

GREAT BLUE HERON COLONY STATUS AND NEST SITE CHARACTERISTICS AT SINKING POND, TENNESSEE

BRIAN D. CARVER, JOHN W. LAMB, LAURA JENNINGS, RYLAND MOORE, and GEOFF WEST
1100 Kindel Drive, Arnold Air Force Base, TN 37389

INTRODUCTION

The Great Blue Heron (*Ardea herodias*) received Tennessee state listing as "In Need of Management" in 1974. The Tennessee Wildlife Resources Agency delisted the species from that status in 1990 due to increases in numbers (Bob Hatcher, TWRA pers. com., 1998). The Great Blue Heron colony located at Sinking Pond, a 400-acre seasonally flooded, forested wetland, is one of the largest in Tennessee. Sinking Pond, a National Natural Landmark, is located on Arnold Air Force Base in Coffee County, Tennessee (35° 25' 04" N, 86° 03' 32" W). This site is the only example on Arnold Air Force Base of the "critically imperiled globally" overcup oak/river birch/resurrection fern forest community type (Pyne et al. 1998).

Due to the Great Blue Heron's position as a top predator in wetland habitats, it can serve as a biological indicator species for the health of wetland ecosystems (Pullin 1990). This colony enjoys protection from human disturbance and habitat destruction, two major causes of the species' declines in the late 1960s and early 1970s (Short and Cooper, 1985). Carlson and McLean (1996) noted that repeated human intrusions to the nesting area, particularly during the early stages of breeding, may lead to nesting failure or colony abandonment. The Sinking Pond colony was first censused in 1965 by Dubke who found 25 active nests and, previous to 1998, the last census was conducted in 1988 by Pullin who found 227 active nests (Pullin 1990). This paper presents results of an additional census conducted in 1998.

METHODS

Methods used for this census follow those developed for and used at this site by Pullin (1980). This census was conducted on 15-18 June 1998. The census was conducted by two groups of observers. Canoes were used in order to facilitate quiet travel through the rookery to reduce disturbance to nesting birds. The following parameters were documented for each nest site when conducting the survey:

1. Tree tag number placed on each nest tree and year recorded.
2. Tree species.
3. Condition of nest tree.
4. Number of nests (active or inactive). Nests were designated as active based on the presence of nestlings, fledglings, or significant concentrations of guano within or below nests.
5. The position of the nest relative to the trunk was recorded using a compass.
6. Nest location (proximal/ distal) — Distance from the tree trunk was recorded as proximal (< 1.0 meter from the main trunk) or distal (> 1.0 meter from the main trunk).
7. Branch support for each nest was identified as either a heavy limb (diameter > 10.0 cm), moderate limb (5.0 < diameter < 10.0 cm), or light limb (diameter < 5.0 cm).

RESULTS AND DISCUSSION

The rookery at Sinking Pond has been surveyed on several occasions and has been steadily increasing in size. Numbers of active nests increased from 18 in 1977 to 227 in 1988 (Pullin 1990). We located a total of 319 trees containing Great Blue Heron nests. Eight hundred fifty-six nests were counted; 743 were active and 113 were inactive. The number of nests per tree tagged ranged from 1 to 9 with an average of 2.6. A marked increase in number of active nests from Pullin's 1988 census has occurred.

Pullin (1980) did not give data on the species of nest trees but did note that the pond was dominated by willow oak and red maple. We found the most common nest tree used was overcup oak which is the dominant tree in Sinking Pond (Table 1). The most common nest position relative to the tree trunk was North but the nest positions were fairly evenly distributed (Table 1). The majority of nests were located distally relative to the tree trunk (> 1.0 meter from the main trunk) and the most common size of branch support for nests was moderate ($5.0 < \text{diameter} < 10.0$ cm) (Table 1). Of the 319 trees used by the herons for nesting, only 2 were dead, while the majority of the trees appeared to be in good condition.

Table 1. Selected Parameters of Great Blue Heron Nests.

Nest Tree Species	# of Trees	% by Species
Overcup Oak (<i>Quercus lyrata</i>)	250	79%
Red Maple (<i>Acer rubrum</i>)	4	1%
Sweetgum (<i>Liquidambar straciflua</i>)	58	18%
Willow Oak (<i>Quercus phellos</i>)	7	2%
Position of Nest Relative to Trunk	# of Nests	% of Nests
North	174	20%
Northeast	88	10%
East	69	8%
Southeast	76	9%
South	146	17%
Southwest	82	10%
West	114	13%
Northwest	107	13%
Distance from Trunk	# of Nests	% of Nests
Proximal (< 1.0 meter from main trunk)	101	12%
Distal (≥ 1.0 meter from main trunk)	756	88%
Size of Nest Limb	# of Nests	% of Nests
Heavy Limb (diameter > 10.0 cm)	362	42%
Moderate Limb ($5.0 \leq \text{diameter} \leq 10.0$ cm)	489	57%
Light Limb (diameter < 5.0 cm)	8	1%

Results of the parameters measured showed a divergence from those documented by Pullin (1980). While Pullin found heavy limbs to be used most frequently, this census found moderate limbs to be used more for nest support. Pullin noted that 60% of all nests were proximal in location while our survey found 88% of all nests to be located distally from the main trunk (Table 1). Perhaps the most striking difference in the findings of these two studies involves the position of the nest relative to the main tree trunk of the nest tree. Pullin found "over one-third of nests to be oriented on the southwest side of trees" and attributed this to the thermoregulatory benefits of direct sunlight. This study found only 10% of nests oriented in this direction with the most common position being North at 20%. Differences in the findings of these two studies that were conducted using the same methods may be attributed largely to sample size. While Pullin had a sample size of only 31 nests, the findings of this study are based on a sample size of 856 nests.

The large increase in the number of active nests at Sinking Pond over a 10 year period illustrates how rapidly changes can occur in the population size of a Great Blue Heron colony. Whether the population of herons in the region and the colony size at Sinking Pond is continuing to grow or has reached its carrying capacity is unclear at this time and more data will be needed to answer this question. Due to the size of the colony and the difficulty in locating nests because of the dense canopy, a complete survey is a time-consuming process. It is recommended that these protocols be repeated at two-year intervals to monitor the colony status while reducing disturbance from monitoring activities.

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