Vancouver Park Board Goose Management

2022 Survey Technical Report

Prepared for:

Dana McDonald
Environmental Stewardship Coordinator
Vancouver Park Board

Prepared by:
EBB Environmental Consulting Inc.

REPORT TO **Dana McDonald**
Vancouver Park Board

FOR **Vancouver Park Board Canada Goose Management**

2022 Survey Technical Report

DATE September 2022

PREPARED BY **EBB Environmental Consulting Inc.**
PO Box 18180 1215C 56th Street
Delta, British Columbia, V4L 2M4
Phone: 604-943-3209
Fax: 604-948-3273
Toll-Free: 1-877-943-3209
Website: www.ebbconsulting.ca
Email: enquiry@ebbconsulting.ca

CONTACT **Kate Hagmeier MSc RPBio**
Mobile: 604-790-2412
Email: hagmeier@ebbconsulting.ca

Table of Contents

List of Tables

List of Figures

Executive Summary

This document provides a summary of the non-migratory resident Canada goose data collected in the City of Vancouver February to September 2022. The summary includes information that will assist the Vancouver Park Board with development of a ***Vancouver Park Board Canada Goose Management Plan*** and interim mitigation options***.*** Topics addressed in this document include:

- Description of the non-migratory resident Canada in parks and project rationale;
- Identification and methodology of Tasks;
- Review of existing data
- Canada goose population survey data summary and analysis; and
- Discussion and mitigation options based on survey findings.

Surveys indicated that during moult (June-July), greater than 1000 geese used parks that were selected for survey, but that use varies. Over the course of all surveys, highest use was observed at Stanley Park, English Bay, Vanier Park, and Jericho Park. Additional data supplied by the Park Board indicated that during the summer, parks supported greater than 2100 geese.

Population composition contained approximately 25% young which indicated population control from egg-addling is not sufficiently effective. Mitigation options are available to reduce pressure on key sites, but without substantial population control, measures may lose effectiveness over time.

1.0 Introduction

1.1 Document Intent

The intent of this document is to provide information to assist with strategic management of Canada geese in the City of Vancouver parks. Where Canada geese are discussed in this document, the term refers only to urban nesting and moulting Canada geese. These geese are often referred to as resident, non-migratory, or temperate nesting geese. Information provided in this document is based on the best knowledge available at time of development. As part of the management process, recommendations in this document should be reviewed through an adaptive management process as new information becomes available.

1.2 Development of a Canada Goose Action Plan

The population of non-migratory resident Canada Geese (*Branta canadensis*) has increased in southwestern BC, including the City of Vancouver (the City, Vancouver) to the extent geese are a general public nuisance, and impact parks, recreational areas, and natural habitats. The Vancouver Park Board (Park Board) plans to develop a ***Vancouver Park Board Canada Goose Management Plan*** to provide guidance on controlling adverse impacts of non-migratory resident Canada geese in Vancouver parks.

The Park Board requested EBB Environmental Consulting (EBB) survey the Canada goose population in parks, particularly geese that seasonally occupy key park sites. The Park Board is concerned that the nesting population is increasing, and conflicts associated with health and safety, environmental degradation, and recreational experience are increasing. As such, the Park Board would like to develop an action plan to guide decisions regarding population control of nesting geese and mitigate conflicts caused by geese.

Technical data collected during spring and summer surveys provide information to assist with developing of the action plan. Objectives of the surveys and technical summary include:

- Reviewing of the existing data and identifying data gaps,
- Seasonal abundance and distribution estimates of geese in selected parks,
- Identify priority areas for goose management in selected parks,
- Identify mitigation options.

2.0 Regulatory Context

Canada geese are regulated under the federal *Migratory Birds Convention Act* (1994) and pursuant regulations. Any interference with geese, their nests, or eggs must be done with authorization from the Canadian Wildlife Service (CWS) of Environment and Climate Change Canada (ECCC). Canada geese use lands governed by various jurisdictions including Federal, Provincial, Municipal, First Nation, and private properties such as golf courses and schools. Goose management activities are subject to bylaws and authorizations dependent on location and invasiveness of the management activities.

3.0 Canada Geese

3.1 Population Status

The global population of Canada geese and the smaller, closely related cackling geese (*Branta hutchinsii*) are comprised of 11 different subspecies (Banks et al. 2004). Subspecies have similar features, yet differences in physiology, behaviour and distribution are significant enough that unique management approaches must be considered for different taxonomic groups.

Across Canada, many Canada and cackling goose subspecies (hereafter, collectively referred to as Canada geese or geese) do not have overlapping ranges and would not interact under natural conditions. However, this is not the case in southwestern British Columbia where management programs designed to boost Canada goose numbers caused mixing of non-migratory resident populations resulting in hybrid offspring.

Prior to the 1960's, Canada geese were considered migrants and summer visitants in British Columbia (Campbell et al. 1990). By the 1970's, goose numbers had increased through management programs aimed at providing sustainable hunting and viewing opportunities. Management programs focused on importing breeding stock and flightless young of large-bodied subspecies from outside British Columbia. Introduced geese came from as far as Minnesota and Ontario (Smith 2000). Being outside of their native ranges, translocated geese did not learn traditional migratory patterns. In contrast, this mix of subspecies and their generations of offspring nested in their new habitats, and conducted protracted migrations, if any. Generations of offspring include hybrids of different stocks that were transplanted decades ago (Smith 2000). These mixed-race hybrids would not occur in natural systems and do not fit into standard taxonomy.

At the time of relocations, the British Columbia landscape also changed. Urban and rural areas increased, and many areas were closed to hunting. Increased habitat with fewer population controls assisted Canada geese to become abundant in areas throughout the province. Today, many populations of Canada geese are largely perceived as problem wildlife, due to their abundance, territorial behaviour during breeding season, crop damage, potential risks to human health and safety, fouling of grassy areas with droppings, fecal coliform contamination of public swimming areas, damage to lawns and green spaces, as well as other economic losses (Smith et al. 2005).

3.2 Goose Population in Vancouver

Reports (Pierce 2016, Worcester 2010) clearly describe the history of Canada goose management in Stanley park. In the 1970's thousands of geese used the park. Park Board wildlife staff reported an estimated 10,000 geese lived in the City in the mid 1990's (Jones 2022). In 1984, the Vancouver Board of Parks and Recreation adopted a policy to actively control goose populations. Annual round up and relocation programs were conducted, where up to geese 2000 were collected during moult and relocated outside of Vancouver. Funding restrictions prevented relocations from continuing after 2009. Egg-addling was also conducted at Stanley Park, which combined with relocation was described as providing effective population control.

The Park Board does not have a current estimate of the goose population. Jones (2022) estimated the 2021 population for Stanley Park and surrounding area was between 3000-4000 geese. Pierce (2016) provided a winter estimate of approximately 2300 based on Christmas Bird Count data but acknowledged that no standardized approach has been undertaken to achieve an estimate of resident nesting and moulting birds that used the City.

