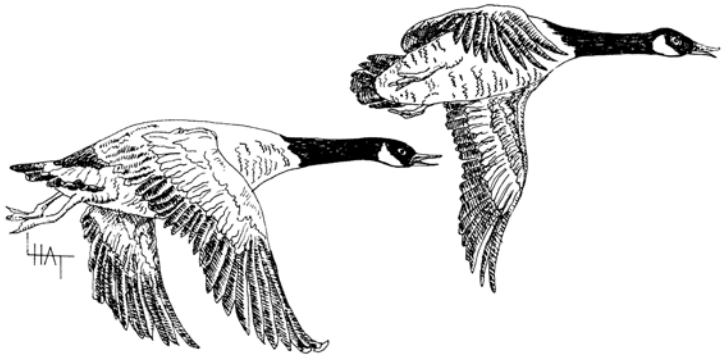
Humanely Resolving Conflicts with Canada Geese

A Guide for Urban and Suburban Property Owners and Communities



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Introduction

Not long ago, the sight of Canada geese landing on a neighborhood pond was unusual enough to cause celebration. These birds had become so rare from human exploitation that they were eagerly welcomed back. Today, however, Canada geese are considered problems in many communities. How did this change come about?

At the end of the nineteenth century, overhunting and mass killing of geese for markets had reduced their populations to near extinction. Landmark legislation to protect migratory birds was enacted in 1916 and amended several times as the Migratory Bird Treaty Act (MBTA). The MBTA provided broad protections that helped preserve dwindling numbers of Canada geese, but experts still thought that one of the 11 or so recognized "races" of geese, the "giant" Canada goose (*Branta canadensis maxima*) had vanished. In the early 1960s, small groups of this goose were discovered and federal and state agencies began a concerted effort to rebuild their populations. These efforts, launched with the best of intentions, nonetheless have led directly to one of the most controversial and problematic wildlife management issues in the United States and Canada today---overabundant Canada geese.

A principal reason for our current human-goose conflicts is that the geese---raised in captivity and moved about by wildlife agencies to rebuild their populations---weren't strong migrants and their migrancy instinct was further lessened by their captive propagation. Such birds came to be known as "resident" geese, tending to stay yearlong in the rich urban and suburban landscapes to which they had been moved. Expansive lawns, parks, golf courses, and artificial ponds made perfect goose habitats. These resident flocks expanded, and by the mid-1980s researchers were drawing attention to the new phenomenon of "too many" geese. Numbers have reached such a point in recent years that the same state and federal agencies that recently were propagating geese are now calling, in many cases, for drastic population reductions, or culls.

Such proposals are opposed by those individuals and organizations who object to the mass killing of wild animals simply because they are regarded as nuisances. Where such approaches have been rejected, communities are resolving human-goose conflicts with more humane approaches. This guide focuses on these humane solutions for conflicts with resident Canada geese in urban and suburban communities.

About Canada Geese

Canada geese are easy to recognize by their size, color and markings, and---of course---their distinctive "honking" calls. Canada geese are grazers and prefer to forage on grass, especially fertilized lawn grass. They tend to eat and loaf in grassy areas with open sight lines and access to a body of water---to see and escape predators. Sexual maturity is usually not until three years of age and geese can live up to 20 years.

Mated geese pair off in early spring and defend preferred nesting sites from other geese. These sites are usually near water with a good view of the surrounding area. Geese show a great preference for islands and peninsulas when choosing nest sites. However, they will also nest in less-than-ideal places, such as landscaped areas in parking lots, planters next to busy building entrances, or flat roofs. Geese tend to use the same nest site year after year, laying 5 or 6 eggs (on average) and incubating them for 28 days. Both parents defend the nest and goslings until they are approximately 10 weeks old and can fly. Within a day or two of hatching, parents may lead goslings as far as two miles to grass and water if their nest site does not offer them.

Adult Canada geese molt (completely replace flight feathers) each summer and cannot fly during this month-long period. After adults have completed the molt and young geese grow their first flight feathers, they begin to travel in groups or flocks. Resident Canada geese usually move only short distances for the winter, but bad weather can cause them to move hundreds of miles in search of open water and forage.

