

# TROPICBIRDS IN THE CAROLINAS: STATUS AND PERIOD OF OCCURRENCE OF TWO TROPICAL PELAGIC SPECIES

DAVID S. LEE AND E. WAYNE IRVIN

The recent documentation of a second species of tropicbird in the northwest Atlantic Ocean (Bull 1964, Lee et al. 1981) makes it desirable to summarize and evaluate the current knowledge of the status and the season of occurrence for the two tropicbirds in the offshore waters of the Carolinas. The records presented here provide a needed base against which future records can be tallied. They come from a widely diverse body of published sight reports, unpublished records maintained at the North Carolina State Museum, and personal field experience. Few specimens, photographic records, or literature reports provide enough details to separate the two species of Atlantic tropicbirds. This is understandable because prior to 1964 there was little reason to suspect that any tropicbird seen off the coast of North America was anything other than a White-tailed (*Phaethon lepturus*). The reported occurrence of the Red-billed Tropicbird (*P. aethereus*) off the southeastern coast (Lee et al. 1981) makes the specific identification of previous sight reports suspect. It is our purpose to alert readers to this problem as well as to evaluate the status of these two species based on the fragmentary information presently available.

## IDENTIFICATION AND BEHAVIOR

The problems of specific identification between White-tailed Tropicbirds and Red-billed Tropicbirds are discussed in detail by Lee, Wingate, and Kale (1981). Basically, *Phaethon* are high-flying birds and therefore are normally seen from below, while most of their distinguishing field marks are on the dorsal surface. Additionally, the immature Red-billed has a yellow bill, the breeding-season White-tailed may have a reddish bill, and immatures of both species and the adult Red-billed have thin barring on the back and upper wing surfaces (Fig. 1, 2). Differences in size and relative bill thickness are appreciated only after both species have been well studied, and then are useful characters only at short distances under good field conditions (Fig. 3). Thus, confirmation of bill size and color, dorsal pattern, and presence of tail streamers would be desirable for accurate, specific identification of adults. Field identification of flying immatures would be difficult under most circumstances for people not familiar with both species. [It should be noted that parallel identification problems exist for the three frigatebirds (*Fregata* sp.) that occur in the Atlantic.]

We found flying fish (*Exocoetidae* sp.) in the stomachs of both species of tropicbirds, and remains of squid in White-taileds. Although the prey items examined were large, because of partial digestion the fish and squid were not identifiable to species. The tropicbirds' habit of flying above moving boats may actually be a learned feeding adaptation. Flying fish are frequently flushed into "flight" by boats, thus providing plunge-diving tropicbirds increased foraging efficiency.

## SUMMARY OF TROPICBIRD RECORDS

*North Carolina:* For nearly 20 years the only information available was the three records given by Pearson, Brimley, and Brimley (1942). The first report was a sighting on 3

