Post Point Heron Colony

2019 Monitoring - Annual Report

prepared for:

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ATTACHMENT

Post Point Heron Colony Annual Chronology

EXECUTIVE SUMMARY

The Post Point Heron Colony is the only known heron nesting site in the City of Bellingham. The colony was first documented in 2000, at its present location in south Bellingham's Fairhaven district, adjacent to the Post Point Resource Recovery Plant. The colony is located in a forest patch on City owned property, situated between the wastewater plant and privately owned undeveloped land. Due to the sensitivity of the heronry and its uniqueness within the city, Bellingham Public Works requested a management plan (2003), followed by a scientific baseline study of the colony in 2005 to document breeding chronology, nesting activities, colony status and habitat use. Following these efforts, annual monitoring of the colony has been employed as a conservation measure due to the colony's local significance as a critical habitat area, and unique natural feature within the urban area.

Habitats used by the Post Point herons include upland forest, fallow grass field, freshwater, estuarine and nearshore marine areas. All of these essential habitats form a habitat mosaic supporting staging, nesting, roosting and foraging. The heron nesting area is situated on a nearshore slope in mixed forest. The herons utilize this habitat for both nesting and roosting and are present seasonally in large concentrations to nest, and in smaller year-round roosting aggregations in the same contiguous forest as the colony. Herons forage along grassy margins and the intertidal shoreline of Post Point, Marine Park, Post Point lagoon and Padden Creek estuary, as well as shoreline areas of Bellingham Bay, Chuckanut Bay and Portage Bay.

The results of the 2019 Post Point Heron Colony Annual Monitoring are detailed in this annual update. Monitoring of the site spanned just over 5 months and included 23 site visits from March 4 to August 8, 2019.

The 2019 nesting season was once again delayed due to cold wintery weather extending through February and into March. This is the fourth year in a row that the breeding season has been delayed. The record-setting cold February weather was fueled in part by a "Kona" storm from the Pacific which impacted the whole Northwest region according to the Office of the Washington State Climatologist. As a result of late winter storms, snow and high winds, the herons were delayed in returning to the colony until March 21.

In addition to the nesting season delay, damage from winter storms included downed trees on the northern buffer of the colony. Additional trees were also blown down and snapped off following the nesting season. A total of 36 trees were lost between 2018-2019, including 5 nest trees.

For the 2019 season, the Post Point colony supported a total of active 40 nests and 38 nesting pairs successfully produced young. This active nest total was 4 less than 2018 which was the all time high count for the heronry. Although the nest count was down slightly the number of young produced (n=103) was higher than 2018.

Bald Eagle presence around the colony was infrequent and also peaceful this season, with no incursions in the colony reported. No major disturbances were observed or reported in the colony during the nesting season. Passive human related disturbance at the Marine Park foraging area does occur, as well as occasional flushing by the nearby train. Overall, the 2019 nesting season for the Post Point Heron Colony was a success.

INTRODUCTION

The Post Point Heron Colony Annual Report details the 2019 heron colony monitoring results and provides a comparison with previous years. The Post Point heronry is located near Fairhaven in south Bellingham, Washington (T37N/R2E/Section 2)(Figure 1). This is the only known heron nesting site in the City of Bellingham and is considered a sensitive breeding habitat area. This nesting colony is moderate in size, is unique within the city, and is important for sustaining the area's heron population.

The Great Blue Heron *(Ardea herodias)* is a year-round resident in western Washington, and recognized as a Priority Species by Washington Department of Fish and Wildlife (WDFW). Heron colony sites are also considered Priority Areas by WDFW, and as Critical Areas in many jurisdictions, including the City of Bellingham. Heron nesting colonies are sensitive to human disturbance, requiring special management to maintain their stability and productivity.

The City of Bellingham Public Works Department has supported the conservation of the Post Point Heron Colony site by developing a management plan 2003, establishing a scientific baseline 2005, and funding professional monitoring of the colony, which has been ongoing since 2005. The WDFW Management Recommendations for Great Blue Heron 2012 provides heron life history information and management guidelines to inform planned projects and activities near heron colonies.

Monitoring of the Post Point Heron Colony includes four primary components:

- **general monitoring**, focusing on heron in-colony activity, nesting chronology and related behavior;
- **disturbance monitoring,** observing and documenting any disturbances to the herons within the colony or feeding areas;
- **productivity monitoring**, tracking nesting activity, number of young/nest and fledging;
- **nest and nest tree survey,** updating the number of nests, nest tree location and utilization during the breeding season and assess overall forest health. Mapping of the colony also provides vital critical area information.

In addition to the colony monitoring, heron foraging observations are also made in the immediate area during the nesting season, to document feeding activity and habitat use.

Bald Eagle activity in the vicinity of the colony is also recorded during monitoring site visits, due to their role as the heron's primary predator.

Monitoring usually spans six months but may vary, depending on nesting season duration.

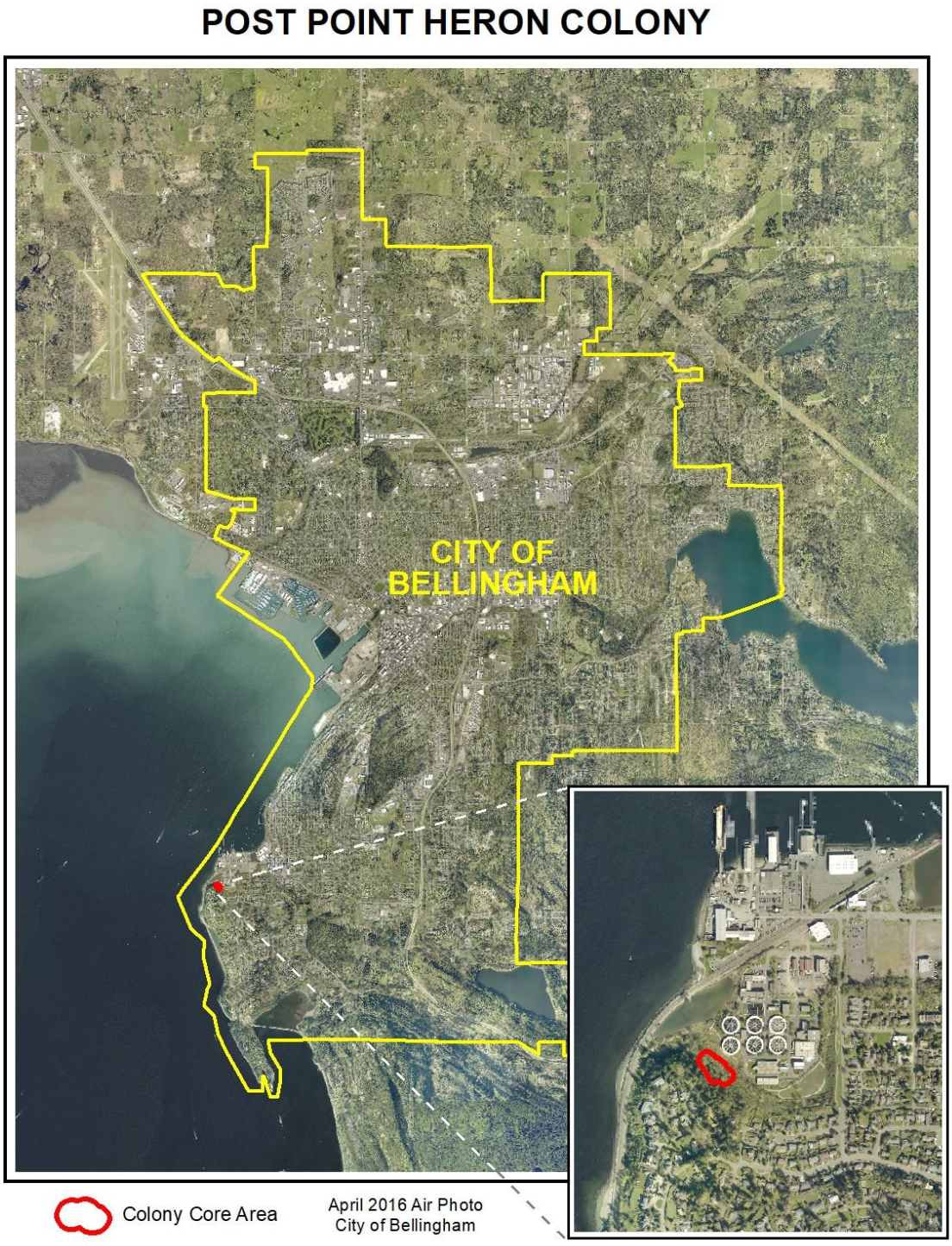
Planning and implementation of monitoring in 2019, including on-site field observation and data collection, was conducted by Tami DuBow and Ann Eissinger of Nahkeeta Northwest Wildlife Services. Ms. Eissinger has over twenty-five years experience monitoring Great Blue Herons and is expert in heron ecology, behavior, colony dynamics and stewardship. Her 2007 publication provides the only synopsis of heron life history and status as a valued ecosystem component in Puget Sound - Great Blue Herons in Puget Sound: Technical Report 2007-06

prepared for the Puget Sound Nearshore Partnership. This technical report, serves as the general reference for heron life history and breeding information used in this annual update.

Ms. Eissinger is also the author of the 2003 Post Point Heron Colony Management Plan and 2020 management update, and 2005 Post Point Heron Colony Baseline Study prepared for the City of Bellingham, Department of Public Works. In addition, the Biologist has assisted in the development of interpretive displays and public education materials for Post Point and has provided public educational programs featuring the herons of Post Point and elsewhere around Puget Sound.

Progress reports submitted to the City of Bellingham during each nesting season document the heron's nesting activity and any observed disturbances.

Figure 1
Post Point Heron Colony Location

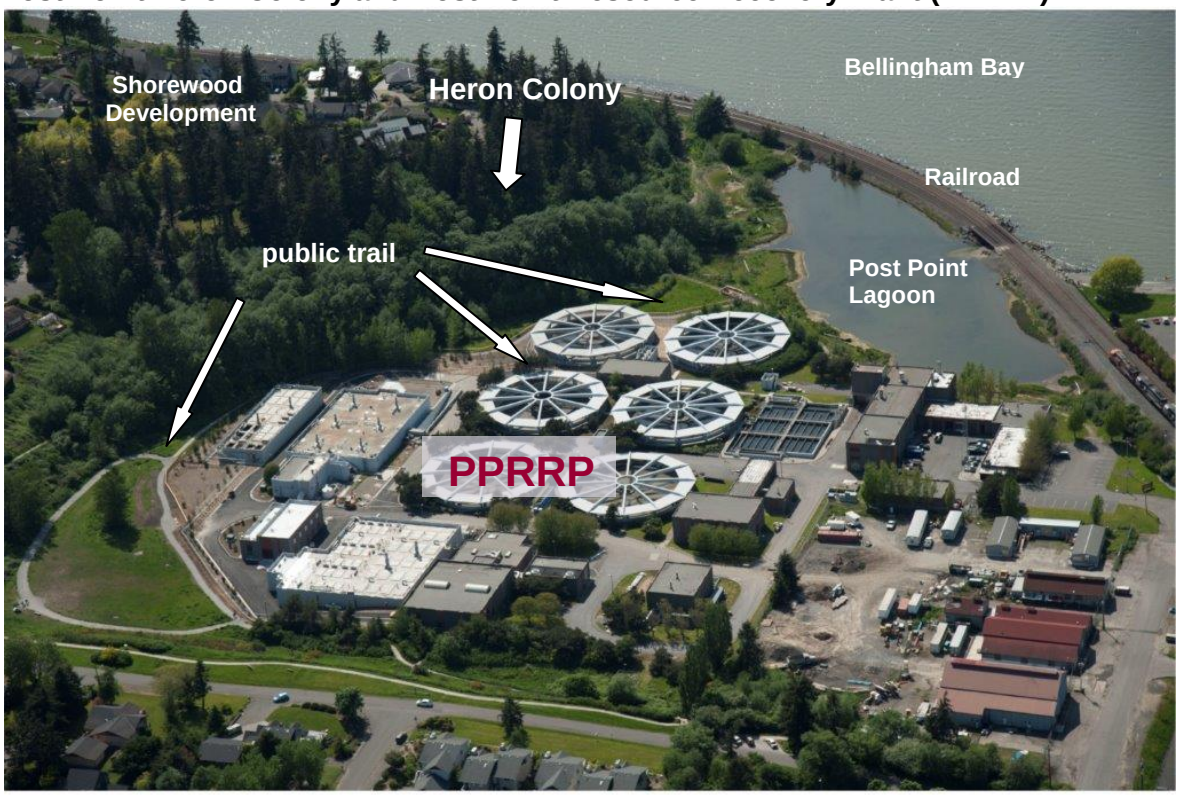


SITE DESCRIPTION

Historically, Great Blue Heron would gather and roost year-round in the forested nearshore area of Post Point (Figure 1). This forest habitat has provided protection from prevailing south/southwest winds and weather, with the exception of wintery northeasters. The site occupies a patch of native mixed forest situated on a historical shoreline bluff, buffered from growing residential and urban development, and provides direct access to foraging areas and associated habitats. In 1999, a group of herons were displaced from their nesting colony along Chuckanut Drive during construction of the Blue Heron Estates, and the following year the herons settled to nest in their present location at Post Point. This heron colony has been present and active for 20 years, since 2000.