3.3 Goose Ecology

In southern British Columbia, Canada geese may begin nesting as early as February, but generally egg-laying is initiated in April and can continue into late May. Geese will pair for life but will find a new mate if one dies. Females are responsible for building nests and incubating eggs. Males will diligently "mate guard" ensuring other geese and predators do not disturb the female.

Nests are generally simple, constructed from weeds, twigs and other local material (Figure 1). Females use their bodies to make a depression in the vegetative mound and insulate it with down and feathers removed from her breast, resulting in a noticeable area of fewer feathers (brood patch). Females typically lay 4-7 creamy white eggs (average is 5; total can be greater than 12) on consecutive days. They may also lay replacement eggs if original eggs are preyed upon, or the nest is destroyed early in incubation, which is approximately 25-27 days (Mowbray *et al*. 2002, Environment Canada 2003).

Canada geese usually build nests within sight of water; however, will find alternative sites if necessary (Elphick *et al*. 2001, Environment Canada 2003). Preferred nesting locations are islands, including tops of beaver lodges and floating mats of vegetation. In urban environments, nest sites can include balconies, boat covers, planter pots, building roofs and topped trees. First-time breeders exhibit high natal fidelity and will attempt to nest in the same area they were fledged (Mowbray *et al*. 2002). Geese often return to old nest sites, or nearby locations year after year.

Following nesting, geese go through a period of moult when they are flightless and rearing young. The geese remain as a family unit and will flock with other families. This accounts for large numbers of young often seen with relatively few adult geese. These nursery groups are referred to as creches. During moult grow new flight feathers in preparation for fall migration. Moulting geese stay close to water where they can escape threats. Geese are flightless for approximately 4-6 weeks in June and July (Figure 2). Migratory geese migrate south in the fall after moult is completed and young birds are sufficiently developed for the journey. Resident geese may conduct protracted migrations but stay close to their nesting areas.

Geese prefer to graze on grass and are attracted to farmland and urban landscapes with manicured lawns (e.g., parks, schools and golf courses). Areas that have grass/water interfaces are ideal locations for geese. Canada geese start nesting at age 2 to 3 years and can live greater than 20 years. Annual survival in urban environments is considered higher than their migratory counterparts. In urban settings, juvenile survival is only slightly less than adults, accounting for a long-lived population with low rates of mortality (e.g., see Balkcom 2010, Luukkonen et al. 2020, Pilotte et al. 2014, Shirkey et al. 2018 for varying estimates).

Figure 1. Canada goose at nest.

Figure 2. Goose in moult, growing new flight feathers

4.0 Canada Goose Study Area

The City of Vancouver is located in southwestern BC, within the traditional and unceded territories of the Squamish, Musqueam and Tsleil-Waututh peoples. The City has an area of approximately 115 km^2 bordered by English Bay and Burrard Inlet to the north, the Fraser River to the south, the Strait of Georgia to the West and the City of Burnaby to the east (Figure 3).

Historical ecology of Vancouver was temperate rainforest, dominated by Douglas-fir (*Pseudotsuga menziesii*), western red cedar (*Thuja plicata*), and western hemlock (*Tsuga heterophylla*). Original rainforest habitat has been modified with logging of the original trees, including in Stanley Park which primarily consists of second and third growth forest. Vancouver is one of the warmest cities in Canada with high annual rainfall, particularly through the winter.

Vancouver now consists of urban neighbourhoods, many of which are characterized by high-rise residential and mixed-use development. The 2021 population census reported 662 248 people and the highest population density in Canada (Statistics Canada 2022). To support these neighbourhoods, the Park Board operates greater than 250 parks, gardens and golf courses that comprise 11% (1,298 ha) of the city land base (City of Vancouver 2022). Eight parks contain ocean beaches, and one contains a freshwater lake, together comprising 18 km of beach shoreline (City of Vancouver 2022). Natural and recreational park spaces are critical to maintaining characteristics of Vancouver neighbourhoods, providing opportunities to gather and recreate, habitat for native species, moderating carbon emissions, and improving livability in the City as a whole.

Figure 3. City of Vancouver.

5.0 Methodology and Definition of Tasks

The survey was divided into a series of tasks:

Task 1: Acquire historical or anecdotal data
The Park Board provided an assortment of reports and data. These were reviewed to identify usefulness, information gaps, and high-level patterns of goose conflicts.

Task 2: Site selection and habitat classification
Based on the review in Task 1 and conversations with Park Board staff, key park sites were selected for survey. Criteria included high complaints/conflicts in "311" records, anecdotal evidence provided by parks staff, data from previous reports, high-use parks, and habitat (e.g., water/beach/lawn interface).

Being mindful of budget considerations and logistics (e.g., access and in come cases, safety) a list of parks was developed. Additional parks and incidental observations were included that were on the survey route between key parks. Parks included:

- Balaclava
- Carnarvon
- Charelson
- Connaught
- Creekside
- David Lam
- Devonian
- Elm
- English Bay (including Morton Park/A-maze-ing Laughter Statues)
- Fraser River
- George Wainborn
- Granville Island
- Hastings Community/Richards Saunders Field
- Jericho
- Kitsilano
- Locarno
- Maple Grove
- Momiji Gardens/Sanctuary Pond
- New Brighton
- Oppenheimer
- Queen Elizabeth
- Seaforth (including Welcome to Kitsilano Sign)
- Spanish Banks
- Stanley Park
- Sunset (and Barge Chilling)
- Thornton
- Trout Lake (John Hendry)
- Vanier Park Complex (includes Hadden Park and beach in front of the Vancouver Maritime Museum and shoreline along Vanier Park)

Task 3: Canada goose surveys

The goal of the survey was to identify abundance and distribution of geese in park sites, and habitat use. Surveys were divided into biologically meaningful time periods for geese. These were:

- Pre-breeding—February and March
- Primary Nesting—April
- Primary Hatching/Early Rearing--May
- Moult--June and July
- Pre-migration/Staging—August
- Early fall migration/first hunting season—September.

During each survey, the following data were collected:

- Environmental and abiotic variables
- Location (GPS coordinates and/or site name),
- Number of geese (identification of adults and young where possible) and
- Habitat type.

Habitat categories contained:

- Beach/shoreline
- Forest edge/tree
- Garden bed
- Lake
- Manicured Lawn
- Naturalized Vegetation
- Ocean
- Paved/Path
- River
- Shrub
- Wetland
- Other.

Surveys were conducted approximately 2x/month during pre-breeding, pre-migration, and migration. Surveys were conducted approximately weekly during nesting until the end of moult, which coincided with high park use by people. Each survey consisted of driving a route and observing each park. Once at a park site, most parks were surveyed on foot so that all habitats were observed. Incidental observations were also recorded.

Task 4: Analysis

Data were summarised to show population abundance, distribution, and habitat use during biologically meaningful periods and overall. Population composition (adults and young) was based on surveys conducted between mid-May and mid-June when young are still easily discernable from adults.

