

Seasonal distribution of offshore and pelagic birds in North Carolina waters

*An ongoing survey is revealing new insights
into the year-round status of many species*

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UNTIL RECENTLY THE GEOGRAPHICAL and seasonal distribution of offshore and pelagic birds has constituted one of the weakest areas in our knowledge of North American avifauna. While the distribution of seabirds on the West Coast is now relatively well known (*e.g.*, Sanger 1970, Ainley 1977), along the eastern seaboard only the North Atlantic region has been surveyed (Wynne-Edwards 1951, Murphy 1967, Finch *et al.*, 1978), although Richard Rowlett is currently surveying Maryland's offshore waters. There is little need to elaborate on the problems of observing, identifying, photographing, or collecting birds at sea. Much of the published information available on seabirds of the central Atlantic states is based on storm casualties, which do not necessarily reflect normal patterns of distribution, and on widely scattered reports from oceanic trips. Special mention of Paul DuMont's and Robert Ake's offshore excursions should be made since observations from their trips have not only allowed a large number of bird students the opportunity to see unusual pelagic species, but also have contributed significantly to our knowledge of seasonal occurrence. Compiling of these reports, literature records, museum specimens, and data obtained from our observations provides a fairly complete summary of the fragmentary knowledge of these birds in local offshore waters.

FOR THE LAST FOUR YEARS we have been gathering data on seasonal and ecological distribution, abundance, and comparative foraging strategies of North Carolina's seabirds. Points of departure for our studies were Virginia Beach (VA) and Oregon Inlet, Hatteras Inlet, and Beaufort (NC). We found that Oregon and Hatteras inlets provided the best access to concentrations of seabirds. The edge of the Gulf Stream and local upwellings (Wells and Gray 1960) of nutrient-rich waters along the edge of the continental shelf, although constantly changing, tend to attract dependable bird concentrations which are within easy access of North Carolina's Outer Banks. Thus far our 63 offshore trips, as well as those of others, have provided fairly uniform coverage from late spring to early fall, but the observations during the remainder of the year have been sporadic (Table I).

Since it will be several years before our field work is complete, we felt it desirable to share some of our more unusual observations and provide a summary of

the known seasons of occurrence of these offshore birds. We hope this will be useful to the many persons who make excursions in pursuit of pelagic birds off North Carolina but who are unable to appreciate the significance of their sightings because of the need for a data base. It is apparent that any trip could add considerably to our understanding of these birds. Extensions of known periods of occurrence are made on nearly every trip

and the opportunity to add "new" species to the known fauna is always a strong possibility. Nearly half of the species discussed here have been added to North Carolina's fauna in the last decade and a third only recently documented by our studies.

The birds discussed include both true "pelagic" and certain other "offshore" species. A rigid definition of "pelagic species" is difficult. Generally these true dwellers of the open ocean are distinguished from such "offshore" species as gannets and alcids, which inhabit the relatively shallow waters over the continental shelf. Both these groups are included here, whereas most of the "inshore" group, comprised of grebes, loons, marine ducks, and most of the gulls and terns, are not. Jaegers, kittiwakes, and several tropical terns are generally considered pelagic during the non-breeding season, and the Arctic Tern is pelagic during migration. These were included in this survey, as were certain other gulls, terns, and phalaropes typically encountered far out at sea.

THE SPECIES DIVERSITY of the state's offshore avifauna is enhanced by its varied geographic origins. While the winter fauna is composed essentially of boreal species that move southward, the summer fauna is derived from three distinct geographic areas (Table II). Migrants are essentially from northern stock, but one species, the Sooty Shearwater, breeds during the austral summer in the region of the Straits of Magellan and "winters" in the subarctic waters of the North Atlantic, and individual South Polar Skuas may exhibit a similar migration pattern. Other species, usually considered as migrants from the southern hemisphere, have at least small summer

Table 1. Monthly occurrence of storm frequency, offshore seabird trips, and known avian diversity.

Months	J	F	M	A	M	J	J	A	S	O	N	D	
Mean # of storms 1950-1974 (from Hayden 1975)	3.0	3.0	1.5	2.0	1.5	.5	.2	.5	1.0	2.2	2	2.5	—
# of reported offshore trips 1970-1978	0	1	0	0	7	8	6	17	10	8	0	0	57
# of offshore trips N.C.S.M.	0	1	0	4	6	6	5	16	14	5	2	4	63
Total # of offshore trips	0	2	0	4	13	14	11	33	24	13	2	4	120
# of pelagic and offshore (range) species observed per trip (mean) (N.C.S.M. records only)	—	2	—	5-10 (7.5)	4-10 (8)	3-11 (6.0)	4-7 (5.0)	3-9 (4.1)	3-8 (4.9)	5-9 (7)	10-11 (10.5)	3-6 (4)	

Table II. Origin and seasonal status of North Carolina Seabirds. Numbers indicate total species normally expected. Numbers in parentheses indicate apparently atypical seasonal records of species based on individual vagrant birds. Records of sick or injured birds are not included.

