



Stanley Park Heronry Annual Report

2023 Season

Overview

Another Stanley Park heron breeding season has come to an end. SPES staff successfully monitored the Pacific Great Blue Heron (*Ardea herodias fannini*) colony located at the Vancouver Park Board office along Beach Avenue, adjacent to Stanley Park. SPES personnel noted another year of the herons returning to this colony, with sightings and behaviour consistent with previous years. 2023 represents the 23rd consecutive year the great blue herons (GBHE) have returned to this location since 2001.

2023 saw a continuation of an increase in Park visitorship, as numbers return to pre COVID-19 levels. Additionally, the Festival of Light fireworks returned for a second year in English Bay, after a two-year hiatus during the COVID-19 pandemic. It is important to consider changes in human activity in these surveys as the Pacific Great Blue Heron can be vulnerable to anthropogenic disturbance (Vennesland, 2006).



Figure 1. Heron at Lost Lagoon on 6 July 2023 (Photo: Frank Lin)

This year also marked a significant change in the survey methodology used by SPES. To minimize sampling bias and improve accuracy in heron productivity estimations, SPES shifted to both rooftop and ground surveys. This change allowed us to monitor the entire colony, and derive metrics without the need to make sampling estimations, which can introduce bias and influence overall accuracy of results. This change was necessary as the colony itself has greatly changed in the past 20 years, and our previous methodology was not capturing such shifts. This change in how surveys are conducted and analyzed has led to some novel results, which we feel are more closely representative of the actual population metrics for this heron colony.

The 2023 monitoring results differ from previous years in various regards and must be compared within the context of these methodological changes. Previous heron report metrics are therefore not as easily comparable with the 2023 dataset. This is because the way we measure productivity, nest success and general sampling metrics have changed. Our updated methodology overhaul was done to reflect changes in the colony since the formation of this survey back in the 2000s. In addition, by updating our methodology to be more in line with methods used in surveys of other colonies in the Lower Mainland (eg. Jones et al. 2013), our data can be used in contrast to other colonies and can help us compare the Stanley Park colony to other nearby colonies. Importantly, we will better detect changes in trends related to breeding productivity.

These changes have resulted in different population estimates and other metrics relative to past reports, however we feel this change was necessary. By updating our protocols and methods, SPES will have the ability to make more confident recommendations to the Vancouver Park Board with respect to heron management. New methodology suggests that the heron population at the colony is smaller than previously estimated. However, the findings from this year also provide evidence that the colony remains stable.

Background

This report details and summarizes key metrics for the heron colony (the “heronry”) located near the Vancouver Park Board office. An area map of the nesting trees can be found in **Appendix 1**.

Pacific great blue herons (*Ardea herodias fannini*) are protected under the *Migratory Birds Convention Act*, the *BC Wildlife Act*, and are designated as a blue-listed species (BC Ministry of Environment). With nearly 60% of BC’s Pacific GBHE population found in and around the Lower Mainland (BC Conservation Status Report, 2022), the productivity of

this heronry has important wildlife conservation implications for the viability of the whole subspecies.

SPES has been actively involved in the monitoring and conservation of the GBHE colony within Stanley Park since 2002. Our findings contribute to the regional efforts of many groups that study their local populations and are crucial to these birds' conservation. Nest productivity and nest success are key measures of the suitability of the Stanley Park colony's current location; therefore, special attention by SPES is dedicated to continually seek to improve accuracy of estimates of these metrics. Because herons are sensitive to disturbance in their immediate nesting area and feeding grounds within a 3 to 5 km radius (VPB, 2006), results from our monitoring may reflect changes in the quality of those habitats, or the overall habitat suitability for these herons. Sharp drops and sustained negative trends to these measures may precede colony abandonment wherein the herons discontinue using this location in favour of another.

Monitoring Program

Methodology

As previously mentioned, this year marked a significant change in how we conduct our heron surveys, and how we analyze the results. Our updated and current methodology design was informed by GBHE survey protocols written for the Heron Working Group and similar organisations that research these herons (Vennesland, 2006). Changes in our survey protocol this year are intended to bring our protocol closer in line with the method indicated by the Heron Working Group for the *fannini* subspecies (Vennesland & Norman, 2006), while still considering situational factors unique to our colony.