Spatial data were retrieved from Metro Vancouver and the City of Vancouver's open data catalogues and included Land Cover Classification 2014 - 2m LiDAR (Raster) data and parks boundary polygons. Land Cover raster data were converted to polygons, then spatially joined with parks polygons to attribute land cover classes applicable to each park. Area calculations were generated for suitable habitat for Canada geese including modified grass and herb (e.g., manicured lawn), natural grass and herb, and water (e.g., wetlands, lake, river or ocean shoreline) to facilitate estimates of population densities and a real representation of suitable habitat within applicable parks. Habitat use observed during surveys were compared based on the total number of individuals observed using each habitat for each survey point. Spatial analyses were done with ArcGIS Pro 3.0.2. All other data compilation and data analyses were in MS Excel.

6.0 Results

6.1 Background Data

High-level review of "311" data indicated that issues with geese (positive and negative) have been increasing over the last decade (time period for which most records were provided). For example, Table 1 lists 311 reports from 2010 to 2021 in the most relevant goose-related categories showing a general increase across years.

Table 1 showing a general increase in 311 reports regarding goose issues

Year	Dead Animal	Street Cleaning/Debris Pick-up	Parks Ranger Case	Citizen Feedback
2010	6	0	0	0
2011	8	0	0	0
2012	7	3	5	1
2013	18	0	6	2
2014	10	1	15	1
2015	22	1	30	6
2016	12	1	35	18
2017	20	1	34	16
2018	26	0	47	24
2019	30	2	71	22
2020	37	1	61	29
2021	42	3	67	7

Addling data provided by the Park Board indicated that on average, 36 nests were addled each year 1996 to 2022 (minimum 8 in 2018; maximum 127 in 2022). The last two years saw a greater number of nests successfully addled than in pervious years (Table 2).

Table 2 Addling data provided by the Vancouver Park Board

Year	Total eggs	Total nests
1996	309	67
1997	231	47
1998	276	49
1999	217	42
2000	122	21
2001	145	27
2002	116	20
2003	114	19
2004	96	17
2005	123	25
2006	147	23
2007	122	20
2008	99	17
2009	60	11
2010	121	19
2011	90	19
2012	81	15
2013	129	22
2014	186	30
2015	184	35
2016	138	27
2017	227	41
2018	58	8
2019	300	51
2020	247	41
2021	660	125
2022	656	127

6.2 Survey Data

Population Composition

EBB conducted 19 surveys between February and September. Survey counts ranged between 202 (April 27) and 1092 (June 15) geese. Table 3 provides a summary of survey data. Percent young of the year was estimated from surveys on May 11, 18 and June 4,7,15. Only geese that could be confirmed as adult or juvenile were included. Table 4 provides a summary of population composition data used to calculate percent young. Young were distributed across the study area, but highest numbers of young were observed at Devonian Park, Granville Island, Vanier Park complex and Jericho Park.

Table 3. Summary of goose survey data

Date	Juvenile	Adults	Unknown	Total
23-Feb	0	425	75	500
11-Mar	0	281	65	346
23-Mar	0	355	50	405
05-Apr	0	283	10	293
14-Apr	0	212	20	232
20-Apr	0	273	0	273
27-Apr	17	185	0	202
04-May	65	220	20	304
11-May	88	343	25	456
18-May	187	353	20	560
25-May	200	491	45	736
04-Jun	100	442	90	632
07-Jun	154	522	150	826
15-Jun	208	586	298	1092
29-Jun	64	361	549	974
13-Jul	0	10	1028	1038
29-Jul	4	51	574	629
11-Aug	0	0	747	747
02-Sep	0	0	689	689
Total	**1087**	**5393**	**4455**	**10935**

Table 4. Subset of data used to estimate percent young in the population

Date	Juvenile	Adult	Total
11-May	88	343	431
18-May	187	353	540
04-Jun	100	442	542
07-Jun	154	522	676
15-Jun	208	586	794
Total	**737**	**2246**	**2983**

Abundance and Distribution

Table 5 lists total number of geese observed in parks. Geese were consistently observed (i.e., present most surveys February-September) at:

- Devonian
- East Vancouver Parks (emphasis on Creekside, Thornton, Oppenheimer)
- English Bay
- False Creek Parks (emphasis on David Lam, George Wainborn)
- Granville Island Parks

- Jericho
- Stanley Park
- Trout Lake
- Vanier Complex (Vanier, Hadden, fields around Vancouver Maritime Museum, Vancouver Academy of Music).

Parks with the highest use included:

- Stanley Park,
- English Bay,
- Vanier Complex
- Jericho. (Figure 4).

Parks with the highest use in summer months (June 29-Sept 2 surveys) were:

- Stanley Park,
- English Bay,
- False Creek,
- Granville Island,
- Jericho,
- East Vancouver parks,
- Trout Lake.

Figure 5 shows count data at specific sites, including within larger parks during each biological period to understand the distribution of geese. Figure 6 shows park use overall.

Specific habitats were used within parks. Habitat use observations indicated that manicured lawn followed by beach were most heavily used by geese (Figure 7). Following identification of such narrow habitat use, parks were examined more closely to look at use of suitable available habitat within parks available to geese (e.g., fields, natural grass, water). Areas of suitable habitat were did not include ocean. Use (i.e., geese/ha) estimates provided an index of relative pressure at parks removing bias of total park size (Figure 8).

Table 5. Cumulative goose counts

Park	Juvenile	Adult	Unknown	Total
Balaclava Park	0	0	1	1
Carnarvon Park	0	320	30	350
Charelson Park	0	6	46	52
City Misc	0	0	78	78
Connaught Park	0	0	0	0
Devonian Park	190	60	261	511
East Vancouver	12	244	227	483
Elm Park	0	0	0	0
English Bay	5	332	807	1144
False Creek	40	59	636	735
First Narrows	0	1266	0	1266
Fraser River Park	9	20	34	63
Granville Island	178	14	306	498
Hastings Sunrise	0	0	11	11
Jericho	135	501	303	939
Kitsilano	0	0	55	55
Locarno	0	0	4	4
Maple Grove Park	0	0	0	0
New Brighton Park	0	65	68	133
Queen Elizabeth Park	54	86	87	227
Seaforth	0	0	41	41
Spanish Banks	0	0	74	74
Stanley Park	24	1020	1604	2649
Trout Lake	45	260	213	518
Vanier Complex	395	202	506	1103
Grand Total	**1087**	**4455**	**5392**	**10935**