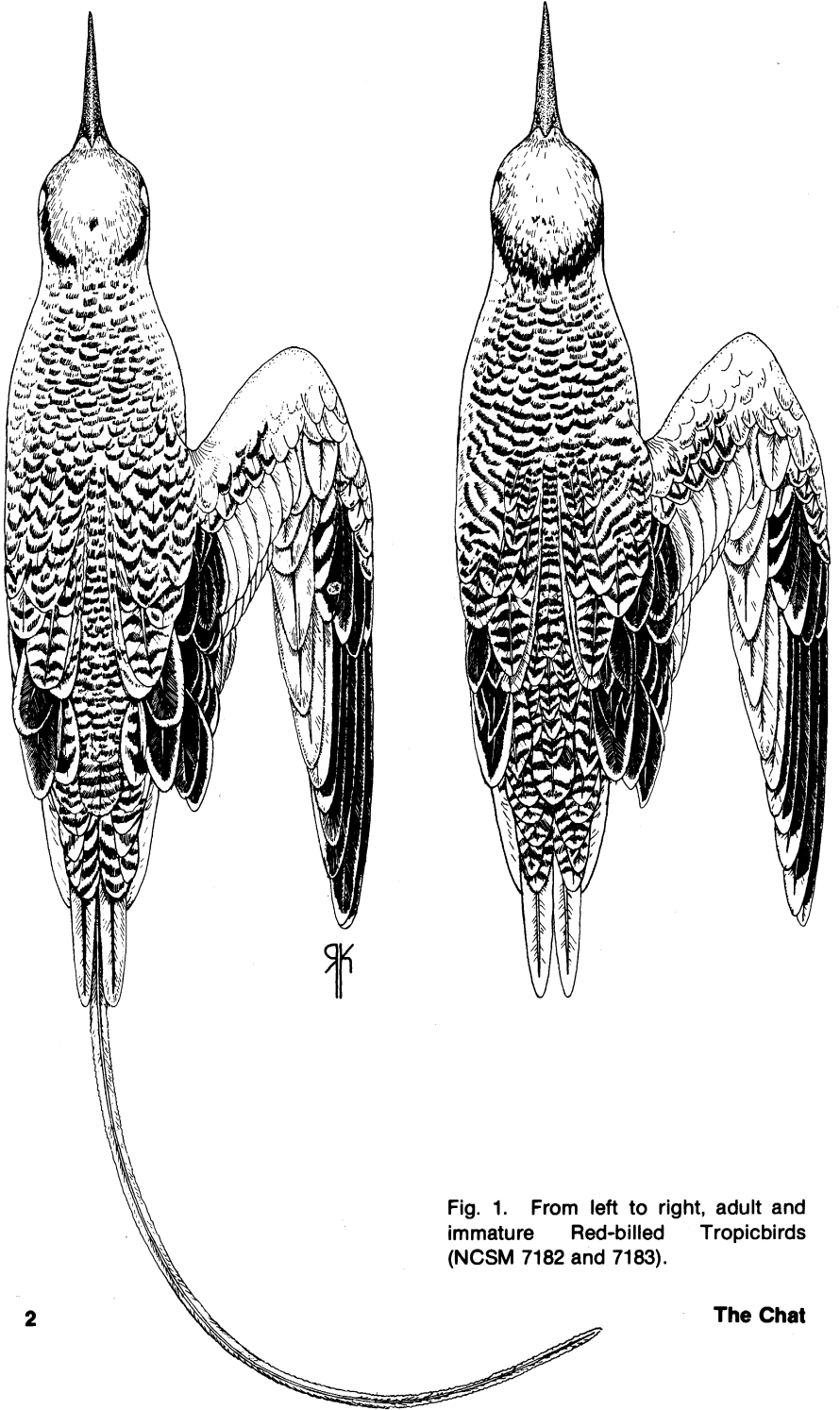


Fig. 1. From left to right, adult and immature Red-billed Tropicbirds (NCSM 7182 and 7183).

