

Process for at-sea identification in the feae-complex applied to a petrel observed off the Isles of Scilly

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Introduction

The *feae*-complex comprises the three taxa of petrel Cape Verde Fea's *Pterodroma f. feae*, Desertas Fea's *P. f. desertae*, and Zino's *P. madeira*, breeding on the Cape Verde Islands, Desertas Islands, and Madeira Island, respectively (Mathews 1934; Bourne 1983). At-sea identification (ID) of these three cryptic taxa is challenging. A petrel belonging to this complex was observed from a boat off the Isles of Scilly, SW England, on 16 August 2015. An excellent series of photographs document the sighting and key ones reproduced below permit detailed examination of the petrel's characteristics and assessment of its ID.

Observation

Late morning on 16 August we were drifting and chumming over Seven Stones Reef, about 18 km NE of St Mary's, Isles of Scilly. The wind was c. 8 knots south-easterly and the sea state was slight. Other seabirds seen in the preceding few hours included Manx Shearwater *Puffinus puffinus*, Sooty Shearwater *Ardenna griseus*, and Great Shearwater *A. gravis*. At 10.50 am I noticed c. 250 m away a petrel flying low over the sea heading toward the boat. Flight jizz was characteristic of a *Pterodroma*, revealing the greyish upperside and an underside with starkly contrasting white body and dark underwings, indicating a member of the *feae*-complex. The petrel circled the boat several times, drifted out a little as it checked over the chum and oil slick, and made a very close pass off the stern at c. 4 m. It was observed and photographed from every possible angle before heading away. The duration of the sighting was 2.5 minutes from first sighting to flying away, based on photograph times, plus about another 1.5 minutes after it left the boat.

Ranges

Recent geolocators studies have, for the first time, thrown light on the at-sea range of breeding adults of the *feae*-complex. Nothing is known about the movements of immature and non-breeding birds. Zino's Petrels ranged widely in the NE Atlantic, predominantly to the north and northwest of Madeira, extending to the Azores and a few hundred miles off SW Ireland (Zino *et al.* 2011). The results were similar for Desertas Fea's Petrel (Menezes *et al.* 2010; Ramírez *et al.* 2013). Geolocator studies of Cape Verde Fea's are currently limited to a small number of birds but show them ranging north at least as far as Madeira and the Azores (J. González-Solis *in litt.*). It is possible that all three taxa reach British and Irish waters.



Figure 1. Fea's Petrel *Pterodroma feae* off the Isles of Scilly, 16 August 2015. © Joe Pender. As the petrel flew toward the boat the jizz - in particular the fairly thickset head and body and the long-winged look - gave a strong impression of Fea's Petrel.

Light-morph Soft-plumaged Petrel *Pterodroma mollis* from the Southern Hemisphere looks similar to members of the *feae*-complex and has been recorded once in the North Atlantic (Catley 2009). However, it was quickly eliminated since the Scilly bird, for example, lacked that species' complete dark breast band and compact and neckless structure (Flood & Fisher 2013b).

Process for identification

The following process for ID within the *feae*-complex is based on at-sea experience of three accepted records of Fea's Petrels off the Isles of Scilly, several off North Carolina, USA, and considerable experience of Fea's and Zino's Petrels at their breeding grounds. The findings of Shirihai *et al.* (2010) were applied in more recent trips and are central to the process. Flood & Fisher (2013b) present details of the process and several case studies.

The five main criteria essential to at-sea ID of the *feae*-complex are jizz, wingspan, whitish in the underwing-coverts, primary moult timing, and bill size and structure (in an order by which they might unfold as a bird flies toward a boat or a headland). The process works using combinations of strong impression (jizz, wingspan), precision (bill size and structure, extent of whitish in the underwing coverts), and position in the annual life cycle (moult timing). A number of support criteria can help in tricky cases. The result will be an identification that is unequivocal, probable or irresolvable (based on current knowledge).



