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# Biodiversity Report: National Parks Service

Gordon Hay • 27.01.2018

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# Overview

## Conservation Status

3.2% of species are protected

## Likelihood of Endangerment

- Mammals more likely to be endangered than Reptiles
- Mammals no more likely to be endangered than Birds

## Foot and Mouth Progress

Time needed to assess foot and mouth program efficacy:

2 weeks at Bryce National Park

1 week at Yellowstone National Park

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# Conservation Status

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# Data

## species\_info.csv

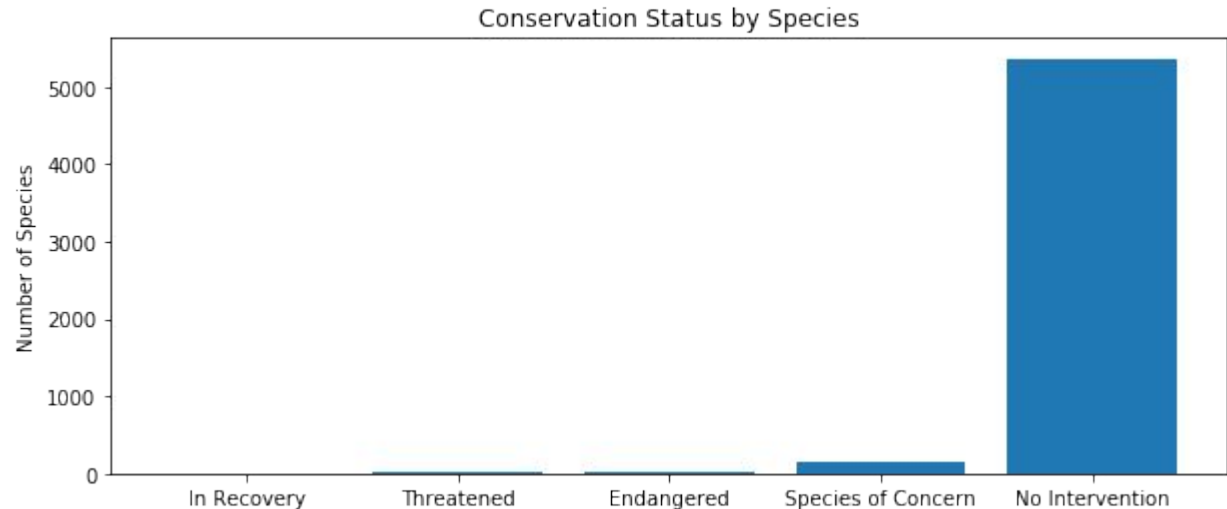
Information on 5541 different species in national parks including:

- Category (Mammal, reptile etc.)
  - Scientific name of each species
  - Common names of each species
  - Species conservation status
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# Conservation Status

Overall health of national parks is good with only 3.2% of species in protected status (In Recovery, Threatened, Endangered or Species of Concern)



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# Which Species were more likely to be endangered?

## Process

- Group species data by category and protection status
  - Calculated percentage of species in each category that is protected
  - To test for significant differences between two or more categorical datasets, a Chi Squared Test was performed
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# Results of Chi Squared Tests

## Mammals v Birds

p -value = 0.688

Null hypothesis accepted

Mammals are no more likely than birds to be endangered

## Mammals v Reptiles

p -value = 0.038

Null hypothesis rejected

Mammals are more likely than reptiles to be endangered

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# Conservation Recommendations

Conservation efforts should focus on mammals and birds.

It was noted that plants were least likely to be endangered

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# Foot and Mouth in Sheep

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# Data

## observations.csv

Information on numbers of sightings of different species in national parks for the last 7 days including:

- Scientific name of each species
  - Park Name
  - Number of sightings
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# Next steps

## Filter Sheep species

Using species\_info.csv, species whose common names included “Sheep” and whose category was “Mammal” were found

## Merge Sheep species with observations

The data frame containing sheep species was merged with observations to find number of sheep observations

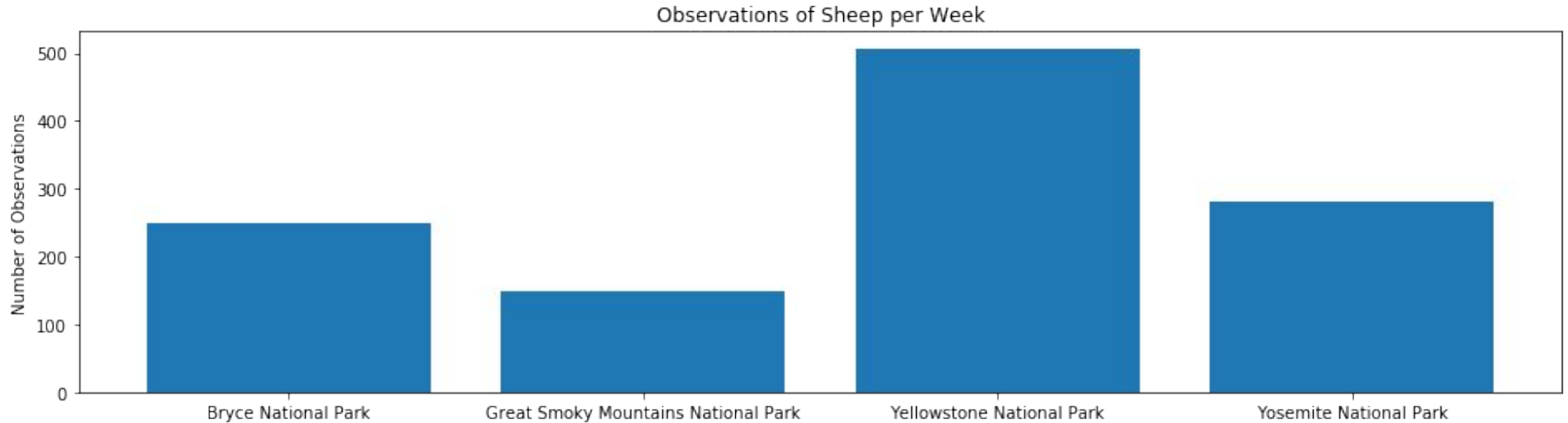
## Determine sheep observations by park

Data grouped by park to show number of sheep sightings in each park

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# Observations of sheep by park



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# Is the foot and mouth program working?

## Baseline Conversion Rate

We know that 15% of sheep in Bryce National Park have foot and mouth. It was assumed this was the same in all parks.

## Minimum detectable effect

We want to be able to see a 5% reduction in disease rate. This translates to a 33.33% change in the baseline disease rate.

## Statistical Significance

We want to assess the program with 90% significance level.

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# Is the foot and mouth program working? (cont)

## Required Sample Size

The parameters detailed on the previous slide were entered into online sample size calculator [Optimizely](#). A sample size of 510 is needed.

## Time needed to collect observations

Bryce National Park:	2 weeks
Great Smoky Mountains National Park:	4 weeks
Yellowstone National Park:	1 week
Yosemite National Park:	2 weeks

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# Next Steps

1. Collect observations for required duration
2. Calculate rate of foot and mouth in sample of sheep
3. If sample disease rate  $\leq 10\%$ , we can be confident the program is working