BIODIVERSITY FOR NATIONAL PARKS

Codecademy Data Analysis Capstone project

PURPOSE

To analysis data on the conservation statuses of identified species within national parks

Investigate if there are any patterns or themes to the types of species that become endangered

Prepared by Michael Randle

Species Data Collection

Data about different species found in our National Parks was collected. The data collected falls under the following headings:

- Species Category
  - Mammal
  - Bird
  - Reptile
  - Amphibian
  - Fish
  - Vascular Plant
  - Nonvascular Plant
- The scientific name of each species
- The common names of each species
- The species conservation status
  - Endangered
  - In Recovery
  - Species of concern
  - Threatened

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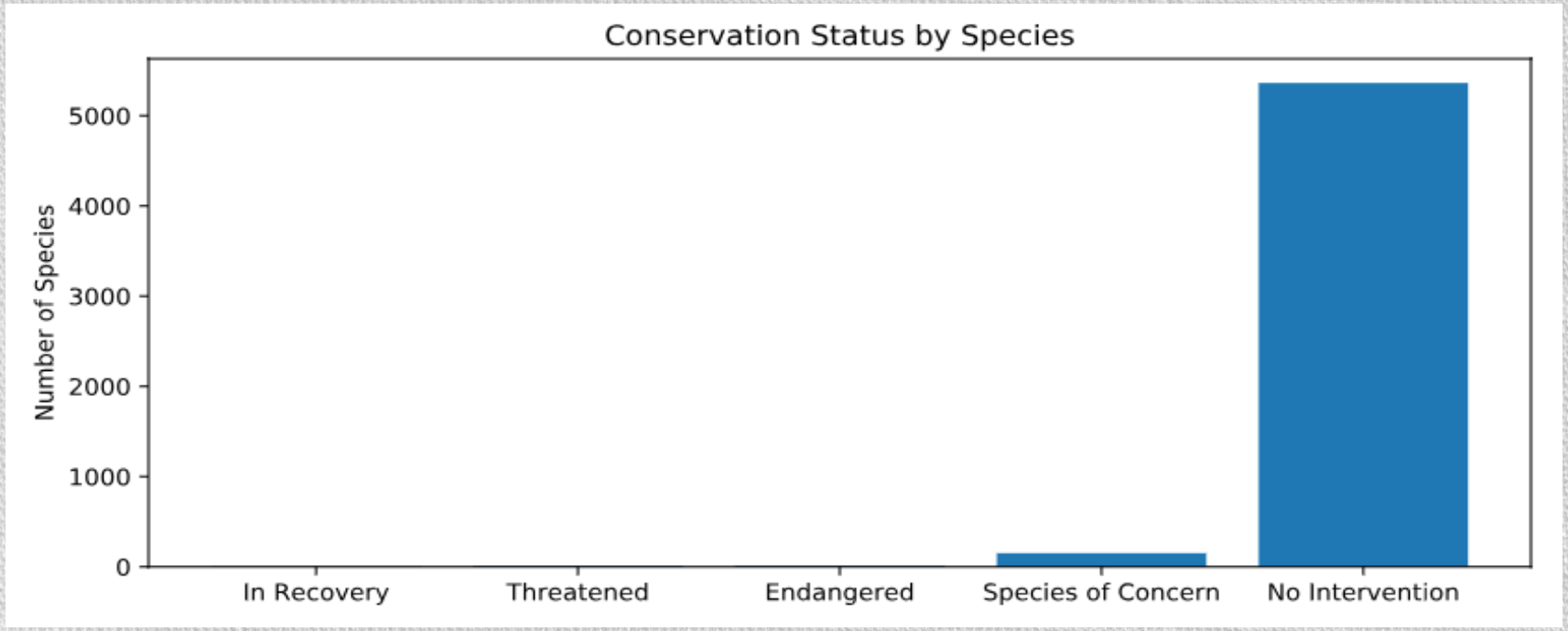
Conservation Status definitions

- **Species of Concern**: declining population or appears to be in need of conservation.
- **Threatened**: vulnerable to endangerment in the near future.
- **Endangered**: seriously at risk of extinction.
- **In Recovery**: formerly Endangered, but currently not in danger of extinction throughout all or a significant portion of its inhabitable range.
- **No Intervention**: No current threat to the population

About the data

- Data for a total of 5,541 different species were collected
- An analysis of the data by Conservation status had the following results:

Conservation status	Count
Endangered	15
In Recovery	4
No Intervention	5363
Species of Concern	151
Threatened	10



Conservation Status by Species

- A breakdown of the species data by Category produced the following results based on whether a species required intervention.

Species Category	Protected	Not Protected	% protected
Amphibian	7	72	8.86%
Bird	75	413	15.37%
Fish	11	115	8.73%
Mammal	30	146	17.05%
Nonvascular Plant	5	328	1.50%
Reptile	5	73	6.41%
Vascular Plant	46	4216	1.08%

Vulnerability of species categories

- Statistical analysis of these results demonstrates that some species categories are more vulnerable than others.
- Chi-squared tests demonstrated the following significance results:
- There is no significant difference in risk between mammals and birds
- There is a significant difference in risk between mammals and reptiles
- Based on these results there appears to be the greatest risk of species endangerment for birds and mammals
- Vascular and non-vascular plants have significantly lower risk
- Amphibians, fish, and reptiles have a similar level of risk, between the above two groupings.

