

COMMENTARY

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SPECIES AND SUBSPECIES LIMITS IN LEAST TERNS¹

BARBARA W. MASSEY,² *California State University,
Long Beach, Long Beach, CA 90840, e-mail:
bmassey@csulb.edu*

Abstract. In their recent commentary, Patten and Erickson (1996) raised two issues: (1) the specific distinctness of the Least Tern (*Sterna antillarum*) from the Little Tern (*S. albifrons*) and (2) the subspecific name(s) to be applied to breeding populations of Least Terns in coastal western Mexico. Here I briefly summarize evidence supporting the separation of Least and Little Terns and make a case for considering all populations of Least Terns on the west coast of the Americas as one subspecies (*browni*) until and unless field studies indicate otherwise.

Key words: *Least Tern, Little Tern, Mexico, Sterna, subspecies.*

Questions about the taxonomy of Least (*Sterna antillarum*) and Little (*S. albifrons*) Terns were raised by Patten and Erickson (1996) in a recent commentary on an earlier note by García and Ceballos (1995). Two issues are of concern: (1) the specific distinctness of *S. antillarum* from *S. albifrons* and (2) the subspecific name(s) to be applied to breeding populations of Least Terns in coastal western Mexico (García and Ceballos 1995, Palacios and Mellink 1995).

On the first point, Patten and Erickson suggest that the study that led to the separation of *S. antillarum* from *S. albifrons* in 1983 (AOU 1983) was incomplete because it was based upon “only three taxa in the complex (4–7 species and up to 11 additional subspecies worldwide),” and that the significance of the results “has been exaggerated regarding the distinctness of Little and Least Terns.” The study referred to was mine (Massey 1976), and I believe there is substantial evidence to justify the separation of these two species.

The taxonomic history of the small terns began in 1764 with the first description of the European Little Tern *Sterna albifrons* Pallas (Vroeg’s Catalog 1764). As new populations of small terns were discovered over the next 150 years, they were mostly considered new species. In 1831 a new genus *Sternula* was established, and when the Least Tern was first described in

1847 it was assigned to this genus and named *Sternula antillarum* (Lesson 1847). By 1915 there were 19 recognized species of very similar small terns worldwide, and the reevaluation undertaken by Hartert (1921) was clearly in order. At this time “lumping” of species was in vogue, and the chaotic state of the taxonomy of *Sterna/Sternula* is a good example of the need for consolidation. However, Hartert’s consolidation was sweeping; he eliminated *Sternula* and combined all described species under *Sterna albifrons*, recognizing five subspecies –*albifrons*, *saundersi*, *sinensis*, *antillarum*, and *browni* (*athalassos* was not yet known). Twelve taxa previously called species were not even ranked as subspecies but included within *albifrons* or *sinensis*. The North American birds were given subspecific status (*antillarum* on the east coast, *browni* on the west coast) but continued to be called Least Terns (Peters 1934).

Hartert’s revision was based upon morphology and distribution with no explanation for why so many taxa were reduced to one species. His description of *S. a. albifrons* covered a little over a page and encompassed adult breeding plumage, ranges of adult measurements, juvenile plumage, distribution, and breeding ecology. He gave little justification for his decisions on subspecies. For example, in a single sentence he noted that *S. a. antillarum* was analogous to the European form but with rump and tail feathers gray like the back.

The value of vocalizations and behavior in delineating species of terns was not recognized until later in the century; if understood in 1915, the lumping of Old and New World terns probably would have been avoided. Individual recognition has since been acknowledged as basic to the breeding biology of many, and probably all, species of *Sterna*. The advertising call is the key tool, both for mate identification and chick/parent recognition, in all species that have been studied (Royal Tern *S. maxima*, Buckley and Buckley 1972; Arctic Tern *S. paradisaea*, Cullen 1956; Common Tern *S. hirundo*, Stevenson et al. 1970). In situations where two very similar species of terns nest together, it can act as an isolating mechanism. Cullen (1956), for example, found that many of the vocalizations of the Arctic Tern were both homologous and similar to those of the Common Tern, but the call used by a male advertising for a mate was noticeably different and appeared to be the mechanism that prevented hybridization. Conversely, when hybridization has occurred between close-nesting species, it was thought to result from a breakdown in the mechanisms for vocal recognition as in Common × Roseate Tern hybrids (Hays 1975).