Origin of Breeding Stock	Status in N.C. waters	Total Species	Season														
			J	F	M	A	M	J	J	A	S	O	N	D			
North Atlantic/Boreal	Winter Visitors	7	5	4 (1)	2	2	2 (1)	1		(1)	(1)	(1)	(1)	2	5	5 (1)	fulmar, gannet, kittiwake, Great Skua, Razorbill, murre, Dovekie
	Pelagic Migrants	9	(1)	(1)	1	2 (2)	7 (2)	6		(1)	3 (1)	5 (2)	4 (2)	3 (2)	3		Manx Shearwater, Leach's Storm-Petrel, phalaropes, jaegers, Sabine's Gull, Arctic Tern
Eastern Atlantic		4					1 (1)	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)			Cory's & Little Shearwaters White-faced & Harcourt's Storm-Petrels
Tropical & Sub-tropical	Summer Visitors and Residents	10	(1)	1 (1)	2 (1)	4 (1)	6 (2)	6	6	6 (2)	6 (1)	3	2				Audubon's Shearwater, Black-capped & South Trinidad Petrels, tropicbird, frigatebird, boobies, and Sooty, Bridled & Noddy Terns
South Atlantic		4			1 (2)	3 (2)	2	2	2	2 (1)	2 (1)	2 (1)	1		(1)		albatross (sp), Greater Shearwater, Wilson's Storm-Petrel, South Polar Skua
	Pelagic Migrant	1	(1)	(1)			1	1		(1)	(1)	(1)					Sooty Shearwater
	Totals	35	5 (3)	5 (2)	3 (4)	7 (6)	18 (4)	17 (3)	9 (2)	12 (7)	14 (6)	12 (6)	12 (3)	8 (2)			

resident populations off North Carolina's coast. Many of the birds discussed here appear to reach either the northern or southern limits of their known (or expected) range in North Carolina's waters.

Most of North Carolina's offshore and pelagic birds have relatively protracted periods of occurrence. There are several factors that account for this, the more obvious of which include: (1) local oceanic currents and upwellings that provide important foraging areas for both "warm" and "cold water" species, (2) differential timing in migration between different age classes of seabirds, and (3) a typically long adolescence during which sub-adults may linger in local waters for extended periods without obligation to return to nesting areas.

A brief discussion of each oceanic species known from North Carolina offshore waters follows. The birds are presented in two groups: (I) those officially recognized as occurring in the state (Parnell *et al.*, 1978), or recently verified by specimens; and (II) those whose occurrence is presently unrecognized or considered hypothetical by the North Carolina Records Committee. Abbreviations used in the text are: *A.B.* = American Birds; *Atl. Nat.* = Atlantic Naturalist; *B.N.C.* = Birds of North Carolina; *Chat* = The Chat; *N.C.S.M.* = North Carolina State Museum; and *U.S.N.M.* = United States National Museum. An asterisk (*)

indicates a N.C.S.M. specimen record. Observations that lack literature citations are from our records.

I. Species Recognized as Occurring in NC Waters

[Order of species follows Morony, John, J., Jr., Walter J. Bock and John Farrand, Jr., 1975. Reference List of Birds of The World, American Museum of Natural History, New York. 207 pp.]

Northern Fulmar, *Fulmarus glacialis*. Even though the Northern Fulmar has experienced rapid population and range expansion in Europe during this century (Fisher 1952, Lockley 1974), and there are numerous winter sight records from the Baltimore Canyon (Rowlett, *pers. comm.*) and one from South Carolina (Nugent 1978), its occurrence in North Carolina's offshore waters has only recently been documented (Lee and Rowlett 1979).

In the early spring of 1973 John Williamson, Manager of the Pea Island Nat'l Wildlife Refuge, received an injured fulmar found by a visitor on a refuge parking lot. The bird died several days later, but the specimen was not saved.

On October 14, 1976 we watched a light phase fulmar for approximately 15 minutes as it flew parallel to the course of our boat at a distance of 50-70 yards. The bird glided several feet above the water, occasionally flapping its wings. Its large, light head and neck provided a marked contrast to its gray wings. This sighting was made approximately 35 miles southeast of Oregon Inlet at the edge of the continental shelf.

Lee and Rowlett (1979) reported fulmars on the following dates: May 17, 1978, May 18,

1978*, October 1, 1978 (2)*, and November 14, 1972 (2, one a dark phase), and we have records for two other occasions. On April 22, 1979 Captain Allan Foreman reported seeing six individuals and on April 23, 1979 Lee saw nine and collected one. All North Carolina sightings have been made on excursions departing from Oregon Inlet, and, except for the November 14 record listed above, all individuals encountered have been light phase birds.

