STANLEY PARK ECOLOGY SOCIETY

Stanley Park Heronry Annual Report
2022 Season

Overview

Another Stanley Park heron breeding season has concluded with standard observations from this year's monitoring program. 2022 represents the 22nd consecutive year the great blue herons (GBHE) have returned to this location since 2001.

In 2022, human activity in Stanley Park continued to increase after being reduced due to Covid-19. Additionally, we saw a return of the Festival of Light fireworks in English Bay after a two-year hiatus. It is important to conduct breeding surveys consistently to aid in understanding the potential effects of human traffic on the heron colony.

2022 monitoring results (**Table 1**) are relatively consistent with historical data from previous years and suggest that this location continues to provide viable nesting habitat for these birds.

Figure 1. *Four fledglings on Lost Lagoon photographed on July 13th, 2022*

(Photo: Frank Lin)

Table 1. *A summary table of results from this year's colony monitoring (details on page 3).*

# Total nests	**90**	Colony productivity (fledglings/nest)	**1.24**
# Active nests	**73**	Estimated total fledglings	**90**
Nest success rate	**61%**		

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) and of special concern (COSEWIC). With nearly 80% of BC's Pacific GBHE found in and around the Fraser River Delta (COSEWIC, 2008), the productivity of this heronry has implications for the viability of the whole subspecies.

SPES has been actively involved in their monitoring and conservation since 2002, and 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, for this year and years to come. 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. 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

Our methodology design was informed by GBHE survey protocols written for the Heron Working Group and similar organisations that research these herons (Vennesland, 2006).

From February to August, data was collected during 13 rooftop surveys, nine (9) ground surveys, and weekly monitoring of the Stanley Park Heron Cam. The Heron Cam was launched by the Vancouver Park Board (VPB) in 2015 and is used to supplement our observations from the rooftop and group surveys.

Until April 2022, we obtained the total nest count from ground surveys. After that, ground survey observations became limited due to growing tree foliage. Therefore, for the rest of the season, only a number of nests were visible from the rooftop; these visible nests are the "sample nests". Measures taken from the sample nests were used to infer results for the whole colony. For more details on our survey techniques, limitations, and results from the sample nests, please refer to our website.

Results

Timeline

In 2022, herons returned relatively late to the heronry relative to previous years. The first herons (a total of five) were initially observed on nearby apartment buildings on February 17th, 2022 but they did not fully descend on the nests until March 23rd, 2022 when 64 herons were counted near and in nests. In previous years, the herons would descend on the nests immediately at the start of breeding season, however, this year they congregated on nearby apartment rooftops for many weeks before finally descending into the trees.

Figure 2. A heron perching on a nearby apartment building, overlooking the colony on March 8, 2022

(Photo: Frank Lin)

The first eggs were observed to have been laid on April 4th, 2022 with 25 eggs counted during the rooftop survey. Many residents in the area stated that they found egg shells on the ground due to numerous eagle raids in the area. Juveniles were first observed exhibiting their "flight test" behaviour on June 10th, 2022, strengthening their wings for fledging. The first fledges were likely to have begun around the end of June 2022 with the first fledge recorded and directly observed occurring on July 13th, 2022. While Pacific GBHE chicks usually fledge after 60 days (or 8-9 weeks) from hatching (VPB, 2006), the fledglings in this colony have been found to leave later than average, at 10-12 weeks after hatching.

July 26th, 2022 was the last date with recorded fledges with no fledglings remaining in the nests as of August 10th, 2022. This was the first year the Celebration of Light fireworks returned on July 23rd, 27th, and 30th. Many residents reported the herons

immediately leaving the nests during this time. Please refer to **Appendix 3** for additional details on trees and nests of note during the breeding season.

Figure 3. Nest building and eggs spotted in the nest on April 7, 2022

(Photo: Frank Lin)

Colony Counts

A **total of 90 nests** were counted in 2022. In comparison, 90 were also counted last year with 102 in average over the last 23 years.

25 out of 41 sample nests were observed to be active in 2022. For reference, 30 out of 39 nests were active last year (2021), with an average of 27/38 nests in the last 16 years). At the end of the 2022 breeding season, **51 fledglings** were counted, lower than the 66 fledglings counted in 2021, and lower than the 16-year average of 53 fledglings.

