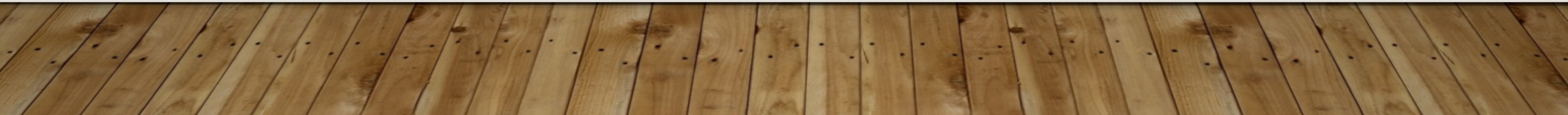


# BIODIVERSITY PROJECT

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ANNIE LEE

MARCH 3<sup>RD</sup>, 2018



# Analyzing Species In Our National Parks

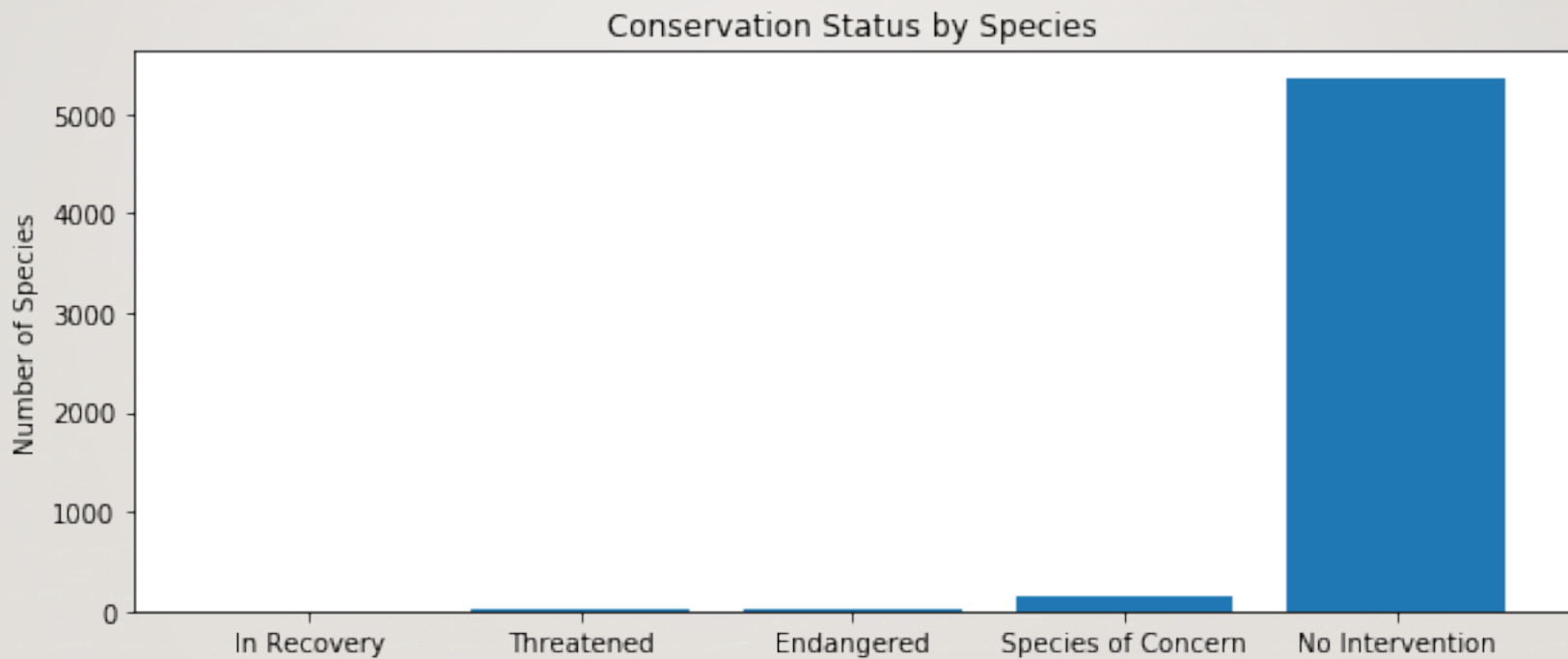
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- Based on the data provided by National Park Services
  - There were a total of 5,541 different species in our park. Seven types of species which includes the following categories: mammal, bird, reptile, amphibian, fish, vascular plant, and nonvascular plant.

