

Little and Least Terns

Breeding on Midway Atoll:

Identification, Range Extensions, and Assortative Breeding Behavior

Peter Pyle

4990 Shoreline Hwy.
Stinson Beach, California 94970
(ppyle@prbo.org)

Nancy Hoffman and Bruce Casler

Midway Atoll National Wildlife Refuge
P.O. Box 29460
Honolulu, Hawaii 96820-1860

Tristan McKee

PO Box 307
Pescadero, California 94060

The Little Tern (*Sterna albifrons*) and Least Tern (*S. antillarum*) represent Old World and North American forms, respectively, of a complex of small terns comprising from two to six species (Cramp 1985, Sibley and Monroe 1990, Higgins and Davies 1996, Thompson et al. 1997). Other members of this complex include the Saunder's Tern (*S. [albifrons] saundersi*) of the Middle East, the Yellow-billed (*S. [antillarum] superciliaris*) and Peruvian (*S. [antillarum] lorata*) Terns of South America, and the Fairy Tern (*S. nereis*) of Australia. Following work by Massey (1976) on the vocalizations of Little and Least Terns, the American Ornithologists' Union (AOU 1983) considered these two separate species, a belief that subsequently has gained widespread acceptance (Sharrock 1993, Olsen and Larsson 1995, Higgins and Davies 1996, Thompson et al. 1997, AOU 1998; but see Patten and Erickson 1996). These two taxa do not breed sympatrically, however, and the only previous record of them together involves a single bird identified as a Least Tern within a colony of Little Terns in England between 1983 and 1992 (Yates and Taffs 1990, Chandler and Wilds 1994). The British Ornithologists' Union (BOU) has withheld acceptance of this record pending a better understanding of variation within the African subspecies of Little Tern (Scott and Dickson 1996; BOU 1997, 1999).

The only records of Little Tern in the area covered by the AOU (1998) involve two specimens of the Asiatic subspecies (*S. a. sinensis*) and several sight and photograph records from the Northwestern Hawaiian Islands (NWHI; Clapp 1989, Conant et al. 1991, Pyle, pers. obs.). In the Hawaiian Islands overall, members of this species-pair have been observed annually since at least 1976, with up to 6 recorded at once and as many as 10–12 different individuals observed within a year (Clapp 1989, R. Pyle, pers. comm.). Records are from late March to early December, with the majority from June through October. Evidence of breeding has been reported from Oahu in 1984 (R. Pyle pers. comm.), French Frigate Shoals, NWHI, in 1980 (Pyle 1980), and Pearl and



Figure 1. Little Tern, Midway Atoll, early June 1999. Note the white rump and tail contrasting crisply with the gray back, and the reduced amount of dark to the inner webs of the middle primaries. Photograph by T. McKee.

Hermes Reef, NWHI, in 1988 (Conant et al. 1991). Except for two specimens of Little Tern (Clapp 1989, Conant et al. 1991), however, the specific identity of these terns, including breeding individuals, has remained unknown. It has been speculated that birds occurring in the "main" (southeastern) Hawaiian Islands have been Least Terns and those observed in the Northwestern Hawaiian Islands have been Little Terns (Pyle 1987, Clapp 1989, Conant et al. 1991), but confirmation based on critical identifications is needed.

In the spring and summer of 1999 we observed 5 small terns on Sand Island, Midway Atoll, NWHI, 2 of which we identified as Little Terns (*S. a. sinensis*) and 3 as Least Terns (subspecies unknown). A pair of each species subsequently nested within 5 m of each other, near the water-catchment basin within Midway's runway system. Here we describe the identification and behavior of these terns and discuss the implications of their side-by-side breeding on Midway.

The first small tern observed on Midway in 1999 was a Little Tern recorded by McKee and Pyle on 15 May at the water-catchment basin (Figure 1). This individual was observed daily, or nearly so, through 14 June, most frequently in the water-catchment area but also feeding just off shore at several localities around Sand Island. On 15 June the bird was joined at the water-catchment basin by a Least Tern, on 18 June a pair of each species was present, and on 20 June a third Least Tern was observed.



Figure 2. Little Tern, Midway Atoll, 24 June 1999. Note the relatively long outer rectrices and the pale under surface to the middle primaries. This area averaged darker on the Least Terns. Photograph by Peter Pyle.

