

# BIODIVERSITY ANALYSIS OF NATIONAL PARKS JULY 23, 2025

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# PROJECT SCOPING

- **GOAL:** TO ANALYSE SPECIES BIODIVERSITY AND CONSERVATION STATUS ACROSS MANY NATIONAL PARKS TO INFORM CONSERVATION EFFORTS.
- **DATA:**
  - species\_info.csv
  - observations.csv



- ANALYTICAL STEPS:
  - DATA CLEANING (FILL MISSING VALUES IN CONSERVATION STATUS)
  - SUMMARY STATISTICS ON SPECIES BY CATEGORY AND CONSERVATION STATUS
  - STATISTICAL TESTS TO ASSESS SIGNIFICANCE OF PROTECTION STATUS BY CATEGORY
  - FOCUS ON SPECIFIC SPECIES GROUPS AND THEIR OBSERVATION PATTERNS
  - CALCULATE SAMPLE SIZES FOR MONITORING STUDIES



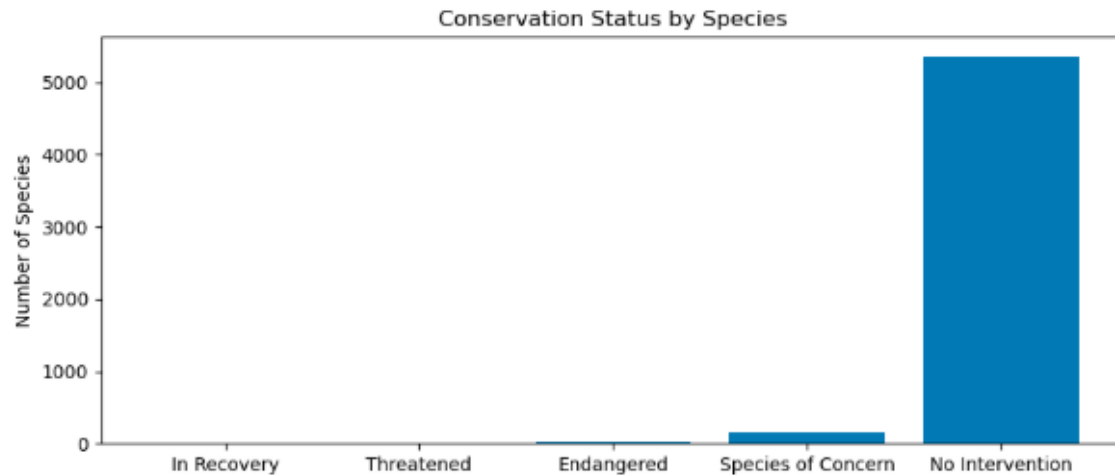
## 2. DATA EXPLORATION AND EXPLANATION



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

WHAT IS THE DISTRIBUTION OF CONSERVATION\_STATUS FOR ANIMALS?

MOST SPECIES HAVE "NO INTERVENTION" CONSERVATION STATUS.



- ARE CERTAIN TYPES OF SPECIES MORE LIKELY TO BE ENDANGERED?

BIRDS AND MAMMALS HAVE A HIGHER PROPORTION OF PROTECTED SPECIES WHILE MOST PLANTS (ESPECIALLY VASCULAR) HAVE VERY LOW

	category	not_protected	protected	percent_protected
0	Amphibian	72	7	0.088608
1	Bird	413	75	0.153689
2	Fish	115	11	0.087302
3	Mammal	146	30	0.170455
4	Nonvascular Plant	328	5	0.015015
5	Reptile	73	5	0.064103
6	Vascular Plant	4216	46	0.010793

Mammals vs. Birds:

p-value  $\approx 0.688 \rightarrow$  Not significant

Mammals vs. Reptiles:

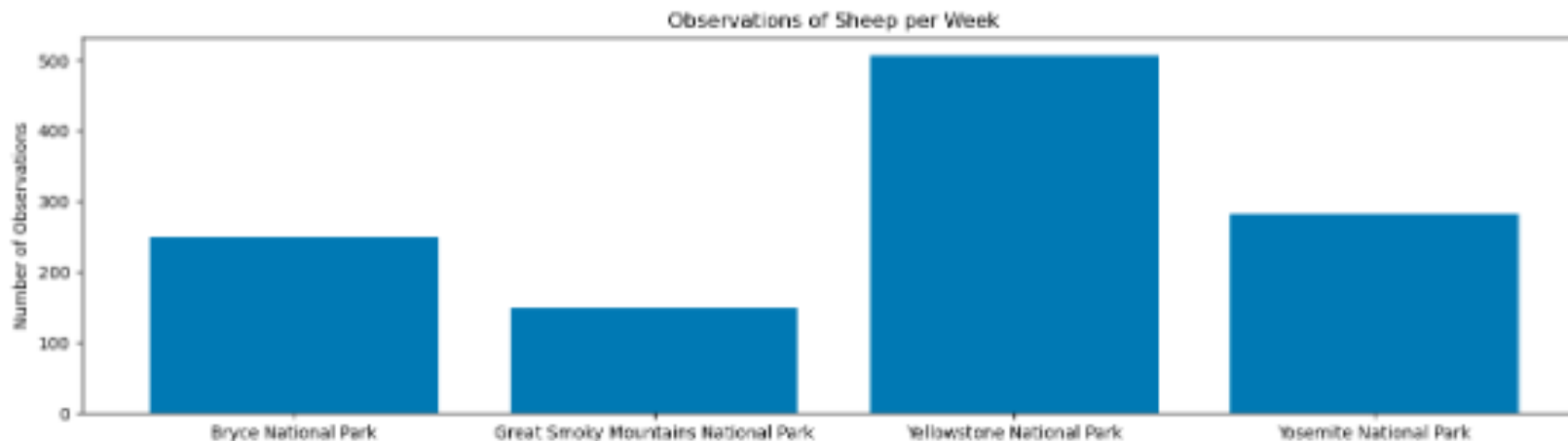
p-value  $\approx 0.038 \rightarrow$  Statistically significant

- ARE THE DIFFERENCES BETWEEN SPECIES AND THEIR CONSERVATION STATUS SIGNIFICANT?

