

How Does the Public Process Impact the Selection of a Nuisance Wildlife Management Plan?

By

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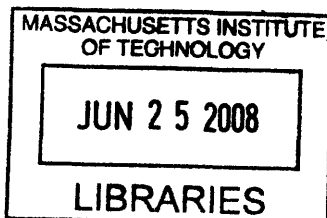
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Abstract

Since the 1950s the human relationship with wildlife in the United States shifted dramatically; from primarily consumptive to primarily recreational. Over the same time period a trend of humans moving into suburban communities further from the urban core developed. These people inadvertently enhanced their new suburban environment to be more appealing to certain generalist species known as nuisance wildlife. Policy decisions for nuisance wildlife species are made at a national or state level; however, municipalities manage most nuisance wildlife-human conflicts. An individual town or city is responsible for controlling populations of nuisance species both financially and tactically. Given that a municipality must select a wildlife management tactic when conflict occurs, do different decision-making processes yield different outcomes? This study identifies the link between public process and management outcomes; a connection that informs municipalities of the decision-making methods that lead to the most effective wildlife management.

Through an examination of resident Canada goose management in four small Massachusetts cities and towns this study demonstrates the processes used to select nuisance wildlife management plans and the success or failure of those plans. Through the trials of the municipalities examined, it is clear that management plans selected in the most straightforward and transparent manner, and those that engage the public experienced the greatest success. I contend that open decision-making significantly reduced the risk of public conflict or controversy, and ensured the longevity of the selected management plan.

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In writing this thesis I set out to answer a question that fascinated me. Along the way I learned just many other people shared my curiosity, and struggled with this puzzle on a day-to-day basis.

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Thank you very much to my advisor, Ms. Judith Layzer and my reader, Mr. Allen Rutberg – their expertise and kind words helped me to realize my vision.

Lastly I would like to thank my family and friends who now know far more about Canada goose management than they ever dreamed.

“Like the resource it seeks to protect, wildlife conservation must be dynamic, changing as conditions change, seeking always to become more effective.” – Rachel Carson

Table of Contents

INTRODUCTION	8
METHODS	11
CANADA GEESE IN THE UNITED STATES	13
Facts About Canada Geese	13
Changing Human-Wildlife Relationships	14
Human-Goose Conflict	15
GOVERNING CANADA GOOSE MANAGEMENT	16
Local Management and Governance	17
Federal and State Management	20
Management Techniques	22
CASE STUDIES	24
Wakefield	24
Worcester	31
Braintree	36
Raynham	42
CONCLUSIONS	47
Bibliography	51

INTRODUCTION

Over the past fifty years the human relationship with wildlife shifted dramatically; human society no longer relies on wildlife for sustenance and people believe they can choose when and how they interact with their wild neighbors (Adams et al 2006). Today developers build homes farther from the urban core, occupying formerly natural areas. As people move into these communities, they create opportunities to exercise their growing recreational interest in wildlife. They plant trees that attract the birds they want to watch and landscape their yards to draw in butterflies and rabbits. But as we make our human places more habitable for our species of interest, we also make our environment more appealing to other generalist species that we do not intend to attract.

We are accustomed to shaping our environment to match our personal tastes, but the process of managing wildlife populations to our liking is more difficult and has greater consequences than landscaping our yards. Population management is complicated, and throughout history we made errors even when we were trying to act in the best interest of a species. If we engage in wildlife population management, we must do so in a thoughtful manner that causes minimal harm to wildlife and corrects some of our past management errors.

While policy decisions about most wildlife species are made at a national or state level, municipalities manage most nuisance species. An individual town or city is responsible for controlling populations of nuisance species both financially and tactically. Given that a municipality must select a wildlife management tactic when conflict occurs, do different decision-making processes yield different outcomes? If there *is* a link between

how a management tactic is selected and what tactic is selected, that connection could help inform municipalities of the decision-making methods that lead to effective management. With better information more towns and cities could achieve successful methods of wildlife management. In order to search for this link, I will examine the public processes, which lead to management decisions and uncover which types of processes lead to which decisions. From this I will draw conclusions that will advise municipalities on the decision-making method that will be most successful for that community.

I contend that there is a close relationship between how a municipality chooses a nuisance wildlife management tactic and which tactic it selects; however, it is important to initially consider the character of a community before exploring its decision-making processes. Community characteristics such as the attitude of the decision-maker, the number of actors involved in making a management decision, the involvement of the community in government or the financial status of the municipality may have a some impact on a community's management decisions; it is however, how municipal leadership manages these characteristics during the decision-making process that impacts management choices. Some municipalities over-emphasize the need to select an inexpensive management plan or one that demonstrates instant success, and will make a final management decision without informing residents. Ultimately the management plans that are decided on in the most straightforward and transparent manner will be the most successful; they are able to gain support from the population, financially and

emotionally. Also, open decision-making significantly reduces the risk of public conflict or controversy, and ensures the longevity of the selected plan.

The Canada goose is an excellent species to examine in relation to nuisance wildlife management. Canada geese are widespread, experiencing rapid population growth and are recognizable to most urban and suburban Americans. People often feel a connection to Canada geese, and generally do not want to see them hurt. But when people must choose between saving a goose and ensuring their personal comfort, past management cases demonstrate that personal comfort wins almost every time. For the Canada goose, human expansion provides safe nesting areas, an abundance of food, and a healthier environment for their young to grow. As a result of better conditions and misguided management efforts, many Canada geese no longer migrate. When humans moved closer to nature, they inadvertently brought nature closer to themselves, generating what is now an uncomfortable relationship (Adams et al. 2006).

Massachusetts is an ideal state in which to examine the local public process of resident Canada goose management. Canada goose populations are on the rise in Massachusetts, and many communities feel burdened by growing Canada goose populations (Heusmann 1999). Massachusetts's municipalities tend to be relatively small and are assembled in a patch-like pattern. Since many communities are very small in terms of area or share natural features with each other, the politics of goose management in New England is generally regional, as an overpopulation of Canada geese in one community can be indicative of overpopulations in neighboring communities.

A great deal of information is available about wildlife management, but little formal research has been done on how municipalities reach nuisance wildlife management decisions or on the relationship between the process used and quality of the ultimate decision. This thesis can help communities decide how to make nuisance wildlife management decisions and approach management in the future. Selecting the right management tactics leads to better management outcomes, potentially resulting in better long-term management plans. Also, understanding which decision-making process typically yields the best solution will provide wildlife managers with a tool to help most communities achieve a positive outcome.

