

---

# Tracking Oregon's Wildlife

J. Mark Daniels, PhD  
Data Scientist

Flatiron School  
Washington DC



---

# Target Audiences

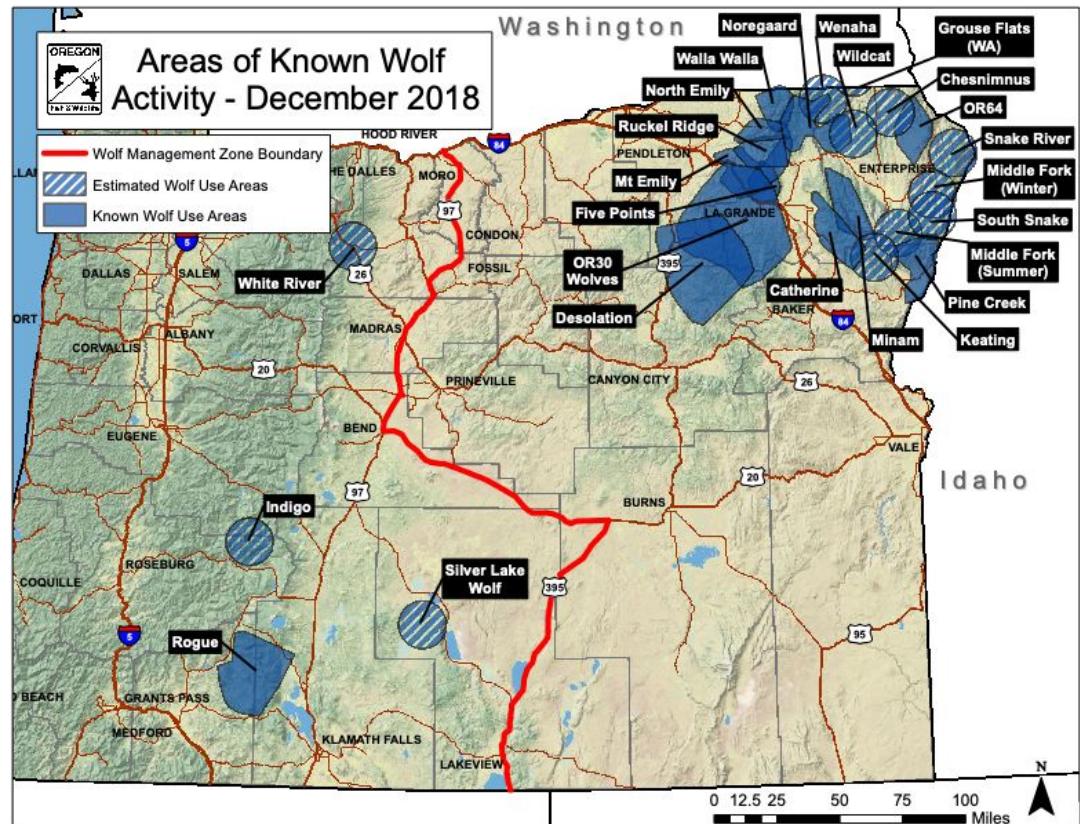
- 01 | State of Oregon
- 02 | Department of Fish and Wildlife
- 03 | Conservation Groups
- 04 | Wildlife Biologists



[Image Credit](#)

# Oregon Fish and Wildlife tracks the wolf population

Why?





# The current reporting form

A bit archaic and cumbersome

**Wolves in Oregon -- Wolf Reporting Form**

ODFW relies on reports from the public to establish wolves' presence. Please, use this online form below to report sightings of wolves and wolf sign. It may be important for a biologist to contact you for additional information, so a phone number or email could be helpful.

[Wolves and wolf sign](#)

**Online Reporter**

First Name  Last Name   
Phone Number  -  -   
###    ###    ####

**Observer**  
Leave blank if you are the Online Reporter also.

First Name  Last Name   
Phone Number  -  -   
###    ###    ####

**Observation Information**

Observation Date  /  /    
MM DD YYYY

Time  :  AM   
HH MM AM/PM

County  Unknown

Wildlife Management Unit  Unknown

[Image Credit](#)

---

# What if it was easier?



[Image Credit](#)

---

## Simplify reporting:

- Track sightings of species of interest (endangered, invasive, and/or nuisance).
- Extract image geotags to plot and track animal locations.
- Incorporate citizen scientists similar to the Backyard Bird Count
- Track migration and distribution patterns.

