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Article

Site occupancy of brown-headed nuthatches varies with habitat restoration and range-limit context: Habitat Restoration and Nuthatch Occupancy

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ABSTRACT

Knowledge about species' responses to habitat restoration can inform subsequent management and reintroduction planning. We used repeated call-response surveys to study brown-headed nuthatch (Sitta pusilla) patch occupancy at the current limits of its apparently expanding range in an area with active habitat restoration. We fit a probit occupancy model that accounted for spatial autocorrelation using restricted spatial regression. Nuthatch occupancy was related to patch-level vegetation structure and range-extension context, i.e., latitude, but not prescribed fire history. Latitude and percent tree stocking had a negative relationship with occupancy (coefficients and 95% credible intervals: −1.07 [CI: −1.63, −0.67] and −0.63 [CI: −0.97, −0.350]). The density of recently killed and well-decayed snags had positive associations with occupancy (coefficients and 95% credible intervals: 0.57 [CI: 0.17, 1.16] and 0.37 [CI: 0.05, 0.72]). Neither grassy herbaceous cover nor percent of stocking in pine were associated with occupancy. We found that restoration efforts created suitable stand structure for brown-headed nuthatches, but many restored sites in the range-extension zone appeared to be vacant. Occupied habitats in the range-extension zone had fewer snags, less frequent fire, and more shrub cover than occupied sites where the species was established. Release from conspecific competition may have permitted nuthatches in the range-extension zone to exploit habitats that would otherwise have been marginal. Alternatively, nuthatches may be restricted to such sites although there are more suitable sites tens of kilometers away. Experimental translocations and reintroductions could determine how habitat structure and nuthatch density affect the quality of restored sites in the range-extension zone and enable those sites to achieve their biodiversity potential. Published 2015. This article is a U.S. Government work and is in the public domain in the USA.

Figures in this publication