

Biodiversity for the National Parks

Species data description

- 5541 different species
- 7 different types of species: Mammal, Bird, Reptile, Amphibian, Fish, Vascular Plant and Nonvascular Plant
- 5 conservation status: No intervention, Species of Concern, Endangered, Threatened and In Recovery

Conservation status	Species
Endangered	15
In Recovery	4
No Intervention	5363
Species of Concern	151
Threatened	10

Category	Species
Amphibian	79
Bird	488
Fish	125
Mammal	176
Nonvascular Plant	333
Reptile	78
Vascular Plant	4262

Species data calculations

1. Organize each type of species into protected and not protected.
2. Calculate the percent protected of each category of species.
3. Run several Chi-Squared Test to compare the resulting data of two different species and see if there are certain types of species more likely to be endangered ($pval < 0.05$).

Category	Not protected	Protected	Percent protected
Amphibian	72	7	8.8608 %
Bird	413	75	15.3689 %
Fish	115	11	8.7302 %
Mammal	146	30	17.0455 %
Nonvascular Plant	328	5	1.5015 %
Reptile	73	5	6.4103 %
Vascular Plant	4216	46	1.0793 %



Pval = 0.687594809666 Not significant
Pval = 0.0383555902297 Significant
Pval = 0.0336269831073 Significant

As we can see mammals are not more likely to be endangered than birds, but they are more likely to be endangered than reptiles. Also is important to notice that plants are less likely to be endangered than any other species.

Sample size determination

The baseline is 15%, which is the percentage of sheep at Bryce National Park have foot and mouth disease last year.

As we want to detect reductions of at least 5 percentage points, the minimum detectable effect must be $(100*5)/15 = 33.33$.

Using these and a default level of significance (90%), the sample size per variant is 870

If we want to know how many weeks must be taken in each park we just have to divide 870 between the number of observations per week in his respective park, shown in the next table.

Park name	Observations/week
Bryce National Park	250
Great Smoky Mountains National Park	149
Yellowstone National Park	507
Yosemite National Park	282

Graphs

