

DIFFERENCES IN THE STARTLE RESPONSES AMONG GEESE IN THE WINGRA WATERSHED

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Abstract

The numbers of urban and migrant geese inhabiting the Vilas Park area of the Wingra Watershed has increased significantly in recent years. We observed the behavioral patterns of the geese to determine if the geese that currently reside in the watershed are migrant or urban based on their startle response to the presence of humans. Once we made this determination, we charted our results to determine if the urban and migrant geese intermingled within the various zones of Vilas Park. We observed the geese on eight different occasions, and recorded the reactions of the geese in each zone. We came to a logical conclusion that based upon their reaction to human presence, over half of the geese we observed were most likely urban while the remaining percentage were most likely migrant. Based upon our assumption we also discovered that both urban and migrant geese did intermingle in two zones of the park. These findings provide information that may aid in promoting the health of the Wingra watershed. We discuss the implications of these findings in the report.

Introduction

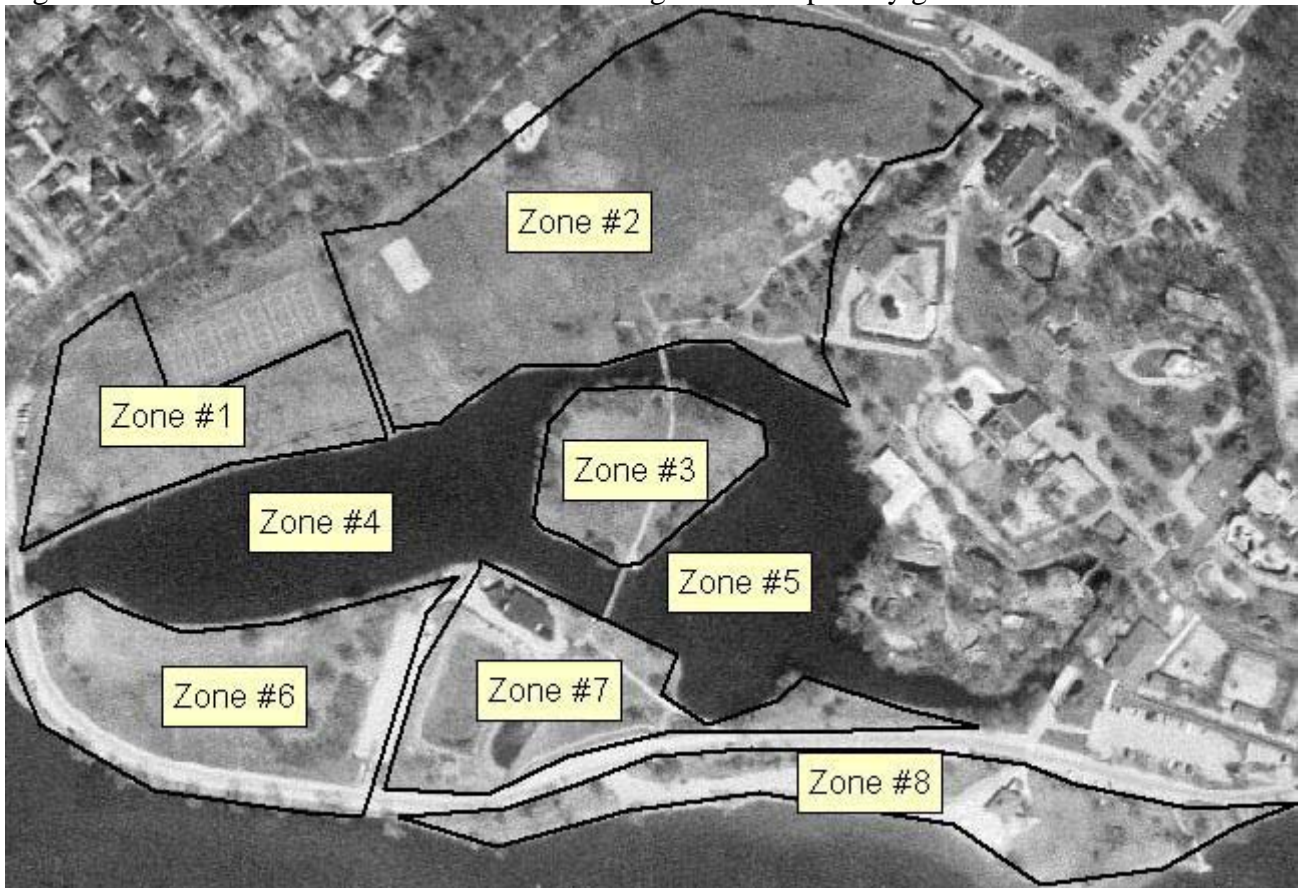
The Wingra Watershed is home to a large number of geese, both migrant and urban. In recent years, studies have been conducted to determine the numbers of geese in Vilas Park. According to Jim Lorman, the numbers of migrant geese in this area have increased significantly since the 1980's and have become increasingly adapted to urban and suburban environments such as the area contained around Lake Wingra in Madison. There are distinct differences in the behavior patterns of migrant and urban geese, with migratory Canada geese flying south during fall to their wintering range while the resident geese spend most of the year in the same general area and fly only far enough to find food or open water. We also learned that geese display particular movements when they sense danger. The most common movements in geese are the "alert display", where the goose's head is raised, and the neck is vertical and straight, and the "head forward display, where the goose's head is bent low and forward, and can sometimes be accompanied by a call or a honk (Link 2006). The calls made by geese can vary from a mild alert call, in which the geese generally do not perceive any immediate danger and an alarm call, which occurs when geese use a variety of honks and take flight, usually flying into the safety of a nearby body of water. Geese who do not appear threatened by the presence of humans and only emit a single call can be thought to be urban, while geese who tend to let out a series of honks and then fly away when confronted by humans are more than likely migrant (Streng 2007).

