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IDENTIFICATION OF MANX-TYPE SHEARWATERS IN THE EASTERN PACIFIC

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Recent seabird identification guides (e.g., Tuck and Heinzel 1978, Harrison 1983, 1987) and articles on the Manx Shearwater (*Puffinus puffinus*) complex (e.g., Jehl 1982, Bourne et al. 1988), do not satisfactorily address the problem of separating the Manx Shearwater (*P. puffinus*) from Newell's (*P. auricularis newelli*) and Townsend's (*P. a. auricularis*) shearwaters, presumably because Townsend's and Newell's are Pacific Ocean species while Manx is essentially a bird of the Atlantic Ocean. The Manx, however, is a long-distance migrant that has occurred in the Pacific off Australia and New Zealand (Kinsky and Fowler 1973, Lindsey 1986, Tennyson 1986) and off Washington state, in September–October 1990 and September–October 1992 (Tweit and Gilligan 1993). In addition, five California records of the Manx from July to October 1993 have been submitted to the California Bird Records Committee (M. A. Patten pers. comm.). Here, on the basis of museum and literature research, combined with extensive field experience of this complex, we summarize identification characters of the Manx, Townsend's, and Newell's shearwaters.

METHODS

We examined specimens of these three forms, plus the Black-vented Shearwater (*P. opisthomelas*), at the American Museum of Natural History (AMNH; n = 35 Manx, 14 Townsend's, 1 Newell's), New York, the Bishop Museum (BM; n = 30 Newell's), Honolulu, the California Academy of Sciences (CAS; n = 9 Townsend's), San Francisco, the Los Angeles County Museum of Natural History (LACM; n = 3 Townsend's), and the Museum of Vertebrate Zoology, University of California, Berkeley (MVZ; n = 3 Manx, 1 Townsend's). In addition, personnel at AMNH, BM, LACM, the Carnegie Museum of Natural History (CM; n = 6 Townsend's), Pittsburgh, and the U.S. National Museum (USNM; n = 8 Townsend's, 40 Newell's), Washington, D.C., kindly provided further data on specimens at those institutions.

We researched published literature, as well as unpublished information from Point Reyes Bird Observatory's (PRBO) on-going research on Newell's Shearwaters nesting in Kauai, Hawaii. Our field experience with this complex comprises about 6000 hours of at-sea and land-based observation of thousands of each form.

RESULTS AND DISCUSSION

The only small shearwater occurring regularly off California is the Black-vented (A.O.U. 1983), the plumage variation of which was discussed by Loomis (1918) and Everett (1988). The field separation of this species from Townsend's, Newell's, and Manx shearwaters should not be a problem if the bird is seen well. Characters distinguishing Townsend's and Newell's from the Black-vented were discussed adequately by Jehl (1982). The main features of the Black-vented are its lack of white flank patches and its dark brownish upperparts blending smudgily into whitish underparts (versus sharply contrasting blackish upperparts and white underparts of the others). Although one bird in more than 50,000 Black-vented Shearwaters we have seen showed white flank patches (Pyle pers. obs.), we consider this to have been an aberrant individual; in all other respects it looked like a typical Black-vented Shearwater. Howell and Engel (1993) discussed differences between Townsend's and the eastern Pacific race of Audubon's Shearwater, *P. lherminieri subalaris*.

Size and Shape

Manx, Townsend's, and Newell's shearwaters are all about the same size as the Black-vented Shearwater, and all four fly in a similar manner, so size and flight are unlikely to be useful identification points, particularly with a lone bird. Townsend's averages longer-tailed than Manx, and Newell's averages longer-tailed than Townsend's, with virtually no overlap between Newell's and Manx (Table 1). Newell's generally appears fairly long-tailed in the field, although we doubt this would help in separating it from Townsend's (note overlap in Table 1). Recently fledged Newell's (in October and November) and birds in worn plumage can be short-tailed; e.g., the type specimen of Newell's has a tail of 76 mm (King and Gould 1967) or 77

Table 1 Tail Lengths and Widths of Distal Black Undertail Band (in mm) of Manx, Newell's, and Townsend's Shearwaters

	Tail length Range (Mean ± SD[a])	Distal black undertail band[b] Range (Mean ± SD)
Manx (n = 38)	68–79 (72.4 ± 2.7)	4–21 (9.9 ± 4.3)
Newell's (n = 38)	77–89 (83.9 ± 3.0)	20–46 (35.2 ± 6.8)
Townsend's (n = 41)	71–83 (76.3 ± 3.0)	43–72 (59.0 ± 7.8)

[a]SD, standard deviation.
[b]See Figure 1.

mm (Loomis 1918), within the range of the Manx. Tail length thus appears of little use in separating Townsend's from either Manx or Newell's but could be helpful in distinguishing between Newell's and Manx.