METHODS

To understand the impact of the management tactic selection process on the type of resident Canada goose management tactic selected within a municipality, I completed a literature review, a review of relevant laws and policies as well as discussions with experts in the areas of wildlife management, conservation biology and local public process. I also investigated the experiences of four Massachusetts municipalities. For these cases I sought communities that addressed a human-Canada goose conflict in the last five years. Based on recommendations and newspaper articles, I interviewed actors in seven communities in Massachusetts; each community shared commonalities in its socioeconomics, proximity to a major urban area, and quality of education system. I then chose four communities, Worcester, Raynham, Wakefield and Braintree, to study in depth: Two chose successful management tactics and two chose unsuccessful management tactics. For these cases, a

successful management tactic is defined as a management tactic that is humane and maintains a Canada goose population size that is comfortable for the community and safe for the geese. I based my evaluation of the success of each management plan on the following criteria: First, a successful management tactic must adequately manage populations from season to season and prevent further population growth. Second, a successful management tactic must contribute to regional management and not simply move a goose flock to a neighboring community. Last, a successful management method must be humane, meaning that the tactic must minimize unnecessary harm to the geese. Inhumane management methods have the tendency to cause a greater amount of controversy in municipal management from upset residents and activist groups. Towns and cities that select humane management plans appear to have less public opposition and more public participation in management, thereby reducing the cost of the management plan.

In each community, I conducted interviews with major stakeholders at the center of a human-goose conflict. These stakeholders included local politicians, government officials, residents, representatives from humane organizations, pest control companies, and wildlife management experts. In addition I studied newspaper articles written about each municipality's conflict. I also examined public documents and management plans to build a context for these case studies

CANADA GEESE IN THE UNITED STATES

The story of the Canada goose in America varies by flyway (migration path). However throughout the country Canada geese are settling in suburbanized areas, ceasing to migrate, and experiencing a population explosion (Smith et al. 1999). The Atlantic Flyway is the migration route for birds along the east coast of North America. The most northern point in the Atlantic Flyway is the Canadian Maritimes, and the most southern point before divergence is southern Florida. The route, which encompasses the Appalachian Mountains, experienced the largest population growth of any flyway in North America (USFWS 2005).

Facts About Canada Geese

The Canada goose or *Branta canadensis* is a familiar sight to most urbanites across New England. In order to successfully manage resident Canada geese, one must first understand their needs and behavior. Canada geese feed primarily on terrestrial vegetation, insects and favor short grassland with open sightlines near bodies of water. An adult goose can consume four pounds of vegetation per day and produce one pound of droppings per goose per day. Thus, human conflicts with Canada geese generally stem from droppings or property destruction (Smith et al 1999; Owen 1975).

There are roughly ten subspecies of Canada goose. The giant form, *Branta canadensis maxima*, is the most common in Massachusetts; these geese can weigh between 20 and 25 lbs and live for up to 20 years. Life expectancy is increased in urban

areas, which are safer and have ideal goose habitat. While they prefer to nest in protected areas, such as islands or peninsulas, they will make do in any location and can tolerate urban disturbances. Geese pair in early spring (at three years of age) and nest on the same site from year to year. The average clutch size (number of eggs in a nest) for a resident Canada goose is five to six eggs, which they incubate for 26 to 28 days. Re-nesting frequently occurs when an egg or nest is destroyed early in the egg-laying period. Reproductive success is high for Canada geese in urban and suburban areas where they have few natural predators. In these conditions, roughly 90 percent of geese live at least through their first year (Smith et al. 1999). Because urban and suburban environments provide Canada geese with all the major conditions they need to thrive, there is great deal of conflict with the human communities that share these spaces.

Changing Human-Wildlife Relationships

The historic of the relationship between Americans and wildlife is tumultuous. The arrival of the first European settlers brought a dramatic shift in the human-wildlife relationship. During the Colonial period North America seemed to have an endless supply of both land and wildlife. It may have been difficult to imagine that a time lay ahead where the United States would be in danger of losing native species (Adams et al. 2006). Despite visions of infinite wild game, by the mid-1800s many native species in the Northeast had been extirpated, including the Canada goose, as a result of sustenance and commercial hunting (Decker et al 2001/Adams et al. 2006).

At the end of World War II, America experienced prosperity and a new American dream. This era brought rapid development across the country with new neighborhoods encroaching on wildlands and new human habitats being defined. Grass lawns and grocery stores diminished our need to hunt for our dinner and so our relationship with wildlife underwent extreme changes (Hayden 2002). America quickly shifted from a primarily agrarian society to a primarily urban society. Between 1940 and 1950 the number of Americans living in urban or semi-urban areas jumped from roughly 40 percent to 60 percent. This number has steadily increased, to today, when 80 percent of Americans live in areas categorized as urban (Adams et al. 2006). As we rapidly became a more urban society our relationship to wildlife and our landscapes shifted dramatically. While most Americans no longer consume wild animals, American appreciation for wildlife continues. It seems the further humans live from the wilderness, the more they are infatuated with it. (Adams et al. 2006). Yet within this comes a paradox. Americans will pay money to watch or learn about wildlife, but when it stumbles into their backyards they will go to great lengths to remove it.

Human-Goose Conflict

Changes in the relationship between humans and wildlife led to increasing conflict on suburban and urban turf. Most human-goose conflict stems from real or perceived property damage, or loss of use. Geese flock to landscaped areas with adjacent water features such as golf courses and parks. Humans heavily use these areas, and conflicts occur when geese leave a large volume of droppings and feather litter (Smith et al. 1999).

Human health and safety is often cited as a primary source of human-geese conflict. Many perceived risks stem from the goose droppings that may raise fecal coliform levels in small bodies of water. Ponds and lakes are closed because of the perception of a health risk; however, there is no known link between goose feces and human diseases (though a variety of bacteria is present in goose feces) (Hailu et al. 2006). A handful of personal injuries have been attributed to geese, including injuries from being bitten, chased or struck by wings; however, these numbers are small enough that they do not raise serious concern (Smith et al. 1999).

GOVERNING CANADA GOOSE MANAGEMENT

Shortly following the arrival of Europeans in North America, hunters drove all wild Canada geese in the Atlantic Flyway locally extinct. From the early 1900s until the late 1980s various conservation and reintroduction efforts, as well as the banning of captive live decoy birds led to a new and growing population of Canada geese in the United States. Highbrow sporting clubs after the live decoy ban, released more than 15,000 birds alone (Smith et al., Dill and Lee 1970; USFWS 2005). Migration is a learned behavior so these formerly captive birds could never learn to migrate; thus they became resident geese (Heusmann 2/19/08). By the early 1990s the population of resident Canada geese in the Atlantic Flyway reached about 1 million individuals, and that number increased an average of 2 percent per year between 1995 and 2005 (Sheaffer and Malecki 1998; USFWS 2005). In Massachusetts alone, the resident Canada goose population increased from 26,000 in 1991 to 38,000 in 1997 (Heusmann 1999).

Today, Canada geese are managed in a variety of ways. Most management occurs at the local level, enabled by permits or registration with federal and state agencies. The Canada goose population continues to grow rapidly, having reached 3.4 million individuals in 2005 (FR 71 154 8/10/06). It is nearly impossible to eliminate geese from a community without continued management. If an area is appealing to geese then when one flock is removed, another will quickly replace it. Therefore, management must focus on what is an acceptable population size in both social and biological terms for a specific area. Biologically, the geese must sustain a population size at which they can thrive. Socially, there should be few enough geese that conflict can be avoided (Loker et al. 1999).