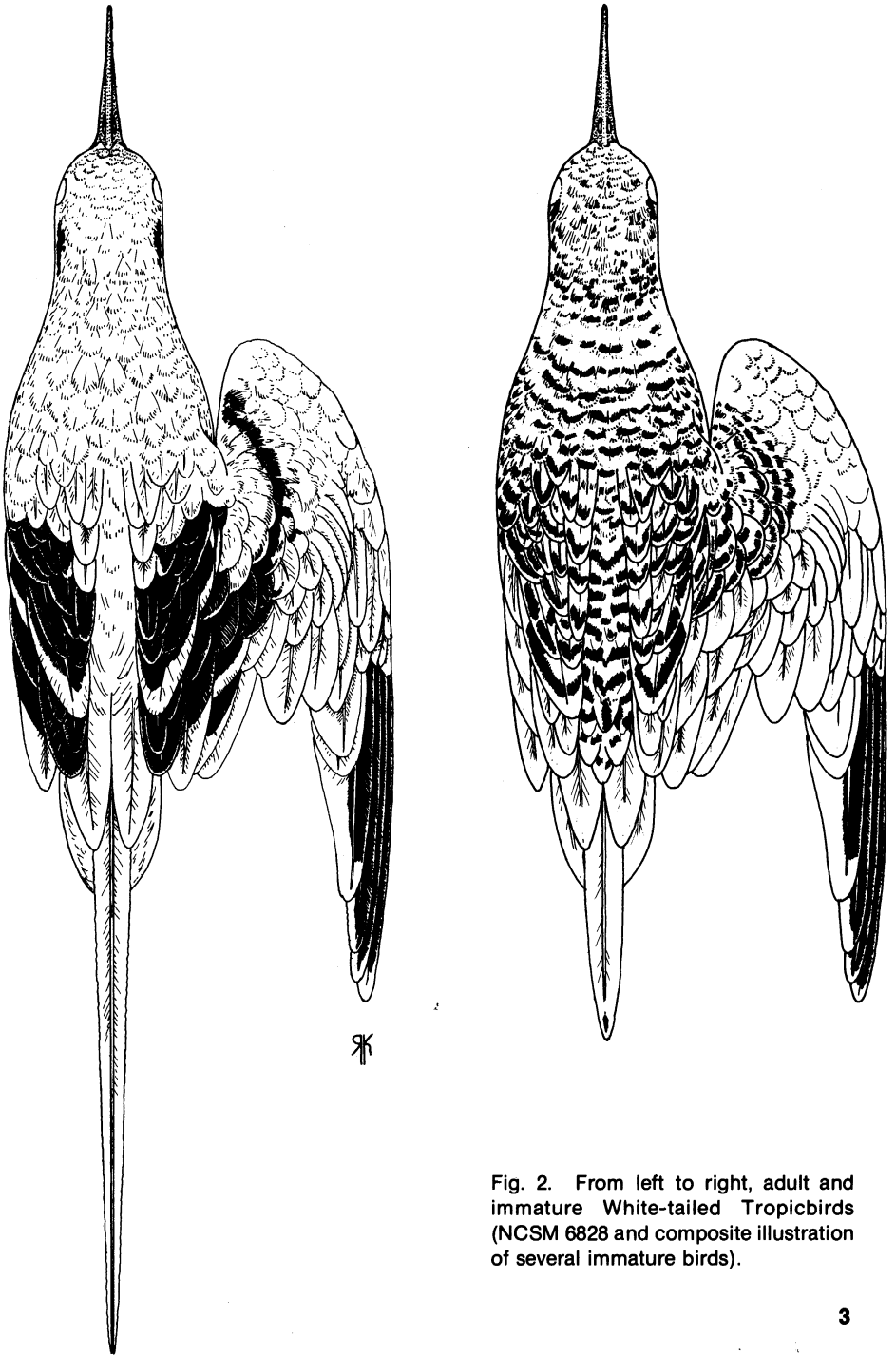


Fig. 2. From left to right, adult and immature White-tailed Tropicbirds (NCSM 6828 and composite illustration of several immature birds).