Upperpart Coloration

As noted above, Manx, Townsend's, and Newell's are basically blackish above and white below. Manx and Newell's have been described as blacker dorsally than Townsend's, which is browner (Jehl 1982), and Newell's has been noted as blacker dorsally than Manx (Dunn 1988). We were unable to compare similarly fresh (blacker) or worn (browner) specimens of all three forms directly, although we found fresh-plumaged Manx as black dorsally as Townsend's, and Loomis (1918) noted that fresh-plumaged Townsend's are as black dorsally as Newell's. Because of variable lighting, plumage fading, plumage wear, and poorly known molt schedules of immature birds, subtle differences in the blackness of the upperparts appear not to be useful in identifying a lone bird at sea.

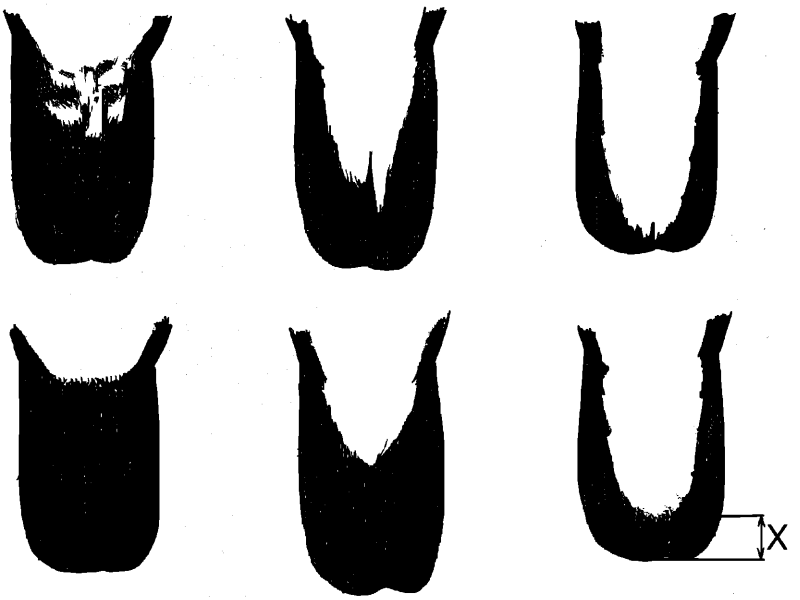

Figure 1. Variation (minimum extent of black above, maximum extent of black below) in undertail covert pattern of Townsend's (left), Newell's (center), and Manx (right) shearwaters. The lower figure is typical of Townsend's, whereas most Newell's have patterns intermediate between the upper and lower figures. Only juveniles of the Manx show as much dark as the lower figure. Note that Manx is overall white-vented, Townsend's is black-vented, with Newell's intermediate between these two extremes. See Table 1 for measurements of the distal black undertail band (distance X).

Sketch by Steve N. G. Howell

Face and Neck Pattern

As Jehl (1982) noted, Newell's shows a more sharply defined border between the black and white through the face than does Townsend's, which shows some dark freckling in this region, making the border more diffuse (Figure 2). The Manx Shearwater has a face and neck pattern similar to Townsend's (freckled and not sharply demarcated through the face; Figure 2). We agree with Jehl (1982) that these patterns are likely to be useful only at close range. Another feature that may be helpful at close range is the narrow band of pale feathers across the base of the maxilla shown by many Manx Shearwaters (e.g., numerous photos, and 20 of 36 specimens; Figure 2). No specimens or photos of Townsend's or Newell's we examined showed this feature; in these forms the forehead is solidly black (Figure 2).

The extent of dark on the sides of the neck and chest varies considerably in all three forms. Differences suggested by Jehl's (1982) figure 3 are an artifact of the preparation of the specimens shown; specimens of Townsend's Shearwater at CAS match the neck pattern of the upper Newell's shown by Jehl. Manx Shearwaters also match the pattern of Townsend's (although the neck sides of the latter are perhaps slightly blacker), and we consider neck pattern of no use in distinguishing these three forms.

Flank Patch

The white flank patch of Townsend's (formed by clean white longest flank feathers) was first noted by Jehl (1982) as a field mark distinguishing it from the Black-vented and Audubon's shearwaters. Newell's also shows white flank patches like Townsend's, although the patches on both forms can be inconspicuous (Howell and Engel 1993; pers. obs.). Furthermore, up to 30% of several hundred Manx Shearwaters studied critically in April and May (off Wales and England; Howell), in August (off New Brunswick; J. L. Dunn, photos), in September (off Maine; Pyle), and in November (off Chile; Howell) showed distinct white flank patches, with some birds being similar to a typical Townsend's or Newell's. Also, 18 of 38 specimens of the Manx had mostly white flanks that probably would appear as patches, although the flank feathers are not as long as on Townsend's; in the other 20 specimens, the flanks were marked with blackish and at sea probably would not look like white patches. Thus, extensive white flank patches strongly suggest Townsend's or Newell's but may not eliminate the Manx. A bird clearly lacking white flank patches is most likely a Manx but could be a Townsend's or Newell's molting its flank feathers.