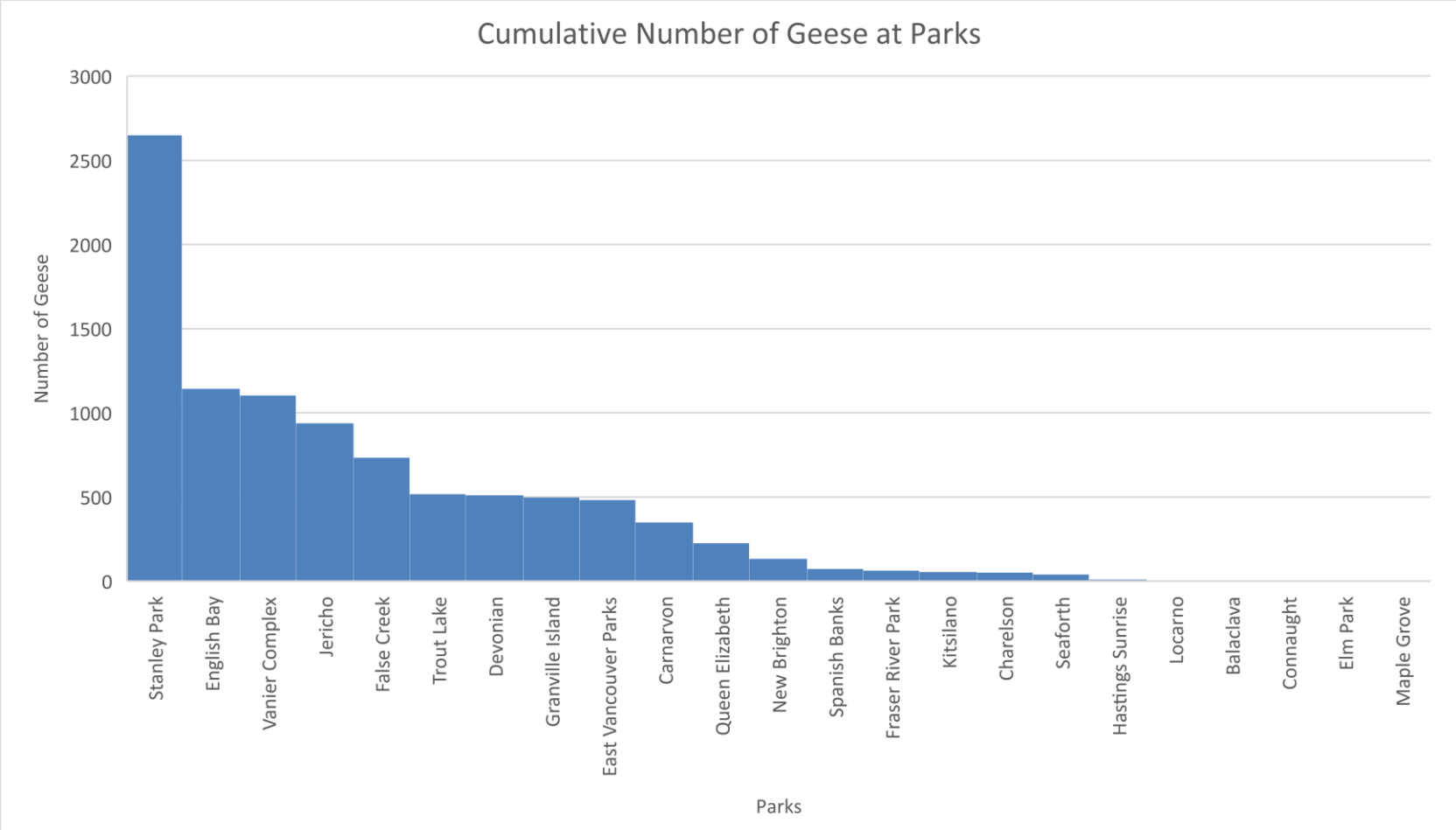


Figure 4. Cumulative number of geese displayed form most to least goose observations.

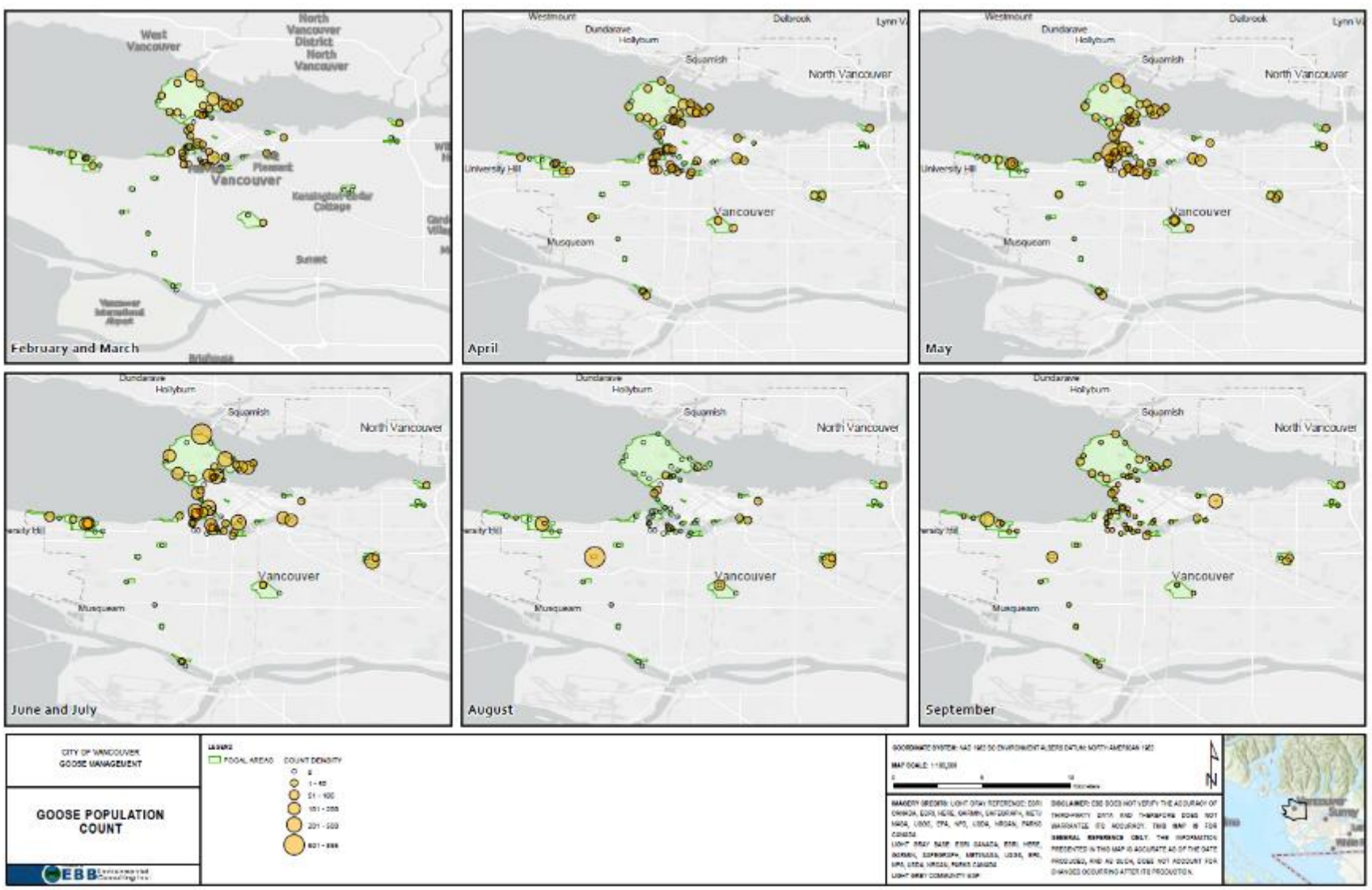


Figure 5. Data expressed as density circles at each count location for each survey period

