

Hybrid Terns Cryptically Similar to Forster's Terns Nesting in Massachusetts

Ian C. T. Nisbet

On June 16, 1975, Karen Wilson and I found an unusual tern resembling a Forster's Tern at Monomoy National Wildlife Refuge, Chatham. The bird was mated to a Common Tern and had a nest in the middle of the large colony of Common and Roseate terns on North Monomoy Island. Although I was unable to catch it and examine it in the hand, I studied it carefully in the ensuing weeks and took detailed notes and photographs. At that time, I had only recently encountered hybrid Common x Roseate terns for the first time. I had found two hybrids nesting at Monomoy in 1974, and in 1975 was studying a hybrid nesting at Bird Island, Marion, and a pure Common x pure Roseate interbreeding pair at Monomoy. I tentatively concluded that the 1975 Monomoy bird was probably a Common x Roseate hybrid, but I could not rule out the possibility that it might be a Common x Forster's hybrid or even an aberrant Forster's Tern.

In the intervening years, I have seen and handled many more Common x Roseate hybrids and backcrosses, and I have learned the range of their characteristics. No other has remotely resembled the 1975 Monomoy bird, and no other has resembled a Forster's Tern. I was recently prompted to reexamine my notes and photographs of that bird. I now believe that it was probably a hybrid with a fortuitous resemblance to a Forster's Tern, but I am still uncertain about its parentage.

Detailed description

A page from my 1975 field notebook and two photographs taken by Karen Wilson are reproduced here as Figures 1-3. This was a very large tern, about ten percent larger than its mate, stood taller, and had noticeably longer legs. The upperparts were pale gray, intermediate between those of Common and Roseate terns, and the underparts were pure white, without trace of the gray color of a Common or the creamy-pink of a Roseate. The bill was more robust than that of a Common, bright orange-red with about thirty-three percent blackish at the tip (see Figure 3). It thus had more black on the bill than most of the Common Terns at that stage in the breeding season, but more red than any of the Roseates. At rest, the tail projected 2-3 cm beyond the wing tips (i.e., intermediate between Common and Roseate). The outer tail feather (t6) was white; t5 was dark gray on the outer web and light gray on the inner web, and tt1-4 were white (Figure 2). The outer five primaries (pp6-10) appeared black, with white "frosting" when the wing was folded, but the frosting was less prominent on pp6-7, so that at some angles these appeared blackish, contrasting with the silvery pp8-10. Also, pp5-8 had narrow white fringes on the inner webs, forming a very thin white trailing edge to the closed wing (Figure 3). On the underside of the spread wing, the black on the inner webs of pp6-9 formed a narrower dark margin to the trailing edge than on a Common Tern, and the inner webs of pp9-10 were translucent (Figure 3).

