

Biodiversity for the National Parks

By Alex Nicoloff

Conservation Status

- A total of 5541 plant and animal species are being tracked for conservation efforts in the National Parks
- Each species falls within one of these categories: mammal, bird, reptile, amphibian, fish, vascular plant, and nonvascular plant
- Species conservation status can have the following values based on how well the species is thriving: endangered, threatened, species of concern, and in recovery
- The value of no intervention is used for healthy populations

Conservation Status

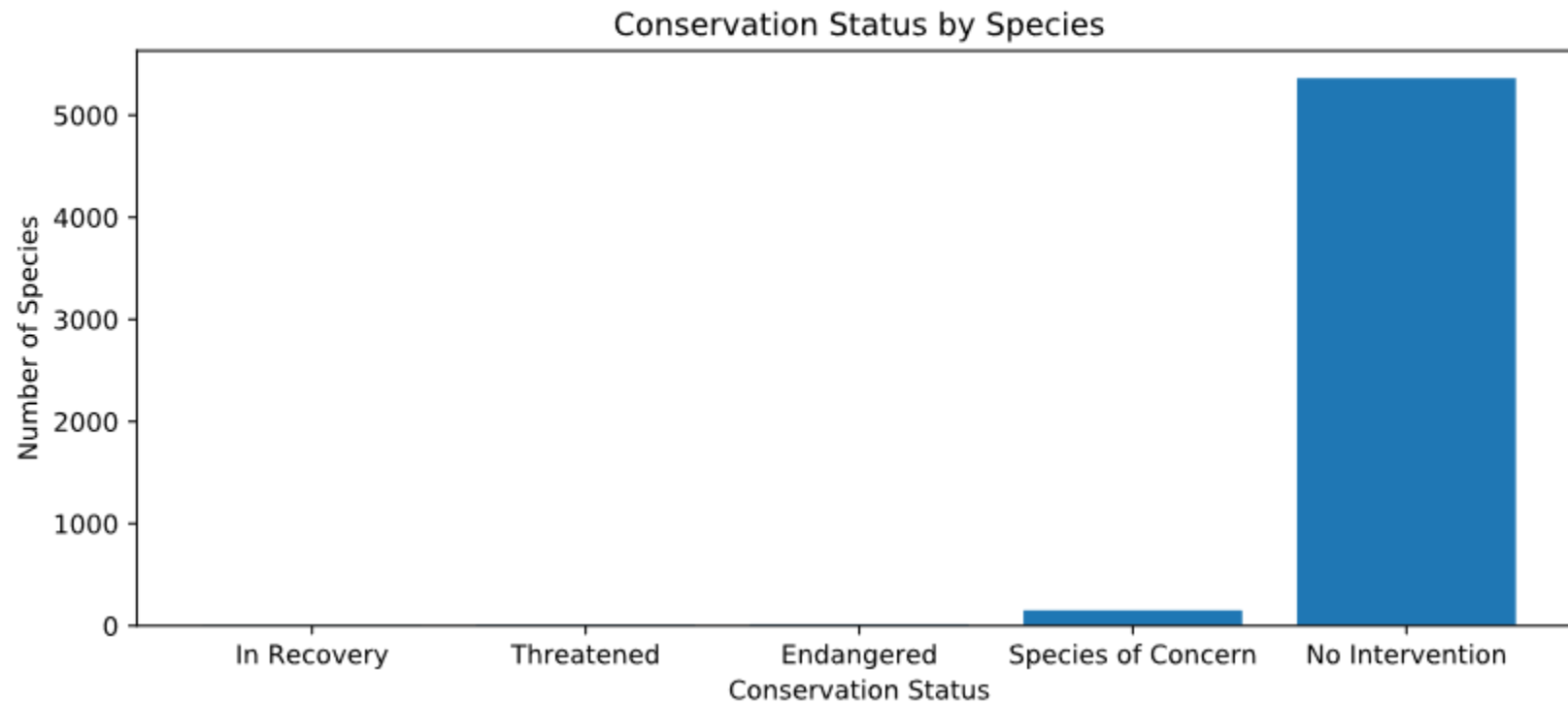


Figure 1: Conservation Status

Conservation Status

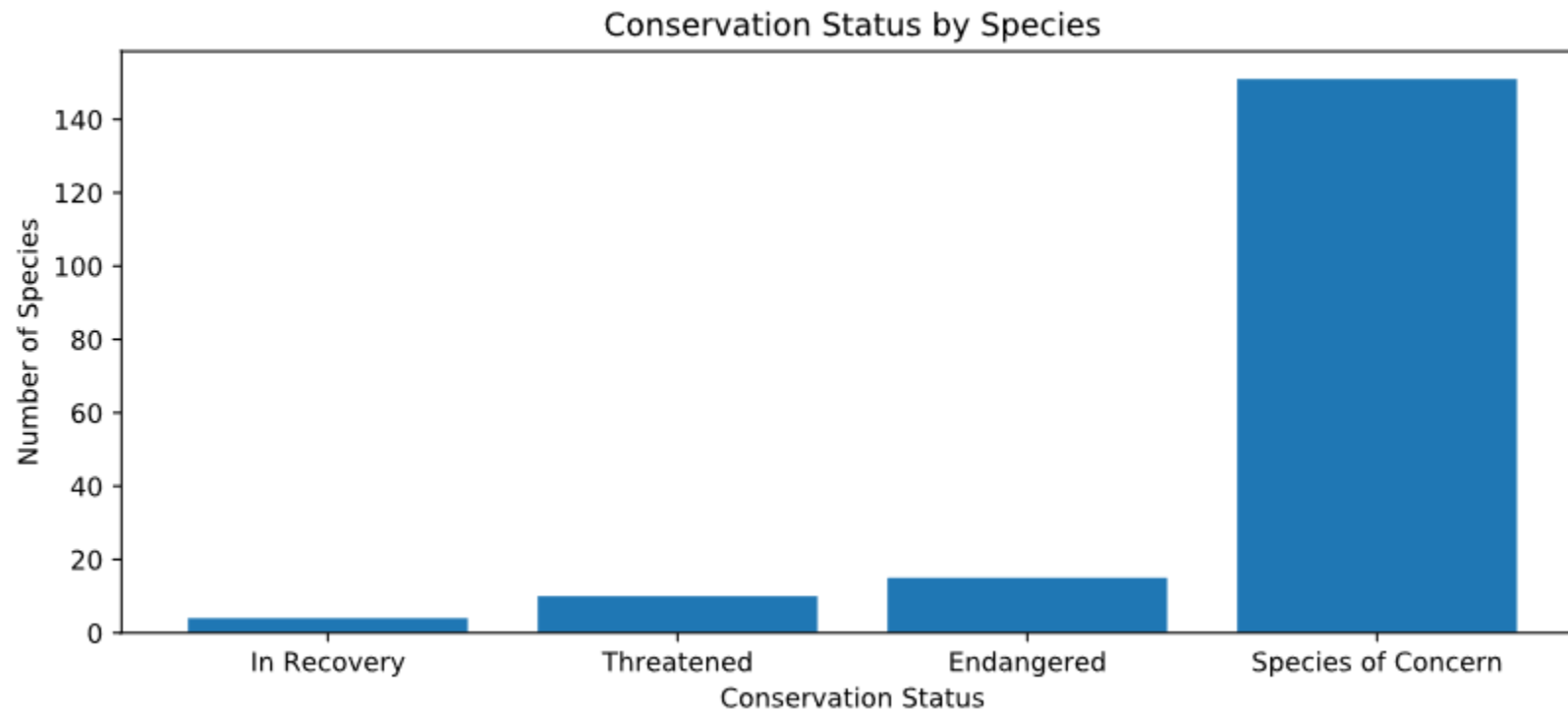


Figure 2: High Concern Chart

Conservation Status

- Figure 1 shows that a vast majority of species do not need any form of intervention
- This is great news, conservation efforts can be more focused on species that need our help the most
- Figure 2 shows the status of species needing the most help
- Less than 20 species in each category are threatened or endangered
- About 150 species are showing concern

Are certain types of species more likely to be endangered?

