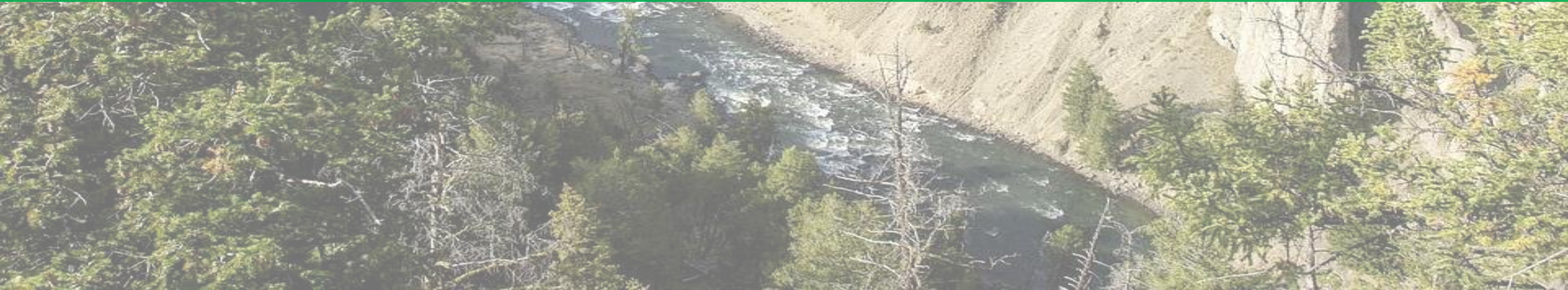




Biodiversity in National Parks

Insights by Alessandra Suguiuti





Agenda

- Introduction
- Species Information
- Species Categories of Most Concern
- Species Sightings in National Parks
- Sightings of Endangered Mammals
- Concluding Remarks on Biodiversity in National Parks

Introduction

This project aims to support the National Park Service by analyzing data on endangered species from several different parks in the US.

What are the main issues?

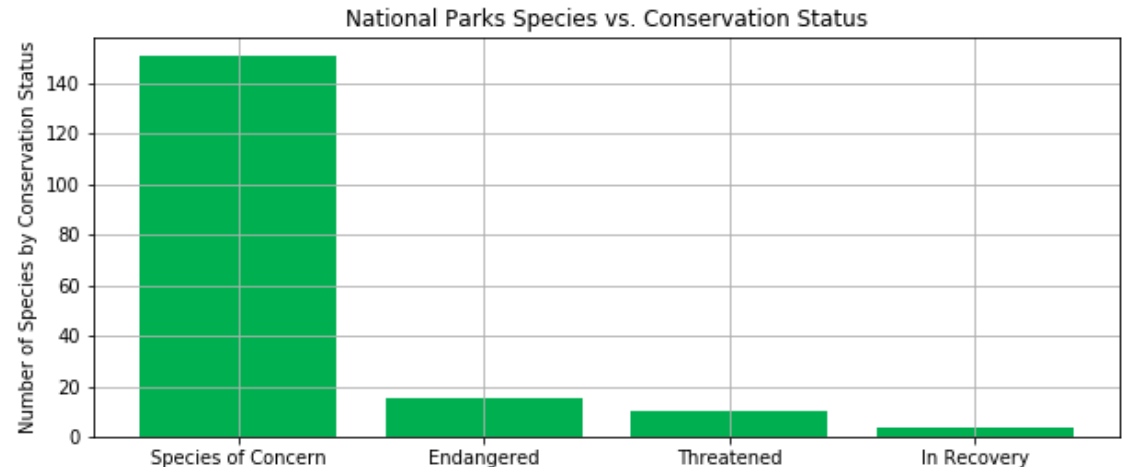
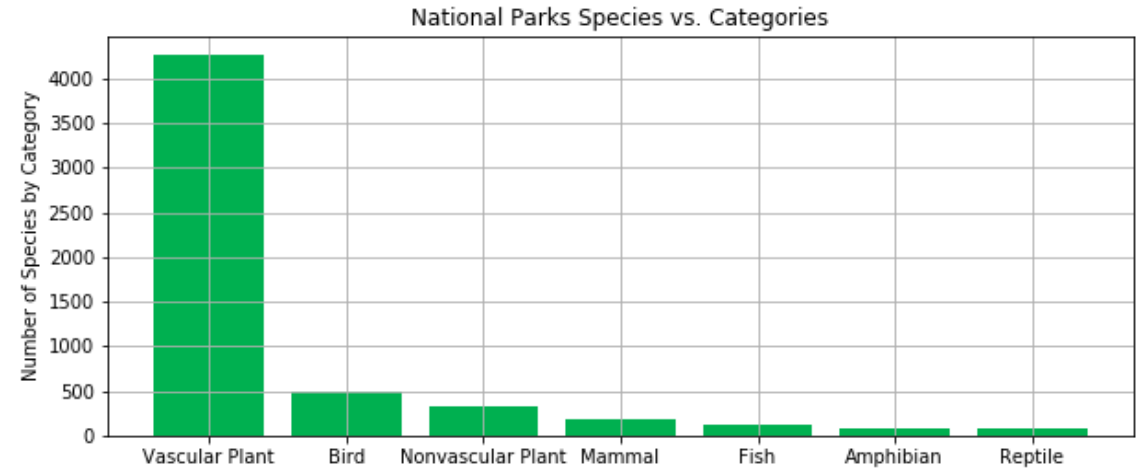
- What is the percentage of protected species?
- How protected species are classified?
- Which categories are most likely to be endangered?
- Which species have been sighted in the National Parks recently?
- Do protected species sightings vary among National Parks?