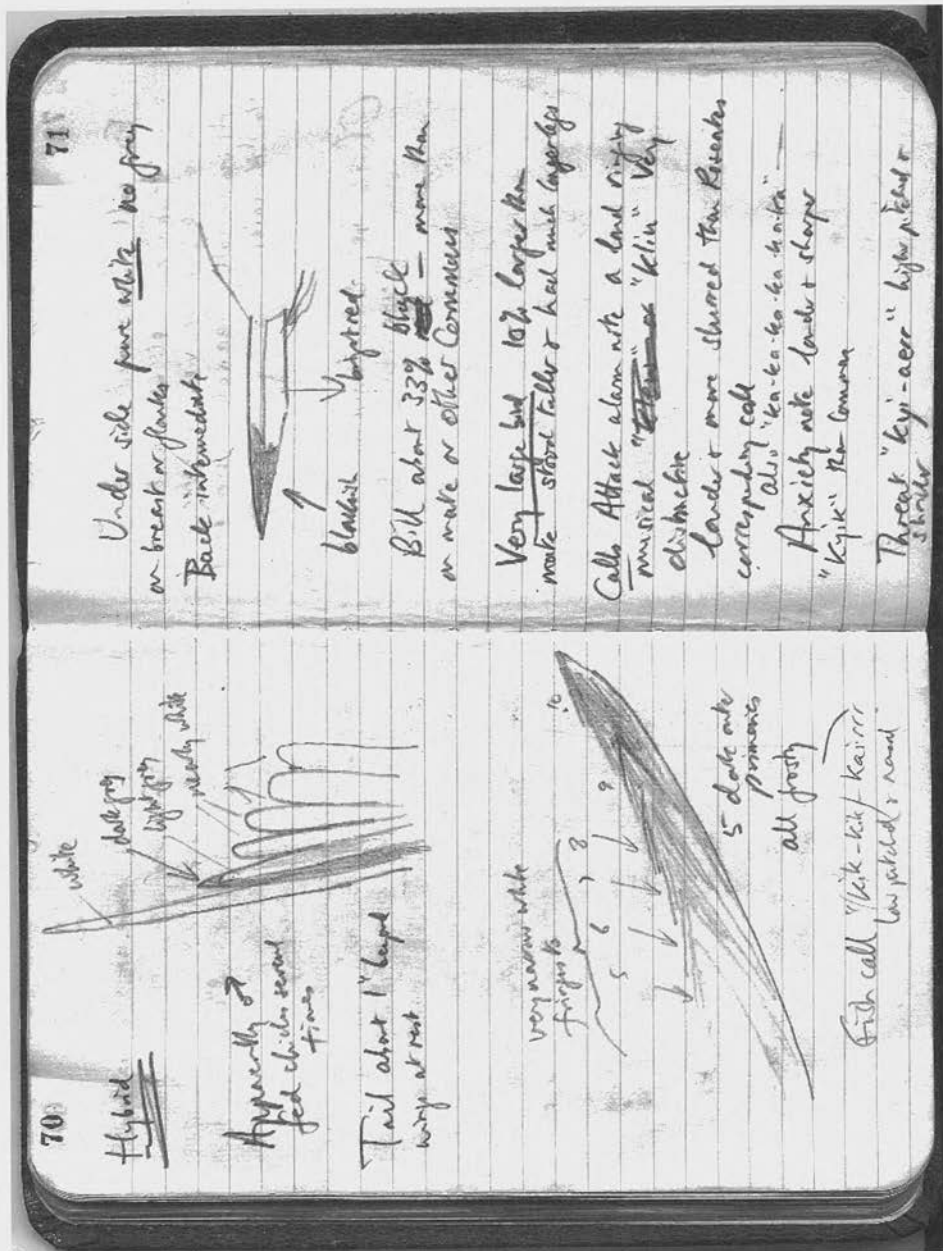


Figure 1: Double page from the author's field notebook for 16 June 1975

The bird had a number of distinctive calls. It initially drew attention to itself with a loud, ringing, musical alarm or attack call, *kliu*, louder and more down-slurred than the similar alarm call of the Roseate. This call was given regularly when we approached the nest or chick, and was used when the bird attacked us, sometimes combined with a rattling *ka-ka-ka-ka-ka*. The bird was extremely aggressive,



KAREN WILSON

Figure 2: Hybrid tern at Monomoy National Wildlife Refuge, 17 June 1975. Note the white breast, dark upper surface to outer primaries, white outer tail feather (t6), and dark gray outer web to t5.

continuing to attack us vigorously even after its chick could fly in early July, when most Common Terns had almost stopped doing so. Another aggressive call was a rasping *aaach*, more nasal than the corresponding call of Roseates. The high intensity alarm call was *kyi-aerr*, similar to but higher-pitched and shorter than the corresponding call of Commons. The advertising call, given when the bird flew in with a fish, was a down-slurred *kaaerr*, or *kik-kik-kaerr*, low-pitched and slightly nasal in tone. The anxiety note was *kyik*, louder and sharper than that of Commons.

Breeding

The bird was mated to a tern that appeared identical in all respects to a Common Tern (Figure 3), including the patterns of black and white on the outer primaries and gray and white on the tail. We suspected that the "Forster's" was the male, because it brought most of the food during the first few days while its mate did most of the brooding, it was much more aggressive than its mate, and its mate had a relatively small bill. The pair had a nest in an open, flat sandy area with no vegetation except for a small clump of seaside goldenrod and a few tufts of dead beach grass (Figures 2-3). This was unusually open habitat for Common Terns, which were nesting all around it, and would have been completely atypical for Roseates or Forster's. When we found the pair on June 16, they had a chick about four days old and an unhatched egg. They were still sitting on the egg occasionally, but abandoned it within a day or two. The egg measured 4.370 x 3.188 cm and appeared identical to a Common Tern egg in shape and coloration. It contained a dead embryo, about two-thirds developed.