Staff surveyors completed a pre-season nest count on 24 January 2023. Staff and volunteer surveyors then completed eleven (11) surveys of the colony from March – July as herons arrived, raised their young, and fledged. On 3 August 2023, the Urban Wildlife Programs Coordinator completed a walkthrough of the colony and surrounding area, observing no further breeding activity, confirming the end of the breeding season.

Methodology Updates

In previous years, many heron nests were concentrated near Park Lane, in trees just south of the main tennis courts. Over time, because of a loss of these trees (due largely to windstorms, tree age and poor soil conditions), herons have increasingly nested within new trees further northwest, in-between the tennis courts. Previous

methodology involved conducting surveys to assess the nests in trees adjacent to Park Lane, then extrapolating this sample to the colony as a whole to predict key population metrics. Due to the shifting conditions of the heronry, as time progressed, this sample became less representative of the colony, and has facilitated the need for SPES to change how these surveys are conducted.

In 2023, SPES began surveying the entire colony through both rooftop and ground surveys. This was done to reduce sampling bias as a result of overrepresentation of heron nests visible only from the rooftop. This overrepresentation in our sample was likely leading to flawed population metric estimates. To account for more nests being built in areas less visible from our rooftop, SPES began also surveying from the ground, effectively surveying all nests across the colony, ensuring that these newer nests, mainly located in trees between the tennis courts, were not underrepresented.

In our previous methods (prior to 2023), we may have been biasing our population metric estimates, as we were not accurately capturing the shifting nature of the colony. By amending our methodology and surveying the whole colony via the addition of ground surveys, we can get a better estimate of the overall activity across all nests. This will help lead to an increase in the overall accuracy of our survey results as it pertains to the entire colony, as we no longer require the need to extrapolate results from only a subset of the colony's population.

It is important to re-evaluate survey methods periodically, as over time surveys may need to be adjusted as conditions change. SPES observed that conditions around the heron colony have changed within the past few years, including the survey area. A potential future avenue for exploration may be whether the loss of historic nesting trees along Park Lane is linked to these new nesting observations.

Monitoring the entire colony was not initially feasible for SPES, however, SPES now feels more confident in being able to assess the entire heron colony to increase the accuracy of our estimations of key metrics surrounding the colony. Another benefit of this updated methodology is that by including ground surveys conducted adjacent to the tennis court area, we also were able to record evolving nesting activity as the season progressed. This new method allows our survey to respond to the colony's dynamic nesting processes as they spread from historic trees into new trees at the site.

Another new change this year was in relation to when we assessed observed juveniles as fledged. In our previous reports, we counted chicks we directly observed at an estimated ten weeks of age as fledged and used this count to create our projected nest success. This was an overly restrictive criteria compared to the suggested methodology published by the Heron Working Group (Vennesland & Norman, 2006).

We are now following the criteria indicated in the Heron Working Group Survey Protocol, which indicates chicks observed at the age of 4 – 6 weeks should be counted as likely fledged if their nests become later obscured by foliage during the survey. We continue to count juveniles who remain visible throughout the survey and fledge between 8 – 10 weeks as expected.



Figure 2. Heron with eggs on 15 June 2023 (Photo: Frank Lin)

A breakdown of confirmed fledged (juveniles observed at the age of approximately 8 – 10 weeks) and likely fledged (as per the Heron Working Group protocol) for this year's numbers can be seen via **Figure 6**.

It is important to capture the estimates of chicks that may have fledged despite their nests becoming obscure using these established norms as failing to do so may lead to artificially deflated nest productivity rates for the colony.

These methodology changes mean that our results will look different from previous years. Due to these improved changes, raw count totals will appear markedly different from previous years' totals, and as such, they are not directly comparable. As a result, we are providing summary results for this year (see **Table 1**) as well as a summary of the last ten years of pre-season nest counts (see **Figure 5**). These results for 2023 are to some degree still affected by survey changes and will be more directly comparable to future years' data using the same methodology. Finally, modifying our existing methods

to follow the Heron Working Group protocol more closely will assist in making our reports more comparable to other reports that use the same protocol, increasing the utility of this report.

Results

Year	Maximum Observed Nests	Observed Active Nests	Successful Nests	Fledges	Nest success rate	Colony productivity*
2023	90	77	41	61	46%	0.79

Table 1. A summary table of results from this year’s colony monitoring. *Colony productivity estimate is impacted by changes in survey methods. Definitions for terms are available at the end of this document (see Appendix 4).