Federal law protects Canada geese. It is illegal to harm geese, their eggs, or their nests in the United States without permission from the U.S. Fish and Wild Service (USFWS).* **When applying any of the techniques described here and in any interaction with Canada geese, do no harm to geese, goslings, eggs, or even nests except as permitted by the USFWS.** One technique described in this guide currently may only be conducted with a USFWS permit. Geese may be hazed (harassed or scared away) without a permit as long as the geese, goslings, eggs, and nests are not touched or handled either directly or indirectly by something under your control (for example, by your dog, by an object you throw, or by a device or vehicle you control).

The Conflicts

The problems people have with Canada geese are largely aesthetic but may include concerns about health and safety, as well. Geese prefer to graze on mowed and fertilized grass typical of lawns, golf courses, and playing fields. Where geese graze, they also defecate. Concerns are raised about both the potential for the spread of disease through contact with goose feces and water quality issues as feces breaks down and enter the water.

Studies to date do not show that goose feces poses any special health threats. Obviously, people want to avoid contact with any animal feces regardless of health issues. Abundant deposits on playing fields and in high traffic areas make that difficult and it is reasonable that people would want to avoid accumulations in urban parks and open-space recreation areas. Killing birds to achieve this, however, is both shortsighted and senseless. Problems posed by the accumulation of goose feces should be resolved through holistic approaches. Sensible management of the

* As this is being written, the USFWS has proposed sweeping changes in the way it oversees the permitting process. We urge readers to consult The HSUS website at *www.hsus.org* or the USFWS website at *www.fws.gov* for up-to-date information.

environment includes addressing the presence of wild (and domestic) animals *and* poor or inadequate water circulation, nutrient loading, sedimentation, overfertilization, monocultural landscapes, and other environmental issues that contribute to the problems of urban and suburban lakes and ponds.

Canada geese maintain strong family bonds and nesting geese and parents of young goslings protect their young. Approaching a nest or family of goslings often provokes defensive reactions from one or both parents. Serious injury from protective geese is rare and nearly always occurs when a startled person falls rather than from contact with a goose. In some places, geese may cross roads or loaf around roadsides, creating a potential traffic hazard. Airport managers are quite concerned about geese since the danger of one or more striking an aircraft is serious, given their large size. Airports, more than other facilities, adopt comprehensive and integrated approaches, many of which are nonlethal, to resolving potential conflicts with geese or other birds. They represent special cases in terms of their needs but often are in the forefront in developing and implementing innovative approaches.

Resolving Conflicts

There are two key points to resolving human-goose conflicts. First, it is not possible---even if it were desirable---to eliminate geese from a community. The goal of humane conflict resolution is to reduce problems to a manageable and acceptable level while enjoying the benefits we derive from the simple presence of wild animals like geese and from knowing that the quality of the environment is high enough that they can live within our communities. To reach this goal, solutions need to address the specific conflicts and the sites on which they are occurring---not attack the geese generally.

The second key point is that there is no single quick fix that will resolve human-goose conflicts at every site. Integrating a variety of techniques, experimentation, and creative thinking is most likely to lead to successful conflict resolution programs. This guide presents a range of available techniques. How and when they are used, in what combinations, and how intensively are critical to success. There are two sides to every wildlife conflict, animals and people. Both must be addressed in seeking environmentally responsible, lasting, and humane solutions.

Achieving Success

One of the most obvious failings of projects launched to deal with problems caused by geese is that they involve too little commitment of either time or resources. In human-wildlife conflicts people often expect to resolve conflict issues quickly and easily. While a golf course manager might be perfectly understanding of the need to repeatedly treat turf for insect or disease problems and accept the need to both monitor for problems and respond when they occur, the fact that geese management requires the same diligence often receives far less acceptance. Solving problems with geese in a humane and environmentally responsible way will require dedicated and persistent efforts. Goose management programs must be based on reliable

information and have carefully evaluated alternatives that reflect both the specific problems and any site-specific characteristics that might influence success or failure.

To solve conflicts with geese, first examine how, when, and why geese are using the site so that you can select the best combination and timing of techniques to make it less attractive to them. Next, assemble the resources you need to address the problems, including the personnel---volunteer or paid---who will dedicate sufficient time and effort to see things through to resolution. Only then should you act, monitoring your actions closely to determine their efficacy. Don't declare the war to be won after the first battle has been fought, unless your situation turns out to be one of the fortunate few where this actually happens. Be prepared to regroup and try again, and to monitor and evaluate the program on a continuing basis so that new and more effective strategies can be devised.

