

NESTING LEAST BITTERNS AT THE TONAWANDA/IROQUOIS/OAK ORCHARD WETLAND COMPLEX

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ABSTRACT — Least bitterns (*Ixobrychus exilis*) have been proposed for listing as threatened in New York State since January 1994. Because of their secretive nature they are hard to survey and confirmation of nesting is difficult. Two nests were located at the Tonawanda/Iroquois/Oak Orchard wetland complex, Genesee and Orleans counties, in 1996. Each nest was composed of narrow-leaf cattail (*Typha angustifolia*) and was suspended over water at a height of 15–25 cm. Both nests contained 6 eggs. It was the first observation of nests there in 38 years.

INTRODUCTION

The Least Bittern is a secretive marsh bird of the heron family Ardeidae. Although it looks similar to the American bittern (*Botaurus lentiginosus*), it is much smaller and can readily slip through dense stands of emergent vegetation. Because of its small size and secretive nature, it has adapted a strategy of slipping silently away to avoid detection. Observation of the species is, therefore, difficult.

The American bittern frequently nests in grassy upland areas near wetlands (Bent 1926, Middleton 1949). The Least Bittern however, typically nests over water in emergent vegetation such as cattail (*Typha*), bulrush (*Scirpus*) or bur-reed (*Sparganium*) (Anistowicz 1981, Bent 1926, Kushlan 1973, Murchison 1893). On rare instances Least Bittern nests have been found in atypical situations. Roberts (1936) reported a nest in weeds on the ground. Other nests were discovered in *Phragmites* (Bent 1926), *Salix* (Baker 1940), and on bog or drift (Cooke 1881) and (Chapman 1900).

The desire to nest over water appears to be very important. Weller (1961) believed that the incidents of Least Bitterns nesting over land, as reported by Trautman (1940), Saunders (1926), and Roberts (1936) is a result of water level declines. He considers the drop in the numbers of nesting Least Bitterns at two Iowa lakes to be a result of low water levels. In 1958, 5 nests and numerous sightings of adults and juveniles were reported. In 1959, water levels were so low that there was little water at the base of emergent vegetation. Despite a greater intensity of field work in 1959, no nests or young were found and only 1 adult was reported at each lake.

Kushlan (1973) reported on a "colony" of Least Bittern nests. Eleven nests were located in a 260 square meter stand of saw grass (*Mariscus jamaicensis*). He suspects that the high density was a result of the severe drought in 1970–71.

That particular stand was one of a few parts of southern Florida wetlands where standing water remained through the drought. Kushlan suggests that the bitterns converged on the area because of the availability of food and remained there to breed the following season.

The Tonawanda/Iroquois/Oak Orchard wetland complex (hereafter referred to as the complex) is a 7,963 hectare (19,668 acres) area situated about halfway between Buffalo and Rochester in the counties of Genesee and Orleans. It is composed of two state Wildlife Management Areas, Tonawanda and Oak Orchard, that sandwich the federal National Wildlife Refuge. The area consists mostly of freshwater emergent marshes with the state areas containing 682 hectares (1,685 acres) of emergent vegetation. Other habitats include flooded timber, uplands with both cool and warm season grasses, and a small portion in deciduous forests. The state properties are managed by the Department of Environmental Conservation (DEC) to maximize waterfowl production, in part through water level control in an extensive dike system.

FIELD OBSERVATIONS

On 22 May 1996, Sonny Knowlton, a Wildlife Technician for the DEC, observed a Least Bittern land in a very small marsh on the Tonawanda Wildlife Management Area. The next day a very thorough foot search of the isolated pool revealed a nest containing 3 eggs. Least bitterns are known to approach and depart from their nests on foot (Ehrlich and others 1988). Another Least Bittern nest was discovered 10 June by DEC staff in Iroquois National Wildlife Refuge's Cayuga pool, approximately 0.8 mile northeast of the first nest. An adult flew off the nest as I approached, allowing me to get within about 7 meters before retreating.

The two nests were the first confirmed direct observation of nests of the species at the complex in 38 years by DEC or federal staff. The last known nest was discovered in 1958 by Odmund (Odie) Olson, a biological technician for the Iroquois National Wildlife Refuge. The nest was found in the cattails of Beaver Marsh and contained 4 eggs (Olson, personal communication, 1996). The New York State Breeding Bird Atlas recorded the complex as a site of confirmed breeding in 1982 as a result of an observation of a fledged bird (Smith 1988).

