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Front Cover: A Clapper Rail at its nest at the Dupont Plant near Delisle, Mississippi, 15 May 1978. Photo by Jerome A. Jackson.

Food of Nestling Little Blue Herons in an Upland Mississippi Heronry

David F. Werschkul

Department of Biological Sciences
Mississippi State University
Mississippi State, Mississippi 39762¹

I studied the reproductive biology and ecology of the Little Blue Heron (*Florida caerulea*) in a heronry located near Brooksville, Mississippi (33° 10'N 87° 45'W). For information on heronry structure, history, and species composition see Werschkul (1977a). During the 1977 breeding season I collected and analyzed regurgitated food pellets from nestling birds. The caloric content was measured as follows: (1) samples by separating food pellets into identifiable components; (2) dry weight by desiccating at 103° C for 72 h; (3) ash free dry weight (AFDW) by combustion at 550° C for 6 h; and (4) energy content by combustion in a Paar Adiabatic Bomb Calorimeter Model 1214TM. All analyses were done in triplicate. Accuracy was such that the variation among triplicates for net energy content was within 1.5% of the mean. Herein I report my findings.

I collected 30 pellets by walking through the heronry and picking up pellets regurgitated by juveniles. Juveniles between the ages of 11 and 25 days readily regurgitate when alarmed. Of the 30 pellets 13 were not appreciably digested, were intact, and probably represented the entire last feeding. These 13 intact food pellets averaged 14.33 g (SD=3.57). I observed juveniles to be fed about 5 times per day between the ages of 11 and 21 days so their average intake would be 71.65 g. The net caloric content of this food was 101.26 Kjoules g⁻¹ AFDW.

The diet of nestling Little Blue Herons consisted primarily of fish, crayfish, and amphibians (Table 1). Fish, primarily *Lepomis* spp., were the most common prey item in both quantity and volume. Amphibians were the least common. Amphibians were, however, the food source with the highest caloric value (106.69 Kjoules g⁻¹ AFDW) followed by fish (101.25 Kjoules g⁻¹ AFDW), and crayfish (99.58 Kjoules g⁻¹ AFDW). Prey availability and abundance must override caloric content in shaping the search image of Little Blue Herons.

Jenni (1969) found, by volume, the diet of Little Blue Herons in north Florida to be 54% amphibian, 33% fish, and 12% invertebrate. Meanley (1955), although he did not report food by volume, also found amphibians to be the most common large prey. Amphibians were in 26% of the pellets he examined. They were followed in frequency by crayfish, found in 24% of the pellets, and fish, found in 14% of the pellets. The lesser frequency of amphibians from nestlings at Brooksville is puzzling

¹Present address: 306 Wharf, Rural Delivery, Brookings, OR 97415.

Table 1. Food of nestling Little Blue Herons.

Phyla	Class	Species	# items (%)	Volume (%) in ml	Length \pm 1 SD (cm)
Chordata	Amphibia	<u>Rana catesbeiana</u>	2 (2)	19 (6)	6.3 \pm 1.8
		<u>Rana sp.</u>	6 (5)	14 (4)	4.3 \pm 0.8
		Amphibia subtotals	8 (7)	33 (10)	
	Teleostomi	<u>Gambusia affinis</u>	9 (7)	12 (4)	4.1 \pm 0.6
		<u>Esox americanus</u>	3 (3)	8 (2)	11.0 \pm 1.8
		<u>Fundulus notti</u>	3 (3)	4 (1)	4.8 \pm 0.3
		<u>Elassoma zonatum</u>	6 (5)	3 (1)	2.3 \pm 1.4
		<u>Amia calva</u>	1 (1)	5 (2)	9.5
		<u>Lepomis spp.*</u>	59 (49)	154 (47)	4.3 \pm 1.4
		unidentified	2 (2)	4 (1)	---
Teleostomi subtotals	83 (69)	190 (58)			
Arthropoda	Crustacea	<u>Pomifelis sp.</u>	3 (3)	2 (1)	3.5 \pm 0.5
		unidentified crayfish**	27 (22)	102 (31)	7.6 \pm 1.8
		Crustacea subtotals	30 (25)	104 (32)	

* includes L. macrochirus, L. cyaneillus, L. marginatus; ** includes Procambaras, Cambaras.

since the habitat of the 3 studies is similar. The solution is probably prey availability. During 1977 little rain fell in the Brooksville area during the nesting season (Werschkul 1977b) and amphibian populations, many dependent on temporary pools for breeding, were low (R. Altig pers. comm.).

I thank Drs. R. Altig and G. Clemmer for help in identification of prey items. The study was supported in part by funds from the Frank M. Chapman Memorial Fund of the American Museum of Natural History and the Sigma Xi Grant-in-Aid Program. Dr. Jerome Jackson provided helpful comments on an early draft of this manuscript.

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Rhythmic Feeding Patterns Among House Sparrows

James N. Sappington
Department of Biology
William Carey College
Hattiesburg, Mississippi

Most species of birds adopt diurnal or nocturnal rhythmic patterns of behavior that are synchronized with the 24-hour solar day. Feeding rhythms have been studied in species of birds ranging from American Wigeons (Mareca americana) (Leck 1971) to House Sparrows (Passer domesticus) (Summers-Smith 1963). In a 4-year study of House Sparrow breeding activities at Mississippi State University, Oktibbeha County, Mississippi, from 1972 through 1975, I observed temporal rhythmic feeding patterns of House Sparrows under natural conditions in 4 different nesting areas.

During the winter months of 1972 and 1973 I studied the extent of feeding activity in adult House Sparrows. A more detailed study of the feeding of nestlings was made from 1972 through 1975. A total of 254 nests was studied. My observations included 145 days on which continuous observations were made from 05:00 to 19:00 and 32 days on which I observed nests for shorter intervals. Because of the placement of nests I was able to observe from 1 to 7 nests at one time.

