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Geese Management at the University of Richmond

Abstract

Geese are a nuisance in all fifty states and particularly at the University of Richmond. For the most part, Canada Geese, *Branta canadensis*, have effectively stopped migrating which has led them to be a problem for the surrounding ecosystem (Handwerk, 2021). The university has taken some preliminary steps to discourage geese from inhabiting our campus, but none have proven to be effective in the long run. To answer the question of how to deter geese from hanging out on campus, I assessed various geese management practices with the intention that the university could potentially adopt one of the practices. Our results show that the four most likely to be pursued and most effective methods are a Border Collie Program, a Remote-control Speedboat Program, pesticide sprayed on the grass, and additional signage around the lake. This study aids in the general goal of the university to promote beauty on campus and provides concrete options of ways in which the university can continue to develop the campus.

Introduction

Westhampton Lake holds as a centerpiece for the University of Richmond campus, benefiting those who spend time in and around the campus. The lake was created in the early 19th-century when Little Westham Creek was blocked. Westhampton Lake was open for recreational use at the time as well (Figure 5). Today, the lake still serves as a prominent

ecosystem area for local flora and fauna. In this capstone project, the Lake Team proposes projects to improve the overall quality of Westhampton Lake. My portion of the project serves to focus on Geese Management in and around the lake. My team members have chosen to focus on nutrients in the lake, illicit discharges, and their impact on the lake as well as the viability of adding additional organisms to the lake ecosystem. For this portion of the Lake Team Project, I focus on Canada geese management as they are a nuisance to members of the University of Richmond campus due to the geese's exuberance and waste.

Individuals and groups are subject to being hissed at or honked at by the geese. Visitors of the university campus may also experience stepping in goose poop which litters the grounds. Not only are humans subject to geese harassment, but humans are also at risk of contagious diseases carried by geese such as *Giardia* and *Escherichia coli* (*E. coli*) (Dieter, 2001). Nuisance geese are an issue for almost all fifty states and an increasingly frustrating issue for the University of Richmond campus as the geese bother visitors, students, faculty, and staff (Forbes, 1993). The geese not only annoy visitors on campus, but also create a biological problem for the lake itself (Cole et al, 2005). Geese excrements are considered illicit discharges and are thus a source of pollution for the lake (Conover, 1992). Geese at the University of Richmond area also known for ripping the freshly planted grass out of the ground. This capstone project is focused on improving Westhampton Lake which encompasses pollution in the lake as well as the overall aesthetic of the lake.

The University of Richmond has already taken steps in an attempt to limit geese interaction with campus. There are three main steps which have been taken thus far. The first step was a Border Collie Program. A Border Collie Program has proven to be successful in other areas by successfully decreasing the number of geese in each area (Castelli & Sleggs, 2000). The

previous program that the university instated did not remain instated long enough to make noticeable changes. The university felt that the company lacked experience and therefore were taken off the project. Another step the university has taken is the installation of the yellow rope at the bottom of Boatwright hill, the hill outside of Boatwright Memorial Library. The rope is meant to serve as a barrier so the geese cannot walk up towards the library (Lowney et al. 1997). Geese are known to avoid things that could trigger their senses or provide an inconvenience for them to seek a nesting site. With this knowledge, the university installed the rope at the bottom of Boatwright Hill to try to keep the geese away from the library and other academic buildings. The third action which the University of Richmond has taken to deter geese is the installation of a flashing light in the middle of the lake. The light serves as a deterrent to the geese. They get confused by the light on the water and thus steer clear. Dr. Sevin's class conducted research on the geese some years ago and found that the light effectively kept the geese out of the water at night. These three methods of geese control have been backed up by the literature, but they do not appear to be effective on the University of Richmond campus. This conundrum makes the issue of geese management even more interesting.

The question that I will be addressing is: "What can the University of Richmond do to either get rid of the geese or limit their interaction with campus and its visitors?" This question works to propose ideas which will inevitably limit geese pollution into the lake as well as limit the geese bothering campus visitors which will then make the campus more approachable. In this paper, I provide preliminary steps that the University of Richmond could take to mitigate geese interaction with campus. For the university to see the greatest change, steps would need to be taken on a consistent basis for years.

Methods

Site Description

All data for this capstone project will focus on Canada Geese, *Branta canadensis*, mitigation in and around Westhampton Lake, located in the center of the University of Richmond Campus in Richmond, Virginia (Figure 1).

