**Methods**

*Vertebrate diversity surveys*

Don is writing

*Acoustic indices*

Acoustic indices were generated from the audio for the entire 7 days (12pm on day of first spotlighting survey – 12pm on the day of last bird survey) at a 1-min resolution using Kaleidoscope Pro (ref). The acoustic indices used were the Normalised Difference Soundscape Index (NDSI), Acoustic Complexity Index (ACI), Acoustic Diversity Index (ADI), Acoustic Evenness Index (AEI), and the Bioacoustic Index (BI). The settings used for each acoustic index are in SuppInfo.

To determine the correlation between acoustic indices and bird diversity the average of each acoustic index was taken for between 6am-9am for the entire 7 days.

To determine the correlation between acoustic indices and frog diversity the average of each acoustic index was taken for between 6pm-9pm for the entire 7 days.

To determine the correlation between acoustic indices and vertebrate diversity the average of each acoustic index was taken for the entire 7 days.

*Statistical analysis*

Species richness and Shannon’s diversity index were fit using linear mixed-effects models with sampling.period and sensor nested within site as random effects.

The ability of multiple acoustic indices to predict to predict biodiversity was assessed using random forest models. All acoustic indices were used as predictors for each biodiversity measured and fit using 1000 trees (caret and party packages?). Model performance was evaluated using 3x10 cross-validation and normalized MAE and R-squared.

**Results**