APPLICATION OF A NOVEL NEST DENSITY ESTIMATOR: AN EXAMPLE USING SAGEBRUSH-STEPPE SONGBIRDS

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Studies show nest density is an important demographic rate for shorter-lived species, such as sagebrush-steppe songbirds. A recent analytical approach, temporal nest density estimator (TNDE), was developed to estimate the nest density of waterfowl species using data routinely collected to assess nest success while accounting for detection and availability of nests. To understand the general applicability of TNDE to species in other avian orders, we evaluated the performance of TNDE on a songbird species, Brewer's sparrow (*Spizella breweri*). We assessed the TNDE by comparing estimates of nest detection rate and nest density from TNDE to distance sampling methods for 43 Brewer's sparrow nests monitored in 2015. The TNDE method produced similar but more precise nest detection and density estimates than the distance sampling method. Now that TNDE has been validated, we plan on converting it to a Bayesian framework and using it in conjunction with fine resolution remote sensing data to determine nest-site selection for three sagebrush-steppe songbirds: Brewer's sparrows, McCown's longspurs (*Rhynchophanes mccownii*), and vesper sparrows (*Pooecetes gramineus*). These three species are representative of sagebrush specialists, grassland specialists, and generalists that use both, respectively. This study will allow us to explore the capability of TNDE and remote sensing data to assist in habitat selection studies. These methods may allow more accurate nest density estimates on broader scales with less effort, which will aid in identifying priority areas for conservation and management.