CHI-SQUARE TEST INDICATES  
SIGNIFICANT DIFFERENCE IN  
PROTECTION BETWEEN MAMMALS AND  
REPTILES BUT NOT BETWEEN MAMMALS  
AND BIRDS.

• WHICH SPECIES WERE SPOTTED THE MOST AT EACH PARK?

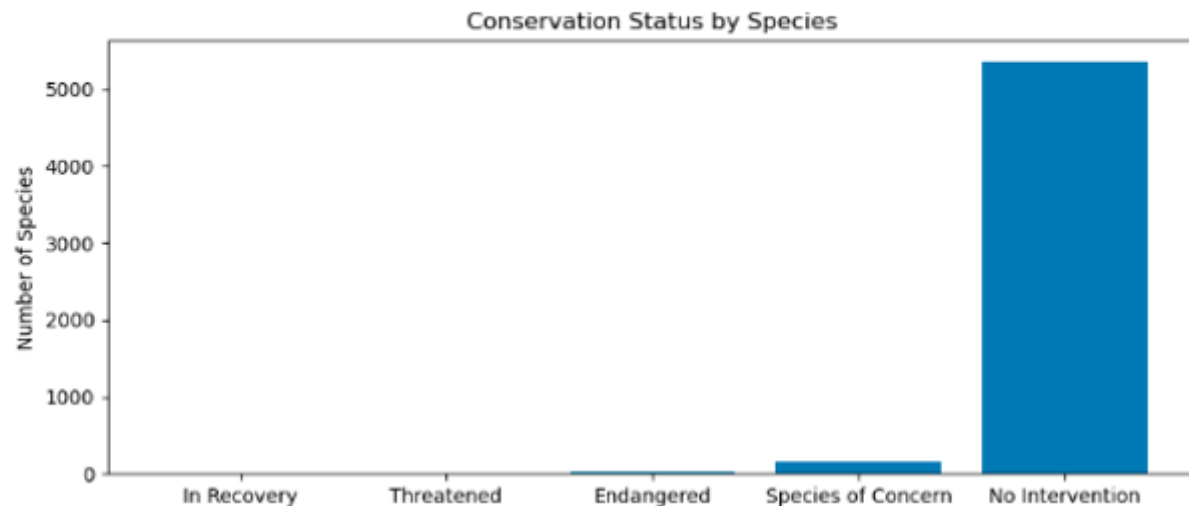
SHEEP SPECIES. YELLOWSTONE NATIONAL PARK HAS THE HIGHEST NUMBER OF SHEEP OBSERVATIONS AND THE GREAT SMOKY MOUNTAINS NATIONAL PARK HAD THE FEWEST SIGHTING.



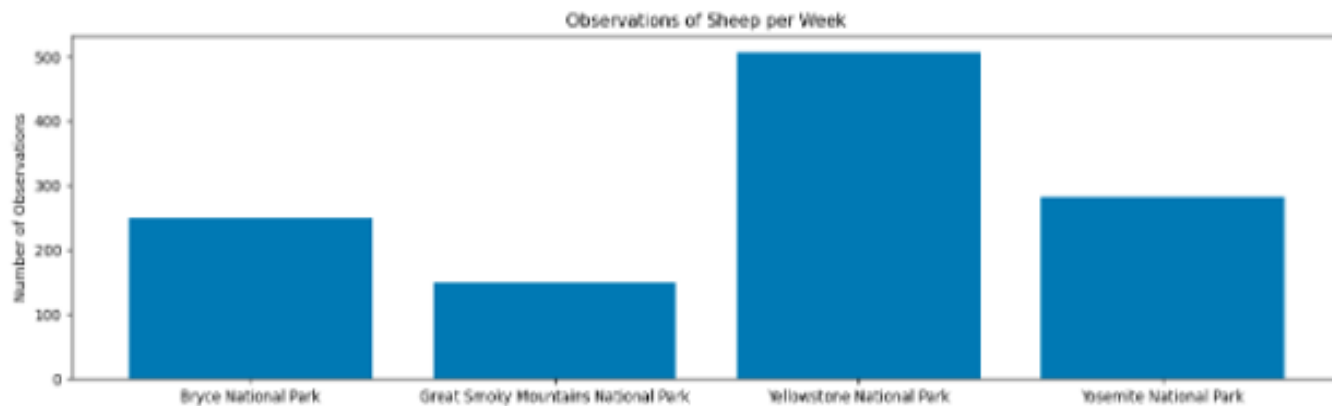


- **Visualizations:**

- Bar plot of species counts by conservation status.



- Bar plot of sheep observations per park.



# CONCLUSIONS

## WHAT DID YOU LEARN?

- Majority of species are not currently protected.
- Mammals have the highest protection percentage.
- A chi-squared test showed a significant difference in protection rates between mammals and reptiles, suggesting mammals are more often targeted for conservation.
- Certain species need focused conservation efforts.

- **KEY FINDINGS:**

- Significant difference in conservation status distribution between categories.
- Yellowstone has the highest number of sheep observations.
- Sample size calculations indicate monitoring will require many weeks of observations depending on the park.



THANK YOU

