Biodiversity Capstone Project - Investigating Protected Species

Project Presentation Slide Deck

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Spices Dataframe

First 5 Entries

	category	scientific_name	common_names	conservation_status
0	Mammal	Clethrionomys gapperi gapperi	Gapper's Red-Backed Vole	nan
1	Mammal	Bos bison	American Bison, Bison	nan
2	Mammal	Bos taurus	Aurochs, Aurochs, Domestic Cattle (Feral), Domesticated Cattle	nan
3	Mammal	Ovis aries	Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral)	nan
4	Mammal	Cervus elaphus	Wapiti Or Elk	nan

Conservation Status

Conservation status aggregate on scientific_name

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

Conservation Count part 1

	category	scientific_name
0	Mammal	Clethrionomys gapperi gapperi
1	Mammal	Bos bison
2	Mammal	Bos taurus
3	Mammal	Ovis aries
4	Mammal	Cervus elaphus
5	Mammal	Odocoileus virginianus
6	Mammal	Sus scrofa
7	Mammal	Canis latrans
8	Mammal	Canis lupus
9	Mammal	Canis rufus

Conservation Count part 2

Uncleaned data: NaN in status column

	common_names	conservation_status
0	Gapper's Red-Backed Vole	NaN
1	American Bison, Bison	NaN
2	Aurochs, Aurochs, Domestic Cattle (Feral), Dom...	NaN
3	Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral)	NaN
4	Wapiti Or Elk	NaN
5	White-Tailed Deer	NaN
6	Feral Hog, Wild Pig	NaN
7	Coyote	Species of Concern
8	Gray Wolf	Endangered
9	Red Wolf	Endangered

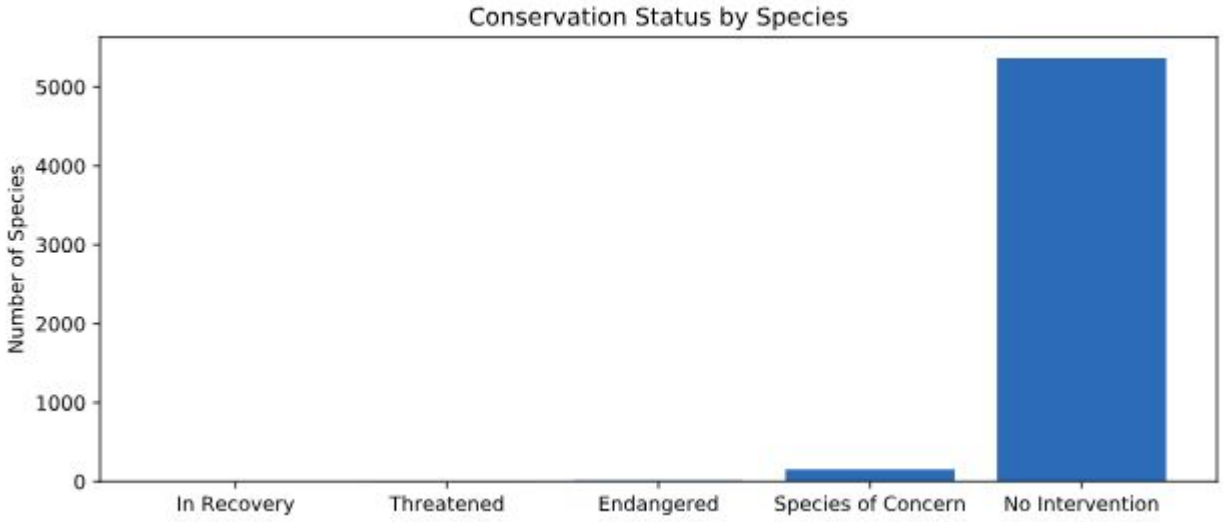
4 - Conservation Status Data (fixed)

Cleaned data

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

5 - Conservation Status (plot)

Bar graph representation



6-Conservation Status (Ambiguous data table)

