

# FLORIDA FIELD NATURALIST

SEMI-ANNUAL PUBLICATION OF THE FLORIDA ORNITHOLOGICAL SOCIETY

VOL. 8, No. 2

FALL 1980

PAGES 37-56

## REPRODUCTIVE SUCCESS OF THREE HERON SPECIES ON THE WEST COAST OF FLORIDA

JAMES A. RODGERS, JR.

Most species of herons in Florida are listed as "species of special concern" because they have experienced decreases in their range and numbers (Kale 1978). The primary reason for their decline in the recent past is the overdrainage of wetlands in Florida. How this has affected ardeids may be learned from their breeding success and ecological requirements. However, few data exist on the reproductive success of herons in Florida (e.g. Jenni 1969, Maxwell and Kale 1977); less so for the west coast of Florida (Rodgers, in press). This paper provides data on the reproductive success of the Snowy Egret (*Egretta thula*), Louisiana Heron (*Hydranassa tricolor*) and Yellow-crowned Night Heron (*Nycticorax violacea*) in the Tampa Bay region.

### METHODS AND STUDY AREA

Data were collected during 1976 and 1977 on Sunken Island (27°5' N, 82°2' W), Hillsborough Bay, Hillsborough County, Florida, where large numbers of herons and White (*Eudocimus albus*) and Glossy ibis (*Plegadis falcinellus*) nest. The dominant canopy and nesting vegetation on this spoil island is Brazilian pepper (*Schinus terebinthifolius*), black mangrove (*Avicennia germinans*), white mangrove (*Laguncularia racemosa*) and cabbage palm (*Sabal palmetto*). See Lewis and Lewis (1978) for a detailed description of the vegetation. Nests were checked once or twice weekly. Because of the small sample size, data for 1976 and 1977 were combined.

### RESULTS AND DISCUSSION

The clutch size, percent of eggs hatching and nestling survivorship to 2 weeks of age are in Table 1. The mean clutch sizes for Snowy Egrets and Louisiana Herons on Sunken Island are relatively low when compared to

data from other studies. Reported mean clutches for the Snowy Egret are 2.9 (Maxwell and Kale 1977), 3.2 (Teal 1965), 3.0-3.5 (Wiese 1978) and 3.9 (Jenni 1969). Reported mean clutches for the Louisiana Heron are 2.2-2.7 (Gaston and Johnston 1977), 3.0 (Rodgers 1978), 3.1 (Teal 1965, Maxwell and Kale 1977), 3.2 (Wiese 1978) and 4.1 (Jenni 1969). A general trend in these two species is for larger clutches in more northern latitudes (Teal 1965, Wiese 1978) and freshwater habitats (Jenni 1969). No comparative data exist for the Yellow-crowned Night Heron.

TABLE 1. Clutch size and nestling survival rate of three heron species on Sunken Island, Tampa Bay, Florida during 1976 and 1977.

	Louisiana Heron	Snowy Egret	Yellow-crowned Night Heron
Clutch size			
$\bar{X} \pm S.E.$	2.79 $\pm$ 0.10 <sup>a</sup>	3.15 $\pm$ 0.15 <sup>b</sup>	2.94 $\pm$ 0.17 <sup>o</sup>
mode	3	3	3
range	2-4	2-4	2-5
No. eggs hatching/nest			
$\bar{X} \pm S.E.$	2.66 $\pm$ 0.10 <sup>b</sup>	2.82 $\pm$ 0.23 <sup>i</sup>	2.55 $\pm$ 0.25 <sup>p</sup>
mode	3	3	3
range	2-4	2-4	1-4
% eggs hatched	96.6%	91.2%	90.3%
No. 1-week old young/nest			
$\bar{X} \pm S.E.$	2.51 $\pm$ 0.10 <sup>c</sup>	2.54 $\pm$ 0.22 <sup>j</sup>	2.36 $\pm$ 0.23 <sup>q</sup>
mode	3	3	2
range	1-4	1-4	1-4
No. 2-week old young/nest			
$\bar{X} \pm S.E.$	1.89 $\pm$ 0.17 <sup>d</sup>	2.00 $\pm$ 0.39 <sup>k</sup>	2.25 $\pm$ 0.31 <sup>r</sup>
mode	2	2	2
range	0-3	0-4	1-4
Survival rates			
egg-1 week	89.9% <sup>c</sup>	80.5% <sup>j</sup>	83.9% <sup>q</sup>
egg-2 weeks	64.7% <sup>d</sup>	62.5% <sup>k</sup>	81.8% <sup>r</sup>
hatched to 1 week	97.6% <sup>e</sup>	93.5% <sup>l</sup>	100% <sup>s</sup>
hatched to 2 weeks	70.5% <sup>f</sup>	70.8% <sup>m</sup>	94.7% <sup>t</sup>
1 week to 2 weeks	73.3% <sup>g</sup>	76.9% <sup>n</sup>	94.7% <sup>t</sup>

<sup>a</sup> N = 109 eggs, 39 nests.

