
Biodiversity and
Conservation Efforts
Great Smoky Mountains, Yosemite, Bryce, and
Yellowstone National Parks

NOTE:

This data was received from Codecademy, and is inspired by real data collected by the National Parks (Not Official Data)

Dataset Breakdown

- There are two datasets:
- species_info.csv – This data set contains:
  - The **category** for each species (Mammal, Bird, Reptile, Amphibian, Fish, Vascular Plant, Nonvascular Plant)
  - The **scientific name** of each species
  - The **common names** of each species
  - The **conservation status** of each species (No Danger Status, Species of Concern, Threatened, Endangered, In Recovery)

Dataset Breakdown

- Dataset two:
- observations.csv – This data set contains:
  - The **scientific name** of each species
  - The **park name** of the National Park
  - The number of **observations** in that park for each species within the past week

Questions to answer

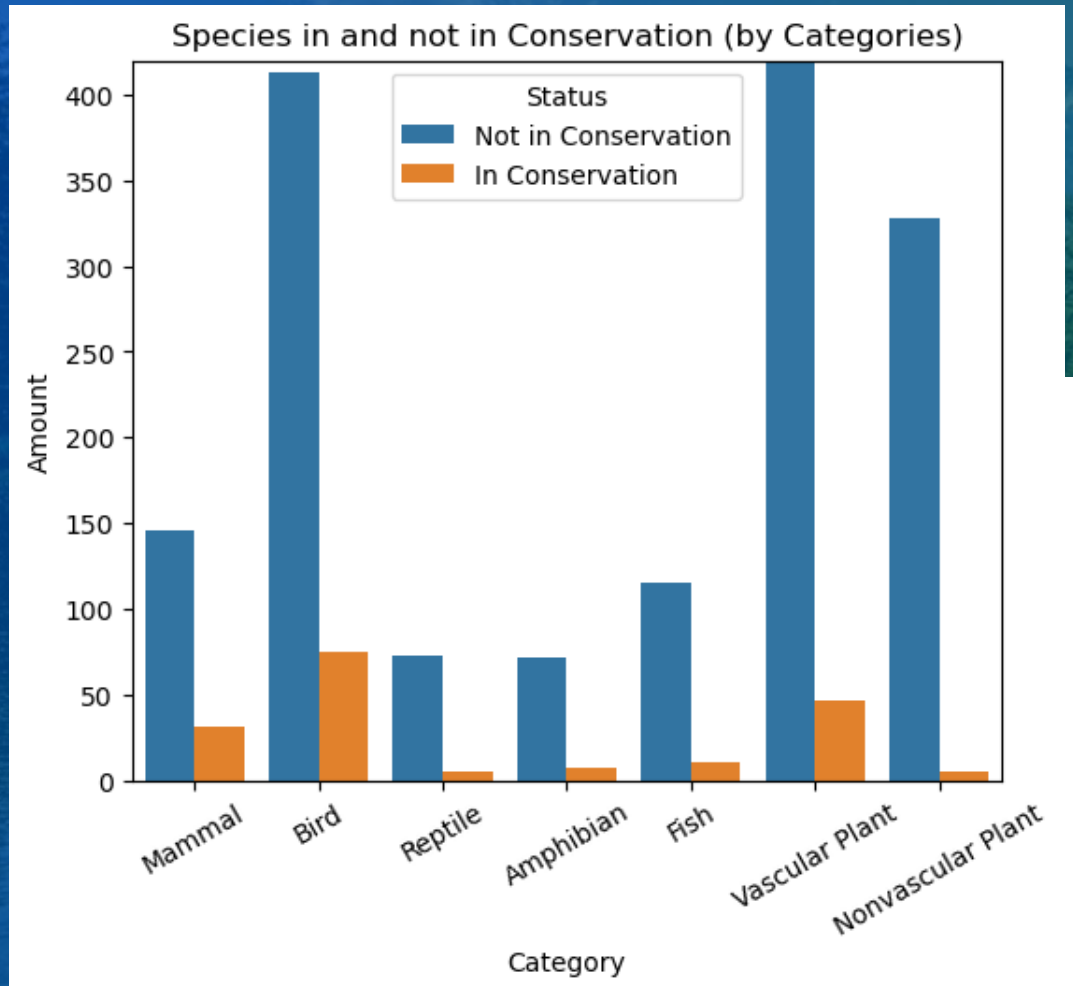
1.) Which category of species has the highest percentage of species in conservation?

2.) Which category of species have the greatest amount in each category of conservation status?

3.) Is there a significant difference between the number of species in conservation per category?

4.) Which endangered species have the lowest observation counts within the last 7 days?