The number of visits to the nest with food was used as a measure of feeding activity. Royama (1966) stated that feeding frequencies are far too variable to be used as a true index of food consumption per nestling, but according to Pettingill (1970), no matter how food is supplied, the individual nestlings receive approximately equal amounts during the course of a day due to automatic apportionment. Records were kept of the number of food visits for each hour of the day for each nest.

Statistical analyses were performed on the UNIVAC 1106 computer at Mississippi State University. Basic statistics were obtained from these data by the first option of UNIVAR (1973 version), a basic statistics program written by D.M. Power. The second option of UNIVAR was used to rank the means in descending order by Gabriel's sum of squares simultaneous test procedures (SS-STP). I used a probability level of 0.05 as the criterion for significance in all statistical analyses.

The hourly rate of nestling feeding followed a similar pattern for each year and for each of the colonies. Three peak feeding periods occurred daily, late morning, mid afternoon, and late afternoon (Fig. 1). Feeding was minimal between 05:00 and 06:00 and between 18:00 and 19:00. Although the diurnal variation in feeding followed a rhythmic pattern, analysis showed significant differences among the hours of activity. Where these differences occurred is revealed by the SS-STP analysis

(Table 1). I found a mean feeding rate of 16.5 times per hour with a mean of 3.55 young per nest (Sappington 1977). Kendeigh (1952) reported a mean rate of 20 times per hour for nestling House Sparrows with 4 in the nest. Comparison of our data sets indicates that they do not differ significantly ($\chi^2 = 0.334$).

TABLE 1. Comparison of mean total number of hourly visits to nests made by House Sparrows feeding nestlings.

Time (CST)*	Number of Cases	Mean	SS-STP
1400-1500	293	27.1	
1000-1100	297	27.0	
1700-1800	298	24.4	
0600-0700	295	19.9	
0900-1000	298	19.7	
1100-1200	296	18.7	
0700-0800	296	18.6	
1300-1400	299	17.8	
1500-1600	295	17.6	
1600-1700	297	17.5	
1200-1300	294	17.4	
0800-0900	294	16.9	
0500-0600	300	6.3	
1800-1900	205	6.3	

Hour intervals are arranged in descending order of magnitude of the mean frequency at which nestlings were fed. Lines in the column labelled SS-STP connect hour intervals for which the feeding rates are not significantly different.

My study of adult House Sparrow foraging activity during the winter showed also that the feeding rate was synchronized with 3 peaks occurring, one in the early morning lasting until about 08:00, another near the middle of the day from 12:00 to 14:00, and the third beginning about 16:00 and continuing until just before going to roost. I postulate that the reduction of feeding nestlings by parents during the early morning and late afternoon was because they were feeding themselves during those times.

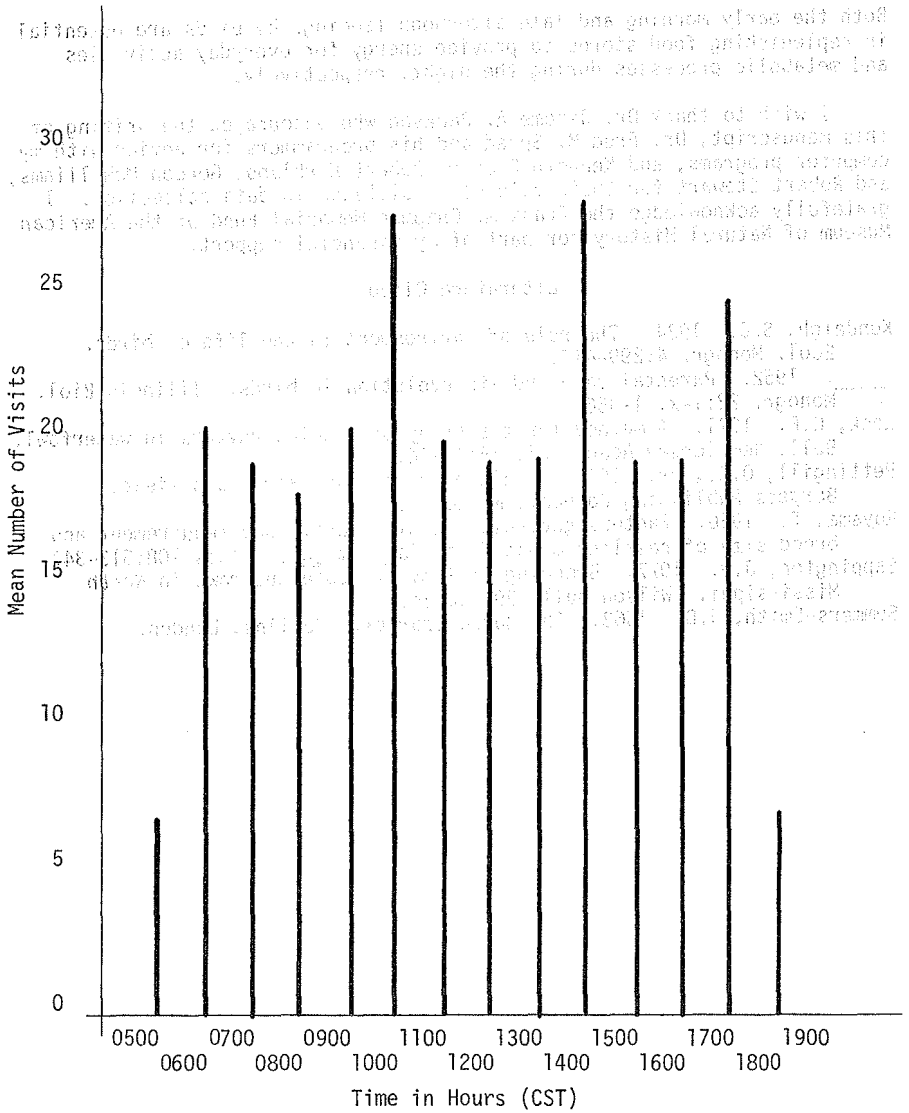


Figure 1. House Sparrow Nestling Feedings per hour (Sample sizes as in Table 1).

