Biodiversity for the National Parks

By Emily Laermer

What's the Data Look Like?

- There are seven different types of species….
  - Mammal
  - Bird
  - Reptile
  - Amphibian
  - Fish
  - Vascular Plan
  - Nonvascular plant
- And four types of conservation statuses
  - Species of concern
  - Endangered
  - Threatened
  - In Recovery

More About the Data

- However, the vast majority of the animals are not endangered
  - Endangers: 16
  - In recovery: 4
  - Species of concern: 161
  - Threatened: 10
  - No intervention needed: 5633

Significance calculation

- The pval between mammals and birds is 0.69, which means that there is no statistical significance
- However, there is a statistical significance between mammals and reptiles. The pval is 0.04

Mammals vs. Birds

Create a table called `contingency` and fill it in with the correct numbers

```
In [21]: contingency = [[146, 30],
                        [413, 75]]
```

In order to perform our chi square test, we'll need to import the correct function from

```
from scipy.stats import chi2_contingency
```

```
In [22]: from scipy.stats import chi2_contingency
```

Now run `chi2_contingency` with `contingency`.

```
In [25]: chi2, pval, dof, expeced = chi2_contingency(contingency)
         print(pval)

         0.687594809666
```

Mammals vs. Reptiles

```
In [26]: contingency2 = [[146, 30],
                         [73, 5]]

         chi2, pval, dof, expeced = chi2_contingency(contingency2)
         print(pval)

         0.0383555902297
```
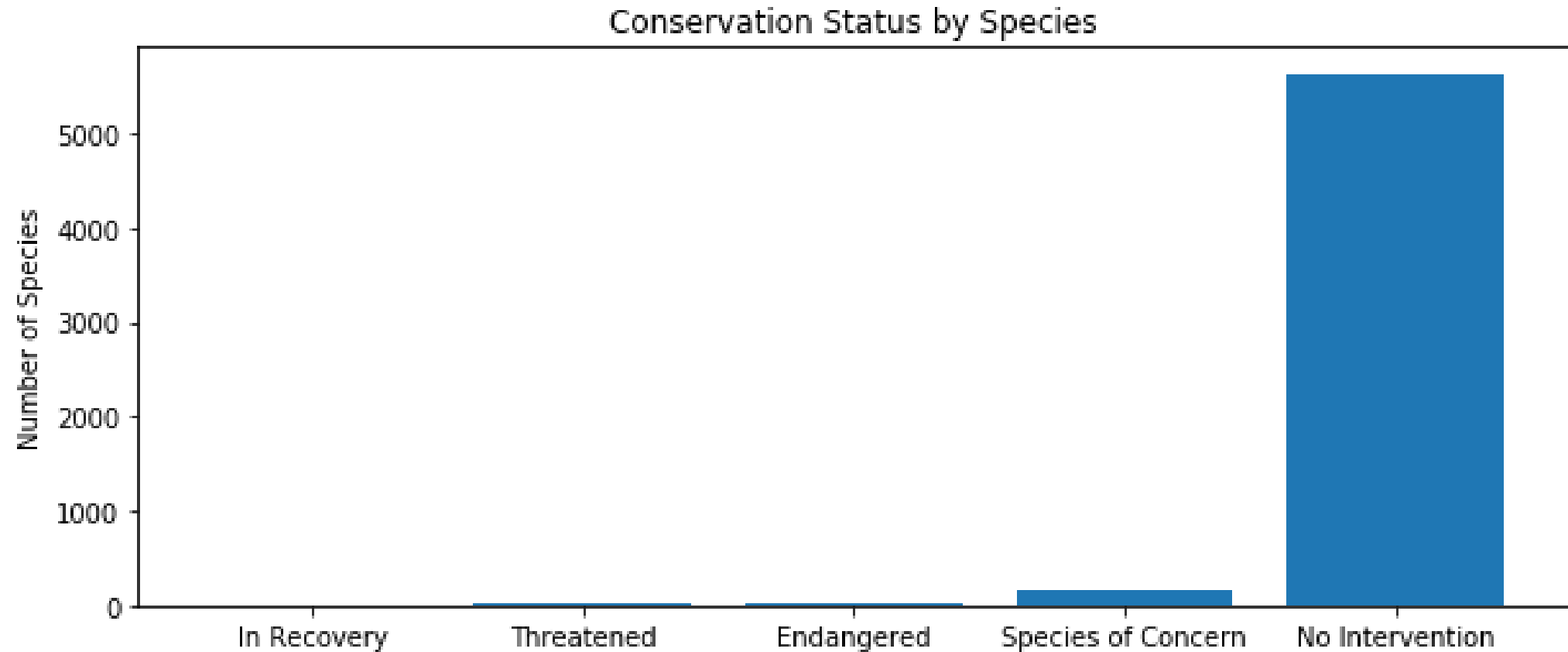
Recommendations

- Mammals and bird are basically equally likely to be endangered species.

- Reptiles are significantly less likely to be endangered.

- Conservation efforts should be focused equally on mammals and birds, and should be less focused on reptiles.

Sample size for foot-and-mouth

- Baseline conversation rate = 15%
- Minimum detectable effect: 33
- Statistical significance = 90%
- Sample size variation = 520

- We would need to observe sheep at **Bryce National Park** for 2.08 weeks, or **3 weeks**, in order to observe enough sheep
- We would need to observe sheep at **Yellowstone National Park** for 1.02 weeks, or **2 weeks**, to observe enough sheep

Graph 1: Conservation Status by Species

Graph 2: Observations to Sheep per Week