Evaluating the presence and extent of white flank patches demands care. If viewed from the side or above, with the wings held bowed (as on the bottom of a downstroke), all three forms show a white flank patch between the black upperwing and the black thighs. The extent to which these white patches extend up onto the sides of the rump, as in typical Townsend's and Newell's, is best seen when the bird is flying slightly away from the observer. Critical prior experience with one or more forms is desirable in evaluating the extent of white flank patches.

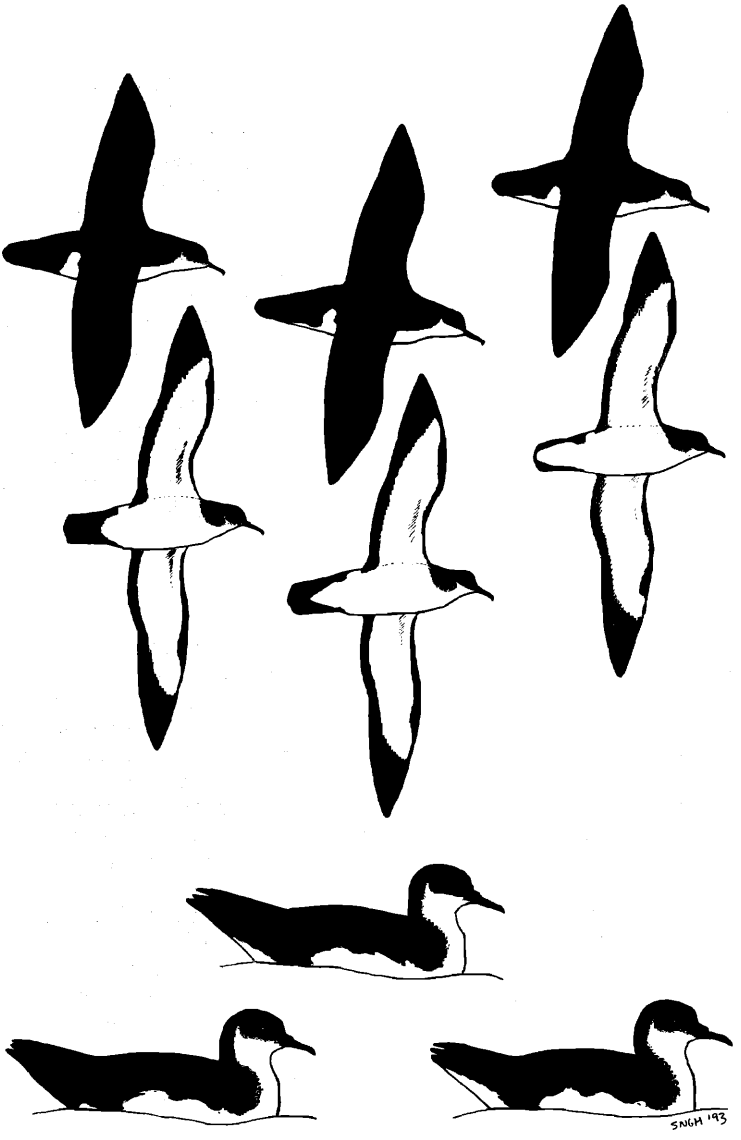

Figure 2. Comparison of Townsend's (left), Newell's (center), and Manx (right) shearwaters. Note the longer tail of Newell's relative to the Manx (but see Table 1) and the different undertail covert patterns of all three forms (also see Figure 1). See text for other differences.

Sketch by Steve N. G. Howell

Undertail Covert Pattern

The best feature for distinguishing the three forms is the pattern of the undertail coverts. The undertail coverts of these shearwaters are long, reaching almost to the tip of the tail and covering most of the underside of the closed tail. Because clear views from directly below are seldom possible at sea, and because black undertail coverts often cannot be distinguished from black rectrices, it is usually easier to determine the extent of black distally on the undertail (Figures 1 and 2, Table 1).

Manx Shearwaters older than one year have white undertail coverts, with black restricted to the outer webs of the lateral undertail coverts (Figure 1, upper). Birds in juvenal plumage (identified by axillar pattern; Baker 1993) also show dusky markings at the tips of the longest undertail coverts, which are still mostly white (Figure 1, lower). In the field, therefore, the Manx looks white-vented (Figure 2). If a bird is seen from above, however, shadowing combined with the blackish thighs can suggest the dark vent of Townsend's Shearwater, and from the side the undertail pattern can appear white basally and black distally, like that of Newell's Shearwater. With birds on the water, the white appears as an extensive wedge under the tail (Figure 2).