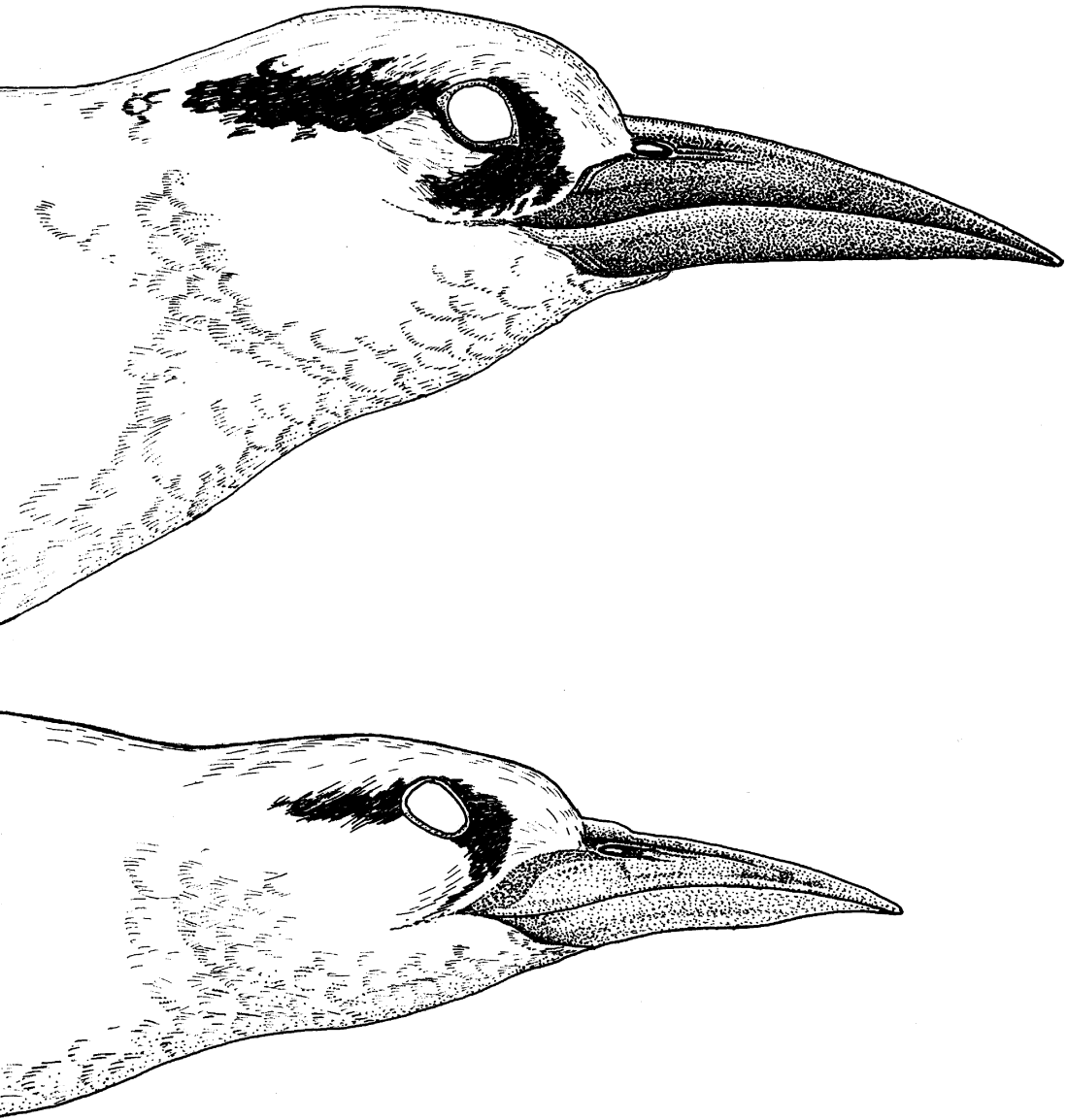


Fig. 3. Adult Red-billed Tropicbird (NCSM 7-182, above) and adult White-tailed Tropicbird (NCSM 6828, below). These life-size drawings illustrate the subtle differences in the bill proportions of the two species.

August 1936, 15 miles off Cape Lookout. (Brimley's original notes [1937] state: "One seen by a party from the U.S. Fish Commission Laboratory 20 miles off Cape Lookout, on or about August 12, 1936. R. Collie.") The second sighting occurred 25 July 1941 in the Gulf Stream off Beaufort. An "immature" specimen was reported as having been found dead on the beach at Pea Island on 5 July 1939. (NCSM records state that the bird was an adult found on 18 August 1939.) The photograph and skull of this beached specimen are apparently lost, and the description in *Birds of North Carolina* is not adequate for determining which species was found. No additional reports appeared in the 1959 revision of this book; however, one early record (Gault 1902) has long been overlooked.

Between 1959 and the start of the North Carolina State Museum's intensive studies of seabirds in 1975, several sightings of White-tailed Tropicbirds were published in *Chat*, *American Birds*, or both journals (see Table 1). Lee and Booth (1979) summarized the available records. They were aware of a total of 19 reports, which seasonally ranged from 8 June to 11 September. All were assumed to be reports of White-tailed Tropicbirds because that was the only species then known to occur in the area. Since 1979, additional tropicbird records have come to our attention. Sightings confirmed to species seem to be equally divided between the two North Atlantic species (see Table 1).

*South Carolina:* Sprunt and Chamberlain (1949) report a single *P. lepturus* record that "Astonishingly enough comes from the foot of the Blue Ridge Mountains." The only specimen record for the state was picked up in Jocassee, Oconee County, on 30 July 1926. The authors of *South Carolina Bird Life* went on to add: "Even to one not familiar with the species the bird can hardly be confused with anything else. The beautiful, streaming feathers of the tail are at once diagnostic." Between 1954 and 1974, four additional sightings were published (see Table 1), and all were listed as White-tailed Tropicbirds.

*Specimen and photographic records:* Because of the problems created by having few specifically verifiable records of the two similar-appearing tropicbirds now known from the Carolinas, some of our previous understanding of the seasonal distribution and abundance of White-tailed Tropicbirds has become masked. Interestingly, the only two specimens of a White-tailed Tropicbird for North Carolina (see Table 2) represent the earliest (18 June) and latest (11 September) records of seasonal occurrence. Paul Sykes (*Amer. Birds* 29:40) examined "good slides" of a White-tailed Tropicbird taken by a boat captain off Hatteras in July 1975, and Mike Tove photographed an adult (Fig. 4) on 2 September 1979 at the "rock pile" off Cape Hatteras. The bird seen by Lee 33.5 miles SE of Beaufort, N.C., was certainly a White-tailed. This identification is based on his experience with both species. Irvin photographed an adult and an immature (Fig. 5) of this species on 15 August 1982 off Beaufort, N.C. The one specimen record for South Carolina of a storm-driven *P. lepturus* has already been discussed. This makes a total of eight positively identified White-tailed Tropicbirds for the two states.