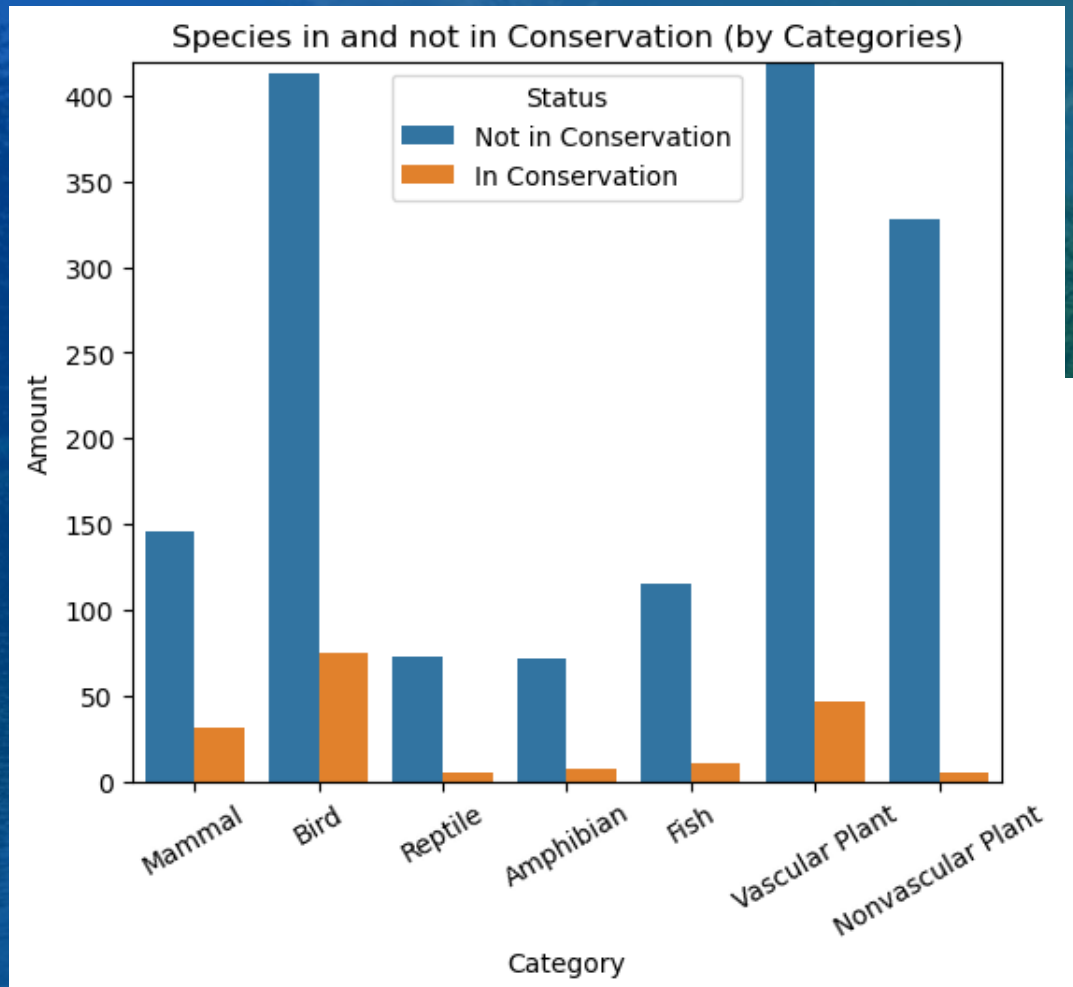
Which category of species has the highest percentage of species in conservation?



- Despite vascular plants having the most entries in this dataset, very few of those species need conservation. Thus, they have the smallest percent in conservation.

Category	Not in Conservation	In Conservation	Percent in Conservation
Mammal	146	31	17.514124
Bird	413	75	15.368852
Amphibian	72	7	8.860759
Fish	115	11	8.730159
Reptile	73	5	6.410256
Nonvascular Plant	328	5	1.501502
Vascular Plant	4216	46	1.079305

Which category of species has the highest percentage of species in conservation?



- Similarly, nonvascular plants have a very low percentage of needing conservation as well.