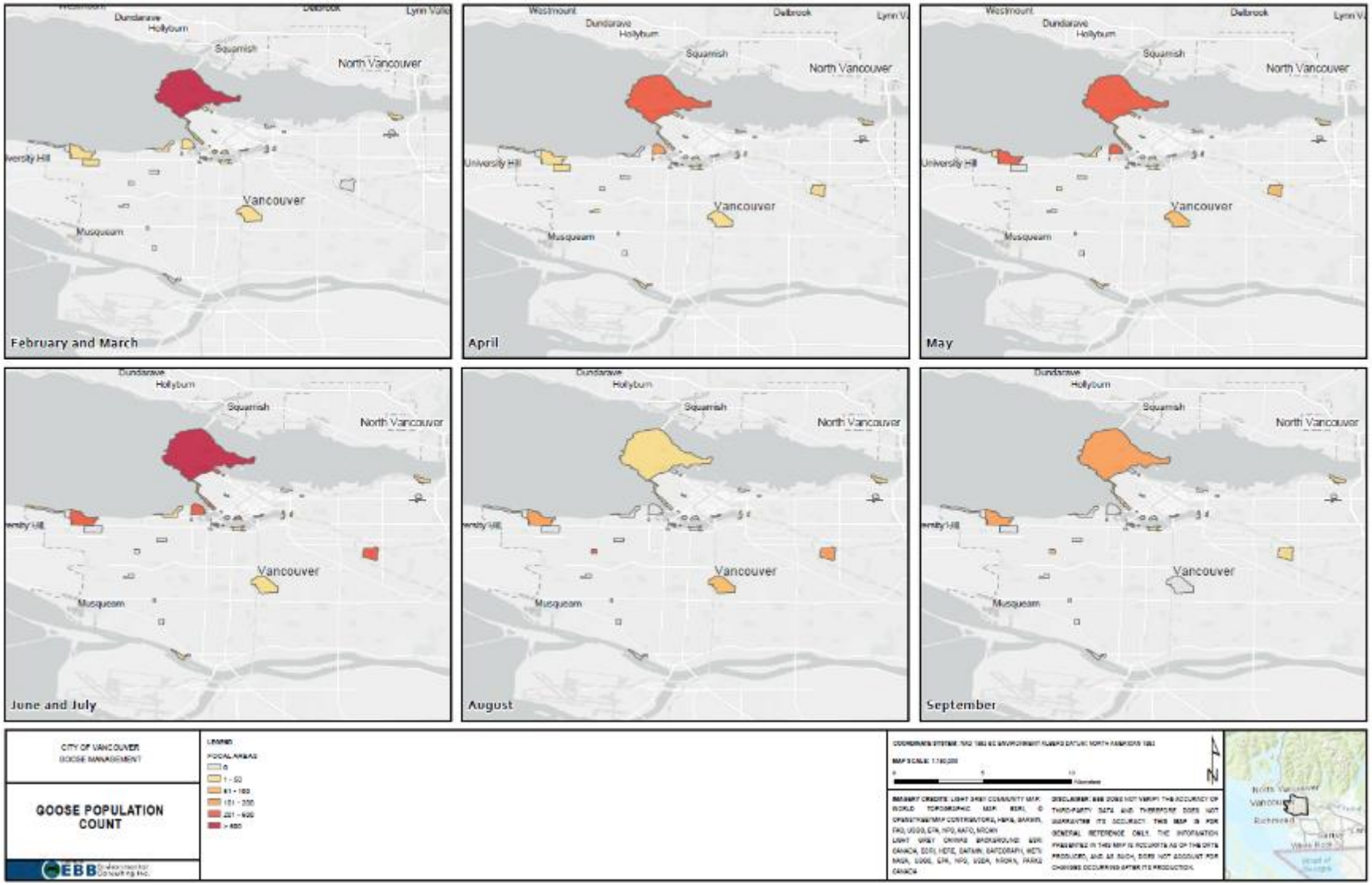


Figure 6. Count data expressed as relative use for each park for each survey period