| conservation_status | scientific_name |
|---------------------|-----------------|
| Endangered          | 15              |
| In Recovery         | 4               |
| No Intervention     | 5363            |
| Species of Concern  | 151             |
| Threatened          | 10              |

# National Park Species Conservation Status Totals

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# Protective Species by Category

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- Mammals have the highest likelihood of being endangered @17% followed by Birds @15% and Fish & Amphibians @9%
- Plants for both Nonvascular Plants @2% and Vascular Plants @1% have the lowest protected rates and seem to be least likely to be endangered at present.

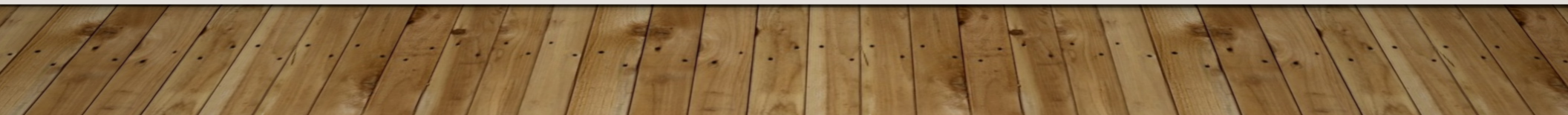
| Category          | Not_Protected | Protected | Percent Protected |
|-------------------|---------------|-----------|-------------------|
| Amphibian         | 72            | 7         | 9%                |
| Bird              | 413           | 75        | 15%               |
| Fish              | 115           | 11        | 9%                |
| Mammal            | 146           | 30        | 17%               |
| Nonvascular Plant | 328           | 5         | 2%                |
| Reptile           | 73            | 5         | 6%                |
| Vascular Plant    | 4,216         | 46        | 1%                |



# Using chi-squared test for Species endanger certainness

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- Chi-Squared Test is used to test whether there is significant difference between two data points.
- Sorting by categories showing significant difference between the species.
  - There is a significant difference between mammal and reptile of  $\sim 0.038$ .
  - There is a significant difference between reptile and nonvascular plants of  $\sim 0.033$ .
  - There is a significant difference between reptile and vascular plants of  $\sim 0.0001$ .



# Observation of Sheep in National Parks

- Conservationists' tracking of sightings of sheep by National Parks by using past 7 days data.

| scientific_name         | park_name                           | observations | category | common_names                                      | conservation_status |
|-------------------------|-------------------------------------|--------------|----------|---|---------------------|
| Ovis canadensis         | Bryce National Park                 | 109          | Mammal   | Bighorn Sheep, Bighorn Sheep                      | Species of Concern  |
| Ovis canadensis sierrae | Bryce National Park                 | 22           | Mammal   | Sierra Nevada Bighorn Sheep                       | Endangered          |
| Ovis aries              | Bryce National Park                 | 119          | Mammal   | Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral) | No Intervention     |
| Ovis canadensis         | Great Smoky Mountains National Park | 48           | Mammal   | Bighorn Sheep, Bighorn Sheep                      | Species of Concern  |
| Ovis canadensis sierrae | Great Smoky Mountains National Park | 25           | Mammal   | Sierra Nevada Bighorn Sheep                       | Endangered          |
| Ovis aries              | Great Smoky Mountains National Park | 76           | Mammal   | Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral) | No Intervention     |
| Ovis canadensis         | Yellowstone National Park           | 219          | Mammal   | Bighorn Sheep, Bighorn Sheep                      | Species of Concern  |
| Ovis canadensis sierrae | Yellowstone National Park           | 67           | Mammal   | Sierra Nevada Bighorn Sheep                       | Endangered          |
| Ovis aries              | Yellowstone National Park           | 221          | Mammal   | Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral) | No Intervention     |
| Ovis canadensis         | Yosemite National Park              | 117          | Mammal   | Bighorn Sheep, Bighorn Sheep                      | Species of Concern  |
| Ovis canadensis sierrae | Yosemite National Park              | 39           | Mammal   | Sierra Nevada Bighorn Sheep                       | Endangered          |
| Ovis aries              | Yosemite National Park              | 126          | Mammal   | Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral) | No Intervention     |

