Tuesday Lecture

2024-09-17

**Designs of Wildlife Habitat Studies: Uses, Unused, and Available**

Quiz:

What is the difference between E(λ) (expected finite rate of population growth) and λt (finite rate of growth between Year *t* and Year *t* + 1)? *Estimated value of finite population growth across time versus the true value.*

According to Kellner et al., what is the difference between habitat suitability and habitat quality? *HS = λ ≥ 1, HQ = E(λ).*

The finite rate of population growth is a rate based on the net change in population size, but it is not the actual number of individuals compromising that net change.

N(*t*+1) = N(*t*) + B(*t*) + I(*t*) - D(*t*) - E(*t*)

N(*t*+1) = [1 + bt + it - dt - et]N(*t*)

N(*t*+1) = N*t*

N(*t*+1) = λtN(*t*)

λ ≥ 1 = suitable habitat (Kellner *et al.*)

B = births, I = immigration, D = death, E = emigration

**Kellner *et al*.**

* Are short-term studies worthwhile? YES!
  + May not get as good of a picture of why an organism is surviving/reproducing, but the behavior we’re trying to capture, **settling response triggered by sign stimuli**, can still potentially be observed in a couple field seasons.
  + Distinct events in an organism’s lifetime may not be repeated (i.e. juvenile dispersal from natal habitat).

**Habitat Studies**

1. Studies generally begin by describing use. What habitat features (resources) an animal is using within an area of space over a period of time.
   * Resources that the animal is using aren’t necessarily known, but a proxy for those resources: what are good proxies that we can give to the combination of resources, conditions, risks, etc. for an organism.
2. Make distinction of used (sometimes called available) (presence-only) versus non-used (absence)
   * Described by presence (use) and absence (non-use) of an organism. *Binomially distributed data.* -> *Binomial Generalized Linear Model (GLM) or Logistic Regression*
3. Determine study design.