Species Information

The data presents **5,541** different species and the vast majority belong to the category Vascular Plant (**76.9%**), followed by Bird (**8.8%**), Nonvascular Plant (**6.0%**), Mammal (**3.2%**), Amphibian (**1.4%**) and Reptile (**1.4%**).

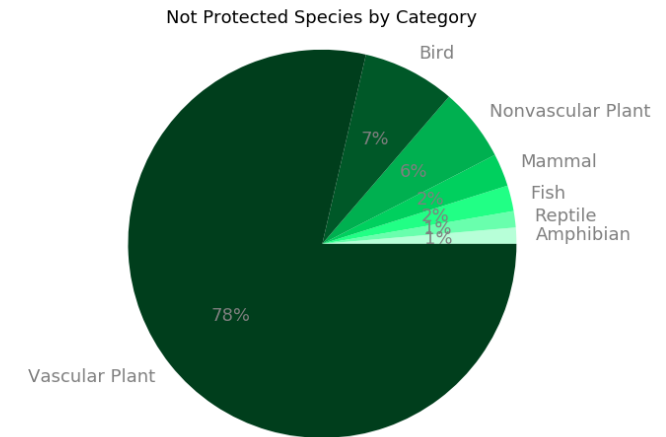
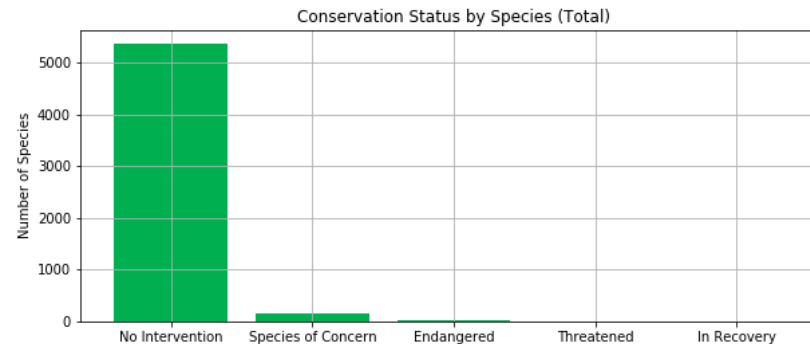
Of all different species registered, only **180** of them are categorized as needing some sort of protection (**3.2%**), according to Conservation Status:

