Biodiversity Capstone Study

Observing National Park Populations by Species, Threat Level and Analyzing Disease

What is Included in the Dataset

The Purpose of the Study

This study was conducted in order to determine the overall strength (population numbers), conservation concerns and health of the individual species residing in some of America's largest National Parks.

The Data that was Collected

Our dataset combines the observations of different species, from multiple National Parks.

It includes numbers of individuals observed, the conservation status of each species and the threat level that the populations face, as well as the disease levels within individual populations.

Data Observations

Through this presentation we will share the findings of the studies.

This presentation includes two different studies which outline the following: The overall level of threat for specific groups. Recommendations on endangered species based on significance calculations and a study on foot and mouth disease affecting sheep in the parks.

Species and Conservation Status Analysis

The Study

The next two slides present the information and conclusions of the species protection status study and include an investigation into the protected species in the parks.

It also includes statistical analysis on the species which were of protected status.

The Process

The first step was to clean and sort the data and group all species by their corresponding protection category.

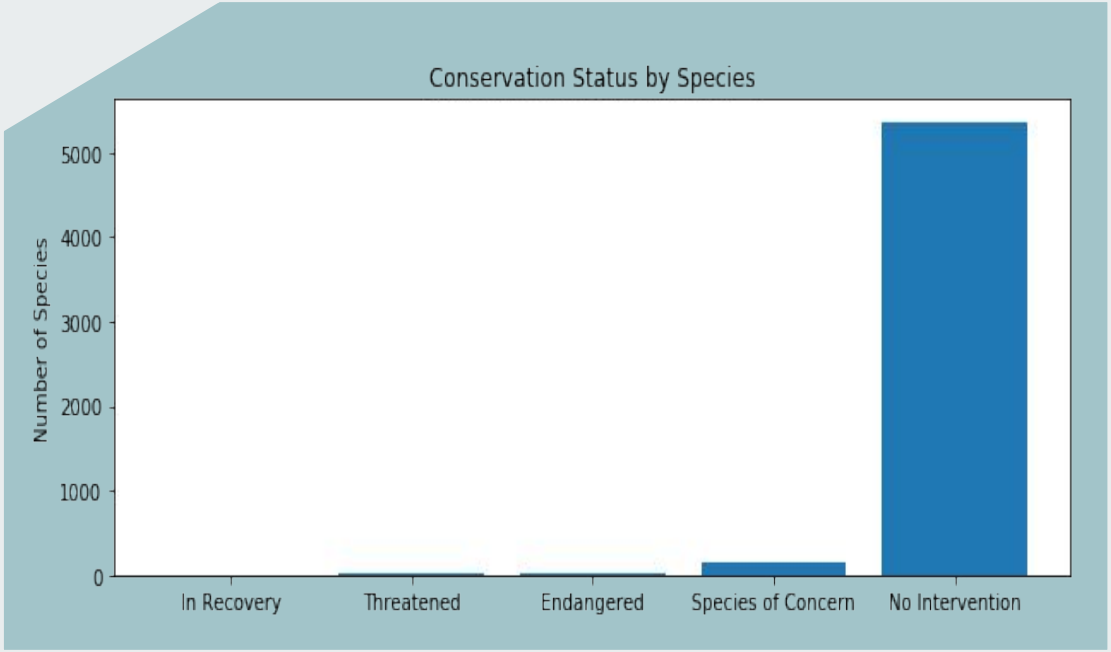
The data was then funneled through a number of sorts in order to make calculations on the threat level specific groups faced.

We then performed statistical analysis on specific species which were threatened and appeared to be of a higher risk than other species, then confirmed the results with a Chi Squared test.

Analyzing the Overall Conservation Status for all Species

The figure to the right shows that, overall, the conservation efforts in the national parks are highly successful for the majority of the species. Meaning that Intervention is NOT required for the vast majority of species.

There are however still approximately 180 species in the parks that are either of concern (151), endangered (10), threatened (15), or in recovery (4) which should be further studied in order to determine better conservation strategies.