NESTS

The nests at the complex were nearly identical in composition, materials, and placement. Both were composed of dead narrow-leaf cattail leaves and both were woven into the standing cattails so that they were suspended about 15–25 cm above the water. The typical height range is 15–60 cm (Allen 1915, Bales 1911, Bent 1926, Murchison 1893, Pearson 1909, Provost 1947, Weller 1961). Anistowicz (1981) reported a nest at 70 cm.

The depth of the water at nest sites ranges from 7 to 105 cm (Aniskowicz 1981, Weller 1961). Murchison (1893) reported the deeper the water, the better. At the complex, the first nest was in a small marsh with a water depth of 30-45 cm. The second nest was in a very large marsh with a water depth of 100-110 cm.

The nests themselves were more of a platform than a bowl (Weller 1961), composed entirely of narrow-leaf cattail, the predominant vegetation in the area in which they were constructed. Weller considers the use of old vegetation from the previous season almost vital as a foundation for a nest. In the absence of old vegetation, when spring water levels are high, Least Bitterns may not select such sites, favoring instead sections providing old growth. Material is laid down in a radial pattern and appears to be rather flimsy. The nests have been compared to dove nests except that they are larger and deeper (Murchison 1893). All of the materials are likely collected from the immediate vicinity, probably within a matter of a meter (Weller 1961). Bent (1926) reported that sticks were used to construct a nest built in rushes. Weller observed the use of willow sticks, gathered at the site. Nests in saw grass were constructed entirely of spikerush (*Eleocharis cellulosa*) that was interspersed among the saw grass (Kushlan 1973).

EGGS

When the first nest was discovered 23 May it contained 3 eggs and eventually grew to a total of 6. The average clutch contains 4-5 eggs (Anistowicz 1981, Murchison 1893, Weller 1961). The second nest contained 6 eggs. Weller (1961) noted that most 6 clutch nests are reported from northern states. Incubation has been reported to be between 17 and 20 days (Allen 1915, Baker 1940, Ehrlich and others 1988, Trautman 1940, Weller 1961). An inspection 21 days after the discovery of the nest revealed that some of the eggs had hatched. Eventually, all did. The second nest was not revisited after its discovery.

NEST DEFENSE

On 12 June, I was surprised to find an adult bird on the first nest. It refused to leave despite the fact that I was within a meter of the nest and was making eye contact. The bird was identified as the male, based on plumage.

The bird's first response to my advancement was the initiation of the freeze pose with the neck fully elongated toward the sky. The body remained low and fully covered the nest's contents. In the peculiar way that bitterns do, the eyes remained fixed directly on me while the bill remained pointing up. When I closed the distance to about a half a meter, the male changed his tactics. Sinking low on the nest, he swelled his feathers and partially spread his wings until he appeared nearly twice the size he was a moment before. His body effectively shielded the nest so that I was unable to examine it's contents. His head and

neck were drawn back tight like a compressed spring ready to thrust the bill forward should I continue the confrontation. He rhythmically swayed his body slowly side to side.

I carried a wooden yard stick with me to take measurements and to bend the vegetation back with as little disturbance as possible. I reached toward the bird with the stick hoping he would fly off the nest. Instead he pecked at the stick a couple of times and remained on the nest.

I realized that I was not going to be able to subtly persuade him to leave for a few moments. His nest defense was remarkable. I fully believe that if I were wearing leather gloves I would have been able to lift him off the nest with my hands. Instead I attempted to use the wide side of the yard stick to gently lift him high enough to examine his brood. He allowed me to slide the yard stick down his breast and lift him up. He tried to slide to one side or the other to slip past the yard stick and get back on the eggs. Eventually, I was able to elevate him high enough to determine that some of the eggs had hatched. The offspring were covered with a very soft, beige colored down that matched the breast feather coloration of the adult.

In contrast to the shy, elusive, timid nature of the small herons, bittern nest defense is very commendable. Allen (1915) described a Least Bittern nest investigation in which the female assumed the "reed-posture" on the back side of the nest while he counted the eggs, unaware for a moment that she was even there. Allen attempted to reach for the bird. "My hands came within 12 inches of it before it melted away over the back of the nest." Allen also described a "third-posture" that the female assumes on the nest after she realizes she has been seen. He described, in excellent detail, the exact situation I encountered when trying to examine the chicks. Allen states that such "fierce devotion" applies only to the female, claiming that the male demonstrates courage and devotion to a lesser degree. Murchison (1893) claimed to have picked up an American Bittern off her nest during such a display and was nearly able to repeat the feat at another nest.