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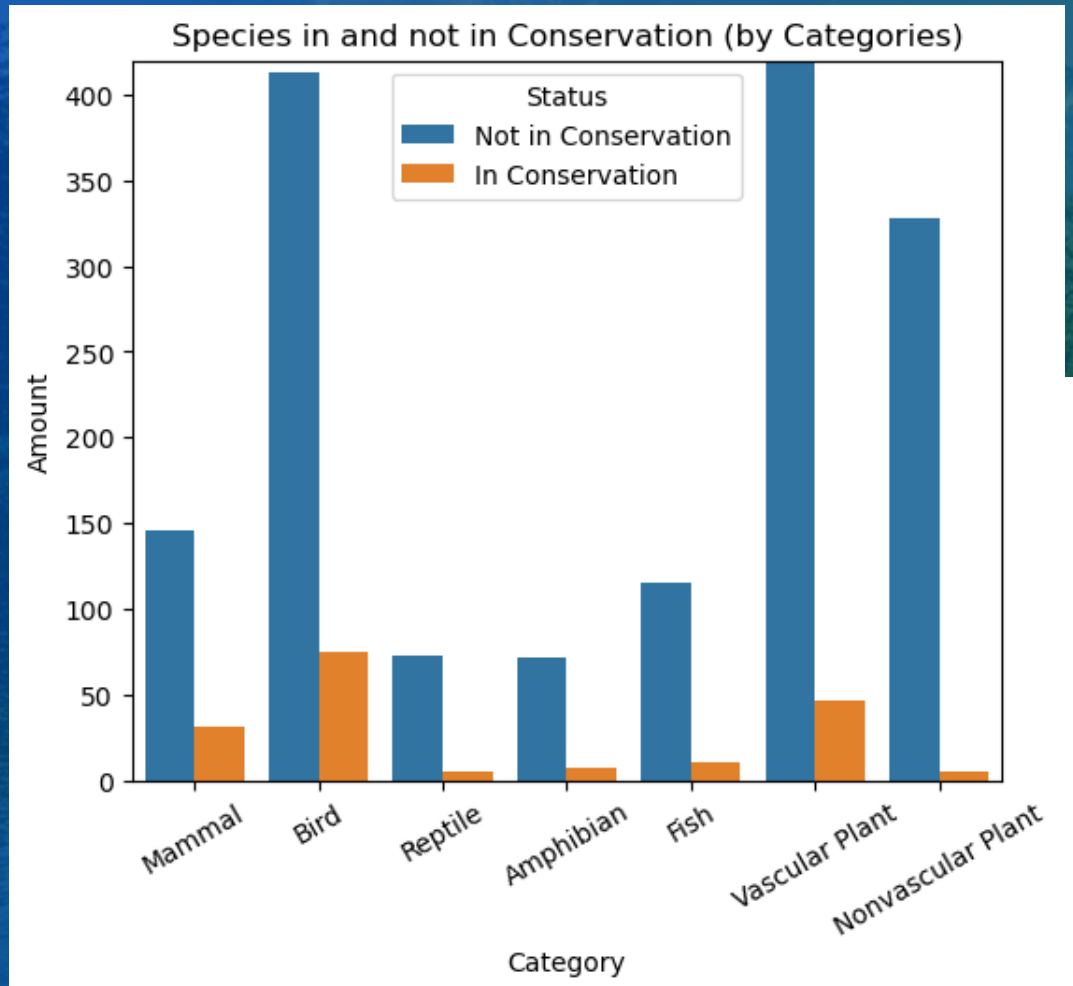

- **Mammals** and **birds** have the **highest percent** in **conservation**. They are each almost double that of the third highest percent (amphibians)!