Finally, start a process of long-term planning that incorporates environmental modifications that can permanently alter goose behavior. Just letting grass grow to a height that diminishes geese's interest in it as forage might be one step; planting emergent vegetation in aquatic benches or configuring plantings of shrubs and trees on land are other, more intensive (and in the short term, expensive) approaches. In a nutshell, it is necessary to identify the basis for conflicts and plan on appropriate tactics to address these and to have a strategy that establishes when and where implementation is to occur and how program components are to be employed and combined to complement one another. We know far less about this aspect of goose conflict management than we do its other elements.

Program Components

This guide describes a wide range of techniques. Enough detail is given to understand each technique and, for simpler techniques, to implement them. Some techniques will require additional information, technical assistance from experts, or both. Most techniques work better before geese become strongly attached to a site. The longer geese have used a site, the harder it will be to get them to move. Geese are also more willing to relocate before they establish nesting territories in early spring and again after goslings are flighted in late summer. When geese are migrating through an area it may be easy to move them using the simplest techniques. It may seem, however, that these are failing because flocks after flock of new birds are moving through.

Quite a few techniques have been tried and failed. Swans, for example, have been placed on ponds under the theory that they will keep wild waterfowl, including geese, away from their territory. Unfortunately, they often do not. Balloons, predator effigies, and other devices intended to frighten geese may do so temporarily, but geese are highly intelligent and will quickly realize when something doesn't pose a real threat. There is no evidence that ultrasonic devices have any effect on geese, either. As with any new and emerging issue, people are trying any number of techniques in efforts to deter geese; some will work and some will not. And as

with any human venture, common sense and experience are the most important tools to bring to bear on human-goose conflict resolution.

Perhaps the least explored of any aspect of management is the examination of sites where geese are not causing problems. Ironically, it is likely that such sites greatly outnumber those in which geese do cause problems, but like the dog that did not bark in the Sherlock Holmes story, they are overlooked. A considerable amount of useful information is likely to come from closer examination of such sites.

Tolerance Zones

Geese may quickly choose not to rest or forage at specific locations where even mild harassment is occurring when alternative sites are available. An important component of any comprehensive management plan is to identify and set aside areas where geese can be tolerated and leave them undisturbed there. Ideally these should be as easily accessible as the problem areas and offer the elements geese prefer---forage, good sight lines, and access to bodies of water.

Public Education

Perceived conflicts can sometimes be resolved simply through education. An understanding of goose biology and behavior, even simplistically, can help foster greater tolerance and willingness to work through issues. Likewise, the public will often be understanding and sympathetic just by knowing that a problem is being addressed and that managers are making a concerted effort to resolve conflicts. Public education is a key component of any program focused on resolving human-goose conflicts also because it is the people affected who should be playing an active role in decisions about programs. In almost every respect, the key to successful goose management programs will not be how many geese are present at a given site, but how people feel about them.

Feeding

Geese will congregate where food is easy to find, so places where people offer handouts will often have more geese who will stay there more persistently. Feeding occurs along a continuum, with the occasional handout having far less consequence than the daily arrival of a dedicated feeder with a trunk full of bread. It would be nice if we all could enjoy geese, watching and appreciating their natural behavior free of human inducements and interference, but this is not realistic. Antifeeding ordinances may help raise public awareness about the issue, but they should not be overzealously enforced. Education, especially of the committed and large-scale feeders, is preferable. Often, people who care about the animals respond more positively to explanations of the potential harm feeding can cause the geese than to unexplained feeding bans. Canada geese do not need food from humans. Even in severe weather, these birds can and will move considerable distances to better forage when necessary. The occasional injured bird who cannot move should be cared for by a licensed wildlife rehabilitator rather than fed.

Targeted Cleanup

Usually, the major complaint about geese in public places is the droppings. For limited problem areas, regular cleanup by paid staff or volunteer crews can resolve this conflict. Hosing or sweeping walkways, if these areas are the primary concern, may be feasible. Specialized landscaping equipment can sweep up goose droppings as well as other waste from turf and walks. This approach is best as a short-term and stopgap measure that addresses concerns while other approaches are being considered and evaluated.

Chemical Repellents

Two chemicals are registered in the United States to teach Canada geese to avoid a specific site: anthraquinone and methyl anthranilate. Both have been tested and proven effective in controlled situations when used according to the manufacturers' instructions.

Anthraquinone is a naturally occurring compound, not harmful to plants, mammals, or birds when used according to label directions. By triggering a strong, harmless digestive irritation in geese who eat treated grass, anthraquinone conditions these birds to avoid treated areas. This compound also absorbs light in the ultraviolet range that geese, but not humans, can see. Since geese visually recognize treated areas, they learn to avoid them by sight.

