

# IT'S TIME TO GIVE A HOOT!

Tufts

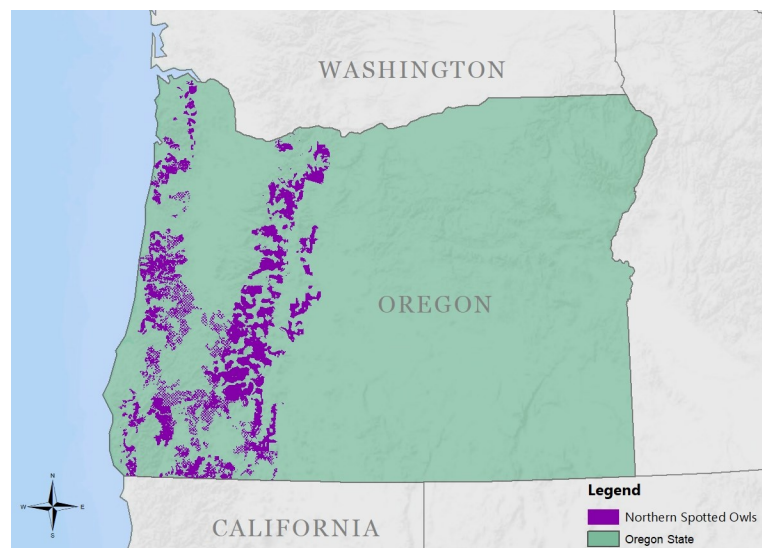
## Identifying Suitable Habitats for Northern Spotted Owls in Oregon

### INTRODUCTION

In recent decades, Northern Spotted Owl (*Strix occidentalis caurina*) populations have declined greatly. In the United States, they are considered “Threatened” under the Endangered Species Act. Historically, they have been found in almost every forest along the western coast of North America, as far north as southwestern British Columbia and as far south as San Francisco. They live in complex forested landscapes and are very sensitive to disturbances in their habitats. Northern Spotted Owls are declining rapidly mainly because of Barred Owls invading their habitats, and deforestation from urban development and the logging industry. This analysis works to identify the remaining habitats suitable for Northern Spotted Owls that should be a priority for protection in the state of Oregon.

### METHODS

To create the suitability analysis for Northern Spotted Owls, I considered a few factors: the presence of Barred Owls (*Strix varia*), canopy density, light pollution as a proxy for urbanization, and the location of late-successional and old growth forests. Since these owls are only found in western Oregon, most of the analysis focused on that area.