Local Management and Governance

When a Canada goose-human conflict occurs on municipally owned land, it is the responsibility of the town or city to negotiate and settle that conflict. Because nuisance wildlife conflicts are extremely place based, and are often the result of wildlife interfering with every day life, conflict resolution is dependent on the style of local government and the leadership's ability to negotiate the problem.

All New England towns were once governed by town meetings. These were assemblies at which all qualified voters would elect officers, levy taxes and pass local legislative measures. In their heyday, town meetings were attended by a majority of eligible town voters. Women were allowed to attend these meetings, but only allowed to vote on educational matters (Fairlee 1906). In the early 1900s, attendance at many town

meetings began to decline; this left town decision-making vulnerable to special interest groups that would bring large numbers of supporters to empty meetings in order to sway decisions in their favor. To counter this, the idea of a representative town meeting emerged, and in 1915, Brookline, Massachusetts became the first town to choose a representative style town government. The new style of town government that emerged looked similar to the town meeting; however, it generally had both executive and legislative branches. The executive branch is made up of three to nine selectmen who are voted into office by the town residents in staggered terms. The selectmen are responsible for executing policies, making recommendations on the budget, authorizing expenditures, making administrative appointments and often approving the requests of various town boards. The legislative branch of town government forms when each district of the town elects "town meeting members," who serve as the legislative body of the town (Fahy 1998). In nuisance wildlife conflicts, generally only the executive branch of town government is involved, approving budget increases for management plans.

In New England cities there are two distinct types of mayoral systems (some towns also have symbolic mayors). The first, and most popular, is the mayor-council style of government, also known as the "strong mayor" system. Here the mayor is the elected executive and the elected city council acts as the legislative body. The other primary type of mayoral system is the council-mayor or weak mayor system. Here the elected mayor either sits on or chairs the elected city council, but holds equal power to the other council members. In both systems there are many administrative departments; however in the strong mayor system, the mayor appoints the department heads, whereas in the weak

mayor system, the entire council determines the heads of each municipal department (Fairlee 1906).

As with all forms and areas of government, decision-making is a complicated endeavor, but in local politics many issues are personal and quickly become contentious. Across America, town and city representatives report that egos, personal agendas, inflexibility of opinions, lack of respect, lack of consideration and “old baggage” are some of the main issues that impede the effectiveness of local government. While all of these issues come into play in nuisance wildlife conflicts, the desire of a town or city council to avoid conflict may have the greatest influence on how local wildlife decisions are made. Because municipal leadership is generally conflict averse there is a tendency to make management decisions quietly and in some cases to strategically withhold information (Ohren 2007). In wildlife conflicts, often the methods of management that appear quickest and cheapest are the most controversial. Leaders who select such methods may believe that by hiding the management decision they will prevent conflict; however if they are later exposed, the conflict will be worse and more difficult to mitigate. It is critical that, even when the public is not at a decision-making meeting, municipal leadership consider the wants and needs of residents to avoid potentially explosive situations.

Although most Canada goose management decision-making occurs on a local level, municipalities must still adhere to federal and state laws and policies. These policies range from federal laws to local ordinances dating back to the early 1900s. In order to begin most management plans a town or city must act in compliance with these regulations or obtain the necessary permits.

Federal and State Management

In the late 1800s in America, when exotic birds graced the tables of the country's finest restaurants, and beautiful feathers graced the hats of the country's finest ladies, many species' populations went into dramatic decline. In response to this heavy commercial trade, the United States passed a series of laws to protect the dwindling migratory bird population. These laws included the Lacey Act (16 U.S.C. 701), the Weeks-McLean Law and ultimately the Migratory Bird Treaty Act (16 U.S.C. 703-711), passed in 1918. The Migratory Bird Treaty Act protects Canada geese, and other migratory bird species by making it illegal for any person or organization to "take, capture, kill, possess and transport migratory birds" without a special permit (USFWS 2005, I-1). There is no wording in the act to address the modern problem of resident populations of migratory species, such as the resident Canada goose, however, today, special permits are available for the management of Canada geese and in-state hunting seasons have been extended to help achieve population control.

Through the National Environmental Policy Act (NEPA) process, the United States Fish and Wildlife Service (USFWS) evaluated and redeveloped its approach to resident Canada goose management. While it does not prescribe a community based approach, it sets up the framework for local management. In August of 1999 USFWS began its Environmental Impact Statement (EIS) on resident Canada goose management, through which it hoped to improve management tools and make successful management as simple as possible. In the fall of 2005, USFWS released its Final EIS (FEIS) on resident Canada

geese and put forth a proposed action that included mechanisms for control and depredation, expansion of hunting through special Canada goose sport hunting seasons, and the introduction of a management program that would directly address population control. The most critical portion of the EIS was a shift in procedure that gave authority over Canada goose populations to state wildlife agencies. The final rule issued in August of 2006, designates state wildlife agencies the sole responsibility for issuing depredation permits from March 1 through August 31. This allows states to approve early and late goose hunting seasons (Maryland Department of Natural Resources).

The new federal rules require that in order to manage a Canada goose population through nest or egg destruction, any land owner, public land manager or local government in the lower 48 states or the District of Columbia must register with USFWS on an annual basis¹. After registration, any manager of geese must report the number of eggs or nests destroyed in any county. All states may participate in this permitting, however, some have stronger restrictions on egg or nest destruction. Massachusetts requires its own Egg Addling Permit in addition to the Resident Canada Goose Nest and Egg Registration, issued through the Massachusetts Department of Fisheries and Wildlife (MDFW). As a resource and conservation agency, the MDFW requires anyone applying for an Egg Addling Permit to prove the goose population they wish to control is a nuisance.

The Migratory Bird Harvest Information Program (HIP) is a method of information gathering that allows USFWS and state wildlife agencies to collaborate in determining the

¹ This registration replaces a Federal permit, which is still required in Alaska.

number of migratory birds harvested nation-wide. HIP is a voluntary survey, but some states, including Massachusetts, require migratory bird hunters to register for a HIP number and report their take. HIP information allows states to determine if hunting is a successful management tool in Canada goose management. As the USFWS reports “hunters were concerned about wildlife conservation long before it was trendy to do so. They have a long history of taxing themselves, paying license fees, buying stamps--all to ensure the health and vigor of wildlife populations--hunted and non-hunted alike. HIP is just another page in that history. It is simply good conservation” (USFWS HIP).

Legislation, and permitting procedures provide a crucial pause in the wildlife management process. In taking the time to apply for depredation permits or special hunting permits, wildlife managers must think carefully about their chosen method of management and its implementation. In addition, practices such as HIP allow us to better understand our management efforts, and their effect on wildlife populations.

Management Techniques

Canada goose management methods appear to be of two categories: effective and ineffective. On closer examination, however, the dividing line is not so obvious. While some management techniques simply do not work, many others are extremely controversial. If a municipality selects a controversial management method, they may see initial success in goose population reduction, but ultimately may experience failure when residents or activists oppose the management decision and protest or litigate. There are two major categories of management tactic that create controversy in a community:

management methods that may negatively impact people and lethal management methods.

