Results

After five weeks of data collection, polling results were collected and tabulated to be analyzed for certain research questions. 58 total responses were collected, some data were excluded or modified based on repetitive or irrelevant content. The main purpose of this survey was to determine how people react to geese based on their use of outdoor recreation spaces and what their personal biases towards geese are.

The first question to be evaluated was if people observe more geese when they use outdoor spaces if they use them more often. Figure 1 shows the relationship between frequency of outdoor space usage and frequency of geese sightings when in these spaces.

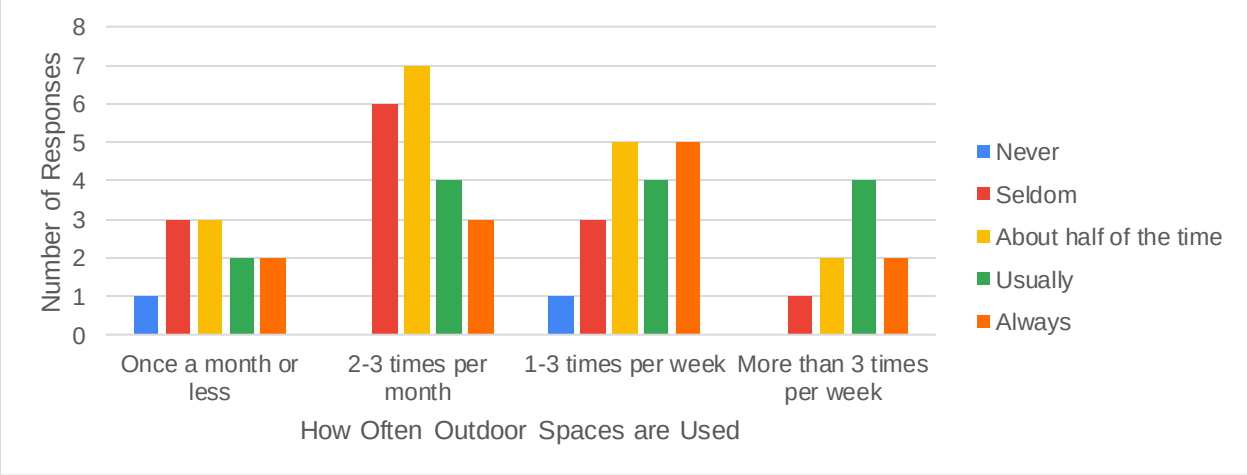

Figure 1: How often respondents see geese versus how often they use those outdoor spaces.

The horizontal axis of this graph indicates how often, on average, individuals utilize a variety of outdoor recreation spaces including parks, beaches, nature trails, or farmland. About 34% of all respondents indicated they used outdoor spaces 2-3 times per month, 31% indicated they use these spaces 1-3 times per week, 19% use them more than 3 times per week, and about 15% of people use them once a month or less. Overall, 29% of all individuals indicated they witnessed geese outside about half of the time.

The second question to be evaluated was how people feel about geese based on the kind of outdoor space they use. The graph below shows the relationship between type of outdoor space used most often by individuals and their tolerance level towards geese.