Category	Not Protected	Protected	Percent Protected
Amphibian	72	7	8.9%
Bird	413	75	15.4%
Fish	115	11	8.7%
Mammal	146	30	17.0%
Reptile	73	5	6.4%
Nonvascular Plant	328	5	1.5%
Vascular Plant	4216	46	1.1%

Table 1: Percent Protected Categories

Are certain types of species more likely to be endangered?

- A chi squared test was used on the table to determine if there were significant differences between the categories in Table 1
- Between birds and mammals a p-value of 0.6876 was calculated indicating there is no significant difference between these categories
- Between reptiles and mammals a p-value of 0.0384 was calculated indicating there is a significant difference between these categories
- This shows that some categories of plants and animals are more likely to be endangered

Conservation Recommendations

- Based on significance calculations between populations it is recommended to focus on mammals as the most vulnerable group in National Parks
- While birds have a high protected percentage at 15.4% significance tests between them and amphibians were not significant at a value of 0.1759
- Plants are of least concern as they are significantly less likely to be endangered compared to reptiles (p-value = 0.0336)

Foot and Mouth Reduction Effort

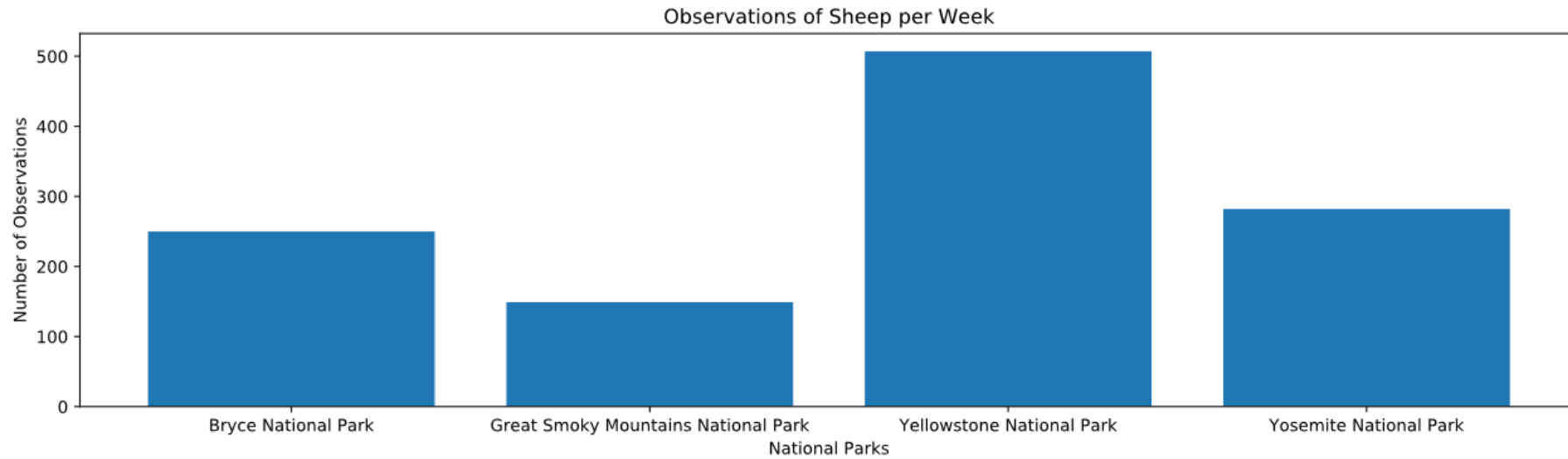


Figure 3: Sheep Sightings

Foot and Mouth Reduction Effort

- Is the program working?
- Last year 15% of sheep at Bryce National Park had F&M disease, this will be the baseline used for this year's survey
- 5% reduction of the disease gives a minimum detectable effect of 33.3% for the model
- To achieve 90% confidence in the results a total sample size of 890 sheep must be counted

Foot and Mouth Reduction Effort

- Based on Figure 3 and the sample size calculator:
 - The survey will last 1.75 weeks at Yellowstone National Park
 - The survey will last 3.56 weeks at Bryce National Park
 - The survey will last 5.97 weeks at Smoky Mountains National Park
 - The survey will last 3.16 weeks at Yosemite National Park