- ***Species of Concern***: declining or appear to be in need of conservation (**83.9%**)
- ***Endangered***: seriously at risk of extinction (**8.3%**)
- ***Threatened***: vulnerable to endangerment in the near future (**5.6%**)
- ***In Recovery***: formerly Endangered, but currently neither in danger of extinction throughout all or a significant portion of its range (**2.2%**)



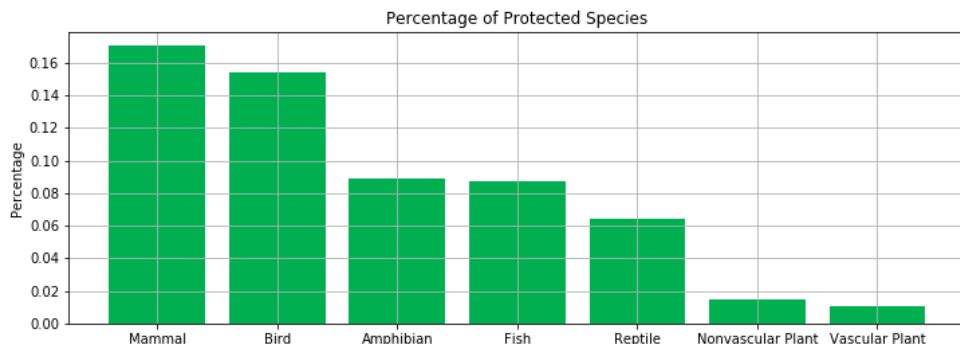
Species Categories of Most Concern

Analyzing the **Conservation Status** of all species, we observed that **96.8%** are classified as ***No Intervention***. This group was categorized as **Not Protected Species** and the others as **Protected Species**.



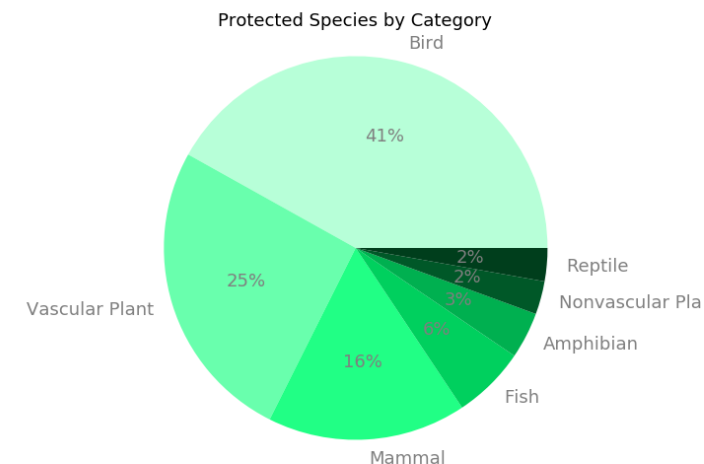
Not Protected Species follow a similar distribution to the total base. For **Protected Species**, ***Bird***, ***Vascular Plant*** and ***Mammal*** are the most representative categories (**totaling 82.0%**) – see *Pie Charts at right*.

The chart below shows the **Percentage of Protected Species**. Analyzing the most representative percentages, it looks like species in category ***Mammal*** are more likely to be endangered than species in ***Bird***. Although, the Chi-Squared Test did not show significance for it.



The test was significant for the difference between ***Mammal*** and ***Reptile***, i.e., ***Mammal*** are more likely to be endangered than species in ***Reptile*** (***p-value = 0.03***).

The test was also significant for difference between ***Mammal*** and ***Plants***.