Four confirmed records for Red-billed Tropicbirds exist for North Carolina. Two specimens were collected 16 May 1981 (one adult and one immature); one adult (Fig. 6) was photographed by Irvin on 6 May 1981, 23 miles E of Cape Lookout; and one adult was seen off Oregon Inlet on 1 September 1981 by Lee, Eloise Potter, Steve Plantania, and Mary K. Clark. There are presently no reports of Red-billed Tropicbirds from South Carolina.

All other records from the Carolinas must, because of lack of published details, be regarded as tropicbirds of undetermined species. This includes the specimen (skull only)

TABLE 1. Summary of tropicbird reports from the Carolinas. All locations are in North Carolina unless South Carolina is specified.

<i>Date</i>	<i>Location</i>	<i>Number</i>	<i>Source</i>	<i>Remarks</i>
mid-April 1974	70 miles off Charleston, S.C.	1	Amer. Birds 28:788	
26 April 1980	35 miles SE of Oregon Inlet at 27 fathoms	1	this study	
6 May 1981	23 miles E of Cape Lookout	1	this study, EWI	<i>P. aethereus</i> photo record
16 May 1979	40 miles W of Oregon Inlet	1	Lee et al. 1981	<i>P. aethereus</i> (imm.) NCSM specimen
17 May 1979	off Oregon Inlet	1	this study	
29 May 1959	18 nautical miles SSE of Charleston, S.C. sea buoy	1	Manigault 1959	
1 June 1977	off Oregon Inlet	1	this study, DSL	distant bird, not good view
3 June 1981	ca. 35 miles ESE of Oregon Inlet at 100 fathoms	2	this study	
6 June 1978	off Oregon Inlet	1	this study	
8 June 1976	off Oregon Inlet	2	Lee & Booth 1979	
14 June 1975	ca. 40 miles SE of Charleston, S.C.	1	Amer. Birds 29:958	
15 June 1976	off Oregon Inlet	3	this study	
18 June 1981	off Beaufort	1	this study	<i>P. lepturus</i> NCSM specimen
25 June 1976	34° 17' N, 76° 12' W 33.5 miles SE of Beaufort Inlet	1	this study, DSL	<i>P. lepturus</i>
? July 1975	off Cape Hatteras	1	Amer. Birds 29:40	<i>P. lepturus</i> photo record
7 July 1981	off Oregon Inlet	1	this study	
18 July 1975	ca. 45 miles SE of Morehead City	1	Chat 40:17	
18 July 1980	42 miles NE of Oregon Inlet	2+	this study	

TABLE 1, continued

<i>Date</i>	<i>Location</i>	<i>Number</i>	<i>Source</i>	<i>Remarks</i>
19 July 1977	off Oregon Inlet	1	this study	
25 July 1941	off Beaufort, Gulf Stream	1	Pearson et al. 1942	
25 July 1958	30 miles offshore, 20 miles S of Cape Hatteras	1	Harte and McCallum 1959	
25 July 1978	off Oregon Inlet	1	this study	
29 July 1980	37 miles E of Oregon Inlet at 50 fathoms	1	this study	
30 July 1926	Jocassee, Oconee Co., S.C.	1	Sprunt and Chamberlain 1949	<i>P. lepturus</i> Charleston Mus. specimen
late July 1971	off Oregon Inlet	1	this study	
3 Aug. 1936	ca. 15 miles off Cape Lookout	1	Pearson et al. 1942	original notes state 12 August 1936
15 Aug. 1982	34° 12' N, 76° 14' W 29 miles SSE of Cape Lookout	1	this study, EWI	<i>P. lepturus</i>
15 Aug. 1982	34° 6' N, 76° 17' W, 36 miles SSE of Cape Lookout	1	this study, EWI	<i>P. lepturus</i> (imm.) photo record
18 Aug. 1939	Pea Island, Dare Co.	1	Pearson et al. 1942	specimen lost; see Lee et al. 1981
21 Aug. 1977	40 miles ESE of Oregon Inlet	1	this study	
24 Aug. 1960	120 miles off N.C. coast	1	Chat 24:104-105	
24 Aug. 1976	35 miles SSE of Beaufort Inlet	1	Amer. Birds 31:164	
29 Aug. 1972	70 miles S of Morehead City	1	Amer. Birds 27:40	Chat 37:29 says 28 Aug.
1 Sept. 1976	12 miles SE of Marker 14, Beaufort Inlet	1	this study	
1 Sept. 1981	off Oregon Inlet	1	this study, DSL	<i>P. aethereus</i>