Methyl anthranilate is a grape-flavor food additive approved by the U.S. Food and Drug Administration for human consumption and exempted from the U.S. Environmental Protection Agency's pesticide residue tolerance requirement. Sprayed on grass, it makes the grass unpalatable to geese. Used in this way, it is a taste-based repellent and geese must eat some before they learn not to eat at the treated site. Methyl anthranilate is also dispersed into the air from special equipment as a fog that irritates geese so they leave the area immediately. It will work as a repellent on any bird species, however, so its use especially in fogging equipment merits caution. Experienced and conscientious professional applicators are recommended, either to provide service or train employees on how to use this chemical.

Although treating large areas with chemical repellents can be costly, repellents may be the right tool for high-priority areas with heavy use by both geese and people. Sites where people place a high value on open grassy areas near water (swimming beaches and picnic areas, for example) are often top candidates for repellents.

Sprayed-on repellents vary greatly in duration, especially under wet conditions and when grass is being mowed frequently. Although repellents condition geese to avoid a site, it is unclear how long this conditioning lasts. For this reason chemical repellents should be used in conjunction with other techniques. In areas used by both resident and migrating geese, the residents may be conditioned to avoid treated grass but migrants may continue to stop over because they are not conditioned.

Hazing (Harassment, Frightening, or Scaring)

Simply frightening geese away from problem areas can frequently alleviate conflicts. Devices and techniques to frighten (or haze) geese must seem threatening to the geese. Some devices rely on sounds to frighten geese away, others rely on visual elements, and some use both. Geese lose their fear of---or habituate to---most hazing devices and techniques so their effectiveness may decline with repeated use. For a more effective program, consider using a number of hazing devices or techniques, moving devices around the site, and alternating approaches frequently enough that the geese cannot habituate. Hazing used with other types of techniques will be more effective than when used alone.

Shooing. In some situations, mild persistent harassment by people chasing or shooing geese is enough to keeps geese away from places where they are not wanted. It can also be useful when combined with others techniques. However, the geese readily become accustomed to this strategy.

Ambush. Geese are large birds who cannot quickly take flight when avoiding danger. For this reason they prefer to have good sight lines when they are in an open area and a separation of at least 30 feet between them and any vegetation or structure that might conceal a threat. When uncertain as to whether or not an object is threatening they may become hesitant to use an area. Although it has been little tested, the concept of concealing a threat (e.g., a motion-activated sprinkler, a propane cannon, etc.) and suddenly confronting geese with it in a sort of ambush could be a powerful deterrent.

Flags. Flags made of about two--by-three-foot pieces of black plastic (cut from a trash bag, for example) can be stapled to a four-foot-high piece of wood (lathing material works well), with a notch cut in the free edge of the sheet to catch breezes and set out at about one flag per acre. This was one of the earliest techniques used for deterring geese from sites and its effectiveness may have diminished over time as geese have habituated. Moving flags around a site every couple of days may enhance their effectiveness.

Balloons and kites. Inexpensive Mylar® party balloons with bright silvery coatings can be filled with helium and staked out in open areas at 50- to 100-foot intervals. Allow 10--15 feet of line on the staked balloons so they float under fair conditions or move when winds are blowing. The "helikite" is a more durable device that combines balloon-like and kite-like qualities. Because they are buoyant from helium and move with wind as kites do, geese may not become habituated to them as quickly as simple balloons. Commercially available eyespot balloons have super-enlarged and exaggerated eyespots that may have a deterring effect. Where geese are using a swimming pool, a beach ball left to float and move with the wind may be enough to deter them.

Mylar tape. Shiny, reflective Mylar tape is a staple for many bird conflicts. To deter geese from flying into a site, use it to make streamers set on poles similar to the manner described for

balloons. To deter geese who walk into a site, make a temporary fence by stringing the twisted tape between posts. Check tape fences and streamers regularly, especially after storms or windy weather. This tape holds up well in the environment but may be moved or disturbed by people or larger animals like deer and dogs.

Scarecrows (effigies, decoys). Scarecrows have a long history in our attempts to deal with bird conflicts. They can still be effective on geese, especially if placed before birds arrive. It is more important that a scarecrow appear alive and threatening than that it look like a person. Therefore, movement is very important. One commercially manufactured scarecrow automatically inflates on a periodic basis so it appears that a person has suddenly jumped up. This represents one application of an ambush strategy, but only when it can be set to respond when geese are present, not at a fixed time. Occasional shooing by real people can reinforce the effectiveness of scarecrows.