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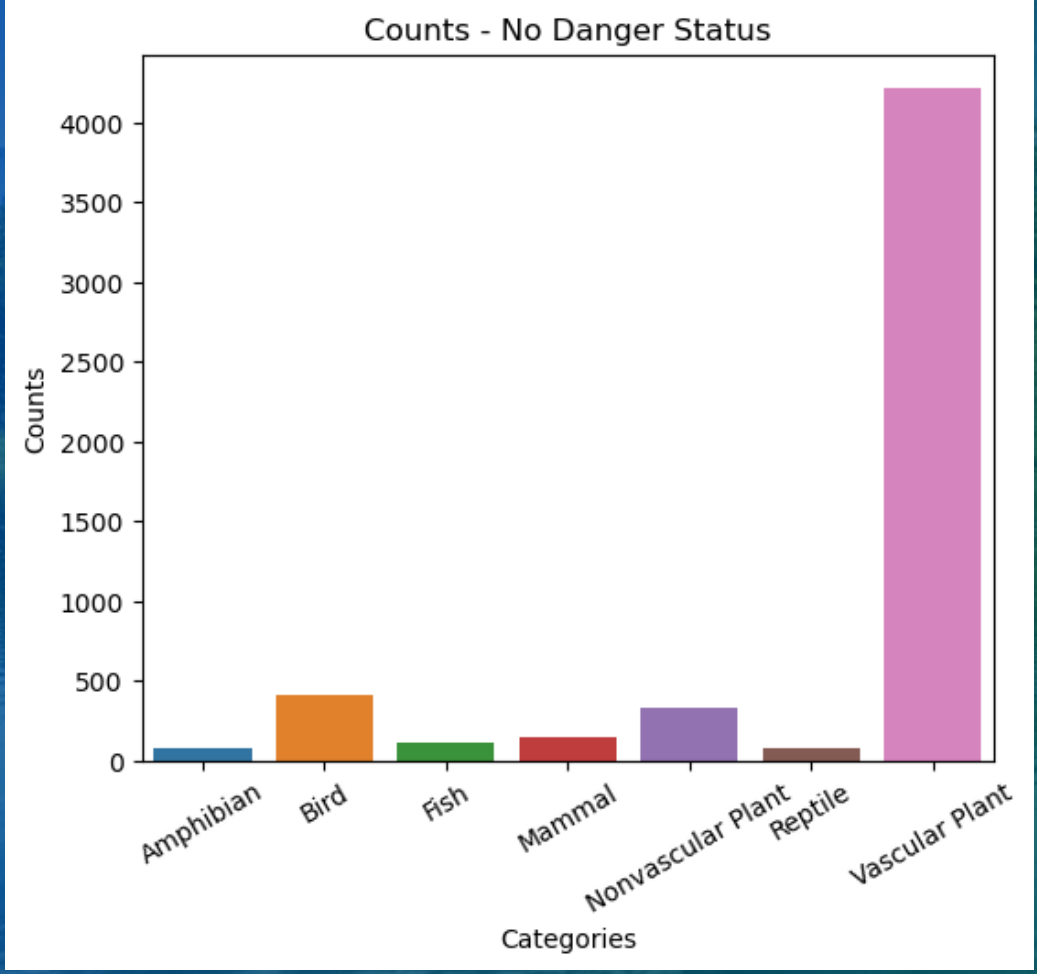
Which category of species have the greatest amount in each category of conservation status?

- The four categories are: No Danger Status, Species of Concern, Endangered, Threatened, and In Recovery

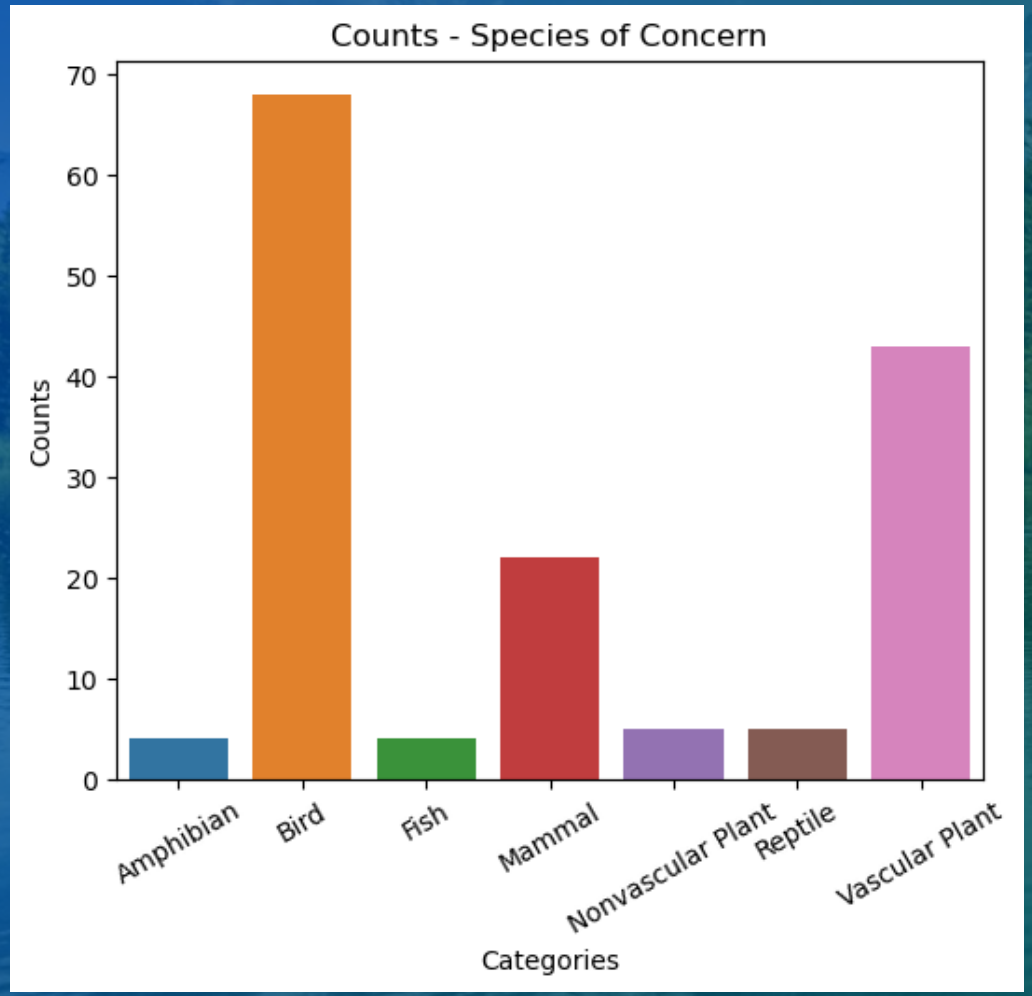
- So which categories of species had the highest in each of these?