Please refer to **Table 2** in **Appendix 4** for an outline of all results from this year's monitoring and details on how they were obtained.

Analysis

This year's sample nest success **decreased to 61%** relative to last year's 77%. A nest was considered successful when it fledged one or more chicks, as opposed to failed nests that were occupied at one point but did not fledge any chicks. Nest success has been steadily increasing from a nesting success low of 52% in 2017. 2022 however, represents a change in the upward trend of nesting success. The average productivity (number of fledged chicks per successful nest) in the sample decreased this year at **1.24 fledglings/nest** compared to last year's 1.68 fledglings/nest. One potential explanation for this could be an increase in nest predation, as inferred by the increased number of eagle raids reported this year. As not all nests are surveyed, only sample nests that are

used to infer data for the entire colony, there can be limitations to conclusions made for the decline in sample nest success and productivity seen in 2022.

Active nests refer to all nests that are occupied at some point in the season, whether successful or failed. We estimate **73 active nests in the whole colony**, applying the sample nests' active rate to the total nest count taken from ground surveys. The 16-year average is 95 nests. Based on the count of fledglings and active nests in the sample, **we estimated 90 fledglings for the whole colony**. This estimate is a decrease from the previous year (116 fledglings) and is lower than the 23-year average estimate of 127 fledglings.

We note the limitations and assumptions from this study in Appendix 2, which gives necessary context when interpreting the results reported above. These results remain a valuable reference for the condition and long-term trends of the colony and the health of the local GBHE population.

Trends

This year's results add to a consistent trend of colony success over the past 20 years despite a decrease in nest productivity and nest success. **Figure 4** presents productivity and nest success per year since 2007, when SPES began doing rooftop surveys with our current methodology.

This year has seen a significant change to nest productivity since 2007. **This year's outcome (average of 2.05 fledglings per nest) was lower than the historical average of 2.20 nestlings per nest**. There was a decrease in nest success, with **this year's outcome (61% of the total nests were successful) also being lower than the historical average of 73%**. Results for nest success have fluctuated between 54% and 93% over the years. Changes in predation rates from raptor species such as bald eagles (*Haliaeetus leucocephalus*) may play a role in negatively influencing productivity and nesting success. It should be noted however, that most years with low nest success such as 2009, 2011, and 2014 have yielded relatively higher productivity (2.36, 2.00, and 2.44 respectively) compared with years with higher nest success. This may suggest that heron families that successfully reared chicks when other families failed were able to sustain more chicks, possibly due to lower intraspecific competition. This may be a natural result of finite resources in the colony's proximate feeding habitat, though measures for habitat quality are beyond the scope of this study. However, 2017 did not follow this pattern, when both nest productivity and success were low, on a year of particularly high eagle predation through the season. Although this year's numbers are not as low as they were in 2017,

a similar pattern was observed. **Figure 5** plots the estimates of active nests, total nests, and fledgling counts from 2007 to 2022.