Members of a community frequently oppose management tactics that seem to pose a threat to human health or quality of life. The potential danger associated with tactics such as repellants and oral contraceptives that put chemicals or hormones on grassy areas near water is not well documented. Nonetheless, there is fear about how these substances might affect people if they should enter the water supply. Also, tactics like habitat modification, which require people to compromise their personal comfort, are extremely unpopular. Since Canada goose management is generally entered into to improve human quality of life, most communities view solutions that downgrade human quality of life as unacceptable.

Lethal management tactics are also often controversial, as many people perceive them to be inhumane. Capture and euthanasia, known as lethal round up, or, managed hunts are often initially successful, as they allow managers to remove a large number of birds at once. Use of these methods acts under the assumption that residents want to see a decline in the population in the short-term and at any cost. Lethal management is short-term; killing birds does not change the conditions of the habitat, and new geese will soon travel to the same space. Also, many people would like goose free environments, but do not want to see wild animals hurt or killed. It is nearly impossible for municipal leaders to gauge the feelings of residents in their communities and nearby communities. Therefore, it is extremely challenging to carry out lethal management in a transparent fashion.

Communities are left with a cadre of management options, which work best when used in conjunction with each other. The most accepted plan is one that combines effective destruction of eggs, with harassment and community education. Through these three components, managers can prevent future generations of geese as well as involve the public in the management solution, significantly reducing controversy and eliminating the potential for later backlash.

CASE STUDIES

Canada goose management is specific and personal to a time and place. No two situations are exactly the same; however there are some general commonalities, which make management approaches universal. The four cases I examined were all different and complex, but all four communities sought to deal with a wildlife problem that overwhelmed residents and local government alike. Through a decision-making process each community chose a management plan, which it implemented. It is what happened after the implementation that was telling as to whether management was a great success or failure.

Wakefield

Utilizing community leadership is one way to achieve transparent government decision-making. In the small Massachusetts town of Wakefield, located just 14 miles north of Boston, a single community member offered her time and commitment to humane goose management in response to a contentious and growing problem within the town. As the

Canada geese multiplied on and around Wakefield's Lake Quannapowitt, the town government recognized the growing population as a problem, but was unable to take a stance on management that would not cause disappointment to some town residents. Exactly at the peak of the goose-human conflict, a resident came forward with a plan that was available to the public for examination and called for resident participation in management. Town officials approved her plan at a public meeting in a transparent process, which made the goose issue far less contentious. In a town of just 24,825 people and 7.91 square miles it is critical to keep all residents involved in management to prevent backlash or later frustration with the town government or the management plan (Town of Wakefield). If the public is involved from the start of management, residents can approve or disapprove a plan before it is implemented, rather than uncovering a plan in full swing.

Since the early 1990s, Wakefield experienced human conflicts with geese on the 254-acre Lake Quannapowitt. The lake is shallow and surrounded by vegetation on all sides. At one end of the lake is the Comverse company, which has a rolling lawn, and at the other end is the historic and beautiful Wakefield town green. The combination of open water, mowed grass, and safe havens makes the lake very appealing to resident Canada geese. In the late 1990s, the town began to feel overwhelmed by the number of geese feeding on the common and crowding the lake, so it purchased a trained Border collie, as its sole goose management effort. The Animal Control Officer worked daily with the dog to flush the geese from the lake and elsewhere in the town. In 2005 several factors converged to cause a spike in the Canada goose population on Lake Quannapowitt. Habitat near the lake became available to the geese at roughly the same

time as the town Border collie was forced to retire due to old age. Without warning, the geese suddenly had free range of the entire lake. At its peak in August 2005 the goose count on the lake reached 205. The main problem in Wakefield was the volume of droppings, with an estimated 75,000 pounds of droppings in and around the lake over a four-month period. The droppings on the grass made recreational areas unusable and the droppings in the lake over-fertilized the water and caused an algae bloom (Masterson 2006).

In the past, Canada goose decisions were made by the Board of Selectmen and implemented by the Animal Control Officer. When the goose population surged, there were many administrative town departments that could have taken responsibility for management including the Conservation Commission, the Recreation Department and the Board of Health. Resident complaints about the geese and their droppings poured into town hall every day, but the town leadership stood paralyzed, unable to make a concrete decision about how to manage the geese. Letters were written to the local paper either demanding the lethal removal of all the geese, or sympathizing with the geese. Mounting fear over the possibility of avian flu being spread to communities through migratory birds forced the town leadership to take action. Selectman Steve Maio noted, "If we're going from a nuisance to a public health problem, we really need to increase our efforts" (Masterson 2006). The town government wished to take action, but was not sure how to address the town residents who were split on a management solution, so Bronwyn Della-Volpe, a long-time resident, member of the local non-profit Friends of Lake Quannapowitt and self-proclaimed wildlife lover took matters into her own hands.

Ms. Della-Volpe began to intensively research methods of Canada goose management to understand what type of plan would work best for her town. After examining different management possibilities, she gave a presentation to the Board of Selectmen proposing a three-pronged approach to goose management. These three prongs were oiling eggs, harassing the geese with a Border collie, and launching a “no-feeding” campaign. Following her presentation the selectmen realized that the town needed to develop a unified approach to goose management, and voted to create the Goose Control Committee (GCC). The Board of Selectmen appointed Ms. Della-Volpe chairperson of the committee and selected other committee members from the Board of Selectmen, the Department of Public Works, the Board of Health, Animal Control, the Conservation Commission, the Friends of Lake Quannapowitt (FOLQ) and members of the community.

Once appointed, the Board of Selectmen asked the GCC to conduct more research to determine the most effective method of goose control that would be financially feasible for the town. The GCC met frequently and performed additional research. Eventually the group determined that Ms. Della-Volpe’s three-pronged approach would be the most successful and cost effective approach to management. After committing to the plan, the GCC went before the Finance Committee at a town meeting to lobby for funding for their plan. This funding was not only awarded, it was approved unanimously. Selectmen Chairman Al Turco commented: “I think there is a way we can find the funds; I am in full agreement of what you [the GCC] are proposing” (Masterson 2006). The town awarded the goose management plan \$15,000 annually. Later the GCC received a donation in

2007 of \$5000 from FOLQ as well as a private donation of \$100, and began to implement its management plan.

Working with the FOLQ, the GCC gathered volunteers to addle and oil eggs on both Lake Quannapowitt and nearby Crystal Lake. Shortly thereafter the GCC secured a contract with the professional Border collie harassment company Geese Police, of Gloucester, who comes to harass the geese on the lake at least weekly. The GCC formed a critical partnership with the town's Board of Health and launched a campaign to discourage goose feeding, imposing a \$25 fine for all feedings. Since volunteers performed many of the goose management tasks, the GCC used some of its funds to test new methods of goose management. Water harassment with a boat, a goose distress-call system and the addition of coyote decoys were all added to enhance the management system. The GCC's attitude entering into management was realistic. Ms. Della-Volpe stated: "We know this isn't going to take place overnight. It is a long-term plan and it's going to take a long time to get the population down" (Masterson 2006).