Both the early morning and late afternoon feedings by birds are essential in replenishing food stores to provide energy for everyday activities and metabolic processes during the night, respectively.

I wish to thank Dr. Jerome A. Jackson who encouraged the writing of this manuscript, Dr. Fred M. Speed and his programmers for advice with my computer programs, and Kenneth Bicker, Robert Kirkland, Gordon McWilliams, and Robert Stewart for their valuable assistance in data collection. I gratefully acknowledge the Frank M. Chapman Memorial Fund of the American Museum of Natural History for part of my financial support.

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A Nest Record for the American Goldfinch in Mississippi

Randall C. Warren and George A. Hurst

Department of Wildlife and Fisheries
Mississippi State University
Mississippi State, MS 39762

On 17 June 1976, Warren found an American Goldfinch (Carduelis tristis) nest about 11.2 km (7 miles) southwest of Wahalak, Kemper County, Mississippi in a Weyerhaeuser Company 5-year-old loblolly pine (Pinus taeda) plantation, an area that had been site prepared by tree-crushing and burning. The female was seen as she was flushed from the nest.

The nest contained 3 pale bluish-white eggs and was lined with thistle down. A common plant in the immediate area at the time was yellow thistle (Carduus spinosissimus). Nest measurements were: 4.50 cm inside diameter, 4.10 cm depth, 7.25 cm outside diameter, and 7.20 cm height. The nest was in a forked limb of a willow oak (Quercus phellos) sapling, about 1.1 m above the ground. Four smaller branches radiated around the fork, thus making a whorled arrangement. The sapling had a diameter of 4.6 cm and was 2.4 m tall. The upper crown was dead, having been "top killed" by an aerial application of herbicide in May 1975.

On 23 June, when the nest was revisited, neither parent was observed and the eggs were gone. Although the nest was not disturbed, predation by a snake was suspected. Several gray rat snakes (Elaphe obsoleta spiloides) had been seen within 100 m of the nest site. The nest was collected and is in the ornithological collection in the Biological Sciences Department at Mississippi State University.

American Goldfinches have been seen carrying nest material, feeding, and just flying about the many young pine plantations in Kemper and Oktibbeha Counties since 1974 (Randy Warren, M.Sc. Thesis, Miss. State Univ., Miss. St., 1979). As far as we know, however, the observations reported here are the first documentation of American Goldfinches nesting in Mississippi.

We regard young pine plantations with many hardwood saplings and thistle plants as excellent American Goldfinch nest habitat. With the southern forest industry creating hundreds of thousands of acres of pine plantations annually, the relationship of American Goldfinches to pine plantations should be further investigated.

A Case of Misidentification and Comments on the Value of
Photographic Records

Jerome A. Jackson

Department of Biological Sciences
Mississippi State University
Mississippi State, Mississippi 39762

Dwight Cooley, Bette Schardien, and I recently reported on our observations of Sooty Terns (*Sterna fuscata*) which we had observed on Horn Island, Mississippi (Jackson et al., Mississippi Kite 8(2):42, 1978). Our report was based first of all on our observation of at least three Sooty Terns seen flying near the south shore of the island. These birds were observed for some time and carefully compared to field guide illustrations. Cooley and Schardien had previously seen the species. I had never seen Sooty Terns before. Later the same day I found a strange tern sitting on the beach and immediately assumed it was a Sooty Tern. I photographed the bird and this photo was used to illustrate our article. None of us questioned the identity of the photographed bird. I failed to compare the photograph with field guide illustrations and my students accepted my "authority." As it turns out, the identity of the photographed bird is very questionable. The photo has been examined by a number of authorities at the U.S. National Museum, the University of South Florida, and elsewhere, and most feel strongly that the bird was a Black Tern (*Chlidonias niger*). Still there is some doubt about the bird's identity - and this doubt is shared by a few of those examining the photo. While the overall impression from the photograph is that of a typical winter plumage Black Tern, the colored slide from which the black-and-white print was made clearly shows a much darker bird than a typical winter Black Tern (Fig. 1). Furthermore, I was able to approach to within a meter of the bird before it flew and I was confident at the time that this bird was much larger than a Black Tern. The odds nonetheless favor the notion that the bird was a Black Tern - in which case it represents a late record for Mississippi (14 October 1978). While the issue may be settled for some, there will always be a question in my mind concerning the bird's identity. In spite of having an excellent photograph to examine, this record of either a Sooty or a Black tern will forever remain clouded. Herein lies the remainder of my tale and a lesson for all.

Ironically the Sooty Tern article was followed by an essay I wrote (Mississippi Kite 8(2):43-47) titled: "What constitutes a valid rare bird record?" In the article I stated "Specimens and good photographs are nearly of equal acceptability. Good sound recordings may rank next." Clearly the dilemma of the mystery tern refutes the equality of specimen and photographic records. In some cases there is clearly no substitute for a specimen. It is difficult and often impossible to measure the size of a bird from a photograph and light conditions can distort the "true"

color and pattern of a bird. Photographic records - or sound recordings - of course stand out above sight records and may be adequate documentation, but their value to science will vary with circumstance and species. The superior value of a specimen is clear, though I do not advocate the collection of birds that are rare or unusual in an area just to document their occurrence.

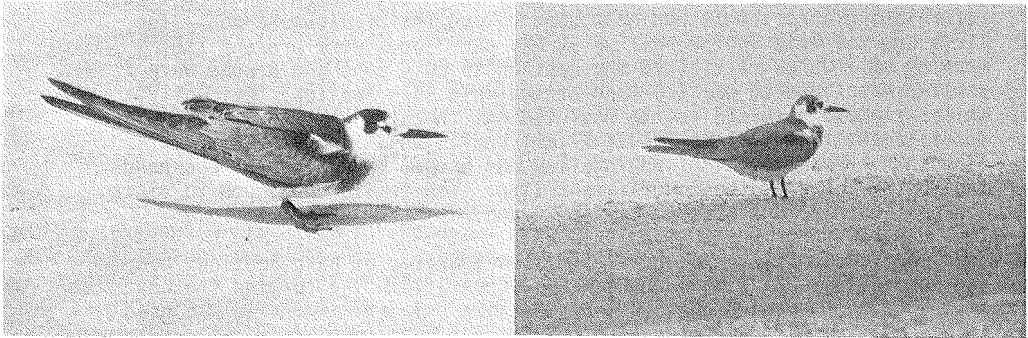


Figure 1. (Left) Tern photographed on Horn Island 14 October 1978 (from Mississippi Kite 8(2):42). (Right) Black Tern photographed on Horn Island on 8 July 1979.