Timeline

Last year, the herons were observed to have arrived on 17 February 2022, with nest building and breeding behaviour being observed on 23 March 2022. This year showed a similar trend in arrival, with a volunteer first observing seven (7) herons in the Stanley Park area on 7 February 2023. Nesting and breeding behaviour was observed on 28 March 2023. The first recorded observations of egg laying at the colony occurred on 11 April 2023. Heron couples were observed to have laid eggs well into June this year.



Figure 3. Heron chicks estimated age 6 weeks, 15 June 2023 (Photo: Frank Lin)

“Branching” behaviour was recorded for the first time on 28 June 2023. Branching can be described as when juvenile herons begin moving from their nest to nearby branches by hopping and gliding to strengthen their wings. The first fledges likely began near late June 2023 with the first fledge recorded on 13 July 2023. While Pacific GBHE chicks usually fledge after 60 days (or 8 – 9 weeks) from hatching (VPB, 2006), some fledglings in this colony have been found to leave later than average, at 10 – 12 weeks after hatching. Many young herons were observed hunting for fish at Lost Lagoon after fledging (**Figure 4**). Please refer to **Appendix 3** for additional details on nesting behaviour.



Figure 4. Juvenile heron at Lost Lagoon, 29 July 2023 (Photo: Frank Lin)

Colony Counts

Provided below is a summary of the observations made by surveyors in the season (**Table 2**). Pre-season nest counts are taken prior to herons arriving at the colony to determine how many pre-existing nests remain at the heronry. Maximum nest numbers are taken from the survey week with the highest numbers of observations for each category. Other definitions pertaining to population and nesting metrics can be found in **Appendix 4**.

Pre-Season Nest Count	Maximum Nests Observed in Season	Maximum Active Nests Observed in Season	Successful Nests	Estimated Fledges
93	90	77	41	61

Table 2. A summary table of results from this year's colony monitoring.

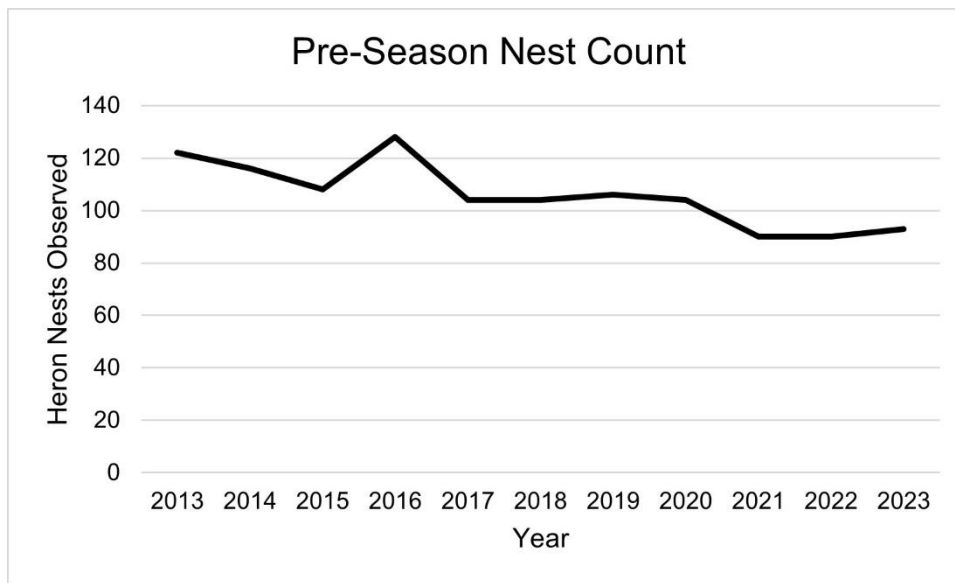


Figure 5. Historic and current pre-season nest counts at the Heronry (2013 – 2023).

Analysis

Trends

In a review of nesting success and productivity, Vennesland & Norman (2006) found that the metrics for our region regarding the *fannini* subspecies of heron ranged from 1.70 – 1.80 fledges per successful nest between 2002 and 2004. As noted by the BC Conservation Data Centre (BCCDC 2022) in their 2022 update on the *fannini* subspecies, population level trends are currently uncertain, though nest productivity may be declining.

