

Public Abstract

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Graduation Term:SP 2013

Department:Fisheries & Wildlife

Degree:MS

Title:HABITAT SELECTION OF BROWN-HEADED NUTHATCHES

Resources shape movement and space use in birds. Movement and space use decisions have a strong influence on individual fitness. The saga of each individual plays out across time and space, generating the dynamic pattern known as a species' geographic range. Changes in geographic range can alter the selective environment encountered by individuals, driving evolutionary change in movement behavior. 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 studies in a cooperatively breeding bird (Brown-headed Nuthatches, *Sitta pusilla*). We radio-tracked 22 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 mainly associated with recently-killed trees and recent prescribed fire. 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 where habitats are occupied in order of quality. The pattern we observed is consistent with a range extension that has been shaped by constraints on successful dispersal. This pattern may be quite common among birds since many species are sedentary and rare long-distance dispersers may have lower survival or fail to reproduce.