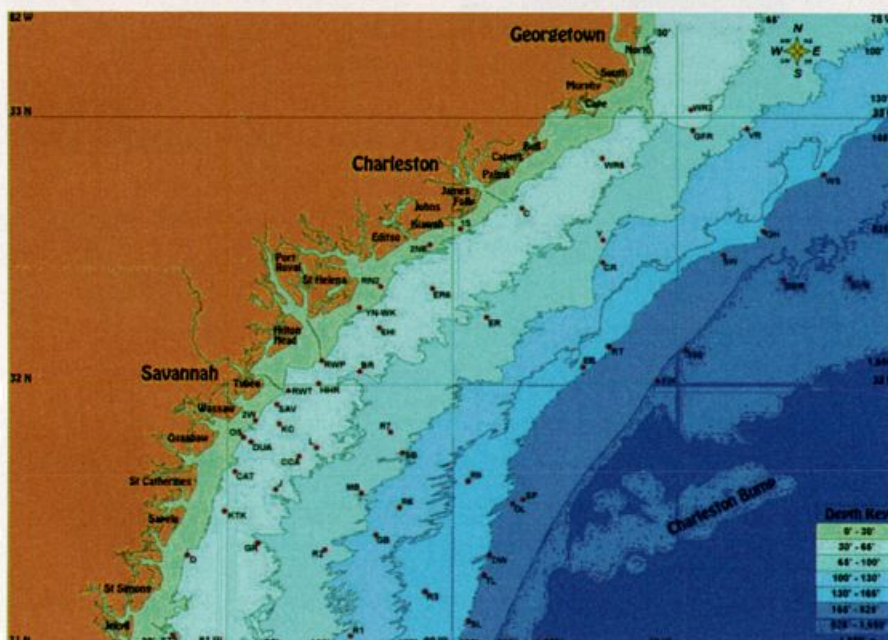


Pelagic birds off South Carolina and northern Georgia: An update on status of selected species

NATHAN WESCOAT DIAS • P. O. BOX 362 • MCCLELLANVILLE, SC 29458 • (EMAIL: OFFSHOREBIRDER@YAHOO.COM)



The pelagic waters considered in this article extend from approximately the latitude of Sapelo Island, Georgia to Georgetown, South Carolina. For the purposes of avifaunal records, the boundary between these states' ocean waters is set by the American Birding Association at 32° 02' north latitude. Image courtesy of, and copyright, Hotspot Charts, LLC.

Abstract

This paper summarizes records of selected seabirds observed in the pelagic waters of South Carolina and northern Georgia since the mid-1980s, with emphasis on those species whose status has become better understood in the past 20-25 years. Observations were both opportunistic (made from fishing vessels) and more ornithological (from boats chartered to study birdlife) in nature.

Data collection

The species accounts in this paper draw from several somewhat disparate sources. In the middle and late 1980s, the author was a crewman on a commercial grouper/snapper fishing vessel that worked out of Charleston in the fall and winter. The author was also a crewman or guest aboard multiple offshore sport-fishing charter vessels during the 1980s-early

1990s and since 2003 has organized and led pelagic birding trips off the state (Table 1). The birding opportunities in these three activities are strongly influenced not just by season and the marine environment visited but also by the type of vessel, its course and speed, and the predominant activity aboard, which differ markedly in each instance.

During stationary fishing operations on the snapper/grouper vessels, there is often an abundance of discarded marine life that is attractive to birds. When large fish are boated, for instance, they usually disgorge recent meals that consist of crabs, small fish, cephalopods, and other prey. These disgorged meals, along with fish below the legal size limit and other bycatch (that is, marine life caught but not targeted by fishing operations), are then hosed or tossed overboard by the crew. The discarded undersized fish often have

distended swim bladders, which causes them to flutter on the surface for some time. In addition, the larger commercial grouper/snapper vessels gut their catch periodically before placing the fish in refrigerated storage or on ice in insulated compartments (smaller vessels usually do not gut fish at sea; they generally return to port each day, with occasional 48-hour trips). The livers, stomachs, and other entrails produced by the gutting process are then dumped at sea. These various types of floating chum attract jaegers, gulls (including kittiwakes), the occasional Manx Shearwater (*Puffinus puffinus*) or Northern Fulmar (*Fulmarus glacialis*), and rarely a skua to the vicinity of the vessel. Northern Gannets (*Morus bassanus*) and Common Loons (*Gavia immer*) are also observed feeding on discarded fish and other offal.

In contrast to these cold-weather commercial bottom-fishing ventures, the spring and summer trips aboard smaller vessels were spent trolling fishing lines along the Continental Shelf edge and in the western portions of the Gulf Stream. Participants aboard these charter fishing ventures remain watchful for bird activity, which usually indicates fish activity, and so there are often opportunities to observe birds at close range on such day trips. When multiple sport-fishing boats are in proximity to one another, captains often communicate about the bird activity they observe.

While fishing boats, both commercial ventures and sport-fishing trips, can afford good opportunities to observe seabirds off South Carolina, pelagic birding trips off the state since 2003 have attempted to optimize such opportunities by combining local fishermen's assessments of the changing marine environment (and its interaction with submarine features known to attract and concentrate wildlife) with the latest technology for interpreting aspects of this environment—above the sea surface, at the surface, and below the surface. Unlike pelagic trips off some other ports, those from Charleston do not have pre-

arranged or fixed survey routes; the boat's course is not determined until the morning of the trip and is subject to continual modification. The boat's course is determined by factors including (but not limited to): recent wind/weather patterns, Gulf Stream position and configuration (and the presence of filaments and eddies), sea surface temperature readings and forecasts, satellite-derived chlorophyll and alimetry data, recent and real-time reports from area fishing captains (who share up-to-the minute news of birds or bird-attracting features), and occasional consultations of commercial fishing forecasts (e.g., Roffer's Ocean Fishing Forecasting Service reports).

