



Seven Sooty Terns were found on September 7 at Cape May, New Jersey, during the days after *Fran*. This discovery was particularly interesting because the storm track was some 200 miles to the west. Weather conditions at Cape May were partly cloudy with maximum east winds of only 25 miles per hour. Records show that Sooty Terns may be displaced by tropical storms, even at their periphery, to a greater degree than most other tropical seabirds. The juvenal plumage of Sooty Tern is rarely seen by birders in the ABA Area, except following hurricanes or during pelagic trips in the Gulf Stream or Gulf of Mexico in autumn. Photographs/Richard Crossley

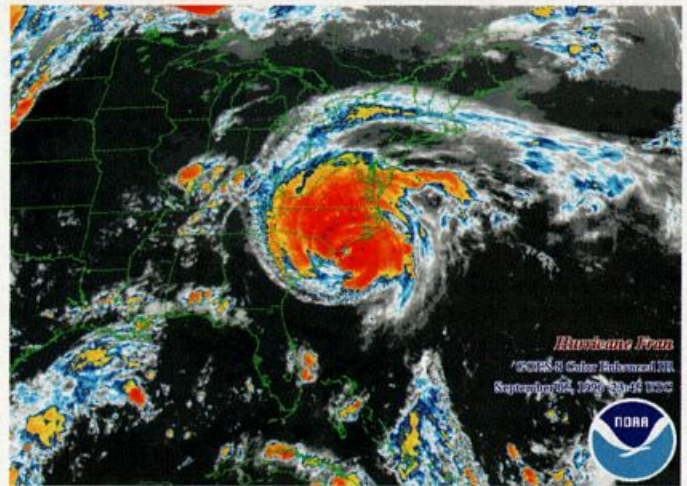
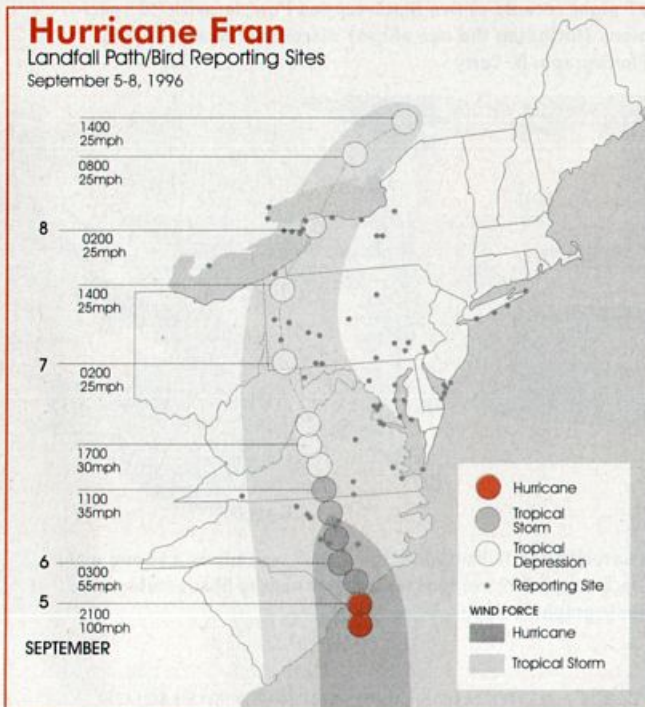


Figure 2. *Fran's* vortex (eye) was nearly 30 miles across at landfall, and the general influence of the storm was already being felt over most of the East Coast at that time. Major feeder bands swept as far north as southern Pennsylvania and Delaware. Moderate easterly winds were reported in advance of the storm in Hamilton, Ontario, on September 6. As much as 15 inches of rain fell in the Cape Fear, North Carolina, area as the storm made landfall. From Cape Fear, *Fran* moved in a northerly direction toward Raleigh and began to lose the

integrity of its eye wall over the evening hours, becoming a tropical storm 60 miles inland at Elizabethtown. The Raleigh/Durham airport reported a record gust of 79 mph. *Fran* was still a tropical storm, with winds over 40 mph, when it reached the Virginia border 20 miles south of Danville at 8 AM on September 6. At 11 AM, *Fran* passed near Lynchburg, Virginia, and was downgraded to a tropical depression, when winds dropped to 35 mph. Gale-force winds between 39 and 73 mph were recorded on the Chesapeake Bay. Early on September 7, *Fran* had arrived at the West Virginia/Pennsylvania boundary north of Morgantown. With winds diminished to 25 mph, *Fran* exited Pennsylvania near Erie. The remnants of *Fran* broke up over Lakes Erie and Ontario and proceeded in a northeasterly direction back toward the Atlantic. Heavy rain squalls and winds over 40 mph were reported from Lakes Erie and Ontario on the afternoon of 7 September. Map/ Jim Lockyer