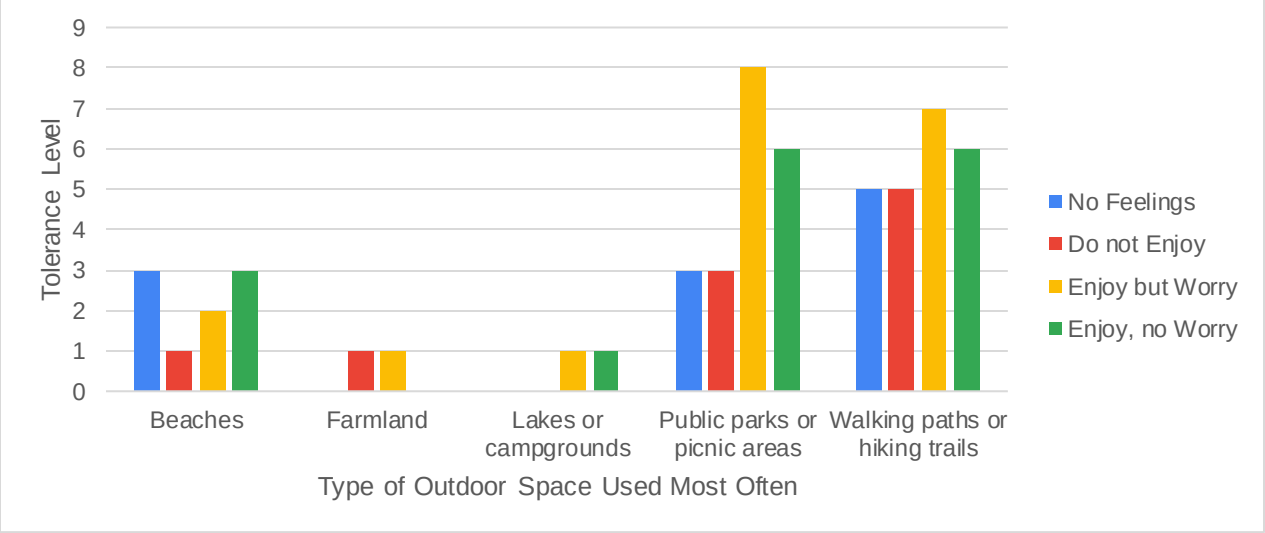

Figure 2: Tolerance towards geese based on what kind of outdoor space respondents use most often.

Responses to tolerance level were converted to numeric data to be quantified. A response of 0 indicates no particular feelings about geese in the individual's area. Tolerance level was measured on a scale of 1-3, with a response of 1 indicating not enjoying the presence of geese and regarding them as nuisances, a response of 2 indicating enjoying the presence of geese, but worrying about problems they might cause, and a response of 3 indicating enjoying the presence of geese without worrying about problems they might cause. These feelings were examined by the type of outdoor spaces individuals used most often. Overall, 33% of all participants indicated that they enjoy the presence of geese but worry about the problems they might cause.

The third question to be evaluated looked at individuals' concern for personal or property damage and how often they see geese around their home and comparing that to how they feel about goose population levels.

Table 1: Public views about geese populations based on frequency of goose sighting around home versus degree of concern of personal or property damage from geese on a scale of 1-5, with 1 being not at all concerned and 5 being extremely concerned.

Frequency of Goose Sightings and Feelings about Population	Level of Concern for Personal/Property Damag				
	1	2	3	4	5
Frequent	**34.6%**	**26.9%**	**30.8%**	**3.8%**	**3.8%**
Goose population should substantially decrease.	20.0%	40.0%	20.0%	0.0%	20.0%
Goose population should decrease.	0.0%	60.0%	40.0%	0.0%	0.0%
Goose population should stay the same.	50.0%	14.3%	28.6%	7.1%	0.0%
Goose population should increase.	0.0%	0.0%	100.0%	0.0%	0.0%
Goose population should substantially increase.	100.0%	0.0%	0.0%	0.0%	0.0%
Infrequent	**40.6%**	**34.4%**	**12.5%**	**9.4%**	**3.1%**
Goose population should substantially decrease.	0.0%	50.0%	50.0%	0.0%	0.0%
Goose population should decrease.	0.0%	16.7%	33.3%	33.3%	16.7%
Goose population should stay the same.	52.6%	36.8%	5.3%	5.3%	0.0%
Goose population should increase.	75.0%	25.0%	0.0%	0.0%	0.0%
Goose population should substantially increase.	0.0%	100.0%	0.0%	0.0%	0.0%
Grand Total	**37.9%**	**31.0%**	**20.7%**	**6.9%**	**3.4%**

The table above shows the percentage of individuals at varying levels of concern about damage based on how frequently they see goose around their home. Furthermore,

we can see the percentage of individuals who hold certain attitudes on geese population levels based on their concern for damage caused by geese. Frequency of goose sightings around the home were categorized as Frequent (many times per month) or Infrequent (once a month or less) and level of concern about damage caused by geese was measured on a scale of 1-5, with 1 being Not at all Concerned and 5 being Greatly Concerned. Individuals were asked how they felt about current geese populations and responses ranged from believing populations should be significantly decreased to significantly increased. Values under level of tolerance were shown as the percentage of row totals. That is, percentages were calculated based on opinion on goose population. Overall, 57% of all participants indicated they believe goose populations should stay the same and 38% of all participants were not at all concerned about damage to person or property by geese.

I was also interested in seeing how people with varying levels of concern for geese felt about their current population levels without considering frequency of sightings. *Table 2* below shows that while those with low concern about property damage generally feel fine with current population levels, those with high concern about property damage exclusively wish to see a decline in population levels.

Table 2: Public feelings toward goose population levels as it relates to level of concern for personal or property damage from geese. Concern for damage ranged on a scale from 1-5, with 1 being not at all concerned and 5 being extremely concerned.