Endangered Species Analysis

Results

Based on the data provided we found that birds and mammals were the groups with the greatest percentage of their total species appearing on the protected list at 17% for Mammals and 15% for birds.

Reptiles were the lowest risk vertebrates and plants are the lowest risk group of all.

A Chi Squared test confirmed that birds and mammals are at a similar risk level while mammals are at a significantly higher risk over reptiles.

Recommendations

The results of the study would suggest that birds and mammals are at the highest risk overall.

More studies should be completed to better understand what is the greatest threats to these species and how current conservation efforts are either helping of failing them.

Although we found that mammals are at a greater risk in comparison to reptiles, amphibians and other groups. The other groups still have significant numbers on the protected list and they also require attention, more studies need to be performed.

Analyzing Foot and Mouth Disease in Sheep

At Bryce national Park observations show that approximately 15% of their sheep have Foot and Mouth Disease.

Conservationists at Yellowstone National Park are studying their efforts to reduce infections in their park by 5% year over year and required a sample size to be determined which is statistically significant.

We performed analysis on available Bryce Park data to determine Yellowstone researchers must observe at least 890 animals over 1.75 weeks to have a statistically valid sample that meets their accuracy requirements .

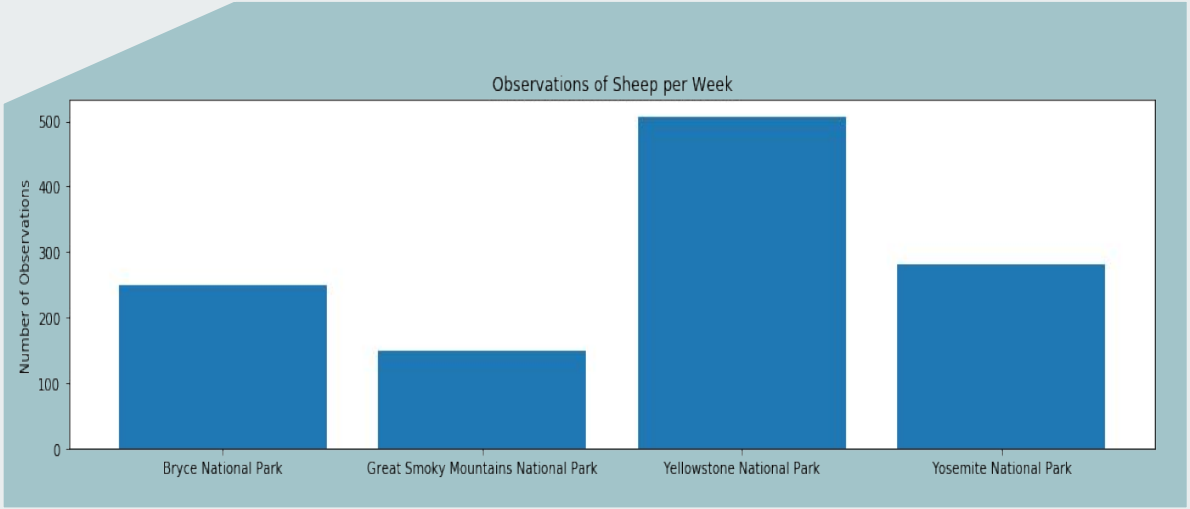


Fig: # of Sheep That can be Observed per Week by Park

Conclusions

Thank You!

For the majority of species residing at the parks the current conservation efforts are adequate and further studies should target the 180 protected species.

Mammals and Birds have the highest proportion of their populations under protected status in relation to unprotected and plants and reptiles have the lowest. A Chi Squared test confirmed these observations and that mammals are more at risk than reptiles.

Foot and Mouth disease in sheep is prevalent at the parks and approximately 15% of the population being affected should be expected. The target of a 5% reduction in infected animals year over year for Yellowstone is a good target to strive for and studies based on the sample sizes determined should be conducted in order to evaluate efforts.