I suspect that the death of the embryo may have resulted in some way from its hybrid parentage, because it is and was very rare for Common Tern embryos to die at this stage of development. In my Common Tern study-plot at Monomoy in 1975, hatching success was over ninety-seven percent (135/139) and the few eggs that failed showed no signs of embryonic development.

The chick closely resembled a Common Tern. We enclosed it within a low wire fence to facilitate study, and gave it a small wooden box to provide shelter from the



KAREN WILSON

Figure 3: Hybrid tern (left) with its Common Tern mate (right) and chick at Monomoy National Wildlife Refuge, 17 June 1975. Note the white breast, bill coloration, and pattern of black, gray, and white on the underside of the outer primaries.

sun (Figure 3). We banded it, checked it every 1-2 days, and scrutinized it carefully just before it fledged. We could find no differences from neighboring Common chicks, despite careful examination and side-by-side comparisons of size, structure, coloration, and details of patterning of tail, wing and upperparts. It was so similar to a Common Tern in all respects that I suspected that it may actually have been fathered by a Common Tern rather than by the "Forster's" that was raising it.

We first saw the chick fly out of the enclosure on July 4. We caught it again on July 6 and put a colored plastic patagial tag on one wing. The wing length was then 172 mm, typical for a Common Tern at the time of fledging. The chick was probably still present on July 8, when the "Forster's" parent vigorously attacked me, but we did not see either again at Monomoy. However, Vernon Laux saw the chick with its tag at Nauset New Island, 19 km north of Monomoy, on July 9, 13, and 14. It was found dead, still banded, at Nauset on July 24 by Gordon Brown. Its head was missing, and it had evidently been killed by a Great Horned Owl. I reported this event in a short note on early dispersal of fledgling Common Terns, published in *Bird-Banding* (Nisbet 1976).

I searched diligently for the "Forster's" Tern at Monomoy in 1976 and 1977, but did not find it.

Identification

The adult was clearly not a Common Tern, nor a Roseate, nor an Arctic (the only three tern species nesting at Monomoy in 1975). In many respects, it appeared similar to an adult Forster's Tern (Figures 2-3). However, the patterns of black, gray, and white on the outer tail feathers and outer primaries were wrong for that species. Adult Forster's Terns have the outer tail feather (t6) white at the base and on the outer web, with the distal third of the inner web dark gray (Figure 4); the remainder of the tail, including t5, is all pale gray. The Monomoy bird had t6 entirely white (like Roseate), t5 dark gray on the outer web and light gray on the inner web (like Common: Figure 2), and t1-4 white (like Common and Roseate). Adult Forster's have much lighter primaries (lighter than the back), and only the tips begin to darken during June (Wilds 1993). Two-year-old Forster's (Alternate II plumage) can have the outer five primaries all black, and three-year-olds may be similar (Wilds 1993, Olsen and Larsson 1995), but they do not have white tips to pp5-8, and they usually have white speckling on the forehead or other signs of immaturity. I have examined the extensive collection of Forster's Tern skins in the Museum of Comparative Zoology (MCZ), Cambridge, and I have not found any with primaries similar to the Monomoy bird.

Although I have no experience of Forster's Terns at breeding colonies, I have been unable to match my notes of the Monomoy bird's calls to published descriptions of vocalizations of Forster's (Hall 1998, McNicholl et al. 2001). The musical attack call *kliu* apparently resembled the advertisement vocalization of Forster's, but that call often has two parts, ending in a trill or buzz, and is used when bringing fish to the chick or calling to the chick near the nest (Hall 1998). The same call is also described as being combined with a harsh-sounding rattle in agonistic encounters with other Forster's Terns (Hall 1998). The Monomoy bird often used this call separately from the rattle and used it only when attacking humans. This call was most similar to the low-intensity alarm call of Roseate, but was louder and more down-slurred, and was sufficiently distinct to draw instant attention to the bird when I first heard it calling overhead.