Winter 1983

TABLE 1, continued

<i>Date</i>	<i>Location</i>	<i>Number</i>	<i>Source</i>	<i>Remarks</i>
2 Sept. 1979	off Cape Hatteras	1	Mike Tove	<i>P. lepturus</i> photo record
4 Sept. 1976	off Oregon Inlet	1	this study	
6 Sept. 1974	Jordan Reservoir	1	Fussell and Allen-Grimes 1980	inland record
9 Sept. 1980	off Oregon Inlet	2	this study	
11 Sept. 1902	ca. 200 miles off Cape Hatteras	1	Gault 1902	
11 Sept. 1978	off Oregon Inlet	1	Lee and Booth 1979	<i>P. lepturus</i> NCSM specimen
mid-Sept. 1979	off Oregon Inlet	1	this study	
16 Oct. 1954	Dillon, Dillon Co., S.C.	1	Harte and McCallum 1959	found alive 60 miles inland, not saved



Fig. 4. Adult White-tailed Tropicbird photographed at the "rock pile" off Cape Hatteras, N.C., 2 September 1979. (Photo by Mike Tove)



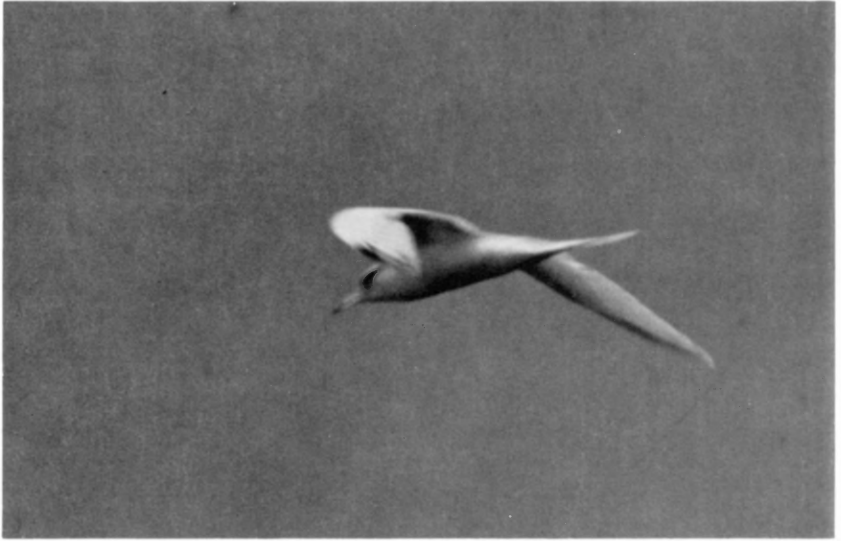


Fig. 5. Immature White-tailed Tropicbird photographed off Cape Lookout, N.C. (34° 6' N, 76° 17' W), 15 August 1982. (Photo by E. Wayne Irvin)



Fig. 6. Adult Red-billed Tropicbird photographed off Cape Lookout, N.C. (30° 11' N, 70° 8' W), 6 May 1981. (Photo by E. Wayne Irvin)

TABLE 2: Specimen records of tropicbirds (*Phaethon*)  
from the Carolinas.

<i>Species</i>	<i>Date</i>	<i>Sex</i>	<i>Weight</i>	<i>Total length</i>	<i>Tail length</i>	<i>Wing cord</i>	<i>Tarsus</i>	<i>Molt</i>	<i>Age and reproductive condition</i>	<i>Remarks</i>
<i>P. lepturus</i> Charleston Museum 1526	30 July 1926	F	—	—	—	281 mm	23 mm		adult	captured alive in road; first S.C. record; only specimen
<i>P. lepturus</i> NCSM 6828	11 Sept. 1978	M	374.7 g	590 mm	272 mm	285 mm	30 mm	general molt of body feathers; primaries 1-5 new, 6 in sheath, 7-10 worn	adult, gonad 2 x 4 mm	wingspan 884 mm
<i>P. lepturus</i> NCSM 8002	18 June 1982	F	480 g	768 mm	465 mm	282 mm	29.9 mm	head, neck, and back moderate to heavy; 10th primaries in sheath, rest new	adult, no bursa; largest ovum 3 mm; oviduct convoluted	
<i>P. aethereus</i> NCSM 7182	16 May 1979	F	624.9 g	905 mm	539 mm	307 mm	34 mm	no molt; central tail feather still in sheath	adult, gonad 10 x 2 mm	wingspan 1035 mm
<i>P. aethereus</i> NCSM 7183	16 May 1979	F	607.8 g	480 mm	130 mm	317 mm	35 mm	first primaries new and coming in, 2-10 worn; head and back molting	immature but past first year; gonad 8 x 2 mm	wingspan 1033 mm; no tail streamers

and photograph record of 5 July (or 18 August) 1935, for the description, while lengthy, is not diagnostic and the skull and photograph cannot be located.