Reef communities and other submarine features

Off the coast of South Carolina and northern Georgia lie hard seafloor areas—also known as hardground reefs, hardgrounds, hard-bottom areas, or live-bottom areas. Hardgrounds provide rare interruptions of large expanses of sand and mud on the Continental Shelf and Continental Slope off the southeastern United States. Composed of limestone, sandstone, and other mineral formations, they provide stable platforms to which reef-forming organisms can attach (Reed 2004). These reefs provide food and shelter for all manner of life, including the fish, arthropods, cephalopods, and other organisms that provide food for pelagic birds. South Carolina's artificial reefs, formed upon old ship hulls, masses of concrete, and other man-made objects, also host communities that provide food sources for pelagic birds. Even when ephemeral features that attract birds—such as deepwater upwellings, pelagic algae masses, or thermoclines (water temperature fronts)—cannot be located, hardground reef communities still attract pelagic birds. But when such ephemeral phenomena occur in the immediate vicinity of hardground reefs, the bird-attracting effects appear to be magnified.

The Gulf Stream, the massive warm-water current that flows northward along the Continental Shelf edge off the southeastern United States, varies in its speed and in its proximity to shore. These variations sometimes occur over relatively short periods of time. A significant influence on the Gulf Stream's path in

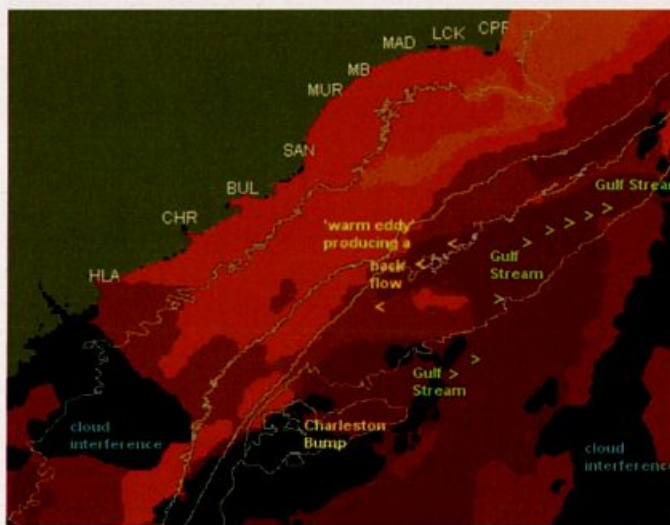


Figure 1. This diagram uses a sea surface temperature image to illustrate formation of a warm-water eddy passing over the Georgetown Hole area off Charleston, South Carolina. This eddy's southwesterly flow of warm water was induced by the Gulf Stream's collision with the Charleston Bump. When the Gulf Stream lies fairly close to shore off northern Georgia and southern South Carolina, it passes inshore of the Charleston Bump. This orientation limits the influences of the Charleston Bump, i.e., upwelling over the Bump and the formation of the Charleston Gyre. When this configuration is in effect, the Gulf Stream passes over the 200-m Shelf break and often over reef communities slightly inshore of the Shelf break. During such events, locations such as the 226 Hole and the 380 Hole, which are depressions located just past the 200-m Shelf break, produce strong upwellings. This configuration often produces well-defined Sargassum lines and sharper temperature divisions along the edges of the two adjacent water masses. Image courtesy of coastwx.org, a now-defunct marine reporting and forecasting website.

the South Atlantic Bight is known as the "Charleston Bump" (see Frontispiece; a marvelous summary of this feature is found on the Internet at <http://www.oceanexplorer.noaa.gov/explorations/islands01/background/islands/sup11_bump.html>). This 30-kilometer wide geologic feature, located roughly 150 km southeast of Charleston, is essentially a rocky ramp. (Note: Distances from Charleston given herein are measured from the city harbor's outer jetties.) The ramp slopes from a 700-m depth at its south end to 400-m depths at the north end. The Bump is composed of a layer of manganese and phosphorite accumulations precipitated from seawater, possibly caused by upward movement of seafloor sections over millions of years. Just north of the Bump lies a deeper section of scoured-out seafloor, which lies against the pitted northern edge of the Bump. The effect of this underwater mountain and adjacent trench on the Gulf Stream is generally to create upwellings and to deflect the Stream eastward. The upwellings, sometimes visible as disturbances that rise more than a meter above the surrounding ocean, bring cold water and nutrients to the surface, feeding plankton, which in turn feed organisms all

the way up the food chain. Among sport fishermen, the Bump is well known as a Swordfish (*Xiphias gladius*) spawning ground, a Blue Marlin (*Makaira nigricans*) hot spot in August and September, and a prime spot for American Wreckfish (*Polyprion americanus*) and other deepwater species. The Bump has importance to pelagic birds as well as fish, but it needs much more investigation and study from an ornithological perspective.