In evaluating the presence of these geese in the Wingra Watershed, our group wondered how many of the geese in the park were migrant, and how many were urban. In making this determination, we pondered if there was a way we could differentiate between the two groups of geese. With this in mind, we decided to test the startle

responses the geese exhibited when they were approached by humans to see if we could determine if the geese in the Wingra watershed were migrant or urban based on their reactions. Once this question has been answered, we will look at the patterns of behavior between the migrant and the urban geese to determine if the two groups intermingle within the various zones of the park.

The park has been divided into nine different zones, which lay out the areas inhabited by the geese on the land surrounding the Vilas park lagoon, where the geese make their habitat (Figure 1). Our initial study will be to observe the geese in each zone to determine if they exhibit distinct patterns in their startle response to humans. Our hypothesis is that we will find differences between the urban and migrant geese, both in their reactions to humans and the specific zones in which they are residing. Knowing the differences between urban and migrant geese will be useful in obtaining information about the numbers of geese that inhabit Vilas Park on a permanent basis. This information may then be able to be used to further studies about the influence geese have on the health of the Wingra Watershed.

Figure 1: Zones in Vilas Park used for determining use of the park by geese



Methods and materials

Our testing methods were conducted over a 10 day time period. We observed the geese twice in one day, with the first observation taking place in the morning, and the second in early afternoon (Table 1).

Table 1: Observation dates and timeline

Date	Observation 1	Observation 2
October 31	8:45-9:45	11:50-12:50
November 2	8:45-9:45	10:15-10:45
November 7	8:45-9:45	11:45-12:20
November 9	8:45-9:45	10:45-11:10