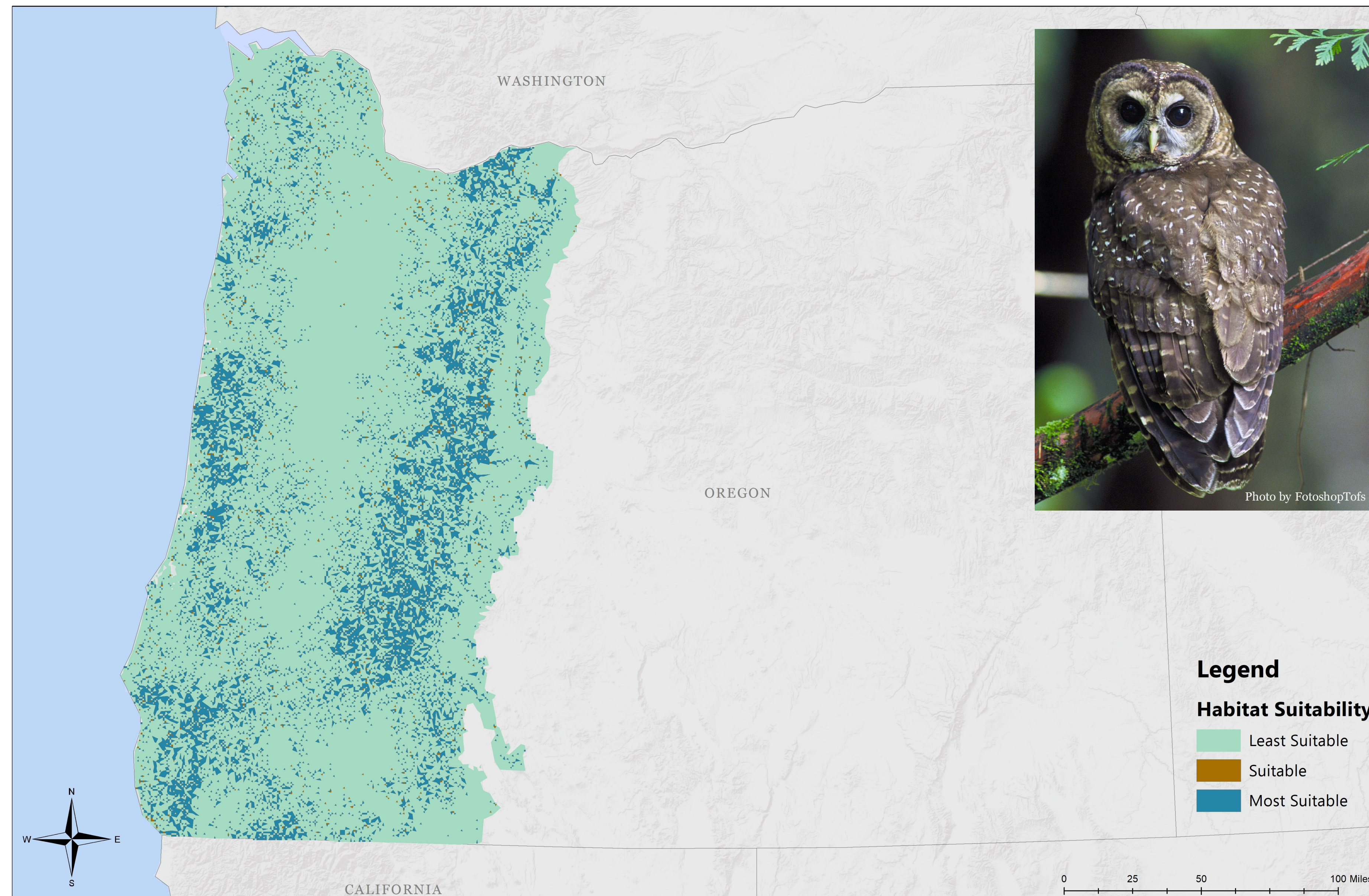
**Barred Owl Density:** After geocoding, point density was used to determine the areas with the most Barred Owls. The results were then reclassified and given a value between 1 and 5, with 5 being the highest concentration of Barred Owls.

**Canopy Density:** After clipping to the state of Oregon, the data was reclassified and given a value between 1 and 5, with 5 representing the most dense canopies.