Black-capped Petrel, *Pterodroma hasitata*. One of the surprises of our studies has been the discovery that this gadfly petrel is a regular, although usually uncommon offshore resident. Single birds are frequently sighted. Lee (1977) provided records of 17 sightings, and more recently Lee and Rowlett (1979) have documented their occurrence with photographs and a single specimen (May 10, 1978*) and provided an additional 17 date records (54+ individuals). Since this time we have made 12 (3 dates) additional sightings. Records indicate that these birds may be present throughout the year with the greatest frequency



Black-capped Petrel, (Pterodroma hasitata), 18 mi s. of Cape Hatteras, N.C., May 21, 1977. All photos/R. A. Rowlett.



Black-capped Petrel, 45 mi e. of Cape Canaveral, FL, Feb. 2, 1977.

of occurrence in spring and fall. Sight records or photographs are available for February (3 individuals), April (10), May (24), June (2), July (1), August (8), September (4), October (25-45), and November (3). Nearly all sightings have been along the edge of the Gulf Stream, although several have been along the edge of the continental slope on days the Gulf Stream was farther to the east than normal.

South Trinidad Petrel, *Pterodroma arminjoniana*. A single specimen*, the second for North America, was collected 74 km ESE of Oregon Inlet (Lee 1979).

Cory's Shearwater, *Puffinus [Calonectris] diomedea*. Numerous records available from May 16* through November 14* indicate that this bird is a common offshore resident and often an abundant migrant. Rowlett (1978) reported a spectacular migration of over 8850 Cory's Shearwaters, counted during 7 hours of observation from Cape Point near Hatteras, N.C., on October 28, 1974. Buckley (1973) sighted over 5000 of these shearwaters from the beach near Hatteras in late May. Participants in offshore trips often see 200-500 Cory's Shearwaters in a single day. In the warmer months this species is regularly seen inshore (5-20 miles), although it is certainly more numerous in the Gulf Stream and along the edge of the continental slope. There is a single apparently early record from April 9, 1966 (Chat 30:90), and sightings made by us on April 4, 1978, April 17, 1978 and April 23, 1979 were apparently this species.

Greater Shearwater, *Puffinus gravis*. Although less common than the preceding species, this shearwater is a common summer resident in North Carolina waters. The normal period of occurrence appears to be from May 19 (A.B. 27:758) through November 14*. There are also reports for April 17, 1978, April 23, 1979, April 27, 1969 (2 individuals; Chat 36:30-31), December 28, 1946 (Chat 11:11), and December 30, 1970 (A.B. 25:262). During our 1977 survey we did not encounter this species until June 22*, and it did not become common until mid-summer. In 1976 it was present in large numbers on July 1*. On several occasions we found this species to be more common than Cory's Shearwater. It is frequently associated with schools of feeding yellow-fin tuna and follows charter boats, attempting to snatch trolling baits. It is less likely to be observed inshore than is Cory's Shearwater.

Sooty Shearwater, *Puffinus griseus*. This is one of a few species discussed in this paper which is perhaps more likely to be seen from shore than far at sea. Often large numbers migrate northward inshore and pass close to various North Carolina capes. Although this bird is an abundant spring migrant along the central western Atlantic coast (May 13 to June 29, with peak abundance in late May and early June in North Carolina waters), it normally migrates south through the eastern Atlantic. To our knowledge there are only a few fall sight records for it in North Carolina. Two were seen off Morehead City on September 13, 1974, three from Kill Devil Hills between October 23-25, 1971 (Chat 36:33), and one off Cape Point, Hatteras Island, on October 28, 1974 (A.B. 29:40). Rowlett (1978) watched the latter individual from Cape Point for about 30 minutes as it fed with a flock of gulls. On August 6, 1977 we observed a single bird feeding 27 miles east of Oregon Inlet. Other seemingly aberrant dates of occurrence in North Carolina are January 8, 1972 (Chat 36:65) and March 11, 1973 (Chat 37:52). The recent discovery of a South Trinidad Petrel in North Carolina waters (Lee 1979) suggests that some of these out-of-season sight records may have been dark-plumaged individuals of the latter species.

Manx Shearwater, *Puffinus puffinus*. In addition to the sight record made by Buckley (1973) of two individuals seen in migration from the beach at Hatteras on May 31, 1970, we have records for the following dates: April 17, 1978 (?), spring 1978 (oil-soaked salvaged specimen*), December 5, and December 30, 1978 (4)* (Lee and Rowlett 1979).

Audubon's Shearwater, *Puffinus lherminieri*. Our observations indicate that small "black-and-white" shearwaters, nearly all of which prove to be Audubon's, occur in North Carolina waters more or less continuously from April 23 through November 7, although their abundance fluctuates greatly. We found these birds to be common-to-abundant mid-May to early June and throughout the fall. On calm days small flocks are sometimes seen swimming and feeding among mats of *Sargassum*. During the summer we typically saw only one or two individuals per offshore trip, but on several trips hundreds were present.



Audubon's Shearwater (Puffinus lherminieri), Gulf Stream, 16 mi e. of Cape Hatteras, N.C., Aug. 1, 1977.



Audubon's Shearwater, Gulf Stream, N.C., Sept. 4, 1977.

