Biodiversity for the National Parks: An Analytical Approach

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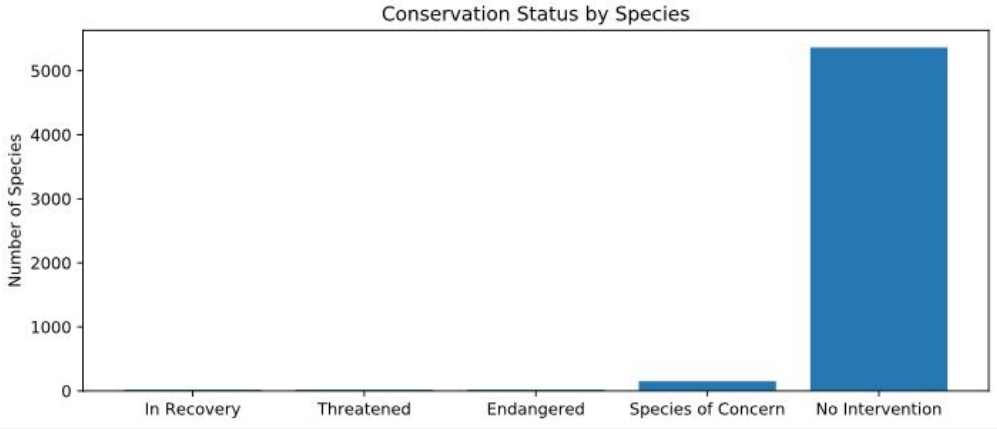
species_info.csv

- species_info.csv is the original data set that was analyzed in order to compare endangerment rates of various species.
- Contains four columns:
  - “category”, defines the general type of organism: Mammal, Bird, Reptile, Amphibian, Fish, Vascular Plant, or Nonvascular Plant.
  - “scientific_name”, defines the scientific name for the species described in a given row.
  - “common_names”, defines the common names for the species described in a given row.
  - “conservation_status”, the conservation status of that particular species. Can have no value.
- There are 283 duplicate entries in this data set.

Endangered Status of Analyzed Species

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



The majority (96.8%) of the species analyzed are in the “No Intervention” category. However, of the remaining species, only <0.1% are in recovery. Over 4% of the species are a Species of Concern, or have a more severe endangered status.

Chi-Squared Tests

- Two Chi-Squared Tests were performed to determine the significance between the percentage of species that are protected across certain categories.
- $p = 0.69$ for Mammals vs. Birds, suggesting that the difference in their protection numbers is likely due to chance.
- $p = 0.04$ for Reptiles vs. Mammals, suggesting that the difference in their protection numbers is likely significant and not due to chance.

Suggestions for Conservationists

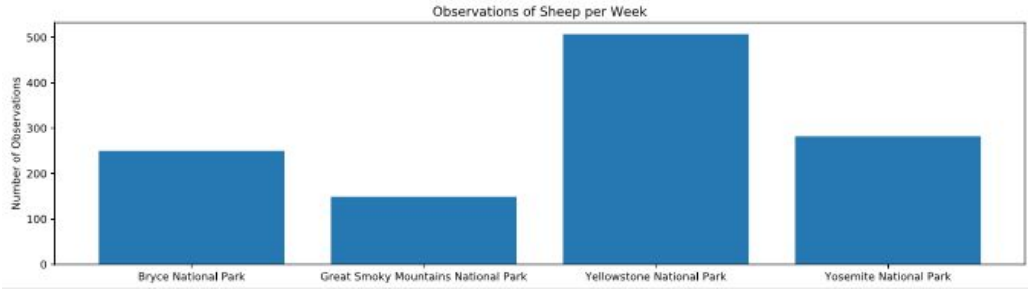
- The data suggests that Mammals are significantly more protected via conservation than Reptiles, while this is not true for Mammals vs. Birds. Considering the information presented here:
  - Conservationists should focus on the endangerment levels of Mammals more than Reptiles, due to the significant difference between their protection percentages.
  - Conservationists should not focus their attention on Birds over Mammals, or vice versa, as their difference in protection percentages is not significant.

Foot and Mouth Disease at Yellowstone National Park

- Park Rangers at Yellowstone National Park have been working to decrease the rate of foot and mouth disease among sheep within their jurisdiction.
- Whether or not this program is significantly reducing the rate of foot and mouth disease is unknown.
- A Sample Size Determination calculator was utilized in order to ascertain the appropriate sample size for this significance analysis.

Sample Size Determination Results

	park_name	observations
0	Bryce National Park	250
1	Great Smoky Mountains National Park	149
2	Yellowstone National Park	507
3	Yosemite National Park	282



Last year, 15% of sheep at Bryce National Park had foot and mouth disease. Using a statistical significance of 90%, a minimum detectable effect of 33.33%, and the above observation data:

- A sample size of 870 sheep is required for significance determination.
- This equates to 1.72 weeks of observation at Yellowstone and 3.48 weeks of observation at Bryce.

Thank you for your time!