

ESTABLISHMENT OF THE GREAT BLUE HERON COLONY ON MOTOR ISLAND

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Historically there have been many Great Blue Heron colonies in the Niagara Frontier Region of New York State. Large colonies existed in Oak Orchard Swamp and on Grand Island, while in adjacent Canada large colonies existed near Chippawa and Wainfleet. Four small colonies existed "in the southern tier counties and a few elsewhere in our territory" (Beardslee and Mitchell 1965). Of the 81 Great Blue Heron colonies found in New York between 1964 and 1968, eight were found in the Niagara Frontier Region. Of 197 colonies found in New York State between 1972 and 1981, 18 were in Region 1 (McCrimmon 1982). *The Atlas of Breeding Birds in New York State* (1988) shows 16 noncontiguous areas of confirmed breeding.

In 1990 while conducting a study of the number of herons occupying Motor Island during the winter, the author had the good fortune to witness the creation of a Great Blue Heron colony (Fig. 1). While attempting to ascertain a departure date for wintering herons, heron nesting activity was observed. This nesting activity led to the establishment of a small, but productive colony that has produced new early and late nesting dates.

DESCRIPTION OF THE NESTING SITE

Motor Island (referred to by the owner as Pirates Island) is located in the east branch of the Niagara River due east of Beaver Island State Park, Grand Island, New York at 78° 55' 30" W longitude and 42° 53' 40" N latitude. It is a teardrop shaped island with a maximum length of slightly more than 1000 feet and a maximum width of nearly 400 feet. Observations were made with an 8 inch Celestron telescope from the boat launch at the west end of Sheridan Drive in the Township of Tonawanda at a distance of 2000 feet.

OBSERVATIONS

Fifteen counts during January produced a maximum of 34 Great Blue Herons on both 26 and 28 January, while four observations during February yielded a maximum of 28 herons on 6 February 1990. From 3 March 1990, until 23 August 1990, 34 observations were made on 29 different days. The following is a summary of these observations:



Figure 1. Motor Island heronry, Erie Co., New York, 22 May 1994. Photograph by Robert W. Brock.

- 24 March 1990. 12:20-12:40 PM. A Great Blue Heron was observed picking up and later dropping a stick. The bird then repeated the process with a second stick. Picking up a third stick (which after some deliberation apparently seemed just right) the heron flew to its mate. The heron's mate, standing on a primitive nest, took the stick, but then seemed just as perplexed as the first heron as to what to do with it. After carefully studying the nest for at least five minutes, this second heron carefully placed the stick in the appropriate location on the nest. Later the original heron came to the nest with another stick and the procedure was repeated.
- 28 March 1990. 3:25-3:35 PM. Five Great Blue Heron were viewed on Motor Island. Two were dutifully standing on two different nests. No incubation behavior was observed.
- 12 April 1990. A total of 13 Great Blue Heron was observed on Motor Island. Two of the nests contained herons in low incubating positions. The head of one of the birds was barely visible.
- 28 April 1990. 7:05-7:15 AM. Eleven Great Blue Heron and seven of their nests were studied on Motor Island. Herons demonstrated incubating behavior on two of the nests and feeding behavior on three other nests.