Wilson's Storm-Petrel, *Oceanites oceanicus*. This is certainly the most common pelagic summer resident in North Carolina waters. We encountered these birds on 53 of 56 trips from April 17* through October 12*, although they became increasingly uncommon after mid-September. Published records range from March 8, 1974 (Chat 38:78) through October 22 (A.B. 27:40). These birds are quickly attracted to chum, and during the season of occurrence we could always attract 10 to 50 within minutes, even when no birds had been sighted for several hours. Conservative estimates varied from 50 to 200 individuals seen on trips made during the warmer months. On a two-day trip on May 17-18, 1978 we counted over 1000 migrating individuals. During the spring period individuals are often seen inshore and on occasion from the beach.

White-faced Storm-Petrel, *Pelagodroma marina*. Records of this species from North American waters are few (Del. N.Y., Mass., N.J.). Buckley and Wurster (1970) and Barnhill and DuMont (1973) surveyed previous North Atlantic records and commented on the limited number of sightings from near shore. There is one storm-associated report from North Carolina (Oregon Inlet, October 2, 1971, A.B. 26:45). During the late summer of 1977 we encountered individual birds on two occasions, August 31 and September 24, 1977*, both approximately 38 miles off Oregon Inlet. This species may not be as scarce or as irregular as these records suggest, since at least one commercial fishing boat captain reported seeing it on several occasions in the fall of 1977 (Lee and Rowlett 1979).

Leach's Storm-Petrel, *Oceanodroma leucorhoa*. Because of its nocturnal habits, and its apparent preference to migrate in cool inshore waters (pers. observ.) while most observational activity is focused along the edge of the Gulf Stream, this spring and fall migrant may not be as uncommon as our few records indicate. Spring records are from May 12 (Atl. Nat. 28:170) through June 25 (Chat 37:48). On both May 18 and 25, 1977 we watched 3-6 individuals along the eastern edge of the Gulf Stream, and on May 17, 1978 and May 16, 1979 we encountered individuals within a few miles of the beach. Unlike Wilson's Storm-Petrels, which were also present, Leach's could not be attracted with chum. There are only a few fall records: September 16, 1973 (Chat 38:25), October 2, 1971 (30-in Oregon Inlet after a tropical storm, A.B. 26:45), October 10, 1974, October 26, 1975 (Chat 40:46), and the first week of November 1969

(U.S.N.M. specimen, *Chat* 36:29). On December 5, 1978 Lee observed a storm-petrel which was assumed to be this species.

Harcourt's Storm-Petrel, *Oceanodroma castro*. One North Carolina record of a storm wreck salvaged by John Fussell on Atlantic Beach, June 22, 1972 (U.S.N.M., *Chat* 38:23).

White-tailed Tropicbird, *Phaethon lepturus*. Nineteen tropicbird records from June 8 through September 11* indicate that it is an uncommon but regular summer visitor, perhaps visiting the North Carolina coast more frequently than any other area in the continental United States. With the exception of one immature individual found dead in July 1939 (*Chat* 4:1), all birds with recorded age or plumage data have been adults. We assume that these sightings are of birds from the breeding population in Bermuda, and our records correspond rather closely with the documented April-August period of maximum occurrence there (Wingate 1973).

Gannet, *Morus bassanus*. These birds are common to abundant winter residents, mid-December through late April. There are regular fall sightings (mostly juveniles and subadults) from mid-October through December, a large number of reports from May and early June, and scattered reports from the remaining months. Individual sightings were made on June 24, 1973 (immature, *Chat* 37:108), July 7, 1950 (U.S.N.M.), July 9, 1972 (subadult, *Chat* 36:111), August 19, 1962 (*Chat* 26:102), August 28, 1957 (*Chat* 22:29), and September 28, 1972 (*Chat* 37:29). Most records are of birds seen from shore where as many as a thousand or more can be seen at one time. The few offshore trips made during the seasons when Gannets are abundant indicate that this species typically remains inshore, as we encountered only small numbers out of sight of the beach. However, Helmuth (1920) noted that they were very common 50 to 80 miles off the Carolina coast on February 24, 1918.

Magnificent Frigatebird, *Fregata magnificens*. Thirty sightings from May 1 (*Chat* 17:70) through September 2 (*Chat* 14:31) were all made from shore. On August 2, 1944, five individuals were observed in the same day. The few birds for which age or sex was reported were mostly immatures (nine) and females (three). To our knowledge the only adult male seen was on August 2, 1944 (*Chat* 8:60). There is one additional winter (January 30, 1939, B.N.C.) and one offshore (August, 1977) record. The latter was reported to us by a charter boat captain at the Oregon Inlet Fishing Center.

Northern Phalarope, *Lobipes lobatus*. There are numerous offshore records of this shorebird from North Carolina. The typical periods of occurrence are August 10* through October 25 (based on 39+fall records) and May 3 (*Chat* 34:84) through June 9* (based on 27+spring records). Sightings for July 10, 1972 (3 birds, *Chat* 36:114), July 11, 1971 (*Chat* 35:115) and August 4, 1974 appear to be of early fall migrants. One winter record (February 5, 1940, B.N.C.) has been reported.

