

# HABITAT SELECTION OF BROWN-HEADED NUTHATCHES AT MULTIPLE SPATIAL SCALES

Richard A. Stanton Jr.

Drs. Dylan C. Kesler and Frank R. Thompson III, Thesis Supervisors

## ABSTRACT

Resources shape the movements and space use of birds. In turn, birds differ in their relative fitness, in part as a consequence of movement and space use decisions. The saga of each individual plays out across time and space, generating the dynamic pattern known as a species' geographic range. Then, changes in geographic range dimensions alter the selective environment encountered by individuals, potentially driving evolutionary change in movement modes. Thus, understanding resource selection requires knowledge of both individual behavior and landscape patterns of patch occupancy.

This thesis describes resource selection from both perspectives. We conducted two concurrent studies in a cooperatively breeding bird (Brown-headed Nuthatches, *Sitta pusilla*).

We radio-tracked 22 Brown-headed Nuthatches, and related their space use to available resources within their respective home ranges. These associations controlled for the influence of the nest site as a central place; thus use of these resources reflected their perceived value to nuthatches. Areas of high use were associated with recently-killed trees, recent prescribed fire, pine dominance, and grassy herbaceous cover in descending order of importance.

We also modeled patch occupancy across a range extension front created by habitat restoration. We found that high quality habitat near the range limit was vacant while marginal habitat was occupied, contrary to the standard model of range extension wherein habitats are occupied in order of quality. The pattern we observed is consistent with a range extension front that has been shaped by constraints on effective dispersal. This pattern may be quite common among birds given that many species are sedentary and that long-distance dispersers may have lower survival or fail to reproduce.