Lesser Antilles, winds of 145 mph and pressure of 934 mb made it a Category 4. When 660 miles SSE of Hatteras on August 30, the storm packed winds of 140 mph, and the next day, a hurricane watch and tropical-storm warning were issued from Cape Lookout, North Carolina, to Cape Henlopen, Delaware. The following day, the storm's eye moved from 105 miles SSE of Nantucket at 2 AM, when the storm became a Category 2, with 90 mph winds and 958 mb of central pressure, to about 115 miles east of Nantucket by 11 AM, when the storm's winds had abated to 75 mph, with pressure of 965 mb. The storm then veered more to the east as it passed Cape Cod. With deep convection diminishing through the day, the hurricane was downgraded to a tropical storm 12 hours later, 195 miles SW of Halifax, Nova Scotia.

Most noteworthy among *Edouard's* birds were over 2100 Leach's Storm-Petrels observed in Cape Cod Bay and over lakes on Cape Cod, and a very heavy and early movement of Northern Gannets. On the afternoon of 2 September, birders at First Encounter Beach in Eastham recorded 43 Greater, three Sooty, and 17 Manx shearwaters, 1000 Leach's and 30+ Wilson's storm-petrels (as well as 500 unidentified storm-petrels), 1200 Northern Gannets, 14 Red-necked Phalaropes, six Parasitic Jaegers, and a Black-legged Kittiwake; the next morning, 1500 Northern Gannets, 44 Red-necked Phalaropes, and six Pomarine Jaegers were seen, along with lesser numbers of the other species. Other sites on Cape Cod saw Leach's at Pilgrim Lake in Provincetown (800), Dennis (160), Head of the Meadow Beach in Truro (200), Nantucket (six), and Wequaquet Lake in Barnstable (100), where observers also noted 18 Red-necked Phalaropes, a Black-legged Kittiwake, two Forster's Terns, and a Black Tern. On 2 September, 400 Northern Gannets were seen in passage at Rockport, and two Parasitic Jaegers and two Red Phalaropes were at Dennis; on the following day at Provincetown, 100 gannets, 400 Greater and 100 Sooty shearwaters, and four Parasitic Jaegers were seen. Very probably related to *Edouard's* passage were 80 unidentified phalaropes on Nantucket on September 2, as were numbers of white *Sterna* terns seen at coastal sites over the weekend. A Black Guillemot at East Gloucester on September 2 was attributed to *Edouard* (Ellison and Martin 1996). Also on September 2 at Montauk Point on Long Island, observers found one juvenile Sooty Tern.

TABLE 1: HURRICANE BERTHA (continued)