Red Phalarope, *Phalaropus fulicarius*. This phalarope seems to be a less common migrant, appearing later in the fall and earlier in the spring in North Carolina waters than the Northern Phalarope. Normal periods of migration are September 30 through December 29* (20+ fall records) and March 8 through May 4 (15+spring records). Records for May 29, 1924 (B.N.C.), August 19, 1972 (A.B. 27:40), August 30, 1975, and September 16, 1973 (*Chat* 38:27) are of small numbers of individuals (1-3) and appear to be atypical. Reports for January (two) and February (one), and the presence of hundreds to thousands of individuals seen during offshore trips on December 5, 1978, December 29, 1977, and December 30, 1978 and on our earliest spring trips, April 4, 1978 and April 17, 1979, suggest possible over-wintering in North Carolina waters.

Pomarine Jaeger, *Stercorarius pomarinus*. There are reports of Pomarine Jaegers in North Carolina waters for all months except February, March, and July. Specimens are available from the spring migration period, April 4, 1978*, April 17, 1979*, May 10, 1979*, June 1, 1977* and June 29, 1977*, as well as from September 22, 23, 24, 1977* and October 18, 1933*. On November 7, 1977* we observed 34 individuals. Fewer than ten percent of those observed by us were in dark-phase plumage.

Although experienced observers should have little difficulty identifying Pomarine Jaegers at any season, our knowledge of the seasonal distribution of all three jaeger species is incomplete. Scarce in the summer months, they are apparently most numerous during the fall migration period. Their periods of occurrence and relative abundance are partly masked by the infrequency of offshore trips from late fall through early spring, and by the difficulty of identifying immature and winter-plumaged birds. There are few specimens, and problems with evaluating sight records are particularly notorious with this group.

Parasitic Jaeger, *Stercorarius parasiticus*. Few spring records exist for this species. Sightings have been reported as early as April 2 (*Chat* 30:27) and as late as June 6 (Ake, *pers. comm.*). There is only one specimen from this period, however, taken on June 1, 1977*. Fall records are quite numerous from August 30 through December 5 (collection of U.N.C.-Wilmington), and there are additional specimen records that span this period of occurrence. Other records include August 3, 1974 (A.B. 29:40), August 25, 1960* (inland TV tower mortality), and December 30-31, 1968 (*Chat* 33:17), 1971 (A.B. 26:590), and 1972 (*Chat* 37:15). This jaeger seems to occur inshore more often than the others.

Long-tailed Jaeger, *Stercorarius longicaudus*. Because of problems in identifying birds not in spring plumage, this jaeger may be more common than our few records indicate. It is interesting to note that all sight records are of birds in spring plumage. Buckley (1973) discussed 10 individuals which he observed from shore during a spectacular seabird migration on May 30 - June 1, 1970. The only other sight report, other than those from our studies, is off Cape Lookout on May 13, 1972 (*Chat* 36:114). On May 25, 1977 we watched an adult Long-tailed Jaeger for more than 20 minutes as it hovered and fed around our "chum slick" 12-15 miles due east of Oregon Inlet. Birds in adult plumage were also seen on May 17, 1978 (Lee and Rowlett 1979) and April 23, 1979. On September 23-24, 1977* we collected two immature females, but were unable to distinguish them by sight from Parasitic Jaegers at the time. An additional specimen was collected on November 7, 1977*.

(Great) Skua, *Catharacta skua*. There is a single documented record of this species from the state. A banded individual was found dead on the beach at Cape Lookout on December 29, 1975. The bird had been banded five months previously in Iceland (Lee and Rowlett 1979).



South Polar Skua (Catharacta macconnicki), Gulf Stream, 18 mi. s. of Cape Hatteras, N.C., May 21, 1977.



South Polar Skua, 18 mi s. of Cape Hatteras, N.C., May 21, 1977.

South Polar Skua, *Catharacta maccormicki*. Only 3 of the 10 North Carolina records of skuas are identified to species. Lee and Rowlett (1979) reported a specimen (U.S.N.M., May 17, 1976, Cape Hatteras) and provided a photograph record (May 21, 1977, south of Cape Hatteras). Skua sightings on May 31, 1970 (A.B. 27:8-10), February 18, 1974 (Ail. Nat. 29:175), July 6, 1975 (reported as July 5 in A.B. 29:959), and August 1, 1960 (Chat 24:105) were assumed to be Great Skuas, but the recent documentation of *C. maccormicki* in the North Atlantic (Veit 1978, Lee and Rowlett 1979) leaves this open to question. Our only two sightings (May 25, 1977 and June 1, 1977) were not identifiable to species.

