National Quail Symposium Proceedings

Volume 8 Article 29

2017

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EFFECTS OF TANGLEHEAD EXPANSION ON BOBWHITE HABITAT USE IN SOUTH TEXAS

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ABSTRACT

Usable space for northern bobwhite (*Colinus virginianus*) has been reduced across a large portion of South Texas rangelands due to the spread of non-native, invasive grasses. A native grass, tanglehead (*Heteropogon contortus*) has rapidly expanded its dominance in the western Sand Sheet of South Texas within the last 10-15 years. It has formed high-density monocultures, similar to non-native grasses, which are associated with losses of forb and grass diversity as well as bare ground, which are key components of bobwhite habitat. The objectives of our research were to 1) determine selection-avoidance of habitat features by bobwhites, and 2) determine the effects of tanglehead cover on vegetation characteristics. We detected 488 coveys across 20,103 ha on helicopter surveys conducted December 2014 in South Texas. We measured 6 vegetation characterstics (grass and forb species richness, vegetation height, woody-plant cover, tanglehead cover, and non-native grass cover) at all covey detections and an equal number of random locations. We developed continuous selection ratios based on probability density functions of used and random points derived using Simple Saddlepoint Approximations to determine habitat selection by bobwhites. We also used quantile regression at the 10^{th}, 50^{th}, and 90^{th} quantiles to determine relationships between tanglehead and vegetation factors. Bobwhite avoided areas of high canopy cover (>20%) of all invasive grasses measured. Brush cover was selected for up to 47%, after which it was avoided. We found significant negative relationships between tanglehead cover and forb and grass species richness, bare ground, and shrub cover, and a positive relationship with vegetation height at all quantiles modeled. Our results demonstrate the negative effects of increased tanglehead cover on native rangeland habitats. Further expansion by tanglehead has the potential to significantly reduce usable space for bobwhites in South Texas.

Citation: Edwards, J. T., F. Hernández, D. B. Wester, L. A. Brennan, C. J. Parent, and F. C. Bryant. 2017. Effects of tanglehead expansion on bobwhite habitat use in South Texas. National Quail Symposium Proceedings 8:132.

Key words: usable space, tanglehead, monoculture, quantile, selection, avoidance

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