While the GCC plan showed promise, it faced significant challenges in its early days. Delays in Border collie harassment due to contractual issues, as well as unauthorized feeding, and unleashed dogs led to setbacks in the management program. Also, some residents questioned the importance of spending \$15,000 annually on goose management, which will never permanently eliminate the geese; however Ms. Della-Volpe pointed out "the hard reality is that short of drastically altering the landscape, a permanent solution to the goose control problem does not yet exist" (Tan 2007). Undeterred, the GCC moved past its issues, and implemented its plan whole-heartedly.

On an examination of the goose counts, the Wakefield management plan seemed to be working. Between 2005 and 2007 there was a 79 percent reduction in the number of goslings, a 79 percent reduction in the number of droppings and 68 percent reduction in the average goose population (Della-Volpe 2007). The town felt great joy at being able to reclaim the lake oriented recreation and celebrated its success. Also, the Massachusetts Society for the Prevention of Cruelty to Animals (MSPCA) took note of Wakefield's humane approach to wildlife management and heralded its achievements in articles and on the organization's website. The GCC continued to meet after its initial success, and left its doors open to any member of the town government or the community who had an interest in participating in management.

In April of 2008, the GCC goose management plan was up for reconsideration at the Wakefield town meeting. Ms. Della-Volpe spoke on behalf of the GCC, presenting the achievements of the goose control plan. At the meeting, the Board of Selectmen awarded the GCC \$12,000 to continue its management efforts. There was little question if the management needed to be continued in Wakefield, as one selectman pointed out after a recent visit to the lake with his grandchildren, "you wouldn't believe how dirty it is down there" (Robertson and O'Neil 2008).

What led to the ultimate selection of a *humane* management method was Ms. Della-Volpe's research and strong will. However she received the opportunity to suggest a management plan when the town government felt uncertain about how to approach its Canada goose problem. Although those who know her describe her as "a force to be reckoned with," it was a combination of opportunity and enthusiasm that led to success in

Wakefield. Through persistence and professionalism, Ms. Della-Volpe was able to convince an overwhelming majority of the town leadership that her plan would not only be effective in population reduction, but would also be cost effective. While she attributes her success to extensive research and strong meetings with the GCC, the open-mindedness of the town government combined with their desire to select a non-controversial method of management secured the success of the GCC plan.

The GCC, voted into existence by the Board of Selectmen, offered a representative style of decision-making. While the majority of GCC members are employees or representatives of the town government, at least two private residents hold equal if not greater weight in management decision-making on the committee. The strong leadership of Ms. Della-Volpe enhanced the success of the GCC, as her perseverance was valuable in establishing and perpetuating the goose management system. Had the Wakefield town government attempted to manage its geese quietly, without public input or notice, it might not have attained such a successful and well-designed management program at a fraction of the cost of a private contractor. Utilizing the skills of a resident resulted in financially efficient management driven by passion instead of political agenda. Though the occasional complaint about the geese or the GCC program makes its way into the local newspaper, Ms. Della-Volpe can usually quell concerns by putting forth the facts that demonstrate her success. Because she deals directly with these concerns, she removes pressure and responsibility from the town government.

In the case of Wakefield a community leader led the local government in selecting a sustainable and humane management solution. However, the GCC is quick to point out the critical role of the community in its plan:

“Effective goose control is truly a cooperative, town-wide effort...The Goose Control Committee understands that education will foster cooperation. Therefore the committee will be providing many opportunities for residents, local businesses and lake users to become familiar with the problems of large goose populations and will endeavor to keep the public informed of methods used and progress made” (Goose Control Committee 2006).

In order to successfully manage geese, the GCC and town of Wakefield understood that the public needed to feel comfortable with and informed about management. In the end it is the public that must not feed the geese, and must support management from year to year, so it is critical to have residents’ support to establish effective and successful management.

Worcester

Urban wildlife management is a complicated undertaking. It requires many different individuals to agree on a method of management in a field, which is often not their area of expertise. In spite of these complications Worcester, the second largest city in Massachusetts, uncovered a non-controversial approach to goose management that satisfied both the city government and park-using citizens. Worcester integrated several humane strategies with the aid of the GeesePeace organization that met the personal conditions of the staff of the Department of Public Health and the tolerance of residents. By taking into account the personal feelings and opinions of all the actors in the goose-

human conflict, the city government won the support and admiration of NGOs and residents who were thankful to be able to use their city parks. Worcester has 175,898 residents and 38.6 square miles, and each inch that is park instead of city block is extremely valuable to residents, especially in the summer time. Residents of Worcester have a median household income of \$35,623, and about 17.9 percent live below the poverty line (City of Worcester). For many residents, public parks are their primary source of recreation and so it is critical that geese and people learn to live in harmony.

Incorporated in 1722, Worcester is home to America's oldest public park, Elm Park. Because the park is a regionally known and historically significant destination, citizens and city officials felt concerned when resident Canada geese made the park their home, raising the quantity of fecal matter both on the ground and in the park's pond. During the summer of 2003, the park, its pond and several other area parks were overwhelmed by a large number of Canada geese. "People couldn't lay out, couldn't walk around here," reported animal control officer Steve Donahue, when asked about the condition of Worcester's parks (Valencia 2007). The goose conflict reached a head when a number of other species of waterfowl died from increased botulism levels (a strain of botulism that does not affect humans) in ponds resulting from goose feces. Decreased water quality and an increased volume of feces forced Coes Pond in Worcester to close at the height of its summer season. With 65-85 geese in Elm Park per day, park goers felt unsafe with the fecal matter and aggressive birds and therefore were uncomfortable using city parks (Welsh 2007).

When Elm Park, along with Institute Park, Green Hill Park, and Coes Pond, became nearly unusable to residents, the Worcester Department of Health and Human Services called upon the MSPCA and the MDFW for help. Both the NGO and the state agency explained their preferred management approaches at a meeting held by the city and attended by a variety of city staff and officials. At the meeting, the MSPCA presented the GeesePeace² approach to wildlife management, while the MDFW proposed a combination of lethal and non-lethal methods. The management decision was the responsibility of the Department of Public Health (a division within Health and Human Services) because they are responsible for protecting human health and safety as well as answering citizen complaints about Canada geese in the park. The Department of Public Health is a natural fit for goose management decision-making in Worcester, as it is responsible for Animal Control and Water Quality. The Department of Public Health ultimately decided to work with the MSPCA; members of the department personally believed that a humane solution was the only ethically appropriate solution, and that city residents would not have accepted a lethal solution. The decision to work with the MSPCA was a result of the city leadership's personal taste, and a desire to prevent conflict with city residents. In fact, members of the Department of Public Health were disturbed at the lethal approaches to management considered by other municipalities. When then envisioned the management solution, they imagined themselves and their community

² GeesePeace is an organization, founded in response to a Virginia community's effort to manage its growing resident Canada goose population. David Feld and Holly Hazard, in conjunction with their community developed an integrated management solution aimed at strengthening communities. After solving the Canada goose conflict within their own community GeesePeace began to speak in other cities and present their humane, community based management method.

explaining to their children how and why they are managing the geese that so many children love to feed and watch. They could not imagine teaching the youth of Worcester that the way to solve a problem was to kill living creatures when other options are available. Instead, they chose to set an example that demonstrated the merits of hard work and conflict resolution.