Before we conducted our research, we created charts to record the data relevant to our study. This information included the zone location, the number of geese present in that zone, and the reactions of the geese at various distances. We limited the number of people observing the geese to two at a time to avoid outside distractions and approached the geese by walking towards them at a steady pace. When the geese gave an indication that they had noticed us, we dropped a beanbag on the ground to mark the place where they gave their first reaction. Indications that the geese had noticed our presence included raising their heads, walking quickly towards the water, giving a loud honk or series of honks, or flying away towards the water. The first beanbag was dropped as the geese raised their heads, and looked in our direction. The second beanbag was dropped when the geese began to walk away from us at a rapid pace, and the third bean bag was dropped at the point where they all walked or flew into the water. We then used a tape measure to measure the distance between where the geese first noticed our presence and when they all gave a visible reaction, i.e. by flying away or moving into the water. We did have several sources of error in this method. In some cases we had to estimate the position of the geese based on landmarks, which prevented our measurements from being 100% accurate. In addition, we were unable to measure the exact distance of the geese as they flew into the water, although from a map of Lake Wingra, we were able to deduce that the distance they were from the shore was always less than 100 feet. We then compiled our data, and graphed our results based on several factors we observed to determine if the startle response in the geese varies between the migrant and the urban geese. These factors include the zones in which the geese were present, the distance they were from us when they reacted to our presence and the numbers of geese in particular zones. (See Appendix A.)

Results

During our study, geese were present in five of the nine zones – Zone 1, Zone 3, Zone 6, Zone 7, and Zone 9. After compiling our data, we were able to determine that there were definite differences in responses of the geese in the various zones of the park. During our observations, we counted a total of 455 geese who gave little or no reactions to our presence as we approached, and 339 total geese that did show a significant startle response. We based our findings on two main factors: the first factor was the intensity of the geese's honking and the movement patterns of the geese, and the second factor was the distance we were in feet from the geese when they showed a visible reaction to our presence. The geese's reactions varied from intense honking to no noise at all, and their movements ranged from the alert head display to flight when they noticed our approach. When the geese honked loudly and flew away when we were at a distance greater than 35 feet, we concluded that the geese were most likely migrant, while the geese who gave no visible startle response as we approached were most likely urban and conditioned to the presence of humans. On two separate occasions there were geese present in Zone 1. These geese remained calm upon our approach, and raised their heads slightly when we were about 50 feet away. They then walked slowly into the water. On both occasions we were able to get within 30 feet of the geese before they responded, and they did not seem started by our presence. We determined that these geese were most likely urban.

In Zones 7 and 9, we were able to get within one foot of the geese. These geese did not appear to be startled by our approach, however, on two separate occasions, one or two geese raised their heads as we began walking toward them, then all the geese began moving slowly, in a circular pattern. On one occasion in Zone 7, the geese walked quickly into the water. Only one goose in these two zones honked, and that happened only once, otherwise, the geese did not make any noise as we infiltrated their group. We determined that the geese in these zones were urban.

In Zone 3 and Zone 6 we found slightly different results. Zone 3 is an island located in the middle of the lagoon. We divided this zone into East and West as it was separated by a pedestrian walkway. In Zone 3 East, the geese varied in their responses to our presence. On several occasions, the geese raised their heads and began to honk loudly and quickly moved away, flying towards the water. We determined that these geese most likely were migrant. However, we also found groups of geese in this area that did not have a strong reaction to our presence, and on November 9th, we were able to infiltrate a group of geese that contained both migrant and urban geese. We determined this based on the way the geese reacted as we came close to them. The geese divided into two groups – the first group put their heads up right away and walked very fast towards the water, while the second group lingered by the edge of the water. From the geese's reactions we were determined that this group held geese that were both migrant and urban. In Zone 3 West, we were able to get within the 35 foot limit we had set, however, the geese in this zone responded to us with loud honking and then flew into the water. In this case, using the tool of a distance of 35 feet was not a useful measure in making our determination for whether the geese were migrant or urban. We found similar results in Zone 6 (Figures 2, 3, 4 and 5).