The Post Point Heron Colony is located on a 30 acre site owned by the City of Bellingham. This site includes a 7.4 acre forest on a north facing slope (part of which is privately owned). The area below the slope is shrub and grassy margins approximately 1.6 acres, with the Post Point Lagoon - a 3 acre pocket estuary - to the northwest. Adjacent to the lagoon west, is the BNSF railroad causeway which separates the lagoon from Bellingham Bay. The colony is situated between a public trail and the Post Point Resource Recovery Plant (PPRRP) to the north and residential development to the south (Figure 2).

Figure 2
Post Point Heron Colony and Post Point Resource Recovery Plant (PPRRP)



PPRRP view from northeast to southwest - June 2014 COB Photo

HERON HABITAT and HABITAT UTILIZATION

The Post Point habitats utilized by herons include: mixed forest, wet meadow, estuary and marine shoreline. The uses include nesting, roosting, loafing, foraging and staging. Each habitat and associated use is described below.

Forest or Nest Stand

The colony's forest or nest stand is mixed second growth containing large conifer and deciduous trees. The dominate overstory species are red alder *(Alnus rubra),* big-leaf maple *(Acer macrophyllum),* and Douglas fir *(Pseudotsuga menziesii).* Emerging western red cedar *(Thuja plicata)* are also present. The forest provides a suitable substrate for large nests, and the material for nests. It also provides protection from wind and weather and screening from human activity.

The heron's primary use of the forest stand is for nesting, although the nesting area or colony nucleus only occupies 0.3 acre, they also require space outside the colony for roosting, loafing, preening and pre-nesting staging.

The tree species utilized by the herons for nesting have changed over time. Trees used for nesting include Pacific paper birch *(Betula papyrifera),* red alder, big-leaf maple and Douglas fir. During the 2019 season only red alder and big-leaf maple were used for nesting. The heron nests are located in the crowns of these trees which are about 80 ft. in height. The vertical distance provide protection from ground predators and buffer from human activites. Some of the older nest trees (alders) are mature, and some have recently died or blown down. Large Douglas fir trees define the upper slope and extend west. These large trees provide a critical overstory, screening, shelter, shade and wind break for the colony; they also serve as the primary roost trees for herons and Bald Eagles.

Wet Meadow

Wet meadow or fallow field habitat, is limited to small patches near the lagoon. These grassy margins are important habitat for upland heron prey, particularly meadow voles *(Microtus townsendii)*, which serve as a vital food source for herons during winter and early nesting season. In addition to foraging areas, this habitat is also used for loafing, sunning and occasional staging.

Estuary

The estuarine habitat is Post Point Lagoon, is a pocket estuary that is fed by surface water runoff and connected to Bellingham Bay through a gap in the railroad causeway. The Post Point Lagoon shoreline and salt marsh edges serve as loafing and foraging habitat. The lagoon supports eelgrass *(Zostera marina)* which was enhanced in 2008. The lagoon also serves as a fledging site for young heron exploring outside the colony. This area is used year-round.

Marine Shoreline

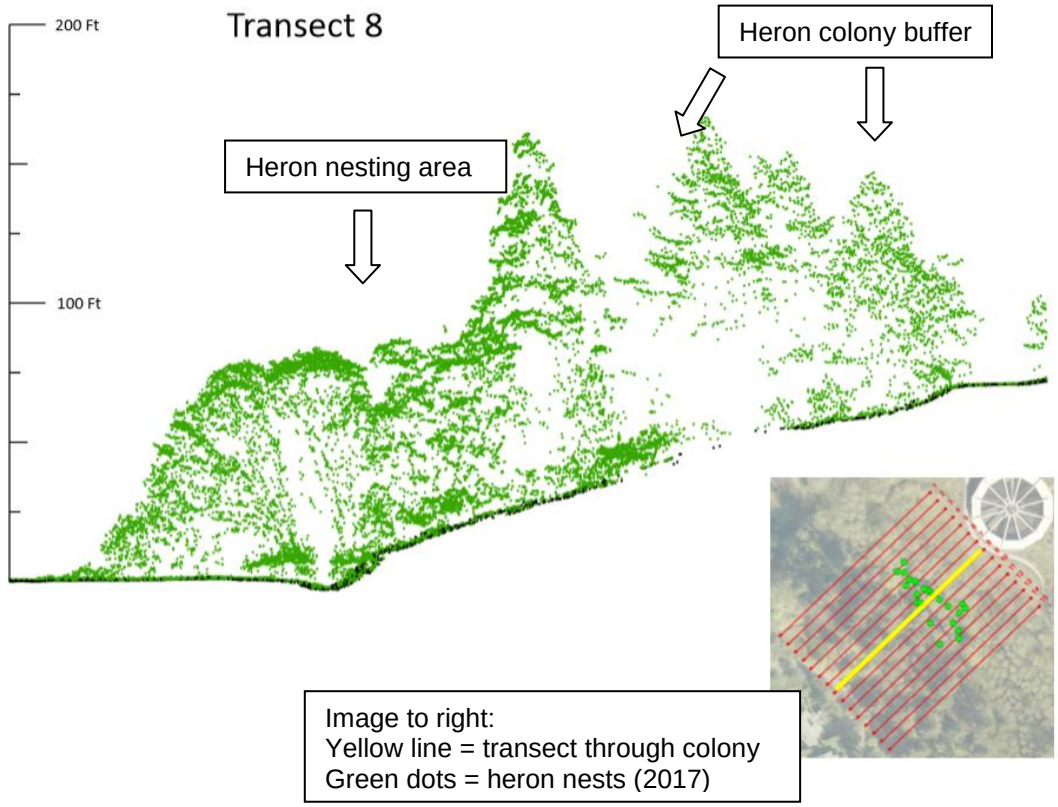
The marine shoreline habitat of Bellingham Bay provides eelgrass meadows and open intertidal areas for herons to concentrate and forage during the nesting season and year-round. The shoreline area from Marine Park to Post Point includes low gradient intertidal habitat that extends over 300 feet from the rip-rap edge out into the bay, providing a wide margin of foraging area during low tides. This is the closest marine foraging area to the colony and is important for that reason. The herons also utilize other areas described later in this report.

One unique habitat feature of the Post Point site is the man-made structures used by the herons. Clarifiers located on the PPRRP grounds are occasionally used for pre-nesting staging.

Herons roosting on PPRRP clarifier - Photo by Tami DuBow 2/8/2016

In 2017, the City of Bellingham provided a cross-section of the Post Point Heron Colony using a LiDAR visualization tool. One of the transects (below) illustrates the topography and vegetation of the center of the colony habitat located on the forested slope.

Figure 3 LiDAR Cross-section of Heron Colony

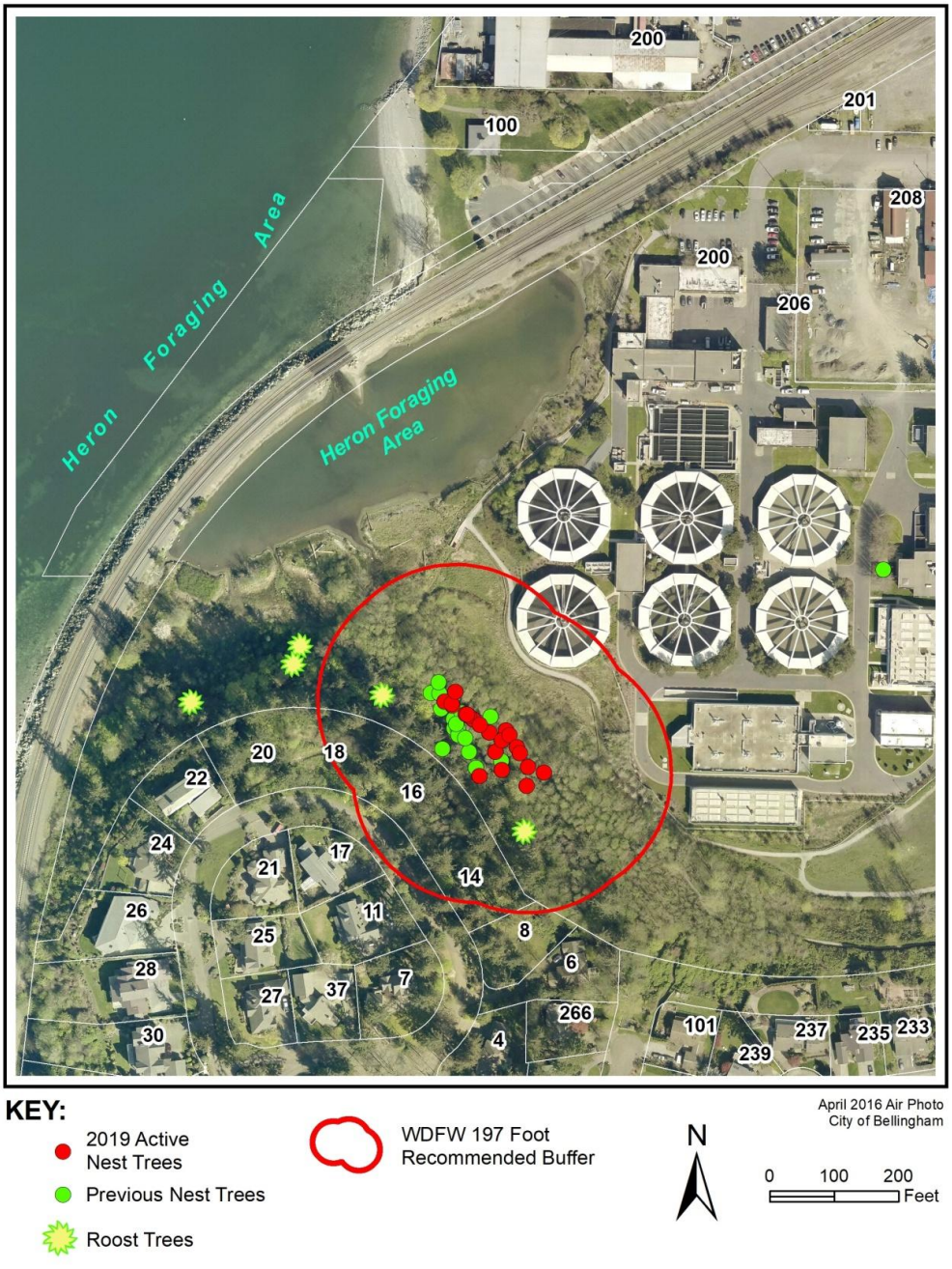


An aerial photograph of Post Point in Figure 4 (below) provides an illustrated view of the heron colony, nest trees, colony buffer, roost trees and important features near the colony, such as the PPRRP, the railroad, Post Point lagoon and marine shoreline feeding areas.

