Animal and Plant Health Inspection Service

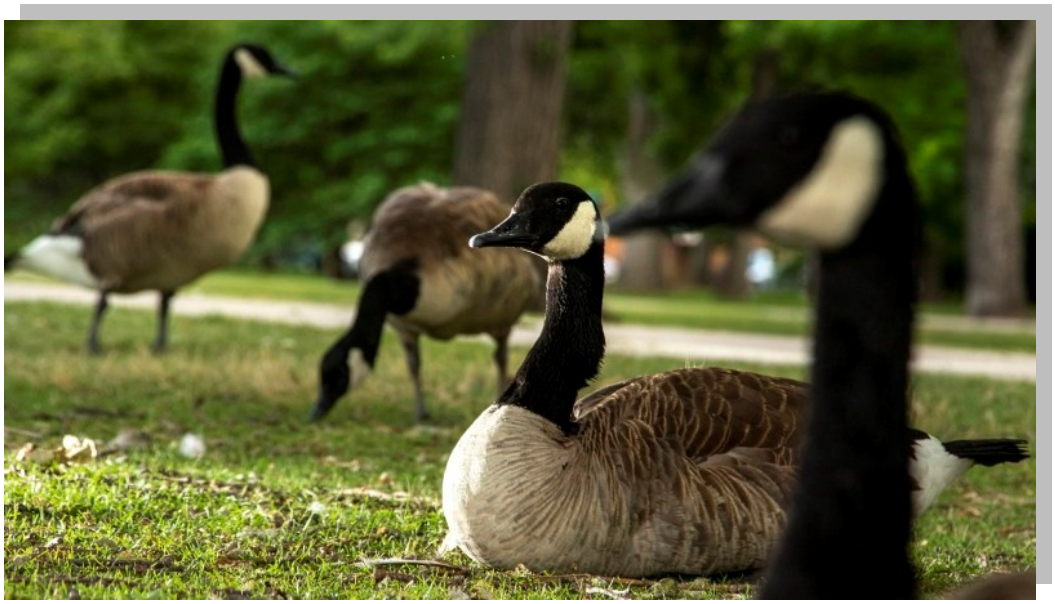
Wildlife Services

Colorado State Office
12345 W. Alameda Parkway
Suite 204
Lakewood, CO 80228
Voice 303.328.9041
Fax 303.328.9047

Canada Goose Damage Management Efforts

Denver Parks

January 1, 2019 through July 31, 2019



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BACKGROUND

In 2017 Denver Parks and Recreation (DPR), along with other city officials, contacted USDA Wildlife Services (WS-Colorado) for technical assistance related to property damage and human health and safety concerns involving Canada geese (*Branta canadensis*). USDA Wildlife Services is a federal, non-regulatory, cooperatively funded wildlife damage management program. Their mission is to provide federal leadership to resolve human-wildlife conflicts through technical and/or operational assistance.

In response to requests for assistance, WS-Colorado personnel visited several city park locations and identified areas of damage associated with large population densities of Canada geese. City officials and public residents repeatedly voiced concerns over continued conflicts with resident (nesting) and migrant (wintering) Canada geese. Canada geese, often habituate and reproduce to abnormally high population densities in urban and suburban areas. These areas provide readily accessible food sources, available habitat, lack hunting pressure, and are void of native predators. Damage in these areas include overgrazing of turf grass and landscaping, excessive bird-fecal accumulations, aggressive nesting behavior towards the public, and human health and safety hazards (i.e., disease transmission, traffic hazards when geese cross roads).

In the United States, populations of Canada geese are managed by federal and state agencies such as the US Fish and Wildlife Service (USFWS) and Colorado Parks and Wildlife (CPW). These regulatory agencies typically manage bird populations based on distinct breeding area affinities. Within Colorado, resident Canada geese that breed east of the Continental Divide are considered to be part of the Hi-Line population (HLP). Waterfowl Breeding Population and Habitat Surveys conducted annually by USFWS on the HLP have shown a seven-fold increase in the HLP numbers from the 1970s to present (Figure 1) (Gammonley 2018).