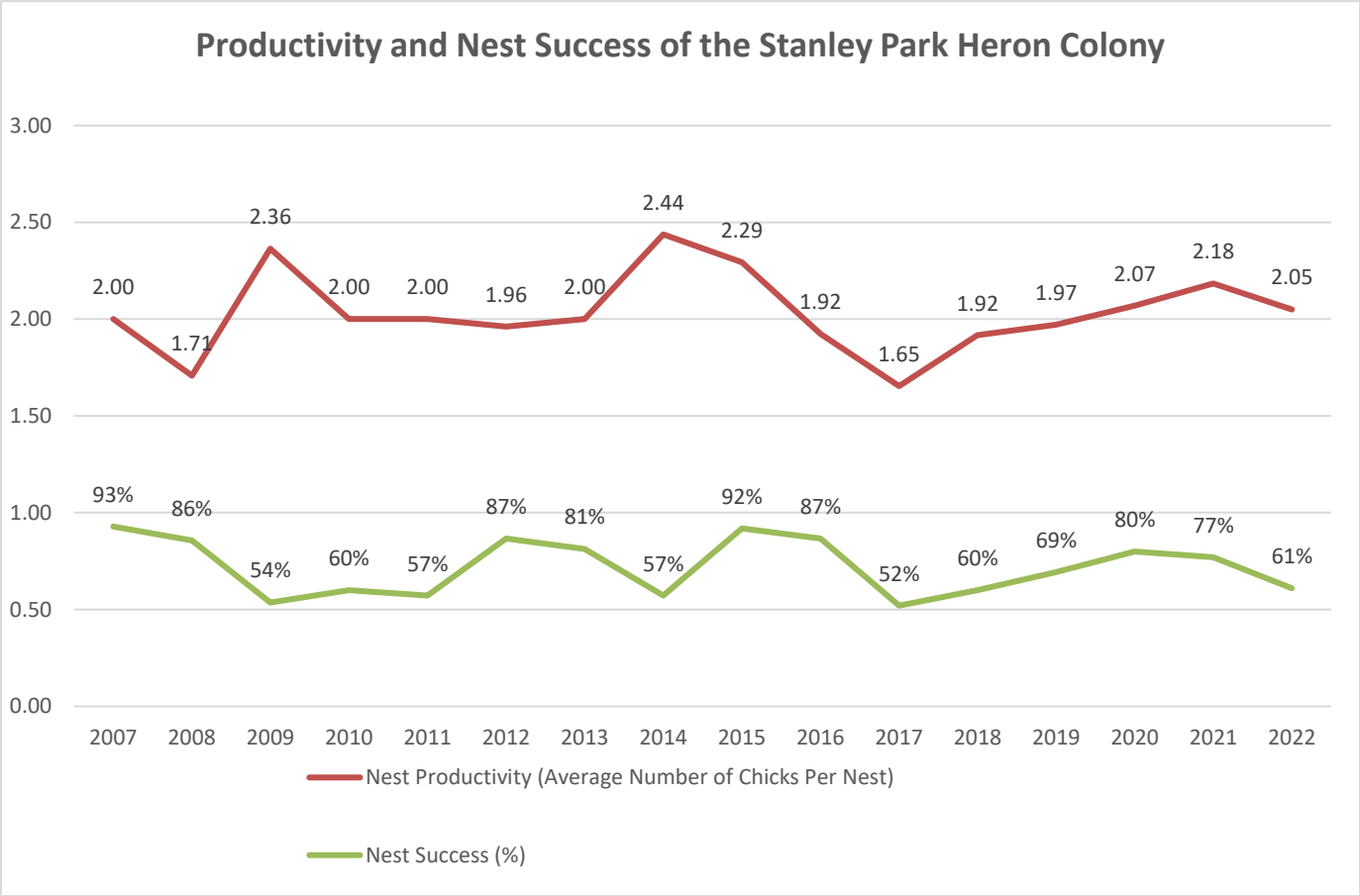

***Figure 4**. Productivity and nest success of the Stanley Park Great Blue Heron Colony (2007-2022).*

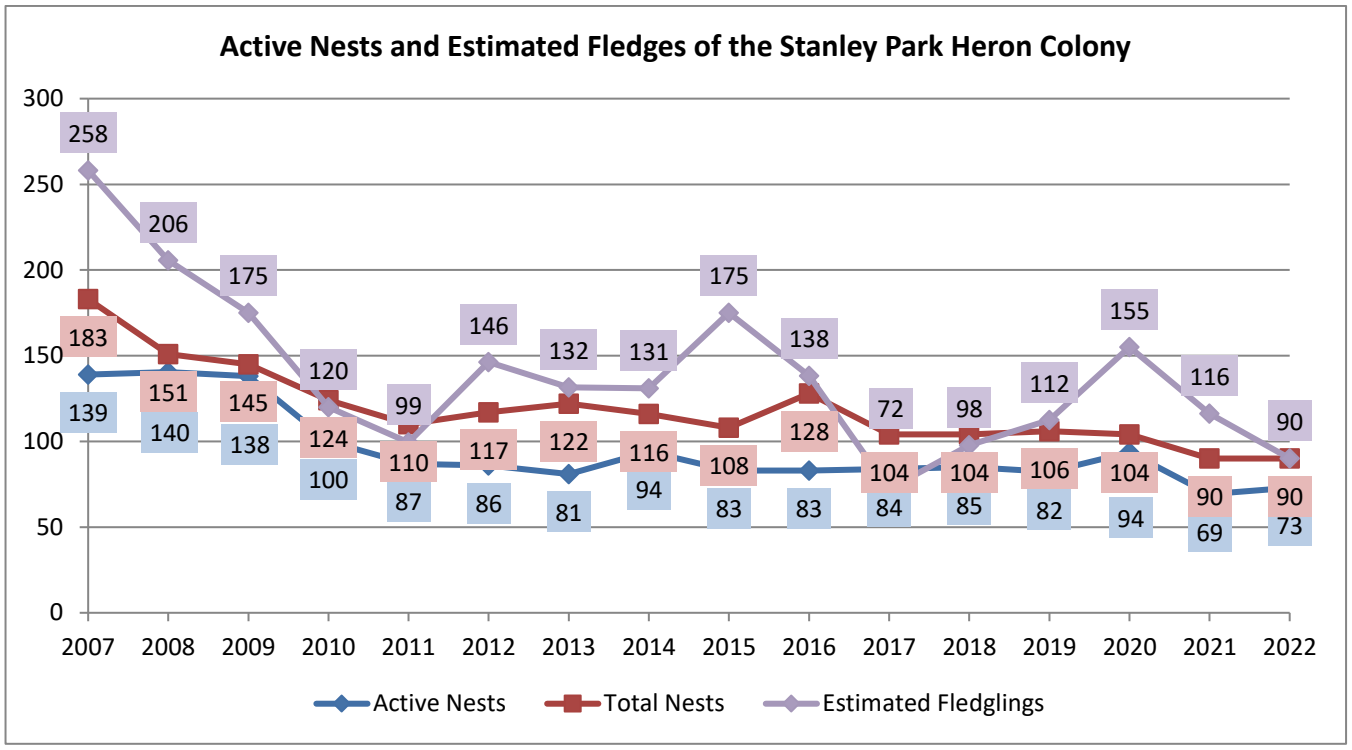

***Figure 5**. Active nests and estimated fledglings for the Stanley Park Great Blue Heron colony (2007-2022).*

Active nest counts were at record highs between 2007 and 2009, which then stabilized to an average of 94 nests for the last 16 years. **This year's estimate of 73 is lower than the 16-year average**.

This year's estimate of 90 fledglings is lower than the 23-year average of 126 fledglings, compared to last year's estimate of 116 fledglings.

Environmental Factors

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.

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 (COSEWIC, 2008).

While **three (3) eagle mating pairs** (compared to two eagle mating pairs in 2021) successfully raised a total of **five (5) nestlings** (compared to three nestlings in 2021) in Stanley Park this year (SPES, 2022), eagle attacks were observed to have occurred on a consistent basis. Late heron fledglings may have come from parents that double-clutched, possibly as a result of eagle predation on their first clutch. Multiple eagle raids were reported by residents in the area, as well as by volunteers during the 2022 breeding season. The first incident of heron predation by an eagle was reported on April 4th, 2022 with subsequent incidents being reported during the week of May 31st, 2022.

Surrounding Areas

This year marked the return of the Celebration of Light fireworks at English Bay, which occurred on July 23rd, July 27th, and July 30th, 2022. The location of the fireworks is adjacent to the heron colony and many residents in the area noted that the herons seemed to depart from the colony after the first show on July 23rd, 2022. It is difficult to determine the extent of disturbance to the heron colony as the Celebration of Light fireworks have been hosted for many years next to the heron colony, before taking a two-year hiatus due to the Covid-19 pandemic. With this year's monitoring results falling within the relative range of previous years (although lower than last years), breeding success may not strongly be affected by human activity around the Stanley Park colony despite being located in a high-traffic area. This colony appears to be very habituated to urban activity, given the frequent proximity to humans relative to other colonies around the Lower Mainland.

Public Outreach

Public education and interpretative programming were identified as an integral component of the heronry's conservation management by the Vancouver Park Board (VPB, 2006).

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 chicks. The web page 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, weekly interpretation at the colony**. EcoRangers directly engaged with over 731 people in over 15 tabling sessions in July and August.

Visitors enjoyed the education service and the chance to see the herons, interacting with physical distancing measures in place.