# In Search of Our Endangered Sierra Nevada Bighorn Sheep

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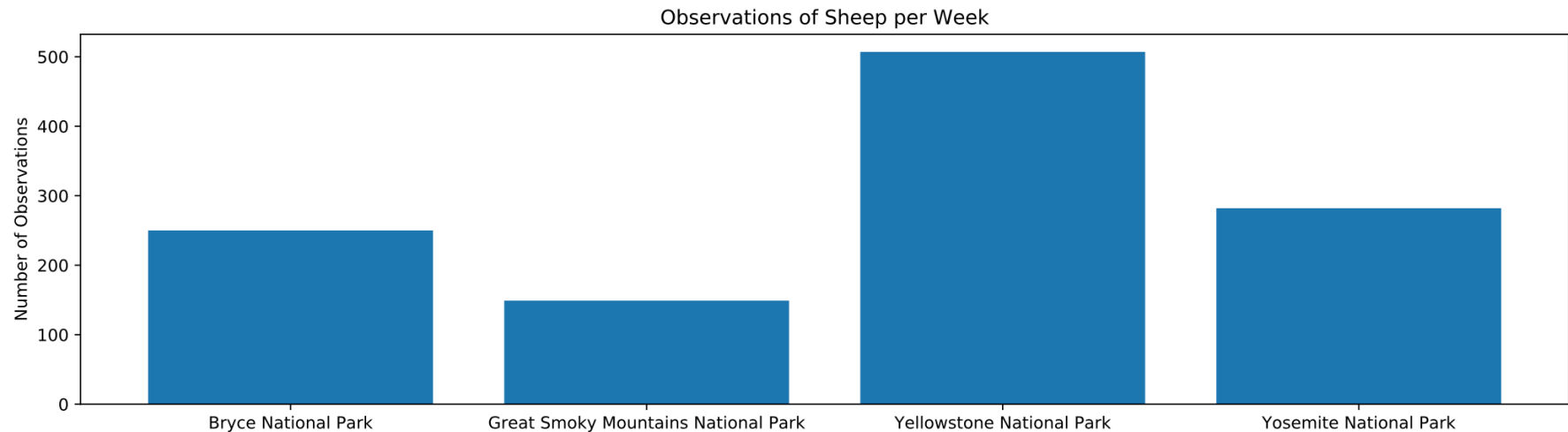
- Yellowstone has highest quantity, 67 endangered sheep Sierra Nevada Bighorn Sheep out of 507 total sheet sighted.
- Great Smoky Mountains National Park has the highest percentage of sighting Sierra Nevada Bighorn Sheep.

| Park Name                           | Observations | Sierra Nevada Bighorn Sheep | Percentage |
|-------------------------------------|--------------|-----------------------------|------------|
| Bryce National Park                 | 250          | 22                          | 9%         |
| Great Smoky Mountains National Park | 149          | 25                          | 17%        |
| Yellowstone National Park           | 507          | 67                          | 5%         |
| Yosemite National Park              | 282          | 39                          | 9%         |

# Analysis Of Number Of Sightings At Each Of The Four National Parks

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- The analysis shows the different number of observations per week at each park.





# Foot and Mouth Reduction Effort

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- Our scientists know that 15% of sheep at Bryce National Park have foot and mouth disease. Park rangers at Yellowstone National Park have been running a program to reduce the rate of foot and mouth disease at that park. The scientists want to test whether or not this program is working.
- They want to be able to detect reductions of at least 5 percentage point. For instance, if 10% of sheep in Yellowstone have foot and mouth disease, they'd like to be able to know this, with confidence.
- It will take approximately 2 weeks at Bryce and 1 week at Yellowstone to observe enough sheep.