In the early 1970s I compared the breeding behavior of the European Little Tern with the American Least Tern and found differences in vocalizations so marked it appeared that the degree of divergence was consistent with ranking these taxa as species (Massey 1976). Further study only has strengthened this conviction. To

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² Current address: 1825 Knoxville Avenue, Long Beach, CA 90815.

determine whether there was divergence among the U.S. subspecies, I observed the interior race *athalassos* in Kansas and found it indistinguishable vocally and behaviorally from the previously studied east coast (*antillarum*) and west coast (*browni*) forms. I studied the Australian Fairy Tern (*S. nereis*) and the Australian Little Tern (*S. a. sinensis*), both of which breed along the south coast of the continent and have an area of sympatry, and observed and recorded the Damara Tern of southern Africa (*S. balaenarum*) in Namibia. Other tern researchers sent me tapes of the vocalizations of the South American Yellow-billed Tern (*S. superciliosus*) and another subspecies of *albifrons* (*S. a. saundersi*). This last-mentioned taxon, Saunders's Tern, is now considered by some as a separate species (*S. saundersi*) based upon plumage characteristics and distribution, although its vocalizations have not yet been studied (Cramp 1985, Chandler and Wilds 1994). By 1981, when I submitted a proposal to the AOU recommending separate species status for *albifrons* from *antillarum*, there was solid evidence that the three U.S. populations comprised a single species readily separable from all the others.

The main thrust of the Patten and Erickson commentary was to argue that insufficient data currently exist to invalidate the subspecies *mexicanus* (van Rossem and Hachisuka 1937) and *staebleri* (Brodkorb 1940) along the west coast of the Mexican mainland. This raises the larger questions of how to define subspecies in a migratory seabird, particularly when the range is only partially known, and whether to retain taxa when the original descriptions do not hold up to current scrutiny. Both of these questions apply to this case.

Geographic isolation, along with measurable morphological and/or vocal differences is considered a necessary, if not a sufficient, condition for the evolution of subspecies of terns. When *mexicanus* was described from Chiapas, no other Least Tern breeding populations were known from the Mexican mainland, Baja California was "terra incognita," and the nearest breeding colony was in San Diego. Thus there was an apparent disjunction of thousands of kilometers between the known nesting sites. Breeding populations have since been found all along the west coast of the Mexican mainland from Chiapas north to Sonora (Binford 1989, García and Ceballos 1995, Palacios and Mellink 1995) with undoubtedly more to be located and described. Other populations are found at the mouth of Río Colorado along the north shore of the Gulf of California (Palacios and Mellink 1996), around the entire peninsula of Baja California from Laguna Percebú on the northeast coast (Carvacho et al. 1989) to La Paz and Cabo San Lucas on the tip (Palacios and Mellink 1996), and up the length of the west coast to Estero de Punta Banda in Ensenada (Palacios and Alfaro 1993). North of the border, the U.S. population extends from Tijuana Estuary to San Francisco Bay. Many of the Mexican breeding colonies are widely separated, often because of lack of suitable habitat, as along the east coast of Baja California where the greatest disjunction occurs, but there is not the vast discontinuity that was thought to exist in 1937 when *mexicanus* was first described.

The whereabouts of *browni* in winter remains a mystery. A few banded *browni* from a California colony were seen in Colima, Mexico (Massey 1981), but flocks of Least Terns have been seen along the Pacific coast of Costa Rica during migration (Stiles and Smith 1980), and the main wintering area is arguably Panama or further south. Without winter observations we cannot determine whether there is mingling of populations during the greater part of the year when they are not breeding.

Morphologic differences used to separate *mexicanus* and *staebleri* from *browni* do not stand up to scrutiny; the single-sentence descriptions, small sample sizes, and casual measurements would not be acceptable today. For *mexicanus* the description was "Similar to *Sterna albifrons browni* Mearns of southern California and northern Lower California, but size definitely smaller; coloration darker throughout and with the underparts even more strongly suffused with pearl gray" (van Rossem and Hachisuka 1937). Measurements were limited to wing and exposed culmen lengths of seven specimens and given only as a range. *Staebleri* differed from *browni* in "... having a longer bill and tail; bill strongly tipped with black; darker gray back; exposed portion of usually two (instead of three) outer primaries blackish" (Brodkorb 1940). Subsequent examination of specimens of *browni* and *antillarum* has shown that the number of dark outer primaries in both ranges from 1-3 (Burleigh and Lowery 1942, Massey 1976) and that this character cannot be used to differentiate them.

Questions concerning the distribution of *browni* and the validity of Mexican subspecies are not trivial; it is a federally endangered species in both the United States and Mexico, and thus its protection is intricately linked to its taxonomy. There is need for further field study to clarify the taxonomic status of the Mexican populations, particularly studies of vocalizations but also measurements of bill length, wing length, and plumage color. In the interim, there seems little justification for maintaining *mexicanus* and *staebleri*; they are but two of the many west coast colonies, with neither geographic isolation nor convincing morphological differences to merit subspeciation.

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