Oak savanna is imperiled across its entire global range, including the Midwestern United States where it has been reduced to less than 0.02% of its historic extent. Sand Dunes State Forest in the Anoka Sand Plain subsection of Minnesota contains high-quality remnants of oak savanna, and efforts are underway to restore additional areas. To inform this restoration, we used N-mixture abundance models to describe relationships between habitat characteristics and rare wildlife species that utilize oak savanna. We found that species’ predicted abundance and occupancy probability were affected by habitat features and management. Lark sparrow (*Chondestes grammacus)* and Leonard’s skipper (*Hesperia leonardus leonardus*) exhibited disparate relationships with management disturbance, with lark sparrow responding positively and Leonard’s skipper responding negatively. Canopy cover also showed disparate responses, with northern barrens tiger beetle (*Cicindela patruela)* responding positively and lark sparrow negatively. These results highlight the importance of careful planning when undertaking habitat restoration projects.