No Danger Status



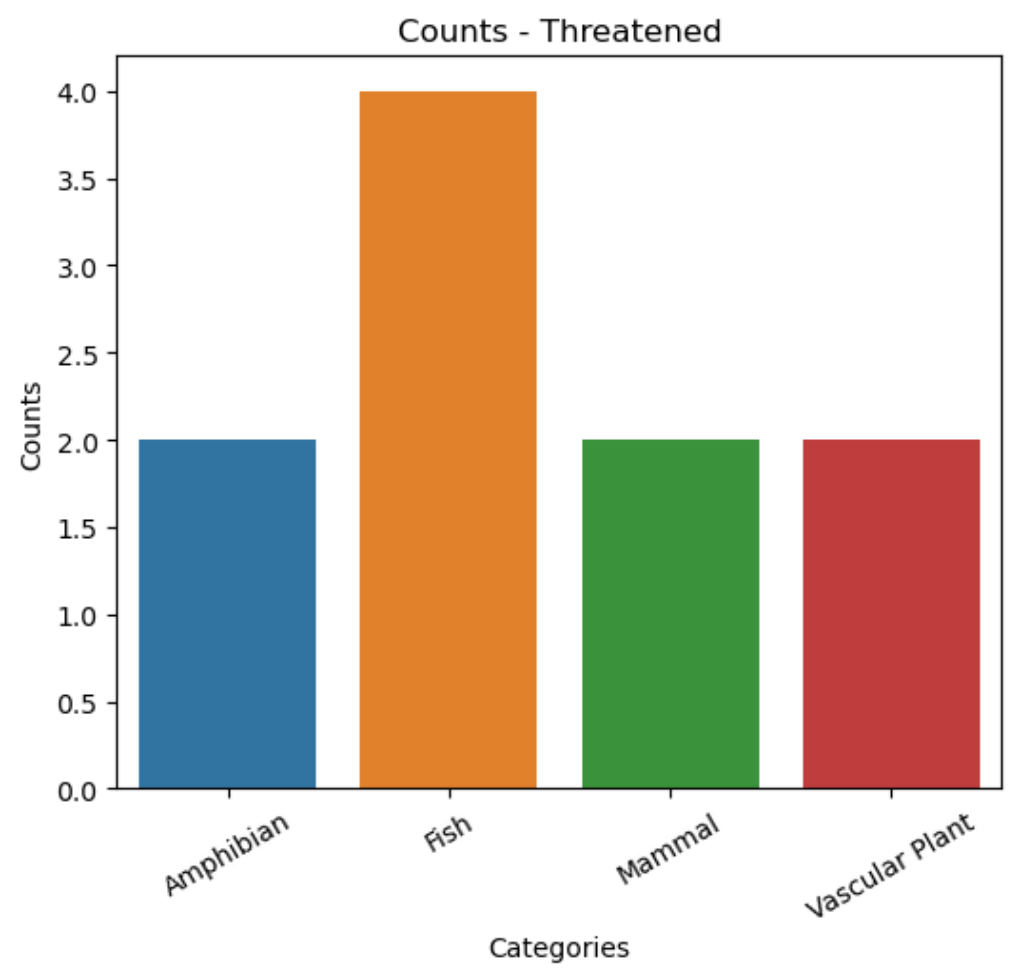
- **Vascular plants** have the **most** with 4,216
- The **second highest** are **birds** with 413
- The category with **the least** "no danger status" is **amphibian** with 72
- **Reptiles** are **right after** with 73