The nest productivity for the Stanley Park colony during the 2023 season was 0.79 fledges per successful nest (**Table 1**). In light of possible downward trends in nest productivity region wide since 2008 (BCCDC, 2022), it is not unexpected for nest productivity numbers to show some level of decline. However, the steepness of the decline should be evaluated within the context of the change in survey methodology. New survey methodology suggests that there are fewer herons on site than previously

estimated, and the addition of ground surveys may capture more empty nests than the previous methodology. This will naturally lead to a reduced productivity calculation than in previous years. This methodological change from previous years’ calculations likely means that this year’s productivity estimate is more reflective of the true productivity of the colony. For context, in surveys conducted during the 2005 and 2006 field season across 15 heron colonies in the Fraser Delta region, colonies that were situated 200 meters (m) or more away from a territorial eagle nest had an average nest productivity rate of 1.04 in 2005 and 0.93 in 2006 (Jones et al., 2013). Stanley Park hosts several territorial and reproductive eagle nests, however none are within 200 m of the heron colony (see **Figure 7**).

Please refer to **Appendix 4** for an outline of all results from this year’s monitoring and details on how they were obtained.

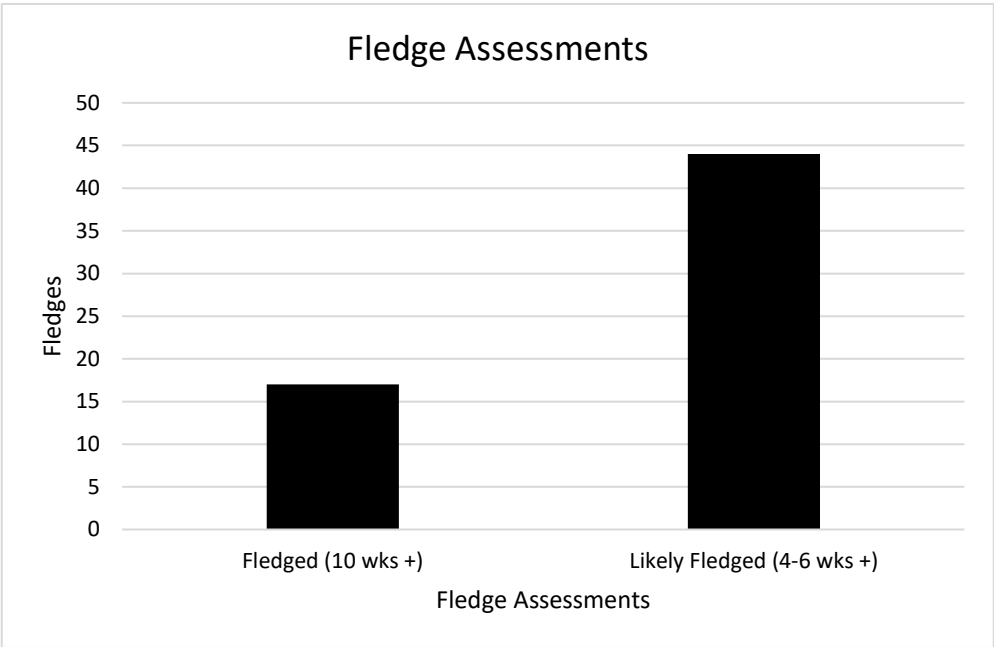


Figure 6. Fledge assessments for 2023.

Our 2023 survey results demonstrate a change in reported nest success from 61% in 2022 to 46% in 2023. However, interpretation of these results must be done with care considering survey method changes. It is possible that some amount of this change observed between 2023 and prior years was driven by the fact that the survey area had increased to include the entire colony. This methodological change means more empty nests are included within nest totals. This addition of more empty nests may influence results relative to previous years. In previous years, only a subsample of the colony was

surveyed, and results extrapolated to the whole colony. These subsamples may not have been representative of the number of empty nests in the entire colony. It may be the case that previous years' nest productivity estimates may be somewhat over-inflated relative to 2023 due to issues with colony nest site changes and sampling bias issues discussed previously in this report. This explanation would therefore account for some of the reduction in the nest productivity metric. The current results and shift in nest success and productivity using our updated methodology may represent a more accurate assessment of these key metrics in relation to this colony than in previous recent years.

