

Summary

The goal of this study was to gain a better understanding of Nahant Marsh's Purple Martin population, with an emphasis on tracking their individual breeding progress and identifying their biggest threats. Although the colony had a successful breeding year, there were many different avian predators that are thought to be the biggest threat to the population.

Introduction

Purple Martins (*Prong subis*) are the largest swallow species that reside at Nahant Marsh. Despite their size compared to other swallows, the Purple Martin population is on a decline. Previous studies have concluded that European Starlings (*Sturnus vulgaris*), House Sparrows (*Passer domesticus*), and Brown-headed Cowbirds (*Molothrus ater*) are the main threat to their species. Although humans can provide protection against some predators, the martins are still very vulnerable. Martins prefer to nest in man-made structures like gourds, where there is less competition for space. A study on the Purple Martins is conducted every summer at Nahant in order to keep track of their population. Previous studies have shown that Nahant has had Purple Martin mortalities each year. Over the summer, I monitored the productivity of the Martins as well as discovered the main threats to their population at Nahant. Mortalities in martin populations can be caused by mites, unfavorable weather, and invasive bird species. This study will help determine the main cause of mortalities of Purple Martins, as well as what steps need to be taken to better protect this species.

Methods

For 11 weeks, nest checks were performed on each Purple Martin nesting cavity at Nahant Marsh. Notes were taken including the number of eggs, young, and other martins observed in the cavities. Nahant Marsh provides three housing options for the martins. One 12 count gourd system (AG12), a wood house with 16 cavities (WH), and a 24 count gourd system (AG24). Once every seven days, nest checks were performed on each nesting cavity. Number of eggs, young, deceased Purple Martins and any other notable abnormalities were documented. To document potential predators, one trail camera was placed in front of each housing system. Over several weeks, the photo data was then analyzed for any birds other than Purple Martins. Deceased Purple Martins that had been found during the observation time period were submitted to Rachel Ruden, the Iowa Wildlife Veterinarian for necropsies to determine a cause of death. The AG24 unit is equipped with an excluder entrance into the gourds prevent other bird species from getting in. The AG12 system is equipped with a Colony II vertical gourd door. The WH system has a small circular hole as an entrance into the nesting cavities.

Investigating the Purple Martin Population at Nahant Marsh

Meah Harfst

Eastern Iowa Community Colleges | Arizona State University



Results

When counting the total amount of nests made, the population of Purple Martins was thought to be around 34 adult martins. 182 eggs were laid, but the total number of nestlings hatched was 69. Eight total Purple Martins were found deceased: two adult males, four after second year females, and two dead young (sex undetermined). All of the deceased Purple Martins were found in the AG24 system. 75 eggs were also lost from various nests: AG12 lost 23, WH lost 17, and AG24 lost 35.