Determine a Particular Study Area

The general site for this capstone project is the Westhampton Lake at the University of Richmond. However, the lake itself is large and leaves the study area to be rather vague. For my section of this capstone project, I chose to focus on the banks of the lake which equated to about fifteen acres of land (Figure 1 and 2).

Assessment of Various Options for Geese Management

There were a plethora of ideas which I considered for this project, but ultimately decided not to pursue because of the nature of a college campus.

Ideas Rejected Right Away

These ideas were rejected right away as they were considered a poor fit for the University of Richmond campus.

- Installing a fence around Westhampton Lake
 - This would block the view of the lake which the administration would not support.
- Sprinklers to spray the geese (Lowney et al., 1997).
 - There is no way to ensure that the geese are the only ones subject to the sprinklers spray.
- Hunting the geese (Lowney et al., 1997).

- This is a college campus and hunting should not be considered
- Limit mowing of grass to deter geese (Owen, 1975).
 - This route would be an issue because the university prides itself on looks and having uncut grass does not meet the standards which the university holds itself.
 - Geese are highly influenced by their foraging potential so if their preferred source of food is modified, they could decide to seek foraging opportunities elsewhere (Harrison et al., 2018).
- Planting wildflowers around the lake (Wehbe, 2020):
 - Mature tall fescue
 - Periwinkle
 - Myrtle
 - Pachysandra
 - English ivy
 - Hosta or plantain lily
 - Ground juniper and Switchgrass

Ideas Considered for Further Investigation

- A remote-control boat riding along the lake to scare away geese (Wehbe, 2020).
- Border Collie Program to scare the geese (Casterly & Sleggs, 2000).
- Geese Repellent which contains Methyl Anthranilate, a chemical found in grape flavoring (Wehbe, 2020).
- Additional signs around the lake telling visitors not to feed the geese.

Cost-Analysis of Options for Geese Management

After determining viable options for geese management at the University of Richmond, the next step would be to determine how much these programs would cost. There is no set budget for geese management at the university, so any information found is helpful in the presentation of these management methods.

Results

Of the options which I explored, there were four which stood out the most as worth further exploring.

1. Border Collie Program

The first option to deter geese and encourage them to find somewhere else to spend their time is to implement a border collie program. Geese do not like to stall in the presence of a predator which is why the dog is effective (Castelli, 2000; Guereña et al., 2016). The program would consist of hiring a trained professional and their dog coming to the university for varying amounts of time. To be most effective, the program takes place as a multi-year phase. I chose this idea as my first route because the university has already tried this plan so I know they will be potentially willing to explore the plan again. Since the geese around the University of Richmond have lived here for a long period of time, the preliminary phase is subject to take longer.

The Border Collie Program typically takes four years to become effective. It is a type of program categorized as a maintenance program which has a multi-year phase. During the preliminary visits, the Border Collie team surveys the site area with trained professionals and dogs to understand some key questions about the geese. The questions asked are as follows:

- a) How long have the geese been there?
- b) Have they been exposed to border collies before?

After the site evaluation, the next step is one year of a conditioning period. During this time, the team spends three to six days in the field, depending on time of year, working to condition the geese.

a. Cost Breakdown

One particular company, which is being used as a baseline for the cost of the Border Collie Program, explains that the first year of these programs tends to be the most expensive since the company needs to come more often to lay the groundwork for the geese. The second year is a reinforcement year in which the team seeks to change the behavior of the geese. The third and fourth years are the years of the maintenance team. Continuous use of Border Collies will encourage the geese to stay away. The company emphasized that terminating the service will result in the geese returning to the area.

Regarding logistics on payment, there is a monthly flat rate, or the site could choose to pay per visit, though the monthly plan includes a discount. The rates are as follows; higher rates are due to more difficult terrain for the team to be required to maneuver:

- a) Large \$9,600 -14,400 annually*
- b) Medium \$7,200 – 9,600 annually
- c) Small \$2,400 – 7,200 annually

*University of Richmond would most likely fit into this category.

2. Chemical Geese Repellent

The second component of the project is meant to change the landscape, so the geese do not make themselves comfortable on campus. A chemical Geese Repellent which contains

Methyl Anthranilate, a chemical found in grape flavoring, can be sprayed on grass so the geese do not eat it anymore. Methyl Anthranilate creates a burning sensation in the geese's throats, not fatally hurting the geese, while the formula does not harm other animals or humans (Wehbe, 2020).

a. Cost Breakdown

A gallon of the repellent, Avian Control, retails for \$175 (Avian control bird repellent). It is suggested that Avian Control be applied at one-to-two-week intervals or after every mowing, these times are subject to vary depending on the university's lawn maintenance. The plot of land which the University of Richmond would need to treat spans 15 acres (Figure 2). No additional pesticide permit will need to be acquired since the school already has one.