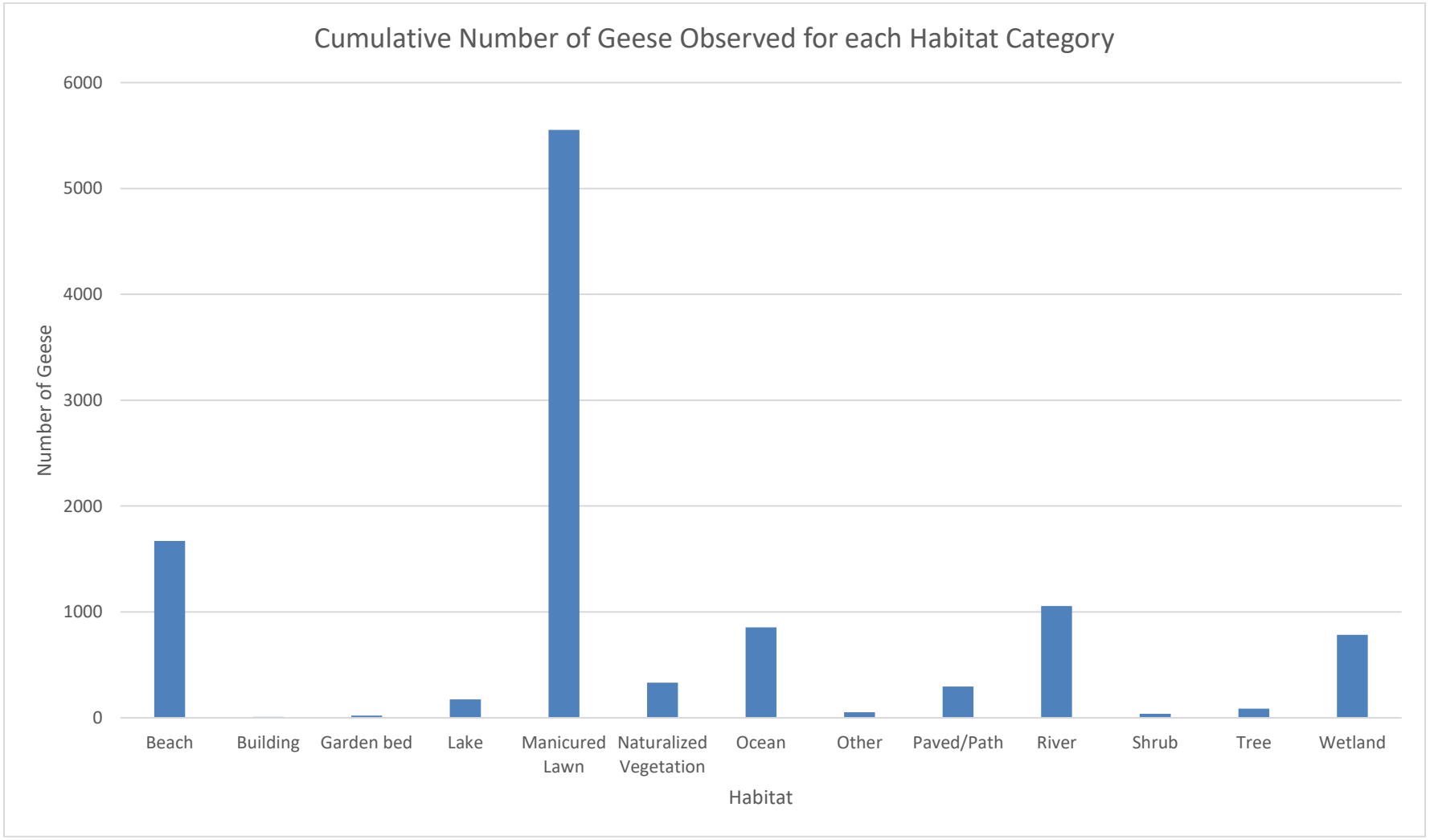


Figure 7. Habitat use by geese.

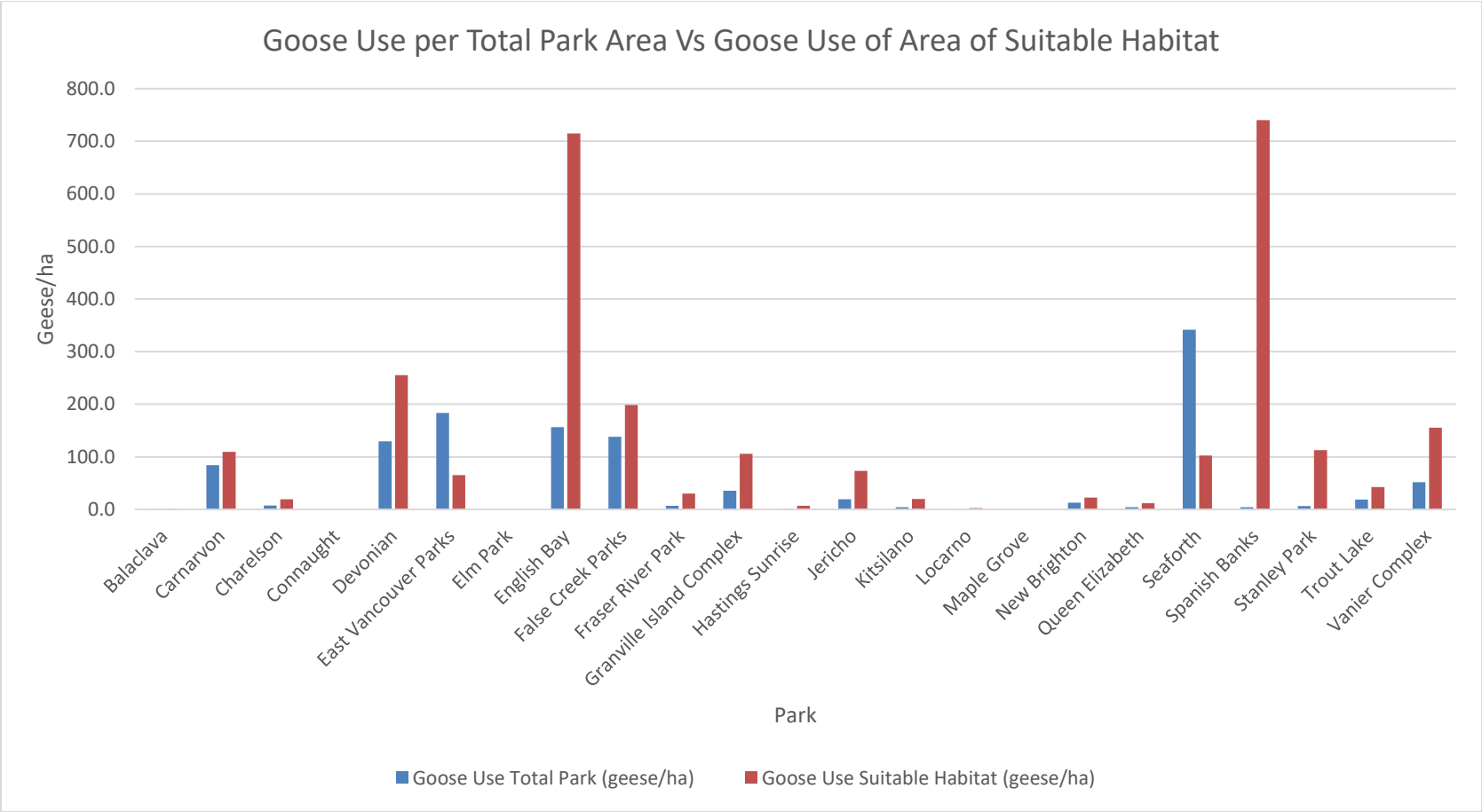


Figure 8. Goose use per total park area and suitable available habitat area in parks

7.0 Discussion

7.1 Population Information

Limitations to understanding the goose population in Vancouver include an inability to complete a census—surveying all areas of Vancouver is not easily achievable. Many areas are inaccessible because they are private property or have safety considerations. In addition, geese are mobile and easily cross municipal boundaries. It is probable that geese observed in Vancouver also use habitat in the larger Metro-Vancouver and Fraser Valley Regions. This was confirmed to some extent during the surveys—a goose with a coded leg-band was observed at English Bay Park on May 25; the goose was banded in Coquitlam in June 2018 during moult. Also, geese were observed moving back and forth between Stanley Park, West Vancouver and North Vancouver (observed from Prospect Point viewing platform), and Fraser River Park and the City of Richmond. We do not have a good understanding of the local (Vancouver) or regional (Metro-Vancouver and beyond) movements of geese, with the exception that we know geese are generally faithful to nesting and moulting areas.

During June, the Vancouver Parks Board (VPB) conducted an independent moult survey of several parks in Vancouver (Lauer 2022a). This three-day survey was conducted by a staff wildlife technician. Where VPB and EBB counts overlapped, data were very similar. The VPB survey was larger in terms of geography and included data from UBC Master's student Dominic Janus and E-bird. Together all four sources of data provide a fairly comprehensive picture of the moult population in Vancouver parks:

- The resident population in parks is in excess of 2100 birds, with greater than 1000 birds regularly using parks that are important to the Park Board during the summer,
- Key park areas used by geese include Stanley, Vanier, Jericho, Sunset/English Bay and Trout lake; however, other parks have variable high use at times,
- Geese are largely using grass/water interface habitats, which concentrates pressure from geese into a narrow range of park habitats.

One difference in the surveys was the estimate of young in the population. The VPB results were 15% young compared to this report's 25%. However, the VPB report stated that goslings were greatly undercounted in observations. A population with 20-25% young will grow quickly, particularly considering mortality rates are low in urban populations (e.g., Pilotte et al 2014). Addling alone, will not control growth—a population estimate of 2100 birds in parks alone, will potentially result in greater than 800 nests in one year, which is substantially more than the number addled each year in the City.