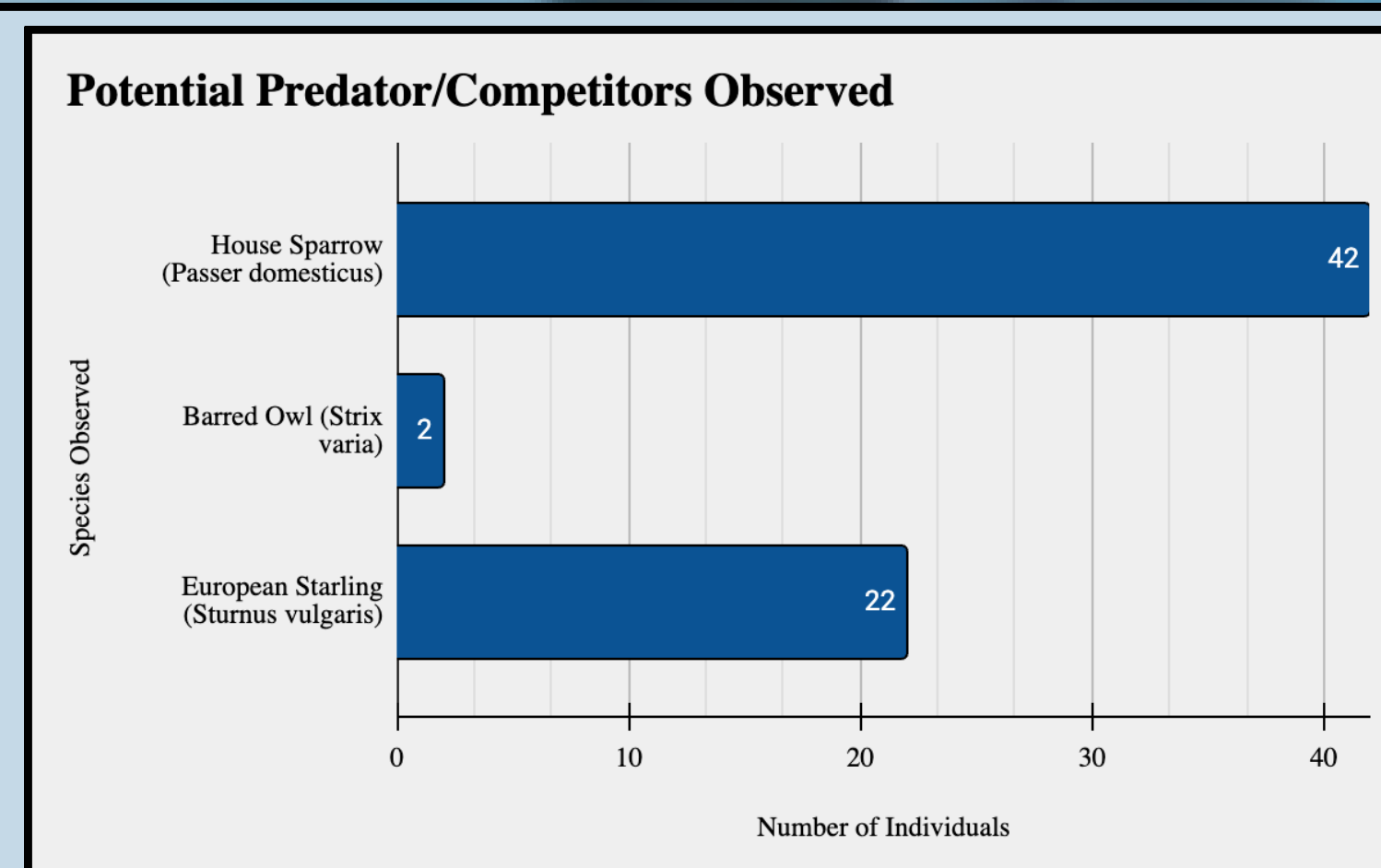


Figure 1.

This chart displays which potential threat species were observed as well as how many times they were seen on the trail cameras.

