Introduction

*Sialia sialis* (Eastern Bluebird) has had notable population reductions, (Navara & Anderson, 2011), and despite various studies done on nest box success, specific factors that influence boxes’ occupancy are still debated. Nest boxes specifically constructed for bluebirds have been used to negate the effects of habitat loss for secondary cavity-nesters by providing premade cavities. To help conserve the Eastern Bluebird population, understanding the effects of nest boxes is crucial.

Various nest box characteristics—location, orientation, and size, for example—have been found to influence the overall success and selection of boxes in the South and the Midwest United States. Eastern Bluebirds seem to prefer shrub-like areas, such as grass lawns, golf courses, and pasture lands over urbanized land (Wetzel & Krupa, 2013). Harford Glen, an environmental educational center located in Harford County, Maryland, offers a variety of habitats, similar to the shrub-like areas preferred by Eastern Bluebirds, primarily forest, pond, and meadow for box placement.

In this study, it was assumed that there was no difference in the percentage of successful nest boxes for each of the four cardinal directions. This data was evaluated, along with data from the Irvine Nature Center in Baltimore County, MD, to determine if Harford Glen is a suitable habitat for Bluebirds, if there are any patterns in box selection, and which factors have the greatest impact to prevent Bluebird extinction.

Materials and Methods

Bluebirds were monitored at Harford Glen every week starting early May 2018 until the middle of August 2018, weather permitting. Monitoring all 13 boxes took about an hour each week. There were 26 boxes originally placed around Harford Glen, 11 of which were removed, and data was not collected for those boxes, leaving a total of 13 boxes monitored this breeding season.

The boxes were made of wood posted on a metal rod and each box had a predator guard (Figure 1). Data at the study site was collected using a paper data sheet and updated in an Excel spreadsheet; the table included the date, the number of which box was being checked, the species that has nested, if the nest was complete, the number of eggs, the number of young, the estimated age of the young, how many had successfully fledged, and a place to add comments. Nest boxes inhabited by other species, house wrens and tree swallows, were monitored and not disturbed (Wetzel & Krupa, 2013). Data from Irvine Nature Center was collected from 2008 to 2018 by Timothy Davis.

Results

This data included box orientation, nest box success, number of fledglings, habitat type, and much more. The data was then organized for statistical purposes to answer the null hypothesis.

Success rate and overall patterns of the boxes were also determined by comparing data from previous years, recorded at Harford Glen, and whether Bluebirds had successfully fledged (Figure 2). With a handheld Garmin GPS, the location of the nest boxes at Harford Glen was mapped and renumbered logically. Using a compass application, the orientation of the nest boxes were categorized numerically from 1° – 360°. The orientations were decided by the following: 315° – 45° (North), 46° – 135° (East), 136° – 215° (South), and 216° – 314° (West). To analyze the data, a chi-square goodness-of-fit statistical test was run through Minitab 18. The data was split into the four cardinal directions and their respective percentages of successful fledglings. The chi-square determined if there was a statistical difference between the percentage of successful fledglings for each cardinal direction.

Conclusions

The purpose of this study was to discover if directionality affects nest box success with *Sialia sialis* (Eastern Bluebird). Success was defined by having at least one fledgling. The *p*-values for the groups were 0.631, 0.354, 0.647, and 0.914. The groups orientation did not have any significant difference and therefore can be placed in any orientation. This data shows that at Harford Glen and Irvine Nature Center directionality of nest boxes does not significantly impact success. Previous studies showed that nest boxes facing southeast or east fledged more young. These studies were conducted in the South and Midwest, possibly explaining the difference in results.

References