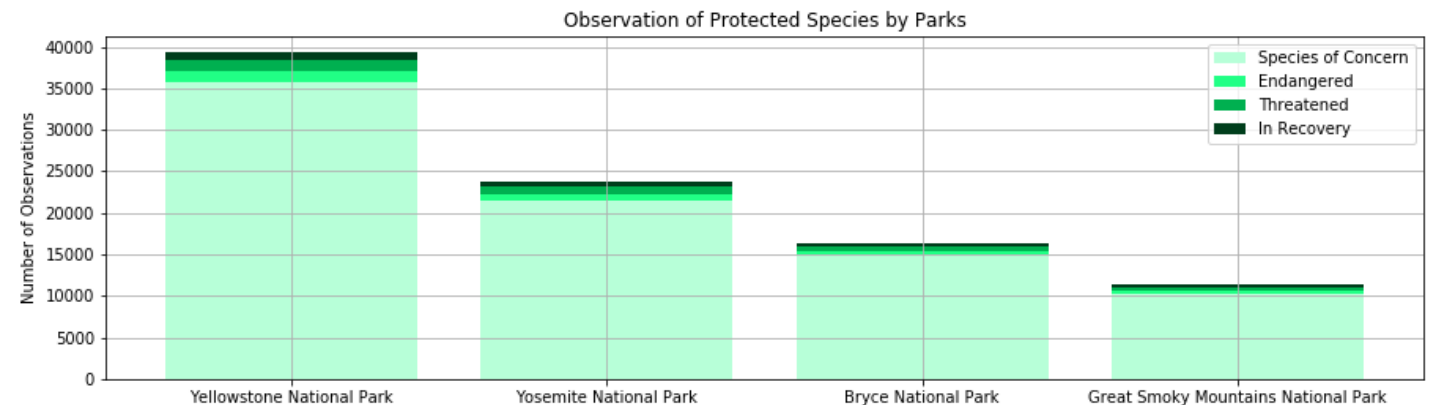
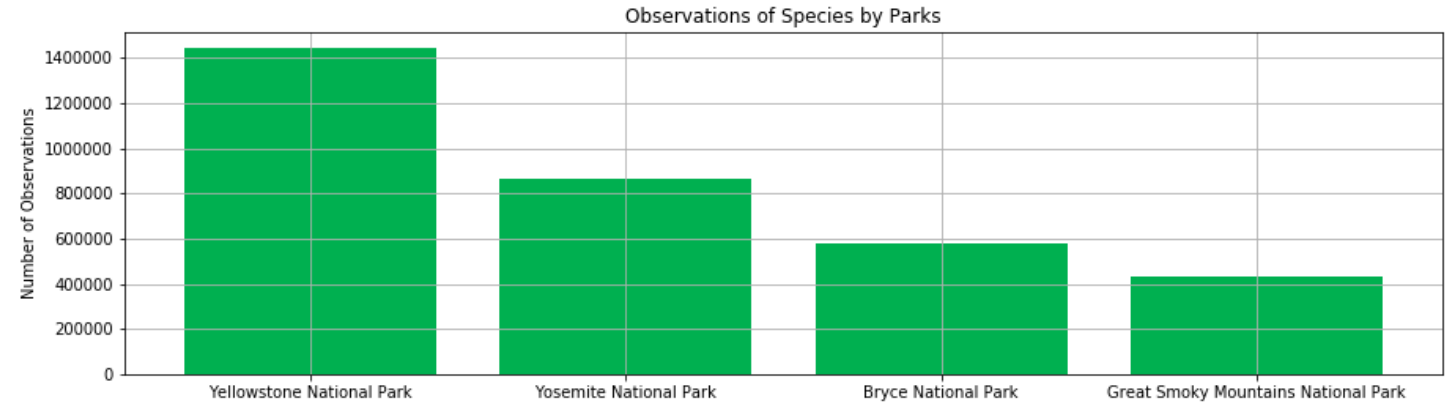


Species Sightings in National Parks

Conservationists have been recording sightings of different species for the past 7 days, totaling over **3.3M** observations. Records were collected from *Yellowstone National Park* (**43.5%**), *Yosemite National Park* (**26.0%**), *Bryce National Park* (**17.4%**), and *Great Smoky Mountains National Park* (**13.0%**).