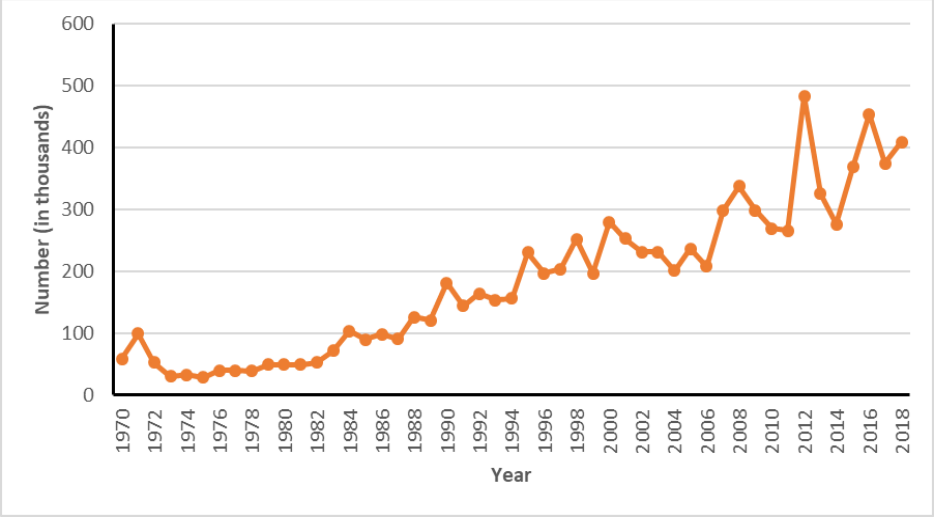


Figure 1. Estimates of the Hi-Line Population of Canada geese from U.S. Fish and Wildlife Service Waterfowl Breeding Population and Habitat Survey in Alberta, Saskatchewan, and Montana (U.S. Fish and Wildlife Service 2018)

Due to translocations and introductions in Colorado from the 1950s through the 1990s, locally breeding/nesting Canada geese have increased substantially and exceeded the social carrying capacity in many areas along the Front Range. As a result, Canada geese that breed and molt in Colorado are largely non-migratory, have high annual survival rates, low natural mortality rates, and breed at an early age; combined with their natural natal homing instinct this species has the potential to continue expanding throughout urban/suburban areas (Sanders and Dooley 2014). According to the most recently adopted management plan all populations of Canada geese currently nesting in the Central Flyway are considered in excess of objective baseline levels by state wildlife agencies (Gabig 2000).

Resident Canada goose population surveys conducted by CPW personnel have documented approximately 44,000 breeding pairs within the Front Range Metropolitan Area (stretching from Fort Collins to Colorado Springs). This represents a 50% population increase over the last two years which can be attributed to an increase in suitable nesting habitat, immigration, and unregulated goose reproduction throughout the area (Jim Gammonley, CPW, pers. communication, 2017).

DAMAGE

Prior to 1990, no state within the Central Flyway had reported damage associated with nesting Canada geese. Today, human-wildlife conflicts involving Canada geese regularly occur along the Front Range I-25 corridor, culminating in the Denver Metropolitan area. Anthropogenic land use changes within these areas, including the installation of artificial reservoirs, water retention basins, and golf courses subsequently increased urban and suburban nesting sites for Canada geese (Conover and Chasko 1985). As a result, landowners and property managers are now voluntarily implementing goose damage management programs in response to increasing Canada goose populations.

Within the Denver area, public complaints primarily involve unsightly bird-fecal accumulations within high-use parks and recreation areas (*pictured right*), human health and safety concerns (i.e., zoonotic disease transmission), water contamination, excessive grazing of native vegetation, traffic safety concerns, and aggressive interactions between the public and nesting geese. It is worth noting that disease transmission between waterfowl and humans through direct contact with fecal contaminants, although unlikely and treatable with antibiotics, remains a priority due to the presence of zoonotic bacterial pathogens such as salmonella, giardia, cryptosporidium, and *Escherichia coli* bacteria (i.e., transmissible between avian reservoirs and humans) (Graczyk 1997).

Cleaning public parks on a daily basis requires multiple hours and resources and detracts from time spent on other important tasks. Maintenance and grounds personnel have dedicated hundreds of hours to attempt to clean fecal droppings from paved pathways. This

has resulted in programs re-directing resources and labor from other essential projects. According to managers and grounds crew personnel, this labor effort has incrementally increased each year (Vicki Vargas-Madrid, DPR, pers. communication, 2018). Although estimates of turf damage are not available at the time of this report, repairs are continuously being made to excessively grazed sod and grass seed by DPR staff.

MANAGEMENT EFFORTS

For more than 15 years, DPR has attempted to keep resident goose populations in parks at appropriate levels by implementing various management tactics including egg oiling, hazing, and eco-friendly wildlife repellents. Additionally, work is being done to restore natural habitats along park lakes by planting native vegetation and creating visual barriers that discourage geese from nesting. However, resident populations continue to grow, despite the use of various management tactics, resulting in an unnatural number of geese.

Presently, DPR actively manage goose populations within 11 parks through a combination of egg oiling and harassment efforts. Egg oiling is a process by which eggs are coated with corn oil to prevent egg development by eliminating oxygen exchange and limit re-nesting attempts. It is estimated, based on the number of eggs oiled each year by DPR, that approximately 1,534 breeding pairs of geese occupy these areas, along with an unknown number of non-breeding geese. Since the implementation of nest and egg treatment programs from 2013 through 2017, annual nest productivity has resulted in approximately 1.8% gosling hatch success effectively slowing population growth rates (Denver Parks and Recreation 2019). However, despite the intensive nest and egg treatment within these managed areas, the overall population of Canada geese residing in the Denver Metropolitan area continues to increase by approximately 41% each year (Figure 2).

