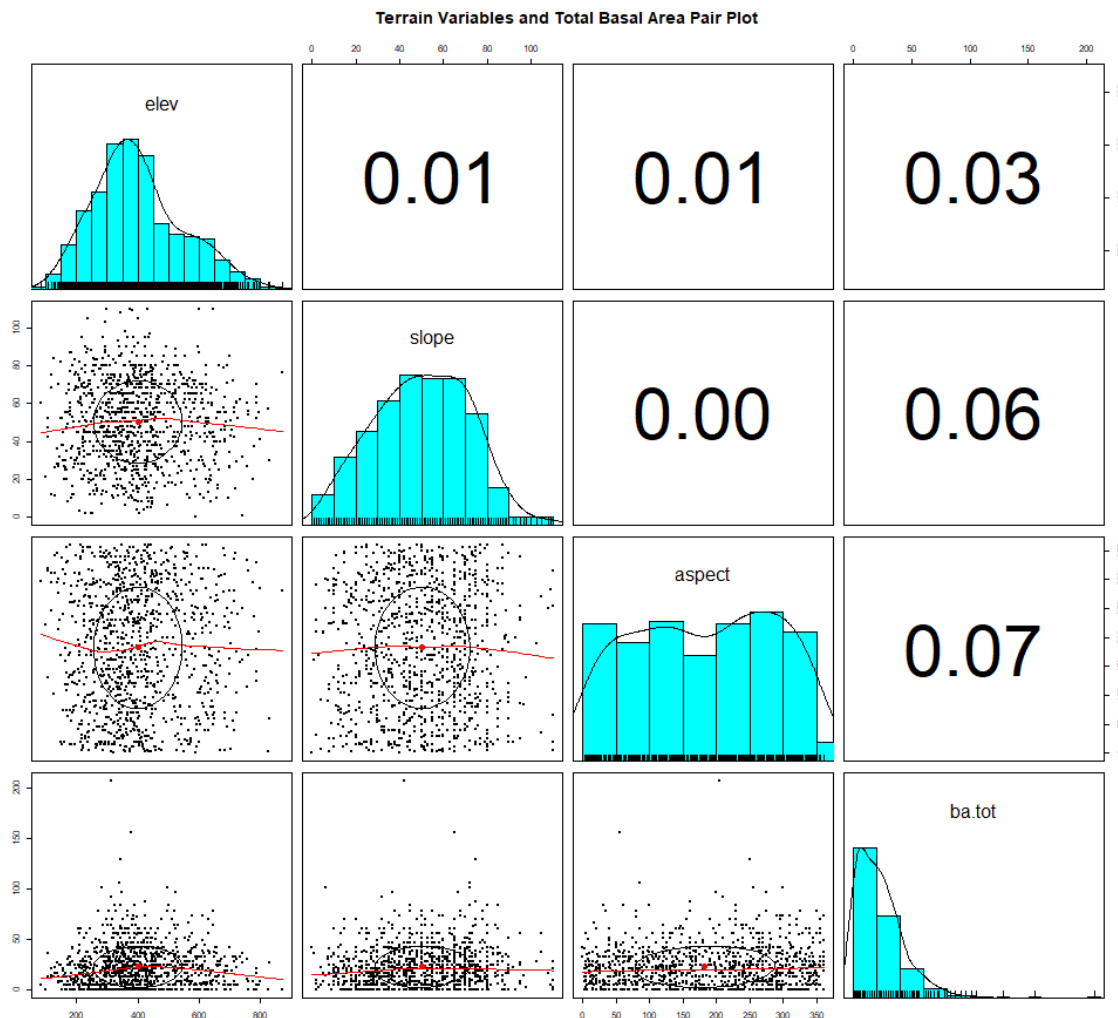


Lab 3 – ECO 634

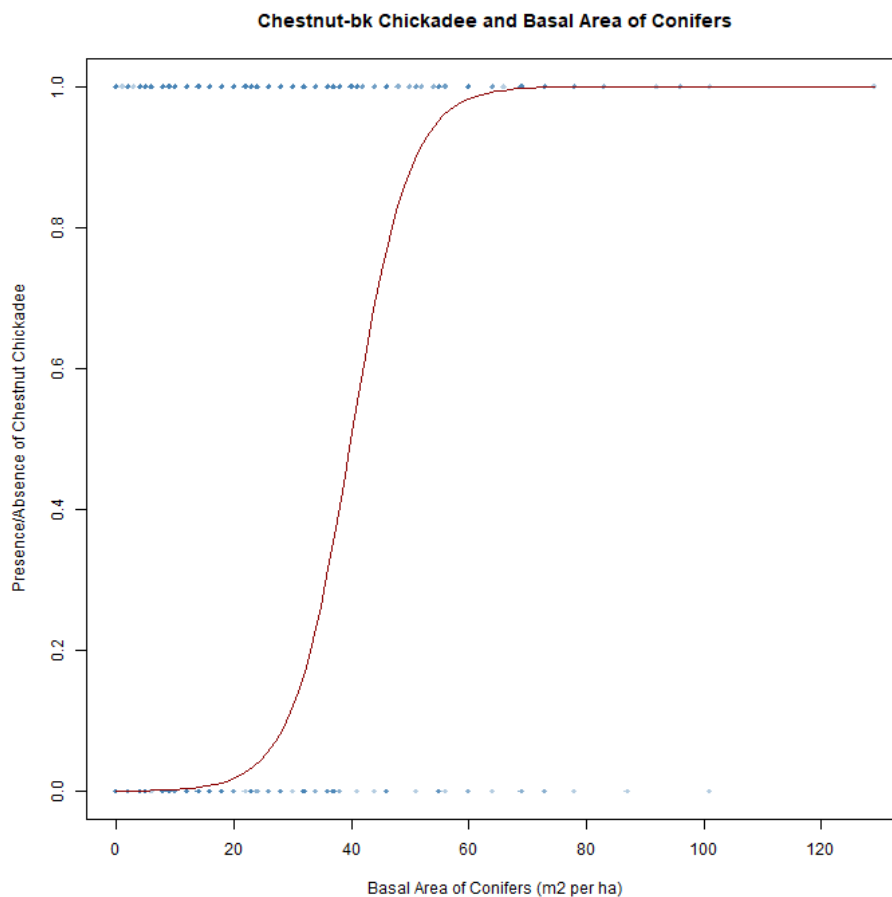
Q5 (1 pt.): What is basal area, and how is it measured?

- Basal area is the density of trees in a given area. It's measured by taking the area of each tree at chest height and adding all the values together for a given stand of trees. The units are m^2 per hectare.

Q2 (2 pts.): Include a figure of your terrain/basal area pairplot.



Q3 (1 pt.): Include a figure of your logistic function plot. Your figure must include the name of the bird species, appropriate title, axes, etc.