Figure 2. Fea's Petrel *Pterodroma feae* off the Isles of Scilly, 16 August 2015. © Joe Pender. All-dark underwing-coverts were evident as the petrel banked for the first time and they lacked extensive whitish that would have pointed to Zino's Petrel *P. madeira*.

Jizz: Jizz is about first impressions and is a holistic approach, and with decent views can give a strong impression of a petrel's ID. However, the use of jizz for ID in the *feae*-complex requires considerable field experience. The Scilly petrel was a medium-sized *Pterodroma*, fairly thickset, with long medium-width wings (Figures 1, 5 & 6). The underwings appeared all dark, except for whitish inner forewing patches. Flight was fast and strong. Zino's Petrel is a medium-small *Pterodroma*, the majority look petite and slimline, with medium-length, medium-width wings; some of them have extensive whitish in the underwing-coverts. Flight typically is more agile than the Scilly bird showed, so jizz gave a strong impression of Fea's Petrel.

Desertas Fea's on average is more heavily built than Cape Verde Fea's, but there is considerable overlap and in most cases the jizz is alike. However, presumed large male Desertas Fea's are uniquely brutish looking. The Scilly petrel was fairly robust but not brutish, and in this respect could have been either of the two Fea's Petrels.

Wingspan: The wingspans of the Fea's Petrels are on average about 1.1 times longer than Zino's Petrel. Perception in the field, however, is that the difference is greater than 10% (see discussion of size illusion in Flood & Fisher 2013a). This illusion can be witnessed at sea off Madeira when both Desertas Fea's and Zino's

Petrels are seen on the same day; if lucky, at the same time. With experience, it is not overly difficult to see that the Fea's Petrels look long-winged, or that Zino's Petrel looks relatively shorter winged (Flood & Fisher 2013b). Assessment of wingspan can give a strong impression of a petrel's ID.

As mentioned under jizz, the Scilly petrel appeared to have long medium-width wings, which gave a strong impression of Fea's Petrel. Assessing wingspan from photographs is difficult, underlining the value of video footage, and the complementarity of the two forms of media. Unfortunately, as the sighting was such a surprise, there was no chance to take video of the Scilly Petrel.

Whitish in the underwing-coverts: The amount of whitish in the underwing-coverts (excluding the inner forewing patches) varies within and between each taxon (Shirihai *et al.* 2010). Whitish may be found in the greater and median primary and secondary coverts. A scoring system was developed using an ordinal scale with the five points 0–4; all-dark underwing-coverts scores 0, and the greatest amount of whitish scores 4 (Illustration 1; Flood & Fisher 2013b).



Figure 3. Fea's Petrel *Pterodroma feae* off the Isles of Scilly, 16 August 2015. © Peter Moore. As the petrel flew closely around the boat, it was clear that the large size and robust structure of the bill was outside of the range of Zino's Petrel *P. madeira*. The nasal tubes are notably raised, the tip of the nostrils to the top of the maxillary unguis is notched - typically wedge-shaped in Zino's Petrel (Harrop 2004), the latericorn is fairly deep, and the maxillary unguis is fairly bulbous and quite strongly hooked.



	sec-covs	prim-covs
CVPE	00	00
DEPE	00	00
ZIPE	12	15

(4)



	sec-covs	prim-covs
CVPE	00	01
DEPE	01	05
ZIPE	15	27

(3)



	sec-covs	prim-covs
CVPE	03	04
DEPE	04	24
ZIPE	24	25

(2)



	sec-covs	prim-covs
CVPE	16	10
DEPE	30	46
ZIPE	24	20

(1)



	sec-covs	prim-covs
CVPE	81	85
DEPE	65	25
ZIPE	25	13

(0)

The underwing-coverts of the Scilly petrel effectively were all dark, notwithstanding the somewhat paler inner webs of the outermost median primary coverts in both wings (Figure 2). Both the secondary coverts and primary coverts scored 0. This is most typical of Cape Verde Fea's (secondary coverts 81%, primary coverts 85%), less typical of Desertas Fea's (secondary coverts 65%, primary coverts 25%), and least typical of Zino's Petrel (secondary coverts 25%, primary coverts 13%).

