Sand Dunes State Forest in Minnesota’s Anoka Sand Plan contains high quality remnants of oak savanna, a habitat that is imperiled across its entire range. To inform local restoration and management, we used hierarchical abundance models to describe relationships between habitat characteristics and rare wildlife species that utilize oak savanna. We found that predicted abundance and occupancy probability of Lark sparrow (*Chondestes grammacus),* Eastern towhee (*Pipilo erythrophthalmus),* Leonard’s skipper (*Hesperia leonardus leonardus*), and northern barrens tiger beetle (*Cicindela patruela patruela)* were affected by habitat features and management disturbance. It was noteworthy that some variables (e.g. canopy closure, recent disturbance) had disparate effects between species. These results highlight the importance of careful planning when undertaking habitat restoration. Plans should consider the habitat needs of individual species and their respective expected responses to active habitat management to achieve balance between maintenance of local populations and habitat restoration on a landscape scale.