**Name:**

**Population Modeling in Ecology**

**Spring 2023**

**Week 3 – Closed Population Estimation**

Complete the questions below and email to [gbarrile@uwyo.edu](mailto:gbarrile@uwyo.edu) with the subject line: **Week 3 Lab Report**

Using the same dataset that we used in class (*BorealToad\_CaptureRecapture.csv*), please run three additional ‘Closed’ models in RMark, specifying different structures for capture probability (*p*) as described below. All three models should share (use *share = TRUE*) capture and recapture probability. Furthermore, all three models should retain the same structure for *f0* as in model “m2” in our code. In other words, *f0* should vary across ponds as in *f0.pond = list(formula= ~ pond)*.

In your first model, let capture probability (*p*) vary by time only. Use the variable in which time is a factor (i.e., lowercase t). As a hint for your first model, you might use a model structure such as: *p.time =list(formula= ~ time, share = TRUE)*. **Question: during which survey was capture probability the highest, according to this model?**

In your second model, again let capture probability (*p*) vary by time only. However, in this model, use the variable in which time is numeric/continuous (i.e., uppercase T). **Question: describe the relationship between time and capture probability, according to this model. Was there evidence that this relationship was statistically significant?**

In your third model, let capture probability (*p*) vary only by pond. **Question: at which pond was capture probability the highest, according to this model?**

Compare the above three models with AICc. Using the model with the best fit according to AICc (i.e., lowest AICc value), fill out the table below.

|  |  |  |
| --- | --- | --- |
| **Site** | **Mean Abundance Estimate** | **95% Confidence Interval** |
| Pond 1 |  |  |
| Pond 2 |  |  |
| Pond 3 |  |  |