The advertisement call of the Monomoy bird, given when bringing fish to the chick, was completely different from the advertisement vocalization described by Hall (1998), and unlike any other call described for Forster's. It was also unlike any call of Common or Roseate (Gochfeld et al. 1998, Nisbet 2002).

The *aaach* aggressive call appears to have been similar to the harsh, raspy alarm vocalization described for Forster's by Hall (1998), but was given only in flight, not on the nest or in combination with aggressive displays on the ground as described by Hall. It was most similar to the high-intensity alarm call of the Roseate, but differed in tone. In the circumstances described by Hall for the alarm vocalization of Forster's ("when nonmate conspecifics or individuals of other species (including humans) approached the nest site or colony or as a general reaction to a non-specific disturbance"), the Monomoy bird usually gave its *kyl-aerr* alarm call. This call was similar to the corresponding alarm call of the Common Tern (Nisbet 2002), but

differed in tone and duration; it was unlike any call of Roseate and appears unlike anything described for Forster's.

Table 1 summarizes twenty-three characteristics of the 1975 Monomoy bird and compares them with those of the three putative parental species. This bird had several features suggesting each of the three species, but several features incompatible with each. It was clearly a hybrid, but its parentage is not clear. Overall, it was most similar to a Common Tern in plumage details and voice, but t6 and several of the calls are consistent only with Roseate. I would have identified it as a Common x Roseate hybrid, except that all the other Common x Roseate hybrids and backcrosses that I have studied appeared and sounded totally different. The possibility that it was a three-way hybrid (perhaps Common x Forster's backcrossed with a Roseate) cannot be dismissed entirely, although it seems extremely improbable. Otherwise, this bird's resemblance to a Forster's appears to have been fortuitous, although the bird could easily have been identified as Forster's without careful examination.

Table 1. Characteristics of the 1975 Monomoy tern compared to those of Common, Roseate, and Forster's Terns. "Yes" indicates that the characteristic was similar to or compatible with the pure species; "(Yes)" that it differed but had some features in common; "No" that it was incompatible with the pure species.

<u>Characteristic</u>	<u>Common</u>	<u>Roseate</u>	<u>Forster's</u>
Mate	Yes	No	No
Nest substrate	(Yes)	No	No
Characteristics of chick	Yes	No	No
Body size	No	No	Yes
Length of legs	No	No	Yes
Color of upperparts	No	No	Yes
Color of underparts	No	(Yes)	Yes
Bill thickness	(Yes)	No	Yes
Bill coloration	(Yes)	No	Yes
Tail length	No	No	Yes
Tail feather 6	No	Yes	No
Tail feather 5	Yes	No	No
Tail feathers 1-4	Yes	Yes	No
Number of black outer primaries	Yes	No	Yes
Frosting on outer primaries	Yes	No	No
Extent of black on outer primaries	(Yes)	No	(Yes)
White tips to pp 5-8	No	(Yes)	No
Alarm/attack call	No	(Yes)	No
Rattling attack call	Yes	(Yes)	Yes
Harsh attack call	No	(Yes)	(Yes)
High intensity alarm call	(Yes)	No	No
Advertising call	No	No	No
Anxiety call	(Yes)	(Yes)	(Yes)

Birds trapped at Ram and Bird Islands, 1947-1949

Veit and Petersen (1993) did not know of any breeding records of Forster's Tern in Massachusetts earlier than 1990. Indeed, they listed only two fully documented spring records of the species in the entire state prior to 1975. However, Oliver Austin, Sr., had reported trapping two adult Forster's Terns at Ram Island, Mattapoisett, in 1947 (Austin 1948). His banding notes, archived at the Wellfleet Bay Wildlife Sanctuary in Eastham, MA, actually list five adult Forster's Terns banded by him in Massachusetts: two at Ram Island on July 8, 1947, one at Ram Island on July 9, 1948,