SPES also led a 'The Herons Are Here' education series that consisted of **one online webinar for the public** called 'The Herons are Here: Heron 101' in May 2022 as well as **one in-person tour of the rookery** in June 2022 called 'The Herons are Here: Rocking the Rookery'. **One online webinar for the public** called 'The Herons are Here: Heron Highlights 2022' is scheduled for November 2022 and will discuss the results of this years breeding season and include 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 Great Blue Herons through the year—in all kinds of weather and through a world-changing pandemic. Without their help, the data for this report (and our continued heron conservation work) would not exist. 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 **44 Adopt a Heron Nest donors** this 2022 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 2023!

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References

[COSEWIC] Committee on the Status of Endangered Wildlife in Canada. 2008. COSEWIC assessment and update status report on the Great Blue Heron fannini subspecies Ardea herodias fannini in Canada. Ottawa. vii + 39 pp. (www.sararegistry.gc.ca/status/status_e.cfm)

[SPES] Stanley Park Ecology Society. 2022. Stanley Park Bald Eagle nest update 2022. Internal Document.

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Appendices

Appendix 1: Area Map and Nesting Trees

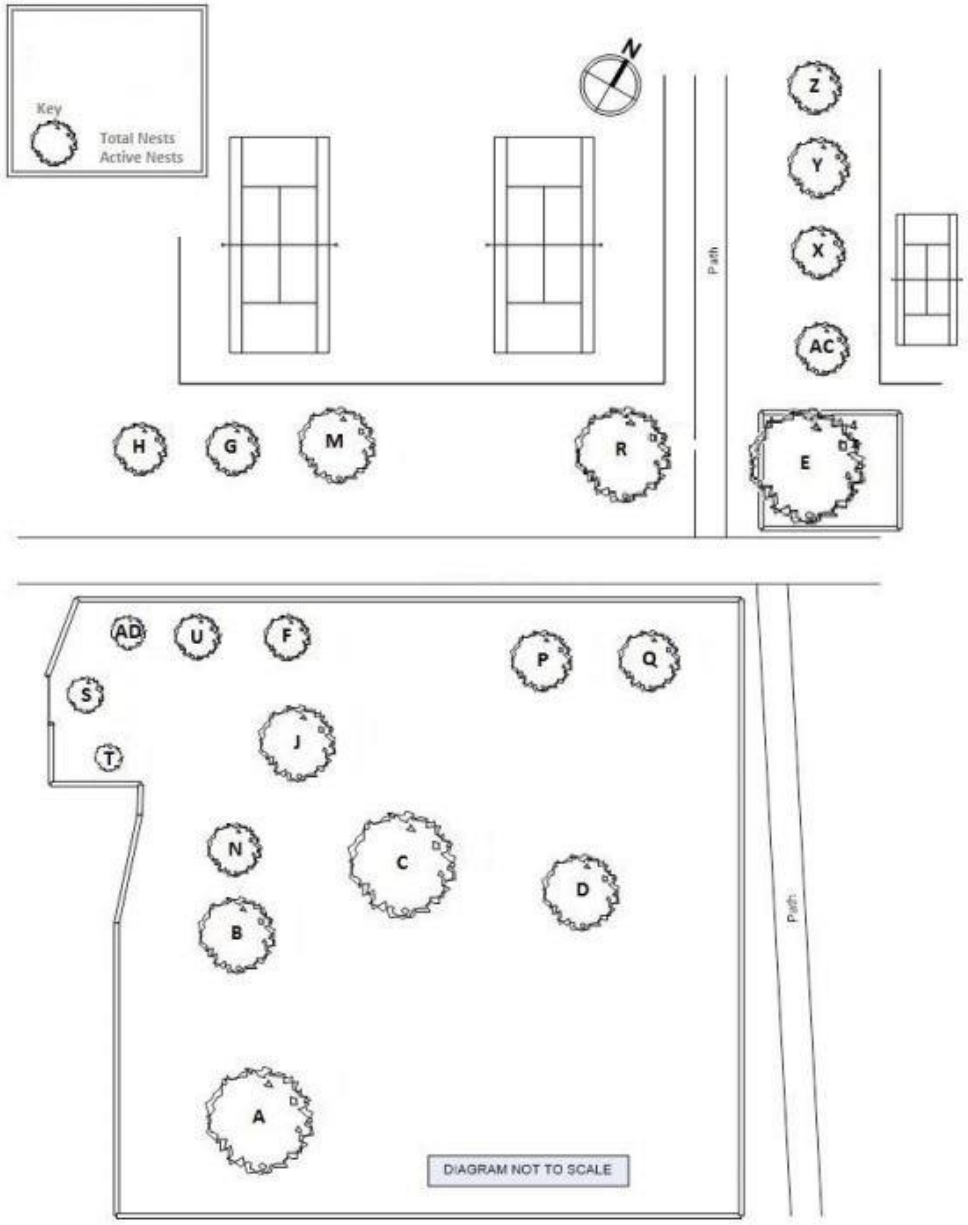

Figure 6. *Map of the Stanley Park heron colony layout with nesting trees labelled.*

Appendix 2: Survey Methods and Limitations

Please visit our website to learn more about our survey methods and limitations.

Appendix 3: Notable Trees

Tree G

- On July 29th, 2021 a tree branch fell belonging to Tree G that housed two nests, thought to be G1 and G6, due to the drought conditions of the summer. The tree branch was large and blocked traffic on Park Lane.
- Over winter 2021, the top of the tree was removed to mitigate safety concerns, therefore, this tree had no nests to survey during the 2022 breeding season.

Figure 7. *Image of fallen tree branch from Tree G on Park Lane on July 29th, 2021.*

(Photo: Nadia Xenakis)

Tree M

Tree M has not played a large role in the heronry, with only one failed nest spotted in 2021. This year, however, some notable activity within Tree M was observed throughout our surveys:

- On March 23rd, 2022 four (4) new nests were observed to have been built within Tree M that quickly disappeared by our next survey on April 4th, 2022.
- On April 20th, 2022 SPES volunteer Bruce Mohun noted that two (2) new nests were being built in Tree M.

- On May 6th, 2022 we noted that two (2) more nests were constructed within Tree M (indicating a total of four nests)