Aspects of the marine environment off South Carolina

Aside from moderate bathymetric differences, the marine environment off South Carolina is relatively similar to that off North Carolina, where the Gulf Stream's movement is likewise affected not just by submarine features but also by other currents and seawater masses. These interactions produce features at the surface and below the surface that are relevant to discussions of foraging seabirds, as they concentrate prey and thus both predatory fish and seabirds. "Filaments" are projections of warm water that grow westward from the Gulf Stream proper and move slowly northward with the Stream. They vary in size and intensity and are usually connected to the Gulf Stream at their northern end. In filaments, the warm water current circulates in counterclockwise fashion. This flow tends to concentrate fish and birds at the southwestward-pointing end of the filament, where there is usually the greatest contrast between warm filament water and cooler water outside the influence of the Gulf Stream. The western and southwestern edges of filaments often have well-formed "rips," that is, areas of turbulence caused by the interaction of warmer Gulf Stream waters with cooler inshore waters. These turbulent seawater fronts may concentrate rows of pelagic macroalgae (genus *Sargassum*) and flotsam, which harbor or shelter prey attractive to pelagic birds.

"Warm-core eddies" are very large filaments that eventually become separated from the Gulf Stream and cease to move northward with the Stream. Eddies are caused by deflection of the Gulf Stream by large underwater

features such as the Charleston Bump. When this phenomenon occurs at the Charleston Bump, the Gulf Stream proper bends sharply eastward, then back to the northwest, before bending northeastward again, under the influence of the southward-flowing Labrador Current. The westward bend often splits into two flows: the main flow, which continues north-eastward, and a counterclockwise-rotating eddy called the Charleston Gyre, which moves toward the southwest from the main Gulf Stream current. This backwards progression of warm water from the main Gulf Stream current often lasts for several days or more before it dissipates. The Charleston Gyre often begins forming to the east-southeast of Georgetown and then gradually extends southwestward across a feature known as the Georgetown Hole (centered at approximately 32° 34' 23.88" N, 78° 35' 40.26" W). Here, the southwestward-moving mass of warm water encounters the Continental Shelf edge, and upwelling occurs. Warm-core eddies are often found much closer to shore than the Gulf Stream's western wall, and they can hold deep-water birds such as the larger (*Oceanodroma*) storm-petrels, gadfly petrels (*Pterodroma*), tropicbirds (*Phaethon*), and other warm-water specialists.

Finally, "weed lines" or "grass lines," the fisherman's vernacular for *Sargassum* windrows, are elongated masses of pelagic algae brought from the Sargasso Sea by the Gulf Stream. These lines are often formed along the seawater fronts and water masses by winds that push together masses of *Sargassum* and concentrate flotsam and jetsam as well. These algae masses primarily float on the sea surface, but on occasion they extend down several meters. Besides being good indicators of the Gulf Stream edge, Gulf Stream eddies, water temperature boundaries (that is, seawater fronts, or thermoclines), weed lines offer food and shelter to baitfish, juvenile pelagic fish, crustaceans, and other fauna. They are essentially mobile reef communities embedded in wider, more nutrient-poor pelagic habitat; they are sometimes termed the "pelagic drift community" (Haney 1986a).

Species accounts

Offshore birding off South Carolina over the past three decades, just as in North Carolina, has permitted numerous revisions in the status of many seabirds previously unknown or thought to be accidental. While South Carolina still lacks accepted records of many species documented off North Carolina—among

them, Yellow-nosed Albatross (*Thalassarche chlororhynchos*), Bermuda Petrel (*Pterodroma cahow*), Fea's/Zino's Petrel (*P. feae/madeira*), Trinitade Petrel (*P. arminjoniana*), Cape Verde Shearwater (*Calonectris edwardsii*), Bulwer's Petrel (*Bulweria bulwerii*), Black-bellied Storm-Petrel (*Fregetta tropica*), Swinhoe's Storm-Petrel (*Oceanodroma monorhis*), European Storm-Petrel (*Hydrobates pelagicus*), Red-billed Tropicbird (*Phaethon aethereus*), Roseate Tern (*Sterna dougalli*), Great Skua (*Stercorarius skua*), and South Polar Skua (*S. maccormicki*)—the status of nearly a dozen species has been revised, though many of the relevant records remain unpublished or unsummarized. South Carolina waters are herein defined as those waters bounded by latitude 33° 51' 07.9" N on the north and by 32° 02' N on the south, and extending seaward 200 nautical miles (nmi), or 368.25 km, from the nearest point of land.

The species accounts below offer the most current information, but they are worded conservatively; in many cases, greater birding coverage in deepwater areas, particularly during the peak of spring migration and in the cooler months, would reveal that species thought to be rather rare are in fact fairly common passage migrants during a narrow window of time, particularly in spring seasons with abundant easterly winds, or are fairly regular wintering species. Georgia, a state with moderate pelagic seabird data (see Haney 1983, Beaton et al. 2003), also lacks records of most of the species listed above, exceptions being one sight report of a Fea's/Zino's Petrel 9 November 1984 (Haney et al. 1993), several records of South Polar Skua (Hass 1993), one record of Red-billed Tropicbird (Haney 1984), and at least one record of Roseate Tern (Beaton et al. 2003). Some of the birds detailed in this paper were recorded in Georgia waters; these waters are defined herein as bounded by latitude 32° 02' N on the north and 30° 42' 45.6" N on the south, and extending seaward 368.25 km from the nearest point of land. The Georgia records are noted as such in the species accounts.

Northern Fulmar (*Fulmarus glacialis*)

Very rare and localized offshore visitor, January through early March, during incursion years; casual to accidental in other years.