Nonhuman scarecrows or effigies are usually made to look like predators such as alligators, coyotes, and owls. As with traditional scarecrows, movement seems more important than resemblance to any specific species. Stationary owl or snake statuettes are unlikely to scare geese while floating plastic alligator heads that move with water current or coyote effigies attached to automated devices may.

The standard goose decoy, used by hunters, has been adapted to look like a dead goose. This is based on the theory that these highly intelligent birds will avoid any place where it appears one of their kind has come to harm. The success of these decoys, as with other effigies, has been mixed.

Sprinklers. A motion-activated sprinkler hazes animals from yards and gardens. Geese may readily accommodate to water or learn the device's range so they can simply avoid it. However, a sprinkler might be effective for smaller areas with light goose use, especially if moved frequently and combined with other techniques.

Lasers and strobe lights. Commercially available lasers have been specifically designed to haze birds, including geese, from land or water. Used under low light conditions or at night, they present a visual stimulus that often causes considerable alarm and panic in some bird species, including geese. Geese moved by lasers at night usually go to different forage areas the next day. In field tests, geese have not habituated to lasers. Flashing or rotating strobe lights achieve the same goal of denying geese their night roost. Both lasers and strobe lights are quiet, which can make them more appealing options in urban and suburban areas than devices that use noise.

Although the type of laser used in avian dispersal is considered generally safe for all but intentional staring, manufacturers' precautions about use should be strictly followed. Both lasers and strobe lights can disturb people and potentially distract people operating vehicles if aimed inappropriately. Therefore, correct use and careful adherence to manufacturers' guidelines are very important, especially in heavily populated urban and suburban settings. A laser rifle and a

smaller handheld laser device are marketed specifically to haze birds. While these devices have relatively high up-front costs, they can be used at many sites and for many years, increasing their cost-effectiveness.

Trained dogs. Using techniques developed over hundreds of years to manage livestock, different breeds of dogs can also be trained to haze geese. Geese probably identify the dogs as predators and, therefore, avoid them. Dogs handled to apply appropriate pressure on geese put them in flight and the geese leave an area entirely. Handled inappropriately they may only put the birds in the water, where, if not pursued, they quickly learn the dog is not a real threat. This technique is most effective when geese feel insecure because the "predator" could appear anywhere, anytime. Hence, it is important to vary the timing of visits and the manner in which the site is approached. Modifying habitat can make hazing with dogs more effective by making geese feel less secure from predators.

Geese may leave when untrained and unhandled dogs roam a property or family pets chase them. However, there are concerns about this strategy. If a dog catches or harms a goose, it is a violation of federal law by the dog's handler or owner. If a dog harasses geese who are defending nests or young, either the geese or the dog may come to harm. Without training and handler direction, these dogs may not be as effective and geese may habituate to dogs used this way.

Radio-controlled model aircraft, boats, and cars. Radio-controlled aircraft have successfully hazed geese away from airports. Radio-controlled boats, for geese on water, and cars, for geese on open land, have similar potential. These devices are labor-intensive and expensive and must be used with care to ensure that they do not harm geese, goslings, eggs, or nests.

Noisemaking devices (sirens, airhorns, whistles, blanks, bangers, screamers, whistle bombs, cracker shells, cannons, and exploders). Farmers use a wide variety of devices that make very loud, often explosive, disruptive noises to frighten migrating geese and other birds. Some are fired from specially manufactured or adapted guns. Cannons use acetylene or propane gas to produce loud explosions, usually on timers at predetermined or random intervals. Geese accommodate rapidly to such devices, especially resident geese used to the noises of urban environments.

These types of noisemaking devices have limited application in urban and suburban areas. They may be prohibited by noise ordinances, restricted by firearms regulations, and (often) simply too intrusive for populated areas. Some have the potential to cause injury or start fires if used incorrectly. Therefore, only qualified, trained users should operate them.

Distress call devices. Another type of noisemaking device plays recordings of goose distress calls. These are less disturbing to other listeners, including people, than other noisemaking devices. Distress calls are species specific, so only Canada goose distress calls will be effective on geese. Birds may not habituate to distress call recordings as quickly as they do to other

noisemaking devices. Success with distress calls has been mixed, but improved models that employ vocalizations that represent real alarm and flight signals look promising. Geese may move only a short distance and return as soon as the calls stop. This technique seems to work better when combined with visual hazing techniques.