Species of Concern



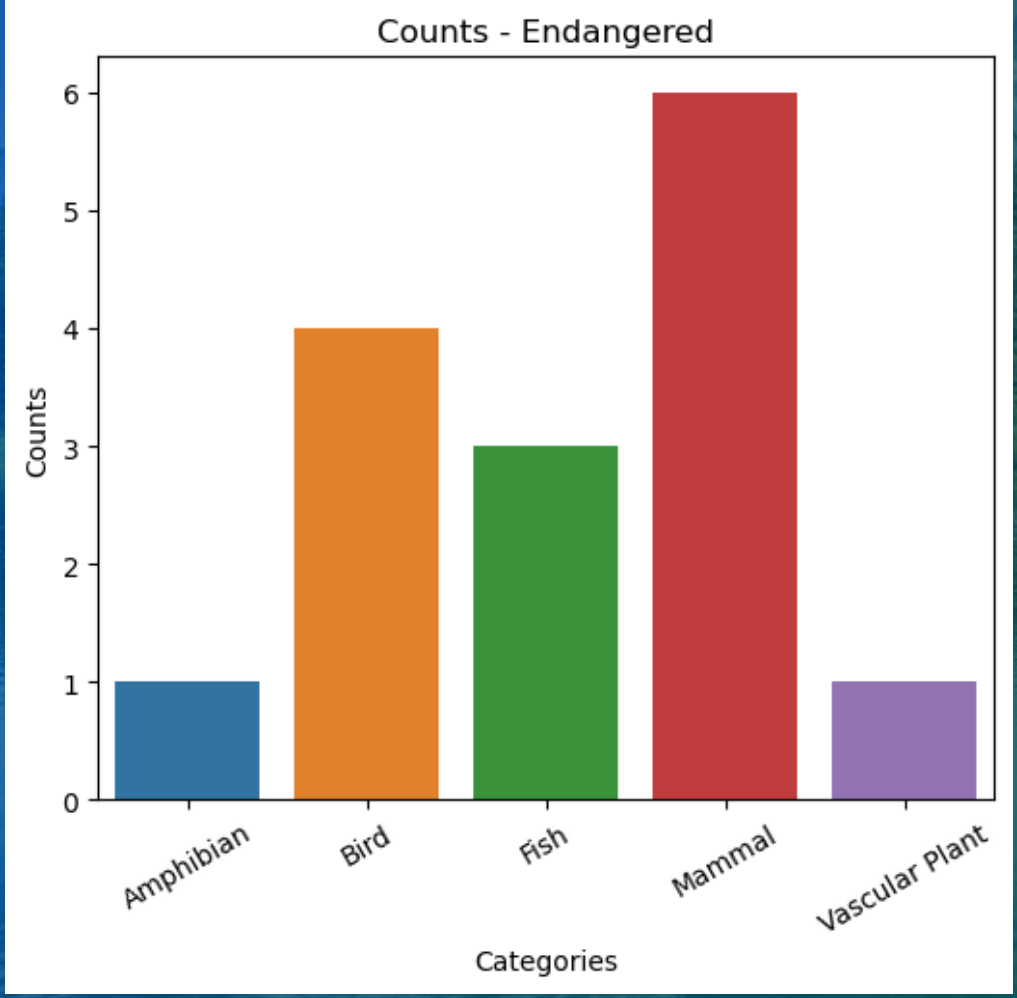
- **Birds** have the **most** with 68
- **Vascular plants second** with 43
- **Mammals are third** with 22