SPECIES	LOCALE	STATE	DATE	BIRDS FOUND
Manx Shearwater	Robert Moses State Park	NY	07/12	1
Audubon's Shearwater	Chesapeake Bay Bridge-Tunnel	VA	07/14	1
Leach's Storm-Petrel	Chesapeake Bay Bridge-Tunnel	VA	07/13	12
	False Cape State Park, Virginia Beach	VA	07/13	12
	Assawoman Bay, Worcester Co.	MD	07/13	2
	Cape May (Bay side)	NJ	07/13	1-2
Band-rumped Storm-Petrel	Chesapeake Bay Bridge-Tunnel	VA	07/14	14
	89th Street, Virginia Beach	VA	07/12	1
	Chesapeake Bay Bridge-Tunnel	VA	07/13	7
	False Cape State Park, Virginia Beach	VA	07/13	2-3
	Cape May (Bay side)	NJ	07/13	11
	Cape May/Lewes Ferry	DE	07/14	1
	Cape May (Bay side)	NJ	07/14	1
	Cape May/Lewes Ferry	DE	07/15	1
unidentified <i>Oceanodroma</i> storm-petrel	Delaware Bay, Cumberland Co.	NJ	07/17	2
	Chesapeake Bay Bridge-Tunnel	VA	07/13	7
	Assawoman Bay, Worcester Co.	MD	07/13	2
	Cape May/Lewes Ferry	NJ/DE	07/13	1
Wilson's Storm-Petrel	Cape May/Lewes Ferry	NJ/DE	07/15	1
	Lake Pinehurst	NC	07/13	1
	Chesapeake Bay Bridge-Tunnel	VA	07/13	69
	Jamestown Ferry	VA	07/13	8
	Cape May (Bay side)	NJ	07/13	8
	Montauk Point	NY	07/13	1
	Chesapeake Bay Bridge-Tunnel	VA	07/14	59
	Chesapeake Bay/Cape Charles	VA	07/14	12
Delaware Bay, Cumberland Co.	NJ	07/17	100+	
Pomarine Jaeger	Chesapeake Bay Bridge-Tunnel	VA	07/13	1
Gull-billed Tern	Pactolus Catfish Ponds, Greenville	NC	07/13	1
	Point Lookout State Park	MD	07/13	1
Least Tern	Goldsboro	NC	07/13	3
	Rocky Mount	NC	07/13	1
	Pactolus Catfish Ponds, Greenville	NC	07/13	7
	Fayetteville	NC	07/14	1
Sandwich Tern	Goldsboro	NC	07/13	4
	Pactolus Catfish Ponds, Greenville	NC	07/13	1
Royal Tern	Goldsboro	NC	07/13	20
	Pactolus Catfish Ponds, Greenville	NC	07/13	9
Arctic Tern	Cape May (Bay side)	NJ	07/13	1
	Cape May / Lewes Ferry	DE	07/15	1
Sooty Tern	Kingsmill, James River	VA	07/13	3
	Chesapeake Bay Bridge-Tunnel	VA	07/13	1
	Cape May (Bay side)	NJ	07/13	5
	Caumsett State Park	NY	07/13	1 (released)
	Shinnecock Inlet	NY	07/13	3
	Griswold Point	CT	07/13	1
	Offshore, Atlantic Ocean	MA	07/13	1
	Old Lyme	CT	07/14	1
	Cape May (Bay side)	NJ	07/15	1 (moribund)
	Hampton Roads Bridge-Tunnel	VA	07/16	1 (dead)
Eastham	MA	07/16	1 (dead)	
Bridled Tern	False Cape State Park, Virginia Beach	VA	07/13	2
	Chesapeake Bay Bridge-Tunnel	VA	07/13	2
	Cape May (Bay side)	NJ	07/13	2
Black Skimmer	Lake Mattamuskeet	NC	07/13	1
	Lake Phelps	NC	07/13	1
Red-necked Phalarope	89th Street, Virginia Beach	VA	07/12	1

TROPICAL STORM PRIMER

Oceanic storms with sustained winds of 39 to 73 mph and characterized in meteorological parlance as "nonfrontal synoptic-scale low-pressure systems[s] over tropical or subtropical waters with organized convection (i.e., thunderstorm activity) and definite cyclonic wind circulations" are properly called *tropical storms* (Holland 1993, in Landsea 1996). If sustained winds are measured at 39 mph or greater, the storms are then given *names* by the National Hurricane Center, whereas the *tropical depressions* (sustained winds 38 mph or less) from which these stronger storms issue are *numbered* but not named. *Hurricanes*, which are generally named while still tropical storms, have winds of 74 mph or greater. "Sustained" winds for North American forecasters are those measured at a consistent rate for one minute. All of the low-pressure systems named above derive "their energy primarily from evaporation from the sea in the presence of high winds and lowered surface pressure and the associated condensation in convective clouds concentrated near [their] center[s]" (Holland 1993). *Subtropical cyclones* (*subtropical storms*), on the other hand, are not named and have not been measured with sustained winds in excess of 70 mph. These storms may form anywhere from the equator north and show "characteristics of both tropical cyclones and mid-latitude (extra-tropical) cyclones. Many of these cyclones exist in a weak-to-moderate horizontal temperature gradient region [a *baroclinic zone*, as in mid-latitude cyclones] but also receive much of their energy from convective clouds (like tropical cyclones)" (Landsea 1996). Frequently, subtropical storms become tropical storms, as did *Florence* in November 1994, but it is far less often that tropical cyclones become subtropical storms, though they are sometimes absorbed into upper-level nontropical lows, as was *Gustav* in 1996, and thereby lose identity.