The subject of this article and the two articles mentioned above has been the establishment of valid rare bird records. I have not discussed the many uses to which specimens are put nor the needs of scientists for large series of specimens. Specimen collections have contributed and will continue to contribute significantly to ornithological knowledge.

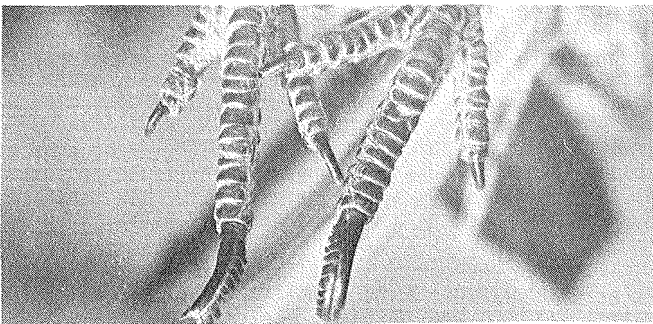
An Unusual Instance of Mortality in the Barn Swallow

Ren Lohofener

Department of Biological Sciences
P.O. Drawer GY, Mississippi State University
Mississippi State, Mississippi 39762

On 26 May 1979, I observed a pair of Barn Swallows (*Hirundo rustica*) refurbishing a nest that had been used during the previous season. The first egg was laid in the nest on 30 May and 3 eggs were present the morning of 1 June. I visited the nest again on 4 June and 3 eggs were still present but so was the body of the male Barn Swallow. Evidently, while attempting to add to the nest lining, the bird had found a piece of monofilament fishing line (about 37 cm long). While incorporating this line into the nest lining, the swallow had become entangled and was hanging in the loops of the monofilament line. The female continued to visit the nest but was not observed after 7 June.

Bent (U.S. Natl. Mus. Bull. 179, 1942) writes of Barn Swallows becoming hopelessly entangled in horse hairs when attempting to line the nest with them. It appears that in this instance a modern synthetic was used in place of animal hair with like results. I have found many different species of waterfowl and waterbirds entangled in monofilament fishing line. Likewise, I have observed nests of other landbirds in which monofilament fishing line had been used in the construction. This was the first instance where I observed death to occur in a landbird due to monofilament fishing line.



Did you know that Common Nighthawks (above), other Caprimulgids, herons, and the Barn Owl all have "combs" on the middle claw of each foot? They apparently use these in preening. (Photo by J.A. Jackson)

First Record of the Bridled Tern in Mississippi

Martha B. Hays

National Fish and Wildlife Laboratory
National Museum of Natural History
Washington, D.C., 20560

On 26 May 1979, while marking Least Tern nests in Mississippi City, Mississippi (30°23' Lat. 89°00' Long.), I found a mummified carcass of a tern in the sand next to the seawall, approximately 65 m from the high tide line. I collected the specimen, and upon examination at the National Museum of Natural History, I identified it as a Bridled Tern (*Sterna anaethetus*), a species not previously recorded from Mississippi. The specimen has been deposited at the U.S. National Museum (USNM #576070).

The bird was an adult with the following characteristics still evident: (1) white forehead and eyebrow stripe extending beyond the eye, (2) light gray feathers in the tail, and (3) light gray feathers on the hind neck -- all of which distinguish it from the similar Sooty Tern (*S. fuscata*). Bridled Terns are seen regularly on the Atlantic Coast from North Carolina to Florida in the summer and fall (Clapp, R. B. and W. Hoffman, pers. comm.), but heretofore have only been recorded sporadically in the Gulf of Mexico. This species is seen occasionally off Clearwater, Florida, but there are relatively few records for other states bordering the Gulf (Kale, H. W., II. 1977. Florida Region. Am. Birds 31:988-992., W. Hoffman, pers. comm.). However, Charles D. Duncan, who has been involved recently with the at-sea surveys off Dauphin Island, Alabama, in the Gulf of Mexico, stated (pers. comm.) that Bridled Terns have been commonly observed along windrows of sargassum weed from April to September; as many as 14 were seen at one time. The species is clearly more abundant in the Gulf than has been previously supposed. I thank Roger Clapp and Wayne Hoffman for aid in identifying the specimen and for helpful comments on the manuscript; I also thank Roxie Laybourne for comments on the plumage of the specimen.

Bridled Tern: First Observation of a Live Bird in Mississippi

Larry Gates and Terrie Fairley

2911 Mamie Street and Route 8, Box 71
Hattiesburg, Mississippi 39401

In the early morning hours of 13 September 1979 the western edge of Hurricane Frederic passed through Hattiesburg, Mississippi with wind gusts as strong as ninety miles per hour. The hurricane left in its wake up-rooted trees, downed power lines and several species of birds which are not normally seen away from the coast. (Hattiesburg is seventy miles inland.)

