*Modeling nest survival with uncertain nest fates using multi-event mark-recapture framework*

Introduction

Modeling nest survival is of ecological importance and is critical to population modeling

* Counts, survival, reproduction/fecundity
* Particularly for species of conservation interest and given ecological changes occurring on local and global scales
* Birds are common indicators bc….?
* However, not all birds (even indicators) are the subject of robust field study/programs, or are otherwise unobservable in situ based on life history characteristics, and nest survival estimation modeling has had to expand and evolve to address a number of different (data situations)

When Mayfield changed the way of nest survival modeling, it spawned a number of expansions of his DSR method, including relaxing X, Y, Z assumptions and applying it to new situations ().

Then there was another few developments to a multistate model, and then MS models expanded in X, Y, and Z ways.

Examples and what came from it and what we take forward.

However, one of the cornerstones/requirement of the classic/typical approach is knowing the given state of a nest, whether a given nest was successful, which in some cases is not known. This required that those cases were removed, but that was discovered to lead to bias.

To estimate state-specific survival in wildlife populations, turn to mark-recovery data, often modeled using a CJS framework that allows for estimates of survival when not every occasion is observed. These models are generally applied to derive abundance based on age- or stage-specific survival, mapping detection error/uncertainty to inform the connection between the state and obs process, etc. This framework was relaxed to apply to open pops in X, Y, and Z and multiple states. JS models don’t condition on first capture, therefore X. Applying this concept to nest survival treats the egg and chick stages as the multiple states to ascertain the probability that the nest survives where nest fate is unknown or unobservable. Few researchers have utilized this technique because most bird nest fates are most often known.

I don’t like the angle of these paragraphs – needs to be more applied to PiGu rather than abstract

In some cases, further ambiguity can arise when observations are made of breeding individual behavior rather than actual eggs or chicks. Certain observations do not match states.

Evolution of ME model