SHEEP FEET

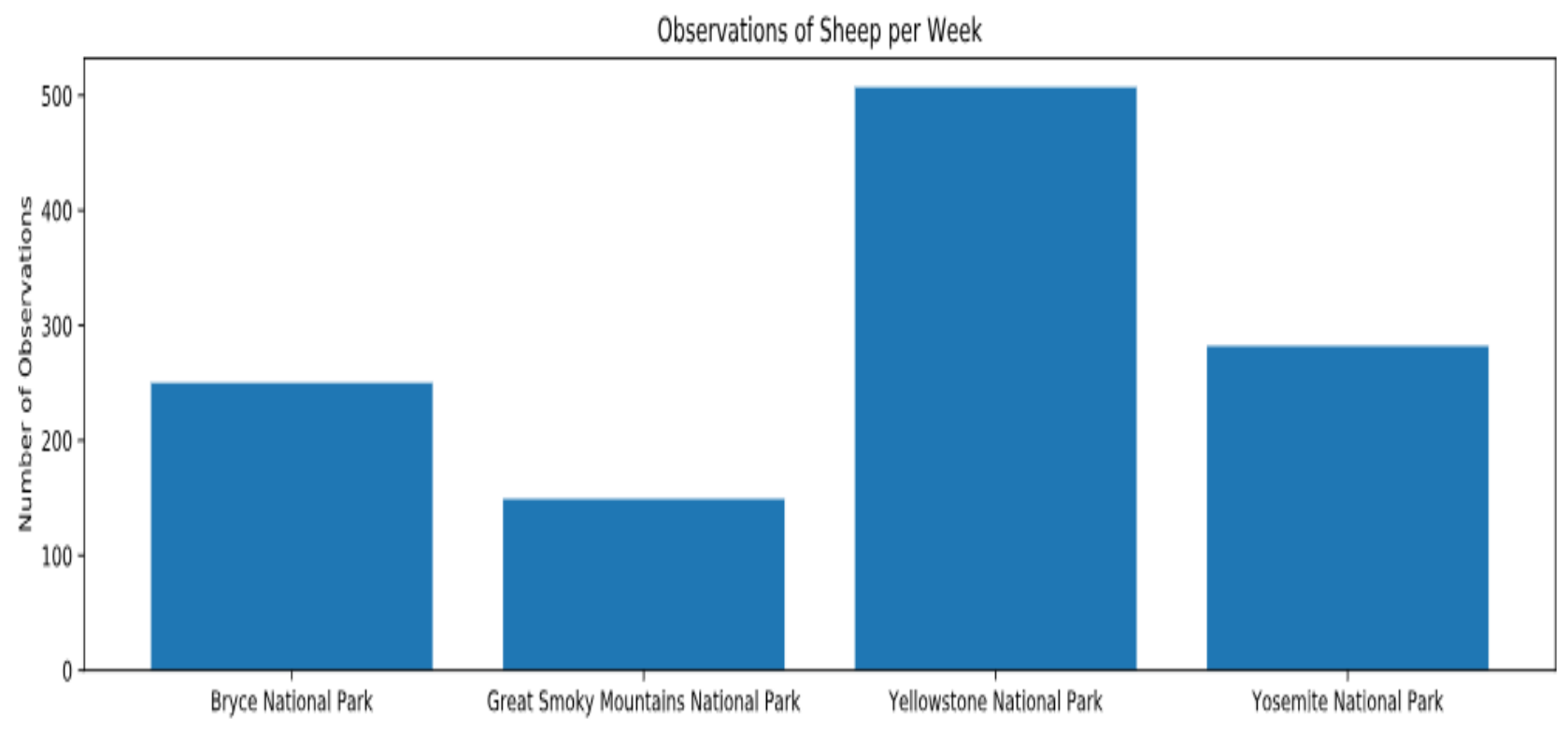
An analysis of sheep numbers in National Parks to assist with foot and mouth disease management

Sheep observation data

- Observations data was collected over a 7 day period
- Observations data for mammalian sheep was extracted and combined with species data for National Parks.
- The table below summarises the number of sheep observations for a one week period broken down by park name.

Park name	Count
Bryce National Park	250
Great Smoky Mountains National Park	149
Yellowstone National Park	507
Yosemite National Park	282

Below is a graphical representation of this data



Foot and Mouth disease reduction

- Park Rangers at Yellowstone National Park have been running a program to reduce the rate of foot and mouth disease at that park
- Determination of an appropriate sample size was necessary to gauge the effectiveness of the program
- The desired parameters for this analysis are as follows:
  - ✓A change in infection rates of 5 percentage points must be detectable
  - ✓In the previous year, 15% of sheep at Bryce National Park had foot and mouth disease
  - ✓A statistical significance of 90% is required
- An A/B test was used with the above parameters for sample size determination

Sample size determination results

- Observations of at least 870 sheep would be required to meet sample size requirements for a statistically significant result.

- Given the number of observed sheep for each National Park, this would require:

  - Approximately twelve days of observing in Yellowstone National Park

  - Approximately three and a half weeks of observing in Bryce National Park