The red buffer line around the colony (Figure 4) is the 2012 WDFW recommended minimum buffer distance for urban colonies. This buffer serves as a reference only.

Figure 4

POST POINT HERON COLONY 2019



Heron Foraging Habitat

Foraging habitats for herons include: field, freshwater, estuaries and marine intertidal areas. The most productive marine foraging areas are frequented during the breeding season and provide the essential prey necessary to nourish both adults and young. The foraging areas for the Post Point herons in and around Bellingham Bay were surveyed and mapped in 2006 and are illustrated in previous annual reports. Foraging areas utilized by the Post Point herons include, Chuckanut Bay, Padden Creek estuary, Portage Island, Brant Island, Lummi Shore Drive shoreline, Marine Dr. Shoreline, Nooksack River delta and suitable locations along the Bellingham Bay shoreline.

The most immediate primary foraging area utilized by the Port Point herons is the intertidal shoreline from Marine Park south to Post Point. The Post Point lagoon also provides some foraging habitat.

The most productive foraging areas for heron during the breeding season are shallow intertidal areas with abundant native eelgrass where prey species, primarily fish, reproduce and concentrate. Eelgrass is plentiful, but patchy, along the Post Point shoreline and heron's use of the area is essential for successful feeding of young and maximum survival.

Heron foraging in eelgrass at Post Point

Other foraging habitat utilized by the herons include terrestrial fields, wet meadows, and freshwater systems including streams, wetlands, ponds, lakes and estuaries, which are important for small mammals, amphibians, and small fish as prey. Freshwater, wetland and terrestrial habitats are important year-round foraging areas due to their non-tidal nature and abundant prey base. Grassy fields and margins in particular support voles and other small mammals which provide a vital protein source during winter, early spring prior to egg laying and during the early stages of nesting.

The foraging areas utilized by the Post Point herons were documented over 10 years ago. A survey update and documentation of current foraging areas is needed to record and map current foraging locations and to inform management of the Post Point Heron Colony.

GENERAL MONITORING

Annual Monitoring of the heron colony is a vital component of conservation and provides an ongoing record of the colony's status, health and productivity. General monitoring of the Post Point Heron Colony includes on-site visits and observations made from various locations in close proximity to the colony. Monitoring occurs during the nesting season from February to August, and includes early season, breeding/nesting and foraging observations. Post-season monitoring takes place following the fledging of young from nests, and includes, nest counts and mapping updates. Both visual and audible monitoring is used. Due to the location and associated vegetation around the nesting area, views of certain nests may be obscured following tree leaf-out. All visible nests are therefore utilized for observation throughout the season.

The 2019 Post Point Heron Colony monitoring began March 4 and ended August 8. Monitoring usually starts February 1, but due to a severe late winter storm and snow the monitoring was delayed. Monitoring is conducted on a weekly basis.

Monitoring of the colony includes four primary objectives: 1) documentation of the nesting cycle or breeding chronology, and related behavior; 2) observation and recording of disturbances including natural predators, human and other natural or unnatural sources; 3) documentation of nest success and productivity; 4) recording and mapping of habitat utilization. All data is collected by onsite observation and recorded on standardized data sheets. A monitoring tracking system is also maintained in a database. Results for the season are then assembled in an annual report.

Monitoring of the colony captures the 6 stages of the herons nesting season.

- Staging (1 week +/-)
- Colony Reoccupation (varies)
- Nest building, Mate selection, Courtship (varies)
- Egg laying (5 days +/-) and Incubation (28 days)
- Hatching and Rearing (8+ weeks)
- Fledging (young leave the nest usually at 8 weeks of age, but can vary)

The total duration of the nesting season is usually about 6 months, but can vary. In the event that nests fail and herons lay a second clutch of eggs, and subsequently rear those young to fledging, the season may then be extended by 3 to 4 weeks. By contrast, the season may be condensed to about 5 months, which was the case for the 2018 nesting season and for 2019 the nesting season was only 4 months for most of the colony.

Pre-season or early season assessment is used to document the condition of the colony and habitat prior to the heron's arrival and post-season assessment and nest count documents the colony condition nests following the nesting season. Mapping of the nests in the colony is also updated each year. With consistent, repeatable methods applied annually, the colony can be accurately tracked over time and results compared.

In addition to the primary monitoring objectives, observations are made of any potential disturbances, including predators, human activity, loud noises, low-flying aircraft or other. Sound level is incidentally measured at each site visit using a cell phone app.

As the primary predator of herons, the Bald Eagle *(Haliaeetus leucocephalus)* is monitored for their, presence near the colony, possible depredation of, or disturbance to herons, and nesting

activity. All vertebrate species identified in the vicinity of the colony are also recorded as part of the monitoring protocol.

2019 MONITORING RESULTS

For this report, monitoring is divided into 4 phases: Early Season, Colony Reoccupation and Early Nesting (arrival and courtship), Mid-Season (incubation, hatching and rearing of young) and Late-Season (fledging of young and post-nesting). This monitoring report will provide a summary for each period with detail provided for the immediate stage of nesting activity.

The weather has been an important factor influencing the Post Point colony dynamics, conditions and possibly productivity. Weather related notes will be dispersed throughout this report. With the exception of the harsh late winter storm that delayed the return of the herons, overall, the 2019 nesting season was milder and cooler than the 3 previous seasons and likely supported the excellent productivity. Wind storms and extreme weather however did impact the colony site both pre and post nesting.

Early Season Assessment

The winter of 2018-2019 was relatively mild, with warmer and drier conditions prevailing until February, according to the Office of the Washington State Climatologist. They reported a mean February temperature of 32.5 F – the coldest since records began, and a record low of 15°F on February 10th. The cold temperatures were combined with high NE winds and snow up to 18 inches deep around Bellingham which made for a significant winter event for both humans and wildlife. An unusual "Kona" storm event was suggested as the cause of the extreme weather. These conditions likely resulted in some weather-related heron mortality and certainly delayed the heron's return to breeding colonies. Late winter storms in 2017-2018, 2014, 2012 and 2011 had also delayed the heron's return to the colony, or forced them out of the colony temporarily prior to nesting.

As of March 4, 2019, no herons were present at the Post Point Heron Colony, so an early season assessment was made of the colony which included the recording of nests present (n=32) and general conditions. Due to strong south winds over the winter, combined with saturated soils, 12 alder trees within the north buffer of the colony uprooted and fell, including one nest tree. These trees provided vital screening for the colony and also wind break and shade which is important for maintaining the colony's mirco-climate during the nesting season.

Post Point fallen trees (red alder) on north side of heron colony 3/4/2019

Due to continued cold, wintery weather, the herons return was further delayed. A visit to the colony on March 12 revealed no herons within the colony or in the vicinity. The heron's return to Post Point was first recorded on March 21, 2019. This is the latest the herons have returned to Post Point since monitoring of the colony began in 2005.

Post Point Heron Colony from public trail – tree blow down in foreground 3/4/2019

Colony Reoccupation, Courtship and Nesting

The reoccupation of the Post Point Heron Colony began very late, however nesting commencing in March has occurred over the past 2 years. This year, following extreme, record-setting cold in February, warming temperatures in March reached the 50's F, providing good weather for returning herons March 21. There were 21 herons present and 15 nests occupied. Herons at that time were actively engaged in interacting, courtship and nest building or enhancement of existing nests.

By March 28, 40 heron were present and of the 32 nests present - 26 nests were occupied. The breeding and nesting season was well underway. Several heron had paired and two nests appeared to have an adult in a horizontal position indicating egg-laying or early incubation.

Egg Laying and Incubation

Egg laying and the onset of incubation occurs following courtship and usually takes place in March.

In 2019, the herons were both late to reoccupy the colony and to start nesting. As soon as the herons arrived they began to pairing, courtship and nesting activities. Leaf-out of nest trees with lush growth added additional challenge for monitoring.

By April 18, 31 nests were active and incubation was well underway for most. As the colony settled into a normal seasonal pattern, the available nests were becoming occupied.

At the end of April a total of 40 nests were visible and 39 were occupied. Incubation takes a total of 28 days. Based on the first indication of egg laying, the first young to hatch were expected the first week of May.

Unlike 2018, there was no surge of growth or new nests built in March-April. The flush of new heron arrivals, nest building and growth in 2018 was clearly associated with the relocation of herons from the Samish Island colony which had abandoned in 2017.

As trees leafed out, it became apparent that some trees were dead or dying, all of which were alder *(Alnus rubra).* Within the colony 4 nest trees were dead. All of these are large, mature, red-alder and were recorded as healthy in the fall of 2018. There was no obvious cause of tree death. This is the first time nest trees had died since 2007 when the western paper birch *(Betula papyrifera),* appeared to have died en masse.

Hatching and Rearing

May is generally the month of hatching young and the onset of the eight-week long rearing period. Hatching in 2019 began about May 2, six weeks following the reoccupation of the colony. Eggshells on the forest floor were visible and indicated the onset of hatching.

During the month of May hatching and rearing of young are the primary activity in the heron colony. Since eggs hatch asynchronously, the hatching at each nest continues over a few days and young are brooded while unhatched eggs continue to be incubated. Although 4-5 eggs are laid in each clutch, normally only a portion of these produce young that survive to fledging age.

In mid-May, 2 small nests disappeared or fell out of their trees and any eggs or brood were lost. Also, 2 young were observed dead in separate nests, which is not uncommon as siblings compete for food and space. By the end of May, 38 nests were visible, and all were occupied.

Overall the colony was very active through May, with active young and adult feeding and attendance.

From hatching in May, the nesting cycle continues with rearing of young which requires 8 weeks. During this time, young are restricted to the nest and are completely dependent on both parents for all food and liquids. The young will start out with sparse downy fuzz, and need brooding by a parent for warmth and protection. Feathers grow quickly and cover the body within three weeks.

Young herons about 4 weeks old - photo by Linda Wright 5/26/2019

Adults also provide shading of young when necessary. At four weeks of age the young are large enough to be on their own in the nest, so both parents may be away from the nest foraging for food. Over the eight weeks of rearing, young will grow feathers, including a full set of flight feathers, and will reach adult size.

The rearing of young continued through June without disturbance or other incident. The weather remained fair and warm, but overall the season was not as dry and hot as 2018.

Heron nest with one dead and 2-3 live young about 4-5 weeks old
Photo by Nancy Downing 6/6/2019

Note: at least 3 nests were observed with one dead young in the nest on June 6, 2019. Dead young in nests are relatively common, since on average only half of the five eggs layed will result in a fledged young. However, one nest at Post Point did successful raise 5 young in 2019.

Feldging

Fledging of young heron from the colony usually begins with individuals exercising their wings while in the nest, followed by walking up limbs near their nests, and then taking test flights around the colony or nearby. The older young leave the nest first, so there may be a progression of young leaving the nest over the course of a week or more. When young actually leave the colony they may return following feeding or disperse from the colony for the season.

The primary activity in the colony during the late nesting period is rearing and fledging of young. At this point in time most young are 6-8 weeks of age, fledging occurs at 8 weeks.