The City of Worcester partnered with the MSPCA, GeesePeace, Coast is Clear kennels, Tufts Veterinary School, and Mass Audubon to develop and implement a humane wildlife plan for Worcester's present and future. The plan included egg oiling, harassment with Border collies, community education, and a massive "no feeding" campaign. The MSPCA and Department of Public Health thoroughly examined each aspect of the plan in order to tailor it to the unique urban community in Worcester. In order to ensure that the plan could be effective in the long-term, it had to be cost effective and reach a wide audience. While the city had to pay for most of the Border collie harassment services (it received a \$1000 donation from the MSPCA), it reduced its other expenses by gathering volunteers from the Tufts Veterinary School and across the city to oil and addle eggs. The Department of Public Health reached out to a greater number of residents through signs and hand-outs translated into four languages, Greek, Albanian, Spanish and Vietnamese, to reach Worcester's primary inner city immigrant communities (Gardiner 2006).

Through the management plan design and implementation process the city government demonstrated a strong commitment to the program, stating: "It is imperative that the City parks, ponds and lakes are clean and safe for the many families who utilize this great resource" (O'Brien 2006). By involving Worcester residents in the physical and

educational components of the management plan, the city government also built a strong foundation of individuals committed to the success and longevity of the Canada goose management plan. The residents involved in management became empowered in the conflict, and went on to educate their peers, and often ask the Department of Public Health when they can begin adding eggs each season.

Since the implementation of this plan, the City of Worcester has experienced significant success in population reduction, with fewer geese in undesired locations. In fact, in the summer of 2007, there were zero to ten geese present daily at Elm Park. As James Gardiner, Acting Director of the Worcester Department of Health and Human Services, noted: "Reducing the geese population and increasing public safety was a great success in Worcester...there were no geese during the concert series at Institute Park, and for the first time in three years, the water quality met bathing standards at Coes Pond." These activities were previously unfeasible due to the presence of the goose feces and feather litter. Residents were very pleased with the management plan and reveled in the outcome. Animal Control Officer Steve Donahue reports hearing from residents who "praise the effort, saying they can again run in the parks, push baby strollers or ride bikes without worrying about geese feces" (Valencia 2007). The compliments demonstrate the city-wide satisfaction and understanding of the management program.

The management program in Worcester also received a great deal of outside positive support, including promotion as a success by the GeesePeace organization as well as the MSPCA. In 2007, GeesePeace gave Worcester its highest recognition, hosting the "GeesePeace 2007 Leadership Conference on Conflicts with Canada Geese" in

Worcester. Twenty-three towns from across Massachusetts came to learn from Worcester's example.

Worcester succeeded in managing its geese in the long-term because its leaders researched goose management, carefully considered what solutions the community could tolerate, and found ways to engage the community early in the management process. Because the community understood the parameters of the management plan and the city sought public engagement in the plan, residents could participate in management and reap the benefits of now spotless public parks. For the Department of Public Health working in conjunction with the community, while still making management decisions at a governmental level was very successful. Incorporating residents into the management solution not only reduced controversy, it reduced costs, which is a valuable lesson for any municipality.

Braintree

Often times municipal officials believe that making wildlife-management decisions without informing the public will result in effective population control with little controversy, thereby minimizing those officials' political risk. In Braintree, Massachusetts, the Parks and Recreation Commission in conjunction with the Board of Selectmen allowed a managed hunt to control Canada geese at the municipal golf course. Hunters who were familiar with the golf course reduced the goose population significantly, but when two local newspapers announced the managed hunt, an animal rights activist group rallied residents to protest the hunt. Since the town had made its management efforts

relatively opaque it suffered not only the outrage of the activists, but also the anger of town residents who felt deceived by their leadership. Much of this conflict could have been avoided if the town leadership had been transparent in its decision-making process from the start. In the wake of failed management, Braintree now faces the serious dilemma of managing its goose population while keeping residents—who are now attentive to the problem—content. This situation is far more complicated than the town’s initial management problem, and could have been solved through smart decision-making.

Braintree is a bustling suburb 21 miles south of Boston with diverse outdoor amenities including a town forest, several parks, a beach, a state reservation trail system and a 200-acre, 18-hole public golf course (Town of Braintree). Braintree is home to the terminal MBTA redline station and a large shopping mall, making it a popular commuter community. It is relatively small, with a total area of only 14.52 square miles and 33,836 residents. The town is upper-middle class, with a median income of \$61,822. It takes pride in its historic character; Braintree is the birthplace of John Adams, John Quincy Adams and John Hancock (Town of Braintree). Until recently, Braintree was governed by a representative town meeting; in January of 2008, however, it converted to a mayor-town council style of government, which is unusual in Massachusetts.

The municipal golf course is the site of major goose-human conflict in Braintree. It is used heavily by a variety of stakeholders, especially during golfing seasons, and contains excellent habitat for resident Canada geese. Three rivers and two ponds run through the course and 13 of 18 holes feature water. The seasonal use of the course provides a safe haven for geese in the colder months. The proximity to other parks and

playing fields makes management especially complicated, as birds can travel between these resources. The golf course is an excellent and versatile recreational resource for the people of Braintree. Although there is a core group of golfers who are long time residents of the town, the golf course offers lessons and juniors programs that enrich the recreational opportunities for town residents at a minimal cost. In Braintree, even the residents who do not play golf hold some stake in the course, as town tax dollars help to pay for its upkeep.

Goose-human conflict on the golf course began in the early 1990s with an estimated 100 to 500 geese on the course each day. The large amount of feces left by the geese made the course virtually unplayable. The geese were not only an irritation for golfers but also for the town leadership because a loss in golfers meant a loss in revenue from greens fees. Without these fees, it was nearly impossible for the Parks and Recreation Commission to pay for daily operations on the golf course. The town set out to find a free method of goose control that would be non-controversial. Initially, the golf course manager, attempted to harass the geese with his pet Labrador retriever, who was somewhat effective at first. Eventually, however, the untrained dog lost interest in the job.

Faced with a dilemma over how to reduce the number of geese on the golf course for the least cost possible, the golf-course manager—in conjunction with Parks and Recreation Commission—decided to attempt a managed hunt. This appeared to be a particularly good tactic, as many of the regulars at the golf course were also avid hunters. In 1995, the golf course manager and the Parks and Recreation Commission approached the Board of Selectmen to request a temporary lift on the town-wide hunting ban to allow

goose hunting during the limited Canada goose season in the months of December, January and February. The selectmen quietly obliged, soliciting no input from residents or goose-management experts. At the time individuals involved report that they did not believe it would be possible for the community to oppose managed hunting. Because all hunters needed to be “properly licensed, approved by the Braintree Police Department, and follow state guidelines,” the town did not view the hunting as a potential source of controversy (Daniel 2005). Every year for the next nine years, the town selectmen voted to temporarily lift the ban on hunting for the managed goose hunt. Each time, the only public notice was a brief announcement in the local and regional newspapers. Due to strict limitations and weather conditions, the number of geese taken in the hunt ranged from 10 to 125 (Collins 2005).