Exclusion

Since geese can both fly and walk into a site, it is difficult to exclude them completely. Geese can be prevented from landing on small bodies of water or preferred forage sites by a grid of overhead wires. The distance between the sides of this matrix can be as much as 25 feet. Panels such as these are often put up over swimming pools visited by geese. Usually this occurs when pools are not being used in the winter, sometimes even when they are covered but have small pockets of water that still attract geese. A perimeter fence can prevent geese from walking under the grid.

Special floating plastic balls can cover an entire pond surface, keeping geese out of the water. These are used primarily for industrial ponds, where dangerous by-products might kill birds and it is necessary to keep all birds off the surface but frequent access is unnecessary.

Fences are most effective when geese are tending flightless young and during the molt period when geese walk to forage sites. Pond edges should be completely fenced so geese cannot simply walk to an opening. It is possible, though not yet proven, that geese will not use small ponds surrounded by fencing to nest and raise young, recognizing that they will be unable to guide their young out of these areas.

In addition to permanent and temporary fences and the Mylar tape fences described above, smooth-wire, rope, or string fences that use multiple lines spaced to exclude both goslings and adults exclude flightless geese. One retractable two-stand fence is designed specifically for geese. Flagging or signs can help make these fences more visible to people.

Habitat Modification

The most lasting approach, and often the most cost-effective, is to alter the habitat to make it less attractive to geese. For new projects or when changing landscaping for other reasons, planners can incorporate these principles from the start. The goals in modifying habitat are to reduce food, reduce preferred nesting and brood-rearing areas, and increase the sense of wariness or insecurity from danger.

Reduce food. Since Canada geese prefer to eat the young shoots of grass, reducing the total amount of lawn area and the amount of young shoots within lawn areas makes a site less attractive to geese. Replacing mowed, fertilized grass with other plantings or materials is the simplest and most direct way to reduce the food a site offers geese.

Leave areas in grass to "naturalize." Grass at least six inches high has fewer young, tender shoots and the shoots are more difficult for geese to find. Leave tall grasses over winter to discourage spring feeding. End or reduce fertilizer use and supplemental watering to reduce the young shoots geese prefer.

Replacing the Kentucky bluegrass geese prefer with other grasses such as tall fescue may reduce the overall attractiveness of a site, but only if alternate and preferred sites are available. Geese will eat fescue and almost any short grass or legume if it is all that is available. When alternative feeding sites (tolerance zones) are available, areas with less preferred varieties of grass or where the grass is taller, less fertilized, and less irrigated will have less goose foraging.

Reduce nesting sites and brood rearing areas. Geese prefer to nest on islands, peninsulas, and along uninterrupted shorelines. Eliminating islands and peninsulas reduces nesting sites but is difficult and expensive after the pond is full of water. When designing new ponds and when draining old ponds for maintenance, potential nesting areas should be reduced. On some protected waterways, the Army Corp of Engineers may require a permit to modify shorelines. Shrubs or boulders every 10--20 yards can interrupt a shoreline to reduce preferred nesting sites.

To reduce a site's attractiveness to geese rearing young, take steps to discourage or prevent geese from easy access to forage. Place large grassy areas such as sports fields at least 450 feet away from the safety of open water. Fencing can be effective to limit access to potential brood-rearing habitat (see above).

When geese nest near areas with heavy human traffic, their protective behavior can be a significant difficulty. To prevent a pair from nesting in a particularly problematic location, physically alter the site so the geese cannot use it. A barrier that completely excludes the geese is one possible solution. Make sure the barrier materials cannot entrap the geese or other wild animals. A planter box used as a nest site can simply be moved away from building entrances and heavily traveled routes. Nesting materials may be removed as geese build a nest as long as there are no eggs in it. Such removal, however, must be done repeatedly and regularly. Even then the geese may complete a nest quickly or simply move their nest site only a short distance.

Increase wariness and insecurity from danger. Many predators stay away from the simplified landscapes people design that leave them no cover for hunting. That absence of predators is one of the things that attracts Canada geese to these sites. The geese feel safe where vegetation is low, allowing open sight lines, and where they can readily escape into open water. Therefore, landscaping changes that reduce sight lines and access to open water increase their wariness and make them less comfortable at a site.