For this season 2019, heron young were beginning to fledge from their nests by July 5. A total of 38 nests were active at the end of June and all had young to fledge. By July 12, 41% of nests had fledged all young. By July 20, young from 30 nests had fledged, or about 80% of the nests in the colony had fledged all of their young. By July 25 only 2 nests remained active and as of August 8, only 2 young and one adult remained in the colony. One young was at a nest, but the other juvenal and adult were perched away from nests. Both young could fly. At that point the season was declared completed.

Four young 6-7 weeks old in nest tree #604d – 1 young second to right is in a nearby branch or nest photo by Nancy Downing 6/21/2019

Post Point Heron Nesting Chronology Summary 2019

February: harsh late winter weather, high winds, freezing temperatures and snow.
March 4: No herons in colony. 32 nests present.
March 12: No herons in colony.
March 21: Colony reoccupation, 21 herons present, 15 nests occupied, courtship, nest building and enhancement underway.
March 28: Onset of nesting, 26 nests occupied. Activity includes nest selection, pairing, courtship, nest enhancement, egg-laying and incubation.
April 18: 31 nests occupied (visible). Incubation.
May 9: 38 nests occupied, hatching, brooding and rearing of young.
June: 38 nests occupied**,** rearing of young.
July 5: fledging begin for 13 nests.
July 12: 41% nests had fully fledged.
July 20: 80% nests fledged.
August 8: Season end - although 1 young (ready to fledge), plus 1 young (fledged) and 1 adult (roosting) remained in the colony.

The total duration of the nesting period at Post Point in 2019 was 20 weeks total. Previous nesting periods include:

- 2018 = 22 weeks
- 2017 = 17-18 weeks for most nests up to 23+ weeks total
- 2016 = 22 weeks, which does not include the initial 2 week occupancy, followed by the 2 week desertion of the colony in February.
- 2015 = 25 weeks
- 2014 = 22 weeks
- 2013 = 19 weeks

In addition to the seasonal chronology, a historic chronology was developed for this colony. The historic chronology outlines the annual colony activity, nest count results and other pertinent occurrences for each consecutive year. The historic chronology is included as an addendum to this report.

PRODUCTIVITY

The productivity of the visible nests within the Post Point Heron Colony is monitored annually, and measured during on-site visits prior to fledging. Productivity within the colony is an important indicator of the health, fitness, and adequate food for a heron colony. It may also indicate mortality or reproductive failure. Herons lay four to five eggs per nest and may fledge a maximum of five young, but normally fledge two to three young per nest.

Productivity is measured by counting young in each nest (small colonies) or by using a sample of nests (large colonies >100 nests). The count is completed late in the season prior to fledging. At Post Point all the young are counted at each visit, as soon as they are visible, particularly when being fed, and this provides an accurate count based on visibility of the nest.

The Post Point herons successfully produced young from 38 nests in 2019, compared to 41 nests in 2018. The colony's success and continued growth up to this year is notable. This year's high nest count was 40, however 2 nests were lost in mid-May. The remaining 38 nests continued to be productive and fledged young. The lack of known predatory incursions or other observed disturbances was likely a benefit to the nest success.

Based on season-long weekly observations of the colony and tracking of the active nests, a total of 103 young were counted. This is a new record for total young in the colony, and all are presumed fledged. In 2018, 97 young were counted, and 89 young in 2017. In the past 3 years the number of young produced has increased by nearly 16%.

The productivity for Post Point also increased in 2019. The productivity for 2019 was 2.57 per active nest and 2.7 per successful nest, compared to 2018 which was 2.2 per active and 2.3 per successful nest.

Mean productivity for a colony may be expressed in 3 different ways.

1. Per successful nest = total young divided by nests that fledged young, which does not account for inactive, lost, depredated or abandoned nests within the colony.
2. Per active nest = total young divided by all active nests for a given season, which does not account for inactive nests.
3. Per total nests = total young divided by all nests within a colony, which skews productivity results depending on the number of inactive nests.

For the Post Point heronry, young in all nests have been counted since 2013, so productivity for all active and successful nests can be calculated. Between 2010-2012 counts were taken from samples of nests that were clearly viewed. In 2008-2009 the colony failed, and prior to that productivity was also based on sampling.

Productivity for Post Point has been above the normal range for this region based on published data. The comparable references include1998-1999 averages for south-coastal of British Columbia which range from 1.24 per active nest to 2.15 per successful nest (Butler and Vennesland 2004) and 2000 averages in King County of 1.77 per active nest and 2.42 per successful nest (Stabins et.al. 2006). Based on these figures mean productivity is 1.5 per active nest and 2.28 per successful nest.

For the Post Point Heron Colony the mean productivity for a period of 7 years, 2013-2019 is: 2.4 for active nests and 2.5 for successful nests.

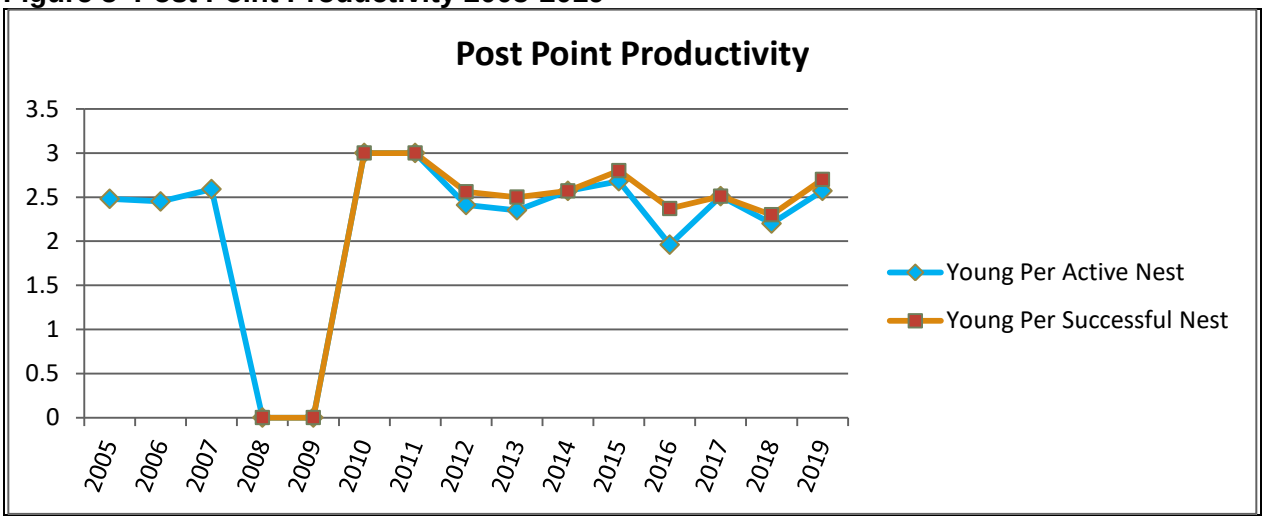
Table 1: Post Point Productivity 2013-2019

Year	No. active nests	No. successful nests	No. young	No. young per active nest	No. young per successful nest
2019	40	38	103	2.57	2.7
2018	44	41	97	2.2	2.3
2017	35	35	89	2.51	2.5
2016	29	24	56	1.96	2.3
2015	25	24	67	2.68	2.8
2014	21	21	54+/-2	2.57	2.57
2013	17	16	40	2.35	2.5

Table 2: Post Point 3 Year Productivity 2010-2012

Year	No. active nests	No. nests sampled	No. young/ sample	No. young per nest
2012	17	10	24	2.4
2011	16	14	42	3
2010	13	13	39	3

Figure 5 Post Point Productivity 2005-2019



Note: the Post Point Heron Colony was active but abandoned mid-season and failed to fledge young in 2008 and 2009.

One major contributor to productivity and the success of the heron's reproduction each year is foraging access and food supply. Herons depend on live prey from marine and fresh water systems, and terrestrial areas. Although the heron's prey species are known, no local data exists for these species, occurrence, seasonality, distribution, or abundance. A local assessment is needed to better define feeding areas, seasonality, and the prey available in each of those areas.

FORAGING OBSERVATIONS

Basic foraging surveys are conducted near the Post Point Heron Colony by the monitoring biologist during each nesting season. In the early season (February and March) site monitoring is timed to coincide with higher tides in order to maximize the number of heron in the colony for observation. Following hatching of young, monitoring in the colony is best timed with low tide in order to maximize observations of adults feeding young, and therefore gain views of the young in each nest.

Documentation of heron numbers at the most immediate foraging grounds and feeding habitats are recorded, however, the herons are known to fly up to 5 miles in search for food. If herons are observed flying to other feeding grounds, flight direction is occasionally recorded. Foraging area preferences vary and are likely based on tides, currents and favorable habitat access, seasonal prey availability, water temperature, and other conditions including waves and disturbance factors.

The Post Point/Marine Park shoreline is the nearest feeding area to the Post Point Heron Colony (Figure 4). This shoreline has extensive eelgrass areas and is used daily for foraging at favorable tides during the peak nesting season. Shoreline observations were made during most monitoring visits in 2019, following the arrival of the herons in late March.

Herons foraging in eelgrass near Marine Park Photos by Alan Fritzberg 2010

Of the total 23 site visits during the 2019 season, 15 were during favorable* foraging periods. Of these favorable foraging visits, 9 resulted in herons observed foraging along the marine shoreline or the lagoon. The tables below provide foraging results by month for years 2015-2019.

Table 3: 2019 Foraging Survey Summary by month

Month 2019	# site visits w/ favorable foraging	# site visits w/ herons observed	# heron observed on Marine Park shoreline per visit	# heron observed at post point lagoon per visit
Feb	no surveys			
March	1 (GBH rtn 3/21)	0	0	0
April	1	1	0	1
May	6	2	0,3,0,4,0,0	0
June	3	2	2,3,0	1,0,0
July	3	3	3,12,2	0
August	1	1	2	0
TOTAL	15	9	31	2

Table 4: 2018 Foraging Survey Summary by month

Month 2018	# site visits w/ favorable foraging	# site visits w/ herons observed	# heron observed on Marine Park shoreline per visit	# heron observed at post point lagoon per visit
Feb	0	0	0	0
March	1	0	0	0
April	1	0	0	0
May	4	4	3,3,1,16	0
June	3	2	4,0,5	0
July	2	2	2,2	3,0
August	2	2	1,2	3,0
TOTAL	13	10	39	6

Table 5: 2017 Foraging Survey Summary by month

Month 2017	# site visits w/ favorable foraging	# site visits w/ herons observed	# heron observed on Marine Park shoreline per visit	# heron observed at post point lagoon per visit
Feb	0	0	0	0
March	2	1	0,1	0
April	2	0	0	0
May	3	3	1,1,4	0
June	4	1	0,1,0,0	0
July	2	1	2,0	1
August	1	1	1	0
TOTAL	14	7	11	1

Table 6: 2016 Foraging Survey Summary by month

Month 2016	# site visits w/ favorable foraging	# site visits w/ herons observed	# heron observed on Marine Park shoreline per visit	# heron observed at post point lagoon per visit
Feb	0	0	0	0
March	2	0	0	0
April	2	0	0	0
May	4	2	3,0,0,5	0
June	4	3	3,6,6,0	0
July	3	2	4,0,1	0
August	1	0	0	0
TOTAL	16	7	28	0

*Favorable foraging periods are at tidal stages below ~1 ft. for the outer shoreline from Marine Park south. The lagoon area is utilized for feeding and loafing, so herons may be present at any tidal stage.

The heron's use of saltwater shorelines is limited by tidal stage (exposed intertidal area and water depth), prey availability, wave conditions and human activity. Eelgrass *(Zostera marina),* which grows in low gradient, soft sediment intertidal areas from 1.3 meters to 9 meters depth, provides habitat for most of the heron's marine prey species. However, as a wading bird, herons have a 12-14 inch depth limit, so tidal stage is the primary limiting factor for accessing eelgrass areas to feed. Eelgrass meadows are light sensitive and regenerate every year, with maximum growth in May and June. The foraging area at Post Point and Marine Park is limited due to substrate and gradient (depth), so use of this area by herons coincides with the eelgrass growth cycle, abundance of prey, and increased need by the herons to feed young, which normally peaks from late May through June, during the last stages of rearing young.