Figure 2

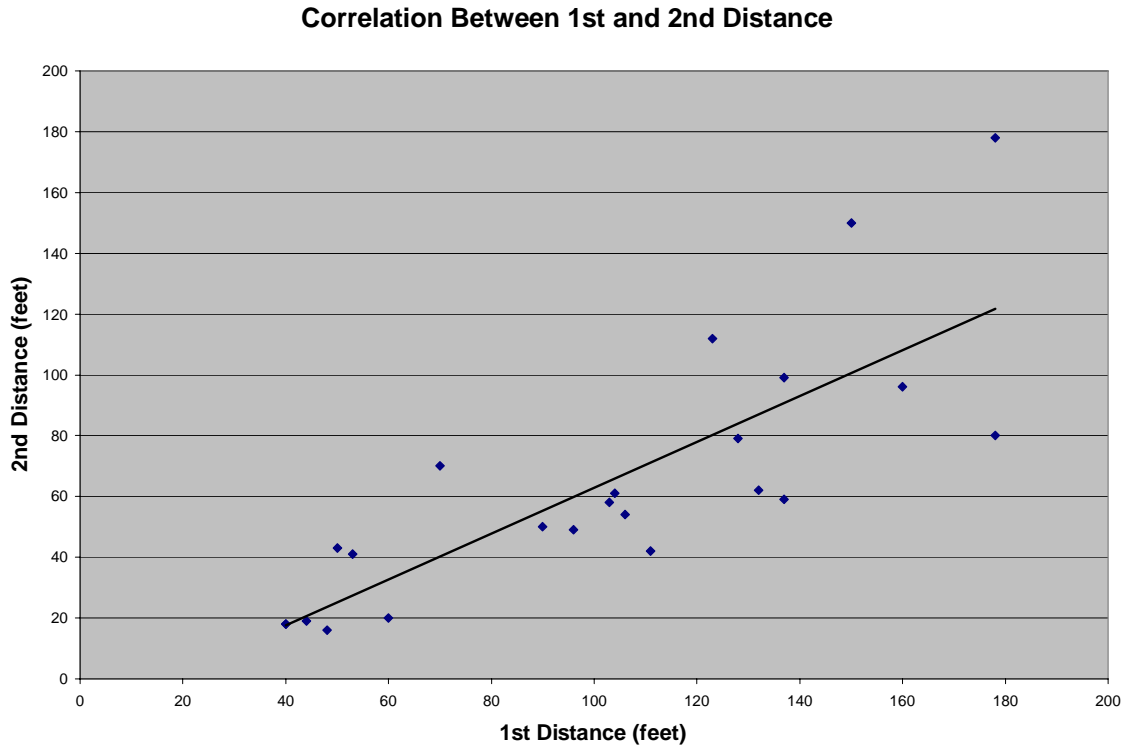


Figure 3