Names for strong storms have only been in use in the United States since 1950. From 1953 to 1978 women's names were used exclusively; in 1979 men's names began to be used as well. Names are rotated on a six-year basis, with only the names of the most destructive storms, such as *Andrew*, being retired. This can easily lead to confusion when birders are discussing lesser-known storms and their effects on birdlife (such as *Bob* in 1985 and 1991, both birdstorms), so it is important to include the year of the storm in all discussions of these phenomena.



FRAN

Hurricane *Fran* began as a tropical depression on August 24 off the west coast of Africa. By the time it threatened the Lesser Antilles, on August 29 and 30, it was still only a weak Category 1 hurricane. During its trek westward, *Fran* first weakened, then strengthened, and at one time reached Category 4, with sustained winds of 135 mph, before eventually making landfall at Cape Fear, North Carolina, at 11 PM on September 5. At landfall, *Fran* was a Category 3 storm, with sustained winds of 100 mph. At Frying Pan Shoals station (25 miles SE of Cape Fear, North Carolina), seas of over 33 feet were recorded, with winds gusting in excess of 120 mph.

As in compilations of sight records for other storms, most of the birds listed here (Table 3) are assumed to have been carried inland and northward along the coast by *Fran*. Some of the birds in the table, though, were clearly overland migrants grounded by the storm, whereas others may have been already present in the interior and merely driven toward lee shores of lakes by the strong winds. (Part 2 of this article will treat various aspects of hurricane displacement of birds.) Reports of shorebirds have been included only for the first day of the storm's landfall, September 6, so as to restrict the table to birds almost certainly transported and/or grounded by the storm: in the case of Virginia and North Carolina, flocks of shorebirds could be observed wheeling around inside the storm. Reports of shorebirds beyond the first day of landfall did not appear to be out of the ordinary, other than several Sanderlings in interior New York and Pennsylvania and several Stilt Sandpipers in Pennsylvania and Maryland.

Viewing conditions varied from poor to excellent for the many observers able to get into the field. Birds observed in the latter stages of the storm were likely observed by more people and for greater lengths of time than those seen earlier in the southern states. Even in the southern states, though, observations were hindered only in the first few daylight hours by light rain and heavy wind. At Kerr and Jordan Lakes in Virginia and North Carolina, the numbers listed in Table 3 must certainly underrepresent the actual numbers of birds present on these large inland lakes. Kerr Lake, for example, is composed in part of many long coves, most of which are inaccessible, and only about 5 percent of the lake surface could be surveyed in 12 hours. Virginia's Smith Mountain Lake, another very large body of water, was not checked at all on the day of the storm, and West Virginia did not report any avian fallout, no doubt owing in part to a paucity of observers. Many potential observers in North Carolina were directly in the storm's path and were confronted with property damage and blocked, flooded roads, and were thus unable to make observations.

Bird records were gathered from 86 sites located in seven states, one province, and the District of Columbia. Excluding records of many jaegers and other likely local migrants on the Great Lakes, this amounts to almost 6000 birds of 47 species believed to have been displaced by the storm in some respect. Most remarkable in *Fran* were the numbers of gadfly petrels, particularly Black-capped Petrels, including 20 dead Black-capped Petrels in the Lake Erie region (Curry 1996) not listed above.

In addition to a variety of pelagic species, shorebirds were also impacted by the passage of hurricane *Fran*. Many individuals migrating over the interior were undoubtedly grounded by the storm. Even more noteworthy was the presumed transport of coastal species inland, such as this American Oystercatcher—one of two birds at Port Colborne, Ontario, on September 9. This established the fourth provincial record. Photograph/Alan Wormington

HORTENSE

The powerful hurricane *Hortense* never made landfall in the United States, remaining several hundred miles offshore along most of its trek northward through the Atlantic. It was declared extratropical on 15 September over the Canadian Maritimes. Nevertheless, the storm, which briefly ranked Category 4, appears to have been responsible for a large number of seabirds observed in Cape Cod Bay, probably in concert with the remnants of Pacific hurricane *Fausto* (Forster et al. 1997). Three to four days after the storm's passage, on 18 and 19 September, a remarkable assemblage of seabirds was seen exiting the bay from First Encounter Beach.