At 08:00 Gates discovered a flock of fourteen Royal Terns (Thalasseus maximus) flying over one of the four large sewage lagoons which lie adjacent to the Leaf River within the city limits of Hattiesburg. The sky was overcast at that time and the wind was gusting out of the north enough that the tripod being used to support the 20x telescope through which the birds were being observed had to be held to prevent it from blowing over. At 08:05 a smaller and more graceful tern soared through the flock. From the considerable distance from which it was being observed it appeared to be black above and white beneath. It tended to fly lower over the water than other terns which we have seen in Mississippi. It also seemed to soar more and flap less. The bird gradually came closer and at about 08:15 flew to within 40 feet of Gates who identified it as a Bridled Tern (Sterna anaethetus). Until the bird came close it was believed to be a Sooty Tern (Sterna fuscata). From 40 feet it was obvious that the bird had a white nape behind the black cap and a dark gray rather than black back. From this range it was also apparent that the bird had silvery white outer tail feathers on a deeply forked tail. After passing by the observer the bird suddenly came down and landed just out of sight on the edge of a dam between two sewage ponds. Gates drove to the spot where the bird had disappeared and approached the place where the bird was believed to be with a camera and a pair of 7x35 binoculars. The bird was suddenly seen only 15 feet away. Certain identification was possible at this time even without binoculars. The bird had a black bill and a thin black line through the eye which joined the black cap at a point well behind the eye. The bird had a white forehead and a white area between the cap and the eye line. Unfortunately, the bird jumped into the air as the camera was being focused, but two quick pictures were taken of the bird in flight before it flew off and out of sight. The pictures, though blurry, show the white area that extends to behind the top of the eye, the white nape and the underwing pattern (Fig. 1). From beneath the wings were white with a well-defined black band of uniform width along the trailing edge. Fairley arrived at the lagoons at about 08:40 and the Bridled Tern was nowhere in sight. She and LG drove around each of the ponds looking for it for about an hour before re-locating it. During this hour we saw three Sandwich

Terns (*Thalasseus sandvicensis*), a Red Knot (*Calidris canutus*) and a Sanderling (*Crocethia alba*) all of which are quite unusual away from the coast. The Bridled Tern was seen again at about 09:40 and studied through 7x35 binoculars and a 20x telescope for about ten minutes. During this time Fairley was able to see the major field identification marks including the white collar which separated the black cap from the dark gray back. She concurred in the identification of the bird as a Bridled Tern. For a time the Bridled Tern was seen flying with Sandwich Terns and Forster's Terns (*Sterna forsteri*). The Bridled Tern was smaller than the Sandwich Terns and close in size to the Forster's Terns, though a little larger. The bird was searched for in the late morning and afternoon by several other observers, but it was never seen again. A Black Skimmer (*Rynchops nigra*) showed up in the afternoon as did several Laughing Gulls (*Larus atricilla*). Eight species of terns were seen on 13 and 14 September.

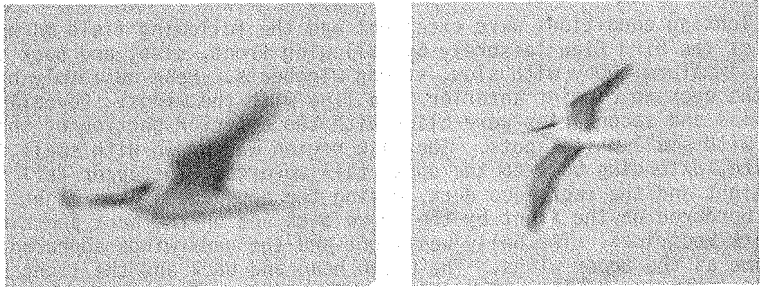


Figure 1. A Bridled Tern at Hattiesburg. Photos by Larry Gates.

Bridled Terns have been recorded once in Alabama (Imhof 1976) and twice in Louisiana (Lowery 1974). Only one of the Louisiana records involved a live bird. In May 1979 a badly decomposed tern, which was eventually identified as a Bridled Tern, was found on the beach at Gulfport, Mississippi. We know of no other Mississippi records of this species.

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Blue-faced Booby Near Horn Island, Mississippi

C. Dwight Cooley, Jerome A. Jackson, and Donald K. Cavin

Department of Biological Sciences
Mississippi State University
Mississippi State, MS 39762

At approximately 16:00 on 6 July 1979 while enroute from Horn Island to the spoil island off the west tip of Petit Bois Island, Jackson Co., Mississippi, we observed a Blue-faced Booby (*Sula dactylatra*) flying at approximately 15 m over Mississippi Sound near the east tip of Horn Island. We first observed the booby 250 m west of our position and followed the bird as it flew to the east out of sight past the spoil island. At one point it was well within 50 m and all field marks were noted using 7 x 35 mm binoculars. At the time of the sighting the sky was clear, temperature 90°F, and winds were from the southeast at 5 mph.

Lighting conditions were excellent and the following field marks were noted as the bird flew leisurely by, allowing front, side, and back views: large, immature booby with slow, strong wingbeats. Head uniformly brown down the neck to a point anterior to a line with the wings. Dorsally, the primaries and secondaries were black with the anterior portion of the wings brown with small white spots. The back region was brown with small flecks of white, extending back to the upper tail coverts. The upper tail coverts were light and the rectrices dark, giving the appearance of a light tail patch bordered on the front by the brown back and on the back and sides by the dark rectrices. The belly was light and the underwings appeared much the same as the upper wings. The brown head and back and the light belly and area anterior to the wings gave the impression of a light collar and a dark hood, characteristic of immature Blue-faced Boobies. In flight the bird held its head at a 45° angle to the water, a behavioral pattern noted by Cooley in both adult and immature boobies on several occasions off the Alabama coast.

This is the second sight record for the state, the other was of five adults on 27 September 1978 by Toups and Morgan (Jackson and Cooley, Miss. Kite, 8:49, 1978). There are numerous sightings from other areas along the northern Gulf Coast and the species is now considered a regular visitor to the region (T.A. Imhof, pers. comm.).

Birds Around the State: June and July 1979

Compiled by Jerome A. Jackson
 Department of Biological Sciences
 Mississippi State University
 Mississippi State, Mississippi 39762

The following is a summary of noteworthy bird sightings in Mississippi for the period 1 June through 31 July 1979. The list of sightings is followed by a key to observers' initials and another key identifying localities mentioned. The significance of sightings is indicated by a capital letter in parentheses following a record. These letters and their meanings are as follows: (A) = arrival date; (D) = departure date; (E) = exceptionally early date; (L) = exceptionally late date; (N) = unusually large number; (R) = species rare in area. Other abbreviations include the following: m = male, f = female, imm = immature, ad = adult, pr = pair, pl = plumage.