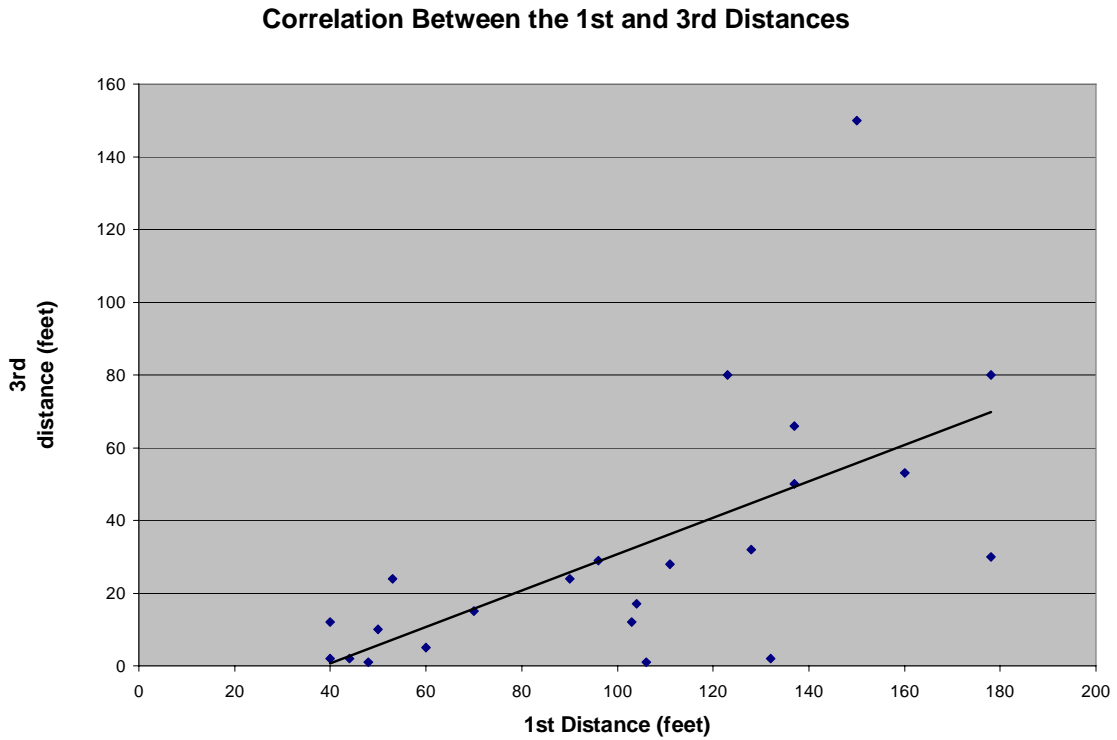


Figure 4

Correlation Between 2nd and 3rd Distances

