

Exercise 5 – Logistic Regression

Due February 14, 2024

Somebody used camera traps to evaluate the presence/absence of native rodents to study the effect of percentage of fragment area covered in shrubs on rodent incidence in three distinct populations in France.

In each population [`pop`], the researchers set up ten circular plots, where they measured shrub coverage [`shrub`] and setup camera traps (**Cams**) to record rodent presence (the result, **Caps**, indicates how many of the cameras recorded rodent presence, not their abundance, as individual identity could not be determined).



1. Use the `Exercise5_data.R` script provided in the class website to generate a sample [`rodents`] following the description above (you only need to run it once and then keep the data as a fixed input for your analyses – HINT: save as a `.csv` file).
2. Choose the most appropriate and informative model to analyze the data and present its coefficient estimates, significance values and credibility intervals.
3. Calculate p (the predicted probability of rodent presence) for an area with 50% shrub cover in each of the three locations.
4. Plot your results in an informative manner – including a plot of your chosen model, posterior distributions, and probability distributions for p for areas with 50% cover.
5. Interpret the biological significance of these results.

NOTE: Please submit your paper as a single document to Michelle.Bardales@ucf.edu (PDF format preferred). Attach also your raw data (csv file) and the code (R file) to the email.

** Binary data can be presented in many ways. In the demo, each row represented a single Bernoulli trial, with the data representing whether it was a success (1) or a failure (0). Here, binary data is presented differently. Your challenge is to figure out how to read this data and incorporate it in the model.