ABSTRACT

THESIS: Advancing understanding of Cerulean Warbler space use through the use of radio telemetry, and failure to advance migratory phenology in response to climate change may pose a significant threat to the Cerulean Warbler.

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The Cerulean Warbler (*Setophaga cerulea*) is a small, Neotropical migrant songbird that breeds in central and eastern United States, and southern Canada. This species has experienced a significant decline in population, and there are important gaps in our knowledge of this species' biology. This research was intended to identify characteristics of Cerulean Warbler space use and phenology. Two types of space use, the territory and the home range, have both been studied for the Cerulean Warbler. However, studies differed in tracking methodologies, and a fair comparison between the territory and home range cannot be made. I used radio telemetry to track adult male Cerulean Warblers that were affixed with a radio-transmitter. I compared resulting territory and home range estimates for each bird to identify the relationship between these two space use areas. I also compared my resulting territory estimate with a previously published territory estimate, which used an alternative tracking method (spot-mapping), to determine if tracking methods have an effect on territory estimates. Cerulean Warbler home

range estimates (n = 14, mean ± SE = 2.33 ± 0.29 ha) were significantly larger than territory estimates (n = 14, mean ± SE = 1.79 ± 0.39 ha). The telemetry-based territory estimates were significantly larger than the published territory estimate (mean = ~0.70 ha). Climate change is affecting the phenology of many species. I examined trends in Cerulean Warbler arrival timing to Indiana from 1982-2019. I also compared arrival and breeding phenologies with several climate variables. Cerulean Warblers did not advance their arrival timing significantly (1-4 days), while growing degree day accumulation indicates that spring conditions in Indiana have advanced by ~14 days. Migratory phenology was best predicted by growing degree days, but breeding phenology was not associated with any climate variable.