- 13 May 1990. 1:32-2:43 PM. After an hour study, it was determined that there were eight heron nests, 14 adult Great Blue Heron, and 10 or 11 nestlings. During this study, a drawing was made showing the location of each nest relative to surrounding trees, the maximum number of adults at each nest, and the number of immature herons in each nest. The nests were then numbered in order from oldest to youngest. Nest 1 (with the oldest appearing nestlings) had four nestlings. Nest number 2 had three or four nestlings, while nest number 3 had three nestlings. The nestlings in nest 2 appeared to be feathered and had dark caps and light throats. These small nestlings could best be counted only when they were erect, stretching their bodies and necks as they begged for food from an occasionally present adult. Although the temperature was 48°F, there was some rain, and the winds were from the northeast at 13 mph, none of the nestlings was incubated by an adult during the 71 minutes of observation time.
- 28 May 1990. 6:25-6:40 AM. One of the four young herons in nest 1 was observed two feet from the edge of the nest, but it later returned to the nest. The adult demonstrated wing flapping to the young, and the young responded by flapping their wings. The four young at nest 2 were all standing and appeared to have moved to a new nest located above the old nest. The three nestlings at nest 3 initially were resting, but at 6:40 all three were standing.
- 3 June 1990. 6:55-7:40 AM. Three of the four immature herons in nest 1 moved outside their original nest to an old nest. One of the nest 2 young birds was on a branch about 3 feet south of and one foot above its nest. Ten of the young herons were standing, while one in nest 2 was sitting. Another in nest 2 was flapping its wings. Two adults in higher nests were still incubating. A total of 11 adults and 11 young was observed.
- 14 June 1990. 3:50-4:05 PM. The adult Great Blue Heron at the southernmost nest demonstrated feeding activity between 3:56 and 3:58 PM and incubated in what seemed to be an abnormally high position.
- 15 June 1990. 10:44-11:41 AM. A total of 21 Great Blue Heron was observed. At 11:06 nest 2 was empty. There were no herons within a five foot radius of this nest. Nest 1 was empty, but an adult and four young were within a loose five foot radius of the nest. Nest 3 still contained three young herons. When an adult Great Blue Heron landed some five feet south of the nest, one of these young ran to meet it. The adult walked past the more assertive young bird and fed

the two that had remained on the nest. There are two possible explanations for this behavior. The first is that the assertive young heron was an interloper and not the offspring of the adult. The second is that the adult recognized the assertive young heron was more precocious than its siblings, and the adult was withholding food in an attempt to encourage this more precocious offspring to search for its own food. There was more evidence of precocial behavior. One young heron was observed with five adults in a grassy field 30 feet from the nearest nest. This bird was probably feeding and could certainly be considered a fledged immature Great Blue Heron. The earliest state record of a fledged Great Blue Heron is July 17. There was also evidence of younger herons. The newer nest first detected still had two immature birds. At 11:29 an adult incubating on the most southern nest of the colony stopped incubating and either rolled its eggs or fed very small nestlings until 11:33. Then it appeared to feed itself from material on the nest and at 11:36 continued incubating.

- 19 June 1990. 10:45-11:14 AM. The young herons continue to become more loosely associated with their nests. At 10:45 nest 1 was empty without any young Great Blue Heron in its vicinity. Nest 2 had one young on the nest, and then at 11:08 it had two young about five feet to the north of the nest. Only nest 3 (the nest with the most immature herons of the three original nests) had substantial activity around it. At 10:45 there were four young about five feet to the north of the nest, but by 10:50 this number had dwindled to two. At 11:00 two young herons were on the nest, and two young herons were five feet from the nest. However, when an adult heron landed at the nest at 11:06 all four young herons were in the nest! Did these young herons go to the nest expecting to be fed? On the basis of the behavior described under 15 June, the answer probably is yes.
- 24 June 1990. 9:30-9:54 AM. At the most southern nest of the colony (in which possible feeding activity had been observed on 15 June) one new nestling was finally observed.
- 30 June 1990. At 1:30 PM three Great Blue Heron nestlings could be seen in the southern nest. The three original nests each have one young heron, while nest 3 has three additional young within a five foot radius of it. At 10:30 AM four young herons had been observed in the nest above the original nests.
- 11 July 1990. 9:46-10:40 AM. The three original nests are all vacant, and it was assumed that these birds had fledged and all or at least most of them had left the colony. The remaining immature herons are in four

other nests or very close to these other nests. Based on the apparent age of the nestlings, the nests were designated nest 4, nest 5, nest 6, and nest 7. Nest 4 was largely obscured by foliage, but appeared to have two young in it and one young heron associated with it. Nest 5 was in a flowering tree, and contained four young. Nest 6 and nest 7 both contained three very young Great Blue Heron nestlings. A new map was again drawn showing the relative position of all the nests, as well as trees, bushes and other landmarks. Since nest 6 and nest 7 contained the youngest herons, they were studied most carefully. Although all the nestlings could stand and probably walk, initially all six young remained in their nests. At 10:08 a nestling on nest 7 stretched its wing. From 9:40 until 10:19 no adults were observed at the colony; however, at 10:20 an adult landed and fed young at nest 7. One nestling at nest 7 was observed swallowing what looked like a sizable orange carp. After the adult left at 10:24, the only significant activity of a young heron from these two nests observed during the 54 minute study period was that a nestling from nest 6 stepped about two feet from the nest.