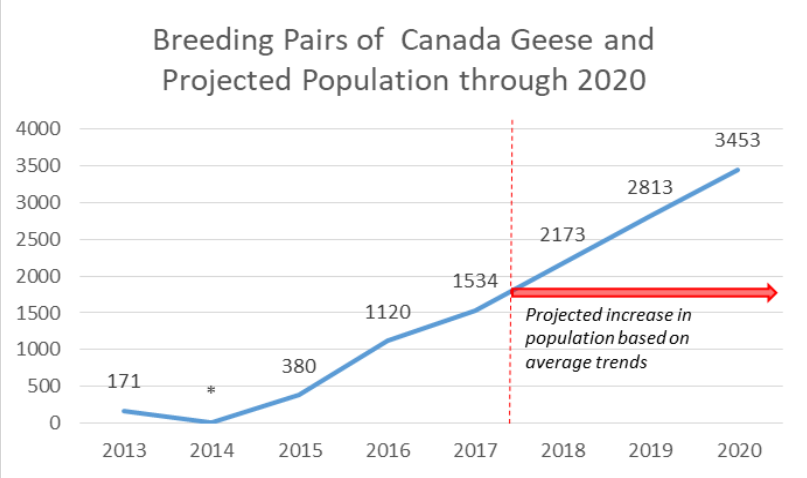


*Figure 2. Approximate number of breeding pairs of nesting Canada geese at 8 high use parks in Denver Metro area from 2013 through 2017. Projected population increase through 2020 is estimated based on historical trends and the continuation of current management efforts by Denver Parks and Recreation. *no data found for 2014*

From January 1, 2019 through July 31, 2019, WS-Colorado coordinated inter-agency meetings between USFWS, CPW, DPR management as well as USDA Wildlife Services Media Relations and Denver Marketing and Media Relations in an effort to collaborate effective management operations. During this time period, WS-Colorado also conducted site visits, surveys, and egg oiling.

In January 2019, WS-Colorado submitted a federal depredation permit application to the US Fish and Wildlife Service (USFWS) for the take of Canada geese during 2019. Shortly after, WS-Colorado met with USFWS and an Environmental Assessment for Bird Damage Management in Colorado was released to the public for a 30-day public comment period. To date, no public comments have been received by USFWS. In June, USFWS issued a permit to WS-Colorado for the take of 2,200 Canada geese during 2019 in the state of Colorado. WS-Colorado submitted a copy of the permit to DPR.

In February 2019, WS-Colorado held a Canada goose working group meeting with federal and state agencies and private cooperators to discuss basic goose biology, population dynamics, and various management efforts currently being conducted within the Front Range corridor and Denver area. Representatives attending the meeting included USDA-National Wildlife Research Center biologists, CPW staff, Nuisance Wildlife Control Operators, and WS-Colorado.

In March 2019, WS-Colorado, DPR biologists and management personnel, and Denver Marketing and Media Relations met to discuss Canada goose management options. Agenda topics included roles and responsibilities for each organization and detailed scope of work. The group communicated frequently to provide updates and progress of each project throughout the year.

In March 2019, WS-Colorado met with a private big game and poultry processor to discuss options of taking donated goose meat and distributing the meat to a charitable organization. WS-Colorado toured the state-inspected facility and agreed to bring live geese to the facility to be euthanized, processed and distributed to a non-profit charitable organization for human consumption or use by a wildlife rehabilitation facility. WS-Colorado contacted the organization who gladly accepted the opportunity to receive donations.

In March 2019, WS-Colorado conducted site visits to 10 public-use parks within Denver. WS-Colorado observed goose populations and activity. WS-Colorado conducted egg oiling (*pictured right*) at Berkeley, Rocky Mountain, Barnum Park, Overland Pond, and Sloan's Lake Parks. Nests and eggs were only found on the center island of Sloan's Lake by USDA and 623 eggs were treated. DPR staff also treated 2,468 eggs during this time at Washington, City, Garfield, and Harvey Parks.

In June 2019, CPW requested a variance from the Colorado Retail Food Establishment Rules and Regulations section to allow wild Canada geese, culled as a part of overpopulation

control efforts, to be processed and donated as food for local charitable organizations. WS-Colorado obtained this variance to use wild geese as food for charitable donations by the Colorado Department of Public Health and Environment (CDPHE) in accordance with USFWS Migratory Bird Depredation Permit.