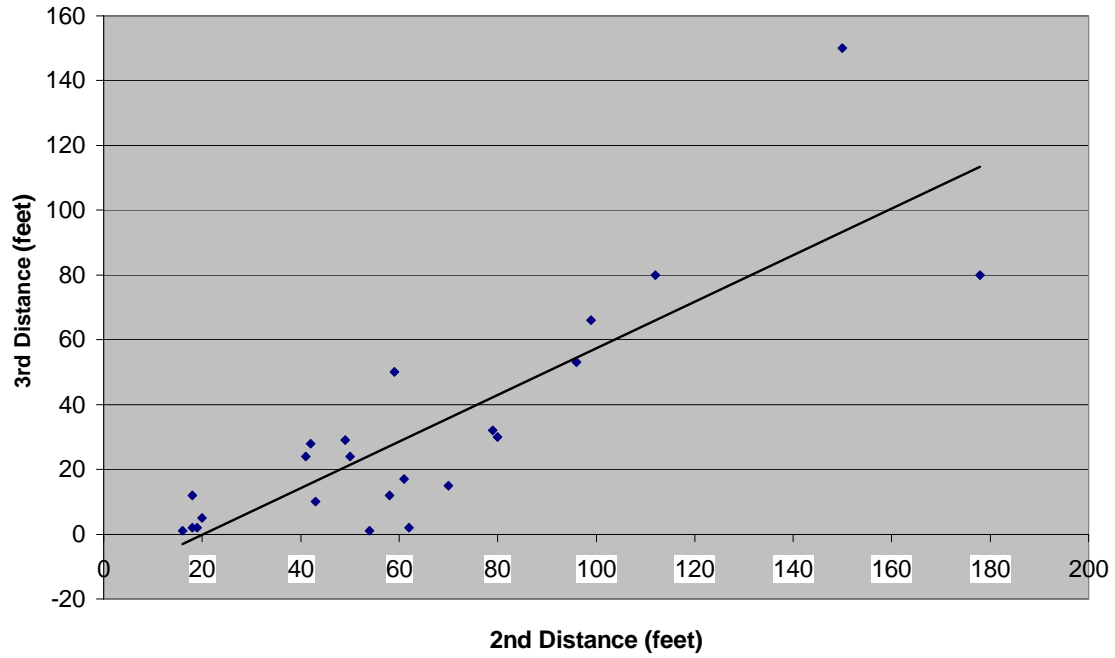
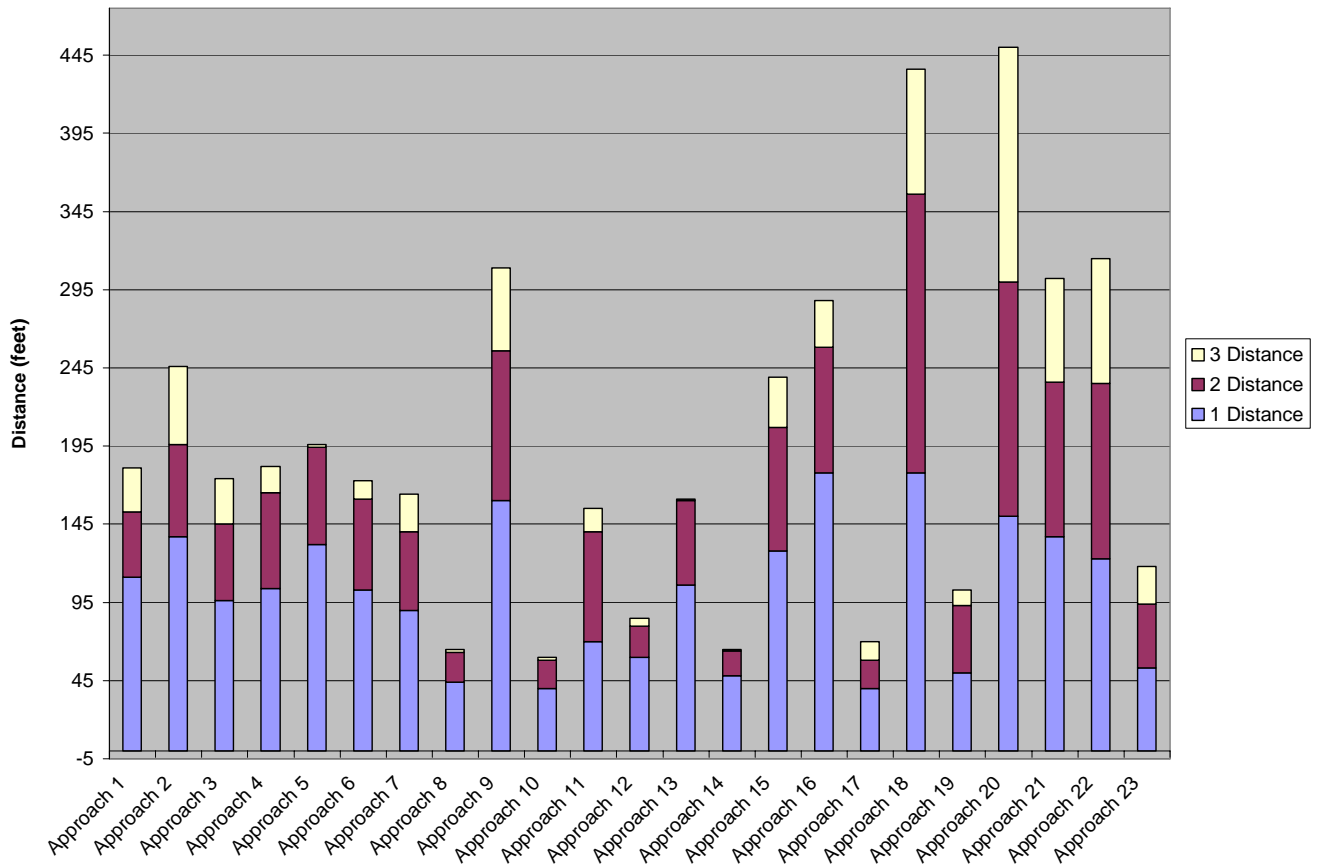


