# Pair Movements in Canada Geese

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## Introduction

Canada geese (*Branta canadensis*) are a staple of most parks, neighborhoods, and even shopping centers (Conover 1998) – wherever there is a body of water with subsequent aquatic vegetation, you will most likely find Canada geese. This is especially true during their molting period, in which they shed and regrow their flight feathers, which occurs every year from mid-June to late July (French and Parkhurst 2009). Prior to the molt, the geese need to locate where their time will be spent while flightless- with or without a brood. It is generally accepted that geese with broods prefer to molt and rear the brood near to or at their own birthplaces- this concept is known as philopatry. It is thought that females tend to be more philopatric than males; meaning that males generally move farther than females for the nesting and molting processes.

Over the summer of 2020, I observed the Canada goose flock of Cookeville, Tennessee to discern whether this trend can be observed within the flock. Geese with broods and those without have been examined and analyzed separately to accommodate for the heightened philopatry that is commonly seen in geese that are rearing broods.

## Research Questions

- Do males travel farther than females to molt and raise broods?
- Is there a difference in the philopatric tendencies between geese that have broods and those that do not?
- Is there a difference in the philopatric tendencies between local geese and non-local geese?

## Methods

Observations were performed on the geese to determine pairs and which pairs did or did not have broods. I would then refer to previous data to identify the geese and obtain the location of their birth or original capture. From there, I was able to measure the distance using Google Earth coordinates to determine how far each goose had moved from its birthplace to the location it was seen or caught at in 2020.

This information was separated into four different categories: local males, local females, non-local males, and non-local females. “Local” refers to a goose that was first caught within the Cookeville flock the same year it was born, and “Non-local” refers to a goose that was caught within the Cookeville flock at least one year after its birth. Statistical analyses were then performed on the data to test my hypothesis that males move farther from their birthplaces than females.

I approached my research from a wildlife management viewpoint. Many people view geese as a nuisance and many geese view people as a threat . This reason is why, to better the interactions between people and geese, it is important to know as much about the geese’s behavior as possible. For example, if we know what type of environment the geese would like to inhabit, then we can inhibit the area to deter geese from residing there (Soulsbury and White 2015).

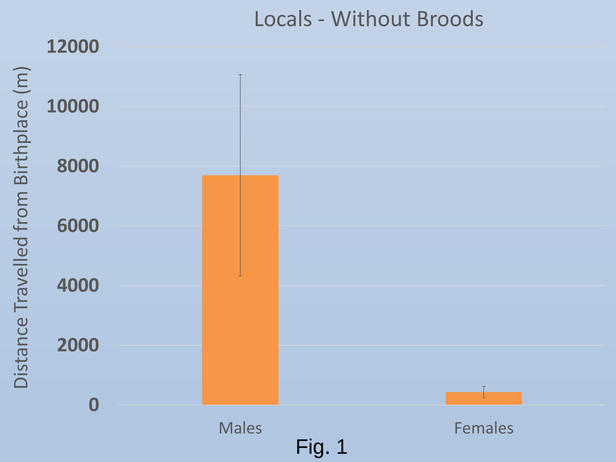


Fig. 1

The difference between the males and females is proven significant with a p-value of 0.000563 at α= 0.05

## Results

Based on the acquired data, the following results were reached based on the previously stated research questions:

**Do males travel farther than females to molt and parent broods?**

- Local males are more likely to travel farther than females for reproducing and molting. Within the local brooding goose population, males moved, on average, approx. 4,500 m farther from their birthplace than females. P-values are noted in Fig 1 and Fig 2.
- There was a non-significant difference between non-local males and females, with and without broods. The p-values for which are: 0.782294 for non-local geese with broods and 0.574695 for non-local geese without broods at α= 0.05.

**Is there a difference in the philopatric tendencies between geese that have broods and those that do not?**

- No. Pairs that had broods and those that did not both showed the same trend: females moved a lesser distance from their birthplace when compared to their male partners.

**Is there a difference in the philopatric tendencies between local geese and non-local geese?**

- No. Within this data set, the distance travelled by local and non-local geese, regardless of sex or parental status, was not significant and can be seen in Table 1. However, I believe the results would likely have been found to be significant in a larger sample size.

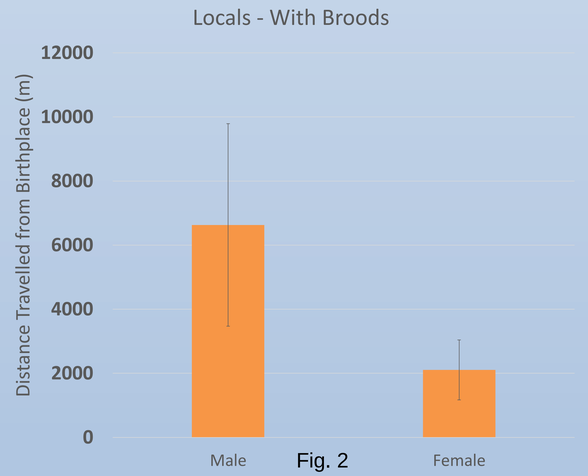


Fig. 2

The difference between males and females is proven significant with a p-value of 0.003896 at α= 0.05

## Conclusions and Implications

With the provided results, my original hypothesis- that male geese move farther distances from their birthplaces to molt and breed- is supported by the data.

The implications from this project are:

- If these trends are followed by the Cookeville, Tennessee flock, are they followed by other flocks across the country?
- Could this information be used to manage wildlife? – For example, with this knowledge a common birthplace for geese could be altered to lower its popularity with the flock, meaning that it would be less likely for geese to be a “nuisance” at that location in following years.

| | *Locals* | *Non-local* |
|---|---|---|
| Mea | 3122.80645 | 4169.51613 |
| Vari | 26646294.6 | 29809775.2 |
| Obs | 31 | 31 |
| Pool | 28228034.9 | |
| Hyp | 0 | |
| df | 60 | |
| t Sta | -0.7756249 | |
| P(T< | 0.22050848 | |
| t Cri | 1.67064886 | |
| P(T< | 0.44101696 | |
| t Cri | 2.00029782 | |

Table 1

## Acknowledgements

I’d like to thank the Creative Inquiry Summer Experience for awarding me with a grant that enabled me to complete my project. I would also like to thank Dr. Combs, Dr. Panter, and Mr. Pirkle for assisting me in all aspects of my work this summer.

## References

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