Northern Fulmars were observed on ten occasions during two winters off South Carolina, in December–January 1988 and January–February 1989, while the author was

working on the *M/V Marsh Grass*, a seasonal commercial bottom-fishing vessel docked in Charleston; this vessel was also a sport-fishing charter vessel during the spring/summer seasons. During winter, the *Marsh Grass* functioned as a commercial grouper/snapper fishing vessel and also carried tuna fishing gear, which was used when surface-feeding tuna were sighted. Northern Fulmars were observed around commercial bottom-fishing operations, when the fulmars came to feed with other pelagic birds on discarded bycatch, fish entrails, and other chum. On one occasion, a fulmar fed upon popcorn and sandwiches tossed overboard. Fulmars were also seen in association with bird flocks attracted to bait-fish driven to the surface by larger predatory fish.

Fulmar observations were invariably over hardgrounds along the Continental Slope, adjacent deep water. Depths at these sightings ranged from approximately 35 to 65 meters, and the water temperature ranged from circa 9–11° C (48–52° F). The majority of fulmar observations occurred near a feature known as the "Southwest Banks," a large area of live bottom reefs roughly 95 km east-southeast of Charleston Harbor (centered at approximately 32° 29' 48.66" N, 78° 47' 48.36" W). Other fulmar encounters occurred along the 45-m Shelf break to the southwest and northeast of the Southwest Banks, primarily to the northeast, just inshore of a feature known as the Winyah Scarp (centered at approximately 32° 47' 29.1" N, 78° 19' 22.68" W). No more than two fulmars were ever observed simultaneously. The highest single-day count was three individuals in mid-February 1990; the individuals were distinguished by color morph and plumage patterns.

This species is found almost annually on pelagic trips off Virginia and North Carolina, numbers fluctuate interannually. In some years, North Carolina pelagic trips encounter dozens of individuals (J. B. Patteson, pers. comm.) Haney reported the species off Georgia on 21 February 1983 (Haney 1983), 8 February 1984 (Haney et al. 1986), and on five other occasions (Haney 1986d). The first record of the species for South Carolina came from Kiawah Island on 27 February 1998, when a dead juvenile light-morph bird was discovered on the beach (specimen ChM 1998.13.010; Post et al. 1998). Off South Carolina, the author recorded fulmars at Southwest Banks on the following dates (single birds unless otherwise noted): 30 December 1988, 15, 21, and 27 January 1989, 7, 20 [2 birds], and 28 January 1990, and 1 and 17 [3 birds] February 1990.

Black-capped Petrel
(*Pterodroma hasitata*)

Uncommon well offshore April–October, typically from the western portions of the Gulf Stream shoreward to the 200-m contour. *Rare offshore April–October* from the 200-m contour shoreward to the 60-m contour, usually in association with Gulf Stream eddies or abnormally westerly Gulf Stream edge (see Haney 1986b, 1986c, 1987; pers. obs.).

From March through early May, Black-capped Petrels are often observed closer to shore off North Carolina, in waters as shallow as 30–40 m (pers. obs.; J. B. Patteson, pers. comm.). The inshore movements in spring off South Carolina are usually associated with temporary localized upwellings over/near live bottom areas; examples of such locations include the Edisto Banks, Royal Terrace, Southwest Banks, and the Winyah Scarp. Recent records of the species in October at depths of less than 90 m may indicate a fall influx into shallower waters that mirrors the species' spring movements. The lack of South Carolina records in the cold months is probably indicative of insufficient coverage of Gulf Stream waters November–March; there are records of the species for every month off North Carolina.

Black-capped Petrels have been observed on all deepwater pelagic birding trips off South Carolina since 2003 (Table 1), and many have been documented with photographs (Figures 2–9). Birding trips venturing into north Georgia waters from South Carolina ports have also recorded Black-capped Petrels in numbers with regularity. Recent birding trips off South Carolina have employed slicks of fish oil (cod liver, Menhaden oils) and shark liver chum to attract Black-capped Petrels. In addition to the slicks' olfactory attractors, the circling and landing petrels surely serve to recruit more petrels visually. Thus, counts of the species on recent South Carolina trips have been higher than during research cruises and birding trips that did not employ such methods of chumming.

Manx Shearwater
(*Puffinus puffinus*)

Rare but annual visitor, mostly December–April, clearly more regular and occurs in greater numbers than previously suspected; found mainly in Continental Shelf and Slope waters.

The first documented specimen of Manx Shearwater for the state was a partially oiled, tideline corpse found by Will Post and Mark Spinks 17 April 1991 on Cape Island, South

Carolina (specimen ChM 1992.15.053; Post and Spinks 1993). There are three previous South Carolina records listed in Haney (1986), all of single birds, 29 September 1983, 10 October 1983, and 7 April 1985, all well offshore (112–155 km from shore); Lee (1995) lists another Haney record, 17 April 1985, at 32° 53' N, 78° 53' E. These birds were found in water ranging in temperature from 10° to 28.3° C and ranging in depth from 20 to 300 meters (Lee 1995). On multiple occasions during the late 1980s, the author observed single Manx Shearwaters from commercial fishing vessels off Charleston, South Carolina. Dates recorded include single birds at the Southwest Banks 21 January 1989; at Winyah Scarp 17 February 1990; and at Georgetown Hole 19 March 1990. Other single Manx Shearwaters (specific dates not recorded) were occasionally seen feeding upon surface-stranded bycatch from commercial fishing operations; these records were in February and March, roughly 95 km east–southeast of the Charleston harbor entrance, in the general vicinity of the Southwest Banks. In addition, there are two unpublished spring records from South Carolina. On 10 April 2004, the author and C. Hocevar observed a Manx 64 km east–southeast of Charleston. On 9 April 2005, I. Pitts, S. Compton, and the author observed one about 60 km southeast of Charleston.