Pacific great blue herons are known for a relatively high level of nest abandonment, as they repurpose old nests as well as construct, deconstruct, and reconstruct nests (Vennesland & Norman, 2006). Our previous methodology was limited in capturing the impacts of this behaviour and identifying trends associated with nest use. By updating our surveying methods to now include the entire colony, we will be able to get a more accurate assessment of the level of nest use and abandonment in this colony over time. As we continue using our updated methodology, we will be able to identify trends in nest use and abandonment, which will help strengthen our understanding of the colony and its overall stability.

Environmental Factors

Numerous environmental factors can influence the productivity, nesting success and other key metrics related to the heron colony within Stanley Park. It is important to consider these factors in the context of interpreting the results of this report. Shifting environmental factors may influence overall colony health, therefore SPES tracks these qualitative factors to better understand their impacts on the herons throughout the nesting season.

Raccoon Predator Guards

In 2010, SPES installed bands of metal flashing near the base of the nesting trees to block raccoons (*Procyon lotor*) from climbing up to prey on the heron eggs. The flashing continues to be effective; no raccoon attacks have been reported since the flashing was installed. SPES continues to periodically remove and update flashing where necessary, especially as herons shift to nesting in new trees.

Eagle Predation

Bald eagles prey on herons and are one considerable factor influencing productivity of heron colonies. Both species' ranges overlap in coastal and riparian habitats, and both

also overlap in their breeding season timing. The presence of eagles can affect the choice of location for heronries as well as fledgling success due to eagle predation on heron eggs and chicks (BC CDC, 2022). Some emerging research indicates that the recovery of eagle populations may be influencing heron nesting behaviour (Jones et al., 2013). These findings will be described further in our discussion, with mention of potential future monitoring opportunities in the Park.

There were three (3) active eagle nests recorded in 2023, producing five (5) eagle fledglings (SPES, 2023). These numbers are identical to last year's eagle metrics. Volunteers and members of the public reported eagle predation at the colony through the season. Late heron fledglings may have come from parents that double-clutched, possibly due to eagle predation on their first clutch.