For Townsend's Shearwater, Jehl (1982) indicated that "the undertail coverts are uniformly blackish." In fresh plumage, some undertail coverts of Townsend's have small white tips unlikely to be visible other than in the hand. Loomis (1918) also noted that some Townsend's have white proximal undertail coverts and concluded "there are no constant characters differentiating the Hawaiian form from the Revilla Gigedo birds." Two specimens (CAS 810, 811; Townsend's by tail length and locality) confirm this variation in undertail covert pattern (Figure 1, upper). However, while a Townsend's with white proximal undertail coverts may approach the pattern of some Newell's, the white proximal coverts of Townsend's are patchy and do not form such a noticeable and solid white area as on Newell's (Figure 1). Also, in the absence of molt, the white central area on the undertail coverts of Newell's is typically tapered, or V-shaped, while on Townsend's it is more rounded or irregular (Figure 1). On the water, Townsend's typically appears all dark under the tail (Figure 2).

Descriptions of the undertail coverts of Newell's have varied. For example, figure 3 in Jehl (1982) shows two specimens of Newell's with undertail coverts white proximally and black distally (the feet obscure the exact extent of white). On the other hand, Harrison (1987) noted that Newell's differs from Townsend's in its "white or mixed black and white undertail-coverts," and Pratt et al. (1987) said "undertail coverts white" for Newell's.

We know of no evidence that Newell's ever has all-white undertail coverts. Museum specimens, photographs, live birds we have handled, and birds seen clearly at sea all showed undertail coverts about half white and half black (Figures 1, 2), as noted by Jehl (1982). Prior confusion may have resulted from observers' being unfamiliar with the extent of undertail coverts covering the underside of the tail (see above). Superficially, however, Newell's appears "white-vented" because the central white area is

generally V-shaped, the same shape as the undertail coverts overall, and the blackish distal and lateral undertail coverts do not differ obviously from the rectrices (Figure 2). The pattern of the undertail coverts of Newell's is actually intermediate between that of Manx and Townsend's. Those Newell's with the most white approach the pattern of the Manx, but the lateral and most distal tail coverts are more extensively black, contributing to a broader black distal area under the tail (Figures 1 and 2; Table 1).

In summary, most birds can be separated by the width of the dark distal undertail band formed by the rectrices and dark undertail coverts. This is generally 5–20 mm wide on the Manx Shearwater, 25–45 mm wide on Newell's Shearwater (30 mm on the type specimen), and 50–70 mm wide on Townsend's Shearwater (67 mm on the type specimen). These differences are detectable at sea under most condiditons when, in direct flight, the feet of shearwaters are tucked in and not visible, enabling clear views of the undertail pattern. The feet of birds alighting on, or taking off from, the water, however, can block the undertail pattern. This may also occur rarely in direct flight, leaving an impression of dark undertail coverts on the Manx Shearwater. Observers should also take into account the effects of lighting, such as bright sun reflecting off the water and making white areas look more extensive than they actually are, or shadows making white areas appear dark. Also, molt of the the longest central undertail coverts of a Manx Shearwater may cause the undertail to show more black than usual at the tip.

Underwing Pattern

Dunn (1988) pointed out that Newell's shows more contrast of flight feathers to underwing coverts than does the Manx Shearwater. While both Townsend's and Newell's have the under surface of their remiges blackish gray, versus a paler, more silvery gray in the Manx, we agree with Dunn (1988; pers. comm.) that this character is subject to variations in lighting and could be of use only under ideal conditions.

The underwing coverts of all three forms are mostly white, with a dark or dusky bar on the proximal lesser coverts. This bar generally shows up most strongly on Townsend's Shearwater but is also present on Manx and Newell's. Thus underwing pattern is not likely to be useful for distinguishing these three forms at sea.

SUMMARY

Field separation of Manx, Newell's, and Townsend's shearwaters is not always easy and requires clear and preferably prolonged views of a bird. The effects of lighting, wear, and molt should always be considered, and an evaluation of all possible features should be used. The pattern of the undertail coverts is the most useful feature: Townsend's has black undertail coverts, Manx has white undertail coverts, while Newell's has a pattern intermediate between these two extremes, with black distal and lateral coverts and white central proximal coverts (Figures 1 and 2). Differences in face pattern are useful but require close-range views: look for the cleaner-

cut black and white facial division of Newell's and the narrow pale band over the bill of Manx (Figure 2). Birds with prominent white flank patches are most likely Townsend's or Newell's; those lacking them are more likely Manx. The longer tail of Newell's compared with Manx may be a useful feature; the tail length of Townsend's is intermediate between that of the Manx and Newell's.

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Manx-type shearwater, two miles west of Point Joe, Monterey County, 29 August 1993.

Photo by Rod Norden