Black-legged Kittiwake, *Rissa tridactyla*. The few winter offshore excursions made from North Carolina indicate that this pelagic gull is a common winter resident. Normal period of occurrence extends from November 7* through March 30 (Grant *et al.*, 1976). Although most records are of single individuals, there is enough supporting evidence to suggest that these birds occur regularly offshore. On November 7, 1977 we counted a minimum of 36 individuals, and counts of 30 and 40 have been made on several Christmas Bird Counts off Pea Island. Several October records (October 4, 1973, Chat 38:28; October 8, 1972, A.B. 27:40; October 14, 1978, October 23, 1971, Chat 36:35; October 27-28, 1974, A.B. 29:41) and one for May 20, 1977 (Rowlett, *pers. comm.*) all appear to be of single immature birds. Grant *et al.* (1976) surveyed 17 records for this species in North Carolina waters, and we have accumulated an additional 18 (date) records.

Sabine's Gull, *Xema sabini*. There are only two records of this pelagic gull from North Carolina: May 27, 1972, Bodie Island (A.B. 26:750) and October 20, 1976, Winston-Salem (photo record, Culbertson 1977). This species has not yet been observed at sea in North Carolina waters.

Arctic Tern, *Sterna paradisaea*. There are few documented records of this tern from the western Atlantic. Sykes *et al.* (in prep.) summarize these records. There are two sight records (May 19, 1973 and September 6, 1976), one photographic record (May 21, 1977) and one specimen (May 18, 1977*) for North Carolina (Lee and Rowlett 1979). Although we



Arctic Tern (*Sterna paradisaea*), Gulf Stream 29 km s. of Cape Hatteras, N.C., May 21, 1977.

have seen large numbers of terns migrating offshore in the fall, there was no indication that Arctic Terns were among them.

Bridled Tern, *Sterna anaethetus*. This tern is a regular and rather common resident throughout the warmer months. We observed individuals from May 17* through October 12 on 23 of 47 trips. On April 17, 1978* we collected an adult pair from a floating board in the Gulf Stream. Most records for June and July are of birds in sub-adult plumage. All sightings were from 20 or more miles offshore, and most were encountered along the western edge of the Gulf Stream. The majority of records are from late summer when as many as 20-60 individuals were seen on several separate occasions.

Sooty Tern, *Sterna fuscata*. Most of the literature records for this species along the Atlantic seaboard are storm wrecks, although there are a few recent sightings that do not appear to be the result of adverse weather systems. We observed two of these terns on June 1 and two again on September 23, 1977. Excluding one March 16, 1869 record (B.N.C.), these dates appear to bracket the entire period of occurrence for North Carolina. This tern is usually seen singly or in twos and is much less common than the preceding species. There are only 21 records for North Carolina, at least nine of which are associated with tropical storms. Several of the remaining North Carolina records are of individual terns observed in tern colonies, and on June 16, 1978 John Fussell *et al.*, found evidence of one nesting attempt, details of which will be reported elsewhere.



Bridled Tern (*Sterna anaethetus*), Gulf Stream, N.C., Sept. 3, 1977.

Dovekie, *Alle alle*. The sporadic appearance of this species in more southern latitudes is well known. At this time we do not know whether this actually represents abnormal winter invasions or whether individuals encountered are blown in from farther out at sea. Period of expected occurrence ranges from November 7 (1932, B.N.C., and 1977) to February 24 (B.N.C.) with 41 recorded dates from this period. One poorly plumaged bird was seen on June 8, 1947 at Wrightsville Beach (Chat 12:15; Funderburg, *pers. comm.*). The November 7, 1977 sighting was of a single bird seen 34 miles east of Oregon Inlet. We know of no other offshore observations.

Razorbill, *Alca torda*. Jones (1967) summarized the status of the Razorbill in the Carolinas and concluded that the Hatteras area represents the southern limit of normal occurrence. There have been few North Carolina records since then (November 16, 1975, Chat 40:50; November 28, 1975, M. Tove, *pers. comm.*; January 29, 1972*, A.B. 26:591; February 25, 1969, Chat 33:51; February 19, 1977, off Diamond Shoals). To date all records are from inshore waters, and it is not known how far offshore this species can be expected to occur.

Thick-billed Murre, *Uria lomvia*. Only 7 records are available for this bird in North Carolina. The earliest record is for December 9 (Chat 31:75), and the latest for February 28 (Chat 24:25). Just as for the preceding species, there are no far offshore observations.

Other species which we observed regularly 20 or more miles offshore were: Ring-billed Gull, *Larus delawarensis*; Herring Gull, *L. argentatus*; Great Black-backed Gull, *L. marinus* (mostly immatures); Laughing Gull, *L. atricilla*; Black Tern, *Chlidonias niger*; Caspian Tern, *Sterna [Hydroprogne] caspia*; Common Tern, *S. hirundo*; and Royal Tern, *S. maxima [Thalasseus maximus]*. Sandwich Terns, *S. [Thalasseus] sandvicensis*, were commonly encountered, but normally fed 6-12 miles from the beach. Our few records of Glaucous Gull, *L. hyperboreus*, are from inshore, and there is one sight report of an Iceland Gull, *L. glaucooides*, from 90 miles off the North Carolina coast (Helmuth 1920). The presence of thousands of foraging Bonaparte's Gulls, *L. philadelphia*, 20-34 miles out of Oregon Inlet on December 29, 1977 and moderate numbers on November 14, and December 30, 1978, suggest that it may regularly



Bridled Tern, 25 mi s.s.e. Cape Hatteras, N.C., Aug. 20, 1978.