<sup>b</sup> N = 88 eggs, 32 nests.

<sup>c</sup> N = 109 eggs, 98 young, 39 nests.

<sup>d</sup> N = 102 eggs, 66 young, 35 nests.

<sup>e</sup> N = 85 young, 32 nests.

<sup>f</sup> N = 78 young, 30 nests.

<sup>g</sup> N = 90 young, 35 nests.

<sup>h</sup> N = 41 eggs, 13 nests.

<sup>i</sup> N = 34 eggs, 11 nests.

<sup>j</sup> N = 41 eggs, 33 young, 13 nests.

<sup>k</sup> N = 32 eggs, 20 young, 10 nests.

<sup>l</sup> N = 31 young, 11 nests.

<sup>m</sup> N = 24 young, 8 nests.

<sup>n</sup> N = 26 young, 10 nests.

<sup>o</sup> N = 53 eggs, 18 nests.

<sup>p</sup> N = 31 eggs, 11 nests.

<sup>q</sup> N = 31 eggs, 26 young, 11 nests.

<sup>r</sup> N = 22 eggs, 18 young, 8 nests.

<sup>s</sup> N = 22 young, 9 nests.

<sup>t</sup> N = 19 young, 8 nests.

I observed no egg loss from nest collapse or predation. The percent of Snowy Egret and Louisiana Heron eggs hatching on Sunken Island is high in relation to other studies. Maxwell and Kale (1977) reported 82% and 87% hatching success for Snowy Egrets and Louisiana Herons respectively. Wiese (1978) found 90.9-92.1% for Snowy Egret and 84.6% for Louisiana Heron hatching success.

The greatest mortality on Sunken Island occurs when the nestlings are 1-2 weeks of age (Table 1). Nestling survival rates to 2 weeks of age on Sunken Island tend to be low when compared to other studies. Reported survival rates to similar ages are 57.5% (Jenni 1969) and 71.2% (Maxwell and Kale 1977) for Snowy Egrets and 64.2% (Jenni 1969), 79.5% (Maxwell and Kale 1977) and 87.5% (Rodgers 1978) for Louisiana Herons. I suspect most of the nestling mortality on Sunken Island is due to starvation since deaths were most often among the youngest nestlings (Snowy Egret 71%, Louisiana Heron 66%). Perhaps the reduced amount of rainfall experienced by the west-central Florida region during the past 10-12 years (data from the National Weather Service, Climatic Center, Ashfield, NC) has resulted in less foraging habitat on the mainland; hence, less food is available to the nestlings. Cattle Egrets (*Bubulcus ibis*) (Siegfried 1972) and Little Blue Herons (*Florida caerulea*) (Rodgers in press) also exhibit higher nestling mortality during the second week and among the youngest siblings.

The success of a nest (egg to 2-week old young) in relation to the brood size varied among the herons on Sunken Island and may reflect low sample size. Louisiana Heron 2-egg clutches (N = 8) had a mean of 1.4 chicks (68.8% survival rate), 3-egg clutches (N = 22) had a mean of 1.9 chicks (63.6% survival rate) and 4-egg clutches (N = 5) had a mean of 2.6 chicks (65.0% survival rate). Yellow-crowned Night Heron 2-egg clutches (N = 3) had a mean of 1.2 chicks (83.3% survival rate), 3-egg clutches (N = 4) had a mean of 1.3 chicks (75.0% survival rate) and 4-egg clutches (N = 1) had a mean of 4.0 chicks (100% survival rate). Snowy Egret 2-egg clutches (N = 1) had a mean of 1.0 chick (50.0% survival rate), 3-egg clutches (N = 6) had a mean of 1.7 chicks (55.6% survival rate) and 4-egg clutches (N = 3) had a mean of 3.0 chicks (75.0% survival rate). St. Clair Raye and Burger (1979) found little difference in survival rates to 13 days among different size Snowy Egret broods with a larger sample size.