While *Fran* was turning mid-Atlantic forests into firewood and North Carolina's cities into swamps, on September 6, *Hortense* was born near 14.5° N 55.4° W about 360 miles east of the Lesser Antilles, as a tropical depression. After clearing the Caribbean, the storm stayed well out to sea from the southeastern United States, bringing only light easterlies and a slight swell to the mid-Atlantic states. Early on September 14, the center of Category 3 hurricane *Hortense* was about 550 miles SSW of Halifax, with sustained hurricane-force winds extending up to 145 miles from the center. Pressure was recorded at 956 mb. By 5 AM on September 15, already 35 miles west of Sydney on Cape Breton Island, Nova Scotia, the storm was downgraded to a tropical storm, with 70-mph winds. The storm had very little deep convection left but had not become extratropical. The storm struck the coast of Cape Breton Island at about 10 PM, tracked across the eastern portion of Cape Breton County, and then headed back toward open water into the Gulf of St. Lawrence.

The first indication that *Hortense* had pushed seabirds shoreward was the flight of 210 Greater, 13 Manx, and nine Sooty shearwaters, two Northern Fulmars, and 75 Northern Gannets at Rockport on September 17, and the flight of 36 Parasitic Jaegers and one Red and 510 Red-necked phalaropes at First Encounter Beach the following day, when five fulmars and 430 gannets passed Rockport. On the next day, however, the heavens opened at First Encounter Beach, and one of the most diverse seabird flights in Massachusetts history poured forth: 18 Common Loons, 800 Northern Gannets, 40 Northern Fulmars, one Cory's, one Audubon's, 21 Manx, 860 Greater, and 15 Sooty shearwaters, 31 Leach's Storm-Petrels, 400 scoters of all three species, 200 Red-necked Phalaropes, one Great Skua, 50 Pomarine,

TABLE 3: BIRDS ASSOCIATED WITH HURRICANE FRAN, 6-23 SEPTEMBER 1996

SPECIES	LOCALE	STATE / PROVINCE	DATE	BIRDS FOUND
Herald Petrel	Kerr Reservoir	VA	09/06	1
Fea's Petrel	Kerr Reservoir	VA	09/06	1
Black-capped Petrel	Jordan Lake	NC	09/06	1-2
	Kerr Reservoir	VA	09/06	6
	Chesapeake Bay Bridge-Tunnel	VA	09/07	2
	Mount Davis-Meyersdale, Somerset Co.	PA	09/07	2
	Butler County Airport, K.W. Scholter Field	PA	09/07	1
	Fort Erie	ON	09/08	3
	Port Colborne	ON	09/08	1
	Skaneateles	NY	09/09	1
	Newfane Township, Niagara Co.	NY	09/09	1
	Miles River, St. Michael's	MD	09/11	1
	Fort Erie	ON	09/09	1
	Fort Erie	ON	09/12	1
	Fort Erie	ON	09/14	2
	Fort Erie	ON	09/15	2
	Lake Erie at Thunder Bay	ON	09/15	1
	Niagara Falls	NY	09/15	1
	Van Wagners Beach, Hamilton	ON	09/16	1
Point Pelee	ON	09/17	1	
Van Wagners Beach, Hamilton	ON	09/17	1	
Fifty Point, Hamilton	ON	09/17	1	
Ratray's Marsh, Port Credit	ON	09/18	1	
Fifty Point, Hamilton	ON	09/18	1	
Hamlin Beach State Park	NY	09/23	1	
unidentified gadfly petrel	Sandy Point State Park	MD	09/06	1
	Chesapeake Bay Bridge-Tunnel	VA	09/07	1
	Hunting Creek, Alexandria	VA	09/07	2
	Potomac River, Prince George's Co.	MD	09/07	1
	Sandy Point State Park	MD	09/08	1
Cory's Shearwater	Kerr Reservoir	VA	09/06	4
	Hunting Creek, Alexandria	VA	09/07	1
	Kerr Reservoir	VA	09/07	2
	Moriches Inlet, Long Island	NY	09/07	1
	Fire Island Inlet, Long Island	NY	09/07	12
	mall parking lot, Montoursville / Williamsport	PA	09/10	1
Greater Shearwater	James River, Suffolk	VA	09/06	1
Sooty Shearwater	Falls Lake	NC	09/06	1
Audubon's Shearwater	Jordan Lake	NC	09/06	1
unidentified shearwater	Kerr Reservoir	VA	09/06	1
	Fire Island Inlet, Long Island	NY	09/07	1
Wilson's Storm-Petrel	James River, Suffolk	VA	09/06	8
	Chesapeake Bay Bridge-Tunnel	VA	09/06	3
	Jordan Lake	NC	09/06	3
	Jaeger Rocks, Fort Erie	ON	09/09	1
	Waverly Beach, Fort Erie	ON	09/10	3
	Jaeger Rocks, Fort Erie	ON	09/13	1
Leach's Storm-Petrel	Jordan Lake	NC	09/06	1
	Lake Pinehurst	NC	09/06	1
White-faced Storm-Petrel	Jordan Lake	NC	09/06	1
	Kingsmill, James River	VA	09/07	1
unidentified storm-petrel	Kingsmill, James River	VA	09/06	1
	Port Colborne	ON	09/09	1
	Port Colborne	ON	09/14	1
	Chub Point	ON	09/15	1
Parasitic Jaeger	Jordan Lake	NC	09/06	1
	Kerr Reservoir	VA	09/06	1
	Black Marsh, Baltimore Co.	MD	09/06	1
	Keystone Reservoir	PA	09/07	1
	Presque Isle Peninsula, Gull Point	PA	09/07	2
	Lake Arthur, Moraine State Park	PA	09/07	1
	Conejohela Flats, Susquehanna River	PA	09/07	1
	Fire Island Inlet, Long Island	NY	09/07	1
	Lake Arthur, Moraine State Park	PA	09/08	1
	Montauk Point, Long Island	NY	09/08	1
Pomarine Jaeger	Kerr Reservoir	VA	09/06	1
	Lake Arthur, Moraine State Park	PA	09/07	1
	Cape May State	NJ	09/07	2
	Lake Arthur, Moraine State Park	PA	09/08	1
Long-tailed Jaeger	Lilypons	MD	09/07	1
	Cape May Point	NJ	09/07	1
	Jones Inlet, Long Island	NY	09/07	1