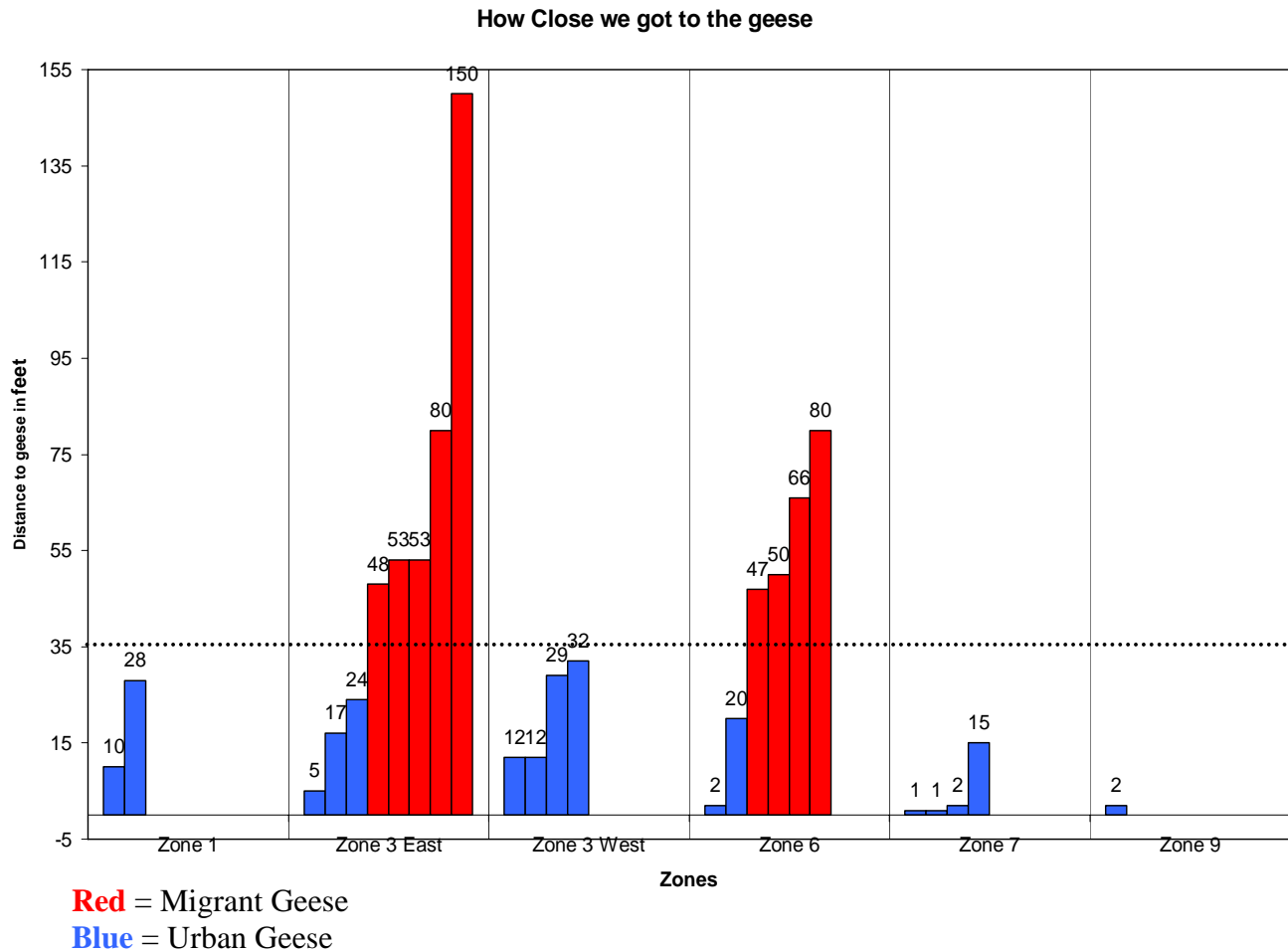
Figure 5



We graphed our results to illustrate the distance we were in relation to the geese when they gave a visible reaction. Based on our calculations that the geese who gave a startle response at a distance of greater than 35 feet were migrant, and geese who gave no startle response until we were in close proximity to them were urban, our results showed that in Zones 3 East and West, and Zone 6, the urban and migrant geese did intermingle (Figure 6). Our results showed that of the 784 geese present in the Wingra Watershed, 58% of the geese present were urban, and 42% were migrant.

Figure 6

Closest Distance in Feet Between Geese and Humans



Discussion

Our hypothesis posed that we would be able to distinguish the difference between the urban and migrant geese in the various zones laid out in Vilas Park of the Wingra Watershed based upon their reactions to humans and specific zones in which they chose to reside. Our results showed that there were distinct differences among the geese which may help distinguish between urban and migrant geese that inhabit the Vilas Park area.

This information is relevant in determining if the numbers of migrant geese in this area have continued to rise and if they have become increasingly adapted to the urban and suburban environment contained around Lake Wingra in Madison.

