

# Biodiversity Capstone Project

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A dark blue diagonal gradient bar that starts from the bottom left and extends towards the top right, covering the lower half of the slide.

# National Parks Service Data

What can we learn from  
`species_info.csv`?

The raw data:

- 5541 different species from seven categories
  - Mammal, Bird, Reptile, Amphibian, Fish, Vascular Plant, Nonvascular Plant
- Four conservation statuses
  - Species of Concern, Endangered, Threatened, In Recovery

The upshot:

- Given this data, what patterns do we see and conclusions can we draw from analyzing these species and their level of endangerment?

# Fact #1: Most species do not have an assigned conservation status

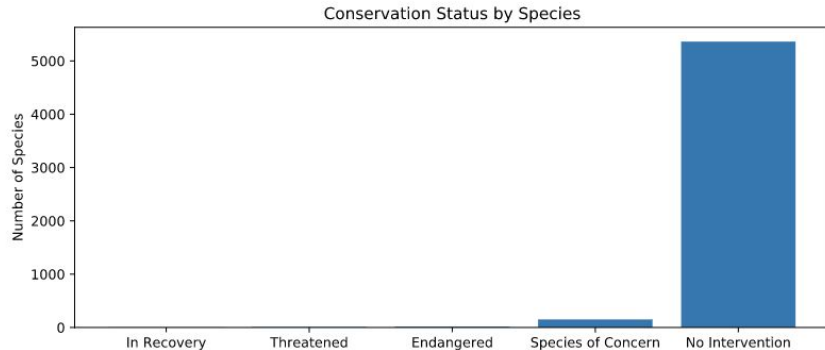


Fig 1 shows that of the 5541 species, only a small percentage (~4.2%) have an assigned conservation status.

	conservation_status	scientific_name
0	Endangered	15
1	In Recovery	4
2	No Intervention	5363
3	Species of Concern	151
4	Threatened	10

# Fact #2: Mammals are the most protected animal type

is_protected	category	False	True
0	Amphibian	72	7
1	Bird	413	75
2	Fish	115	11
3	Mammal	146	30

Fig 2

Fig 2 shows the ratio for each category that is protected vs not protected (either has or does not have an assigned conservation status).

1. Mammals (20%)
2. Bird (18%)
3. Fish (9%)

This means that mammals are more likely to be endangered than any other category

The category least likely to be endangered is the vascular plant at only 1% with an assigned conservation status!

# What about the significance of the data?

pval → 0.687594809666  
→ 0.0383555902297

Fig 3

Using a Chi-Squared Test, Fig 3 shows the pvalue for how significant the difference is between the conservation statuses of mammals vs birds (top) and mammals vs reptiles (bottom).

Our pval threshold for significance is  $< 0.05$ , therefore we can conclusively say that there is no significant difference between mammals and birds, but there is a significant difference between mammals and reptiles!

We are certain that mammals are more likely to be endangered than reptiles!

# Recommendations

1. Funnel resources into accurately labeling every species with a conservation status since so many are without
2. Focus on protecting mammals and birds since they are the most endangered category

# Foot and Mouth Disease

Knowing that 15% of sheep at Bryce National Park has foot and mouth (FAM), what conclusions can we draw through observing the other National Parks?

Sample size we'll need at a 90% significance level and a baseline conversion rate of 15%:

870

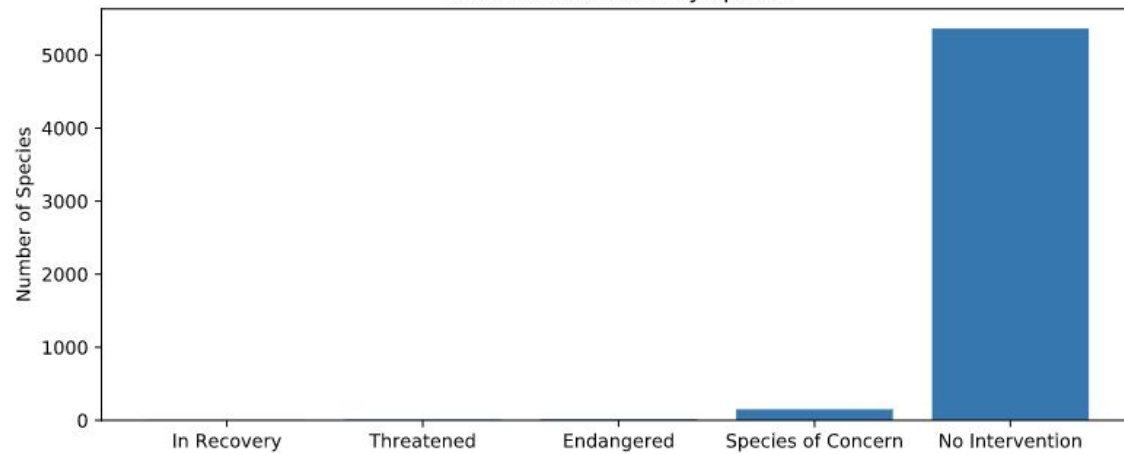
Weeks we will need to spending observing sheep at Yellowstone:

2

Weeks we will need to spending observing sheep at Bryce:

4

Conservation Status by Species



Observations of Sheep per Week