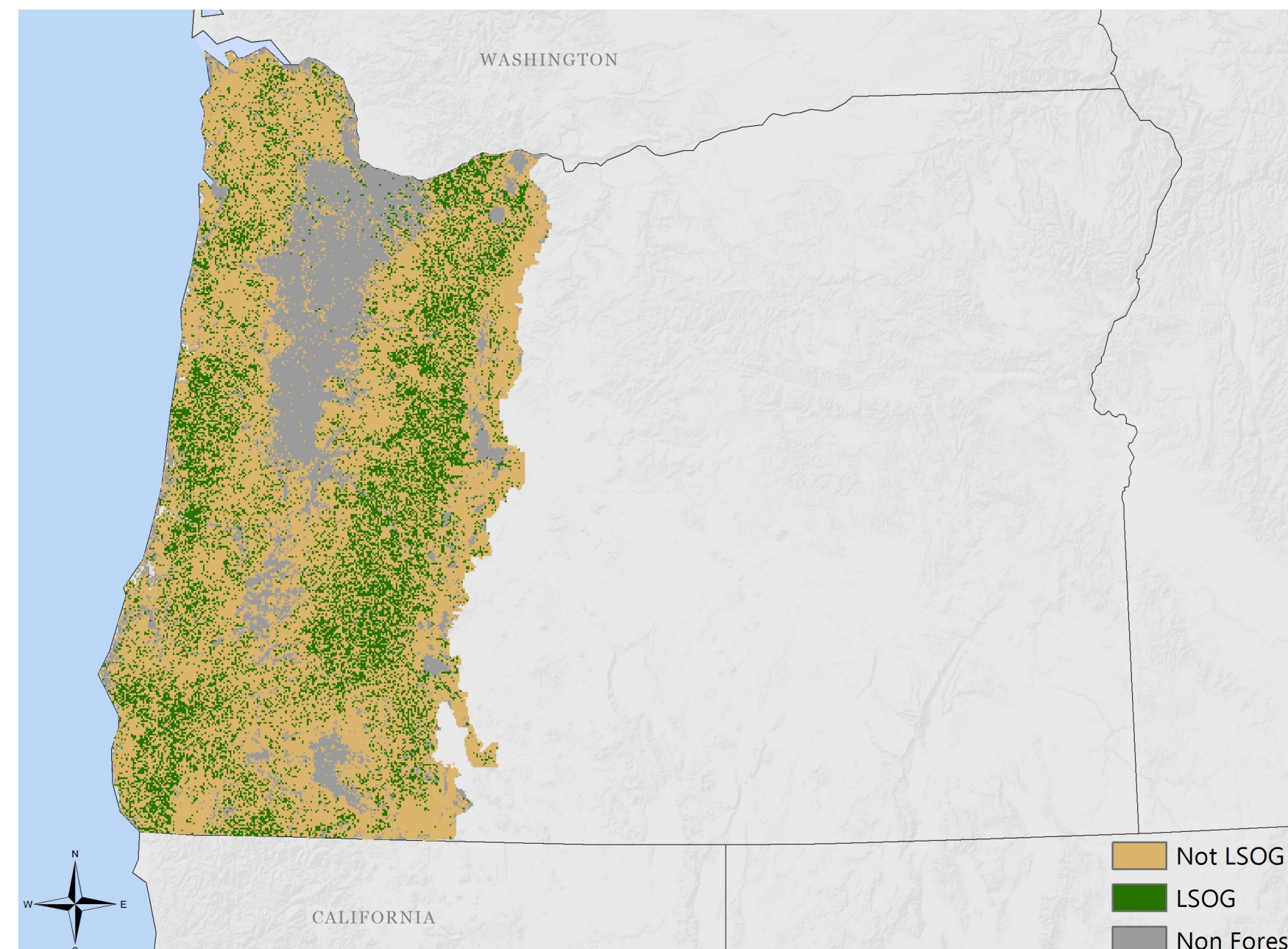
**Urban Lights:** After clipping to the state of Oregon, the data was reclassified and give a value between 1 and 5, with 5 representing the darkest areas.

**LSOG:** The data was reclassified and given a value of 0 or 1. Only LSOG forests were categorized as 1, and everything else became a 0.

**Final Map:** Using raster calculator, barred owl density, canopy density, and urban lights were combined for a score between 1 and 15. Multiplying this score by LSOG, the data was reclassified into three categories: least suitable, suitable, and most suitable habitats for Northern Spotted Owls. The raster was then converted into a vector and intersected with the Northern Spotted Owl range to determine how much overlap occurred.