The Braintree Parks and Recreation Commission perceived hunting to be somewhat effective in reducing the population and scaring the geese, but felt that with the state-imposed hunting restrictions they could not achieve a high enough take. In response to still-thriving goose populations, town officials sought to incorporate alternative management tactics to enhance their results. Braintree then purchased a Border collie, which is cared for and run frequently by the manager of the golf course. It also dabbled in other management tactics such as approved pyrotechnics to harass the geese.

In 2005, Braintree announced its annual hunt in the *Patriot Ledger* and the *Boston Globe*. This time, however, the papers published not only a simple announcement but also an in-depth article about the hunting response to rising goose populations. This article provoked an uprising of citizens and activists who opposed the hunt and demanded

more humane methods of management. The Massachusetts Animal Rights Coalition, a group that mounts efforts to stop what it considers the inhumane treatment of animals in Massachusetts, launched a full-blown campaign to stop the goose hunt. The group protested the Braintree goose hunt for about a week, by standing at a busy intersection and waving a wooden goose carving and signs saying "Stop the Slaughter" and "No Blood for Golf." Their activities gained media coverage in the *Boston Globe*. The protesters argued that the town should do away with the hunt and implement humane methods of management, but the golf course manager claimed that the town tried humane methods in the past, which failed. In defense of the town's decision, one exasperated selectmen exclaimed, "It's just way too many feces. It's impossible to clean up and they spread disease. There are kids out there rolling in it, tackling in it. It isn't healthy" (Jan 2005).

With the arrival of the activists the town selectmen had a new dilemma on their hands. In conjunction with the Parks and Recreation Commission and golf course management, they had made a quiet management decision to hunt their geese. For many years, the hunt went by unnoticed except by those who wished to participate in the hunting activities. Once the hunt was made public, however, the town had to deal with angry citizens, both residents and outside activists, who did not approve of their activities. What had appeared to be an inexpensive, uncontroversial method of management suddenly became very controversial and potentially costly, due to legal fees. In order to quiet the complaints the town quickly cancelled its hunt, and sought new management methods (Jan 2005). The political leadership in Braintree then engaged experts to help them deal with the goose-human conflict, most notably the MSPCA. Representatives from

the MSPCA engaged in a discussion with the town, suggesting the GeesePeace method of goose management. In group meetings, the Parks and Recreation Commission took the stance that the MSPCA was welcome to try the GeesePeace methods in Braintree, but pointed out that when the town had attempted humane methods in the past, those methods had failed. Town officials believed that the large area and great complexity of the terrain made it too difficult to locate the nests, and believed that the use of a Border collie service with four or five dogs would be cost prohibitive. After a month of minimal effort and training, Braintree gave up on GeesePeace and told the MSPCA that the NGO could continue the effort if it wished, but the town would not invest time or money in the project. The MSPCA was willing to teach the golf course manager the GeesePeace techniques and develop a GeesePeace program, but it declined to act as a free goose management service. The two actors dissolved their relationship, and the town sought other ways to manage the geese on its own.

Since suspending its managed hunt Braintree has dabbled in new methods of humane control. Town officials learned about new tactics from golf course publications, catalogues, and conversations with other communities struggling with Canada goose conflicts. The most successful new tactic implemented by the town has been a remote controlled boat, which acted as a harasser to the geese. The town has tested other methods as well, including light deterrents, chemical repellents, habitat modification, and coyote cutouts, but these proved to be completely ineffective: the goose population has shown no decline. Nevertheless, the Braintree Golf Course claims that it has managed to reach a satisfactory daytime goose population that allows uninterrupted recreation--

although the geese remain, and no management plan is in place to protect the town from future population surges. This leaves the town constantly searching for additional methods of management to make up for the loss of the primary method of population control, hunting.

While the geography and topography of the area surrounding the golf course make management complicated, the town would probably find a comprehensive plan, though complicated at the outset, to be effective in the long term. For years the Parks and Recreation Commission and the Board of Selectmen made management decisions in Braintree without consulting the public or explaining their choices. By shielding the lethal nature and insider strategy of the goose management from the public, the town became vulnerable to conflict if their plan was revealed. Not surprisingly, when two local newspapers publicized the managed hunt, Braintree experienced a backlash from residents who were both angry at the management methods and at the back door and opaque decision-making process. Had the town been open to making a true commitment to non-lethal management earlier on, or at least made decisions in a transparent manner, it would probably have prevented controversy and come up with a safer and more effective management approach—at much less political risk.

Raynham

Human health and safety are among the most critical concerns of any municipality. In the small town of Raynham, Massachusetts, when Canada geese appeared to pose a safety risk to residents, it was the mandated responsibility of the Board of Health to manage the

geese on behalf of the residents. Raynham, like many towns, went to great lengths to protect its 11,730 residents, but not to involve them in wildlife management. Instead, the town government made management decisions in small town meetings, where the Board of Health presented vague information to the Board of Selectmen. It appears that the lethal component of the management plan was never openly discussed in public meetings. While any individual can access the details of the management plan through public records, by failing to present the lethal nature of the management plan, Raynham left itself vulnerable to criticism and public outrage.

Settled in 1652 and incorporated in 1731, Raynham sits at the major intersection of Routes 495 and 24 just 40 miles south of Boston. Raynham's 20.9 square miles are home to a variety of recreational and outdoor resources that are ideal goose habitats. The Borden Colony, a 300-acre outdoor sports complex, and nearby Johnson Pond both provide ample resources for geese to thrive. The Conservation Commission and the Park and Recreation Department are responsible for the maintenance of these recreational resources (Town of Raynham).

In 2002 goose-human conflict erupted on Raynham's peaceful Johnson Pond. Several residents whose property abuts the town-owned park next to the pond noticed a significant increase in the number of Canada geese both on the pond and in their yards. When the residents felt that they could no longer stand living with the geese, they filed complaints with the town Board of Health, stating that the Canada geese hindered their ability to enjoy their property and posed a safety risk through their feces and behavior. Property owners attributed the recent increase in the goose population to the park visitors

and children at the nearby playground who fed the birds. The Board of Health conducted an investigation and determined that the complaint was legitimate by their standards. The investigation found that the geese were nuisances to the Johnson Pond residents and that they reduced the usability of the pond and park. The Board of Health also made the claim that geese crossing the nearby road created a public safety hazard to motorists that the town could not overlook (Wallgren 2005).

