BIODIVERSITY IN NATIONAL PARKS

23 JUNE 2020

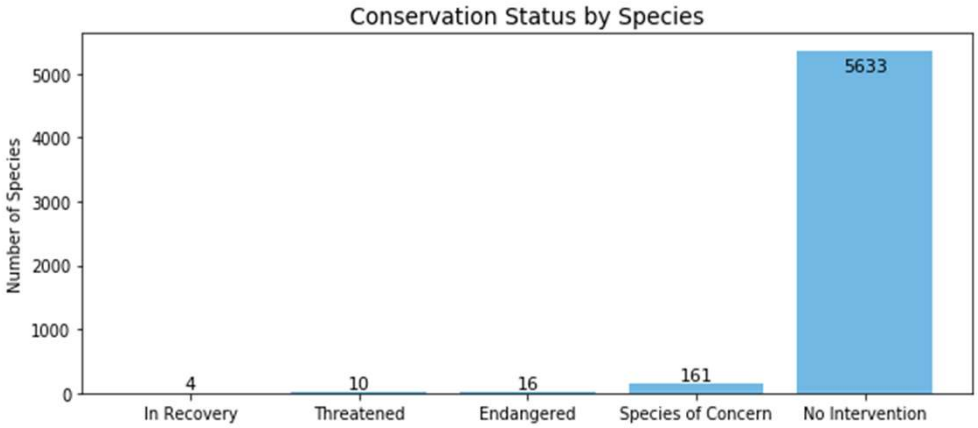
MCNG4570

NATIONAL PARKS DATA DISCOVERY

DESCRIPTION AND OBSERVATIONS ABOUT THE DATA

SPECIES AND CONSERVATION DATA

Fauna	Count	Flora	Count
Bird	521	Vascular Plant	4470
Mammal	214	Nonvascular Plant	333
Fish	127		
Amphibian	80		
Reptile	79		



- Two different CSV datasets
  - One file represents species and their protection status
  - The second file represents species observations within four National Parks
- The compiled species data represents 5541 different species in seven categories: mammal, bird, reptile, amphibian, fish, vascular plant, nonvascular plant
- Species conservation status is represented as Species of Concern, Endangered, Threatened, In Recovery, and None (which was changed to No Intervention)
- The majority of species fall under the conservation status of No Intervention

CHI SQUARE TEST ON SEVERAL SPECIES

- A Chi Square test was run on the percentage endangered significance between two different species
- A 0.05 p-value or lower is statistically significant
- Mammal to Bird chi square test yielded no statistical significance with a p-value of 0.445
- Reptile to Mammal chi square test yielded a statistical significance with a p-value of 0.023 which is less than 0.05
- The result is the null hypothesis is rejected and implying that reptiles and mammal data is independent and reptiles are more likely to be endangered than mammals

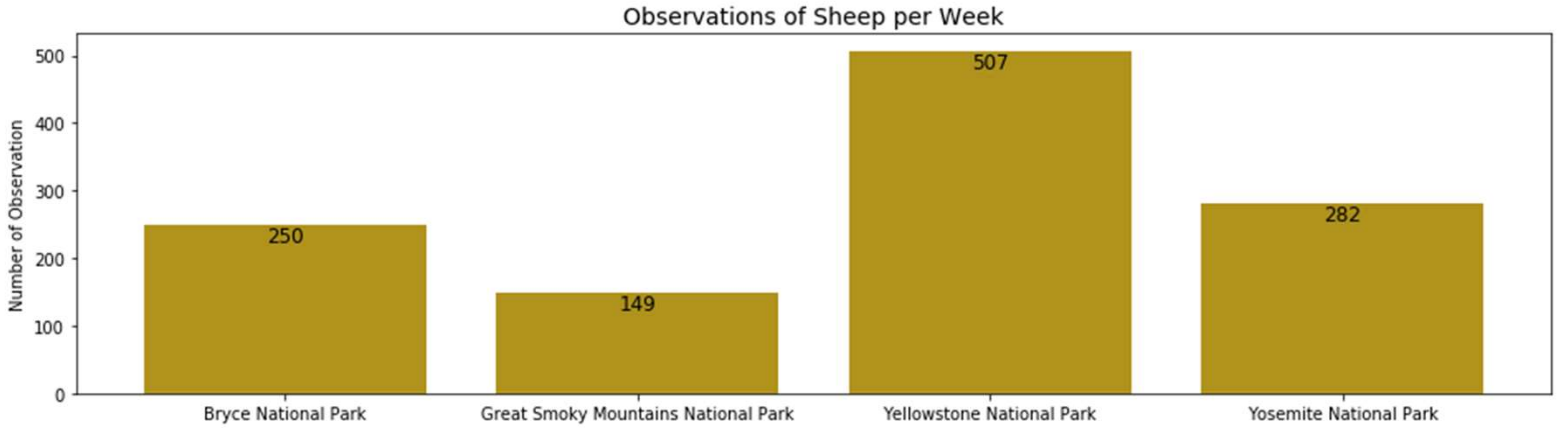
Fauna	Protected	Non-Protected
Bird	79	442
Mammal	38	176
Reptile	5	74

SHEEP IN THE NATIONAL PARKS

DATA OBSERVATIONS AND SAMPLE SIZE DETERMINATION FOR EFFECTIVE DISEASE TREATMENT

SHEEP OBSERVATIONS IN THE NATIONAL PARKS

- New fields, queries, and statistical techniques were used to create statistics and graphs
- Dataset was provided on sheep species observations in the parks



- Three sheep species were identified within the observed data:
  - Ovis aries also known as Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral)
  - Ovis canadensis also known as Bighorn sheep
  - Ovis canadensis sierrae also known as Sierra Nevada Bighorn Sheep

FOOT AND MOUTH DISEASE AT TWO NATIONAL PARKS

- 15% of sheep at Bryce National Park have foot and mouth disease
- Yellowstone National Park rangers have been running a program to reduce the disease. A detectable reduction of 5% is needed to determine if the treatment is effective
- What sample size is needed to determine minimum detectable effect?
- What length of time to collect samples?
- Bryce National Park
  - Minimum detectable effect is (0.05/0.15)*100 = 33.33%
  - According to the sample size calculator with a 90% significance the needed sample size is 890
  - Bryce National Park actual sheep observations = 250
  - Bryce National Park time to determine the significant change is 890/250 = 3.56 weeks or 24.9 days
- For the same program at Yellowstone National Park
  - Minimum detectable effect is (0.05/0.10)*100 = 50.0%
  - According to the sample size calculator with a 90% significance the needed sample size is 610
  - Yellowstone National Park actual sheep observations = 507
  - Yellowstone National Park time to determine the significant change is 610/507 = 1.203 weeks or 8.4 days

CONCLUSION AND QUESTIONS