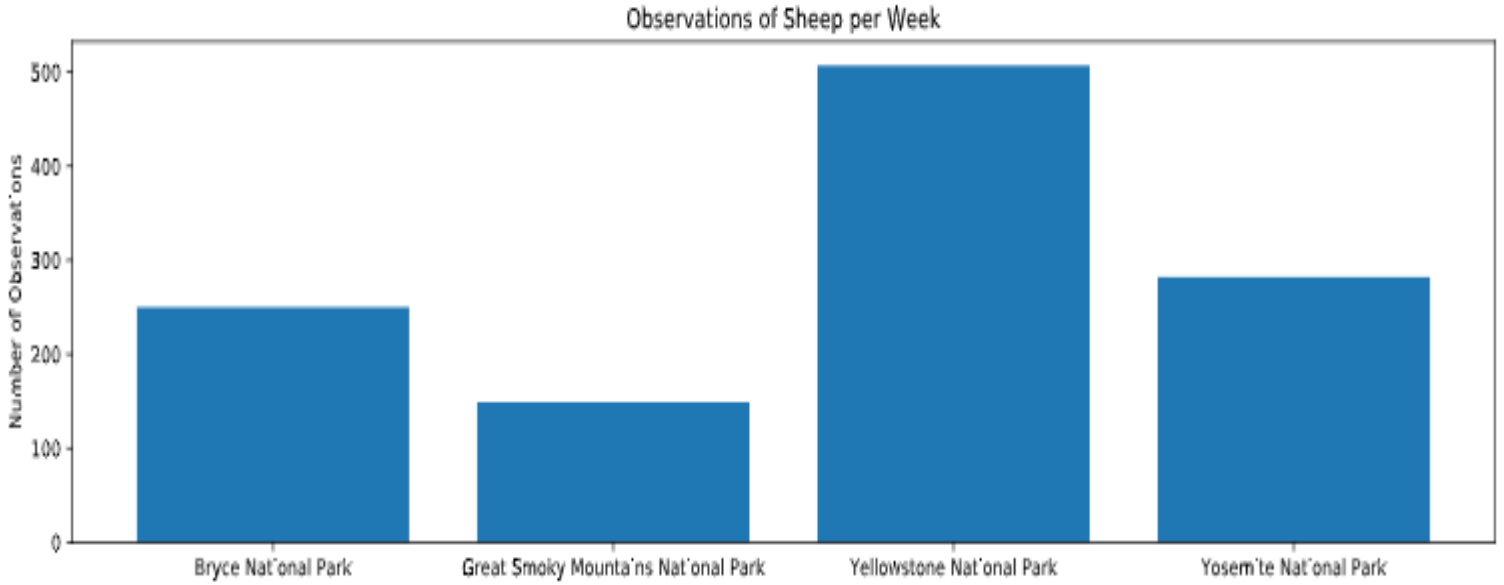
Recommendation

While it is important to implement conservation efforts for ALL protected species, conservations should observe the difference in the effects of habitat degradation, pollution, overpopulation, etc. between reptiles and mammals, and concentrate resources on addressing these issues in increased conservation efforts for mammals.

Foot & Mouth Study Sample Size Determination

Baseline	Last year the recorded percentage of sheep with foot & mouth disease at Bryce was **15%,** leading that to be the expected baseline percentage for the new study
Minimum Detectable Effect	The observers want to detect at least a 5% difference, so the minimum detectable effect is 100*(5/15) = **33%**
Sample Size Per Variant	A default statistical significance of 90% was used, and the sample size per variant was calculated to be **870** sheep
Yellowstone Observation Length	The determined sample size of 870 was divided by number of observations in Yellowstone (507) to get **1.72 weeks**
Bryce Observation Length	The determined sample size was divided by number of observations in Bryce (250) to get **3.48 weeks**

Observations of Sheep Per Week Bar Chart



Thank You!

Questions?