20 July 1990. 7:10-7:25 AM. Nineteen young Great Blue Heron were seen. Six of these herons were feeding along the shore below the nests. Nest 7 and nest 6 still had three heron nestlings in each nest.

2 August 1990. 7:10-7:37 AM. Under clear skies and a temperature of 60°F, three young Great Blue Heron were observed in nest 7, and one young was seen in nest 6. Nest 7 remained occupied by at least one or two herons until the last day of observation, 23 August.

DISCUSSION

There are several factors that make the study of the Great Blue Heron colony on Motor Island unique. These factors are: (1) the fortunate opportunity to study the initial construction of a Great Blue Heron colony; (2) the extraordinary abundance of both early and late new nesting records; (3) the extremely high number of young herons produced by each nest; (4) that unlike the vast majority of heronries that establish nests near the tops of tall trees, the heronry at Motor Island contains nests in scrub trees and bushes which are only three to fourteen feet above the ground; and (5) this colony is presently the only Great Blue Heron colony in the Niagara Frontier Region that is mixed with Black-crowned Night-Heron.

Previously reported dates of eggs in nests range from 15 Apr to 9 June (Beardslee and Mitchell 1965; Andrle and Carroll 1988), so any

incubation of eggs before 15 April should be considered a new early record. Beardslee and Mitchell (1965) have young on nests from 19 May to 2 July, while Andrle and Carroll (1988) report the Great Blue Heron nestling period from 19 May to 17 July. On 13 May, eleven partially feathered young Great Blue Herons were standing on three different nests. Since the birds were not incubated during the 71 minute study period under conditions of 48°F temperature, some rain, and 13 mph northeast winds, these birds were old enough to have some temperature control. Although feeding behavior is sometimes difficult to distinguish from egg rolling behavior, the eggs probably had hatched before 28 April. Although the feeding behavior observed 28 April (21 days before the 19 May early nestling date) may be questionable, 11 nestlings were observed six days before the established record early nestling dates. The late date for unfledged Great Blue Heron juveniles is 17 July for New York State (Andrle and Carroll 1988) and the late date for nests with young is 2 July for the Niagara Frontier Region (Beardslee and Mitchell 1965). Since Great Blue Heron leaves the nest after 64-90 days, the latest nestlings extended both late dates by a considerable margin. Based on this study, the New York State early egg date should be changed from 15 April to 15 March, the early nestling date should be changed from 19 May to 13 May, the early fledgling date should be changed from 17 July to 15 June, and the late nestling date should be changed from 17 July to 2 August.

Of the seven Great Blue Heron nests studied, three nests contained four nestlings and four nests contained three nestlings with an average of 3.43 nestlings per nest. It is believed that all 24 young successfully fledged. This is an extremely high number of young produced per nest. Data collected by John Morse for the Seneca Pool Great Blue Heron colony at Iroquois National Wildlife Refuge makes an interesting comparison. In the early years (from 1972 to 1975) of the Seneca Pool colony, when the number of active nests increased from 62 to 140, estimates of between 1.94 and 2.03 young were fledged per nest each year were obtained. The highest average of 3.15 fledged young per nest did not occur until 1988. In a Buffalo Ornithological Society study in the mid 1970's, only the Arkwright Great Blue Heron colony had fairly productive nests in 1978, when it produced an estimated 2.88 young per nest; however, in 1979 it produced only 1.62 young per nest (*fide* Frances Rew).