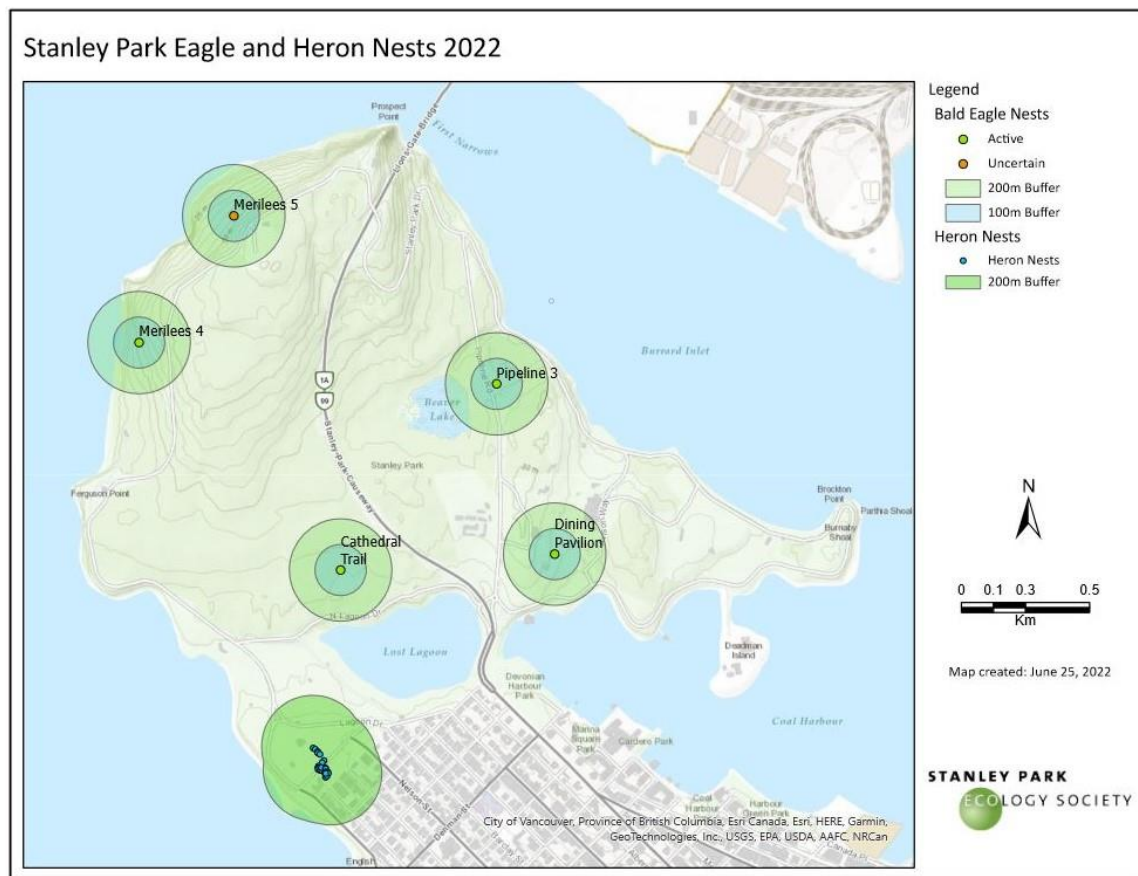


Figure 7. Eagle nest and heronry locations in Stanley Park (2022).

Surrounding Areas

This year marked the second Celebration of Light fireworks at English Bay since the two-year closure during the COVID-19 pandemic. The event occurred on 22, 26, and 29 July

2023. Both SPES and VPB were in close communication in the weeks leading up to the event and proactively monitored the status of the colony to determine if the herons would fledge before the event. This was due to concerns about potential disruptive effects of the event on the colony, as the event coincided with a sudden movement of herons leaving the colony in 2022.

In 2023, we observed 18 juveniles and no adult herons on the survey directly preceding the firework celebrations. The small number of fledglings remaining was a positive sign that fledging was mostly or entirely complete by the end of the Celebration of Light events, meaning that disruptive noise impacts to the colony were probably minimal given that most juveniles had already fledged at this point. Our final monitoring survey was conducted on 29 July 2023, and coincided with the fireworks event which occurred that evening. During that final survey SPES personnel observed eight (8) juveniles and no adults. In both of these surveys, the juveniles that remained in the colony frequently exhibited branching and flying behaviour. This likely indicates imminent fledgling, therefore concern of disruptive impacts to these juveniles was minimal. Due to the gradual waning of activity before and after the fireworks, the observed normal fledging behaviour, and the older age of the juveniles, the impacts of the Celebration of Light on the colony was likely negligible.

Discussion

Colony Dynamics

The new survey protocol may assist in examining and explaining questions about the colony site that may influence colony dynamics and trends in the heron population. One question that emerged over the course of the season was whether changes in the urban forest around the colony (such as tree losses, tree growth, and tree introductions) impact colony nesting dynamics such as nesting locations. Another was whether the age of the colony impacted the rate of unused nests in the season. Given that heron presence has been continuous for many years and nesting patterns have changed, it is possible that the proportion of empty nests may also contain historic nests that are no longer used by the herons and have not fallen or been cannibalized. These nests would not reflect breeding failures and subsequent years of whole-colony observation and mapping may assist in locating any historic inactive nests present.

Eagle Presence

‘Predator protection’ is a phenomenon observed in nature where a prey species will choose to live near their own predator when that predator is a territorial animal that will defend its territory from other predators (Jones et al., 2013). This phenomenon has been observed in several species, including various birds. Jones et al., (2013) also examined the relationship between eagle populations and heron colonies in the Fraser Delta area to understand if the rapid recovery of eagle populations affected heron reproduction and colony dynamics. They found evidence that many of the largest and most successful colonies in the region were not only within 200 meters of a territorial eagle nest, but that some herons had actually shifted their nests to be within range of an already present eagle nest. Cumulatively, the researchers hypothesized that herons in the Fraser Delta may be adapting to higher numbers of eagles for a survival benefit. Their data supported this hypothesis, as while resident eagles did prey on herons and heron chicks, overall colony productivity was higher when colonies were within 200 m of an eagle nest.

This potential trend in heron nesting strategies in response to eagle resurgence in the Pacific Northwest is notable in the context of Stanley Park. While none of the nests currently surveyed by SPES are within 200 m of the Stanley Park colony (see **Figure 7**), SPES has observed eagle flyovers and direct predation at the heron colony. The interaction between herons and eagles is a potential subject to monitor in future years to gain a better understanding of how the Stanley Park heron colony may be adapting to eagle presence.