#### ACKNOWLEDGEMENTS

Grants from the National Audubon Society and AOU Josselyn Van Tyne Memorial Fund helped defray costs of my research while I was a graduate student in the Department of Biology, University of South Florida, Tampa. F. M. Dunstan, R. E. Campbell and L. B. Rodgers assisted me in the fieldwork. I thank H. W. Kale, II, and F. E. Lohrer for comments that improved the quality of this manuscript.

## LITERATURE CITED

- GASTON, G. R., AND P. G. JOHNSTON. 1977. Nesting success and mortality of nestlings in a coastal Alabama heron-egret colony. *Northeast Gulf Science* 1: 14-22.
- JENNI, D. A. 1969. A study of the ecology of four species of herons during the breeding season at Lake Alice, Alachua County, Florida. *Ecol. Monogr.* 39: 245-270.
- KALE, H. W., II (ED.). 1978. Rare and endangered biota of Florida. Vol. 2. Birds. Gainesville, Univ. Presses of Florida.
- LEWIS, R. R., III, AND C. S. LEWIS. 1978. Colonial bird use and plant succession on dredged material islands in Florida. Vol. II: pattern of plant succession. Environmental Effects Laboratory, U.S. Army Engineer Waterways Experiment Station, Tech. Rept. D-78-14, Vicksburg, Mississippi.
- MAXWELL, G. R., II, AND H. W. KALE II. 1977. Breeding biology of five species of herons in coastal Florida. *Auk* 94: 689-700.
- RODGERS, J. A., JR. 1978. Breeding behavior of the Louisiana Heron. *Wilson Bull.* 90: 45-59.
- RODGERS, J. A., JR. in press. Breeding ecology of the Little Blue Heron on the west coast of Florida. *Condor*.
- SIEGFRIED, W. R. 1972. Food requirements and growth of Cattle Egrets in South Africa. *Living Bird* 11: 193-206.
- ST. CLAIR RAYE, S., AND J. BURGER. 1979. Behavioral determinants of nestling success of Snowy Egrets (*Leucophoyx thula*). *Amer. Midl. Nat.* 102: 76-85.
- TEAL, J. M. 1965. Nesting success of egrets and herons in Georgia. *Wilson Bull.* 77: 257-263.
- WIESE, J. H. 1978. A study of the reproductive biology of herons, egrets, and ibis nesting on Pea Patch Island, Delaware. Manomet Bird Observatory, Manomet, Massachusetts.

*Tampa Bay Wildlife Sanctuaries, National Audubon Society, 1020 82nd St. South, Tampa, Florida 33619.*

**Report on the 1979 fall meeting.**—Helen and Bill Dowling were the hosts for the 5-7 October 1979 FOS meeting at the Ramada Inn Oceanside, Ft. Pierce, Florida, and put on a well-organized and most pleasant meeting for the 146 people who registered. Land birding was good with many migrants going through, but the pelagic trip was not as productive. The field trips led by Bill Dowling, Margaret C. Bowman and Herbert W. Kale, II, yielded Peregrine Falcons and 24 species of warblers among others. Saturday's paper session included "Summer behavior of Red-cockaded Woodpeckers in south Florida" by Barbara Brownsmith, "Red-cockaded Woodpecker cavity use and competition" by Robert W. Repenning, "Dusky Seaside Sparrow research" by William Post, "Status of feral Budgerigars in Florida" by Anne F. Shapiro, and "Effects of phosphate mining on north Florida bird communities" by David S. Maehr. The Florida Chapter of the Wildlife Society met jointly with us and held a Saturday morning symposium on the restoration of the Kissimmee River. The banquet program "The best of Brooks Atherton" featured outstanding Florida bird photographs from Pensacola to the Dry Tortugas. The skin quiz, entirely on sparrows, was won by Jack Dozier. The Director's meeting took up the following issues: by-laws revision; dues increase effective in 1981 with regular membership set at \$10.00 and with schedule for other membership classes to be prepared by the finance committee; dealers selling FOS *Special Publications* will be allowed a discount of 25%; local committees will make the decision to allow vendors at meetings and whether to charge them a fee.—BARBARA C. KITTLESON, *Secretary*.