Given the abundance of records of northbound spring migrant Manx off Florida and North Carolina, it is likely that many more pass through South Carolina and Georgia waters than have been detected thus far. Moreover, summer-period records from North Carolina have increased in recent years, and the species should be looked for year-round off South Carolina.

Sooty Shearwater
(*Puffinus griseus*)

Rare but annual April–June, during migration.

Single Sooty Shearwaters were observed three times (out of eight forays) off South Carolina in May–June 2004 and 2005 (Table 1). Records have all been inshore of the western Gulf Stream edge, usually in less than 200-m depths, often near the 50-fathom ledge, a rather steep underwater shelf at the beginning of the Continental Slope.

Band-rumped Storm-Petrel
(*Oceanodroma castro*)

Locally uncommon visitor, late May through late August, to certain deepwater areas and oceanic features, found in water with >26.7° C (80°

F) surface temperature.

First discovered in South Carolina waters by Jay Shuler (1978) in 1975, Band-rumped Storm-Petrel was until recently classified as casual in South Carolina waters (Post and Gauthreaux 1989). However, recent pelagic birding trips off South Carolina—which travel to deeper waters and utilize effective chumming techniques—have proven Band-rumped Storm-Petrel to be a localized late-spring and summer resident of South Carolina waters beyond the Continental Shelf. Numbers of this species off South Carolina peak in early and middle June, with reduced numbers present from late June through mid-August. Numbers fall through late August and early September; there are no records from late September. The species is detected on nearly every Gulf Stream pelagic birding trip out of the North Carolina Outer Banks during the May–August season (J. B. Patteson, pers. comm.) and also occurs along the Gulf Stream edge off Georgia at this time of year (Haney 1985; pers. obs.).

Off South Carolina, there are certain locations slightly offshore of the 200-m contour where Band-rumped Storm-Petrels are found most consistently, regardless of the position of the western wall of the Gulf Stream. These areas are characterized by semi-permanent deepwater upwellings over depressions that are significantly deeper than the surrounding area. The upwellings are caused when Gulf Stream eddies, Gulf Stream edge flow, or generalized northward current flow passes over depressions adjacent to sharp rises in the Blake Plateau. The minerals and nutrients in these upwellings nourish phytoplankton, which attracts organisms all the way up the food chain. Haney (1985) noted that Band-rumped Storm-Petrels also favor ephemeral upwellings caused when the Gulf Stream moves offshore (eastward) over several consecutive days, as well as cold-core edges between Gulf Stream eddies and the Stream proper.

Records from late April through August (Table 1) come most consistently from the following areas: the “380 Hole” (named for its depth in fathoms; 32° 07' 36.6" N, 78° 56' 42.0" W); an unnamed sea valley that lies 0.8–5.6 km southeast of the 380 Hole; the Beaufort Valley (32° 23' 25.1" N, 78° 13' 04.7" W); an unnamed sea valley between 32° N, 79° W and 32° 05' N, 79° W, thus spanning Georgia and South Carolina; and the “226 Hole,” a feature just south of the South Carolina/Georgia border, centered at 32° 00' 41.2" N, 79° 05' 46.4" W. On the seven Charleston, South Carolina pelagic trips that

Table 1. Selected species of birds observed on pelagic birding and fishing trips off South Carolina and northern Georgia, 2003–2006.

	8/24/03	9/20/03	9/27/03	4/10/04	5/19/04	5/30/04	6/18/04	4/9/05	5/14/05	5/19/05	5/28/05
Trip type	headboat + chum	headboat + chum	headboat + chum	headboat + chum	Sportfish + trolling	birding-only Pelagic	birding-only Pelagic	headboat + chum	headboat + chum	sportfish + trolling	birding-only Pelagic
Black-capped Petrel		1	12		11	3	16	2	2	11	5
Cory's Shearwater	15	65	115		43	12	19		11	43	14
Greater Shearwater	2		1		6	1				6	
Audubon's Shearwater	4		7	3	9	23	19		19	9	27
Sooty Shearwater	1			1					1		
Manx Shearwater				1				1			
Wilson's Storm-Petrel	3	6	1		35	17	22		41	35	32
Band-rumped Storm Petrel						6	5				2
Leach's Storm-Petrel				1	1	3			1	1	2
Magnificent Frigatebird											
Arctic Tern					4					4	4
Sooty Tern	12		11	1	2	1			1	2	1
Bridled Tern	14		16	2		1		3	11		11
Brown Noddy											1
Parasitic Jaeger		4	3		1			2	1	1	
Pomarine Jaeger			2					1	1		
Red Phalarope		2	4								
Red-necked Phalarope	12	8	15	350					28		21
dark <i>Pterodroma</i>											
unidentified <i>Pterodroma</i>			1								
unidentified phalarope			12								
unidentified jaeger		4									

Note: numbers in **bold** indicate photographed/videotaped birds

encountered Band-rumped Storm-Petrels (Table 1), all birds were found in water 350–762 m deep, with surface temperatures that ranged between 26.8° and 29.44° C (80.3°–85° F). The species appears to be solitary for the most part, but during spring migration (late May through early June), multiple individuals are often observed in close proximity. On 30 May 2004, Burton Moore obtained two photographs of the species 104 km southeast of Charleston at the “380 Hole” (Figure 10).

Leach's Storm-Petrel
(*Oceanodroma leucorhoa*)

Rare spring migrant, late April through mid-June.

Leach's Storm-Petrel has been observed on six occasions off South Carolina in 2004–2005 (Table 1). It is likely that more trips to deep water in the warmer months will produce more records, as off North Carolina, where the species can be relatively numerous between late May and August (J. B. Patteson, pers. comm.).