Why are the nests of Great Blue Herons on Motor Island nearly twice as productive as the nests of other heron colonies? Why are heron nests on Motor Island found only three feet above the ground, while most

other colonies' nests are found near the tops of tall trees? The answer is that the colony is on a small island that is completely absent of predators that would feed on eggs or young herons. Furthermore, the swift current of the surrounding Niagara River has discouraged Raccoons even at nearby Beaver Island State Park from swimming to Motor Island.

The first year of study produced both early and late new nesting records. Since young herons are able to walk easily among the tree branches, fledging dates (especially late ones) are difficult to determine. As early as 28 May, a young heron temporarily walked out of nest 1. As early as 15 June, an adult heron refused to give a young heron food. Also on 15 June a young heron observed with five adults in a grassy field about 30 feet from the nearest nest should be considered a fledging. Unfortunately no test flights of young herons were observed. By 11 July the original three nests were all vacant, and it was assumed these birds had fledged and left the colony. Of the 24 young herons produced, only 13 remained and these young were found on nests 4, 5, 6, and 7. These three events substantially precede the early state fledgling record of 17 July. Based on an incubation period of 25-29 days, young flying at 60 days and leaving the nest at 64-90 days (Andrle and Carroll 1988) and study data, an early egg date of 2 April, an early nestling date of 28 April, and a fledging date of 11 July seems conservative.

Late dates must be treated with more caution. The first possible feeding activity in nest 7 did not occur until 15 June and the first small young was seen on the nest on 24 June. Although this might suggest that the Regional and State late egg record of 9 June could be extended by 15 days or at least 6 days, the only negative observation with good light and of significant duration (56 minutes) was made on 9 June. Even on 9 June feeding behavior could have occurred outside the study period, and gone unnoticed. There is more convincing evidence that there were record late unfledged juveniles. Three nestlings were on nest 7 on 11, 20, and 24 July, and on 2 August. Not until later in the day on 2 August was a heron observed out of nest 7, about two feet to the north of the nest. On 6 and 8 August, and the last day of the study for the year, 23 August, at least one young Great Blue Heron was found in nest 7 on each day. Although the evidence may indicate an 23 August or later as the late date for unfledged juveniles, 2 August, only 49 days after the first possible feeding activity on 15 June and 40 days after the first observed nestling on 24 June, is a safe new late date for unfledged juveniles based on nest 7.

How can a colony of only seven study nests produce so many new

late and early nesting records for New York State? The late records for a newly established colony should be expected. Newly established colonies are probably founded by younger herons that do not have previously established nests and territories. These inexperienced birds must build a nest and go through the necessary courtship procedures necessary for building a nest and strengthening pair bonds. Certainly having the nest already built (except for a few repairs) territory already established (although this is probably of less importance for colonial nesters) and the pair bond already cemented would save a considerable amount of time.

Why were there three new early nesting records? The answer may be that unprecedented numbers of Great Blue Heron have been wintering on Motor Island since the January-February 1988 (Watson 1990). For the January-February periods between 1988 and 1993, the maximum counts of Great Blue Heron on Motor Island were between 26 and 46 herons each year. A reason birds risk the hardships of winter and possible death may be that survivors can be the first to nest on the best breeding territory in spring. Wintering individuals are not only the first on territory, but also the first to breed, lay eggs and fledge young. It is not surprising that since the colony's nests were already built, during the next (1991) breeding season a Great Blue Heron was observed low on its nest in incubating position on 15 March. Since that date was a more than a full month before the early egg record (Andrle and Carroll 1988) and the nest was only three feet above ground level, a canoe trip was made to the island. A solitary egg was found in the small depression in the center of the nest (Watson 1991). However, recent studies of Great Blue Heron colonies in Clarence Township and Iroquois National Wildlife Refuge suggest that incubation at these colonies, where herons do not spend the winter, may begin even earlier than at Motor Island.

Lastly, it is obvious that egg and nesting data for birds that do not nest in bird houses have been poorly documented, and there is a need for research of colonial and open-nesting birds.

ACKNOWLEDGEMENTS

The author would like to thank Frances Rew and Marian Dornhaffer for their many suggestions in reviewing this article, and Jim Lowe of the Cornell Laboratory of Ornithology for assisting with background information.

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