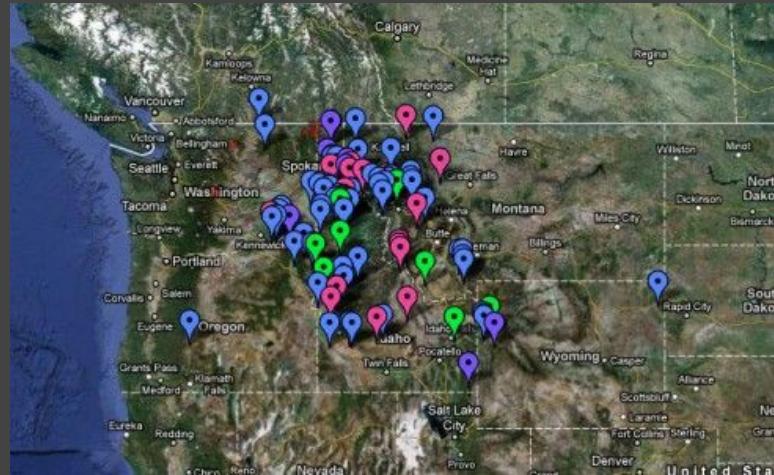


Image Credit

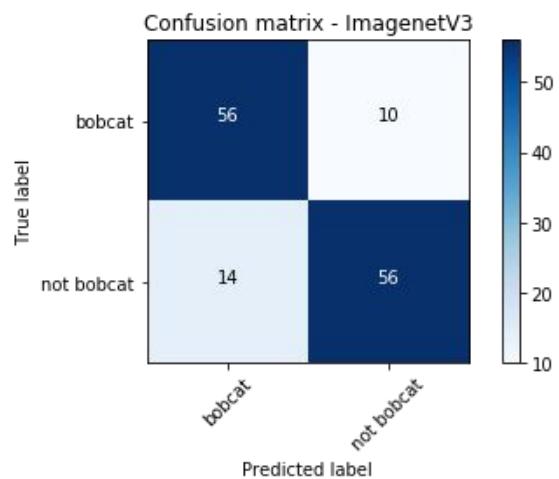
---

## Built image classification to identify wildlife

- [Kaggle Dataset](#) - 14,013 images in 20 classes
- Created binary and multiclass image classification systems
- Binary (88% accuracy) for tracking of specific species of interest
- Multiclass (75% accuracy) for general classifications



# Binary Model Performance



- Binary (Single Species) Classification:
  - 88% Accuracy
  - 82% F1



# Multiclass Misclassification Makes Sense

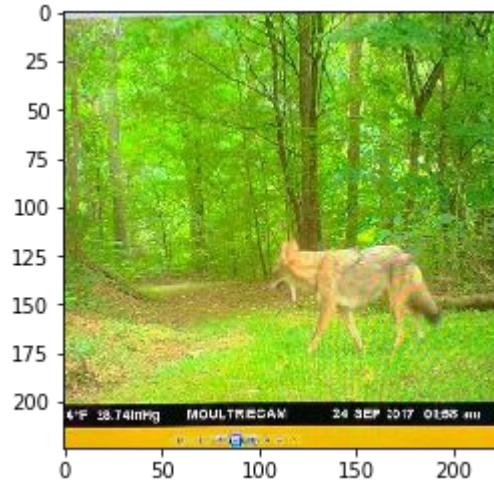
- Multiclass
  - 75% Accuracy for first choice
  - 94% Accuracy for top 3
- Most Common Misclassifications
  - Columbian Deer as Whitetail Deer (6.8% ID rate)
  - Mountain Beaver as Nutria (35% ID rate)
  - Seals as Sea Lions (43% ID rate)



# Real World Application



Top 3 guesses: ['black\_bear',  
'elk', 'gray\_wolf']



Top 3 guesses: ['coyote',  
'gray\_fox', 'gray\_wolf']



Top 3 guesses: ['gray\_wolf',  
'gray\_fox', 'red\_fox']



## Future Improvements

- Retrain models using more game camera photos at night.
- Improve differentiation rates between similar species.
- Refine geolocation data to update maps in real time.
- Build webpage for citizens to upload images.



---

Thank you.

