BIODIVERSITY

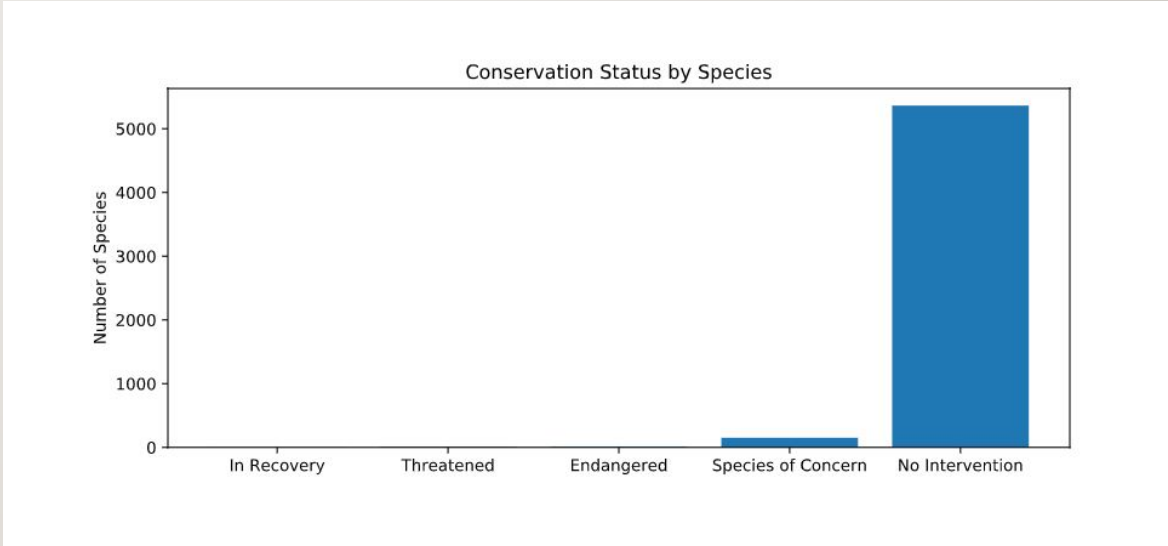
INVESTIGATING PROTECTED SPECIES

SPECIES DATA

- The species information data file contains 5541 unique species of animals
- The file contains 7 types of species:
  - Mammal
  - Bird
  - Reptile
  - Amphibian
  - Fish
  - Vascular Plant
  - Nonvascular Plant

SPECIES DATA

- The comma delimited file contains 5 types of conservation status
  - No Intervention – 5363 species
  - Species of Concern – 151 species
  - Endangered – 15 species
  - Threatened – 10 species
  - In Recovery – 4 species



SPECIES DATA

- It appears that only small percentages of the various types of species are protected
  - Amphibian – 8.86%
  - Bird – 15.37%
  - Fish – 8.73%
  - Mammal – 17.05%
  - Nonvascular Plant – 1.5%
  - Reptile – 6.41%
  - Vascular Plant – 1.08%

SPECIES DATA

- Judging by the percentages on the previous slide, plants (both vascular and nonvascular), and reptiles are the least likely species to be endangered
  - Reptiles – 6.41% protected
  - Nonvascular Plants – 1.5% protected
  - Vascular Plants – 1.08% protected
- Additionally, it appears that mammals and birds are the most likely species types to be endangered, with mammals being slightly more likely to be endangered than birds
  - Mammals – 17.05% protected
  - Birds – 15.37% protected

SIGNIFICANCE CALCULATIONS

- Is the aforementioned difference between birds and mammals significant?
- After completing a chi-squared test for significance, we find that the resulting p-value is roughly 0.69
- Since this p-value is greater than 0.05, we find that the difference in the percentage of protected birds and the percentage of protected mammals is not significant

SIGNIFICANCE CALCULATIONS

- Is the difference between reptiles and mammals significant?
- After completing a chi-squared test for significance, we find that the resulting p-value is roughly 0.04
- Since this p-value is less than 0.05, we can conclude that the difference between protected reptiles and mammals is significant