CHICKS

The last trip to the nest was made on 17 June. The chicks were very alert and cautious. Two of the chicks had climbed out of the nest and were visible climbing through the vegetation behind it. Three young remained on the platform. There was a large difference in the sizes between the siblings. Each of them rose up and assumed the freeze posture to the best of their ability, although the smallest chick appeared only to be able to raise it's head and neck. The young were quite aggressive. They hissed, swayed and lunged at me snapping their bills. The bitterns were about five days old and pin feathers were already apparent. There was no sign of the adults.

At the same time and within 50 meters of the Least Bittern nest, I was monitoring an American Bittern nest. An adult was on the nest each time it was

visited. The bird always flushed into the air when I got within about 3 meters. The retreat was always the same whether there were eggs in the nest or young. I found the Least Bittern chicks to be far more aggressive than their larger cousins. Despite being about double the size of the Least Bitterns, the American Bittern chicks were more bark than bite. They hissed louder, but I was able to easily reach into the nest and remove one for examination. The bird was quite docile in my hands and actually seemed to like being held. The chick's outrageously proportioned feet and legs were very warm to the touch. I did not examine a Least Bittern chick because of the resistance I received.

During all stages of nesting the nest itself remained clean. I had expected it to become soiled with feces. Such was not the case. The nest remained intact throughout its use and for a length of time after its abandonment. The same can be said for the American Bittern nest. Weller also noted that many Least Bittern nests remain exceptionally clean. He proposed that the fecal matter flows over the nest material and through the holes in the nest because of its fluid nature.

POPULATION

The exact size of the Least Bittern population at the complex can only be roughly estimated. In 1996 Least Bitterns were surveyed as part of the Marsh Monitoring Program (MMP), which is run by the Long Point Bird Observatory in Ontario, Canada. Two different broadcast tapes were used to solicit responses from nesting bitterns; the MMP tape and a copy of a calling Least Bittern produced by Cornell University's Lab of Ornithology. The tapes were played at stations established as part of the MMP and at other areas that appeared to be suitable habitat. Out of eight surveys conducted by the DEC and one by a federal biologist, only two responses from Least Bitterns were recorded. Each survey consisted of a minimum of seven survey points.

Studies have shown that responses to broadcast tapes by Least Bitterns are low (Gibbs and Melvin 1993, Swift and others 1988). Gibbs and Melvin determined that the Least Bitterns comprised only 4% of the responses of water birds to broadcast calls of various marsh bird species. They also stated that at least three visits were required to a marsh before being able to claim use or disuse of the area by Least Bitterns within a 90% certainty.

The surveys and nests discovered in 1996 cannot be used to accurately estimate the population of Least Bitterns at the complex. Visual observations conclude that the birds are indeed widespread and probably occupy every large emergent marsh in the combined three areas. Swift and others (1988) determined that only 16% of the responses he recorded were observed or heard prior to the playing of the tape. In a rough estimation based on Swift's determination and my own observations, I would estimate that there were at least 22 pairs of Least Bitterns at the complex.

MARSH WREN

One component that may be a limiting factor in the success of Least Bitterns is the size of the Marsh Wren (*Cistothorus palustris*) population. Marsh Wrens reportedly stab eggs of Least Bitterns (Bent 1926, Ehrlich and others 1988). Allen (1915) reported that Marsh Wrens brought about an alarm reaction in the bitterns. He states that the uneasiness was particularly noticeable when the bird was away from its nest. At the sight or sound of a wren the bittern "would hasten back with such signs of alarm that one could not but think that it recognized the wren as its arch-enemy". Marsh Wrens are very abundant at the complex and data should be collected as to the density of the Marsh Wren population around each Least Bittern nest.

MANAGEMENT RECOMMENDATIONS

Far greater work is required to accurately determine the population size of the Least Bitterns at the complex. Although their response to call-tapes is low, more surveys should be conducted. Gibbs and Melvin (1993) found that call-tape surveys improved detection of Least Bitterns more than 500% over passive observation. The surveys need to coincide with peak periods of bittern activity. Mid May through late June was found by Gibbs and Melvin (1993) to be the period of greatest response to tapes. They also discovered the time of day to be relevant, the hours between 8:00 and 10:00 am being the most responsive.

Foot searches through apparently suitable habitat on a weekly basis during the nesting period would be needed to attempt to locate all Least Bittern nests. Unfortunately, such an effort is usually not feasible because it is too labor intensive.

Water levels should be maintained so that some of the stalks and dead foliage of the previous season's emergent vegetation remains above the water level. Most bittern nests are started in the old stalks and are largely constructed of old vegetation.

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Male Least Bittern in nest defense.

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