

As global temperatures continue to rise, avian species face many challenges, especially during the summer breeding months. Higher temperatures are negatively correlated with nest success, because of the direct effect they have on reproductive behaviors and metabolism. When breeding birds return to the same geographical region every year, they become physiologically adapted to such conditions. However, it is unclear whether these adaptations will remain beneficial as temperatures change. Our overall research question is: how does temperature affect breeding biology and fitness of birds. Specifically, we will examine how temperature effects clutch size, hatching success, fledging success, and nestling growth and development. Eastern Bluebirds are secondary cavity nesting birds that are found in central Michigan and readily use human-constructed nest boxes. We have three sites near Alma, MI, with 50 nest boxes total. We experimentally manipulated the internal temperature of active nest boxes via heating packs, ice packs, and no alterations as a control. We placed a temperature datalogger into each active nest box that records temperature every hour. We will visit nest boxes every 1-4 days, recording clutch size, number of nestlings, and nesting size starting in mid-March and throughout the breeding season. In warm climates, cool nest boxes are more successful, but if bluebirds in Michigan are physiologically adapted to a cooler environment, we expect the opposite relationship. Therefore, we expect that experimentally warmed nest boxes will be more successful than the control or the cooled nest boxes because warm nests will limit the metabolic demands on the attending female. By determining exactly how temperature affects breeding biology of Eastern bluebirds in central Michigan, we will be better equipped to make recommendations that will optimize success while bluebirds adapt to rising temperatures.