Adult herons are also regularly observed flying across Bellingham Bay to access foraging areas near Portage Island and the Nooksack River estuary. During the 2019 season, heron flights from the colony were frequently observed to these locales, indicating their use as primary foraging areas. Chuckanut Bay is also thought to be used, but has not been surveyed in recent years. During the heron's rearing period, following hatching, heron concentrations at Post Point increase during favorable tides.

Foraging surveys for 2019 clearly reinforced previous years data, with the greatest number of heron observed on the shoreline in May and June. This period coincides with the rearing of young. The total number of heron observed during any single visit ranged from 1-12, with the high counts reported in July and represented some fledglings. Overall there were fewer herons observed utilizing the shoreline than in 2018, but more than 2017. Considering that 40 nests are occupied with 80 adult heron present in the colony, foraging numbers are low for this nearby feeding location. This could be a result of survey bias or low use by the herons. A comprehensive foraging survey is needed to determine current use patterns and locations.

Disturbance at or near the foraging areas occur frequently and are related to various sources, including people and dogs on the beach, trains, boats and boat wakes and predators. In an effort to limit encounters between heron and human, human related disturbances or dogs, the City of Bellingham, has posted signs to alert shoreline users at Marine Park to the sensitivity of the eelgrass and lagoon areas and requested that people not disturb herons. However, permanent signage is no longer posted. Citizens, recreationalists, and in some cases educational groups, utilizing the shoreline continue to walk toward herons in the intertidal area,

and subsequently flush heron from feeding areas. Kayakers also use the area, but appear to provide a wide berth around herons if present.

Mike Hamilton photo

Other Species

During the course of the monitoring season, species occurring in the nest stand and in the vicinity are identified and noted. Over 60 species of birds have been observed in or near the Post Point Heron Colony including the shoreline areas. No new species were reported in 2019.

In past years Green Heron *(Butorides virescens)* were observed nesting and raising young near the heron colony, flying through the colony, or foraging on either Post Point or Padden Ceek Lagoon. However, the Green Heron have not been observed or reported in or near the Post Point Heron Colony since 2017.

DISTURBANCE

Disturbances to Salish Sea heron colonies may range from predators, human activities and/or intrusion into the colony, cutting of nest trees or nearby timber harvest, burning of debris, development, to low-flying air craft (manned and unmanned), adverse weather, and environmental toxins. Any natural or unnatural cause of stress, changes in normal behavior, or flushing from nests, impact to the colony, roosts or feeding grounds is considered a disturbance. In some cases, intentional human-caused disturbance would be considered harassment and could be an enforceable offense (RCW 77.15.130). Disruptions in the nesting cycle, reproduction, flight or feeding are also considered a disturbance. Disturbance is defined as an adverse behavioral and/or physiological response from at least one individual (Sutherland 1996, Walker et al. 2006). Repeated disturbances may result in, reduced food intake, reduced productivity or reproductive failure. Disturbances over time may cause the nesting colony to fragment, abandon or relocate.

One objective of on-site monitoring is to record all disturbances or disruptions, including those observed and reported by other sources. Outside reports are followed up on in the field by Nahkeeta Northwest. Any loss of heron, young or eggs, or repeated disturbance to the colony

or feeding area is documented and remedies to counter the disturbance are explored and implemented by the City of Bellingham where possible. Unfortunately, weekly monitoring is usually inadequate to witness disturbances in real-time, so monitoring is supplemented by reporting by neighbors, citizens and PPRRP staff.

With the completion of the Post Point Resource Recovery Plant expansion in 2014, close attention has been paid to the heron's response to the alteration of habitat, new clarifier and associated public trail, both located within 100 feet of the colony. Over the past five years, no obvious disturbance or negative reaction by the herons has been noted, however, there has been a strong chemical odor emitted from the new clarifier which could have an indirect effect on the herons or their young.

An unauthorized trail created in 2009, cuts through the forest immediately east of the heron colony and is within the colony's no-entry buffer. Disturbance to the herons is possible particularly in the early season. The City has attempted to block the trail and post signs, however the trail continues to be used.

Railroad train activity has increased over the past several years, with increased frequency and longer loads. As a result, improvements to the tracks and increased maintenance activities have also occurred. Train whistles or horns, braking and other associated noise is at times pervasive, and has been measured from 70.8 to 85.8 decibels (dB) at the colony, while the average ambient noise level at the colony is 55-60 dB. Train related flushing of heron from feeding along the shoreline has also been observed. According to the BNSF website, train horns are estimated to be 96 to110 dB, and are sounded multiple times when approaching a road crossing or if there are safety concerns. A quiet zone has been proposed for Bellingham, but it is a multi-year process and no date for completion for the Fairhaven segment has been announced.

Drones and helicopters are a concern near heron colonies. Disturbance to herons may occur, and in the case of helicopters damage may result from downwash. In 2016, individuals flying drones were observed at Marine Park, and in February that same year a low flying helicopter was also described over the colony. Drones were also used in this area in 2017. In 2019 a series of aerial photos were posted online to advertise a real estate lot next to the colony. To take these photos a drone or helicopter was flown directly over the colony while occupied; it appears in April as there was also a photo of herons incubating. Drones may be considered a source of intentional harassment by WDFW if flown in sensitive areas such as heron colonies or their feeding areas when herons are present and are disturbed. To avoid disturbance, drones should be restricted from the heron colony, associated forest buffer, and foraging areas during the nesting season.

Photo taken by drone or helicopter for real estate advertising – posted online in 2019

Another type of disturbance, or more of a disruption, is extreme weather. As described earlier in this report, there have been wind storms causing wind-throw in and near the colony over the winter of 2018-2019, a severe late winter storm with record setting low temperatures that delayed the herons return to the colony, unexplained tree death in the colony and nest stand – that may be weather related, and on September 7, 2019, a most unusual thunder and lightning storm hit Puget Sound with an estimated 2,000 lightning strikes, rolling thunder, rain and strong localized winds. These weather events cause disturbance and damage to the heron colony. The electrical storm fortunately hit following the conclusion of the nesting season, because damage to nest trees and buffer trees resulted from the storm. Overall, in 2019, a total of 36 trees were lost in or adjacent to the colony as a result of extreme weather events.

Based on the Washington Climate Change Impacts Assessment, projections include warmer air temperatures, drier summers, more frequent and severe extreme weather events, acidification of marine waters, warmer water temperatures, rising sea levels, increased risk of wildfire, and increased frequency and severity of flooding. Many of the projections listed could negatively affect Great Blue Herons and/or their habitats (Azerrad 2012).

photo by: Jason Shipely from the Bainbridge Island Ferry (KOMO News)

Resident Bald Eagle pair near heron colony. Photo by Jack and Sandi Starr 2/10/14

Bald Eagles and Other Predators

Bald Eagles *Haliaeetus leucocephalus* pose one of the greatest threats to the success of heron reproduction by disturbing colonies, eating unhatched eggs, and both preying on young heron and flushing flightless young out of nests. More aggressive eagles also threaten and prey on adult herons. However there is also clear evidence that Bald Eagle nesting near a heron colony has a beneficial effect on the heron colony productivity because the eagles repel other eagles from their nest territories thus limiting the depredation (Jones et al 2013).

Only Bald Eagles have been known to directly disturb or prey on the Post Point herons. Crows have been known to enter the colony following Bald Eagle incursions, presumably to scavenge on the spoils. Crows also nest near the colony with no conflict with the herons. Great Horned Owls may use heron nests, but do not prey on herons, although no owls are known to utilize the Post Point colony.

Bald Eagles are common near the Post Point Heron Colony. One or occasionally 2 eagles may be seen regularly perched above the colony in a large Douglas Fir or to the west also in large fir trees. The most common occurrence is the mature male eagle, which seems to favor this particular perch above the colony with its view over the bay. The eagle's presence in the big fir does not disturb the herons.

During each monitoring visit to and in the vicinity of the heron colony, observations are made of potential predators, such as Bald Eagles, Red-tailed Hawks, Crows and Ravens. Of the 23 monitoring visits to the colony in 2019, 11 were positive for Bald Eagle presence. Ten of these sightings were of a solitary eagle perched above the colony, and one was of an adult pair. Interestingly, during half of these observations the eagle would vocalize and on at least one occasion another eagle called back. There were no eagle incursions into the colony or disturbance caused by the eagles.

A pair of Bald Eagles, once nested close to the heron colony, but relocated to a nest site on Hawthorn Rd. approximately ½ mile southeast of the colony. The new nest location relative to Post Point is illustrated in Figure 6. This nest site was active between 2014 and 2016.

Following regular visits to the nest tree, no nesting has been observed and no young produced in 2017 or 2018. However, in July 2018, 2 juvenal Bald Eagles were reported and photographed between Briar Rd. and Shorewood Dr. just east of the heron colony. The location of the active nest is not known. The Hawthorn nest was not observed in 2019. It is possible that nesting for the eagles has been relocated.

As noted, no eagle incursions were observed or reported in the heron colony in 2019. No disruptive Bald Eagle incursions have been observed or reported in the past 6 years. Bald Eagles have become either scarce or simply passive near the colony with no depredation of heron eggs or young or disturbance to the colony.

Juvenal Bald Eagle perched east of heron colony July 2018

The status of Bald Eagles in this region is not known, due to the discontinuation of Bald Eagle monitoring by WDFW over 15 years ago. Due to the success of the Bald Eagle population and its rebound following near extinction in certain parts of their range, the species was delisted from the Federal Endangered Species Act in 2007, followed by down listing to “Sensitive” in Washington State in 2008. However, Bald Eagles and their nests, remain protected under the Bald and Golden Eagle Protection Act (federal), and under the Washington State Bald Eagle Protection Rules (WAC 232-12-292) and local Critical Area guidelines.

The illustrated aerial photograph Figure 6 provides the location of the nearest known Bald Eagle nest in proximity to the Post Point Heron Colony. This nest no longer appears to be active.

Figure 6: Bald Eagle Nest Location and Heron Colony

Other Disturbance

The 2019 Post Point nesting colony experienced no human detectable disturbances. However, there are always some human/heron interactions along the shoreline at Marine Park and possibly in other foraging areas. Herons using the shoreline of Marine Park and Post Point are vulnerable to people, dogs and water-sports enthusiasts utilizing this area. It is difficult to determine the impact these interactions have on the herons, however, with greater public education serious impacts can be avoided.

Every Memorial Day weekend, the Ski to Sea Race, an international competitive event, finishes at Marine Park and stages associated festivities in Fairhaven. This multi-leg relay race event involves about 350 teams and 1000 volunteers. As a result, the Post Point, Marine Park area is inundated with people, temporary structures and equipment on race day.

The heron colony seems to be unaffected due to the distance from the activities; however disruption to heron foraging along the shoreline at Marine Park during Ski to Sea has occurred. With hundreds of race-day fans watching from the shoreline, loud music, and boats, Marine Park is not a favorable place for herons attempting to feed. Direct disturbance to herons is dependent on timing, tidal stage, and access to the intertidal area for feeding.

The race finish is set up at Marine Park and the finish line requires the racers to exit their kayaks at the water's edge and then run up the beach to the finish line. Aside from setting up, there is not much activity along the beach until noon or 1pm on race-day when the contestants begin to arrive. If the tide is high above 2 ft. there is little chance for conflict, however if the tide drops, there is more intertidal area exposed and greater access for people, and more potential for conflict with herons attempting to feed.

