Revealing age- and sex-specific survival of the eastern barred bandicoot

Recovery of populations relies upon understanding demographic rates. The eastern barred bandicoot, Perameles gunnii, is a short-lived but fecund small marsupial. The mainland subspecies is considered extinct in the wild and remains extirpated from its historical range largely due to predation by foxes. The bandicoot has now been introduced to three Victorian islands, two with and one without feral cats. We aim to construct a model to estimate juvenile survival in populations with and without feral cats.

Estimation of sex- and/or age-specific population demographics remained intractable due to heterogeneity in detection, and lack of reliable ageing methods. We use an hierarchical spatially-explicit open population model to estimate age-specific population size and survival of an introduced bandicoot population. We shared information on sex-specific detection probability and survival between groups of known and unknown age. This integrated approach allowed the estimation of parameters that may not have been possible from a single dataset.

Preliminary results estimate juvenile survival between 0.6 and 0.8 whilst adult survival declined from 0.9 to 0.6. Population growth rate was positive (ranging between 1.20 and 1.43) until population density attained 2.16 ± 0.23 bandicoots per hectare, population size then remained steady. This indicates that population growth rate is mediated by adult survival on Churchill Island. Future work will explore population-specific variation and environmental drivers of vital rates to inform population viability analyses and reveal impacts of cat density on population demographics.