To administer the pesticide spray, an electric sprayer will need to be used to minimize the workload done by the maintenance team. The costs for the Avian Control are broken down by acre. For every acre of land twenty-four to thirty-two ounces of Avian Control will be mixed with eight to twelve ounces of liquid dishwashing soap and added to eight to sixteen gallons of water. Every bottle of Avian Control can be used for four acres of land.

$$15 \text{ acres} \div 4 \text{ acres per bottle} = \sim 4 \text{ bottles}$$

$$64 \text{ gallons of water per bottle: } 64 * 4 = 256 \text{ gallons of water}$$

$$1.5 \text{ hours for 1 person to do one acre} = \$11/\text{hr (VA minimum wage)}$$

$$15 \text{ acres} * 1.5 \text{ hours} = 22.5 \text{ hours of labor}$$

$$22.5 \text{ hours} * \$11 = \$247.50 \text{ labor hours cost}$$

$$\text{Total Cost to cover 15 acres: } (4*175) + \$247.50 = \$947.50$$

Per year: covering the land every 2 weeks: $947.50 \times 26 = \$24,635$

3. *Additional Signage*

Adding more signage to limit visitors from feeding the geese has the potential to encourage people not to feed the geese which will thus limit the supply of food for the geese. Geese are less likely to stay in a particular location when their foraging potential is decreased (Hauser et al., 2007).

The signs posted around campus should be identical to the current signs which tell people not to feed the geese nor the ducks. These signs highlight the poor implications which feeding geese and ducks have on both the environment and the animals (Figure 3).

a. *Cost Breakdown*

The posts themselves cost \$6 each (Lowe's). The next step would be to print the signs. These signs would be the same signs which are already featured around the lake (Figure 3). The printing of the signs cost about \$4 each (Pricing Guide). To print five additional signs, the total cost would be \$50 with the cost per sign at \$10.

4. *Remote-Control Speedboat Program*

Fourth idea is implementing a speedboat program (Wehbe, 2020). This program can be a work-study for students. This boat serves as a pseudo-predator (Figure 4). The geese are under the impression that there is a predator which lives in the water, formerly their safe place, so the geese start to seek other areas to reside. The speed boat frequency would need to be rather often during the first few months of the program. The student should drive the boat about six days a week for two hours a day. As the birds realize that the boat is not going to leave, the general area and thus the birds begin to seek other living arrangements. After a few months, no definitive time

can be stated as time is subject to change based on the geese reaction to the boat, the student can then arrive at the site to use the remote-control boat less frequently. This would mean the student would change from six days a week to three days a week. The remote-control speedboat method is similar to the Border Collie Program.

a. Cost Breakdown

The remote-control boat costs around \$150 (TesPower Store). Training students would take less than a week. Since the program itself is a work study, the students would receive \$11 an hour in compensation (Student FAQ – Student Employment).

Discussion

Throughout this paper, I have presented options for the University of Richmond to pursue to deter the geese on campus and answer the pressing question of what the university can do to limit the geese interaction with campus. The four main options that have proven to be most worthwhile as they have proven results and are not the costliest options. These four options are a Border Collie Program, a remote-control speedboat program, pesticide spray containing Methyl Anthranilate, and additional signage informing visitors not to feed the geese. None of the plans are a one and done fix. All the plans will take years to fully make a change since they all require visitor acceptance. Any visitor of the campus would need to actively participate in the encouragement of geese migration. The largest difference which people can make would be to not feed the geese so as to decrease their foraging potential.

The goal of these four programs is to deter the geese from campus. Geese are a vital part of the University of Richmond ecosystem. The issue they are causing is disruption to the

ecosystem by staying in one location for too long (Wehbe, 2020). The geese are also known to cause physical damage to the ecosystem. Geese are supposed to be migratory birds, but these geese have instead become residential birds. The University of Richmond has become a place where the geese feel comfortable. They have a water source, the lake, and plenty of food sources from the freshly fertilized and mowed grass to the visitors who feed them (Guerena et al., 2016; Harrison et al., 2018). Geese also contribute largely to the *E. coli* found in Westhampton Lake. *E. Coli* makes its way into the lake via geese excrement, an illicit discharge. If the geese were to migrate or leave completely, the nutrient levels in Westhampton Lake would go back to a level which would seemingly be more appropriate for recreational usage.