7.2 General Recommendations

The Park Board intends to develop a plan to describe the process the Park Board will adopt to undertake goose management. Once adopted, implementation will require many years. Until a comprehensive plan is implemented, the Park Board can take some operational steps. The Park Board must recognize that these options will not reduce the number of geese in the City but may shift goose behaviour to reduce pressure at

key sites and increase awareness. Monitoring (with systematic reporting) must be conducted to understand effectiveness and value of mitigation techniques, and to look for opportunities to adapt goose management. The focus of interim mitigation will include choosing where to actively exclude geese, and where geese will be allowed.

Park Operators:

- Work with park operators who know details of their respective parks in terms of when conflicts occur and specific sites so that mitigation resources are efficiently implemented,
- Clearly define allowable areas for geese
- Ensure goals for allowable goose areas are understood—not to encourage goose use, but to relieve pressure from key sites
- Provide operators with public education resources/point of contact to explain management initiatives

Hazing:

- Allocate resources to scare geese at specific parks, using a rotating suite of tools to ensure geese do not quickly adapt
- Techniques not requiring a federal permit could be trialed first--including noise, motion activated sprinklers, hand-held lasers, dogs, windmills (or similar), lights
- Techniques requiring a federal permit include birds of prey, drone/aircraft, firearms (e.g., screechers).

Reduce attractants:

- Ensure staff and public are not feeding geese, particularly at high priority areas, and garbage or other attractants are cleaned up.

Invest in field sweepers

- Allocate resources to clean fields (e.g., sports) and beaches.

Habitat Modification Projects

- Install barriers or plant trees at suitable locations to prevent geese from easily taking off and landing, or walking between water and land
- Barriers can be temporary or permanent and may be done as pilot projects to judge effectiveness before investing in more permanent solutions
- Establish areas where geese are allowed so that they learn where is safe and where is not based on hazing pressure.

Public education

- Include goose-management education in park interpretation/park ambassador programs—this should include the origins of the population so public understand that the nesting population is not native to the City and causes damage
- Ensure programs deliver the same, focused messaging and support addling, allowable goose area pilot projects, signage and other management initiatives
- Understand effectiveness of wildlife signage in parks so that sign blindness, language barriers, or lack of corresponding public education tools do not prevent information from being received as intended

Addling:

- Continue and expand the program
- Examine the recent gosling count and nest data to identity areas that need increased effort
- Develop a documented protocol which includes field techniques and how data are collected and stored,
- Consider alternate protocols to egg replacement or removal to increase efficiency and effectiveness
- Develop a communications plan to increase reach and understanding (public and staff).

Standardized population monitoring

- Establish monitoring to assess population growth, park use, and response to management programs (e.g., addling and hazing),
- Establish a population level in parks or other metric that can be used as a management benchmark.

Engage partners

- Engage with other jurisdictions and shareholders to understand goose issues at a regional level
- Lay the foundation for building a larger-scale program—e.g., common messaging, shared resources
- Investigate funding opportunities.

7.3 Example Mitigation Options

The following example mitigation options were selected based on survey results at these sites:

Stanley Park Second Beach:

- Conduct hazing using a rotation of techniques, so geese do not acclimatize to any one tactic—this may be a good site for hand-held laser, noise, and dog in a variety of combinations
- Hose pool decks down to reduce feces, but do not allow ponding of water
- Leave lawns uncut and not irrigated in the summer
- Enforce no-feeding by-laws

English Bay and Sunset Beaches:

- Geese move freely between these parks and across to Vanier Park
- Simultaneous hazing to move geese away from parks—ensure hazing is such that geese do not just return from water as soon as hazing is completed (e.g., early morning laser, followed by dog or bird of prey)
- Allow early morning off-leash hours
- Allow geese to use a different area until population numbers are lower, (recognising that this choice will be challenging for the Park Board). For example, Vanier Park does not have playing fields and could accommodate geese from shoreline parks
- English Bay and Sunset Beach may be good sites to increase public communication—e.g., partnering a park ambassador (park naturalist/park interpreter or summer student) with a bylaw officer to first educate, then enforce no-feeding bylaws.

Jericho:

- Increase nest searching at this park and adjacent area to reduce number of young
- Hazing from playing fields, but allow geese in some areas until the population is lower (e.g., allow east field adjacent to 4th Avenue)
- Install barriers or modify habitat to separate the areas where geese are/are not allowed

Trout Lake:

- Install a retractable barrier at the south end of the lake that prevents geese from moving between the beach and the lake (see Appendix B). This could be done as a seasonal pilot project with snow fence and then a more permanent installation based on effectiveness
- Similarly, install barriers between beach area and grassy fields
- Enforce no-feeding by-laws
- Allow early morning/seasonal off-leash hours at the south end

8.0 References and Resources

Balkcom, G. 2010. Demographic parameters of rural and urban adult resident Canada geese in Georgia. Journal of Wildlife Management 74(1):120-123.

Banks, R.C., C. Cicero, J.L. Dunn, A.W. Kratter, P.C. Rasmussen, J.V. Remsen, J.D. Rising, and D.F. Stotz. 2004. Forty-fifth supplement to the American Ornithologists' Union check-list of North American birds. The Auk 121: 985-994.

Begon, M., J.L. Harper, and C.R. Townsend. 1996. Individuals, Populations, and Communities. 4th ed. Blackwell Scientific Publications, Boston, USA.

Campbell W.R., N.K. Dawe, I. McTaggert-Cowan, J. M. Cooper, G.W. Kaiser, and M.C.E. McNall. 1990. The Birds of British Columbia Volume 1. Royal British Columbia Museum, Victoria

City of Vancouver. 2010-2021. 311 reports containing keywords "goose" or "geese."

City of Vancouver. 2022. Parks and recreation. Available at: https://vancouver.ca/parks-recreation-culture/parks-gardens-and-beaches.aspx. [Accessed September 22, 2022].

Dawe, Neil K, and Andrew C. Stewart. 2010. The Canada Goose (*Branta canadensis*) on Vancouver Island, British Columbia. British Columbia Birds 20: 24-40.

Elphick, C., J.B. Dunning Jr., and D.A. Sibley. (eds.) 2001. The Sibley Guide to Bird Life and Behaviour. Alphred A. Knopf, New York.

Environment Canada. Ecological framework of Canada. Available: http://www.ecozones.ca/english/region/196.html [accessed September 10, 2022].

Environment Canada. 2003. Hinterland's Who's Who: Canada Goose. Available at: http://www.hww.ca/en/wildlife/birds/canada-goose.html. [Accessed September 14, 2022].

Environment Canada. 2010. Handbook, Canada and Cackling Geese: Management in Southern Canada. Canadian Wildlife Service. Environment Canada.

Government of Canada, Statistics Canada (February 9, 2022). Profile table, Census Profile, 2021 Census of Population - Vancouver [Population centre], British Columbia. Available: www12.statcan.gc.ca. [Accessed September 5,2022].

