

Biodiversity for the National Parks

Capstone Project 2 – Sarah Brown
04/08/2018



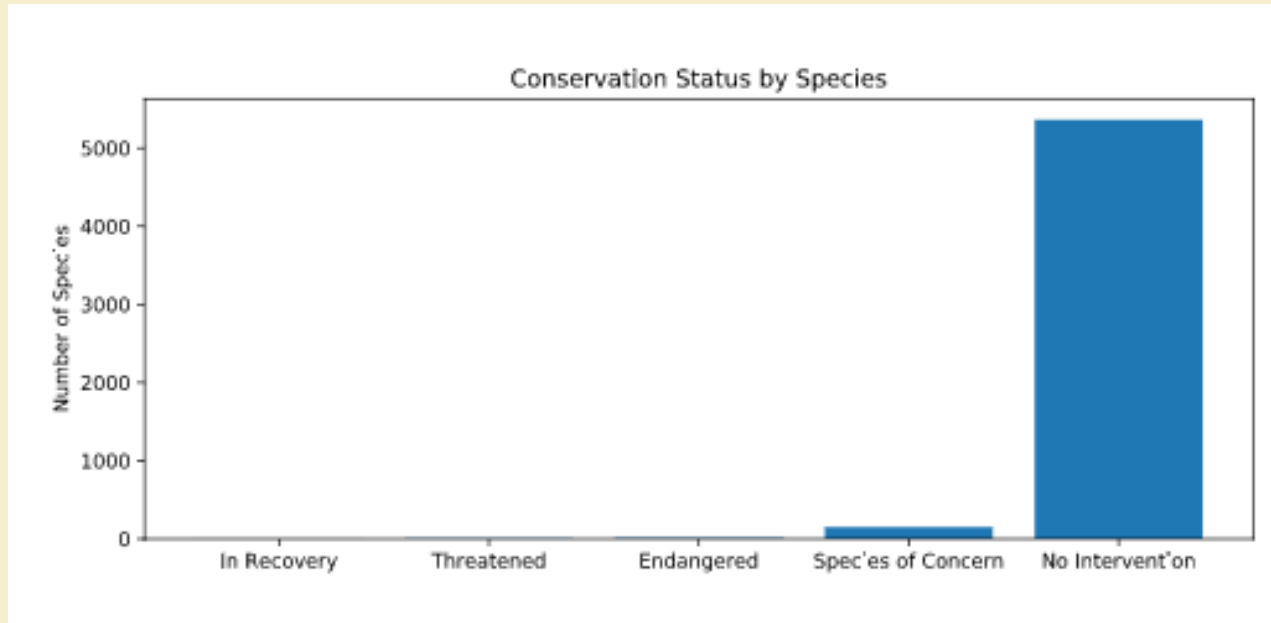
Objective

- Analyze endangered species from several different parks for the National Parks Service
- Examine the conservation statuses of these species and investigate if there are any patterns or themes to the types of species that become endangered

Observations from data

- Data includes information about:
 - Category of animal (Mammal, Bird, reptile, Amphibian, Fish, Vascular Plant, Nonvascular Plant)
 - Scientific and Common Name
 - Conservation Status (Species of Concern, Endangered, Threatened, In Recovery, None)
- Conservation Status has:
 - Species of Concern – 151
 - Endangered – 15
 - Threatened - 10
 - In Recovery – 4
 - No Intervention needed - 5362

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Results from Statistical Analysis

	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

- Chi Square test indicates that even though Mammals appear to be more likely to be endangered than Birds the difference is not significant, $pval = 0.688 > 0.05$
- Significant test indicates that there is a significant difference whether Mammals versus Reptiles were endangered, $pval = 0.038 < 0.05$

Recommendation

- Initial analyses indicated that Mammals are more likely to be endangered than Birds
- The result of a significant chi-square test indicates that the difference between the percentages of protected birds and mammals is not significant and is the result of chance
- The comparison of protected reptiles to mammals indicates that the result is significant
- Certain types of species are more likely to be endangered than others