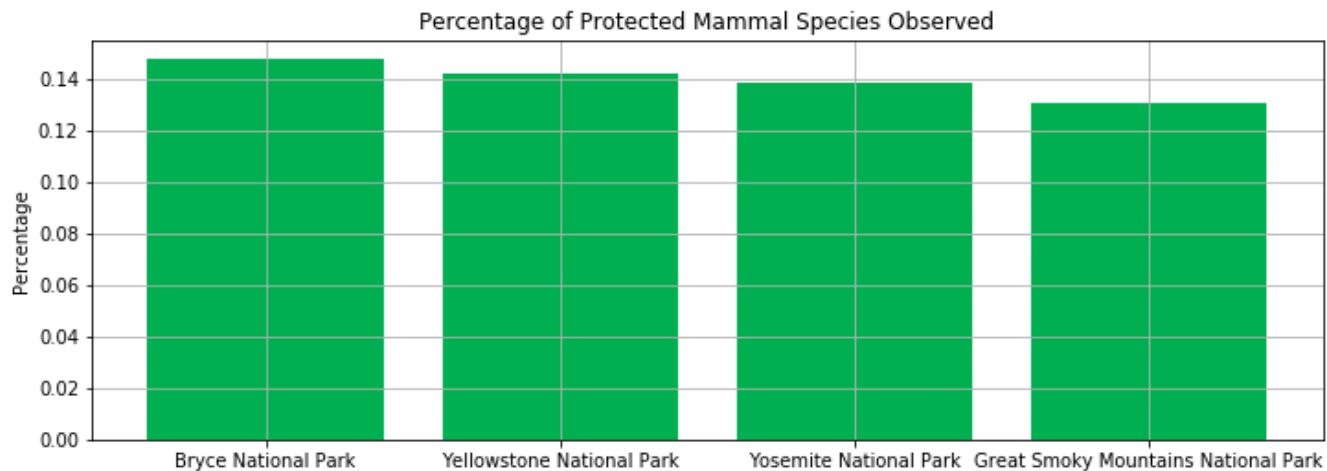
Approximately **2.74% (90.8K)** of sightings were of protected species. The general distribution of observations about those cases are **2.49%** of *Species of Concern*, **0.08%** of *Endangered*, **0.10%** of *Threatened* and **0.06%** of *In Recovery*.

The distribution of each National Park follows the proportion of the total species sighted, not presenting relevant deviating values.



Sightings of Endangered Mammals

As we noted earlier, the number of endangered *Mammal* species is particularly concerning. The graph below shows the percentage of observations of these species in each National Park.



Although ***Bryce National Park*** presents the highest percentage at **14.8%**, it's important to consider whether this difference is statistically relevant. According to the results of a Chi-Squared Test, the park percentage differs significantly from the average percentage of all the parks analyzed, which is **14.1%** (***p-value = 0.01***).

The 5 most sighted species in *Bryce National Park*:

	Common Names	Observations
0	Mississippi Myotis, Southeastern Myotis	152
1	California Myotis	140
2	Silver-Haired Bat	128
3	Brush Rabbit	118
4	Western Red Bat	113

With the exception of the *Brush Rabbit* (**3.9%**), all species on the list belong to the *Bat Family*, comprising **17.6%** of the total sightings.

In all cases, the species are classified as ***Species of Concern***.

Concluding Remarks on Biodiversity in National Parks

Following the analyses presented, it can be highlighted:

- The main issue is the notably low percentage of species that receive any form of protection – only **3.2%** of all species registered.
- It would be prudent to give increased attention to the categories of ***Mammals*** and ***Birds***, as they are more likely to be endangered than other species.
- The ***Great Smoky Mountains National Park*** presented the lowest volume of species sightings in the last week. However, it is not the smallest park in territorial extension. It would be important to improve the monitoring of species in this park.
- It is important to maintain ongoing monitoring of protected species over time, to enable the evaluation of factors such as the higher frequency of observations of these species in ***Bryce National Park***. Such monitoring may facilitate the identification of park-specific management practices that could serve as references for other protected areas.



Codecademy

Analyze Data with Python

Capstone Project: Biodiversity in National Parks