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THE STORMS OF '96

TABLE 3: HURRICANE FRAN (continued)

SPECIES	LOCALE	STATE / PROVINCE	DATE	BIRDS FOUND
unidentified jaeger	Kerr Reservoir	VA	09/06	1
	Sandy Point State Park	MD	09/07	1
Laughing Gull	Lake Pinehurst	NC	09/06	1
	Lake Auman	NC	09/06	2
	Fayetteville	NC	09/06	1
	Jordan Lake	NC	09/06	232
	Falls Lake	NC	09/06	125
	Chapel Hill Country Club	NC	09/06	110
	Kerr Reservoir	VA	09/06	150
	Briery Creek Reservoir	VA	09/06	2
	College Creek	VA	09/06	775
	Sandy Run Reservoir	VA	09/07	1
	Rigby's Folly, Bellevue	MD	09/07	345
	Keystone Reservoir, Armstrong Co.	PA	09/07	2
	Yellow Creek State Park	PA	09/07	4
	Lake Arthur, Moraine State Park	PA	09/07	1
	Bald Eagle State Park	PA	09/07	3
	Lake Somerset	PA	09/07	5
	Delaware River, Philadelphia Airport	PA	09/07	30
	Mount Davis-Meyersdale	PA	09/07	5
	Conejohela Flats, Susquehanna River	PA	09/07	4
	Lake Arthur, Moraine State Park	PA	09/08	1
	Dayton Gravel Pits	NY	09/08	1
	Hamlin Beach State Park	NY	09/08	3
	Woodlawn Beach State Park	NY	09/09	2
	Dryden Lake	NY	09/10	1
	Front Park	NY	09/12	1
	Fort Erie	ON	09/08-09/15	4
	Myers Point, Cayuga Lake, Lansing	NY	09/13	1
	Long Point, Lake Erie	ON	09/13	1
	Stewart Park, Ithaca	NY	09/15	6
	Oshawa	ON	09/17	1
	Hamilton	ON	09/21	1
Van Wagners Beach, Hamilton	ON	09/22	1	
Ottawa	ON	09/28	1	
Hamilton	ON	10/20	1	
Bonaparte's Gull	Lake Arthur, Moraine State Park	PA	09/06	1
Great Black-backed Gull	Jordan Lake	NC	09/06	2
	Falls Lake	NC	09/06	1
	Kerr Reservoir	VA	09/06	2
Sabine's Gull	Kerr Reservoir	VA	09/06	1
	Lake Arthur, Moraine State Park	PA	09/07	2
	Van Wagners Beach, Hamilton	ON	09/07	1
	Lake Arthur, Moraine State Park	PA	09/08	4
	Dayton Gravel Pits	NY	09/08	1
	Niagara River, Fort Erie	ON	09/08	1
Fort Erie	ON	09/14	1	
Least Tern	Lake Pinehurst	NC	09/06	1
	Goldsboro	NC	09/06	1
	Jordan Lake	NC	09/06	6
	Falls Lake	NC	09/06	1
	Lake Auman	NC	09/06	10
	Kerr Reservoir	VA	09/06	2
	Chesapeake Bay Bridge-Tunnel	VA	09/07	1
Arctic Tern	Kerr Reservoir	VA	09/06	1
Common Tern	Curles Neck	VA	09/05	10
	Jordan Lake	NC	09/06	150
	Lake Pinehurst	NC	09/06	2
	Goldsboro	NC	09/06	10
	Lake Anna	NC	09/06	5
	Falls Lake	NC	09/06	35
	Lake Auman	NC	09/06	3
	Harris Lake	NC	09/06	25
	Kerr Reservoir	NC	09/06	35
	Briery Creek Reservoir	NC	09/06	2
	Hunting Creek, Alexandria	NC	09/06	1
	Kerr Reservoir	NC	09/06	30
	Lake Anna	NC	09/06	4
	Fayetteville	NC	09/06	5
	Short Pump	VA	09/07	1
	Chesapeake Bay Bridge-Tunnel	VA	09/07	250
	Rigby's Folly, Bellevue	VA	09/07	24
	Yellow Creek State Park	VA	09/07	1
	Lake Somerset	VA	09/07	1
Lake Arthur, Moraine State Park	VA	09/07	8	

