**Name:**

**Population Modeling in Ecology**

**Spring 2023**

**Week 11 – Reverse-time Pradel model to estimate survival, recruitment, and pop growth**

Complete the questions below and email to [gbarrile@uwyo.edu](mailto:gbarrile@uwyo.edu) with the subject line: **Week 11 Lab Report**

You presented our results from class on the interactive effect of annual precipitation and rangeland health on survival and recruitment of black-footed ferrets to wildlife managers at each reintroduction site. The managers seemed a bit puzzled by the survival results. Managers at southern sites (CO and NM) believe that precipitation influences survival, but that range health does not play much of a role. By contrast, managers at northern sites (MT and WY) believe that range health influences survival, but that precipitation does not play much of a role.

Fit a RDPdfHuggins model with a three-way interaction on survival to determine whether model results support the claims made by the wildlife managers. Use the same structure for capture probability as we used in class. For recruitment, please use a constant model (~1). For survival, fit a three-way interaction of precipitation, range health, and a factor variable that groups northern sites together (MT and WY) and southern sites together (CO and NM). Next, create a two-panel plot (side-by-side plot) of the interactive effect of precipitation and range health at the northern sites versus the interactive effect of precipitation and range health at the southern sites. Insert that plot into this document. Compare and contrast the interactive effect of precipitation and range health between northern and southern sites. Do the results support the claims made by the wildlife managers at each reintroduction site?

Okay, based on the interactive model, something strange is going on with the effect of precipitation on survival. Fit one final RDPdfHuggins model. Again, use the same structure for capture probability as we used in class. For recruitment, again use a constant model (~1). For survival, fit a two-way interaction of precipitation and a factor variable that groups northern sites together (MT and WY) and southern sites together (CO and NM). Create a plot that shows both the effect of precipitation on survival at the northern sites and the effect of precipitation on survival at the southern sites. Include both the mean predicted lines and 95% confidence intervals. Insert that plot into this document. Compare and contrast the effect of annual precipitation on black-footed ferret survival at northern versus southern sites.