Abstract

Oak savanna is imperiled across its entire global range, including the Midwestern United States. Sand Dunes State Forest in central Minnesota contains some of the last high-quality remnants of oak savanna in the state, and efforts are underway to restore additional areas of the state forest to pre-settlement habitat types. To inform restoration and management within Sand Dunes, we surveyed for six habitat specialist wildlife species between 2014 and 2016 and used hierarchical abundance models to describe relationships between abundance and occupancy and habitat charactistics related to management. For gophersnakes (\*Lat name\*) and eastern hognose snakes (\* Lat name\*) we obtained insufficient data for statistical analysis, but for remaining species we found that predicted abundances and occupancy probabilities were affected by habitat features and management disturbances. Eastern towhees (\*Lat name\*) and lark sparrows (*Chondestes grammacus)* both declined in abundance with increasing canopy closure, indicating the importance of open partly-forested habitats for both species. In addition, lark sparrow abundance increased with management disturbance and declined with numbers of woody stems. Leonard’s skippers (*Hesperia leonardus leonardus*) increased in occurrence and abundance with increased abundance of blazing stars (*Liatris* spp.), a preferred food source, and declined in abundance following management disturbance. Finally, northern barrens tiger beetle (*Cicindela patruela)* responded positively to canopy closure and topographical relief. It was noteworthy that some of the same habitat variables (e.g. canopy closure, recent disturbance) affected different species in different directions. These results highlight the importance of careful planning when undertaking habitat restoration projects. Plans should consider the habitat needs of individual species as well as their responses to active habitat management to achieve balance between maintenance of local populations and habitat restoration on a landscape scale.