These 5 birds were studied thoroughly, photographed (Figures 2-6), and video-recorded by Pyle from 20 to 26 June, after which he departed. All 5 terns were in definitive-alternate plumage.

From 27 June through 26 July Hoffman and Casler observed breeding activity by both species of tern. On 28 June 1999 the Little Terns were found incubating eggs near the center of the water-catchment basin which, by this time, had largely dried up. On 30 June a rainstorm caused flooding of the basin and the nest was destroyed. On 11 July the Least Terns were found on a nest on a berm to the northwest of the basin, and on 14 July the Little Terns had re-nested approximately 5 m to the south of the Least Tern nest. By 18 July the Least Tern nest had failed. On 19 July the Little Terns were incubating two eggs, but by 26 July, this nest had failed as well. The terns continued to be observed in or near the water-catchment basin through 6 September 1999.

In May-June 2000 up to 6 small *Sterna* were recorded in the catchment basin by island personnel; the ages (subadult vs. adult) and identifications of all 6 were not confirmed. In July, Hoffman, Casler, and McKee observed up to 3 adult and one subadult Little Terns. A pair of adults bred and successfully fledged at least two chicks by 21 July, which continued to be observed through 20 September. This is the first confirmed successful breeding by small *Sterna* in the Hawaiian Islands, although several observations of juvenile Least or Little Terns in August-October, at times with adults, throughout the Northwestern Hawaiian Islands from 1979-1997 (R. Pyle 1980, 1987; P. Pyle 1984; Clapp 1989; Conant et al. 1991) suggest that successful breeding by these small terns had occurred previously.

The identifications of these terns were based primarily on three criteria, as follows:

Vocalizations: The 2 Little Terns consistently gave single-note nasal *chent* call notes. When courting they (or one of them) gave a dry chatter somewhat reminiscent of the call of a Ruddy Turnstone (*Arenaria interpres*). On one occasion one of the Little Terns give a soft, warbler-like *chwip*. The Least Terns consistently gave double-noted *che-dic* call notes and (when courting) an up-slurred, guttural *rre-it*. The differences in the calls

between the two species were very distinct, such that single individuals could be identified by vocalizations alone.

Size and tail length: The 2 Little Terns were 10-15% larger than the 3 Least Terns and had longer outer rectrices (e.g., compare Figure 2 and Figure 4). Within each species there was some size variation (probably sex-specific), but the smaller of the 2 Little Terns was still approximately 10% larger than the largest Least Tern. This difference would be difficult to appreciate without direct comparison.

Plumage: The 2 Little Terns had white rumps and tails, contrasting crisply with the pale gray lower backs (Figure 1). The Least Terns had gray rumps and tails (except for white on the outer 2-3 pairs of rectrices) which did not contrast with the back color (Figures 4-6). In addition, the 2 Little Terns showed paler upper and under surfaces to the primaries than the 3 Least Terns (compare Figures 1-3 with Figures 5-6). There were no consistent differences between the two species in head plumage, bill color, or leg color.

These 5 birds in alternate plumage were easily identified by the combination of these three criteria, even when single birds were observed alone. Some of these identification features, along with other "average features", have been discussed by Massey (1976), Cramp (1985), Pratt et al (1987), Clapp (1989), Yates and Taffs (1990), Conant et al. (1991), Chandler and Wilds (1994), Olsen and Larsson (1995), and Higgins and Davies (1996).

The difference in the color of the primaries on the Midway birds resulted from the more extensive black shading to the inner webs of the middle primaries (p4-p7) on the Least Terns (Figures 6-7) than on the Little Terns (Figures 2-4). This potential field mark has not been mentioned for the separation of these two species, although variation in the color of the outer primaries has been used to assign sub-specific status among populations of Least Terns (see Patten and Erickson 1996), with eastern subspecies (*S. a. antillarum*) averging paler outer primaries than western and southern subspecies (*browni* and *mexicana*). The amount of dark on the primaries in small *Sterna* is affected by the combination of a complex molt among these feathers and wear (Cramp 1985, Chandler and Wilds 1994, Higgins and Davies 1996). It is possible that the differences noted on the Midway birds were related to differences in the previous molt of the primaries. However, both species are reported to undergo similar primary molt patterns (Cramp 1985, Chandler and Wilds 1994), and on all of the Midway birds the outer 2-3 primaries were blackish (see Figures), indicating retention from the previous pre-basic molt, as expected in these species. Thus, middle primary color per se may be useful to distinguish Least and Little Terns throughout their ranges. This possibility, accounting for geographic variation, molt, and feather wear, should be researched further.