Public Outreach

The Vancouver Park Board (VPB, 2006) identified public education and interpretative programming as an integral component of the heronry’s conservation management. SPES, in coordination with the VPB, has worked to bolster public outreach in relation to the heron colony, raising awareness of this important species, while highlighting key educational aspects around colony management.

The [Vancouver Park Board Heron Cam](#) was active 24/7 from February until late August, when nests visible to the camera no longer had any herons. This interactive web tool allows viewers to control the camera for short periods of time by scrolling through different pre-defined views and directs them to SPES’ e-mail service for questions about the herons.

SPES EcoRangers —with support from the Park Board— continued to offer live, in-person interpretation at the colony. EcoRangers provided three (3) tabling sessions at the colony this season to give visitors high quality interpretation and education services. Park visitors were given the opportunity to learn about the herons and ask questions right at the colony, and the events were well received.

SPES also continued with its successful ‘The Herons Are Here’ education series. This series consisted of an online, public workshop called ‘The Herons are Here: Heron 101’ in April 2023 as well as an in-person tour of the rookery in July 2023 called ‘The Herons are Here: Rocking the Rookery’. One (1) online webinar for the public called ‘The Herons are Here: Heron Highlights 2023’ was completed on December 2023 and discussed the results of this years breeding season and included stunning photos taken throughout the season by SPES volunteer Frank Lin. This educational series was offered free of charge to Adopt a Heron Nest donors.

Acknowledgements

We would like to thank our volunteers for their efforts in counting Pacific great blue herons through the year—in all kinds of weather and varying conditions. Without their help, the data for this report (and our continued heron conservation work) would not be what it is today. SPES would also like to acknowledge the continued efforts of Frank Lin, who contributed various observations of fascinating heron behaviour as well as numerous high-quality photos throughout the breeding season. We also thank Bruce Mohun for providing regular observations and updates and attending the heron surveys.

SPES also wishes to thank the Vancouver Park Board for their support of the colony through the [online Heron Cam](#) and the promotional efforts of their Communications team. Their efforts have allowed thousands of people from all over the world to connect with nature and view these magnificent birds.

We are deeply grateful to the **26 Adopt a Heron Nest donors** this 2023 season. These contributions go directly towards monitoring the herons and raising awareness of this blue-listed species. We welcome new adopters throughout the year and invite you to [visit our website](#) to learn more!

Lastly, we thank everyone who comes out to the colony to enjoy and learn about these birds. We wish the fledglings well this winter and await the colony’s return in 2024