- These four (4) nests were short-lived however, as on May 16th, 2022 only one (1) nest was observed within Tree M. A heron exhibiting incubating behaviour was observed within the nest.
- By the end of the breeding season, Tree M once again had no remaining nests in the tree, with no success for the incubating birds, as no chicks were ever spotted in Tree M.

Tree H

Historically, Tree H was not observed to have any nests, beyond one failed nest in 2021, but this changed during the 2022 breeding season:

- Two (2) nests were observed within Tree H throughout the duration of the 2022 breeding season. Both of the nests were active and produced fledglings. The first successful nest was spotted on March 23rd, 2022 and the second nest was spotted on April 22nd, 2022

Appendix 4: Data Tables

***Table 2**. Number of nests and fledglings at the Stanley Park heron colony in 2022. Each measureable and its associated definitions and surveys they are sourced from are also shown.*

Measure	Definition	Result
Total nests	A total count of all nest structures in the trees, both active and inactive. We used the highest number of the season recorded on May 6th, before tree foliage started to obstruct visibility. (*Source: Ground survey)*	90
Sample total nests	Total number of nests surveyed from the rooftop, both active and inactive, that remained observable through the whole season. (*Source: Rooftop survey)*	41
Sample active nests	Number of nests within the sample total that were occupied by a mating pair. Not all active nests successfully produced young. (*Source: Rooftop survey)*	32
Sample successful nests	Number of sample nests that successfully reared young to the fledging stage. (*Source: Rooftop survey)*	25
Sample fledgling count	Number of fledglings assumed to have survived the nesting season and flown their nests. *(Source: Rooftop survey)*	51

***Table 3**. Sample success rate, sample productivity, number of active nests, and estimated total fledglings at the Stanley Park heron colony in 2022. . Each measureable and its associated definitions, and how they were calculated are shown below.*

Measure	Definition	Result
Sample nest success rate	Percentage of nests in sample that successfully produced young. (*Sample successful nests / Sample total nests)*	61%
Sample nest productivity	The average number of fledglings produced per successful nest. (*Sample fledgling count / Sample successful nests)*	2.05
Active nests	The number of nests in the whole colony that were assumed as occupied by a mating pair (whether successful or not). [*(Sample active nests * Total nests) / Sample total nests]*	70
Estimated fledglings	The estimated number of fledglings from the whole colony which now contribute to the regional population of GBHE. [*(Sample fledgling count / Sample total nests) * Active nests]*	90