There is also variation in the color of the shafts of the outer two primaries: typically white to horn in Asian Little Terns (*S. a. sinensis*) and black, concolorous with the webs of these feathers, in Least Terns and nominate Little Terns from Europe (Cramp 1985, Clapp 1989, Conant et al. 1991, Higgins and Davies 1996). This difference could not be appreciated on the Midway birds in the field or on photographs. Note also that the tails of *sinensis* are longer than in other subspecies of Little Tern (Cramp 1985, Higgins and Davies 1996); thus, tail length may not be as useful in the separation of the Least Tern from European and African forms of the Little Tern.

The contrast between the rump color and back color is likely the best plumage feature to separate Little Terns from Least Terns in alternate plumage, although this contrast can be difficult to discern in harsh, sunny lighting. Certain individuals or populations of Little Tern (e.g.,

those from the Philippines; Cramp 1985, Clapp 1989) may have slightly grayer rumps and tails than others; however, a contrast with the back color is usually if not always present (Higgins and Davies 1996), unlike in Least Tern. Juvenile Little Terns average less black in their plumage than juvenile Least Terns, while the separation of adults in basic plumage requires further study (Chandler and Wilds 1994).

Behavioral interactions between the two species were consistent throughout the period of observation. The Little Terns (both alone and as a pair) clearly dominated the Least Terns, and would not tolerate their presence at the water-catchment area, actively and repeatedly chasing them away when both species occurred in the vicinity. This aggressive exclusion by the Little Terns increased through June as the area of water in the basin, containing "mosquito fish" (*Gambusia affinis*) as prey, became smaller and more easily defended. No aggressive intra-specific interactions were observed, except those related to courtship.

Our observations increase the known breeding ranges of both species by over 4000 km. Observations of the Midway birds by S. Conant (pers. comm.) in June 1999 led her, in retrospect, to identify as Little Terns those breeding in 1988 on Pearl and Hermes Reef (Conant et al. 1991), 120 km to the southeast of Midway. Otherwise, the closest known breeding of Little Tern occurs in Japan, with a single attempt recorded from Saipan, Micronesia (Reichel et al. 1989). Small terns of this complex, likely Little Terns, have also been recorded in Western Samoa, Kiribati, and on several islands throughout Micronesia (Pyle and Engbring 1985, Pratt et al. 1987). The closest known breeding of Least Tern occurs in western North America, over 4900 km from Midway. Except for birds thought to be Least Terns recorded in the main Hawaiian Islands (see above), we are aware of no records of migrants or vagrants of this species closer to Midway than California.

The Midway records indicate that both of these species clearly can travel successfully over large distances of ocean, and that vagrants of each might be expected more frequently within the ranges of the other species. In North America, we suggest that observers on both coasts carefully examine birds among Least Tern colonies and all extralimital small terns, for vagrant Little Terns. The behavior of the Midway birds is also of interest. Although of limited sample size, we suggest that the assortative interactions and breeding we observed support species status for these two closely related taxa.

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Figure 3. Little Tern, Midway Atoll, 17 June 1999. Note the reduced amount of dark to the inner webs of the middle primaries. Photograph by Peter Pyle.



Figure 4. Least Tern, Midway Atoll, 24 June 1999. Note the relatively short outer rectrices and gray rump and tail, concolorous with the rest of the upperparts. Photograph by Peter Pyle.



Figure 5. Least Tern, Midway Atoll, 24 June 1999. Note the gray rump and tail, concolorous with the rest of the upperparts, and the extensive amount of dark coloration to inner webs of the middle primaries. Photograph by Peter Pyle.



Figure 6. Least Tern, Midway Atoll, 24 June 1999. Note the gray rump and tail, concolorous with the rest of the upperparts, and the extensive amount of dark coloration to inner webs of the middle primaries. Photograph by Peter Pyle.

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