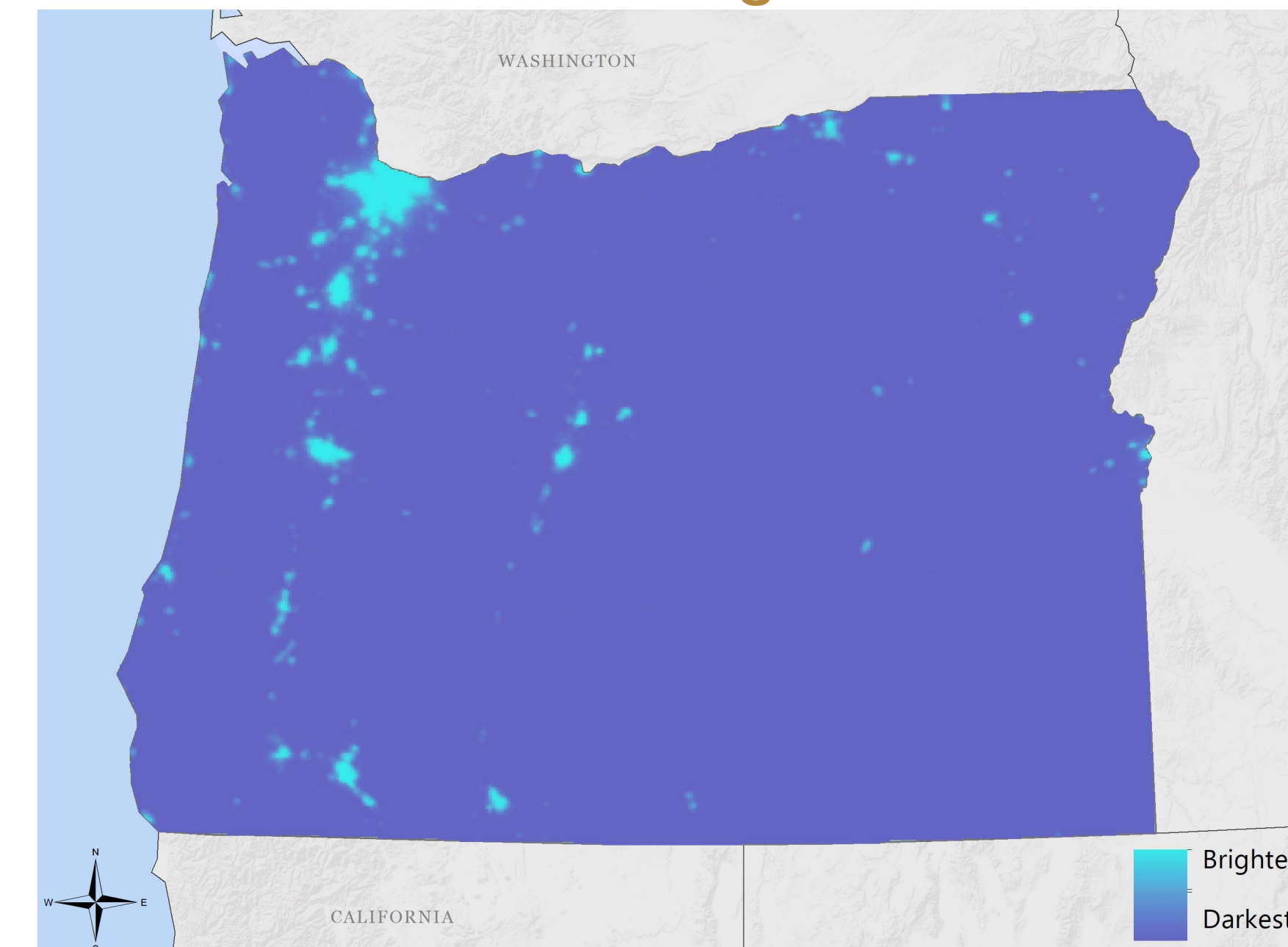


### Late-Successional and Old Growth Forests



Northern Spotted Owls prefer late-successional and old growth forests, mainly because these forests foster a variety of characteristics, including trees of varying ages, abundant logs, and snagged tree tops. Additionally, these habitats maintain a healthy diversity of prey species that these owls rely on.

