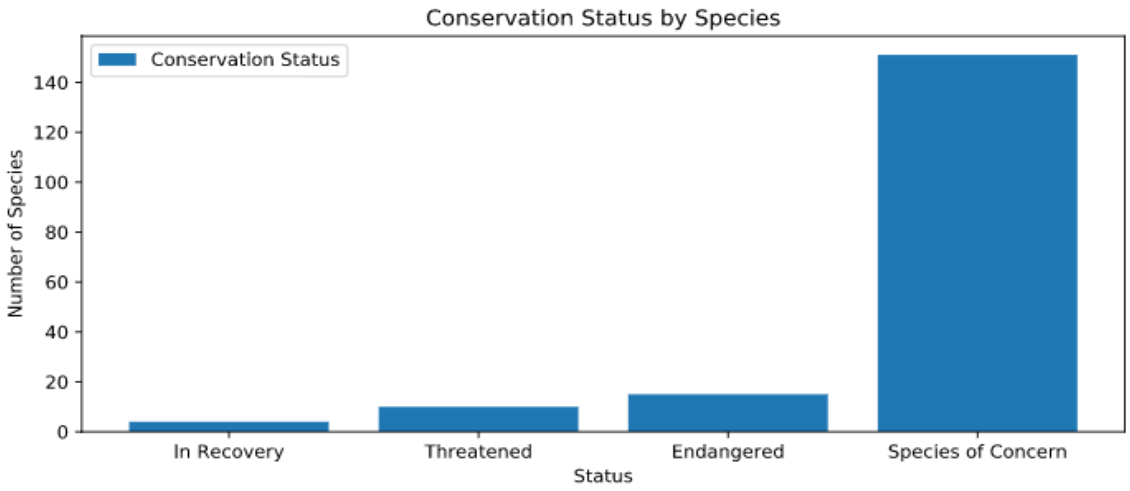
Biodiversity in the National Parks System

- Based upon data from the National Park Service we have performed some basic data analysis on endangered species.
- The data we received from the park service included the common name and scientific name of each species and its conservation status
- From this data we have deduced some surprising information.

Endangered Species monitored by our National Park Service

Regarding all of the species within the National Park System there are 15 that are Endangered. The species sampled included: Mammals, Vascular Plants, Fish, Birds, Amphibians, Nonvascular Plants, and Reptiles. Of the 5541 individual species in all of the park system 5363 require no intervention, and should be presumed to have a health population. 15 are endangered, and 4 are in recovery, only 10 are threatened, and 151 are considered a species of concern.

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



Protected Species in our Parks

Considering all of the species (5363) that are protected, 179 have a status that requires some sort of intervention or 3.23%. Clearly some categories are more protected than others. Plant species have the lowest percentages of protection 1.5”% or less protected. At the other end of the chart Mammals and Birds are both over 15%. Which is 10 times that of the plants categories.

Category	Not Protected	Protected	Percent Protected
Vascular Plant	4216	46	1.08%
Nonvascular Plant	328	5	1.50%
Reptile	73	5	6.41%
Fish	115	11	8.73%
Amphibian	72	7	8.86%
Bird	413	75	15.37%
Mammal	146	30	17.05%

Mammals vs Birds and Mammals vs Reptiles

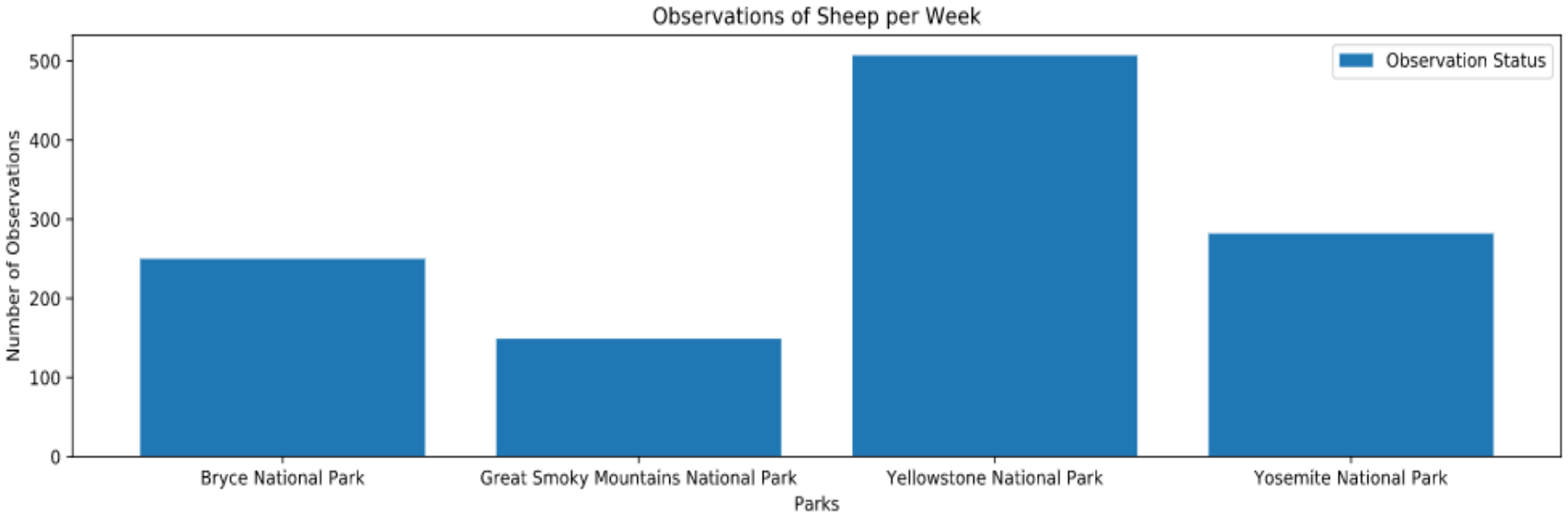
Using Pearson's Chi Squared Test to discover relevance of known differences regarding the percentage of protected species vs un-protected species. Even though Mammals are more protected than Birds, when analyzing the difference there is no significance in the numbers since the pval is 0.69 and is greater than 0.05. While both Amphibians (0.12) and Fish (0.056) categories had numbers over 0.05, the fish are vey close to having a significant difference.

When comparing Mammals with Reptiles using the same test. We discover pval of this Chi Squared test is 0.038 which is less than 0.05. A significant difference is noted. Other significant differences were noted in Nonvascular plants 1.48e-10 and vascular plants 1.44e-55 all less than 0.05.

Mammals are more likely to be endangered than reptiles and both types of plant species. We need to keep working on moving mammals off from the endangered list.

Sheep sightings within the park system

The following graph shows the number of sightings in each national park



Foot and Mouth Reduction Effort
- Sample Size Determination

Park Rangers want to be able to detect reductions of at least 5 percentage points. For instance, if 10% of sheep in Yellowstone have foot and mouth disease, they'd like to be able to know this, with confidence. Last year it was recorded that 15% of sheep at Bryce National Park have foot and mouth disease. The current population will require an observed sample of 510 sheep

- Since we need to have an observed sample size of 510 sheep to detect a 5% change in the diseased population. It will take little more than two weeks at Bryce National park to observe the required number of sheep. And a bit more than one week to find and observe the required sheep in Yellowstone Park