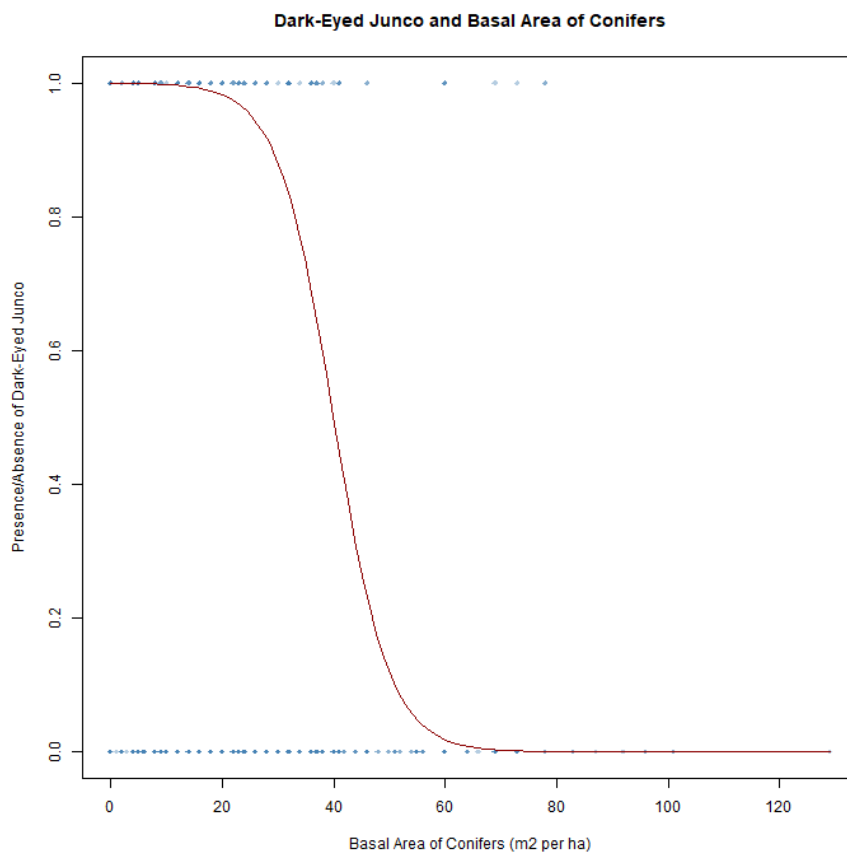


Q4 (3 pts.): Qualitatively describe the bird's presence/absence patterns in terms of basal area (or your other chosen predictor). Your answer should make reference to your fitted logistic model plot. Some questions you might consider are:

- Does the bird species seem to prefer areas with high or low tree cover?
- Does the bird species prefer low or high elevations? (for example, if you used elevation instead of basal area)
- Does a logistic model seem like a good fit?

I visually examined plots of Chestnut Chickadee occurrence with the basal area of conifers, snags, hardwoods, and total basal area. I also looked at plots with the terrain variables for elevation, slope, and aspect. The basal area of conifers resulted in the plot that was the closest to something that we might want to fit with a logistic model. However, the logistic model is not a good fit for these data because there is clustering of both presence and absence of chickadees in areas where there is a lower basal area of conifers. The logistic model doesn't add much to our interpretation of these data. Based on this visual inspection, there could potentially be a higher number of sites with Chestnut Chickadees present in areas with a higher basal area of conifers.

Q5 (1 pt.): Include a figure of your logistic function plot. Your figure must include the name of the bird species, appropriate title, axes, etc.



Q6 (3 pts.): Qualitatively describe the bird's presence/absence patterns in terms of basal area (or your other chosen predictor). Your answer should make reference to your fitted logistic model plot. Some questions you might consider are:

- Does the bird species seem to prefer areas with high or low tree cover?
- Does the bird species prefer low or high elevations? (for example, if you used elevation instead of basal area)
- Does a logistic model seem like a good fit?

I visually examined plots of Dark-Eyed Junco occurrence with the basal area of conifers, snags, hardwoods, and total basal area. I also looked at plots with the terrain variables for elevation, slope, and aspect. The basal area of conifers resulted in the plot that was the closest to something that we might want to fit with a logistic model. I fit a logistic model with a negative slope to this plot because it looks like there could potentially be a negative association between Dark-Eyed Junco occurrence and the basal area of conifers. It looks like there were more sites with Dark-Eyed Juncos absent in areas with a higher basal area of conifers. I'm not sure if the logistic model is the best fit for this data, but it could potentially help to explain the negative association here.

Q7 (1 pt.): How many **total number of Gray Jays** were observed in all of the sampling sites.

181 total Gray Jays

Q8 (2 pts.): Show the R code you used to perform the calculation.

```
sum(dat_all$GRJA) #181 total Gray Jays
```

Q9 (1 pt.): Calculate the **total number of sampling sites** in which Gray Jays were observed.

110 sampling sites with Gray Jays observed

Q10 (2 pts.): Include the R code you used to perform the presence/absence calculation.

```
#create boolean values for if gray jays were observed or not
```

```
boolean_grja <- dat_all$GRJA >=1
```

```
#convert Boolean presence/absence vector into a numeric vector.
```

```
grja_present_absent <- as.numeric(boolean_grja)
```

```
#sum the sampling sites with gray jays present
```

```
sum(grja_present_absent)
```

```
sum(boolean_grja)
```

```
#Answer is 110 sampling sites - can reach this with sum function on the Boolean value or the numeric presence/absence vector
```