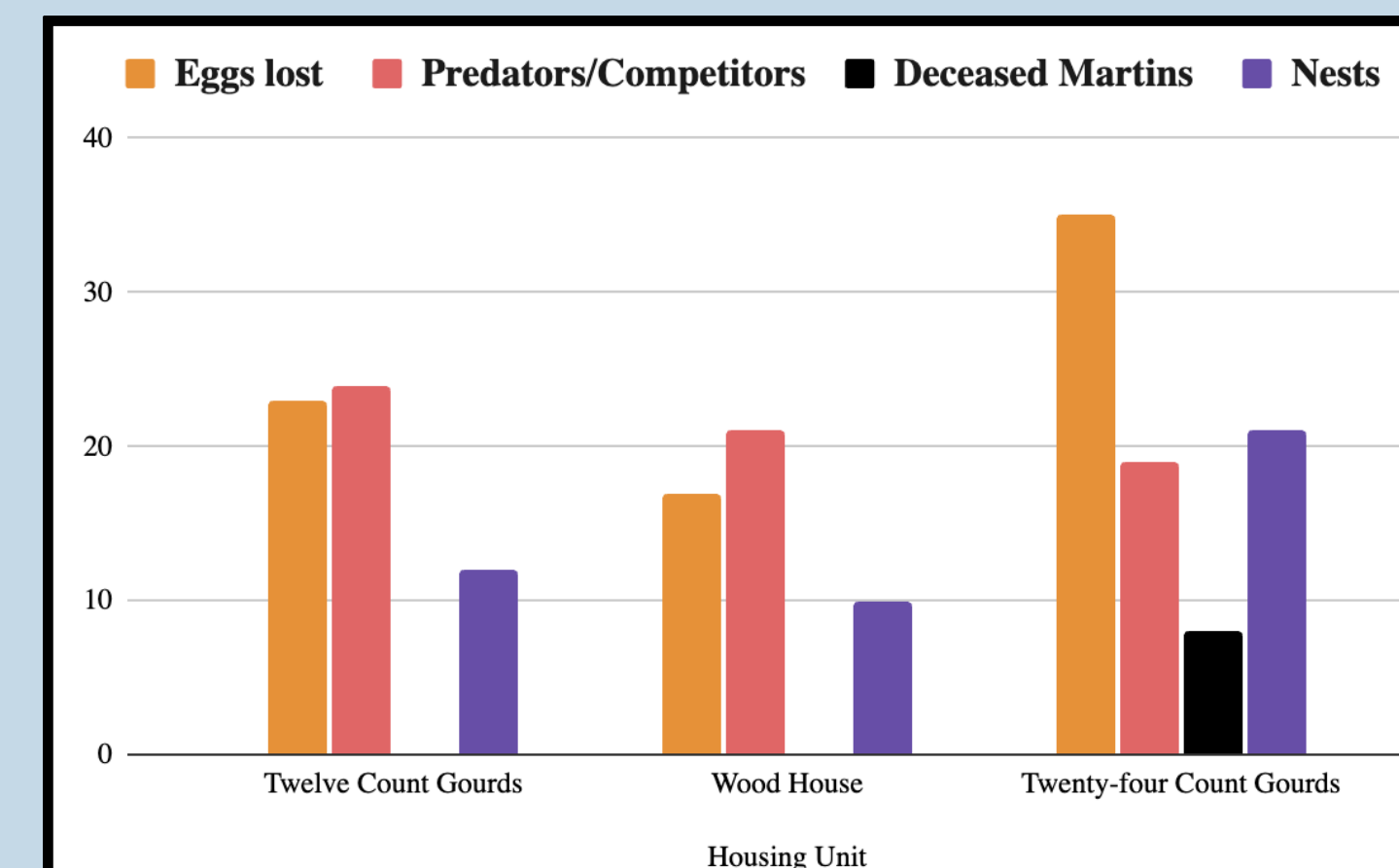


Figure 2.

Shown above is the total number of eggs that disappeared from nests, deceased martins found, potential predators or competitors observed on trail cameras and, the number of nests made.