All contributors please note instructions given in the Mississippi Kite 8(2):61-62, for submission of records.

- COMMON LOON -- 2 winter pl., 5-6 July, Horn I., JJ, CDC; 2 winter pl., 9 July, East Ship I., JJ, CDC.
 EARED GREBE -- 1, 5 June, Hattiesburg, TF (L).
 PIED-BILLED GREBE -- 1 ad, 21 July, PRM, JT, LG, PD, WW.
 WHITE PELICAN -- 2, 6 June, PRM, JT, MH.
 BLUE-FACED BOOBY -- 1 imm, 6 July, Horn I., CDC, JJ (R).
 MAGNIFICENT FRIGATEBIRD -- 140, 11 July, Ocean Springs, MH (N); 275, 25 July, Harrison and Jackson Cos., JT (N).
 GREEN HERON -- 10 (4 ad, 6 imm), 6 June, PRM, JT, MH.
 CATTLE EGRET -- ca. 40, 19 June, Grenada Lake, MD.
 REDDISH EGRET -- 9, 10 July, East Ship I., CDC, JJ (N); 6, 12 July, Horn I., MH; 1 ad, 25 July, Biloxi, JT.
 LEAST BITTERN -- 1, 19 June, Grenada Lake, MD.
 WHITE IBIS -- 18 (8 ad, 10 imm), 19 July, Horn I., MH.
 GREEN-WINGED TEAL -- 1 ad m, 9-16 June, PRM, JT.
 BLUE-WINGED TEAL -- 6 (1 ad f, 5 imm), 9 June, PRM, JT (photographed by PD on June 10); 5, 28 July, PRM, MH.
 WOOD DUCK -- 4 (1 ad f, 3 imm), 16 June, PRM, JT.
 RING-NECKED DUCK -- 1, all summer, Hattiesburg, LG, TF.
 RUDDY DUCK -- 4 (2 m, 2 f), all summer, Hattiesburg, LG, TF.
 SWALLOW-TAILED KITE -- 1, 11 July, Hattiesburg, TF (R).
 RED-SHOULDERED HAWK -- 3, 3 June, Jackson Co., JT.
 BROAD-WINGED HAWK -- 2 ad, 3 June, Jackson Co., JT.
 AMERICAN KESTREL -- 3, 3 June, Jackson Co., JT.
 COMMON GALLINULE -- 4 (2 ad, 2 imm) 6 June, PRM, JT, MH; 5 (1 ad, 4 imm) 9 June, PRM, JT.

- AMERICAN COOT -- 8, summer, Hattiesburg, LG, TF.
 SEMIPALMATED PLOVER -- 20, 16 June, PRM, JT.
 PIPING PLOVER -- 1, 19-20 July, Hattiesburg, LG; TF (E); 18
 RUDDY TURNSTONE -- 3, 6-16 June, PRM, JT, MH; 1, 28 July, PRM, MH (E).
 WILLET -- 1, 22 July, Hattiesburg, TF.
 GREATER YELLOWLEGS -- 1, 26 July, Hattiesburg, LG.
 LESSER YELLOWLEGS -- 1, 19 June, Grenada State Waterfowl Refuge, MD.
 PECTORAL SANDPIPER -- 1, 28 July, Hattiesburg, LG (E).
 WHITE-RUMPED SANDPIPER -- 4, 1 June, Tupelo, LC, BC; 60, 9 June, PRM, JT,
 MH; 60, 16 June, PRM, JT, MH.
 LEAST SANDPIPER -- 1, 11 July, Hattiesburg, LG.
 SHORT-BILLED DOWITCHER -- 2, 5 July, Horn I., CDC, JJ.
 SEMIPALMATED SANDPIPER -- 15, 30 May, Meridian, BBC, LCC; 25, 1 June,
 Tupelo, BC, LC; 150, 16 June, PRM, JT.
 AMERICAN AVOCET -- 1, 6 June, PRM, JT; 40, 9 June, PRM, JT; 42, 16 June,
 PRM, JT; 68, 25 July, PRM, JT (N).
 BLACK-NECKED STILT -- 48, 25 July, JT; 112, 28 July, PRM, MH (N).
 WILSON'S PHALAROPE -- 4 (winter pl.), 28 July, PRM, MH; 1, 6 and 7 June,
 PRM, MH; JT.
 NORTHERN PHALAROPE -- 1, 6 June, PRM Jackson Co., JT, MH (R); 1 (photo),
 7 June, PD -- species no longer hypothetical.
 LAUGHING GULL -- 27, 25-28 July, Hattiesburg, TF, LG.
 BONAPARTE'S GULL -- 1, 6 June, PRM, JT, MH.
 GULL-BILLED TERN -- 5 (2 pr + 1 downy young), June, Spoil I. off W. tip
 of Petit Bois I., JJ, CDC, BS (R).
 COMMON TERN -- 10 (nesting), June, Spoil I. off W. tip of Petit Bois I.,
 JJ, CDC, BS.
 SOOTY TERN -- 19 (14 ad, 5 imm), 11 July, Ocean Springs and Bellefontaine
 beach, MH (R).
 LEAST TERN -- 2, 12 July, Hattiesburg, LG; 2500 pr, June, Spoil I. off W.
 tip of Petit Bois I., JJ, CDC, BJ.
 ROYAL TERN -- 40 pr, June, Spoil I. off W. tip of Petit Bois I., JJ, CDC,
 BJ.
 SANDWICH TERN -- 100, 11 July, Ocean Springs, MH; 3, 11 July, Hattiesburg,
 LG, TF; 500 pr, June, Spoil I. off W. tip of Petit Bois I., JJ, CDC,
 BJ.
 BLACK TERN -- 50, 25 July, PRM, JT; 22, 11 July, Hattiesburg, LG, TF; 1000,
 summer, Horn, Petit Bois and Ship I., JJ, CDC, BS.
 NODDY TERN -- 1 (found dead, dried), 5 July, Horn I., JJ, CDC (R).
 BLACK SKIMMER -- 150 pr, June, Spoil I. off the W. tip of Petit Bois I.,
 Jackson Co., JJ, CDC, BS.
 YELLOW-BILLED CUCKOO -- 7, 3 June, Jackson Co., JT.
 WHIP-POOR-WILL -- 1, 3 June, Bridgetown; AY; 1, 4 June, Yacona Ridge State
 Park, BC; 4, 5 June, Sardis Lake area, BC; 2, 11 June, near Bridgetown,
 BC.
 GRAY KINGBIRD -- 5 pr, summer, Horn I., CDC, JJ.
 GREAT-CRESTED FLYCATCHER -- 15, 3 June, D'Iberville BBS route, JT.
 EASTERN PHOEBE -- 1, 31 May, N. Lauderdale Co., BC; nest with 3 young, 2

