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Influence of natal habitat type on dispersal and habitat selection behavior in a heterogeneous landscape

Overview

Since dispersal is a key parameter affecting population dynamics, knowledge of how animals respond to different habitat types while dispersing and selecting a new home range is crucial to understanding how individual behavior affects population dynamics in heterogeneous landscapes. The response of a natal disperser to different habitat types, including where the animal eventually settles, may be affected by the animal's familiarity with the different habitat types it encounters as it moves through the landscape (1).

I am investigating the influence of natal habitat type on dispersal and habitat selection behavior of brush mice (*Peromyscus boylii*) in a naturally heterogeneous landscape at the University of California's Quail Ridge Reserve in Napa Co., CA (Figure 1). Brush mice (Figure 2) are a small, nocturnal rodent abundant in both chaparral and oak woodland habitat types.

Figure 1: Habitat map of the Quail Ridge Reserve.

Figure 2: Radio-collared juvenile brush mouse.

Scientific Approach

The goal of this project is to determine the relationship between previous experience with a particular habitat type and the response of dispersing brush mice to the different habitat types encountered while dispersing through a heterogeneous landscape and selecting a new home range.

Hypothesis: Dispersers will be more likely to travel through and/or settle in the type of habitat (chaparral or oak woodland) that is similar to their natal habitat.

Approaches:
1) Long-term catch-mark-recapture (CMR) live-trapping
2) Radio-tracking of juveniles
3) Use of molecular markers to detect dispersal
4) Habitat choice experiment

Results: This project is ongoing; however, preliminary data (Table 1, Figure 3) support the hypothesis that brush mice tend to settle in their natal habitat type.

Rearing habitat

	Chaparral	Woodland
Chaparral	9	1
Woodland	0	10

(row axis label: Habitat selected)

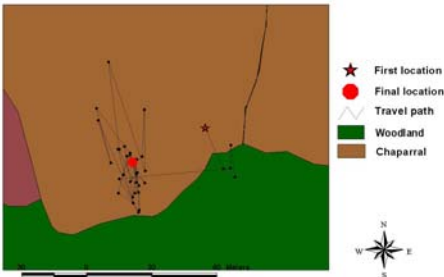Table 1: Number of juvenile brush mice settling in each habitat type.

Figure 3: Path of a dispersing juvenile brush mouse obtained by radio-tracking.

Impact

We currently know very little about how dispersing animals respond to different habitat types, yet this type of information is vital for the conservation of species living in landscapes undergoing modification by human activities. The results of this study will have implications for conservation issues associated with animal movement and settlement patterns in landscapes made up of multiple habitat types. For example, habitat preferences can influence the movement patterns of animals traveling through fragmented landscapes, including the use of wildlife corridors (2). Habitat preferences may also affect the probability that an isolated patch of a particular type will be colonized, thus affecting metapopulation dynamics (3).

References:
1) Davis, J.M. and J.A. Stamps. 2004. The effect of natal experience on habitat preferences. Trends in Ecology and Evolution 19:411-416.
2) Rosenberg, D.K., B.R. Noon, and E.C. Meslow. 1997. Biological corridors: form, function, and efficacy. BioScience 47:677-687.
3) Hanski, I. and M.C. Singer. 2001. Extinction-colonization dynamics and host-plant choice in butterfly metapopulations. American Naturalist 158:341-353.