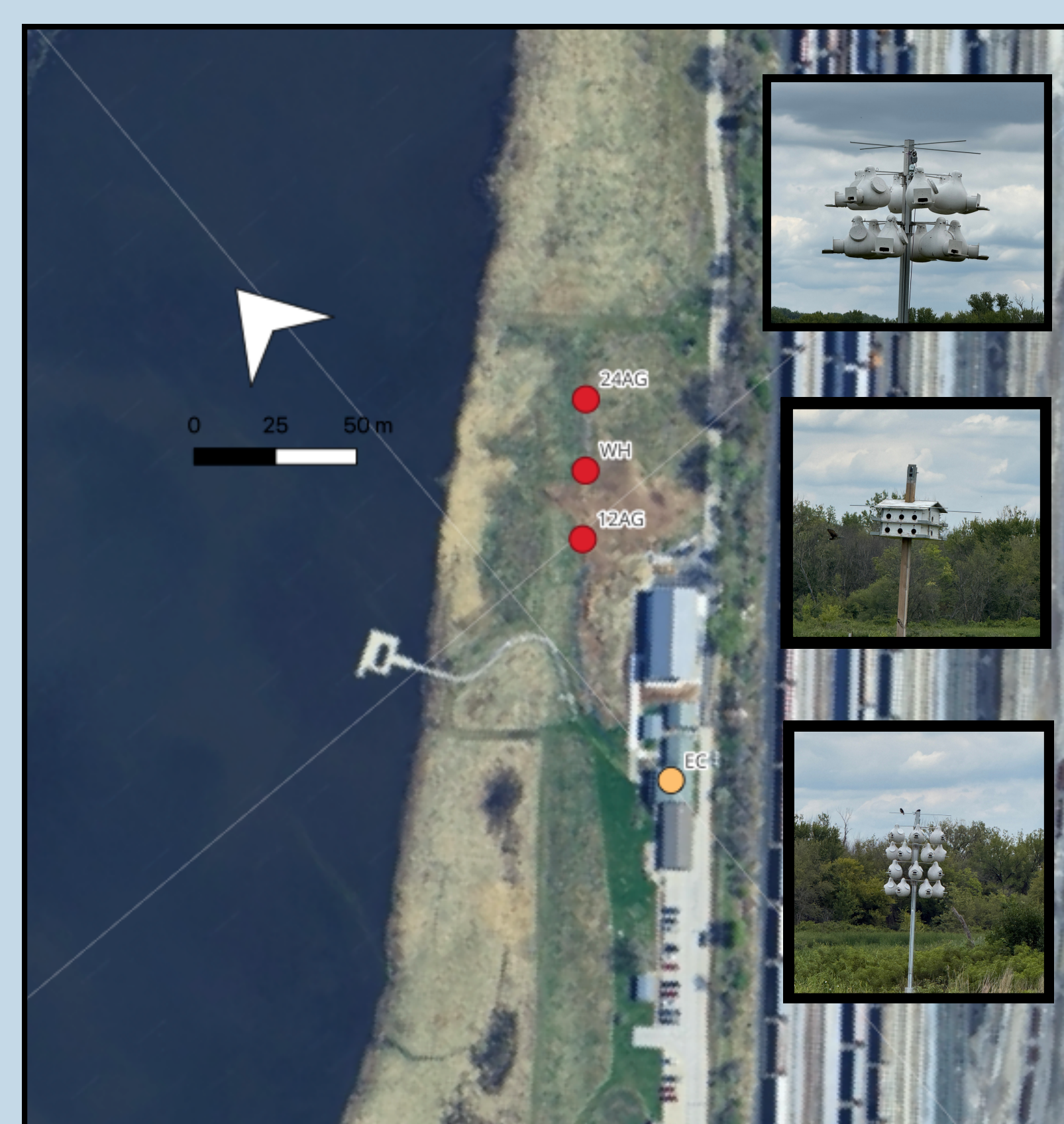


Figure 3.

This map shows the location of each housing unit, each equipped with a corresponding trail camera. The education center at Nahant Marsh is highlighted. Each housing unit is displayed on the right.