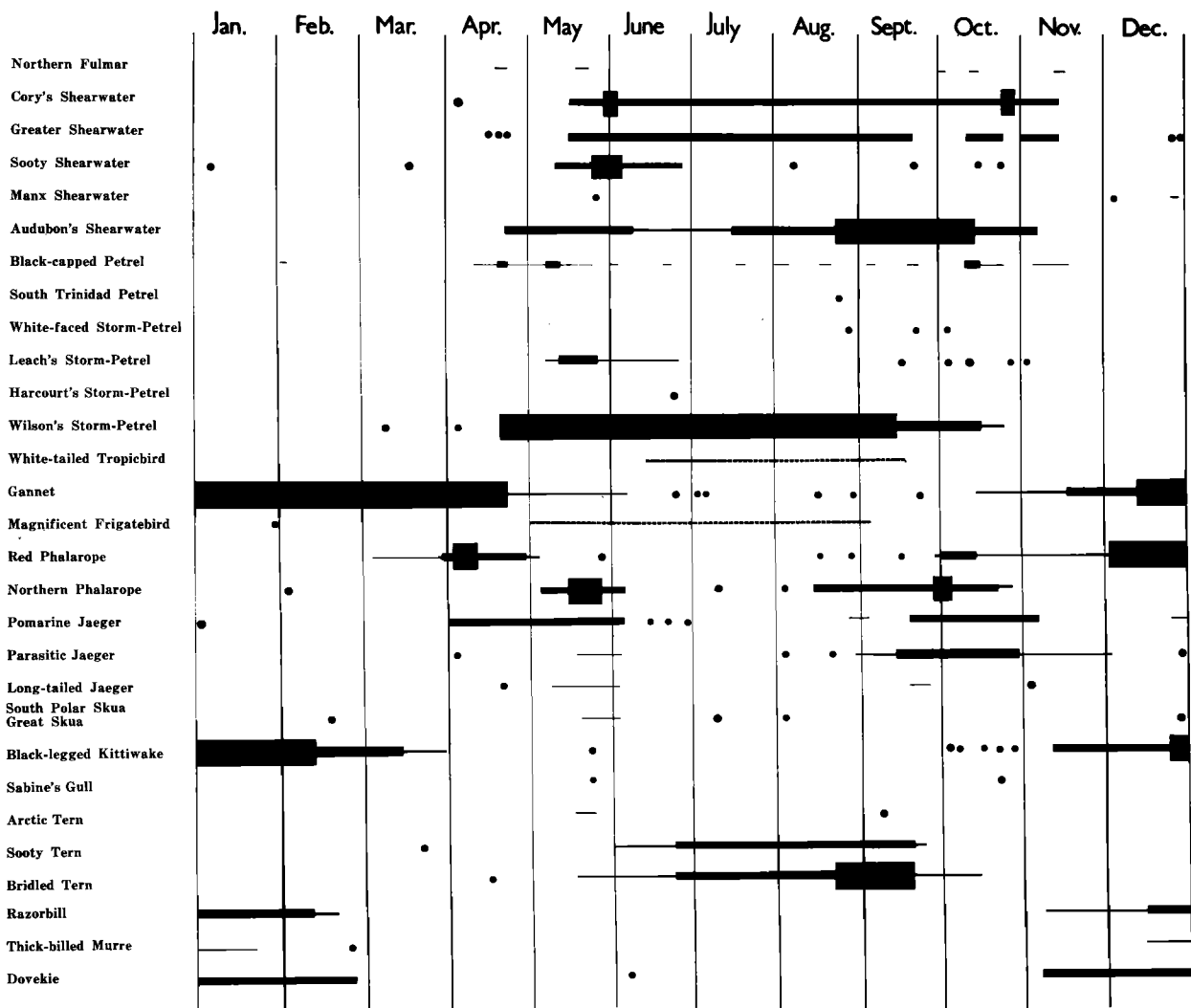


Table III. Seasonal Distribution of North Carolina Birds.

A heavy line means that the species is common or abundant during that period of the year, medium lines indicate fairly common, and a thin line implies that, although the species is uncommon, this time of year is within its expected period of regular occurrence. Dashed lines stand for known period of occurrence of irregular visitors, and dots indicate single records which, based on present knowledge, appear atypical.

winter offshore. Rarely we observed Gull-billed Terns, *Gelochelidon nilotica* (June 22, 1977); Forster's Terns, *S. forsteri* (September 6, 1976; September 10, 24, 1976); Roseate Terns, *S. dougallii* (June 29, 1977), and Least Terns, *S. albifrons* (April 23, 1979, May 10, 1979, June 29 and 30, 1977*) 20-40 miles offshore.