When compiling our results, we discovered several sources of possible error that occurred during our study. The first source of error was that we had two separate groups recording data and making observations, and the data may have been recorded differently. Also, because two of the members of our group are no longer a part of this study, it was difficult to analyze their results as we did not have the capability to discuss their interpretations, leaving us to speculate on their data. We also found a possible source of error in our methods. In Zone 3 W we had difficulty determining whether they were migrant or urban because of the measurement criteria we used. In this zone, although we were able to get closer than 35 feet, the geese responded with frequent honking and flight. In deciding whether the geese were urban or migrant, we used the measurement criteria of less than 35 feet and labeled the geese as urban.

Some possible implications of our study that may be useful in determining how urban and migrant geese affect the health of the Wingra Watershed include water pollution from geese feces, growth of local vegetation, and public sanitation. The numbers from this study could aid health officials in determining whether the increase in geese is a threat to the Watershed. The results may be useful for consideration in future park planning in knowing what zones the geese tend to occupy on a regular basis. Determining whether it is possible to verify if the geese were urban or migrant based on their startle responses and whether or not the two intermingled within the two zones of the park.

Works cited:

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Appendix A. – Results of Observations

Date/ Time	Approach Number	Zone	Number of Geese	1st Dis.	Response	Response			
						2nd Dis.	Response	3rd dist.	Response
10/31/2006 8:45-9:45 am	1	1	10	111 feet	started to walk	42 feet	walking towards the water	28 feet	entered the water
	2	6	20	137 feet	heads up and some honking	59 feet	some honking	50 feet	entered the water
	3	3 West	55	96 feet	heads up and some honking	49 feet	loud honking and flew into the water	29 feet	sporadic honking
	4	3 East	90	104 feet	heads up	61 feet	some honking some flew in the water	17 feet	lots of honking, flew into the water
10/31/2006 11:45-12:30 pm	5	6	100	132 feet	some started to walk	62 feet	some flew into the water	2 feet	lots of honking
	6	3 West	50	103 feet	heads up	58 feet	6-8 honks that was led by on goose some flew away	12 feet	entered the water
	7	3 East	40	90 feet	heads up	50 feet	some flew into the water	24 feet	geese returned from the water
11/2/2006 8:45- 9:45 am	8	7	10	44 feet	heads up and started to walk	19 feet	walked faster away	2 feet	entered the water
	9	3 East	20	160 feet	heads up, sporadically honking, and started to walk	96 feet	started to enter the water	53 feet	all the geese entered the water
11/2/2006 10:15-11:15 am	10	9	8	40 feet	heads up	18 feet	walked slowly away	2 feet	entered the water
	11	7	8	70 feet	heads up and walked to the water	70 feet	walking away	15 feet	entered the water
	12	3 East	40	60 feet	started to walk	20 feet	walked towards the water	5 feet	entered the water
11/07/06 8:45-9:45 am	13	7	30	106 feet	a couple heads went up	54 feet	walked away	1 foot	entered the water
	14	7	30	48 feet	leader put his head up tall and the rest followed	16 feet	no reaction	1 foot	followed the leader into a single file line slowly into the water
	15	3 West	19	128 feet	heads up	79 feet	some honking and quickly walking towards water	32 feet	flew into the water
11/07/06 11:45-12:20 am	16	6	25	178 feet	some honking	80 feet	slowly started to walk towards the water	30 feet	entered the water
	17	3 West	40	27 feet	some honking	18 feet	heads up and started to walk	12 feet	walked into the water
11/9/2006 8:45-9:45 am	18	3 East	10	178 feet	started to move before we even got there	178 feet	walked towards the water	80 feet	entered the water
	19	1	50	43 feet	one head went up and started to walk	43 feet	whole group started to walk	10 feet	walked into the water
	20	3 East	13	150 feet	moved before we got near	150 feet	moved before we got near	150 feet	entered the water
11/9/2006 10:45-11:10 am	21	6	6	137 feet	heads up	99 feet	started to enter the water	66 feet	entered the water
	22	6	75	123 feet	heads up	112 feet	one goose made a call	80 feet	more calls went up some walked into the water some flew into the water
	23	3 East	55	53 feet	heads up	41 feet	walked towards the water	24 feet	entered the water