It should be noted that Westhampton Lake is a smaller part of the larger Chesapeake Bay Watershed. Westhampton Lake connects to the James River. A cleaner flow of water, meaning water with recreational levels of nutrients, from the lake to the river will only contribute positively to the flora and fauna found in the James River as well as the Chesapeake Bay Watershed. Working to get rid of the geese will help to promote a more approachable campus as fewer geese will be left to harass visitors as well as less geese excrements which flow into the lake.

The Border Collie Program is the option which will provide the largest change, but it will also take the longest to complete. Border Collie Programs have proven to be successful in other areas by scaring the geese away and decreasing their presence in each area (Castelli & Sleggs, 2000). The drawback of this plan is that it's not a one and done fix; the dog would need to come back a few times so the geese think the dog is always there, thus scaring the geese away. An important distinction to make about this plan is that the border collie will not nip at the geese nor harm them in any way. The dog is simply there to scare the geese and create the illusion that

there is a predator always around on campus. Border Collie Programs have been proven to be effective so long as the university sticks with the program and does not stop the service after a short period of time.

None of the plans are a one and done fix. All the plans will take years to fully make a change since they all require visitor acceptance. Any visitor of the campus would need to actively participate in the encouragement of geese migration. The largest difference which people can make would be to not feed the geese so as to decrease their foraging potential.

Now, it is up to the University to take these results into consideration and implement a program to mitigate the geese involvement with campus. It is instrumental that the university take action to deter the geese as the geese have stopped migrating. If the university works to no longer provide a safe habitat away from predators with adequate foraging potential, the geese will seek other accommodations.

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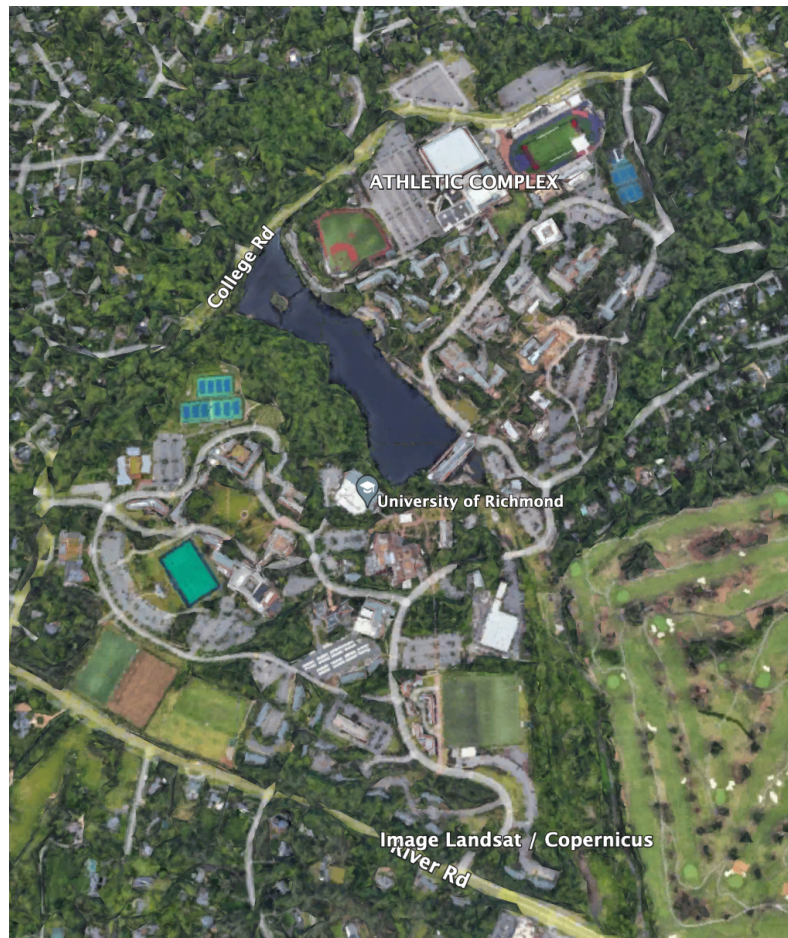


Figure 1: Westhampton Lake in the University of Richmond campus via Google Earth.



Figure 2: Site area of banks of Westhampton Lake at the University of Richmond defined in red via Google Earth.



Figure 3: Example of the signs found around Westhampton Lake.



Figure 5: Westhampton Lake history presented by GreenUR and Earth Lodge.



Figure 4: Image of a remote-control speedboat to be used on the lake. Image via TesPower Store, Amazon.