Threatened



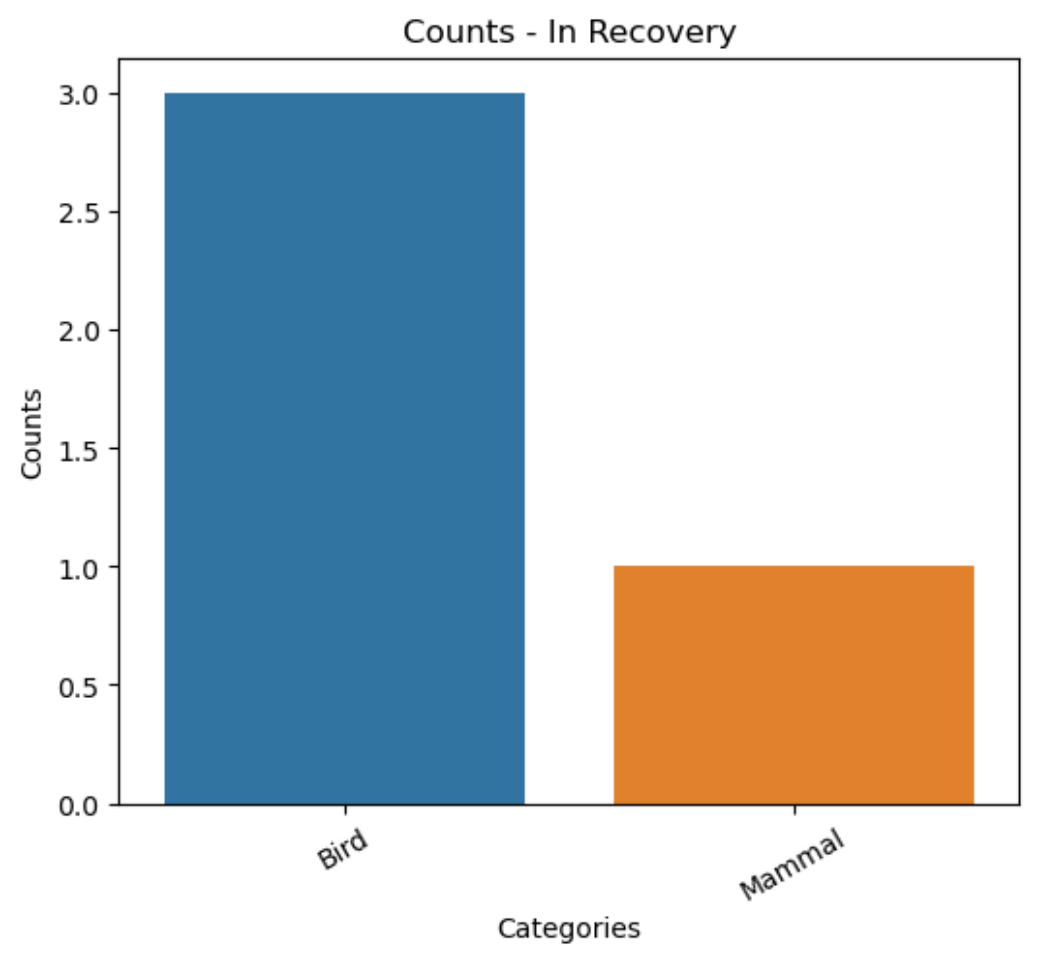
- **Fish** have the **greatest number** of threatened species with 4
- Amphibians, mammals, and vascular plants, are all tied for second with 2
- Note there are no reptiles, vascular plants, or birds

Endangered



- **Mammals** have the **most endangered** species with 6
- **Birds** have the **second most** with 4
- Note there are no nonvascular plants or reptiles

In Recovery



- The only 2 categories in recovery are birds and mammals. The only mammal in recovery is the **wolf/gray wolf**, and the 3 birds are the **Bald Eagle, American Peregrine Falcon, and the Brown Pelican**.

Is there a significant difference between the number of species in conservation per category?

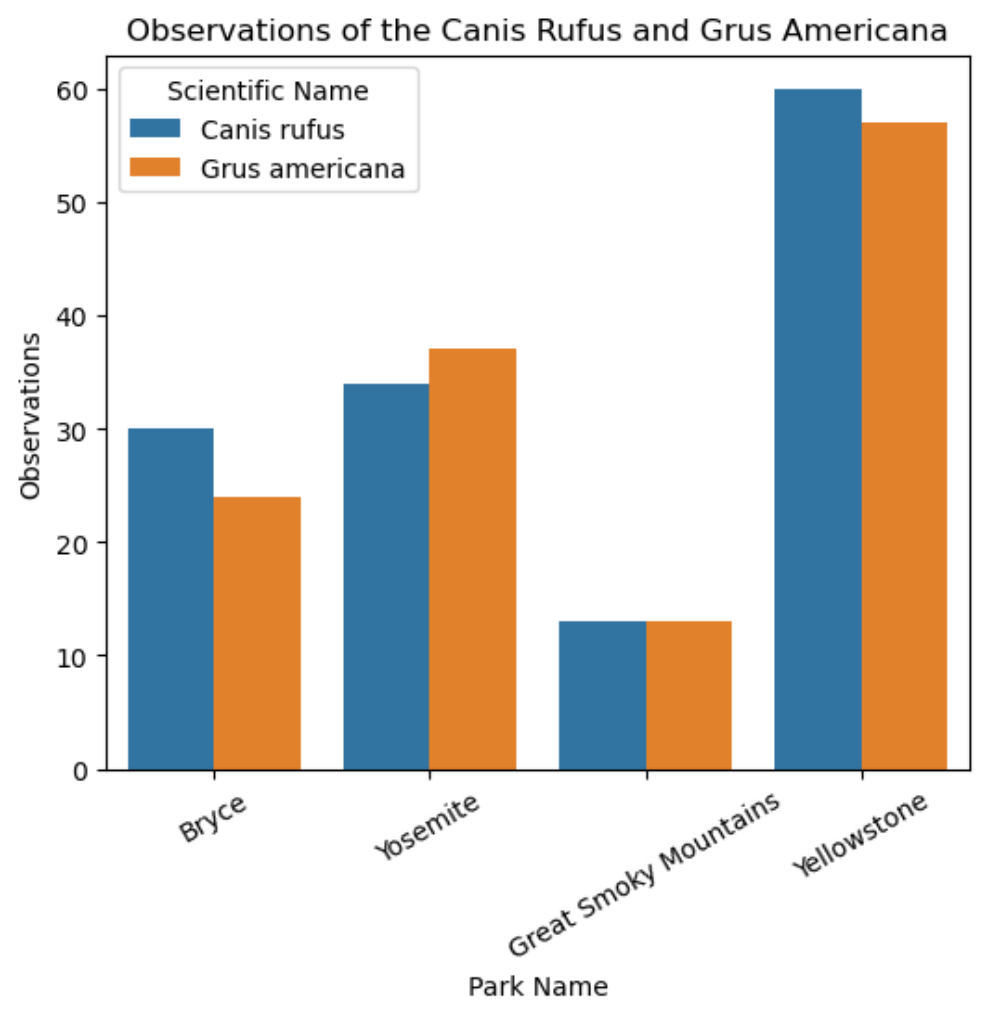
- From what we know now, mammals and birds have a very large percent of their observed species needing conservation compared to others.
- Using Chi-Square tests with a significance value of 0.05, we find that for mammals and reptiles, there is a statistically significant difference between their relationship of being in conservation. This is also the same for mammals and fish.
- Since mammals have the highest percentage in conservation, that means that **mammals have a statistically significant higher rate of needing protection compared to reptiles or fish.**