Aerial view of Ski to Sea finish line at Marine Park - photo courtesy of skitosea.com

According to the City of Bellingham personnel, steps were taken to minimize potential heron conflicts during Ski to Sea. The City coordinated with the Port of Bellingham, park owner, to post temporary signs at Marine Park and Post Point Lagoon asking citizens to keep their distance from herons and avoid flying drones over the heron colony and foraging habitat. The City also worked with the Ski to Sea organizers and the Bellingham Herald to confirm they would avoid drone use over these same areas.

For the 2019 Ski to Sea race day May 26, 2018, Tami DuBow was at Marine Park to make observations of the foraging area and colony. Arriving near low tide 5:30 pm, the tide was low at 1.28 ft. and the race was nearly over, although there was still a lot of activity and the music was measured at 82.4 dB at Marine Park. No herons were on the intertidal area, however some were flying over to other areas to feed.

Looking ahead, the 2020 Ski to Sea Race is scheduled for May 24, and at 1pm the tide will be a minus 1.7 ft. This tide level will expose the intertidal area and eelgrass will be accessible for the herons. Due to the minus low tide coinciding with the peak in spectators and onslaught of race contestants arriving at Marine Park, there is potential conflict with herons. It is recommended that signage be placed at Marine Park asking the public to avoid herons, and the beach to the south of Marine Park be temporarily fenced off to spectators.

Marine Park Shoreline looking northeast – railroad to right – Bellingham Bay to left

Herons foraging at Marine Park minus 2.8 ft. tide – photo by Tami DuBow

NEST SURVEY & MAPPING UPDATE

The annual nest count is the standard method for determining the number of nests within a heron colony. Autumn nest counts, following leaf drop, allows maximum viewing of the whole heronry, and is the most accurate means of attaining a total nest count.

In most heron colonies not all nests are active or successful in fledging young, so although the autumn nest count provides a total, it does not represent active nests. A count of active nests needs to be conducted during the nesting season or immediately following the fledging of young.

During each annual nest count, each nest tree is tagged or existing tags are read, and tree condition is noted. New nest trees are located with GPS, recorded and tagged. The number and size of nests are recorded as well as the presence of egg shell, remains or blown down nests. All information is recorded.

A record of nest tree locations and nest numbers per tree is also made and updated in the autumn of each year. All nest trees are assessed, tagged and then added to a database of nest trees present in the colony. A map, illustrating the nest trees and locations in the heronry, is updated annually (Figure 7).

For 2019 two colony assessments were made, September 30 and November 3. All nest trees and perimeter trees were evaluated for wind damage and other signs of disease or insect infestation. Only one nest tree needed to be tagged. The new nest tree location was triangulated for the map update. The previous on site mapping update was completed in 2018 by the City of Bellingham GIS department.

The results of the 2019 colony assessment are:

- Total nest trees = 22 (4 dead and 1 broke off, all alder) 2 nest trees active in 2018 were also blown down.
- Total new nest trees = 1
- Total nests (during the 2019 nesting season) = 40
- Total active nests = 40
- Total nests lost during the season = 2 (fell out of trees)
- Total nests successfully fledging young = 38

The total number of nest trees is unchanged from 2018. The high nesting concentration in certain trees has also continued from 2017. This year 20 nests or 50% of the total nests were located in only 5 nest trees, similar to 2018. These trees held 3-5 nests each. In 2017, 26 nests or 74% of the total nests were located in 8 trees or 54% of the total nest trees, each of which held 3-6 nests each. This concentration increases the density of the core nesting area.

In 2019, 38 nest trees were red alder and 2 big-leaf maple.

In review of previous years (Table 7), the colony started in 2000 with 6 nests in 5 nest trees and grew for the next 6 years to a high in 2006 of 37 nests.

In 2007 the colony declined slightly, followed by two years of complete colony failure. The failures of 2008-2009 were mid-season following the reoccupation and nesting of the herons. This was likely due to Bald Eagle depredation.

Following two failed nesting seasons (2008-2009), in 2010, the colony rebounded with 13 active nests, all of which fledged young and the colony has gradually grown every year except 2013.

Between 2014-2018 the colony has grown at a rate between 19%- 23% per year. In 2018, the colony jumped by 32% over 2017. Although the colony declined slightly in the number of nests from 2018 to 2019, the productivity actually increased in 2019.

The following is a summary of nests and nest trees since 2000. Also see Figure 8

Table 7: Post Point Heron Colony Annual Nest Count

Year	Total number of nests	Total number of nest trees	Percentage change from previous year (# of total nests)
2000	6	5	----
2001	8 estimated	6 estimated	+33%
2002	10	6	+25%
2003	14	8	+40%
2004	19	10	+36%
2005	31	10	+63%
2006	37	15	+19%
2007	27	12	-27%
2008	17 active but failed mid-season	9	-37%
2009	11 active but failed mid-season	8	-35%
2010	13 active	9	+44%
2011	16 active, 1 not active	12	+23%
2012	17 active, 1 not active	13	+6%
2013	17 active, 1 not active	14	0
2014	21 active – all active	14	+23%
2015	25 active -24 successfully fledge young	15	+19%
2016	29 active – 24 successfully fledge young	16	+16%
2017	35 active and successful	18	+20%
2018	44 active – 41 successfully fledge young	22	+32%
2019	40 active – 38 successful	22	-9%

Colony Mapping

A colony map update was completed in December 2018, the City of Bellingham. The detailed colony map (Figure 7) illustrates the colony, its location on the landscape, the core area, nest tree location and nest tree number. The nest tree locations were also updated by the City of Bellingham in December 2018, and the new nest tree location for 2019 was added by using triangulation measurement with other nest trees. The base used for the colony maps is the 2016 aerial photo.

The 2019 colony map (Figure 7) illustrates all nest trees in the colony, including those used in past years (green) and those active in 2019 (red).

For 2019, a new buffer line in red, surrounds the colony and represents the 2012 recommended minimum buffer for urban heron colonies by Washington Department of Fish and Wildlife (Azerrad 2012). This line is a 197 ft. buffer measured from the perimeter of the colony's nest trees. The colony was previously illustrated, in 2003, with a different core area, showing the colony's perimeter calculated 50 feet laterally from the base of the outermost nest trees and a 100 foot buffer measured from the perimeter. This buffer was created as the minimum no-entry/ no disturbance area during the breeding season (2003 Post Point Heron Colony Management Plan). This buffer however does not represent or conform to current WDFW buffer or setback recommendations for disturbance, or land use activities.

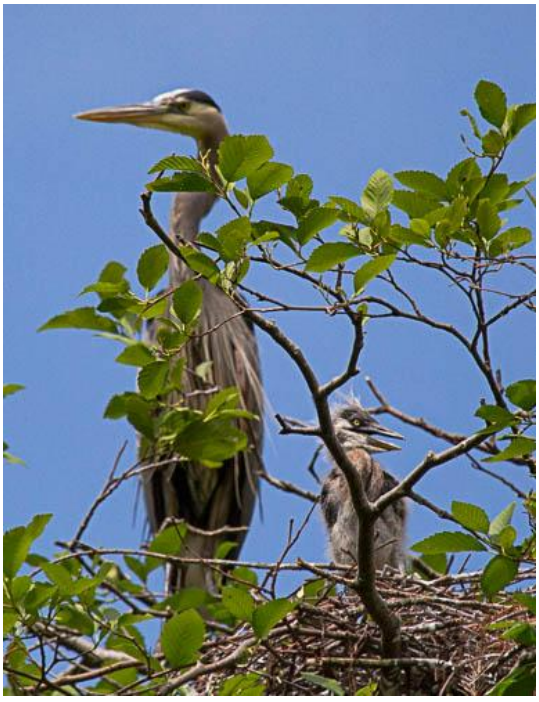
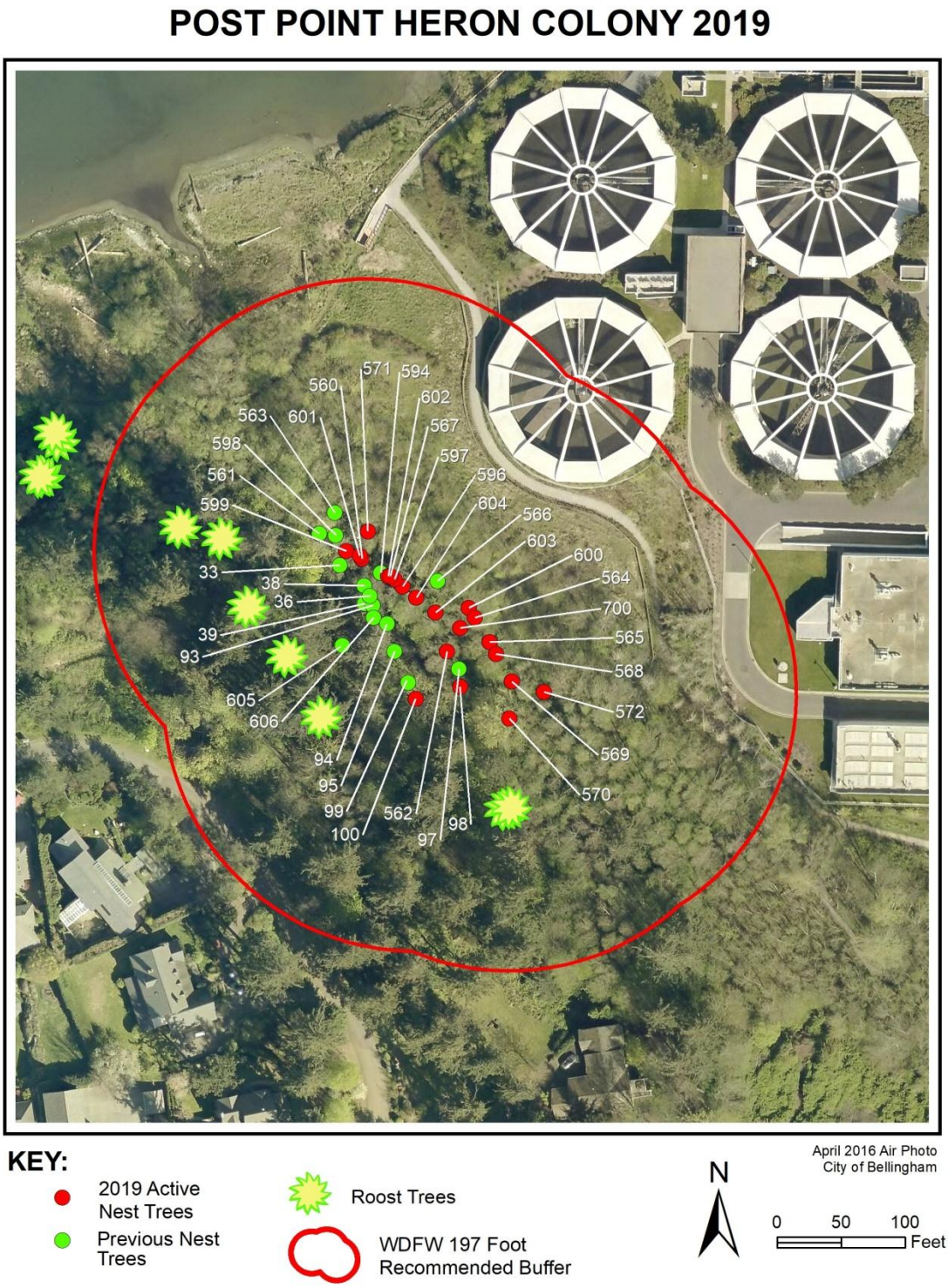


photo by Alan Fritzberg 2018

Figure 7: Colony Map 2019 Detail



Note: 28 of 38 tagged tree locations have been located by PW Survey staff in 2013 and 2018. Six additional trees (2014-2019) were located in the field by Nahkeeta NW and/or City Planning staff by triangulating between previously-mapped trees. Four historic nesting trees that have since blown-down or been damaged are represented with last known location.