During the months of June through July 2019, WS-Colorado used standard "drive-traps" (Day 1980) to capture Canada geese during the molt (i.e., when they are flightless). After nesting, geese undergo an annual "molt" a 4-5 week flightless period when wing feathers are shed and re-grown. Molting occurs between mid-June and mid-July, and birds resume flight by August. A drive-trap typically consists of panels constructed of aluminum frame with nylon netting that are erected into a 15 ft^2 to 100ft^2 temporary enclosure, depending on the number of geese or other target species, with two wings made of 2-3 ft. high plastic fencing extending 60-200ft. in a "V" from the enclosure with panels. Canada geese are slowly herded into to the pen at each site by people on foot and in boats. When they are fully enclosed in the temporary pen they are removed by hand and placed into poultry carriers for live transport off-site (*pictured on page 8*). During mid-June to mid-July WS-Colorado collected geese from Washington, City, Sloan's, and Garfield parks (Table 1).

Table 1. Total numbers of geese removed during herding (round-up) operations from Denver Parks from Mid-June through Mid-July.

Park	Number Removed
Washington	576
City	703
Sloan's	235
Garfield	148
TOTAL	**1,662**

WS-Colorado removed a total of 1,662 geese from the four parks. Some geese were freed at each location to ensure continued public enjoyment of wildlife within Denver parks (see picture page 7).

During June and July 2019, 1,521 pounds of Canada goose meat was donated to families in Denver and Larimer counties. Across the U.S., numerous charitable food organizations have established cooperative relationships with wild game hunters and other organizations in need of quality protein sources such as meat. In Colorado, there are no known health advisories for waterfowl and no food industry regulations for waterfowl testing prior to consumption. Therefore, Canada goose meat can be donated without testing.

Following live-capture, geese were humanely euthanized in accordance with AVMA guidelines at a state licensed CDPHE approved processor. The meat was ground and packaged into 1-pound portions and remained frozen until

being collected and distributed. One of these organizations, MetroCaring in Denver, received 268 pounds of the 1,521 pounds collected (*pictured on page 6*). In 2007, nine Wildlife Services programs across the U.S. donated 6,443 lbs of goose meat to charitable organizations. This source of protein from goose mitigation efforts is valuable for many families along the I-25 corridor.

WS-Colorado provided information to several members of the community, city officials, news media as well as federal and state agencies after mitigation operations were conducted. WS-Colorado worked closely with Denver Parks and Media Relations personnel to provide prompt responses with detailed descriptions of the scope of work and management efforts.

MANAGEMENT RECOMMENDATIONS

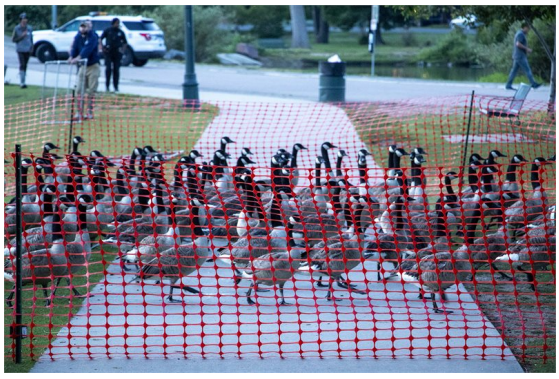
The most effective strategy for alleviating resident Canada goose conflicts is an integrated wildlife damage management program to reduce the overall local population of geese. This involves limiting resident goose reproduction, and discouraging and/or limiting the number of birds in sensitive areas. Throughout the year an integrated goose program may include: harassment with radio controlled boats, lasers, or pyrotechnics; limiting reproductive success through egg oiling or addling; and reducing resident goose populations. However, it should be noted that hazing and egg oiling/addling programs are costly, have temporary impacts, and dispersed geese remain within 2 miles of the original locations hazed from (Holevinski et al. 2006, Preusser et al. 2008, Seamens et al. 2009). Conducting surveys to monitor populations and evaluating the efficiency and efficacy of each management technique are crucial to the continued success of this program.

Canada geese freed from temporary pens at City Park after herding (round-up) operations were conducted in June.

Canada geese are effectively managed using a variety of methods based on bird behavior and time of year. Migratory (wintering) flocks must be managed with a combination of both lethal and non-lethal techniques. Resident (nesting) goose populations need to continue to be managed by herding (rounding-up) geese that are molting and flightless and continuation of nest and egg treatments.

Photos below of goose herding (round-up) operations conducted by USDA*

Biologists on foot and in boats slowly herd geese together during the molt



Geese walk up onto the bank just after daylight into temporary enclosures (pens)

Geese are placed in temporary pens

Geese are lifted out of the pens and placed in poultry carriers for live transport

**All photos used with permission by Kevin Beaty/Denverite*

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Prepared by:
Kendra Cross, District Supervisor
USDA APHIS Wildlife Services
Lakewood, CO