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# SPECIES VULNERABILITY ANALYSIS IN AMERICA'S NATIONAL PARKS

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Capstone Project  
Introduction to Data Analysis – Codecademy  
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Glacier Wilderness

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# Multi-species Data Analysis

Data Source – NPS as provided by Codecademy April 2018

Data Files - species\_info.csv

Data Content – Category, Scientific Name, Common Name & Species Status

Categories – Mammal , Bird, Reptile, Amphibian, Fish & Vascular & Non Vascular Plants

Conservation Status – None (No Intervention), In Recovery, Species of Concern, Threatened & Endangered

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# Multi-species Data Analysis

## Data Analyses – Step by Step

Clean up data– Replace Species Status 'None' with 'No I Intervention

Identify - Identify Conservation Status by Scientific Name

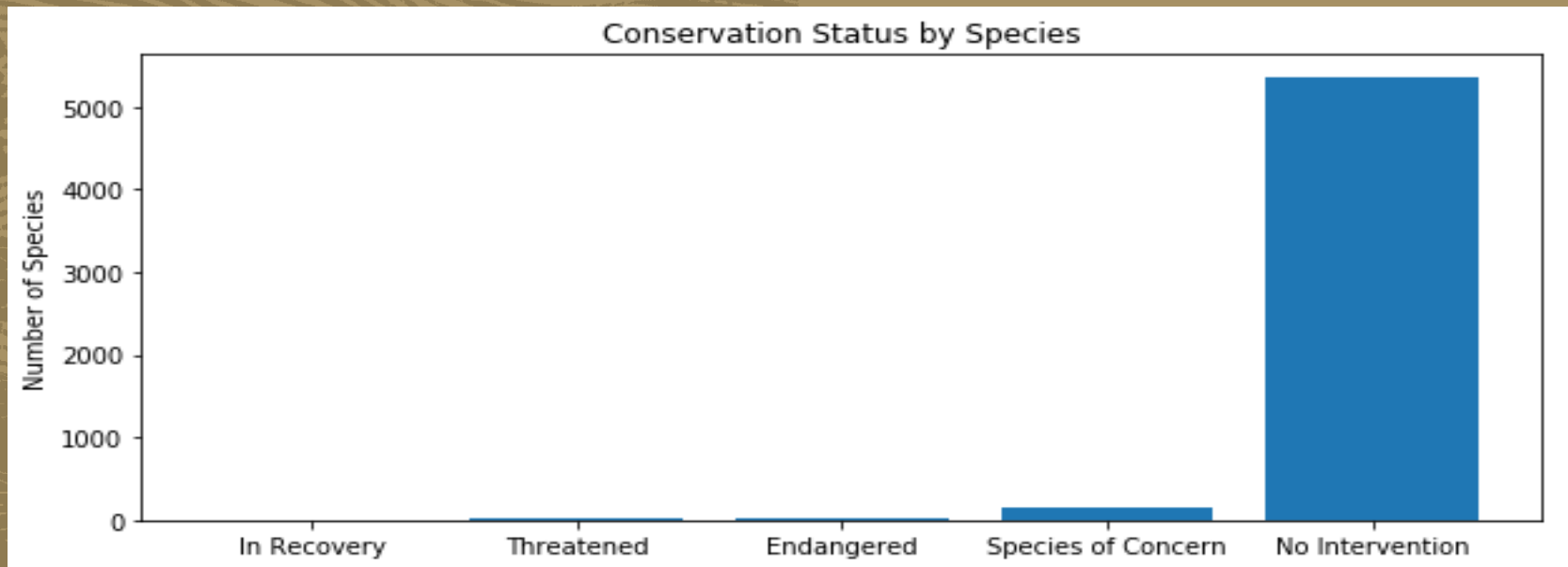
Group by - Species Categories

Evaluate Results - Graphs, Tables & Statistical Analyses

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# Multi-species Data Analysis





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## Multi-species Data Analysis

category	not_protected	protected	percent_protected
Amphibian	73	7	0.087500
Bird	442	79	0.151631
Fish	116	11	0.086614
Mammal	176	38	0.177570
Nonvascular Plant	328	5	0.015015
Reptile	74	5	0.063291
Vascular Plant	4424	46	0.010291

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# Multi-species Data Analysis

## Species Vulnerability - Statistical Significance (Chi Squared Tests)

### Mammals vs Birds

Pvalue = 0.46 implies no significance difference in number of category species protected

### Mammals vs Reptiles

Pvalue = 0.02 implies significance difference in number of category species protected

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# Multi-species Data Analysis

## Recommendations

**Most NPS species are NOT in a protected species category**

**Currently, protected species categories range considerably from the highest in mammals (18%) and lowest in plants (1%)**

**Statistical testing reveals that significant differences may or may not exist between the protection status of species categories**

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# Hoof & Mouth Disease Data Analysis

**Data Source – NPS as provided by Codecademy April 2018**

**Data Files - species\_info.csv, observations.csv**

**Data Content (observations.csv) – scientific names, park names, number of observations per week**



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# Hoof & Mouth Disease Data Analysis

## Data Analyses – Step by Step

Identify data in `species_info.csv` that are mammals  
with sheep in common name

Merge with species with observations

Determine Sample Size

Evaluate Results – Graphs & Statistical Analyses

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# Hoof & Mouth Disease Data Analysis

Baseline Conversion Rate  
based on Bryce Canyon  
Survey

Minimum detectable effect  
based on 5% change in  
baseline hoof & mouth  
disease rate

Baseline conversion rate:	<input type="text" value="15"/> %
Statistical significance:	<input type="radio" value="85%"/> <input checked="" type="radio" value="90%"/> <input type="radio" value="95%"/>
Minimum detectable effect:	<input type="text" value="33.3"/> %
Sample size:	870

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# Hoof & Mouth Disease Data Analysis



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# Hoof & Mouth Disease Data Analysis

## Required Weeks for Survey

**Yellowstone Survey = Weekly\_obs (507) / sample\_size (870) = 1.7 weeks**

**Bryce Survey = Weekly\_obs (250) / sample\_size (870) = 3.5 weeks**

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# Discussion

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