II. Species not recognized as normally occurring in North Carolina

Albatross, *Diomedea* sp. Several albatross sight records for North Carolina are available. Our only sighting was on April 17, 1978, 37 mi SE of Oregon Inlet. Another sighting in the same location two days later, possibly the same bird, was reported to us by one of the captains of an Oregon Inlet charter boat. The only field mark observed, other than size, was a light mantle and dark wings, suggesting the possibility that the individual in question was a **Yellow-nosed Albatross** (*D. chrysostoma*). DuMont (1973) reported sighting two birds that appeared to be Black-browed Albatrosses off North Carolina but the Carolina Bird Club Records Committee (see Parnell *et al.*, 1978) did not accept the record. The dilemma of accepting albatross sight records for the

Atlantic Coast of the United States has been discussed by McDaniel (1973). The captains of Oregon Inlet reported single October 1976 and 1978 sightings of these birds. There is no doubt that albatrosses occur in offshore waters but species confirmation is still needed.

Little Shearwater, *Puffinus assimilis*. Two to four shearwaters which appeared to be this species were seen on November 14, 1978 by Lee and Steve Platania, ca. 50 miles SSE of Oregon Inlet. Details are provided by Lee and Platania (*Chat*, in press). Post (1967) summarized the five reported sight records and two specimen records of this species for the northwestern North Atlantic and discussed field identification (1964).

Blue-faced Booby, *Sula dactylatra*. On June 7, 1966, after tropical storm *Alma*, two immature birds were reported off Bogue Banks (*Chat* 30:107).

Brown Booby, *Sula leucogaster*. On May 10, 1979, Lee, Platania and John E. Cooper saw a distant, gannet-like bird (shape and flight style) with a brown dorsal surface and a sharply contrasting white ventral surface. The tail was

distinctly pointed, but the distance and angle of view made it difficult to verify additional field characters. By elimination processes we deduced that the bird was a Brown Booby. This sighting was ca. 15 miles off Cape Hatteras.

Noddy Tern, *Anous (stolidus?)*. We know of four summer sightings of this tropical tern in North Carolina: August 29, 1949, Ft. Caswell (B.N.C. and *Chat* 15:33); June 16, 1974, Cape Lookout (*A.B.* 28:890); June 9, 1977, out of Oregon Inlet; and September 3, 1977, out of Hatteras (DuMont, *pers. comm.*). Our June 1977 sighting was of two birds foraging with several other species of terns along a tide line 8 miles NE of Oregon Inlet. The birds were observed intermittently for approximately 20 minutes. Their large size and dark bodies and wings distinguished them from the other terns, even though the weather, the seas, and the angle of view were unfavorable. Twice we were within 10-20 yards of the birds and were able to see the white cap on one individual. Distinguishing species of *Anous* in flight would be quite difficult, and North Carolina identifications are speculative and influenced by geographical probability.

IT SHOULD BE POINTED OUT that, although the best way to observe oceanic birds in the western Atlantic is by boat in areas of high seabird activity along the edge of the continental shelf, on the Outer Banks large numbers are often seen from shore. This is particularly true during the spring and fall migration periods. Small numbers of shearwaters, particularly Sooty Shearwaters, and occasionally other pelagic species, can normally be seen on almost any day during their respective spring migration periods, although occasionally large flights occur. Buckley (1973) tallied an impressive number of species and individuals of seabirds between May 30 and June 1, 1970 from near Hatteras, and Lynch and Marsh (1977) reported a similar though less intense migration on June 11, 1975 in the Frisco area. Over the years an interesting variety of oceanic species has been seen with some regularity from Cape Lookout. Rowlett (1978) commented on an unusually large concentration of Cory's Shearwaters which he observed on October 28, 1974 from Cape Lookout. During the winter months Gannets and occasionally other offshore species can be seen from shore, and although this is not unique to the Outer Banks region, they seem to appear with great regularity. Many of the records summarized in Table III were made from shore.

One of the real problems with offshore observations in addition to the unpredictable nature of seabirds, is scheduling trips in advance. Hayden (1975) pointed out that mid-Atlantic coastal wave climates have increased in duration and frequency in the last three decades. His data indicate that the greatest monthly frequencies of storms (waves greater than 5 feet at Cape Hatteras, North Carolina) currently occur during months when bird diversity should be high (migration, October and April) and during the time of year for which our knowledge is the least complete (December through April). In contrast, from June through September, when the summer resident offshore avifauna is most stable and well documented, storm frequency is lowest (Table I). This, combined with the general unavailability of charter boats during the winter season and the problems associated with the recent increase in fuel costs, suggest that it may be many years before we have a relatively complete understanding of the seasonal occurrence of seabirds in North Carolina's waters.

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