Aggregate query data

	category	is_protected	scientific_name
0	Amphibian	False	72
1	Amphibian	True	7
2	Bird	False	413
3	Bird	True	75
4	Fish	False	115

7-Endangered Species (Pivoted data table)

Pivoted for meaningful view

	category	is_protected	scientific_name
0	Amphibian	False	72
1	Amphibian	True	7
2	Bird	False	413
3	Bird	True	75
4	Fish	False	115

6 - endangered Species (Protected Percentage)

With percent column

	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

8-Chisquare Test For Mammals Vs Birds (numerical data)

Contingency Table:

p-value = ~0.688

8-Chisquare Test For Mammals Vs. Reptiles (numerical data)

Contingency Table:

p-value = ~0.038

Park Observations

	scientific_name	park_name	observations
0	Vicia benghalensis	Great Smoky Mountains National Park	68
1	Neovison vison	Great Smoky Mountains National Park	77
2	Prunus subcordata	Yosemite National Park	138
3	Abutilon theophrasti	Bryce National Park	84
4	Githopsis specularioides	Great Smoky Mountains National Park	85

Has Sheep In Name

	category	scientific_name	common_names	conservation_status	is_protected	is_sheep
3	Mammal	Ovis aries	Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral)	No Intervention	False	True
1139	Vascular Plant	Rumex acetosella	Sheep Sorrel, Sheep Sorrell	No Intervention	False	True
2233	Vascular Plant	Festuca filiformis	Fineleaf Sheep Fescue	No Intervention	False	True
3014	Mammal	Ovis canadensis	Bighorn Sheep, Bighorn Sheep	Species of Concern	True	True
3758	Vascular Plant	Rumex acetosella	Common Sheep Sorrel, Field Sorrel, Red Sorrel, Sheep Sorrel	No Intervention	False	True
3761	Vascular Plant	Rumex paucifolius	Alpine Sheep Sorrel, Fewleaved Dock, Meadow Dock	No Intervention	False	True