Primary moult timing: *Pterodroma* petrels follow an annual life cycle that includes breeding and moulting, which do not overlap significantly. Members of the *feae*-complex appear to follow a simple basic moult strategy (Howell 2012), moulting all of their feathers once a year, adults mainly after the breeding season has finished, immatures presumably a few months earlier, in their second calendar-year (like well-researched petrels). Timing of breeding differs between the three taxa and accordingly so does moult timing. The most obvious evidence of moult for field birders is primary moult. Proposed approximate primary moult timings for all ages are March–August for Cape Verde Fea's, October–April for Desertas Fea's, and August–December for Zino's.

The Scilly petrel was observed in August, which falls outside of the range of primary moult for all ages of Desertas Fea's, is at the very end of primary moult for adult Cape Verde Fea's, and at the very beginning of their first primary moult for juvenile Zino's. August is one of the least interesting months for assessing primary moult timing since primary moult is not expected in any of the three taxa. The Scilly petrel was not in primary moult and this criterion offered no clues to its ID.

Bill size and structure: Shirihai *et al.* (2010) concluded that relative bill sizes and bill structures are the most reliable and consistent characters for at-sea ID. Prolonged and close views are needed to judge structure since impressions change as the angle of view changes. It is important to build up an impression of the bill and then to critically re-evaluate it by further observation. With excellent views and some experience, it is possible to make a field ID of a typical thick-billed Fea's Petrel and a typical slight-billed Zino's Petrel without recourse to photographs. Photos are essential if views are not excellent, or if the bill appears close to the small overlap range between Fea's and Zino's Petrels. Handled carefully, bill size and structure can offer a degree of precision to the process of ID (a wide range of photographs of bills of the three taxa are reproduced in Shirihai *et al.* 2010 and Flood & Fisher 2013b).

Illustration 1 (opposite). Scorecard for scoring whitish in the underwings of the *feae*-complex (from Flood & Fisher 2013b). Whitish may occur in the underwing greater and median primary coverts primary coverts (prim-covs) and secondary coverts (sec-covs). An all-dark underwing scores 0, the greatest amount of whitish scores 4. A bird can have different scores for primary and secondary coverts. Figures in the tables summarise percentages of birds showing these scores (from Shirihai *et al.* 2010).



Figure 4. Fea's Petrel *Pterodroma feae* off the Isles of Scilly, 16 August 2015. © Joe Pender. A fairly broad base to the bill is evident from above. This is most typical of the two taxa of Fea's Petrel (see illustration depicting average bill measures in Flood & Fisher 2013b, p. 206). On average, the bill of Zino's Petrel *P. madeira* has a somewhat narrower base than this bird.



Figure 5. Fea's Petrel *Pterodroma feae* off the Isles of Scilly, 16 August 2015. © Jim Almond. Note the classic upperside plumage of the *feae*-complex. The petrel has grey coverts and remiges, but grey tones vary creating an obvious dark M-pattern across the open upperwings. It has a dark-grey 'falconer's hood' contrasting with mid-grey nape, mantle, scapulars and back. The rearmost scapulars and most of the rump feathers are dark grey contributing to the dark M-pattern. The uppertail-coverts and tail are light grey and contrast with the darker upperside. Of interest, note a dark gape line separating the white forehead and anterior lores from the white underside.



Figure 6 (above). Fea's Petrel *Pterodroma feae* off the Isles of Scilly, 16 August 2015. © Joe Pender. The underside shows the characteristic starkly contrasting white body and dark underwings of the *feae*-complex. Mid-grey neck tabs extend from the nape down both sides of the neck, and when viewed from certain angles can appear to nearly meet at the centre of the upperbreast suggesting a neck collar. However, this is unlike the great majority of Soft-plumaged Petrels *P. mollis* that have a distinct breast band, and are also more compact than members of the *feae*-complex.



