

Biodiversity and Species Endangerment in our National Parks



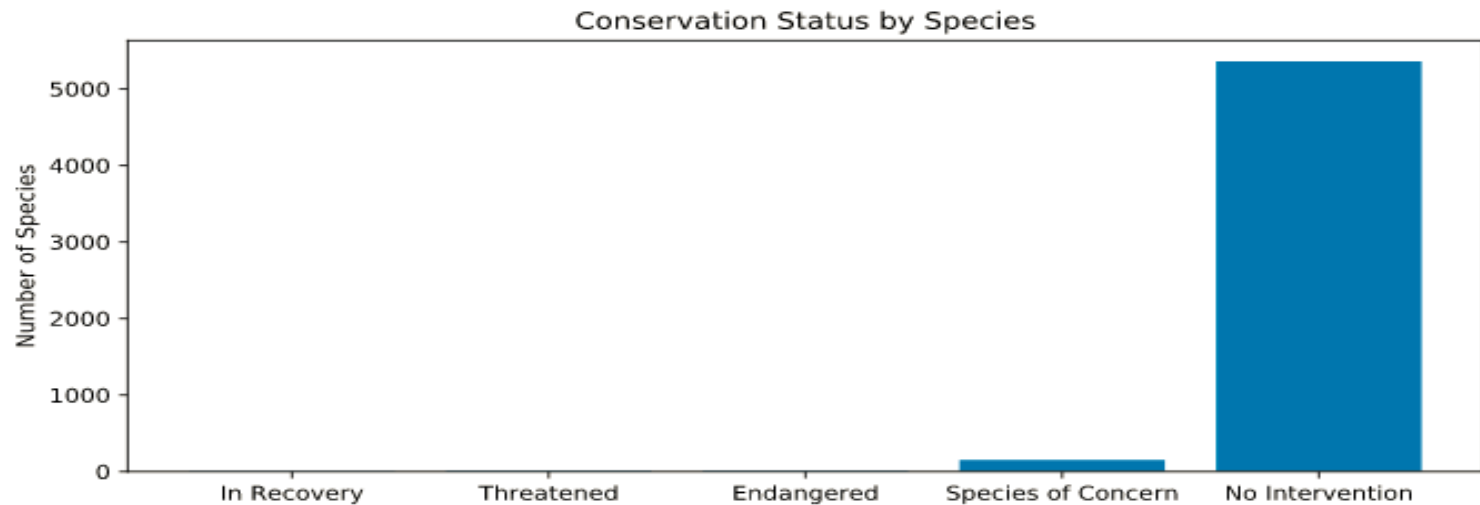
Park Species Data I

- The endangerment of certain species of wildlife in our National Parks has become a growing concern. One of the major factors being looked at is the spread of Hoof and Mouth disease, particularly in the sheep population.
- In an attempt to stem the tide, researchers have been observing sheep health in Bryce National, Great Smoky National, Yellowstone National, and Yosemite National Parks.

Park Species Data II

- The data collected for the study included category, scientific name, common name, and conservation status.
- The data was cleaned up, massaged, analyzed, and used to produce the graphs and results you will see in this presentation.

Reduction Study - Endangered Species



Note: The number of species that were In Recovery, Threatened, or Endangered was 15 or less, whereas the Species of Concern was about 10 times larger. The number of species where No Intervention had been carried out was over 5,000. This could translate to even more species in potential danger.

Reduction Study – Part I

- An initial study was performed to calculate what percentage of species were endangered, were close to endangerment, or were considered safe for now. At the same time, park rangers implemented a program to reduce Hoof and Mouth Disease in sheep at Yellowstone.
- A scientific study was conducted to determine if the program was working. Scientists were looking for a 5% reduction of the disease per week.

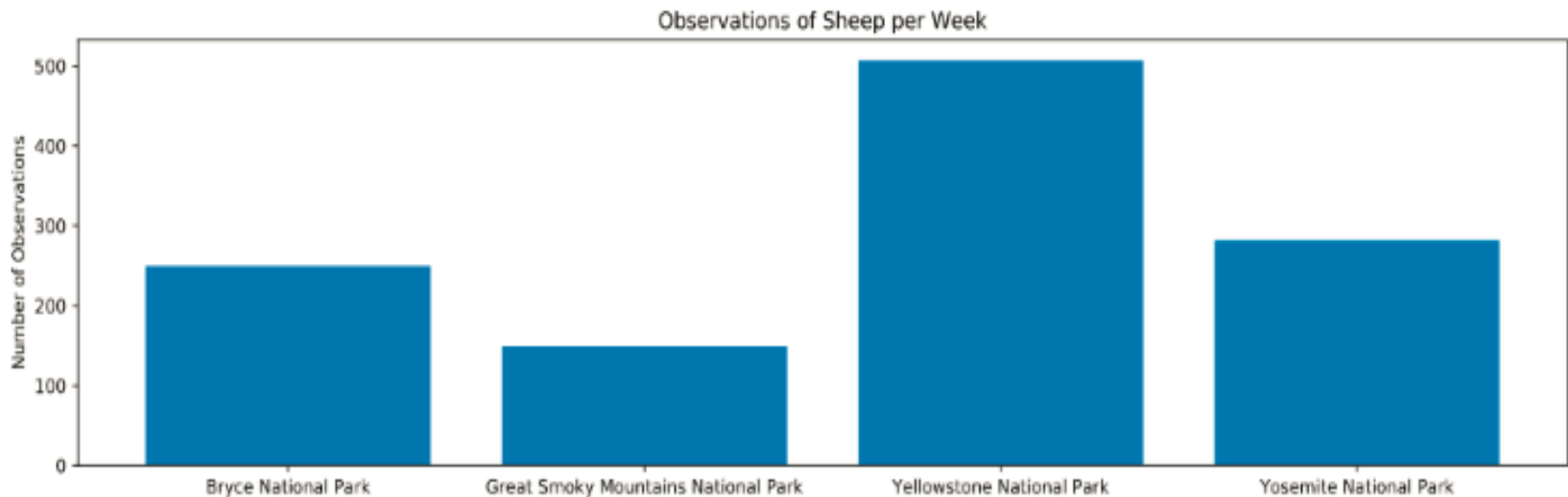
Reduction Study – Part II

- 250 diseased sheep, or a baseline of 15%, had been observed at Bryce National Park. That data was used in the Yellowstone study.
- For accuracy, scientists applied the Minimum Detectable Effect (MDE), the baseline, and a target of 20% to the calculation: $100 * (\text{new target} - \text{baseline}) / \text{baseline}$. The result was 33.3%.

Reduction Study – Part III

Observations Per Park

The chart below represents the number of sheep observed by scientists at each of the national parks. It is the baseline used to determine the number of sheep and the length of time it will take to complete a credible study.



Reduction Study – Part IV

- To determine the study sample size, the numbers previously produced were entered into the study calculator:
 - Baseline: 15%
 - Statistical Significance: 90%
 - Minimum Detectable Effect: 33.3%
- Sample Size: **870**

Reduction Study – Part V

- The number of weeks it will take to achieve the desired results is determined by calculating the sample size/the baseline amount:
 - Yellowstone = $870/507$ = approximately 1 week
 - Bryce Canyon = $870/250$ = approximately 2 weeks

Reduction Study Summary

- The scientific study determined that certain species were more at risk for endangerment than the others.
- The study also showed that the scientific community must be proactive in halting threats such as Hoof and Mouth Disease with the sheep in the National Parks, in order to prevent further endangerment.