**Slide 1:**

Hello, my name is Tobin Haefele and my project is the Russian Olive Watch. Predicting the Spread of Russian Olive in Missoula County.

**Slide 2:**

A quick introduction to this project, I aim to address two Key Objectives:

First includes Assessing the Current Distribution of Russian Olive across the county and predicting the potential spread using habitat suitability modeling techniques to identify areas of interest.

*Why now?*

Russian olive was recently classified as an invasive species by the Missoula county ecology extension. So when I approached them with my initial idea of analyzing the spread of invasive species, they pointed me in the direction of Russian Olive.

*My Approach*

I chose to used habitat suitability modeling as it is a common in the industry and considers important environmental factors when predicting the presence of Russian olive. This can then allow me to highlight priority areas for surveying, treatment, and management for the city.

**Slide 3:**

Russian olive was originally introduced in the United States during colonial times and grew to be a popular plant due to its value as an ornamental plant and as a windbreak.

It is currently illegal to distribute or sell in a number of states in the central and western US due to the rapid spread. Montana banned it in 2010, there is a heavy presence especially in Eastern Montana. There have been a number of studies on it’s spread along the rivers.

Ecologically Russian olive can grow in a variety of conditions. This leads to it displacing native plants such as cottonwood and the willow, which in turn disrupts the local ecosystem. There have also been studies that have shown changes in soil and hydrology conditions.

As I referred to earlier, Missoula recently listed the Russian Olive in the noxious weeds list. This presented me an opportunity to apply my data science and analytics skills to a local issue that is important to me.

**Slide 4:**

Just a quick project overview:

This project has a fairly straightforward process including:  
data collection from various sources

Data processing and preparation for modeling

Model development

Finally generating the habitat suitability map

**Slide 5:**

A brief description of a random forest model and why I selected it for my project:

Random forest models build multiple decision trees using different data points. Then it combines these trees to make a final prediction either via majority vote or average prediction. This can help reduce overfitting and improve model accuracy.

Some other benefits include it’s ability to handle complex, non-linear data, and it’s ability to handle categorical and continues variables in a single dataset.

I also like that it allows me explore the impact the variables have on the outcome, which can make it more interpretable than other machine learning models. which can be somewhat of a black box as to why it came up with said result.

**Slide 6:**

Moving on to data collection, I had 3 main groups of data including:

Presence points where Russian Olive presence has been confirmed by field surveys from the Missoula county ecology extension.

Pseudo-absence points generating within Missoula county, where there is assumed to be no Russian olive presence.

And finally the environmental variables that will be the “independent variables” in this case.

These are broken down into 3 main categories of Land Cover, Climate, and Soil.

**Slide 7:**