True Sheep data-frame

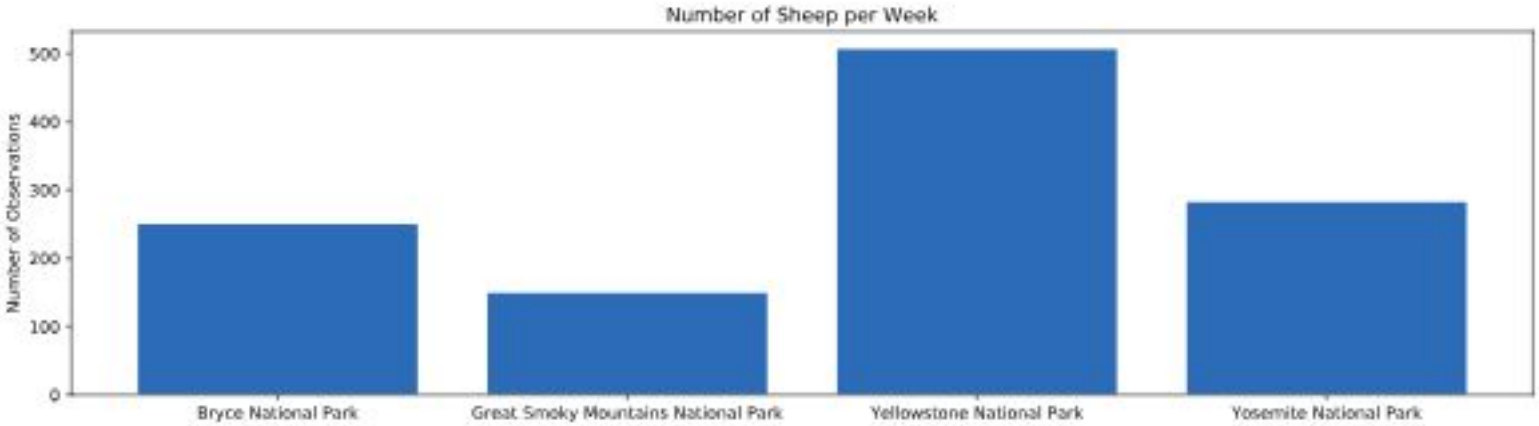
Different sheep spices

	category	scientific_name	common_names	conservation_status	is_protected	is_sheep
3	Mammal	Ovis aries	Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral)	No Intervention	False	True
3014	Mammal	Ovis canadensis	Bighorn Sheep, Bighorn Sheep	Species of Concern	True	True
4446	Mammal	Ovis canadensis sierrae	Sierra Nevada Bighorn Sheep	Endangered	True	True

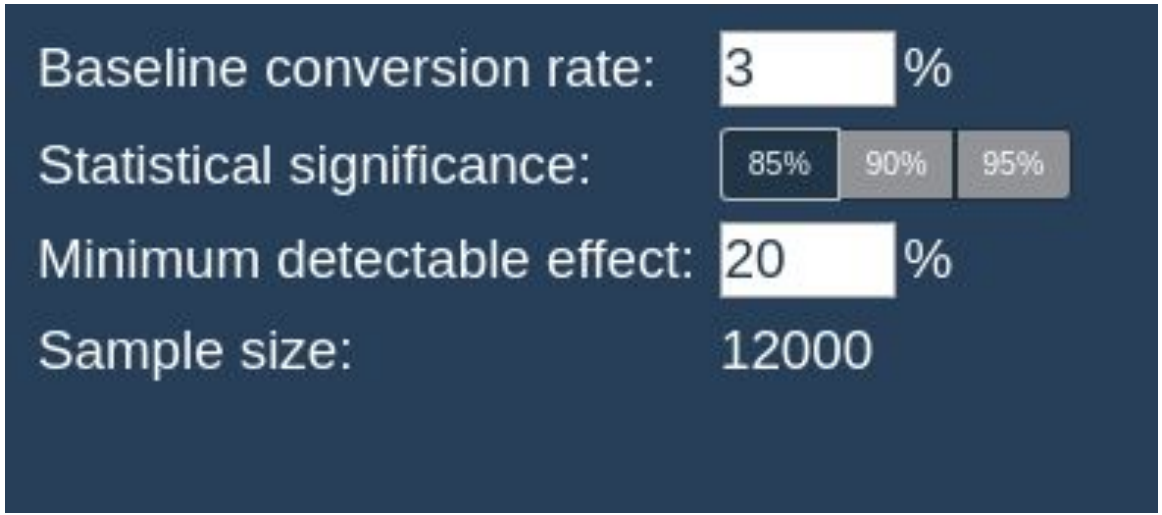
Sheep Observations By Park Name

	scientific_name	park_name	observations
0	Vicia benghalensis	Great Smoky Mountains National Park	68
1	Neovison vison	Great Smoky Mountains National Park	77
2	Prunus subcordata	Yosemite National Park	138
3	Abutilon theophrasti	Bryce National Park	84
4	Githopsis specularioides	Great Smoky Mountains National Park	85

Number Of Sheeps per Week per Park



Sample Size Calculation Formula



Foot And Mouth Reduction Effort

Combine 2 data frames we can use a sample size calculation formula the determine the number of weeks to perform significant observation:

baseline = 15

minimum_detectable_effect = 100*5/15

sample_size_per_variant = 870

yellowstone_weeks_observing = sample_size_per_variant/507

bryce_weeks_observing = sample_size_per_variant/250

Conclusions

We used a baseline of 15% occurrence of foot and mouth disease in sheep in one park: Bryce National Park.

Then with a 5% drop in cases observed for foot and mouth disease in Yellowstone National Park we were able to determine the appropriate sample size of 870.

Finally, from the observations of sheeps in the prior analysis, we could determine the number of weeks required to properly observe sheeps in Yellowstone National Park (3 weeks), and Bryce National Park (1 week)