July, Woodland Lakes, RP

- ACADIAN FLYCATCHER -- building nest, 20 July, Archer I., Ark., NH.
 CLIFF SWALLOW -- 3 ad, 19 June, Grenada Lake, MD.
 PURPLE MARTIN -- 400-500 in a 2-mile stretch of levee, 15 July, Archer I., Ark., NH.
 WHITE-EYED VIREO -- 26 m, 3 June, D'Iberville BBS route, JT.
 WORM-EATING WARBLER -- 1, 20 July, Hattiesburg, TF.
 BLUE-WINGED WARBLER -- 1 m (singing), 1 June, Tupelo BBS route, CDC.
 YELLOW WARBLER -- 1, 18 July, Hattiesburg, LG, TF.
 PRAIRIE WARBLER -- 12 m, 3 June, Jackson Co., JT.
 OVENBIRD -- 2, 1 June, Tupelo BBS route, CDC.
 YELLOW-BREASTED CHAT -- 11, 3 June, D'Iberville BBS route, JT.
 AMERICAN REDSTART -- 12 (all f or imm), 18 July, Hattiesburg, LG.
 YELLOW-HEADED BLACKBIRD -- 1 imm m, 22 July, Petal, TF, MF (R).
 NORTHERN ORIOLE -- 1 m, 1 June, Tupelo BBS route, CDC.
 SCARLET Tanager -- 1, 1 June, Kemper Co., BC (R); 1, 1 June, Scooba BBS route, BC (R); 1, 1 June, Tupelo BBS route, CDC (R); 1 m, 15 June, Lipscomb's Lake, HC (R); 1 m, 26 June, Lipscomb's Lake, JE (R); 1 m, 26 June, Sardis Lake, MD (R).
 BLUE GROSBEAK -- 17 m, 3 June, D'Iberville BBS route, JT.
 PAINTED BUNTING -- 5-7 prs, summer, Hattiesburg, TF, LG; 1, 3 June, D'Iberville BBS route, JT.
 RUFOUS-SIDED TOWHEE -- 42 m, 3 June, D'Iberville BBS route, JT.
 LARK SPARROW -- 2, 2 June, Aberdeen BBS route, CDC.
 BACHMAN'S SPARROW -- 1, 2 June, Corinth BBS, BC, LC; 26 m, 3 June, D'Iberville BBS route, JT.

Key to Observers.-- AY=Alvin Yancey, BC=Ben Coffey, BS=Bette Schardien, CDC=C. Dwight Cooley, HC=H. Collicott, JJ=Jerome Jackson, JE=James Ewart, JT=Judy Toups, LC=Lula Coffey, LG=Larry Gates, MD=Marvin Davis, MF=Marlo Fairley, MH=Malcom Hodges, NH=Nona Herbert, PD=Peter Donaldson, TF=Terri Fairley, WW=Wayne Weber.

Key to new or unusual localities.-- Aberdeen BBS route=Clay Co., Archer I.=Chicot Co. Arkansas, Bellefontaine Beach=Jackson Co., Bridgetown=DeSoto Co., Corinth BBS route=Aicorn Co., D'Iberville BBS route=Jackson Co., East Ship I.=Harrison Co., Grenada Lake=Grenada Co., Grenada State Waterfowl Refuge=Calhoun Co., Hattiesburg=Forrest Co., Horn I.=Jackson Co., Meridian=Lauderdale Co., Ocean Springs=Jackson Co., Petal=Forrest Co., PRM=Pascagoula River Marsh, Jackson Co., Sardis Lake=Lafayette Co., Scooba BBS route=Kemper Co., Spoil I. off W tip of Petit Bois I.=Jackson Co., Tupelo=Lee Co., Tupelo BBS route=Lee Co., Woodland Lakes=DeSoto Co., Yacona Ridge State Park=Yalobusha Co.

Reviews

Birds and How They Function. By Philip S. Callahan. Holiday House, New York, 1979: 156 pp., black-and-white photographs, glossary. \$8.95.

Mr. Callahan opens this book with mention of his American Indian ancestry and the close association and appreciation of American Indians for the natural environment. He follows this theme through his book and also draws on his interest in the birds of prey. "Birds and How They Function" is a general book about bird biology that emphasizes something close to "environmental physiology" of birds, but ends up a little weak on the physiological end. The book is written for a nonprofessional audience but it is also rather detailed and technical in places. I would not recommend it for any but the best upper level high school students but it would be suitable reading for anyone interested in birds beyond that level. The information presented is generally accurate and up to date. For example, the author follows the presently popular notion that birds are direct descendants of dinosaurs. The illustrations in the book add to it but are of only good to poor quality. Many of them are of captive birds of prey.--J.A. Jackson, Department of Biological Sciences, Mississippi State University, Mississippi State, MS 39762.

Granivorous Birds in Ecosystems. J. Pinowski and S.C. Kendeigh, eds. New York, Cambridge University Press, 1978: 431 pp., 60 figures, 76 tables. \$47.50.