### Urban Lights

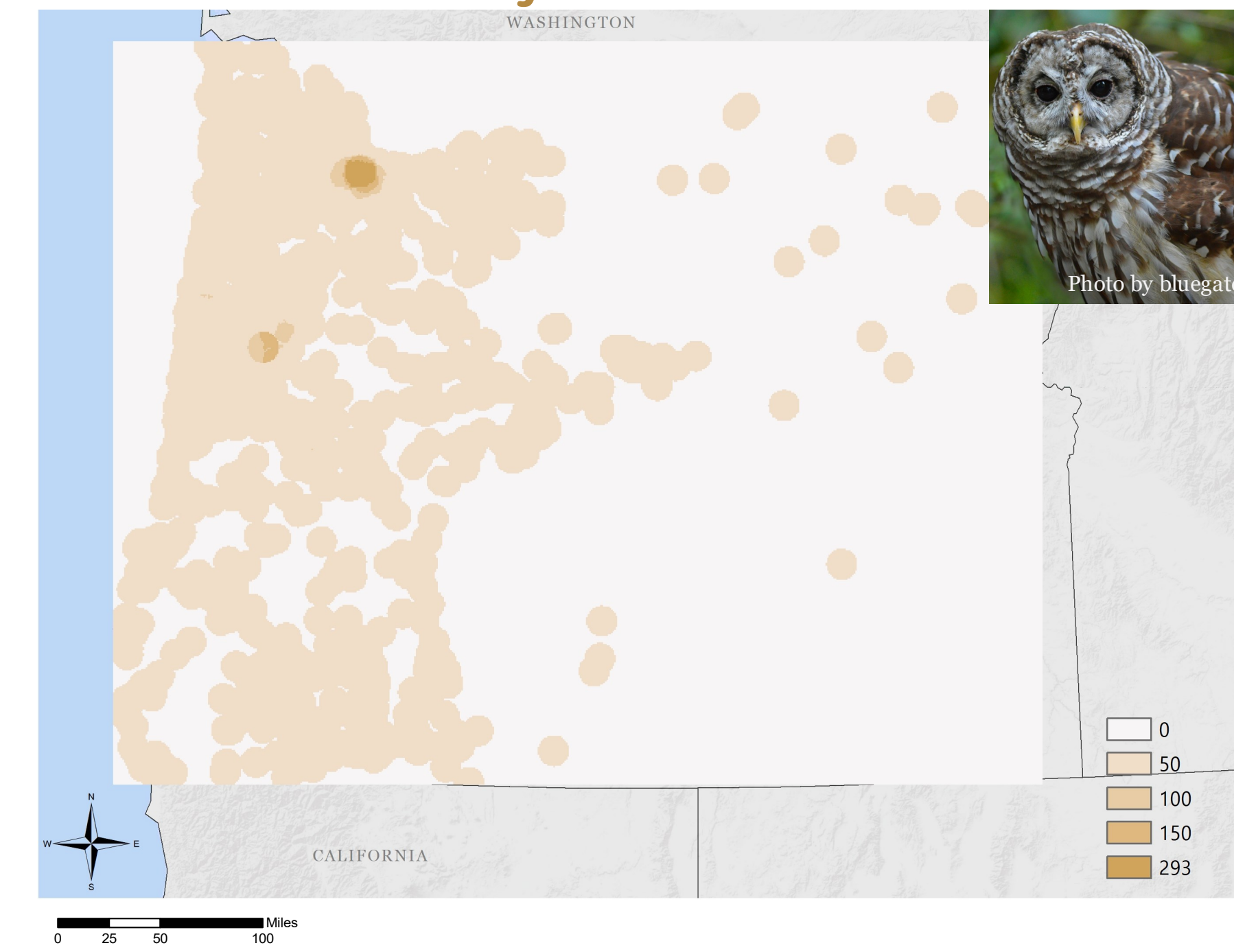


Northern Spotted Owls are shy by nature. They tend to avoid humans when possible, rarely venturing into cities. Nighttime Light data was used as a proxy for urbanization. Ideal habitats will be locations in the darkest parts of Oregon.