White-tailed Tropicbird
(*Phaethon lepturus*)

Rare offshore, mid-May through August.

Encountered more often in some years than in others, with below-average numbers present since 2003. Found in Gulf Stream waters, along the western Gulf Stream edge, and in “blended” waters of the Continental Shelf. Crews aboard Charleston area sport-fishing boats and head boats report tropicbirds annually, with most reports occurring in late May and June. During the late 1980s and early 1990s, Randolph Scott, Captain of the *Carolina Clipper* charter fishing boat, reported White-tailed Tropicbirds off South Carolina on multiple occasions during late May and June to Dennis Forsythe (Post and McNair 1993). The author also encountered White-tailed Tropicbirds off South Carolina multiple times annually in late spring during the mid-to-late 1980s, and, more recently, an adult on 19 June 2006, just north of the South Carolina/Georgia border at 32° 03' 28.5" N, 78° 55' 19.32", over 400-m depths. In late May 2003 and late May 2004 (Memorial Day weekends), the first mate of the *Thunderstar* sport-fishing

boat reported White-tailed Tropicbirds to the author. Red-billed Tropicbird could well be involved in some of fishermen's reports of tropicbirds; North Carolina has about 30 records of the species (J. B. Patteson, pers. comm.).

Magnificent Frigatebird
(*Fregata magnificens*)

Very rare visitor along the coast in spring and offshore in summer.

Onshore observations of Magnificent Frigatebirds grow more common during May and early June, when incursions of the species may extend well up the Eastern Seaboard. Offshore, birds are usually encountered in the vicinity of the Gulf Stream, in waters beyond the 200-m contour. Off South Carolina, sightings of frigatebirds have often occurred in conjunction with the presence of Blue Marlin.

Great Skua
(*Stercorarius skua*)

Hypothetical.

On 27 January and 17 February 1990, the author observed a skua (large *Stercorarius*;

continued from facing page

	6/10/05	8/13/05	8/20/05	9/17/05	7/15/06	8/5/06
Trip type	sportfish+trolling	birding-only Pelagic	birding-only Pelagic	birding-only Pelagic	sportfish+trolling	sportfish+trolling
Black-capped Petrel	12	23	4	22	2	56
Cory's Shearwater	162	107	27	14	51	184
Greater Shearwater	237				4	
Audubon's Shearwater	11	12	5	9	17	138
Sooty Shearwater						
Manx Shearwater						
Wilson's Storm-Petrel	214	14	11	3	54	23
Band-rumped Storm Petrel	1		1		1	2
Leach's Storm-Petrel						
Magnificent Frigatebird					1	
Arctic Tern						
Sooty Tern	3	9	2	10	2	13
Bridled Tern	13	12	31	14	9	19
Brown Noddy		1		1		1
Parasitic Jaeger		1				
Pomarine Jaeger	1					
Red Phalarope						
Red-necked Phalarope			5			11
dark <i>Pterodroma</i>			1			
unidentified <i>Pterodroma</i>					1	
unidentified phalarope						
unidentified jaeger						

formerly *Catharacta*) off South Carolina. The birds appeared uniformly dark, with broad wings, heavy neck, and wide tail. The first, seen more clearly, showed no pale collar. Both sightings occurred in the vicinity of the Southwest Banks, the first directly over the south end of the Banks, the other took place between Banks and the Georgetown Hole. In neither of these cases could South Polar Skua or other species of skua be conclusively ruled out (see Brinkley 1994). Both Great and South Polar Skuas have been documented off North Carolina, the former mostly in winter, the latter mostly spring through fall. There are no firm records of Great Skua south of North Carolina. Off Georgia, South Polar Skua has been documented at least three times (Beaton et al. 2003) and is certainly an expected spring migrant and summer/fall visitor to South Carolina waters, as in North Carolina waters, where recorded annually.

Black-legged Kittiwake (*Rissa tridactyla*)
Rare offshore, late December through mid-March; very rare to casual closer to shore in

winter, at locations such as the Charleston jetties, Murrell's Inlet jetties, Winyah Bay jetties, and the Frapp Island shipwreck.

Off South Carolina, wintering Black-legged Kittiwakes are found in the cooler waters that lie well inshore of the Gulf Stream. They are most often found along the Continental Shelf break, mainly from Edisto Beach northwards. This is perhaps due to the larger expanses of cold water north of Edisto Island. The author frequently observed Black-legged Kittiwakes scavenging near commercial bottom-fishing vessels during winter. It is not uncommon for three or four of these vessels to spend days anchored around areas such as the Southwest Banks or Winyah Scarp. The prolonged presence of these boats and their offal serves to attract and retain flocks of birds that can include Black-legged Kittiwakes. The species was recorded feeding upon discarded small fish (12-15 cm), the eyes of larger discarded fish, discarded fish entrails, popcorn, and on baitfish driven to the surface by predators. Feeding flocks of kittiwakes were observed on roughly two-thirds of winter trips to hard-

ground reefs along the Continental Shelf when large commercial grouper/snapper boats were present. Counts range from three to 12 birds, the latter maximum recorded 17 February 1990 at Winyah Scarp.

Arctic Tern
(Sterna paradisaea)

Rare offshore spring migrant, late April through late May.