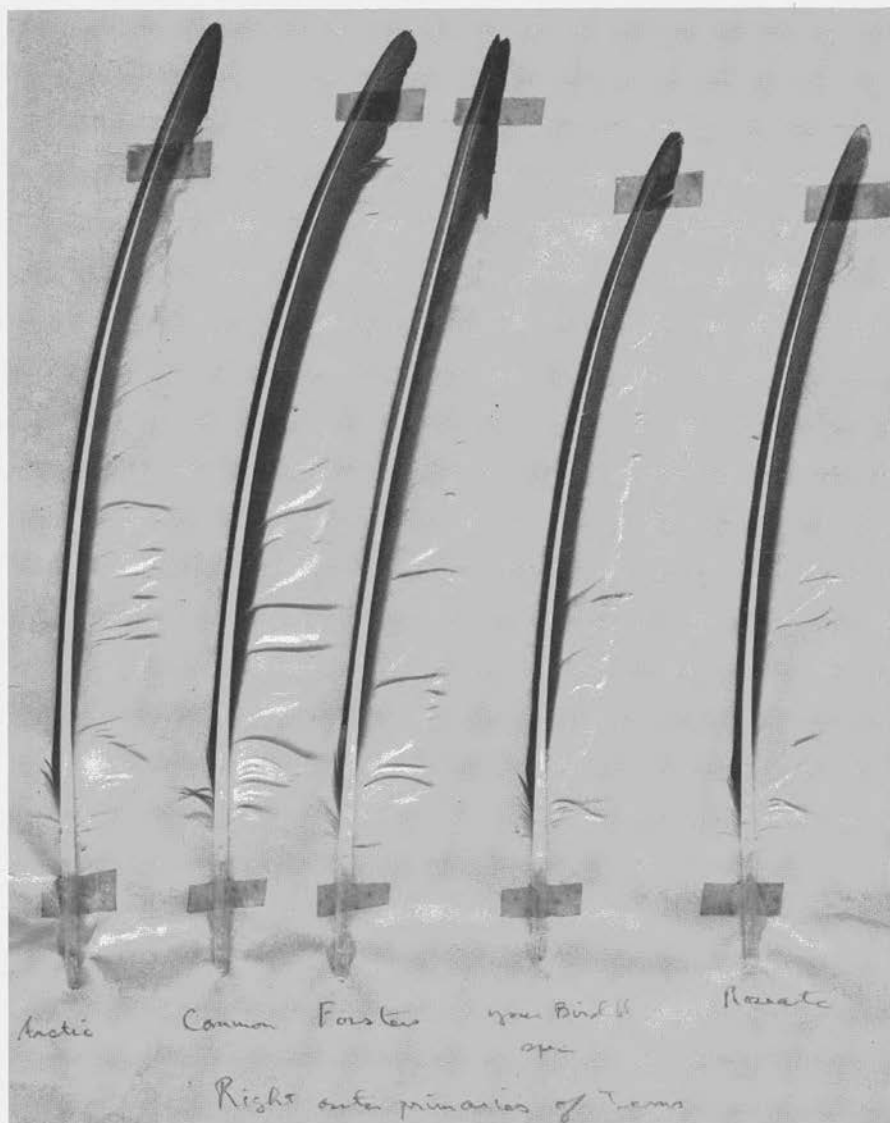


Figure 4: Right outer primaries (p10) of five terns. (Left to right): Arctic, Common, Forster's, an apparent hybrid trapped at Bird Island on 5 July 1949, and Roseate. Display prepared for Oliver Austin, Sr., by James Peters.