Feelings Toward Current Goose Populations	Level of Concern for Personal/Property Damage				
	1	2	3	4	5
Goose population should substantially decrease.	1	3	2		1
Goose population should decrease.		4	4	2	1
Goose population should stay the same.	17	9	5	2	
Goose population should increase.	3	1	1		
Goose population should substantially increase.	1	1			
Grand Total	**22**	**18**	**12**	**4**	**2**

Discussion

From the data collected, we can gain more insight into how people perceive geese in public spaces, something that has become increasingly important as we navigate human dimensions within wildlife management. Studies have been conducted in the past examining public acceptance of geese, including factors like attitude and acceptance capacity. From examining the results of this survey, we can begin to explore what factors affect these public perceptions.

Figure 1 demonstrates that more people are likely to always see geese if they use outdoor spaces 1-3 times per week but overall, it is more likely to only see them about half the time outdoor spaces are used. Eriksson et al. (2020) conducted a study on

human-geese interactions in Sweden, exploring how people's interactions with geese varied while considering place dimensions, interactions with geese in different settings, and psychological factors. Wildlife value orientations, beliefs about the ecosystem services and/or disservices geese provide, and emotions, all affected how people perceived geese. The study concluded that people held a generally favorable view on the occurrence of geese, however, a significant number of people believed the number of geese to be too high. Place-based experiences of geese seemed to be correlated with acceptance (for example, experience on beaches was typically associated with a negative attitude). These conclusions are not necessarily consistent with the results obtained from my survey. Figure 2 for instance highlights that experience on beaches is correlated with mostly positive or no particular opinion on geese. However, people are intolerant of geese more often in parks or on hiking trails. While most people who took part in this survey indicated the use of hiking trails most often, tolerance levels were relatively even in that group, although a small majority indicated that they liked geese but were worried about damage they might cause.

It's important to try and understand how people's tolerance levels toward wildlife vary with the amount of perceived damage they cause. Figure 3 shows that regardless of how frequently people interact or see geese around their home, they are generally unconcerned about damages. Few individuals indicated that they wanted geese populations to decrease but those that did had generally low concern for the damage geese would cause. A study done in Chicago on the attitudes of homeowners toward nuisance wildlife demonstrated similar results: Canada geese were at the bottom of the list of animals that people believed posed threats to property damage (Miller et al. 2001). However, the study did report that homeowners wanted to see a change in geese population levels, a vastly different results than what my results said.

Human dimension surveys are difficult to analyze and retrieve consistent information from because human opinions and values differ and vary depending on factors like geographic area, culture, race, age, gender, and endless others. Sample size is another factor in retrieving reliable data. For instance, my survey instrument collected a total of 58 responses. While this isn't necessarily a bad sample size, the Chicago study had data from 2,562 questionnaires to comb through. A larger sample size is sure to provide more insight because trends are easier to see when you have more responses. Additionally, the questions asked in a human dimensions survey must be meticulously crafted and free of bias. My survey was closely modeled after Eriksson et al. (2020) and Loker (1996) in terms of the kinds of questions asked. These questions aimed to focus specifically on individual experiences and how these experiences affect people's perception of geese.

As Loker's (1996) thesis explores, understanding the human dimensions of wildlife conflict helps create efficient management plans for dealing with animals typically seen as nuisances. Similar to this study, she looked at varying degrees of tolerance for geese and compared these results with where and how often individuals

interacted with geese. She then used this data to look at how people reacted to certain management methods in an attempt at revising and modifying management for Canada geese. She found that residents who were highly concerned about problems or conflict were most supportive of lethal management actions for controlling wildlife (Loker 1996). To an extent, this correlates with the findings of my survey, which indicated that those with high concern about damage wished to see goose populations decrease (Table 2).

Although the results achieved from my survey were certainly informative and allow for investigation into further research, there were areas that were lacking. First, a larger sample size would be beneficial, as it would allow for an increased number of responses, which, of course, leads to more data that can be analyzed and manipulated. If I had conducted this study with a bit more time, resources, or forethought, I might've asked different questions or included questions that piggybacked off others. I could've potentially explored how people feel about certain management methods for geese, how time of year affects the number of geese sighting or geese aggression, or how demographics like age, sex, social class, etc., affect perceptions of geese. Regardless, the data collected serves well in its purpose of understanding the complexities and nuances that come with exploring the human dimensions of wildlife management.

Works Cited

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