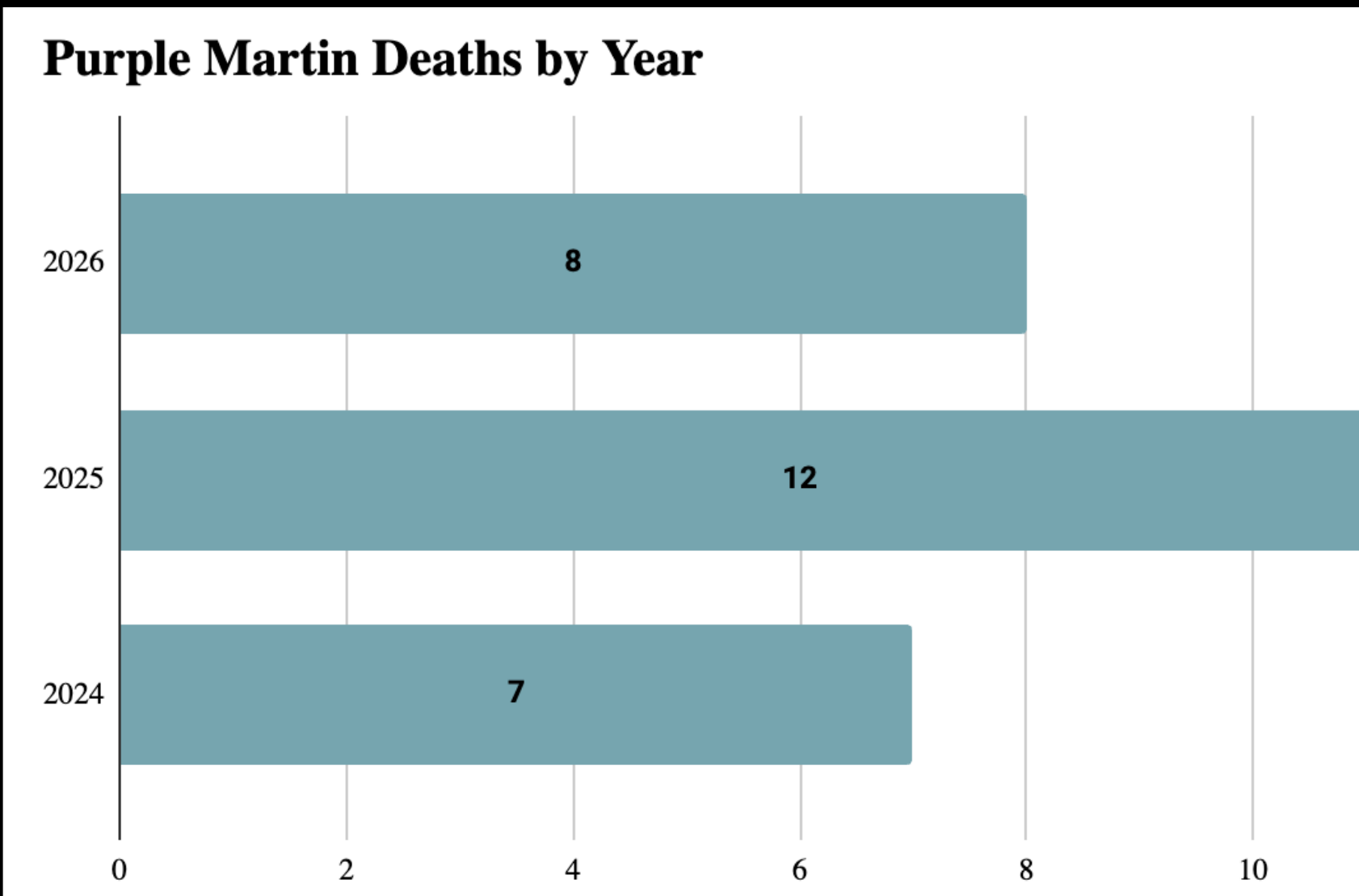


Figure 4.

Shown above is the number of Purple Martin deaths compared by year.



Necropsy Results

10 deceased purple Martins were sent to be necropsied. Two birds sent were found in previous years. Not all results from the necropsies have yet been received but listed below is what has been found so far. Two out of 10 tested positive for *Aspergillus fumigatus*, a species of fungus that can infect a bird's respiratory tract. This can cause the bird to die of suffocation, and it can be spread from wet bedding in nesting areas. One Purple Martin was found with its lungs filled with blood which was caused by severe trauma to the bird. Another martin was found with an infected reproductive tract which is likely the cause of death.

Conclusion

The amount of deceased Purple Martins found and eggs that were lost this year at Nahant is alarming. All of the observed predatory species could be to blame for this number. The potential predator observed the most was the House Sparrow. This is led to be the main threat to the martins population. House Sparrows are a species known to take over established nests and make it their own. This could also explain the huge egg loss this season as well as the martin who died from severe trauma. When comparing the amount of death across the last three years, there are consistently high numbers of mortalities. This makes it essential to keep monitoring these numbers. In order to protect Nahant's Purple Martin population in the future, several changes should be made. AG24 is the farthest away from where humans are at Nahant, moving all of the Housing cavities closer to humans could provide more protection for the martins. Changing the gourd doors to either a circular hole or, the Colony II entrances could also detour predators from getting in. All of these solutions as well as continuously monitoring future populations, will help bring mortalities down.



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