By Muneeb Delair

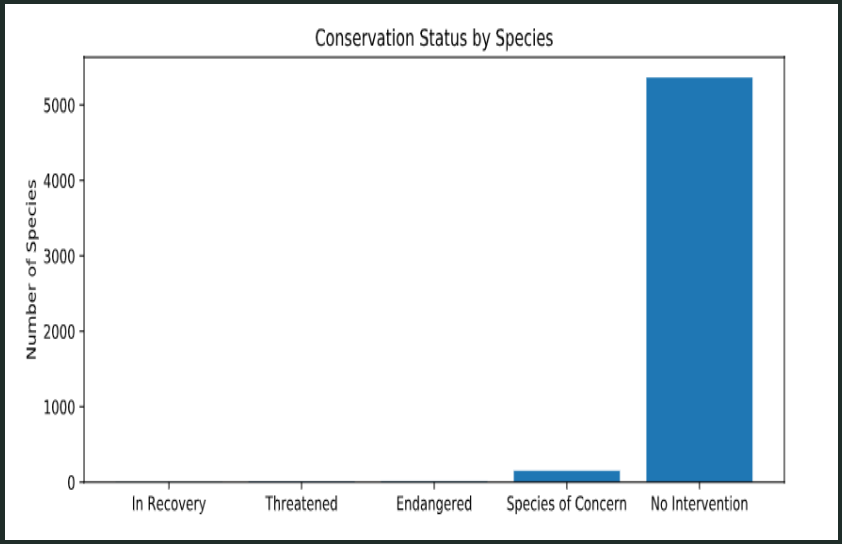
National Parks Service Investigation

AIMS

1. To analyse conservation statuses of the animals on file

2. To investigate if there are any patterns or themes to the types of species that become endangered.

What is in the **species_info.csv file?**



There is no intervention for a significant number of species.

There are 5823 rows and 5 columns.

The data shows 5541 species complete with the ‘scientific name’ and ‘common name’ of each of the species.

The data shows 5 conservation status of each of the species (nan, 'Species of Concern’, 'Endangered’, 'Threatened’ or 'In Recovery').

The data shows the 7 category of each species (e.g. 'Mammal’, 'Bird’, 'Reptile’, 'Amphibian’, 'Fish’, 'Vascular Plant’ or 'Nonvascular Plant’).

Calculations for endangered status between different categories of species

17% of Mammals are protected while 15% of fish are protected too.

Chi-squared test proved that the difference between both percentages is not significant so the result is by chance

	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

Calculations for endangered status between different categories of species

- 6% of reptiles are protected.
- Chi-squared test between the percentages of reptiles and mammals proved that the difference between both percentages is significant, not chance
- This shows that certain types of species *are* more likely to be endangered than others.

	category	not_protected	protected	percent_protected
0	Amphibian	72	7	0.088608
1	Bird	413	75	0.153689
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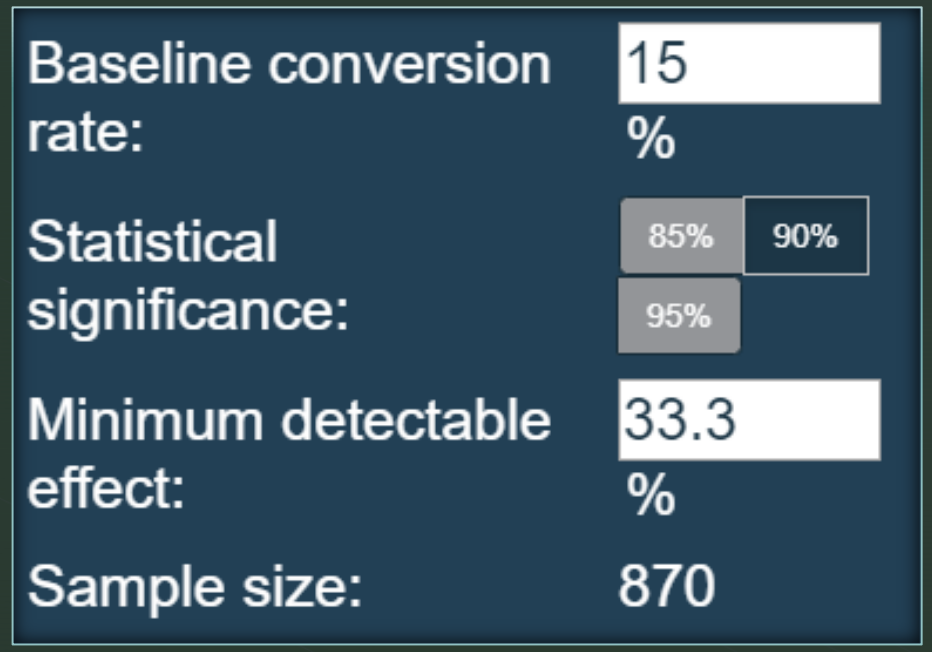
Recommendation for Conservationists concerned about endangered species

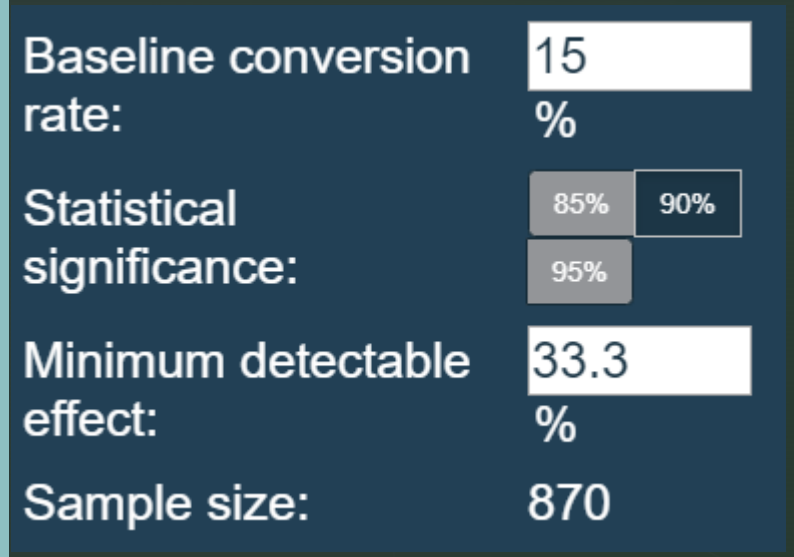
To pro-actively endeavour to protect all types of species

- For example, work out which species are likely to become endangered as a result of the current endangered species.
- Remember, each species can impact another. A decrease in one species could result in a decrease in another while it could also lead to a significant increase in a third.
- A decrease or increase in one species could have knock-on implications on other species too.

Sample Size Determination For Foot and Mouth Reduction Effort

- Scientists at the National Parks want to detect a 5% decrease in foot and mouth from a baseline of **15%**
- So the minimum detectable effect is 100 x 5 / 15 = **33.3%**
- Adding the above two figures to the calculator with a default level of **significance** of **90%** gives a sample size of **870**





Sample Size Determination
For Foot and Mouth Reduction Effort

- How many weeks of observing is required at the different National Parks?
  - Bryce National Park = 3.48 so **4 weeks of observations could be taken**
  - Grey Smoky Mountains National Park = 5.84 so **6 weeks of observations**
  - Yellowstone National Park = 1.72 weeks so **2 weeks of observations**
  - Yosemite National Park = 3.09 so **4 weeks of observations**
- **The above number of weeks of observation will provide the required sample size from each of the National Parks for the scientists to complete their observations, with Yellowstone National Park being the shortest time for which observations would be required to meet the sample size.**

Graphs created in the project