Jones, Z. 2022. 2021 Goose Report. Unpublished report for Vancouver Park Board.

Lauer, K. 2022. Canada Goose Egg Addling Program Technical Report 2022. Internal report. Vancouver Parks Board.

Lauer, K. 2022a. Population Survey Report of Canada Geese (*Branta canadensis*) in the City of Vancouver 2022. Internal report. Vancouver Parks Board.

Migratory Birds Convention Act, 1994 (S.C. 1994, c. 22). Current to September 11, 2022. Minister of Justice. Available at: https://laws-lois.justice.gc.ca/eng/acts/m-7.01/

Migratory Birds Regulations 2022 (SOR/2022-105). Current to September 11, 2022. Minister of Justice. Available at: https://www.laws-lois.justice.gc.ca/eng/regulations/SOR-2022-105/index.html#hist

Mowbray, T. B., C. R. Ely, J. S. Sedinger, and R. E. Trost. 2002. Canada Goose (*Branta canadensis*). *In* The birds of North America, no. 682. A. Poole and F. Gill, editors. The birds of North America, Inc., Philadelphia, Pennsylvania

Pierce, J.R. 2016. Understanding and Managing Resident Canada Geese in Vancouver. Report for the Vancouver Park Board and City of Vancouver

Pilotte, Catherine, Reed, E., Rodrigue, J., and Giroux, JF. (2014). Factors Influencing Survival of Canada Geese Breeding in Southern Quebec. The Journal of Wildlife Management. 78. 10.1002/jwmg.666.

Simmons, M. and A. Nightingale. 2011. The Canada goose on southern Vancouver Island--is it an alien and invasive species? The Victoria Naturalist Vol 67.6 (2011).

Smith, D. W. 2000. Management of Canada Geese in the lower Fraser Valley, southwestern British Columbia. p. 151-158 in Dickson, K.M. 2000. Towards conservation of the diversity of Canada Geese (Branta canadensis). Canadian Wildlife Service, Ottawa.

Smith, D.W., G. White and G. Grigg. 2005. A Handbook for the Control of Problem Canada Geese, Revision 2005. Environment Canada Canadian Wildlife Service Pacific Wildlife Research Centre, Delta BC.

Worcester. R. 2010. State of the Park Report for the Ecological Integrity of Stanley Park. Stanley Park Ecological Society.

APPENDIX A

Project Photographs

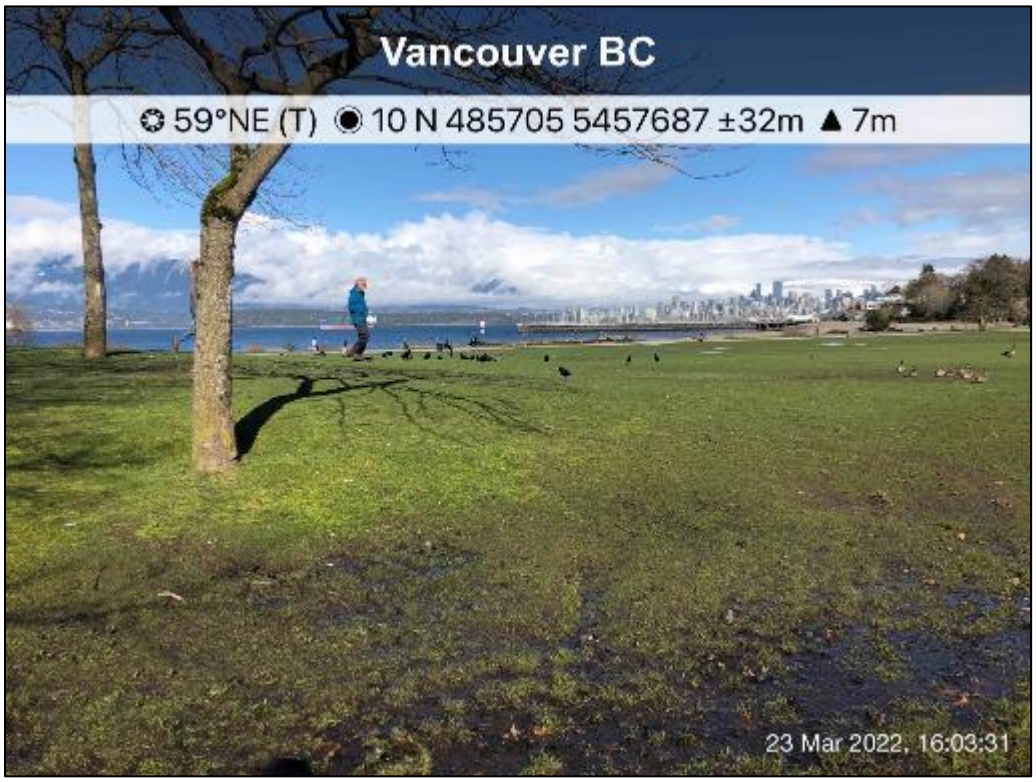
Large number of goslings in Sutcliffe Park in May (Granville Island)

Large number of goslings remain in Sutcliffe Park in June (Granville Island)

Goose family groups at Creekside Park in the evening, unfazed by public

Moulting geese using shade at David Lam park

Moulting geese walking to the beach from the grass at Jericho Park



Geese and crows being fed at Jericho Park

Geese grazing on irrigated grass at Carnarvon Park


Goose not concerned about surveyor's car at Stanley Park

Traffic hazard at Queen Elizabeth Park

Recently hatched goose family at south end of Trout Lake

APPENDIX B

Examples of mitigation

Example 1: Temporary barrier at Como Lake, Coquitlam BC

Green snowfence with signage is placed each year prior to moult to prevent geese from accessing the shoreline.

Example 2: Semi-permanent Barrier at Alta Lake, Whistler BC

Retractable nets have been installed at Alta Lake, Whistler BC. Parks staff roll up the nets in the morning and extend nets in the evening to prevent geese from accessing the shoreline. The black barrier (foreground) blocks the small space between the post and the wharf. The posts remain throughout the year, but nets are seasonally removed. This is most effective during moult.

Example 3: Permanent shoreline habitat modification, Penticton BC

Penticton underwent a waterfront revitalization project in 2015. The City incorporated features that assist in preventing geese from accessing shoreline parks from the water.

Before: Geese have unobstructed access between Okanagan Lake and park shoreline (June 2012; source Penticton Parks)

After: Plantings and fencing provide barriers that help prevent geese from accessing the shore. In addition, design and improved walkways are inviting to park users, including dog walkers, whose presence discourages geese from accessing the area. Since this photo (November 2015), the plantings have grown providing a stronger barrier.

Example 4: Scare Windmill, Naramata BC

This is one of several scare windmills that have been placed along Naramata's waterfront parks. They have been successful as part of the scare program, which also allows off-leash dog use of parks outside of peak hours and scaring of geese in the early morning hours during beach clean-up.

Example 5: Communications

Creative signage prevents "sign blindness" where users no longer see or respect signs. Consistent messaging and noting consequences increase message effectiveness.