This book is volume 12 in the International Biological Program series. Its content is further suggested by the subtitle "Their evolution, populations, energetics, adaptations, impact and control," but the scope and significance of the book is only hinted at. With increasing human populations, those animals that are thought to compete with man for crop resources are coming under increasing scrutiny and many are quick to suggest "control" measures for these "competitors." Granivorous birds are among the foremost vertebrates to compete for man's grain crops. This volume is a very integrated investigation of the role of granivorous birds in ecosystems. It includes chapters by several investigators. Charles Kendeigh and Jan Pinowski set the stage by identifying the major granivorous species and their ranges. Not surprisingly the House Sparrow and other members of the genus Passer figure significantly in most chapters. Various species of North American blackbirds are also frequently discussed. Chapter topics include: the evolution of the House Sparrow (R.F. Johnston and W.J. Klitz); population dynamics in the genus Passer and in the family Icteridae (M.I. Dyer, J. Pinowski, and B. Pinowska); biomass and production rates (J. Pinowski and A. Myrcha); avian energetics (S.C. Kendeigh, V.R. Dol'nik, and V.M. Gavrilov); assessment of the impact of

granivorous birds (J.A. Wiens and M.I. Dyer); management of pest situations (M.I. Dyer and P. Ward); and the adaptive correlates of granivory in birds (J.A. Wiens and R.F. Johnston). While each chapter includes considerable review material, much new information is included. Happily, it is recognized that of the many granivorous bird species in the world, few have become truly pests. Many that are sometimes considered pests really have a net positive impact on agriculture as a result of their dependence on weed seeds and insects at various times of the year. This volume should be required reading for any about to set out on a "pest bird eradication" program. It is a fine contribution to the International Biological Program series. Unfortunately, the cost of the book will likely limit its distribution.

Birds of Man's World. By Derek Goodwin. Cornell University Press, Ithaca, New York, 1978; 183 pp., numerous line-drawings and black-and-white photographs. \$10.95.

This small book is about those species of wild birds that have a close association with man. It is informative and quite enjoyable reading, discussing how man has influenced bird behavior and how birds have influenced man. Among the many topics discussed are the relationships of birds to our highways, the affinities of some birds for the salt we put along icy roads and walks, why titmice recognize suet as food, and the problems that man thinks he has with birds that "compete" for human food resources. "Birds of Man's World" is world-wide in scope, though it does have a definite European slant. The drawings and photographs add to the book as does the species index at the end. My only regret is a professional one; I would like to see a bibliography at the end that would allow me to read further on the subject.--J.A. Jackson, Department of Biological Sciences, Mississippi State University, Mississippi State, MS 39762.

Wild Geese. By M.A. Ogilvie. Buteo Books, Vermillion, South Dakota, 1978: 350 pp., numerous maps, line drawings, and 16 color plates. \$25.00.

A number of books on the waterfowl of large geographic areas have appeared in recent years; I would rate "Wild Geese" among the better ones. All of the world's species of geese except the Hawaiian Goose are discussed in detail and illustrated in both line drawings and colored plates. Text material discusses the plumages and plumage variants of each species and population, voice, breeding biology, migration, and population dynamics. A chapter on "Counting, ringing and population dynamics" will be of particular interest to banders. Ogilvie draws not only on his own extensive experience with geese, but on the copious literature of the group to make a very readable book. The color plates by Carol Ogilvie add substantially to the book's attractiveness and usefulness, though many of the birds are a bit stylized and "angular" in appearance. Plates illustrate not only the standing and flying adults of each form and age group, but also the downy young and aging and sexing characteristics. The latter should be of particular use to goose banders. Not included in the book is mention of the introduced populations of the Giant Canada Goose that have become established as non-migratory, breeding, wild flocks in different areas of the southeastern U.S. --J.A. Jackson, Department of Biological Sciences, Mississippi State University, Mississippi State, MS 39762.

Handbook of Ethological Methods. By Philip N. Lehner. Garland STPM Press, New York, 1979: 403 pp., numerous black-and-white photographs, drawings, and charts. \$24.50.

For the person interested in the field study of animal behavior and wondering how to get started, what to measure, how to measure, or what to use in the way of equipment, this volume is a goldmine. If you are already on your way and are familiar with literature associated with the group of animals you are working with, then much of this book will be too basic. The "Handbook" includes descriptions of the features and use of a wide range of equipment that has been used in behavioral studies: binoculars to spotting scopes, cameras to transmitters. In addition to reviewing basic equipment, Lehner discusses preparation of data forms and various statistical techniques that are applicable to behavioral studies. Much of the book deals with animals other than birds, though most of it would be of use in the study of bird behavior. A 23 page bibliography, an appendix of statistical tables, and a special appendix on the study of social organization (by Glen McBride) all add to the quality of this volume. In general this should be a very useful volume.--J.A. Jackson, Department of Biological Sciences, Mississippi State University, Mississippi State, MS 39762.

The Birds of John Burroughs. Edited by Jack Kligerman. Hawthorne Books, Inc., New York, New York, 1976. 240 pp., drawings by Louis Agassiz Fuertes. (softcover).

This book, a series of essays by John Burroughs, offers insights into the life and thoughts of this great naturalist of long ago. Before any of us lifted binoculars and struggled through field guides, John Burroughs, (1837-1921) had mastered the art of watching nature without recourse to sophisticated gadgets and capsulized reams of research by all who had gone before. John Burroughs was a pioneer naturalist; keen observations and insatiable curiosity about the interrelations of living things led him to ponder many mysteries, pose many questions, and, until his death, to seek answers. Through this well selected group of essays, the reader is drawn into the mind of a man who knew how to watch what we so often ignore. The nine essays in this book serve as an enticement to read more of Burroughs. The introduction by Jack Kligerman is like a crash course into Burroughs' background, and should be read. The Birds of John Burroughs is easy, pleasant reading which should leave the peruser with the feeling that we do not watch nearly as well as the "Sage of Slabsides." --J.A. Toups, 4 Hartford Place, Gulfport, Mississippi 39501.

THE MISSISSIPPI KITE

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