Changing plantings along shorelines to create a real or visual barrier is the most effective landscape change. Establish long grasses, shrubs, or other dense tall plant cover along shorelines at least 30 inches high and 20--30 feet wide. Make shoreline plantings dense and thick enough to discourage nesting. Fences, hedges, and a continuous band of emergent aquatic plants like

cattails and bulrushes in the water at the shoreline can be used alone or in combination with other elements to create a barrier. So can boulders---two feet or larger in diameter and more than 12 inches high--- intermixed with plants. The barrier must be continuous with openings no wider than three inches so geese do not simply use the opening for access.

Tall trees with a dense canopy in the flight path between water and grassy areas can prevent geese from flying through to land. The trees need to be tall and near the shoreline to increase the angle of ascent enough to prevent geese from taking off from the pond.

Urban geese habituate to people but still avoid close contact and move off when people approach closely. Where geese are frequently and regularly disturbed in their preferred resting areas---for example, by heavily used paths along shorelines---they are much less likely to use the site altogether. There are two key elements for success with this strategy---regular heavy use and path placement. The path must be along all or nearly all of the shoreline and within the narrow corridor where geese prefer to rest.

Limit Growth of Flocks ("Birth" or Hatch Control; Nest Destruction; Egg Treatment, Oiling, Replacement, or Addling)

Where conflicts exist or are developing, it may be prudent to anticipate and limit future goose population growth by curtailing reproduction. Limiting the growth of flocks can stabilize flock size and influence site fidelity. Geese hatched at a given site are often "philopatric"---they will seek that site and nest there themselves when sexually mature. Breaking this bond by reducing hatching on that site may be in the long term a highly effective component of a holistic strategy.

In urban and suburban areas, concentrated nesting sites often make these techniques feasible. Limiting reproduction requires a long-term commitment to have any significant impact on flock size because it only reduces potential young added to the flock, not adults. While not yet commercially available, research is underway on compounds that can be fed to geese to prevent them from laying viable eggs. This may eventually yield another important technique to curtailing reproduction.

Currently, all of these techniques may only be carried out under a federal permit issued by the USFWS.

Eggs must always be treated or removed at the earliest stages of development before embryos are too advanced to humanely stop development. While some sources classify reproductive control as a "lethal" method (an embryo dies), The Humane Society of the United States (HSUS) considers it humane when done early in the eggs' development. Training is needed to learn to identify mated birds, find nests, and humanely treat or remove eggs. *The HSUS Canada Goose Egg Addling Protocol* has details.

Sites with staff available may include these efforts in their regular spring activities. Already familiar with their site and its geese and at the site regularly, on-site staff members are well placed for these activities. For sites without such staff, volunteer programs have been successful. Volunteers can also be important components of programs in which they supplement staff.

Nest destruction. After assuring eggs are young enough to remove humanely, nests and eggs are removed and disposed of as directed by the USFWS. This method is simple and is being used extensively in some states. Observations of geese have indicated that after their nests are removed many pairs will build new nests and lay additional eggs. The extent to which this occurs is still to be determined, but there is some suggestion that if eggs have been incubated for a week the tendency to renest may be significantly diminished. Nonetheless, frequent, repeated visits may be needed to find and remove new nests for programs to be highly successful.

Egg treatment (oiling, replacement, and other addling methods). Oiling and replacement are the preferred methods of egg treatment. Eggs that are young enough to remove or render unviable humanely are either treated with oil to stop development and returned to the nest or removed and replaced with dummy eggs. Removed eggs are disposed as directed by the USFWS. Replacing eggs, either oiled or with dummy eggs, discourages geese from building new nests and laying additional eggs. This allows less frequent visits than nest destruction. For egg replacement, dummy eggs must be obtained, retrieved from nests at the end of the nesting season, cleaned, and stored for next season. Oiling programs do not have to coordinate dummy eggs. Oiling is reported to be highly effective (between 95 and 100 percent); however, in field use oiling has sometimes failed to stop egg development and some oiled nests have hatched goslings.

Other methods of addling, such as piercing and shaking, are more difficult to learn and do correctly and completely than oiling and replacement. Incorrect or incomplete piercing and shaking can leave the embryo alive but deformed. Therefore, these addling methods are not recommended.