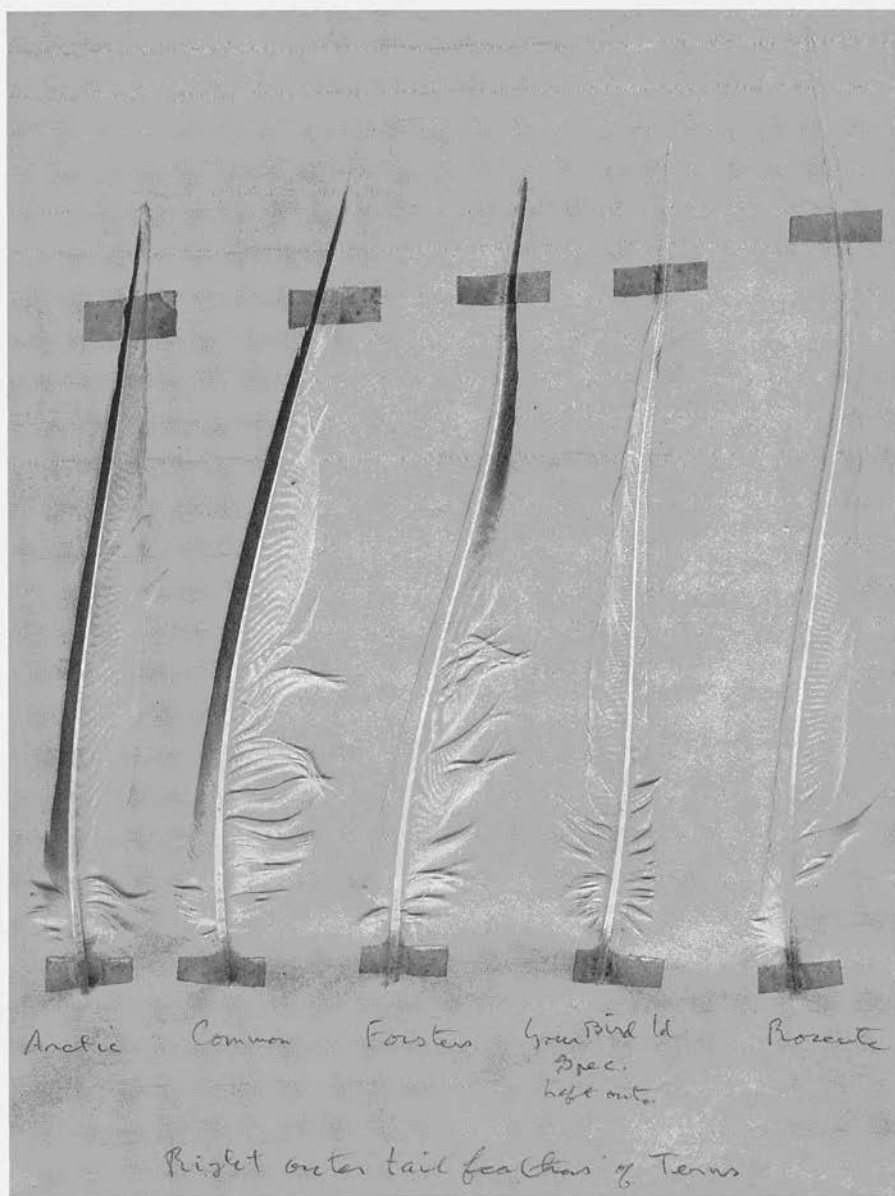


Figure 5: Outer tail feathers (16) of five terns. (Left to right): Arctic, Common, Forster's, an apparent hybrid trapped at Bird Island on 5 July 1949, and Roseate. Display prepared for Oliver Austin, Sr., by James Peters.

one at Bird Island, Marion, on July 15, 1948, and one at Bird Island on July 5, 1949. Austin trapped adult terns on nests, so these were evidently breeding records. Austin's practice when banding adult terns was to set large numbers of traps on unmarked nests, so he would not have known whether the two birds he trapped at Ram Island in 1947 were attending the same or different nests.

I have searched Austin's records, but I have not found any notes, descriptions, or photographs of these birds. In 1947, the center of Ram Island contained depressed marshy areas subject to flooding, which would have provided suitable habitat for Forster's Terns (Austin 1948). However, Bird Island does not now contain suitable habitat for Forster's Terns and probably did not in 1948-1949. Austin's journal for July 15, 1949, states that the bird was "found under a good sized bush," which is typical for Roseate Tern but would be extremely unusual for Forster's.

