Thursday Lecture

2024-09-19

**Sources and Sinks vs. Ecological Traps**

Quiz:

What type of data did we discuss on Tuesday that is often used to study wildlife-habitat relationships that required conducting surveys for your study species at each sampling site? *Presence-absence or used-unused (or nonuse)*

* *Collecting data on where species occurs if you detect it, if you don’t detect the species you have information what the species may not be using in the area (cannot say for certain that the species is not present because of imperfect detection)*

What is the statistical distribution that is used to describe these data? Put another way, what statistical family would we use in a generalized linear model for this type of data? *Binomial or Bernoulli (Bernoulli being a special case of the binomial where trial size is equal to one, as in the case of a coin flip)*

* *0, 1; present, absent; detection, non-detection*

**Source Sinks / Ecological Traps**

Thinking back to Tucson mouse study: presence of antagonistic resident pairs caused emigration of later added pairs despite excess resources.

In the real world, how would this influence new individuals in such an environment? Dispersal from “source” habitat into less favorable areas.

* **Habitat Sink**: area with no net population growth, immigration is offsetting the lack of population growth via reproduction.
* Traps and sinks both fall into the category of negative population growth rate via reproduction. Without any external influences (emigration) that population would go extinct.
* **Sink**, low quality habitat that would not be chosen but some organisms forced into this sub-optimal habitat due to “full” occupancy of better habitats
* **Traps**, sub-optimal habitat chosen over available optimal habitat
  + What can cause this? Consequence of closed genetic program, death or fitness of 0 is the consequence for organisms messing up and responding to sign stimuli
  + Mismatch between cues and the response to those cues.

Example of landscape heterogeneity as a cue for habitat selection for songbird species. Songbirds that would historically nest with interiors of old growth forests, with clearcutting, now responding to forest edge as the most heterogeneous areas that may provide optimal foraging, but consequence is greater risk for predation on nests/individuals.

Sink: Sub-optimal areas individual would not chose if others were available

Trap: Sub-optimal areas individual chose “eyes-wide open”