Conclusion

It will take a combination of techniques and strategies to restore harmony between urban Canada geese and people. The solutions to the conflicts will not come from state and federal agencies or nongovernmental organizations, but from individuals and communities that care about the birds, the environment, and the well-being of their communities. When The HSUS advocates life-affirming solutions as the only reasonable response to the problems people sometimes have with Canada geese, we do so as much to affirm our own lives as theirs.

Sources of Additional Information

Websites

Information on Humane Canada Goose Management
www.wildneighbors.org -- The HSUS Wild Neighbors™ program
www.geesepeace.org -- GeesePeace™
www.canadageese.org -- Coalition to Prevent the Destruction of Canada Geese™

U.S. and Canadian Government Information
http://migratorybirds.fws.gov -- U.S. Fish and Wildlife Service, Division of Migratory Bird Management
www.cws-scf.ec.gc.ca/birds -- Canadian Wildlife Service, Migratory Birds Conservation Division

Information on Goose Biology and Research
www.goose.org -- International Goose Research Group

Information on Geese and Human Health
www.nwhc.usgs.gov -- National Wildlife Health Center

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Lowney, Martin S. (1995). Excluding non-migratory Canada geese with overhead wire grids. *Proceedings of the 6th Eastern Wildlife Damage Control Conference*, 85--88.

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Whitford, Philip C. (2002). Shoreline characteristics of urban lakes as a factor in nuisance Canada goose problems. *The Passenger Pigeon 64(4)*, 271--280.

Retail Sources of Products

Below are retail suppliers of products to manage conflicts with resident Canada geese humanely. **No endorsement of specific brands or any product line by The Humane Society of the United States is implied or intended by inclusion here.** To be as useful as possible, we have tried to make this a comprehensive resource. Some suppliers included offer both lethal and nonlethal products, but a more comprehensive list of sources for humane products outweighs the inclusion of suppliers who sell products we consider inappropriate. We know that the list is not complete and regret any omissions.

Company	Contact Information	Products	
Air-Aqua, Ent. Glenview, IL	1-800-454-1631 *www.airaqua.com*	Retractable goose fence	
Aquacide Company White Bear Lake, MN	1-800-328-9850 *www.killlakeweeds.com*	Chemical repellent Retractable goose fence	
Aquatic Eco-Systems, Inc. Apopka, FL	407-886-3939 *www.aquaticeco.com*	Balloons Cannons Fencing	Mylar tape Pyrotechnics
Ben Meadows Company Janesville, WI	1-800-241-6401 *www.benmeadows.com*	Chemical repellent Moving effigies	Balloons Cannons
Bird Barrier America, Inc. Redondo Beach, CA	1-800-503-5444 *www.birdbarrier.com*	Balloons Sprinkler	Mylar tape
Bird Guard Erie, PA	1-800-331-2973 *www.birdguard.com*	Chemical repellent Distress call device	Mylar tape
Bird-X, Inc. Chicago, IL	1-800-662-5021 *www.bird-x.com*	Chemical repellent Balloons Distress call device Moving effigies Strobe light device	Sprinkler Mylar tape
Fly-Bye Kirkland, WA	1-800-820-1980 *www.flybye.com*	Chemical repellent Mylar tape	Balloons Laser

Gempler's Madison, WI	1-800-332-6744 *www.gemplers.com*	Chemical repellent Mylar tape Pyrotechnics Strobe light device Moving effigies Distress call devices	Balloons Sprinkler Cannons Fencing
Goose Poop Buster Calgary, Alberta	403-819-1973 *www.goosepoop.com*	Landscaping equipment attachment to sweep turf	
Lake Restoration, Inc. Rogers, MN	1-877-428-8898 *www.lakerestoration.com*	Retractable goose fence	
Margo Suppliers, Ltd. High River, Alberta	403-652-1932 *www.margosupplies.com*	Balloons Pyrotechnics Distress call devices Strobe light device	Mylar tape Cannons
Med Pest & Supply Middlesex, NJ	732-469-5999 *www.medpest.com*	Chemical repellent Mylar tape Laser	Balloons Sprinkler
Planet Natural Bozeman, MT	1-800-286-6656 *www.planetnatural.com*	Chemical repellent Mylar tape	Balloons Sprinkler
Reed-Joseph International Greenville, MS	1-800-647-5554 *www.reedjoseph.com*	Chemical repellent Mylar tape Pyrotechnics Moving effigies	Balloons Cannons Laser
Sutton AG Enterprises, Inc. Salinas, CA	1-800-482-4240 *www.suttonag.com*	Balloons Cannons	Mylar tape Pyrotechnics