Though it has proven difficult to obtain diagnostic photographs and videotape of this species, it is now observed almost annually off South Carolina by experienced observers (Table 1). The South Carolina Bird Records Committee recently reviewed, and accepted as valid, videotape of this species obtained by Jack Peachey off Murrells Inlet, South Carolina in May 2004 (Slyce et al. 2005). Off South Carolina, Arctic Terns have usually been encountered in the "blended" waters of the Continental Slope, also favored by shearwaters and other tern species. In this zone, turbid inshore waters mix with the clearer, more saline water of the Gulf Stream. Arctic Terns are frequently found near *Sargassum* masses and along thermoclines, the latter often visible because of a distinctive color change between cooler green water and warmer blue water of the Gulf Stream. On their northbound migration in spring, most Arctic Terns likely occur east of the western Gulf Stream boundary and thus escape detection by mid-Atlantic observers, though easterly winds occasionally result in larger counts on the western wall of the Stream (Lee and Cardiff 1993, Brinkley 1994; J. B. Patteson, pers. comm.). The author has also observed Arctic Tern flocks shadowing schools of surface-feeding Yellowfin Tuna (*Thunnus albacares*) along the eastern Gulf Stream edge off Florida. Perhaps the eastern Gulf Stream edge serves as a migration route for Arctic Terns in spring.

Brown Noddy
(Anous stolidus)

Rare late summer and fall visitor; formerly typically encountered on shore during or just after the passage of tropical cyclones and until recently, considered casual offshore and in periods of normal weather (Post et al. 2005).

During spring 2005, summer of 2005, and summer 2006, both adult and immature Brown Noddies were encountered in South Carolina waters (Table 1). The observations had no obvious connection with tropical storms, hurricanes, or other severe weather. Brown Noddy was observed off South Carolina on four of 11 offshore birding/fishing trips

in 2005 and 2006, and these records are reported in detail below. Prior to 2005, South Carolina had four Brown Noddy specimens and seven sight reports (Post et al. 2005).

On 28 May 2005, a pelagic birding trip encountered an adult Brown Noddy 108 km southeast of Fort Sumter, along the western edge of the Gulf Stream; the bird was first observed at 32° 02' 24.2" N, 79° 04' 37.1" W, flying along an extremely large *Sargassum* weed line that ran for several kilometers. Water depth at this location was 442 m and water temperature was 27° C (80.6° F). Other birds in the immediate vicinity were Black-capped Petrel, Audubon's Shearwater (*Puffinus lherminieri*), and Cory's Shearwater (*Calonectris diomedea*). Observers included L. Glover, C. Snook, C. Feeney, S. Compton, J. B. Hines, W. Hemby, and the author. Compton and Feeney obtained diagnostic photographs of the bird.

On 13 August 2005, a pelagic birding trip discovered an immature Brown Noddy 72.5 km southeast of Charleston in 30-m deep water, where a ledge drops sharply to ca. 61-m depths; the location is 32° 16' 57.1" N, 79° 06' 57.9" W. The bird was in the presence of Common Terns (*Sterna hirundo*) and Bridled Terns (*Onychoprion anaethetus*). Observers included L. Glover, S. Calver, C. Snook, J. B. Hines, C. Feeney, and the author.

On 17 September 2005, a pelagic birding trip encountered an immature Brown Noddy 90 km southeast of Charleston and 141 km east of extreme northern Tybee Island, Georgia. The noddy was over 76-m-deep water, with four Cory's Shearwaters, two adult and three juvenile Sooty Terns (*Onychoprion fuscatus*), and 5 Bridled Terns. The flock was first sighted in Georgia waters at 32° 00' 45.4" N, 79° 19' 54.1" W. The birds were following a school of foraging fish, apparently Little Tunny (*Euthynnus alletteratus*), which was driving baitfish to the surface. We followed this flock for 4 km and lost it while on a heading in a northeasterly direction through South Carolina waters (32° 02' 59.5" N, 79° 18' 58.1" W). Observers included J. Sewell, D. Vickers, C. Feeney, J. B. Hines, A. Mercer, and the author.

On 5 August 2006, a pelagic sport-fishing expedition with the author aboard encountered an adult Brown Noddy 121 km southeast of Charleston at 32° 02' 33.9" N, 78° 48' 02.3" W. The bird was patrolling a *Sargassum* line between the edge of the Gulf Stream and a significant deepwater upwelling. This location is at the southeastern end of a 15-km-long sea valley, whose other end lies near the seafloor depression known as the "380 Hole." A mini-DV format videotape of this bird, converted to MPEG video file and a frame-grab still image, are posted on the Internet (<<http://www.crbo.net/August06Noddy.html>>).



Figure 3. This Black-capped Petrel was located on 17 September 2005 about 201 km east of Ossabaw Sound, Georgia, over the near end of the Charleston Bump, which lies 131 km southeast of Charleston. Many of the pelagic birding trips that depart from Charleston harbor visit northern Georgia waters as well as South Carolina waters, and these trips usually encounter Black-capped Petrels. Photograph by Dan Vickers.



Figure 4. Black-capped Petrel flying with a piece of shark liver at the "226 Hole," a 435-m depression located just seaward of the 180-m contour, on 13 August 2005. The location lies 104 km southeast of Charleston, South Carolina and about 172 km east of the mouth of the Savannah River. Patient chumming utilizing fish oils and shark's liver has proved to be an excellent method to study this species well off South Carolina. Photograph by Chris Snook.



Figure 5. This Black-capped Petrel and this Wilson's Storm-Petrel were photographed in the Gulf Stream 108 km southeast of Charleston, South Carolina (or about 161 km east of Hilton Head Island) on 20 August 2005. Black-capped Petrels show variable appearance in the white collar, from starkly white-collared birds (here, and Figures 4, 6–9) to more dusky-naped birds (Figure 3). The majority show white collars. Photograph by Chris Snook.