COLONY DYNAMICS

In 2019 the Post Point Heron Colony has reached 20 years at its current location. The colony's resilience at this location speaks to the habitat and resources supporting the colony's success and also to the heron's strong site-fidelity. Following is a summary of the colony dynamics and Figure 8 provides a chart depicting the number of nests, trees and young between 2001-2019.

Looking back, the heron colony experienced growth in its first six years, then for unknown reasons declined, failed, and then rebounded in 2010. Between 2000 and 2006, the colony expanded from 6 to 37 nests. During this period the growth rate was approximately 36% annually. In 2007 the colony sharply declined and the colony struggled with Bald Eagle depredation and nest failures between 2008 and 2009. In 2010, the colony rebounded and in 2011 and 2012 the colony continued to be successful with incremental growth. However, at the onset of the PPRRP expansion 2012-2013 no change in the colony occurred. In 2014 the colony started steady growth of 4 nests per year for four seasons, and the number of young also grew. In 2018, the colony exceeded its all-time high nest count of 37 active nests with 91 young from 2006, to 44 nests and 97 young. For 2019, the colony has maintained a high nest count of 40 active nests and 103 young. The growth between 2014 and 2019 is over 90%.

In more detail, the early growth of the colony indicated the annual influx of new breeding adults and likely return of previous fledglings to breed once reaching maturity (2-3 years of age). Based on 2005 fledging numbers, the predicted return of 30 young breeders did not occur, instead approximately 20 heron failed to return to the colony to breed in 2007. In 2008, the return of adult heron to the colony was only half of the previous year and that repeated in 2009. The decline in breeding numbers in 2007 was likely related, in part, to high mortality resulting from harsh conditions and hurricane force winds experienced during 2006-2007 winter months, as well as other environmental stressors impacting heron fitness and survival. Declines and failures in 2008-2009 were related in-part to depredation by Bald Eagles, but other factors were also likely involved, including weather, water temperature, prey availability, and adult heron health/fitness. There may have also been some human disturbance in the colony. Known declines at other colonies in the Salish Sea were also reported in 2008 and reflect the need for region-wide reporting and tracking of colonies.

2010 to 2012 marked a positive upturn for the Post Point Heron Colony. A minor increase in the number of nests and successful fledging of young proved to be an important turn around for the colony. The lack of Bald Eagle incursions during the 2010 season contributed positively to the nesting success. The mid-season loss of viable eggs and young from eagle depredation in 2011 was expected to be devastating to an already stressed colony, however, the colony rebounded with a second nesting attempt and successfully fledged young from all active nests. With no depredation or other problems in 2012, the colony stabilized and produced young.

In 2013 through mid-2014, the nearby PPRRP construction, increased noise and large scale landscape changes and general human disturbance. The colony maintained productivity during both seasons and fledged young in condensed nesting periods. Growth in the colony in 2014 was slight for nests, but jumped 35% for young. The lack of Bald Eagle presence likely contributed to the success of the colony.

2015 proved to be a successful with growth, high productivity and successful fledging of young. Starting from a mild winter, the herons returned and nested in larger numbers than the past 8-9 years. The lack of construction disturbance and absence of Bald Eagle depredation proved

favorable for the herons. As a result the heron colony grew by 19% in 2015, with 67 young, productivity of 2.8 young per nest was well above the previous three year mean of 2.4.

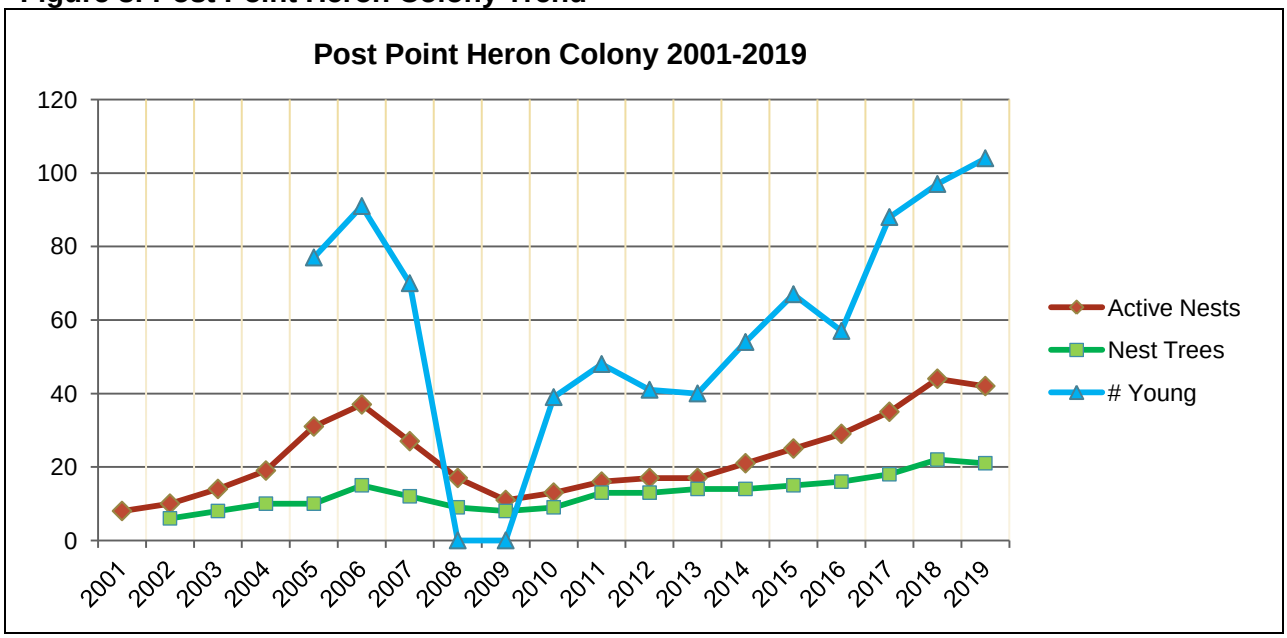
In 2016, the colony experienced some instability from unknown causes. The herons were jumpy in the early season, easily flushed and temporarily deserted the colony. Neighbors reported the herons circling over the colony and also complained of increased train traffic and associated noise and a large helicopter over the colony area. These occurrences likely contributed to the heron's sensitivity, but there may have been other human related disturbance as well. Despite the early season instability, the colony nest count increased by 16%, but number of young and productivity dropped.

During the 2017-2018 nesting seasons the colony experienced a high growth and productivity period. From 2016, the number of nesting pairs jumped by 51% and the number of young increased 70%. Part of this growth is contributed to the abandonment of the Samish Island heron colony in 2017 and the likely relocation of breeding pairs to Post Point. The peak number of active nests in 2018 (n=44) and young (n=97) marked a new high for the colony. Also no disturbances occurred during these years, expect late winter storms which delayed the colony reoccupation.

It is worth noting that the Samish Island heron colony, located 10.5 miles south of Post Point, was one of the oldest, continuously active heronries in the region. Records indicate that the colony was productive for at least 80 years, and was one of the largest nesting sites in the Salish Sea, averaging 250-300 nests annually. Herons displaced from Samish Island have likely dispersed throughout the region, explaining the sudden growth in existing colonies including Post Point.

In 2019, the Post Point Heron Colony maintained a high level of success with 40 active nests, and a new record of 103 young. The productivity also was excellent at 2.57 young per active nest. Overall the heronry has been on a growth trend since 2013.

Figure 8: Post Point Heron Colony Trend



Note: No productivity data 2001-2004. Colony mid-season failure 2008 and 2009.

MANAGEMENT AND STEWARDSHIP

The Post Point Heron Colony was established in 2000 at its current location. Herons have occupied and nested at this site for 20 seasons. During this time, the City of Bellingham's management and stewardship of the site has been vital in maintaining this priority wildlife area.

Recommendations for 2020 management and stewardship of the Post Point Heron Colony are as follows:

- Continue annual biological monitoring of the Post Point Heron Colony.
- Record and report any disturbance to herons in the colony or foraging areas.
- Limit disturbance to, or loss of, associated forest and upland habitat around the colony.
- Permanently protect additional forest buffer and habitat area associated with the colony, particularly vital buffer above the colony to Shorewood Dr.
- Protect the Post Point nearshore foraging habitat from human recreational disturbance by posting educational signage at Marine Park during nesting season - including the lagoon and outer shoreline intertidal and eelgrass area.
- Conduct a comprehensive heron foraging survey around Bellingham Bay and Chuckanut Bay to update 2006 data and document current heron use areas.
- Monitor Bald Eagle activity near the colony.
- Explore the feasibility of a webcam installation in the colony for public viewing and education.
- Work with the Port of Bellingham to minimize disturbance to herons on the marine shoreline from Marine Park to Post Point during the nesting season February 1-September 1.
- Work with Ski to Sea organizers to minimize disturbance to herons and other wildlife during the Ski to Sea event.
- Define the Post Point Heron Colony as a no-fly-zone for drones.
- Conduct a forest assessment by a professional, to evaluate tree health, wind break and provide enhancement suggestions for the nest stand.
- Evaluate chemical odor from PPRRP clarifier near colony and mitigate if possible.

A larger project to asses foraging areas for the purpose to document prey species and seasonal occurrence in Bellingham and Chuckanut Bay is needed to better understand the prey relationship with the heron colony. No survey of nearshore heron prey species has been conducted in Puget Sound and sampling of heron use areas is needed to understand the heron/prey dynamic. Documentation of prey concentrations would also help direct conservation and track the health of foraging areas. Continued observation of foraging areas during the breeding season is also essential due to the dependence of the colony's success on these areas.

In addition, inclusion or support for regional heron colony monitoring would contribute significantly to the understanding, determination of trends and tracking of the heron population as a whole. With this additional information, individual heron colony fluctuations and effects on nearby colonies can be better understood and tracked over time.

The growing use of drones, by both professionals and the general public, has created an urgent need for public agencies to set rules of use and define areas where drones should be restricted. Heron colonies, such as Post Point, are vulnerable to disturbance by drones and their use

should be restricted in these areas. It is recommended that the City of Bellingham establish a drone no-fly-zone around the Post Point Heron Colony.

The City of Bellingham's efforts to educate and inform the public particularly for neighbors, shoreline user groups, and Sea to Ski organizers needs to continue as an on-going effort to inform users and user groups of sensitive heron habitat, and the role they can play to protect these areas for herons and other wildlife.

Post Point Heron Colony photo by Alan Fritzberg 2018

CONCLUSION

This Annual Report provides the final summary of the 2019 heron nesting season and results of all monitoring activities. A total of 23 monitoring visits were made to the colony this season.

During 2019, the Post Point Heron Colony completed a successful nesting season, producing 103 young and contributing to the perpetuation of this species in the Salish Sea. For the 20th season, the heron's return, growth, and productivity are testament to the heron's high site fidelity and resilience in an urban environment.

The Post Point herons returned to the colony later than normal in 2019 due to severe winter conditions and snow in February and early March. Although similar conditions delayed nesting in 2017 and 2018, the winter storms of 2019 delayed reoccupation of the colony until the third week of March and also caused tree damage in the colony and its buffer.

The 2019 nesting season, from late March proceeded through July, with a few herons lingering until August. No disturbance or disruption to the colony was reported during the nesting season. Although eagles were present, no incursions or disturbance were reported.

The Post Point heron occupied 22 nest trees and a total of 40 active nests. Two nests were lost during the season. The remaining 38 nests supported a total of 103 young, averaging 2.7 young per successful nest, which is well above the normal productivity range for this region. The majority of the heron, adults and young, dispersed from the colony by July 20, with 1 nest remaining active into early-August. Overall, the 2019 was a success for the Post Point Heron Colony.