The Board of Health and Board of Selectmen recognized that they needed to take action to satisfy the complaints of the vocal Johnson Pond residents and prevent other town residents from stepping forward and complaining about the geese. The Board of Health contacted the MDFW, assuming that its staff members were the most reliable experts on nuisance wildlife management. The wildlife and hunting agency recommended that the town develop a bylaw to fine park-goers who fed the geese. The Board of Health proposed the bylaw at a town meeting where the Board of Selectmen voted to adopt it. Shortly thereafter the town posted signs on the property surrounding Johnson Pond, threatening offenders with a modest fine. The signs seemed to deter some former goose feeders, but as one resident reported: "I walk by and see the sign saying 'Don't feed the geese' and people are feeding the geese next to it" (Wallgren 2005). After three years, in spite of the bylaw, the goose population continued to grow and the town government realized that stronger action would be necessary to control the geese. The Board of Health contacted other communities dealing with similar problems and decided to assess a range of management options based on cost and effectiveness. In cooperation with the Department of Recreation they purchased several coyote decoys. Though they

reported early success, Marion Larson at the MDFW warned, "it may prove to be a temporary solution, since the geese generally figure out the decoys pose no danger. 'I call it the scarecrow effect...if they are not moved frequently, the geese catch on" (Wallgren 2005). The geese at Johnson Pond caught on quickly, and the stationary decoys were vandalized and later removed.

In the summer of 2005, new resident complaints to the Board of Health indicated a spike in the goose population. One long-time resident said he had never seen the goose problem so bad, and that at one point more than 60 geese were on his lawn (Wallgren 2005). To deal with the growing population, the Board of Health in conjunction with the MDFW appealed to the Board of Selectmen and suggested that Raynham take advantage the state's early goose hunting season, which began September 6th. The Chief of Police challenged this idea and pointed out that children at the nearby playground might be hurt by the gunfire. At the same meeting the Health Agent (of the Board of Health) told the Board of Selectmen that he had been referred to the USDA. Representatives of the USDA recommended that the town apply for a Depredation Permit from the USDA, which would allow egg destruction in the early spring. As a hunting approach posed too great a risk to human safety, the Board of Selectmen voted unanimously that the Board of Health should apply for a Depredation Permit (Raynham Board of Selectmen 8/23/05).

The following spring, after Raynham received its federal and state Depredation Permits, the town government reviewed a plan which would allow the USDA to perform egg and nest treatments as well as a lethal live capture and removal. The Board of Selectmen immediately voted to authorize an agreement between the Board of Health and

the USDA, transferring the funds to support the management program (Raynham Board of Selectmen 3/21/06). After one season of the USDA program, the goose population experienced significant decline, as most birds were rounded-up and killed, and all of the eggs and nests were destroyed. Shortly after the treatment, in August of 2006, the Board of Selectmen congratulated the town Health Agent "on the decision which was made early in the year regarding the geese population at Johnson's Pond" (Raynham Board of Selectmen 8/8/06).

Johnson Pond residents responded positively to the reduced goose population, but the citizens were never adequately informed of the specific details of the management contract with the USDA. The Board of Selectmen discussed the plan briefly at their meeting; however the details were not made available publicly and were even omitted from the Board meeting minutes. In spite of the opaque decision-making, the Board of Health felt confident that it selected the right solution to protect public health, and that not eliminating the geese would have been negligent. Raynham conducted this management program for two seasons, but 2008 is the final year of its contract with the USDA and it must decide if there is funding to continue the program. Complaints about the geese have almost ceased and the population seems significantly reduced, but it is likely that the geese will return if the program is not continued.

At the time of management the Board of Health believed that it was doing what was best in the interest of the complainants. Because the town government kept the management plan a secret from town residents, the community lacks an understanding of how Raynham's goose management tactics work and why. Perhaps if the residents

understood the details of the USDA management and the long-term implications, they might have been opposed to the plan. Raynham enacted a solution on behalf of the community, but because they hired a contractor the community never had to take responsibility for the inhumane management approach. If residents gain a better understanding of the details of the management plan, the town faces the possibility of citizen unrest. At the present time Raynham must decide whether to continue to work with the USDA to manage its Canada geese, or whether it will try a new approach. If the town chooses to continue its current management plan, it may soon learn a hard lesson about concealing controversial information from its citizens.

CONCLUSIONS

How a municipality chooses to work through any nuisance wildlife conflict is directly related to the management decision-making process. In many municipalities a single leader makes the initial nuisance wildlife management decision, but must almost always gain the approval of a local representative government body. Decisions are based on a variety of factors including personal experience, community demand and budget; however, the most important factor municipalities consider when making a management decision is minimizing conflict and controversy. No matter how severe the Canada goose conflict, when municipal leadership selects a management plan, that selection has the potential to unite or divide a community.

The four cases studied in this thesis demonstrate the importance of transparency in nuisance wildlife management decision-making and the key roles residents play in the

long-term execution of a nuisance wildlife management plan. A whole community must buy into a solution to ensure that the plan will be successful and not contested. Residents must feel that they can and want to carry out management in the long-term. If the community takes ownership of the plan, or at least fully understands and accepts it, than a successful plan will survive. Through votes, taxes or participation the citizens are ultimately responsible for how they approach management in their community. The town or city government is merely the steward of publicly held land, not the owner. The local government must act in the best interest of the citizens, but it is also their job to engage the citizens in the management decision.

If transparent process and community involvement are keys to selecting a successful wildlife management tactic, a municipality must carefully approach each nuisance wildlife conflict. Wildlife management decision-makers, on a local level, often know very little about wildlife, and so it is critical for the decision-maker to conduct research and engage experts who have the time, resources and information to unravel a conflict. It is important to note that there is a vast difference between an expert and a contractor. An expert is an individual or organization that provides free and unbiased information, which will help decision-makers, select the best and most effective management practices. A contractor is an individual or organization that offers advice or services at a cost. It is important to engage experts not contractors in the decision-making process, as experts will help a decision-maker make the best choice, where as a contractor stands to gain profit from convincing a decision-maker that a solution is best for his or her community.

During the decision-making process, the decision-makers must consider how, and if, the community will be involved in the wildlife management plan. Certain species lend themselves better than others to citizen participation in management activities, but at the bare minimum, a comprehensive community information campaign should be part of the management plan to ensure that the citizens understand the ramifications of the management decisions. Providing the public with complete information also protects the municipal government from the backlash that might occur if a secretive plan was later exposed. Citizen involvement in wildlife management acts a check to the decision-making process. While the management plan can be established prior to citizen involvement, providing the community with information can help a leader assess if a management decision will be palatable to the community, and if the community will stand by the decision for as long as is necessary to resolve any particular wildlife conflict.

Accountability and responsibility are ethically important considerations in nuisance wildlife management. A decision-maker is not only responsible to the human community that he or she serves, but also to the wildlife and domestic animal community within the municipality's boundaries. For many municipal managers responsibility to animals may be a foreign concept, but it is critical to remember dabbling in wildlife population management can have different outcomes than expected. By fully disclosing the details of management, all members of the community are accountable to the management process and outcome. This minimizes the likelihood of selecting a plan that will be ineffective or have unexpected negative consequences. If leaders and residents fully understand what

management entails, they are more likely to make better decisions, which they will carry into perpetuity.

Ultimately, municipal governments are responsible not only for protecting their community, but serving it in a responsible and careful manner. If nuisance wildlife management decision-making is opaque and residents are left out of management, then the leadership has not adequately served their community. If local governments can make well thought-out decisions and engage their constituents they will find themselves on the road to success and harmony.

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