Stat 363: Poisson Regression

Example: How does age affect male elephant mating patterns? An article by Poole (1989) investigated whether mating success in male elephants increases with age and whether there is a peak age for mating success. To address this question, the research team followed 41 elephants for one year and recorded both their ages and their number of matings. The data is found in **elephant.csv**, and relevant R code can be found under **Elephant.Rmd**.

1. Is there preliminary evidence that number of matings could be modeled as a Poisson response?

2. Is there evidence that modeling matings using a linear regression with age might not be appropriate?

3. Is log transforming our response a good solution? And what’s with the “+0.5” term?

4. Why do we care that log(mean(Y)) is not the same as mean(log(Y))?

5. How do we interpret the model parameter estimates in fit1?

6. How do we interpret a 95% confidence interval for the slope? How does the interval from confint(), which uses profile likelihoods, compare with the interval assuming asymptotic normality?

7. Are the number of matings significantly related to age? Test with (a) a Wald test, and (b) a drop in deviance test.

8. Is there evidence that elephants peak at a certain age in terms of matings?

9. What can we say about the goodness of fit of the model with age as the sole predictor?