**Name:**

**Population Modeling in Ecology**

**Spring 2023**

**Week 5 – Open Occupancy Model**

Complete the questions below and email to [gbarrile@uwyo.edu](mailto:gbarrile@uwyo.edu) with the subject line: **Week 5 Lab Report**

Using the same dataset that we used in class (*Wolves\_Mange.csv*), please run an additional model following the instructions below.

First, within the **df** dataframe, you’ll notice the column named “Year”. Format “Year” as a yearly-site covariate. When/after doing so, **make sure year is a factor variable**.

Next, recreate the same unmarkedFrame (using the *unmarkedMultFrame*() function) that we did in class, only now “Year” is also included as a yearly-site covariate. Again, when you look at the summary of the unmarkedFrame, make sure “Year” is a factor variable.

Now, fit a single model with (1) detection probability as a constant or null model (i.e., ~ 1), (2) initial occupancy as a function of Region (just like in class), (3) colonization as a function of year, and (4) extinction as a function of year.

Next, using predicted estimates from the model that you fit, create two plots. The first plot should display colonization probabilities between each year (include mean estimates and 95% confidence intervals). Label the y-axis “Probability of contracting mange”. The second plot should display extinction probabilities between each year (again, include mean estimates and 95% confidence intervals). Label the y-axis “Probability of clearing infection”. Insert both plots into this document. Both plots should be accompanied by a caption that explains the figure.

Finally, based on the two plots above, write one or two sentences on the disease dynamics in this system over the study period. This is your interpretation of the dynamics, so write whatever you would infer from the figures that you produced.