# Biodiversity for the National Parks

# The project

The National Parks Service asked to perform a data analysis on the conservation statuses of their species and to investigate if there are any patterns or themes to the types of species that become endangered.

# The data

Using the each species and their status of conservation, we can analyse which species and how many are endangered

## Category

kinds of species: Mammal, Bird, Reptile, Amphibian, Fish and Vascular Plant

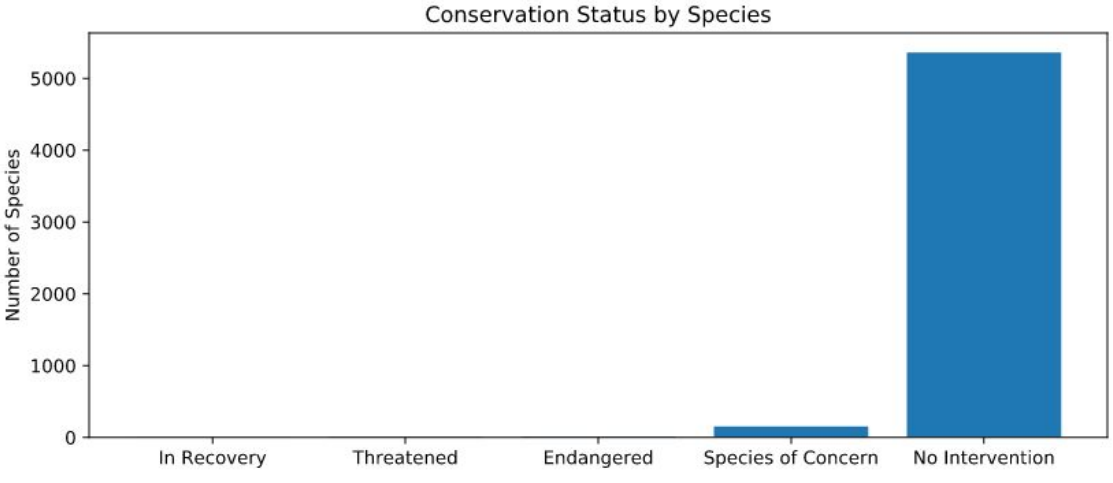
## Conservation status:

nan (not defined), Species of Concern, Endangered, Threatened and in Recovery

| category | scientific_name | common_names | conservation_status |
|---|---|---|---|
| Mammal | Clethrionomys gapperi gapperi | Gapper's Red-Backed Vole | nan |
| Mammal | Bos bison | American Bison, Bison | nan |
| Mammal | Bos taurus | Aurochs, Aurochs, Domestic Cattle (Feral), Domesticated Cattle | nan |
| Mammal | Ovis aries | Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral) | nan |
| Mammal | Cervus elaphus | Wapiti Or Elk | nan |

# Number of species in danger

Of 5541 species most of our animals have the conservation status: ‘No Intervention’, which means that we don’t have the information in which status of conservation they have




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

# Are certain types or species more likely to be endangered?

In this table you can see the amount and percentage of animals and plants, who have been already categorized into different conservation statuses. All the ‘categories’ show how many of their kind have been already checked if they are Species of Concern, Endangered, Threatened or in Recovery. The kinds listed in ‘not protected’ still need to be checked to which conservation status they belong to.

| category | not protected | protected | percent protected |
|---|---|---|---|
| Amphibian | 72 | 7 | 9% |
| Bird | 413 | 75 | 15% |
| Fish | 115 | 11 | 8% |
| Mammal | 146 | 30 | 17% |
| Nonvascular Plant | 328 | 5 | 2% |
| Reptile | 73 | 5 | 6% |
| Vascular Plant | 4216 | 46 | 1% |

The Fish and the Vascular Plant are barely checked and therefore more likely to be endangered.

# Endangered status between single species

With the help of  a chi-square test, we can see, that:

- Reptiles and Mammal are significantly (0.038) different endangered
- While Fish are not more likely to be endangered than vascular plants
- Also Mammals are not more likely to be endangered than Birds

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Therefore, we can conclude that certain types of species are more likely to be endangered than others. The ones having a high difference between ‘not protected’ and ‘protected’ are more likely to be endangered and should be observed and categorized.

# Sheep locations in different national parks

An number of people observed different species in the national parks for the past 7 days. From this data of sightings, I extracted the relevant data, so we can now only see the information about sheeps.

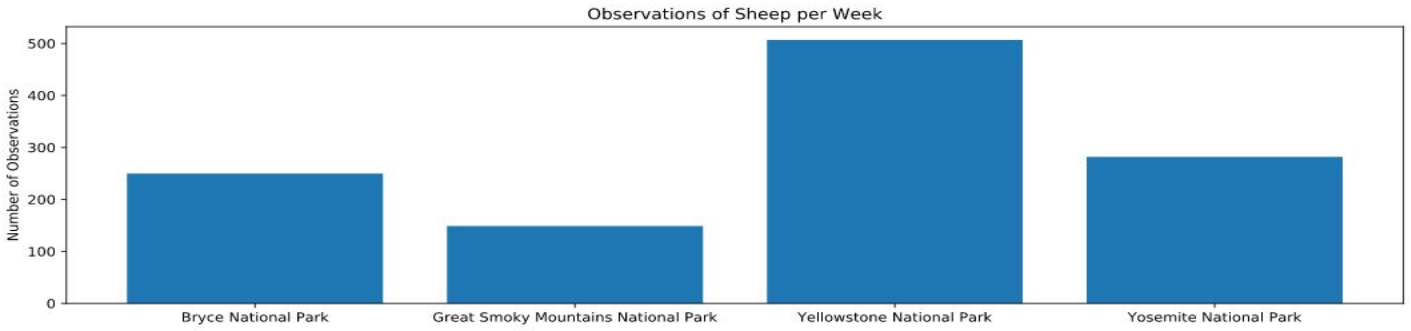
For example 126 observation of Sheeps have been made in Yosemite National Park

See below an extract of the data

| category | scientific_name | common_names | conservation_status | is_protected | is_sheep | park_name | observations |
|---|---|---|---|---|---|---|---|
| Mammal | Ovis aries | Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral) | No Intervention | False | True | Yosemite National Park | 126 |
| Mammal | Ovis aries | Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral) | No Intervention | False | True | Great Smoky Mountains National Park | 76 |
| Mammal | Ovis aries | Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral) | No Intervention | False | True | Bryce National Park | 119 |
| Mammal | Ovis aries | Domestic Sheep, Mouflon, Red Sheep, Sheep (Feral) | No Intervention | False | True | Yellowstone National Park | 221 |
| Mammal | Ovis canadensis | Bighorn Sheep, Bighorn Sheep | Species of Concern | True | True | Yellowstone National Park | 219 |

# Data of Sheeps according to their location

| scientific_name | park_name | observations |
|---|---|---|
| Vicia benghalensis | Great Smoky Mountains National Park | 68 |
| Neovison vison | Great Smoky Mountains National Park | 77 |
| Prunus subcordata | Yosemite National Park | 138 |
| Abutilon theophrasti | Bryce National Park | 84 |
| Githopsis specularioides | Great Smoky Mountains National Park | 85 |



# Program to reduce the rate of foot and mouth disease

In Yellowstone National Park, scientists want to test if their program to reduce the rate of foot and mouth disease works.

To get a significant results, they would have to observe at least 510 sheep This would take them about one week.