FINAL CONSERVATION THOUGHTS

- While the difference between the percentages of protected birds and mammals is not significant, the difference between reptiles and mammals is significant
- With this information, we can conclude that certain types of species are definitely more likely to be endangered than others
- Conservationists should take this data into consideration when choosing which species they should focus their conservation efforts on

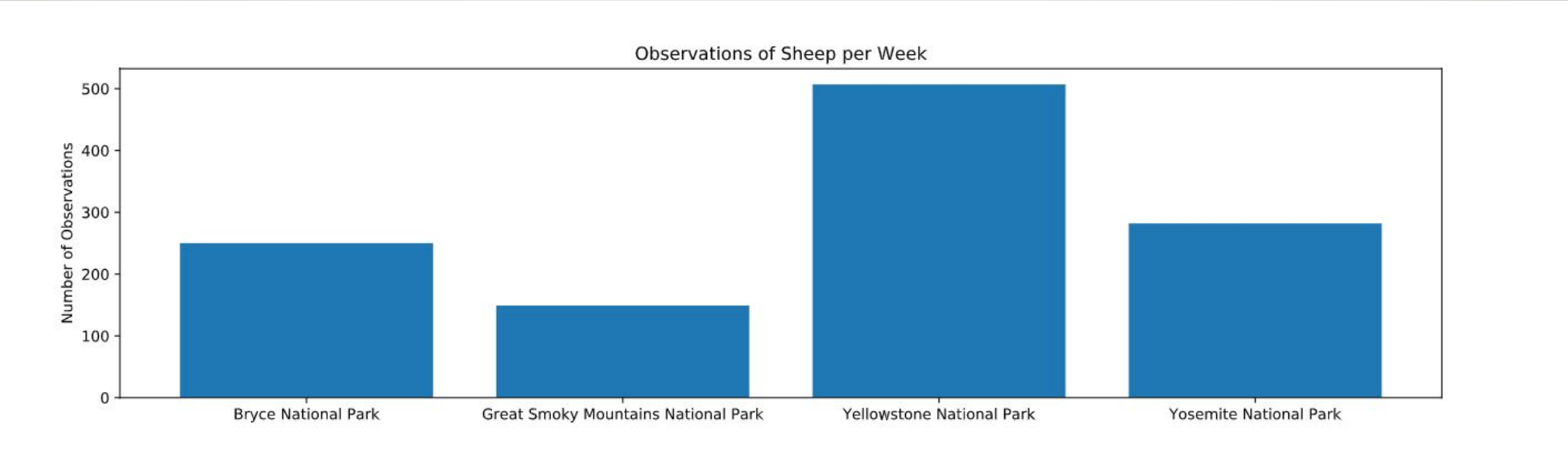
BIODIVERSITY

FOOT AND MOUTH REDUCTION EFFORT

FOOT AND MOUTH REDUCTION

- A week was spent observing sheep in four national parks – the counts of sheep spotted are below
- Observations of Sheep per Week:
  - Bryce National Park – 250 sheep
  - Great Smoky Mountains National Park – 149 sheep
  - Yellowstone National Park – 507 sheep
  - Yosemite National Park – 282 sheep

FOOT AND MOUTH REDUCTION



FOOT AND MOUTH REDUCTION

- How can we tell if the foot and mouth reduction program is working?
- We want to find whether we can see a reduction in the disease of at least 5 percentage points
- How many sheep will we need to observe at each park in order to make a determination?
- Based on this sample size, how many weeks will we need to observe sheep at each park?

FOOT AND MOUTH REDUCTION

- Last year, 15% of sheep at Bryce National Park had foot and mouth disease – this will be our baseline for determining the necessary sample size
- We want to see at least a 5% reduction, so our minimum detectable effect is roughly 33.33%
- With a statistical significance of 90%, the sample size per variant is 870
- We can use this sample size per variant to discern how many weeks will need to be spent observing the sheep at each park in order to see 870 sheep

FOOT AND MOUTH REDUCTION

- Weeks of observation required in order to meet the minimum sample size of 870
  - Bryce National Park – 3.48 weeks
  - Great Smoky Mountains National Park – 5.84 weeks
  - Yellowstone National Park – 1.72 weeks
  - Yosemite National Park – 3.09 weeks