Which endangered species have the lowest observation counts within the last 7 days?

Category	Scientific Name	Common Name	Observations (past 7 days)
Mammal	Canis lupus	Gray Wolf	715
Fish	Etheostoma percnurum	Duskytail Darter	166
Vascular Plant	Geum radiatum	Mountain Avens, Spreading Avens	162
Mammal	Myotis grisescens	Gray Myotis	160
Bird	Gymnogyps californianus	California Condor	156
Mammal	Glaucomys sabrinus coloratus	Carolina Northern Flying Squirrel, Northern Flying Squirrel	153
Mammal	Ovis canadensis sierrae	Sierra Nevada Bighorn Sheep	153
Bird	Picoides borealis	Red-Cockaded Woodpecker	146
Fish	Chasmistes liorus	June Sucker	146
Mammal	Myotis sodalis	Indiana Bat, Indiana Or Social Myotis	145
Amphibian	Rana sierrae	Sierra Nevada Yellow-Legged Frog	144
Fish	Noturus baileyi	Smoky Madtom	143
Bird	Vermivora bachmanii	Bachman's Warbler, Bachman's Wood Warbler	141
Mammal	Canis rufus	Red Wolf	137
Bird	Grus americana	Whooping Crane	131

- As we can see, 10 out of 15 (66.6666...%) of these are either mammals or birds.
- The endangered creatures with the least number of observations are also a bird and a mammal.
- From what we know, mammals and birds have the highest percentage in conservation as well as having the most endangered. Thus, it would be wise for the National Parks to focus on the species in these categories a little more than the others.

Canis rufus(red wolf) and Grus americana (whooping crane)



- These had the least number of observations out of the endangered species.
- The Great Smoky Mountains National Park has the least amount of both out of all 4 parks.

Conclusion

- There is a significant difference between mammals and reptiles, as well as mammals and fish when looking at their relationship of conservation status.
- Mammals and birds have the highest percentage of their observed species in conservation, mammals with 17.514% and birds with 15.369%.
- The National Parks should thus put more focus on maintaining and protecting mammals and birds compared to other categories of species like plants.
- The Great Smoky Mountains should take extra precaution with protecting the canis rufus and grus americana.

Chi-Square Tests (significance value = 0.05)

- Mammal and Bird: P-Value = 0.584, so we fail to reject the null hypothesis of having a significant difference.
- Mammal and Reptile: P-Value = 0.03146, so we reject the null.
- Mammal and fish: P-Value = 0.0441931, so we reject the null.

Category	Not in Conservation	In Conservation
Mammal	146	31
Bird	413	75

Category	Not in Conservation	In Conservation
Mammal	146	31
Reptile	73	5

Category	Not in Conservation	In Conservation
Mammal	146	31
Fish	115	11

Data Analysis and Research:

- https://github.com/DataMathMan13/Biodiversity-in-National-Parks/tree/main