In 1977 I found among Austin's records an envelope containing five outermost primary feathers (p10) and five outermost tail feathers (t6) of terns: one Common, one Arctic, one Forster's, one Roseate, and one "other." The "other" feathers were labeled "your Bird Id spec" (see Figures 4-5). The envelope had been mailed to Austin by James Peters, then Director of the MCZ, and was postmarked July 8, 1949. The notes are in Peters' handwriting. I have not been able to find any correspondence between Austin and Peters, either among Austin's records or at the MCZ, and Austin's journal does not mention removing any feathers. However, the circumstances suggest that Austin had removed two feathers from the tern trapped at Bird Island in 1949, had sent the feathers to Peters for identification, and that Peters had returned them to Austin with reference feathers from the four putative species.

The outermost primary feather labeled "your Bird Id spec" is 185 mm long, versus 187 mm for that of Roseate, 212 mm for Forster's, 213 mm for Common, and 215 mm for Arctic. In pattern, it is most similar to that of Roseate, with less black on the inner web than on either Common or Forster's. However, the trailing edge of this feather is black for 16 mm back from the tip, whereas Common has black for 28 mm, Arctic 29 mm, and Forster's 41mm; Roseate has a narrow white margin to the inner web all the way to and around the tip, forming a 4 mm white tip (Figure 4). The outermost tail feather labeled "your Bird Id spec" is 176 mm long, versus 202 mm for that of Roseate, 169 mm for Forster's, 175 mm for Common, and 164 mm for Arctic. It is pure white like that of Roseate, completely lacking the dark gray on the outer web of Common and Arctic or the medium gray on the distal third of the inner web of Forster's (Figure 5).


These comparisons show that Austin's 1949 bird was not a Common, Arctic, or Forster's Tern. The two feathers were most similar to those of Roseate, but the patterning of p10 suggests that the bird was not a pure-bred Roseate, but probably a Roseate x Common hybrid. I have seen and trapped a number of Roseate x Common Tern hybrids at Bird Island between 1975 and 1998, all of which were similar to Austin's bird in their outermost tail feathers (white or pale gray, without dark outer webs as in Commons) and patterns of black and white on the outermost primaries (less black than Commons, but lacking the white margin around the tip characteristic of Roseates). All these birds similarly had tail streamers intermediate in length between those of Common and Roseate. Most also had wing lengths intermediate between those of Common and Roseate, but my measurements of wing length have been from the tip to the carpal joint, and so are not directly comparable with those of the outermost primaries.

This information does not support Austin's identification of Forster's Terns nesting at Ram and Bird Islands in 1947-1949, but suggests instead that he had

encountered Roseate x Common Tern hybrids. These were evidently sufficiently similar to Forster's Terns to lead to misidentification as that species.

Parker River Salt Marshes, 1990s

More recently, a few Forster's Terns have been reported breeding in salt marshes near the mouth of the Parker River on the Parker River National Wildlife Refuge, Newburyport. Three birds were seen holding territory on June 23, 1990, including one in courtship flight with a Common Tern, and single nests were found in 1991 and 1992 (Rimmer and Hopping 1991, Veit and Petersen 1993, Berry 2000). I have asked the observers of these birds whether they examined the birds sufficiently carefully to verify that they were Forster's Terns and not hybrids. All the observers noted distinctive characters of Forster's Terns, so it is unlikely that these were the cryptic hybrids described earlier in this article. However, it also has to be considered whether they might have been Common x Forster's hybrids. I have not found any definitive records of hybridization between Common and Forster's Terns (Nisbet 2002), but the report of a mixed pair in courtship certainly suggests the possibility of hybridization. Rick Heil believes that some or all of the three birds he saw in 1990 were pure Forster's, but the other observers cannot be certain of this in retrospect.