Figure 6. This photograph shows four molting Black-capped Petrels and a Wilson's Storm-Petrel 106 km southeast of Charleston 13 August 2005. Black-capped Petrels often roost on the water with storm-petrels. Photograph by Chris Snook.



Figure 7. This juvenile Black-capped Petrel is in the process of landing to take chum 161 km east of Hilton Head Island, South Carolina, 20 August 2005. Black-capped Petrels swallowing food are often observed rocking or pumping the head and body up and down, sometimes with tail and wings raised (see Haney 1987). Photograph by Chris Snook.



Figures 8, 9. This Black-capped Petrel can be aged as a juvenile by the neat, pale fringes of the greater secondary coverts. The species is often said to have a "white rump," but in fact the rump is dark brown, while the bases of the rectrices and rectrix coverts are mostly white. Black-capped Petrels tend to fly with spread wings and tail mostly under low wind conditions and when foraging actively; when traveling dynamically in higher winds, the species has a sleeker appearance, with wings and tail trimmed. Photographs by Chris Snook.



Figure 10. A species first detected in 1975 off South Carolina, when it was called "Harcourt's Storm-Petrel," Band-rumped Storm-Petrel was first documented by photograph in the state only much later. This bird was photographed above a seawater upwelling at the "380 Hole," located 105 km southeast of Charleston, on 30 May 2004. The taxonomy of this species is still very much in flux, and it is possible that multiple taxa of Band-rumped occur off the Southeast. Photograph by Burton E. Moore, III.

Literature cited

Beaton, G., P. W. Sykes, Jr., and J. W. Parrish, Jr. 2003. *Annotated Checklist of Georgia Birds*. Georgia Ornithological Society.

Brinkley, E. S. 1994. Spring migration of seabirds off central North Carolina: 22 May 1992, with notes on two skua (*Catharacta*) taxa. *Chat* 58: 94-101.

Haney, J. C. 1983. Previously unrecorded and hypothetical species of seabirds on the continental shelf of Georgia. *Oriole* 48: 21-32.

———. 1984. First Georgia record of the Red-billed Tropicbird (*Phaethon aethereus*). *Oriole* 49: 35-36.

———. 1985. Band-rumped storm-petrel occurrences in relation to upwelling off the coast of the southeastern United States. *Wilson Bulletin* 97: 543-547.

———. 1986a. Seabird patchiness in tropical oceanic waters: the influence of *Sargassum* "reefs." *Auk* 103: 141-151.

———. 1986b. Seabird segregation at Gulf Stream frontal eddies. *Marine Ecology Progress Series* 28: 279-285.

———. 1986c. *Pelagic seabird ecology and its relationship to environmental heterogeneity in the South Atlantic Bight*. Ph.D. dissertation, University of Georgia, Athens, Georgia.

———. 1986d. Records of seabirds from South Carolina offshore waters. *Chat* 50: 44-46.

———. 1987. Aspects of the pelagic ecology and behavior of the Black-capped Petrel. *Wilson Bulletin* 99: 153-168.

Haney, J. C., P. Brisse, D. R. Jacobson, M. W. Oberle, and J. M. Paget. 1986. *Annotated Checklist of Georgia Birds*. Publication number 10, Georgia Ornithological Society.

Haney, J. C., C. A. Faanes, and W. R. P. Bourne. 1993. An observation of Fea's Petrel (*Pterodroma feae*) off the southeastern United States, with comments on the taxonomy and conservation of the soft-plumaged and related petrels in the Atlantic Ocean. *Brimleyana* 18: 115-124.

Hass, T. 1993. Third documented record of South Polar Skua in Georgia. *Oriole* 58: 14-15.

Lee, D. S. 1995. The pelagic ecology of Manx Shearwaters *Puffinus puffinus* off the southeastern United States. *Marine Ornithology* 23: 107-119.

Lee, D. S., and S. W. Cardiff. 1993. Status of the Arctic Tern in the coastal and offshore waters of the southeastern United States. *Journal of Field Ornithology* 64: 158-168.

Post, W., and S. A. Gauthreaux, Jr. 1989. *Status and Distribution of South Carolina Birds*. Charleston, Contributions from The Charleston Museum, No. 18.

Post, W., and D. B. McNair 1993. *Supplement to Status and Distribution of South Carolina Birds*. Charleston, The Charleston Museum.


Post, W., L. Glover, K. Higgins, and T. Piephoff. 1998. Northern Fulmar collected in South Carolina: Southernmost verified occurrence for the Atlantic Coast. *Chat* 62: 152-154.

Post, W., D. Corkern, and I. Pitts, Jr. 2005. A recent South Carolina specimen of the Brown Noddy (*Anous stolidus*) and a review of the species' regional status. *Chat* 68: 161-166.

Reed, J. K. 2004. *Deepwater reefs of Florida, Georgia, and South Carolina: A summary of the distribution, habitat, and associated fauna*. Report to the South Atlantic Fishery Management Council, Contract SA-04-05-NC/UNCW. Harbor Branch Oceanographic Institution, Fort Pierce, Florida.

Slyce D., G. Beaton, Jr., L. Glover, T. Kalbach, T. Piephoff, W. Post, and S. Wagner. 2005. 2004 Annual Report of the South Carolina Bird Records Committee. *Chat* 69: 35-37.

Shuler, J. 1978 First South Carolina Record of Harcourt's Storm-Petrel. *Chat* 37: 78.



www.ansp.org/vireo

Lecture Slides
and JPEG's
45,000 photos on line

© Arthur Morris/VIREO