## DISTRIBUTION AND OCCURRENCE

Excluding storm-driven tropicbirds, all sightings are from far at sea. North of Cape Hatteras all sea records are from the Gulf Stream, but to the south tropicbirds may regularly forage over the extensive shallow waters of the Hatteras Bight. Although information from South Carolina is scant, one record (24 May 1959, from only 18 miles SSE of the Charleston sea buoy) suggests they occur inside the Gulf Stream and over relatively shallow water there as well as in Hatteras Bight. Tropicbirds are high-flying, plunge-diving species adapted to living over nutrient-poor tropical and subtropical waters. Therefore, they seemingly are not as dependent on the edges of oceanic currents and upwelling areas along the continental shelf as are most other pelagic birds of the Carolinas. This is not to say that they will not take advantage of optimum foraging conditions. Indeed, many of our records are from major sport-fishing grounds off Oregon and Hatteras Inlets, where we have concentrated most of our field effort. Nevertheless, the frequency of occurrence in Hatteras Bight and off Cape Lookout is impressive, considering the limited nature of the field work in those areas.

With the exception of one Red-billed Tropicbird collected on 16 May 1979 and one White-tailed Tropicbird photographed on 15 August 1982 (and possibly the 1939 bird beached in North Carolina), all Carolina records for both species are of assumed adults (birds with streamered tails).

The known season of occurrence for the White-tailed Tropicbird in the Carolinas is from 18 June to 11 September. Wingate (1973) reports April to August as the period of maximum occurrence for this species in Bermuda, home of the nesting population closest to the Carolinas. Records for Red-billed Tropicbird occurrence are from 6 May to 1 September. Although there are many sight records for which we are not able to determine the specific identity, there is only one record outside the calendar period covered by positive identifications. This is a 16 October 1954 storm record for a "White-tailed" Tropicbird found alive in Dillon, Dillon County, S.C., approximately 60 miles inland (Harte and McCallum 1959). The specimen, which unfortunately was not saved, was driven inland by Hurricane Hazel. Although seasonal occurrence of tropicbirds in Carolina waters closely parallels our season of maximum field effort, interviews with boat captains give us no reason to suspect late-fall and winter occurrences in our latitudes. Red-billed Tropicbirds have been recorded as late as 9 October in Florida, but the other seven North Atlantic records fall within the mid-June to mid-September period.

Although large storms certainly affect the movements and distribution of most seabirds and are responsible for most, if not all, coastal and inland sightings of *Phaethon*, few of the records available for the Carolinas seem to be of storm-driven individuals. In some instances we are aware of several sightings a few weeks after passage of a storm, but storms are not believed to be a primary cause of displacement because healthy seabirds, including tropicbirds, could return hundreds of miles to favorite feeding areas in a matter of days. Several boat captains have suggested that tropicbirds are most frequently found in Carolina waters during or soon after several days of steady southeasterly winds. While this is without doubt a valid observation, tropicbirds also occur in association with other wind conditions. Furthermore, southeastern winds are a normal occurrence in the summer months.

To provide some indication of frequency of occurrence, Richard Harris, of the Oregon Inlet fishing fleet, kept count of all tropicbirds seen during 100 summer trips off Oregon Inlet in 1982. He personally saw 12 birds, and both species were identified.

With the exception of Florida, tropicbirds have been encountered with more frequency and regularity off the North Carolina coast than off any other state or province in the eastern United States and Canada. This may in part be due to the intensity of field effort in the Hatteras region. In Georgia and South Carolina the continental shelf is so far from land that censusing is difficult. Although tropicbirds may feed regularly in the shallow inshore waters, there probably are no areas of concentration. Georgia has but three tropicbird records, a storm-blown individual over Atlanta (Griffin 1940) and two offshore sightings (Moore 1980). One of the offshore birds was an immature seen on 27 August 1977 about 45 miles ESE of Savannah Beach over water approximately 90 feet deep. The other was an adult (streamered tail) seen in the same vicinity the previous summer by the boat captain, Jim Walthall. Neither offshore sighting was storm related. For many warm-water "summering" seabirds, the Hatteras area represents the northern extent of regular occurrence, or a region of maximum abundance in North America. Cape Hatteras has long been recognized as the breaking point between boreal and tropical elements. Therefore, it is not surprising that there are relatively few reports for either species of *Phaethon* to the north. Additionally, rich feeding areas off the Outer Banks seem to attract "wandering" seabirds on a regular basis. This is supported in part by the great diversity of seabirds documented from the area (Lee and Booth 1979, Lee and Platania 1979).