### LIMITATIONS

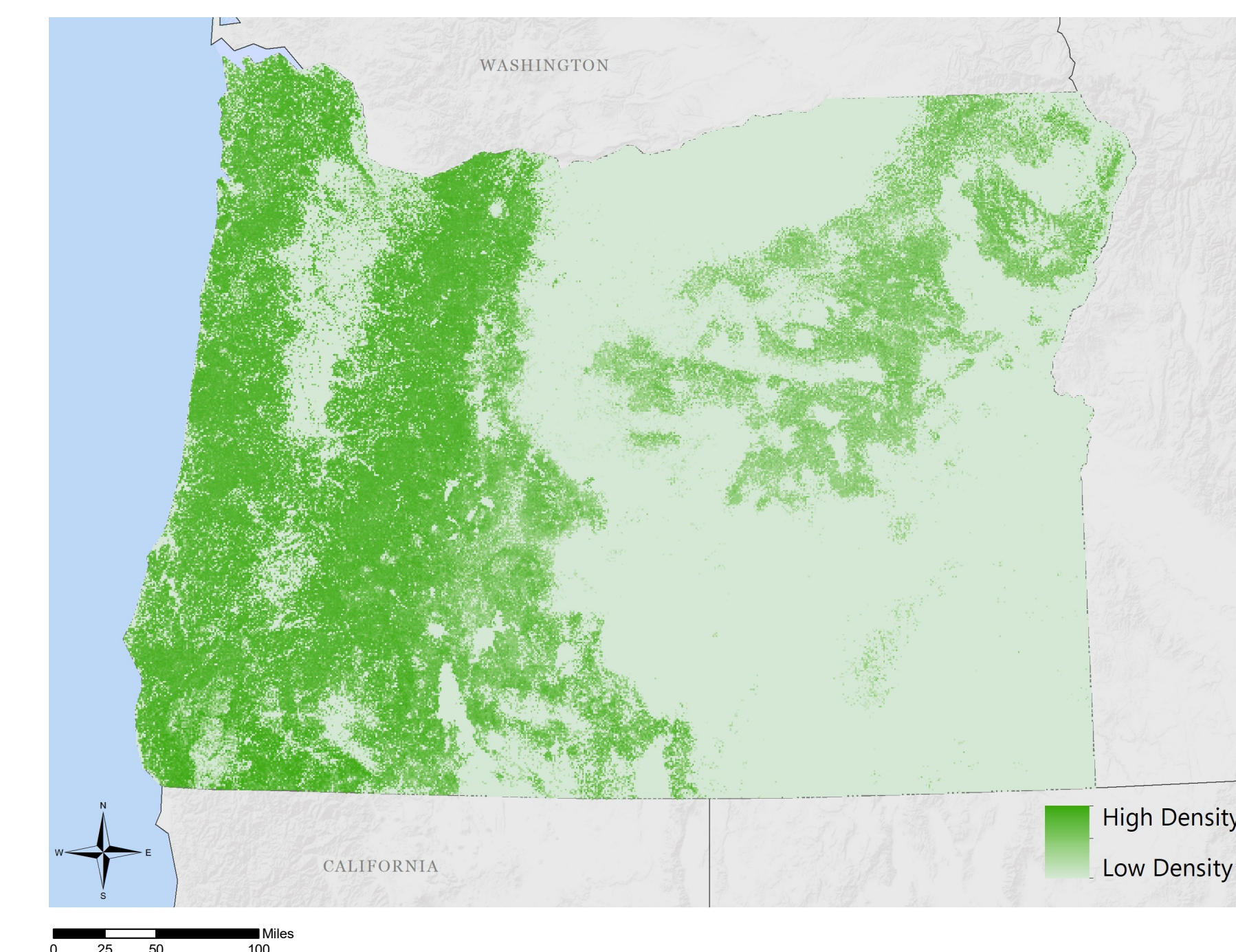
The main limitation of this analysis is that the years that data was collected vary for each criteria. For example, the Late-Successional and Old Growth Forest data was collected in 2006 (but published in 2011) while the Barred Owl data was compiled from observations between 2012 and 2019. Because the years differ between the data, errors in accuracy might be included.

### Density of Barred Owls



In recent years, Barred Owls have encroached on Northern Spotted Owl habitats. They are larger, more aggressive, and because of their broader diet, more resilient to declines in habitat quality. Ideal habitats would have a low density of Barred Owls. The above data shows the number of owls per 100 km<sup>2</sup>.

### Canopy Density



In addition to older forests, Northern Spotted Owls need dense canopies for hunting prey and nest sites. They rely on the shadows cast by the canopies to mask their flights and movement. They also need them to hide from predators such as the Great Horned Owls and the Northern Goshawks.

### CONCLUSION

Perhaps unsurprisingly, most of the suitable habitats identified in this analysis are already occupied by Northern Spotted Owls or are nearby those areas. Of the 1,536,690 hectares considered the most suitable, 45% of that area have these owls. The habitats considered most suitable that do not overlap with the owl's range are mostly located near urban areas. Further analysis should incorporate more criteria and more multi-year change data.

**Cartographer:** Sean Lee

**Poster Produced:** 17 December 2019

**Class:** UEP 232 Introduction to GIS for Urban Analysis

**Data Sources:** USFWS, National Land Cover Database, eBird, USDA, NOAA.

**Coordinate System:** NAD 1983 Oregon Statewide Lambert (2011)

**Owl Pictures:** Pixabay.com

**References:**

- U.S. Fish and Wildlife Services
- National Audubon Society
- Cornell Lab of Ornithology