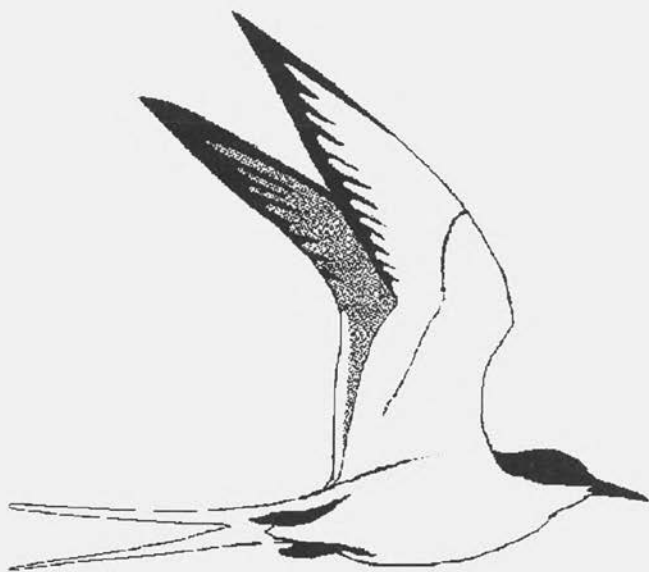
My experience with hybrids between Common and Roseate Terns has taught me that some hybrids or backcrosses look cryptically similar to one or the other parental species, so that it is easy to mistake a hybrid x Common or hybrid x Roseate pair for a Common x Roseate pair, unless both birds are examined very carefully. There are now many reported cases of hybridization among tern species, most frequently at the edge of the range of a scarce species, where birds of that species are present singly among large numbers of a common species and are unable to find conspecific mates. I recommend that any "Forster's Terns" found breeding in Massachusetts (or anywhere else outside their normal range) should be scrutinized very carefully in case one or both members of the pair are in fact hybrids. 

References

- Austin, O. L. 1948. "The Status of the Cape Cod Terns in 1947." *Bulletin of the Massachusetts Audubon Society* May 1948: 14.
- Berry, J. 2000. "Significant Recent Nesting Records from Essex County, Part I." *Bird Observer* 28: 371-377.
- Gochfeld, M., J. Burger, and I. C. T. Nisbet. 1998. Roseate Tern *Sterna dougallii*. No. 370 in *The Birds of North America*. Philadelphia, PA: The Birds of North America, Inc.
- Hall, J. A. 1998. "Vocal Repertoire of Forster's Tern." *Colonial Waterbirds* 21: 388-405.
- McNicholl, M. K., P. E. Lowther, and J. A. Hall. 2001. Forster's Tern *Sterna forsteri*. No. 595 in *The Birds of North America*. Philadelphia, PA: The Birds of North America, Inc.
- Nisbet, I. C. T. 1976. "Early Stages in Postfledging Dispersal of Common Terns." *Bird-Banding* 47: 163-64.
- Nisbet, I. C. T. 2002. Common Tern *Sterna hirundo*. No. 618 in *The Birds of North America*. Philadelphia, PA: The Birds of North America, Inc.
- Olsen, K. M., and H. Larsson. 1995. *Terns of Europe and North America*. Princeton, NJ: Princeton University Press.

- Rimmer, D., and R. Hopping. 1991. "Forster's Tern Nesting in Plum Island Marshes." *Bird Observer* 19: 308-09.
- Veit, R. R., and W. R. Petersen. 1993. *Birds of Massachusetts*. Lincoln, MA: Massachusetts Audubon Society.
- Wilds, C. 1993. "The Identification and Aging of Forster's and Common Terns." *Birding* 25: 94-108.

Ian C. T. Nisbet, who now lives in North Falmouth, was originally a native of Great Britain, but has lived and worked in the U.S. since 1968, mostly in Massachusetts. He was Director of Scientific Staff at the Massachusetts Audubon Society from 1975 to 1980. He has been studying terns at colonies around Cape Cod since 1970. His work at Monomoy in the 1970s was conducted under a cooperative agreement between the U.S. Fish and Wildlife Service and the Massachusetts Audubon Society. He thanks Karen Wilson for help in the field and for taking the photographs, Martin McNicholl and John Hall for reviewing his notes, Douglas Causey for allowing him to examine material in the MCZ, and Bob Prescott for allowing him to review Austin's notes at Wellfleet Bay Wildlife Sanctuary.



GEORGE C. WEST

News from MassWildlife

Topozone.com Check out <www.Topozone.com> for a complete array of U.S. Geological Survey topographic maps for Massachusetts and across the nation. According to MassWildlife Database Manager Sergio Harding, the site is particularly useful for downloading and printing USGS maps as well as locating features that may not be unique in a state, such as one of several Long Ponds or Mill Ponds in the state.