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five Parasitic, and one Long-tailed jaegers (and 85 unidentified jaegers), 14 Sabine's Gulls, 94 Black-legged Kittiwakes, six Black Terns, one Razorbill, and one unidentified large alcid. Also on September 19, seven Leach's Storm-Petrels were at Barnstable, one Pomarine Jaeger was at Dennis, and Provincetown recorded six Manx Shearwaters, five Parasitic Jaegers, four Black Terns, and four large alcids.

Even though the U.S. coast remained west of the storm's eye, several of the birds (Audubon's Shearwater in particular) indicate some probable element of storm-displacement from areas to the south and east. Audubon's Shearwater has been detected in very small numbers in the pelagic zone off Massachusetts during warm-water episodes (Veit and Petersen 1993), but 1996 was a cold-water year. A Leach's Storm-Petrel in the Massachusetts interior at Quabbin Reservoir on September 20 is more difficult to explain. The probability of storm displacement of all these birds is considered in the second part of this article.

In Nova Scotia, where the storm deteriorated, birders scoured the coast from Sheet Harbour to Halifax. These sites are on the eastern shore, where the storm had been forecast to strike but did not. Local birders "could not discover a single bird that could be attributed to the hurricane. Indeed, we were struck by the *absence* of birds of any sort, whether sea ducks, gulls, terns, or alcids. The waters were empty—very strange" (B. Maybank, pers. comm.) In Cape Breton, observers reported a few Leach's Storm-Petrels on Bras d'Or Lake and a fairly heavy flight of Black-legged Kittiwakes past Cape Perce, but nothing else of note.

JOSEPHINE

The center of Tropical Depression Ten lingered in a stationary position on October 4 to 5, about 200 miles SSE of Brownsville, Texas. Two days later, tropical storm *Josephine* had moved very rapidly in the overnight hours from the northeastern Gulf of Mexico toward the NNE, moving inland over northern Florida (about 80 miles west of Jacksonville at 2 AM on October 8) and accelerating along a frontal boundary up the eastern seaboard. By dawn of 8 October, the storm had become extratropical, with no convection anywhere near the surface, but was at its strongest in the Cape Hatteras area, where high winds of 50 to 60 mph and very heavy rains made storm-birding impossible. Similar conditions existed for the