ACKNOWLEDGEMENTS

Nahkeeta Northwest would like to extend our gratitude to the City of Bellingham for supporting the conservation of the Post Point Heron Colony and the individuals that have supported monitoring of the colony site. We would also like to express a special thank you to the City of Bellingham GIS lab for providing expertise in mapping the colony and nest locations and creating accurate updated maps.

We greatly appreciate photographs of the Post Point herons provided by Alan Fritzberg, Nancy Downing, Linda Wright and others by Mike Hamilton, Tami DuBow and the Starr Family. Finally, we acknowledge the support of neighbors and citizens who shared useful information related to the herons and heronry. Thank you!

Photo by Alan Fritzberg

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Inside the Post Point Heronry
Photo by A. Eissinger

ATTACHMENT

Post Point Heron Colony Annual Chronology
2019 Update

Pre 1999:

- Post Point bluff utilized by herons for roosting and possible nesting
- Post Point Lagoon and nearby shoreline utilized for foraging

1999

- Neighbors report heron nesting activity at Post Point (1-2 nests unconfirmed)
- Chuckanut heron colony abandon from Heron Estates
- Herons reported attempting to build nests in cottonwood north of Viewcrest, nesting attempt failed

2000

- Herons establish nesting colony in present location at Post Point
- Total 6 nests in 5 trees and successfully fledge young

2001

- Herons continue to nest at Post Point (no data available - 8 nests estimated)
- Pedestrian trail moved away from base of colony to 111 feet northeast

2002

- Herons continue to nest at Post Point increasing to 10 nests in 6 trees
- 66% growth from 2000 (estimated 25% annual growth from 2001)

2003

- Herons nesting at Post Point increase to 14 nests in 8 nest trees
- 133% growth from 2000 (40% annual growth from 2002)

2004

- Herons successfully nesting at Post Point for 5th year with 19 nests in 10 nest trees
- 216% growth from 2000 (36% annual growth from 2003)

2005

- Herons successfully nesting at Post Point for 6th year.
- 56-58 breeding adults.
- Staging reported February 11 with nesting commencing February 23.
- Hatching confirmed April 19
- Nesting/fledging completed August 26.
- 28 week breeding cycle.
- Productivity: mean 2.5 young per nest = estimated 77 young fledged
- Total of 31 nests in 10 nest trees (including 1 blown down nest)
- 416% growth from 2000 (63% annual growth from 2004)
- Average growth rate = 39.4% annually over 5 years.

2006

- Herons successfully nesting at Post Point for 7th year.
- 72-74 breeding adults.
- Staging reported March 1 with nesting commencing March 15.
- Hatching confirmed May 3
- Nesting/fledging completed August 11.
- 23 week breeding cycle.
- Productivity: mean 2.6 young per nest = estimated 91 young fledged
- Total of 37 nests in 15 nest trees
- 19% annual growth from 2005
- Average growth rate = 36% annually over 6 years.

2007

- Winter storm damage: loss of 5 trees and 7 nests
- Herons successfully nesting at Post Point for 8th year.
- ~54 breeding adults.
- Colony reoccupied Feb. 18
- Incubation started March 12
- Hatching confirmed April 26
- Nesting/fledging completed July 26.
- 22 week breeding cycle.
- Productivity: mean 2.6 young per nest = estimated 70 young fledged
- Total of 27 nests in 12 nest trees
- 27% nesting decline from 2006
- Average growth rate = 35% annually over 7 years.

2008

- Herons return to nest at Post Point for 9th year.
- Colony reoccupied March 6
- ~34 breeding adults
- Incubation started March 15
- First hatching confirmed April 26
- Early nests failed late-May
- Second nesting attempt June
- Colony failure late-June
- Colony abandonment confirmed July 1 – no young fledged
- Total of 17 nests in 9 nest trees
- 37% nesting decline from 2007 – no productivity

2009

- Herons return to nest at Post Point for 10th year.
- Colony reoccupied March 6
- ~18 breeding adults - 11 nests active (2 unable to attract mates)
- Incubation started April 1
- First hatching confirmed May 3
- Bald Eagle depredation observed May 27
- 2-3 nests remain active May 29
- Colony abandonment confirmed June 12 – no young fledged

- Total of 9 nests utilized in 8 nest trees
- 35% nesting decline from 2008 – no productivity

2010

- Herons return to nest at Post Point for 11th year.
- Staging Feb 5
- Colony reoccupied March 6
- 22 breeding adults – 13 nests active (max. 15 nests visible)
- Incubation started March 19
- First hatching confirmed April 27
- Productivity ~3 young/nest
- No Bald Eagle depredation observed or reported
- Fledging late June – early July, fledging complete July 12
- Total of 13 active nests utilized in 9 nest trees
- 2 added nests, positive change from 2008-09 – 100% change in productivity!

2011

- Herons return to nest at Post Point for 12th year.
- Staging in colony February 10 – 5 nests occupied by single adult
- Winter storm and snow force heron out of colony February 25
- Staging on clarifiers March 3
- Colony reoccupied March 7 – 7 nests occupied
- Early Incubation started March 19
- Total 16 nests active (max. 17 nests visible) April 9
- Bald Eagle incursions April 26-27 eggs and young viability lost
- Re-nesting begins May1 – 16 nests remain occupied
- Egg laying/incubation underway May 5
- No Bald Eagle incursions observed or reported
- First hatching confirmed June 1
- Rearing June/July
- Productivity ~3 young/nest
- Fledging late July – early August, fledging complete August 14 (one month later than 2010)
- Total of 16 active nests utilized in 13 nest trees (2 new nest trees)
- 3 added nests, positive change from 2010 = +23%

2012

- Herons return to nest at Post Point for 13th season.
- Staging in colony February 3-22, w/ 1-5 nests occupied by single adults
- Winter storm and snow force most heron out of colony February 29
- Colony reoccupied March 3 – 7 nests occupied, 15 nests visible
- Pairing, courtship begin March 8
- Incubation started March 23
- Total 16 nests active (max. 11 nests visible) April
- Possible Bald Eagle incursion April 25, no impact observed
- Late April – very poor weather obscuring views and extending brooding
- First hatching approximately May1
- Rearing May-June

- First fledglings observed June 26
- Productivity ~2.4 young/nest
- Total of 17 active nests utilized in 13 nest trees (2 new nest trees)
- 3 added nests, positive change from 2011 = +6%

2013

- Post Point Waste Water Treatment Facility expansion underway, construction occurring 100+ feet from colony edge.
- Herons return to nest at Post Point for 14th season.
- Staging in fir tree west of colony 8-10 herons Feb 1.
- Colony Reoccupation: February 26, w/ 10 nests occupied by single adults.
- Pairing, courtship begin March 1.
- Onset of egg laying/incubation March 14.
- Bald Eagle incursion March 22, possible egg loss 1-3 nests impacted.
- Total 16 nests active April.
- First hatching approximately April 15.
- Rearing April-May-June
- First fledgling observed June 10, most fledging June 25-July 10.
- Productivity 2.37 young/nest
- Total of 17 active nests utilized in 14 nest trees

2014

- Post Point Waste Water Treatment Facility expansion construction continued, occurring 100+ feet from colony edge, plus a new trail <100 feet.
- Herons return to nest at Post Point for 15th season.
- Colony Reoccupation: February 20-26, w/ 4-9 nests occupied.
- Late winter storm – heron abandon site
- March 3, heron begin to reoccupy colony
- Pairing, courtship begin March 15, 11 nests occupied.
- Early egg laying/incubation March 17 (2 nests only).
- Available nests saturated (17 nests occupied) March 27
- Onset of egg laying/incubation 10+ nests April 1
- New nest added – total 21 active nests Apil17
- First hatching approximately April 21.
- Rearing late April-May-June
- PPRRP Expansion Competed June 1
- First fledgling observed June 11, most fledging July 1-15.
- Season End August 1
- Productivity 2.5 young/nest
- Total of 21 active nests utilized in 14 nest trees (1 new nest tree)
- 4 new nests, positive change from 2013 = 24%

2015

- Herons return to nest at Post Point for 16th season.
- Colony Reoccupation: February 9, w/ 11 nests occupied.
- Pairing, courtship begin February 15 (one month earlier than 2014), 11 nests occupied.
- Early egg laying/incubation March 16 (5 nests), 20 nests occupied.

- Onset of incubation March 29.
- New nests added – April – May, total nests 25.
- First hatching approximately April 12.
- Rearing April-May-June-July
- Peak fledgling June 27-July 9.
- All young fledged July 9, except 3 nests. Final nest fledge after Aug. 2.
- Productivity 2.8 young/nest
- Total of 25 active nests utilized in 15 nest trees (1 new nest tree)
- Positive change from 2014 = 19%

2016

- Herons return to nest at Post Point for 17th season.
- Heron return to colony January 30, and then leave abruptly mid-February.
- Colony Reoccupation: March 2 w/ 11 nests occupied.
- Pairing, courtship begin March 11, 17 nests occupied.
- Early egg laying/incubation March 23 (3 nests), 19 nests occupied.
- Onset of incubation March 30.
- New nests added – April, total active nests 29.
- First hatching approximately April 21.
- Rearing late April-May-June-July
- Peak fledgling July 1-July 9.
- All young fledged July 15, except 3 nests. Final nests fledge July 17-23.
- Productivity 2.3 young/nest
- Total of 29 active nests utilized in 16 nest trees (2 new nest trees) – 24 nests successful in fledging young
- Positive change from 2015 = 16%

2017

- Herons return to nest at Post Point for 18th season.
- Heron return to colony delayed due to extended winter and snow in February
- Heron present in colony Feb 22 and March 1 – no nesting
- Herons absent from colony – March 8
- Colony Reoccupation, pairing and courtship: March 15 – 23 heron w/ 18 nests occupied.
- Early egg laying/poss. Incubation(1 nst) March 22 (same as 2016), 24 nests occupied.
- Onset of incubation - 20 nests as of April 12, 30 nests occupied.
- New nests added – April, total active nests =33.
- First hatching April 26-May 3.
- Rearing May-June-July (2 nests into Aug) – 2 new nest obs, total active nests =35
- Peak fledgling July 12-July 19.
- All young fledged July 26, except 5 nests. Final nests fledge July 29-Aug 6 except one late nest.
- Productivity 2.5 young/nest
- Total of 35 active nests utilized in 18 nest trees
- Positive change from 2016 = +20%

2018

- Herons return to nest at Post Point for 19th season.
- Heron return to colony delayed due to winter conditions in February
- Heron return March 8
- Colony Reoccupation, March 14 with 20 nests occupied
- Early egg laying and early onset of incubation March 29
- Early hatching begin April 26 – hatching continue through May
- New nests added – April-May, total active nests =44
- Rearing May-June-July – 3 nests lost, total active nests =41
- Fledging start July 6
- Peak fledgling July 13-Aug 2.
- All young fledged Aug 2, except 4 nests.
- Season complete Aug 18
- Total young = 97, Productivity 2.4 young/nest from 41 nests
- Total of 44 active nests utilized in 22 nest trees
- Positive change from 2017 = +32%

2019

- Herons return to nest at Post Point for 20th season.
- Herons delayed due to winter conditions through February to early March
- Colony reoccupation, March 21 with 15 nests occupied
- Early egg laying and early onset of incubation April 9
- Early hatching begin May 9 – hatching continue through May
- Total nests April = 40, nests lost May = 2, total active nests =38
- Rearing May-June-July
- Fledging start July 5
- Peak fledgling July 12-20.
- All young fledged July 25, except 2 nests.
- Season complete Aug 8
- Total young = 103, Productivity 2.7 young per successful nest from 38 nests
- Total of 40 active nests utilized in 22 nest trees
- Negative change in nest numbers from 2018 = -9%
- Positive change in young fledged from 2018 = +6%

Heron Flyover
Photo by Mike Hamilton