Observations from data

	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 specuarioides	Great Smoky Mountains National Park	85

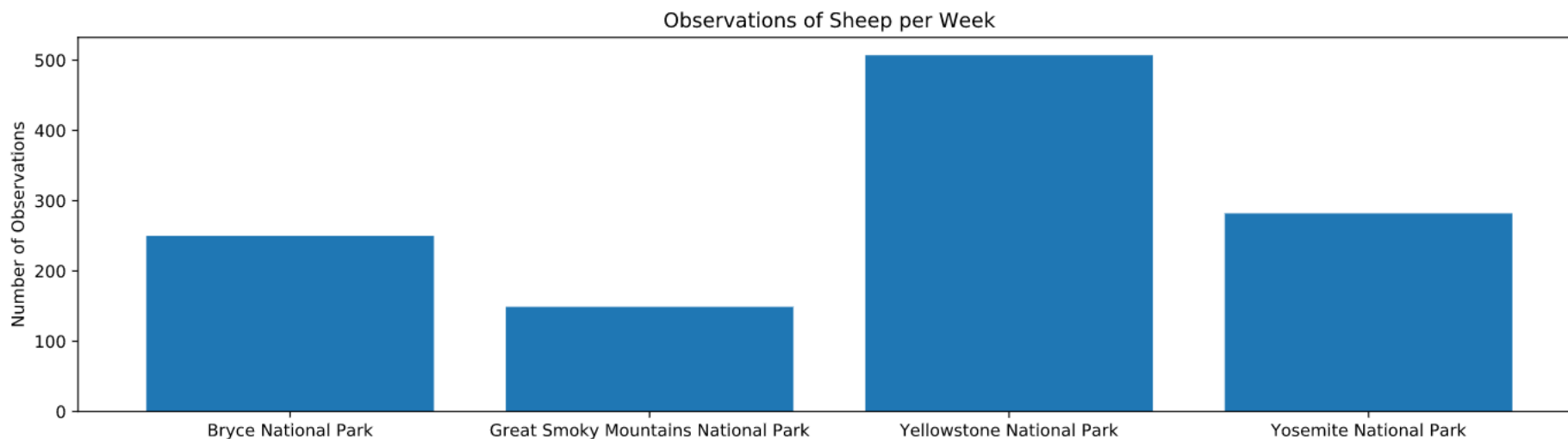
- Sample data set:
 - Scientific and Common name
 - Park Name
 - Number Observed in a week
 - Conservation Status
 - Protected or not

	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
2233	Vascular Plant	Festuca filiformis	Fineleaf Sheep Fescue	No Intervention	False	True
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3761	Vascular Plant	Rumex paucifolius	Alpine Sheep Sorrel, Fewleaved Dock, Meadow Dock	No Intervention	False	True
4091	Vascular Plant	Carex illota	Sheep Sedge, Smallhead Sedge	No Intervention	False	True
4383	Vascular Plant	Potentilla ovina var. ovina	Sheep Cinquefoil	No Intervention	False	True
4446	Mammal	Ovis canadensis sierrae	Sierra Nevada Bighorn Sheep	Endangered	True	True

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Observations from data

	park_name	observations
0	Bryce National Park	250
1	Great Smoky Mountains National Park	149
2	Yellowstone National Park	507
3	Yosemite National Park	282



- Total number of sheep observed in each park over the last 7 days → Observations

Results from Statistical Analysis

- Foot and Mouth Reduction Effort – Sample Size Determination
- Baseline = 15
- Minimum detectable effect = 33
- Sample Size per variant = 890
- Number of weeks needed to observe at Yellowstone to reach sample size = 1.755
- Number of weeks needed to observe at Bryce to reach sample size = 3.56
- Both Yellowstone and Bryce will need to observe for multiple weeks in order to observe enough sheep to see the appropriate sample size to determine if the efforts to reduce Foot and Mouth were successful

Thank You