Because of the unresolved problems of sorting out the distribution, relative abundance, and season of occurrence for the two tropicbirds, we hope that field parties will continue to report details of sightings and that editors will recognize the importance of publishing them.

#### ACKNOWLEDGMENTS

We thank Steven P. Platania, Mary Kay Clark, Eloise Potter, and John B. Funderburg, all of the North Carolina State Museum, and Ron Mobley, of North Carolina State University, for assistance with the field work. The boat captains of the Oregon Inlet fishing fleet, particularly Harry Baum, Richard Harris, and Allen Foreman, were helpful with all aspects of this study. Charles Manooch, of Natural Marine Fisheries, provided opportunity for survey trips off Beaufort. Al Sanders, Charleston Museum, provided information on the single South Carolina specimen. Mike Tove generously supplied a photograph of the White-tailed Tropicbird. Drawings are by Renaldo G. Kuhler, scientific illustrator, North Carolina State Museum. Portions of the North Carolina State Museum's long-range studies of marine birds and mammals were funded by United States Fish and Wildlife Service Contract 14-16-0009-80-044. This financial assistance is gratefully acknowledged. This is contribution number 1983-1 of the North Carolina Biological Survey.

#### LITERATURE CITED

- Bull, J.L. 1964. Red-billed Tropicbird on Long Island, New York. *Auk* 81:433-434.  
Fussell, J.O., III, and A. Allen-Grimes. 1980. Bird sightings associated with Hurricane David. *Chat* 44:89-100.  
Gault, B.T. 1902. Letter from Cayene, French Guiana. *Wilson Bull.* 9:140-143.  
Griffin, W.W. 1940. Seasonal notes from Atlanta. *Oriole* 5:9-10.  
Harte, J., and A. McCallum. 1959. Tropic-bird, a sight record and a capture. *Chat* 23:34.

- Lee, D.S., and J. Booth Jr. 1979. Seasonal distribution of offshore and pelagic birds in North Carolina waters. *Amer. Birds* 35:715-721.
- Lee, D.S., and S.P. Platania. 1979. Unverified sight records of seabirds in North Carolina waters. *Chat* 43:79-81.
- Lee, D.S., D.B. Wingate, and H.W. Kale II. 1981. Records of tropicbirds in the North Atlantic and upper Gulf of Mexico, with comments on field identification. *Amer. Birds* 35:887-890.
- Manigault, P. 1959. Tropicbird off the South Carolina coast. *Chat* 25:62.
- Moore, T.S. 1980. A record of the White-tailed Tropicbird for Georgia. *Oriole* 45:39-40.
- Pearson, T.G., C.S. Brimley, and H.H. Brimley. 1942. *Birds of North Carolina*. N.C. Dept. Agric., Raleigh.
- Sprunt, A., Jr., and E.B. Chamberlain. 1949. *South Carolina Bird Life*. Univ. South Carolina Press, Columbia.
- Wingate, D.B. 1973. *A Checklist and Guide to the Birds of Bermuda*. Published by author.

*North Carolina State Museum, P.O. Box 27647, Raleigh, N.C. 27611.*

## **ATTENTION, PHOTOGRAPHERS!**

**PHOTOGRAPHY CONTEST**—The North Carolina State Museum of Natural History will sponsor a nature photography contest this summer. Persons interested in receiving contest information should write Mary Kay Clark, P.O. Box 27647, N.C. State Museum of Natural History, Raleigh, N.C. 27611.

**SLIDES NEEDED**—High-quality slides depicting native plants and animals, aspects of their life history, natural habitats, or other facets of North Carolina's natural history are needed by the State Museum. Slides will be used for noncommercial purposes to promote natural history and support environmental education in North Carolina. Donations or loans will be duplicated and originals or a high-quality duplicate will be returned to the contributor. Contributors retain all publication and commercial rights to slides. Photo credits will appear on slide mounts, and appropriate acknowledgements will be made when the slides are used. Those interested in contributing should write or telephone Mary Kay Clark, P.O. Box 27647, N.C. State Museum of Natural History, Raleigh, N.C. 27611, (919) 733-7450.