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Appendices

Appendix 1. Area Map and Nesting Trees

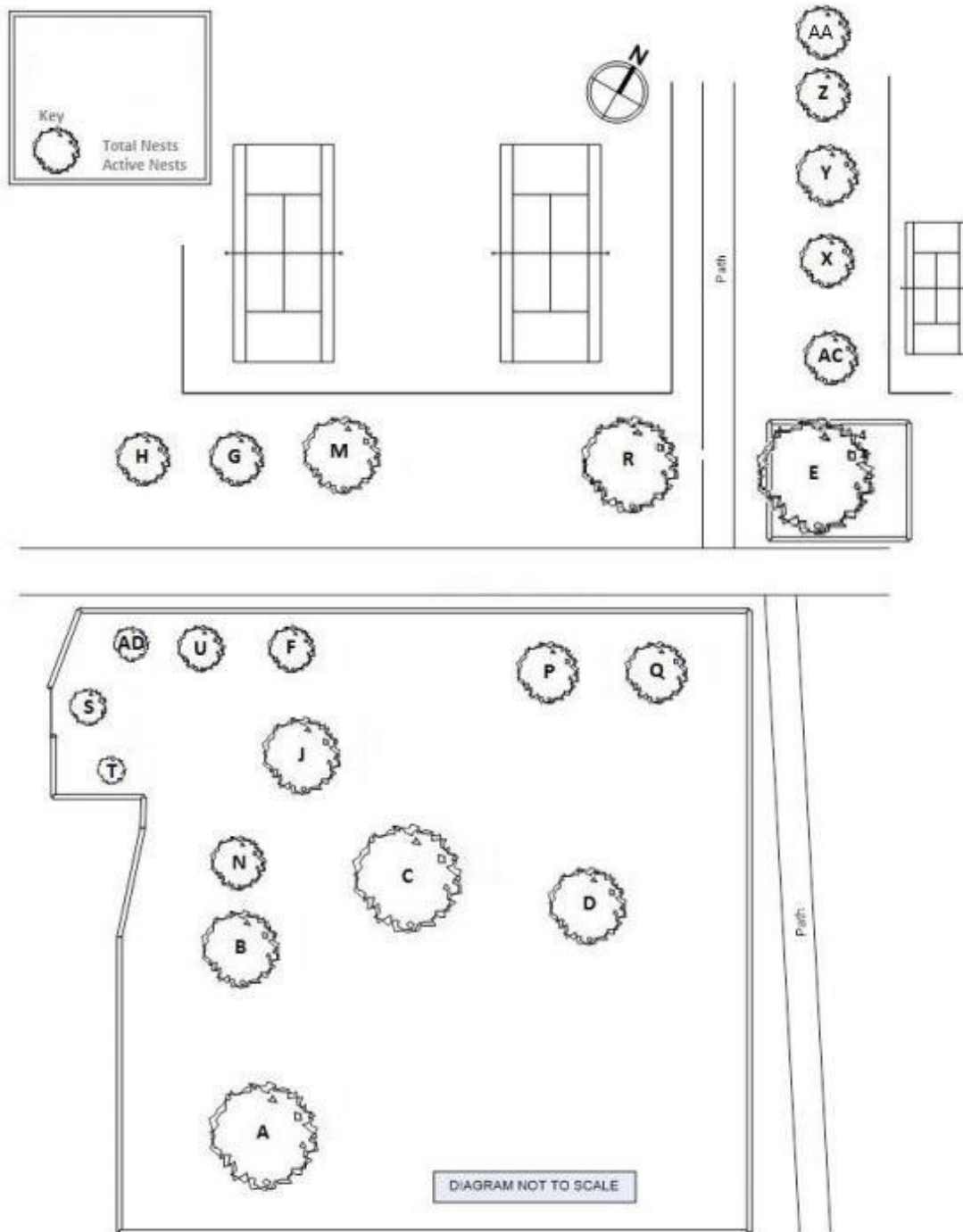


Figure 1. Map of the Stanley Park heron colony layout with nesting trees labelled.

Appendix 2. Survey Methods and Limitations

Please visit our [website](#) to learn more about our survey methods and limitations.

Appendix 3. Notable Trees

Tree AA

Tree AA is a small tree north of Tree Z. Over the course of the survey, herons built nests in Tree AA for the first time, consistent with the trend of the colony expanding into the London Plane trees between the tennis courts. These trees were observed during ground surveys. While these nests were built, it did not appear they were utilized at this time.

Appendix 4. Data Tables

Table 1. Survey counts for total nests, active nests, successful nests, and fledges at the Stanley Park heron colony in 2023. Each measure, associated definitions, and survey sources provided.

Measure	Definition	Result
Total nests	A total count of all nest structures in the trees, both active and inactive. We used the number recorded on the pre-season ground survey. <i>(Source: Ground survey)</i>	93
Observed Nests	Maximum number of nests observed during a single survey during the season. <i>(Source: Rooftop and ground surveys conducted 31 May 2023)</i>	90
Maximum Active nests	Maximum number of nests within the colony occupied by a mating pair during a single survey. Not all active nests successfully produced young. <i>(Source: Rooftop and ground surveys conducted 20 April 2023)</i>	77
Successful nests	Number of sample nests that successfully reared young to the fledging stage. <i>(Source: Survey final analysis)</i>	41
Total Fledges	Number of fledglings assumed to have survived the nesting season and flown their nests. <i>(Source: Survey final analysis)</i>	61

Table 2. Colony success rate and nest productivity at the Stanley Park heron colony in 2023. Each measure, associated definitions, and calculations shown below.

Measure	Definition	Result
Nest Success	Percentage of nests in sample that successfully produced young. (<i>Successful nests / Total nests</i>)	44%
Nest Productivity/Colony Productivity	Measure of fledges compared to number of nests with observed breeding activity. (<i>Fledges observed / Maximum active nests</i>)	0.79