Figure 7 (left). Zino's Petrel *Pterodroma madeira* off Madeira, 24 May 2011. © Kirk Zufelt. Most Zino's Petrels such as this bird lie outside of the overlap zone for size and structure of Zino's and Fea's *P. feae*. Zino's is a medium-small *Pterodroma*, the majority looking petite and slimline, with medium-length wings, and a slight bill.

The views of the Scilly petrel were excellent. As the bird flew around the boat it was quite easy to see that the bill was robust, typical of Fea's Petrel, and not slight like Zino's Petrel, and before consulting photographs, it was felt that the size and structure of the bill fell outside of the range of Zino's Petrel. When consulting photographs the bill looked somewhat more robust than the impression gained in the field (Figures 3 & 4).

There is significant overlap in bill size and structure between Cape Verde Fea's and Desertas Fea's Petrels. However, presumed large male Desertas Fea's have a uniquely massive bill (Figure 8). The Scilly petrel had a robust but not massive bill, and in this respect could have been either of the two Fea's Petrels.

Support criteria

Support criteria come from characteristics studied by Shirihai *et al.* (2010) where there are tendencies toward one taxon or another, but too much overlap for the characteristics to be used as main criteria. Two support criteria were used in this case.

Barring in the inner forewing patches on the underwings: About 95% of Zino's Petrels show little barring, giving this area a clean-white look (versus just over 50% of Desertas Fea's and 35% of Cape Verde Fea's Petrels). Cape Verde Fea's on average shows the strongest barring, with about 65% showing some or strong barring (versus 50% of Desertas Fea's and 5% of Zino's Petrels). The Scilly petrel showed fairly strong barring, most typical of the Fea's Petrels and unlike the great majority of Zino's Petrel.



Figure 8. Desertas Fea's Petrel *Pterodroma f. desertae* off Madeira, 29 June 2011. © George Rezseter. Large male Desertas Fea's are uniquely brutish looking unlike any Cape Verde Fea's *P. f. feae*.

Relative dominance of dark barring versus dark smudging on the flanks:

Hardly any differences were found between the three taxa in the overall amount of dark markings (barring and smudging combined). On average, all three taxa have moderately developed dark barring. However, dark smudging was less developed on Desertas Fea's, poorly developed on Cape Verde Fea's, and fairly well developed on Zino's Petrel. The Scilly petrel showed little dark smudging, typical of the Fea's Petrels and unlike most Zino's Petrels.

Conclusion

The outcome of the process for at-sea ID in the *feae*-complex applied to the Scilly petrel indicated Fea's Petrel. As the petrel flew toward the boat the jizz - in particular the fairly thickset head and body and the long-winged look - gave a strong impression of Fea's Petrel. All-dark underwing-coverts were evident as the petrel banked for the first time and they lacked extensive whitish that would have pointed to Zino's Petrel. As the petrel flew closely around the boat, it became clear that the size and structure of the bill was outside of the range of Zino's Petrel. Subsequent analysis of photographs confirmed field assessment of the robustness of the bill. Also, both barring in the inner forewing patches on the underwings and relative dominance of dark barring versus dark smudging on the flanks were most typical of Fea's Petrel.

Based on current knowledge, it is not possible to determine whether this was a Cape Verde Fea's or a Desertas Fea's. Bill size and structure fell within the large overlap range shared by the two Fea's Petrels. All-dark underwing-coverts is most typical of Cape Verde Fea's, but is known in Desertas Fea's. Jizz, wingspan, primary moult timing, and two support criteria offer no useful additional evidence.

In this article, the process of ID is applied to a bird seen at close range and supported by excellent photographs. What if it had not been photographed? Should the record automatically be relegated to 'not proven'? Not necessarily in my opinion. An experienced observer can determine if the bill structure of a bird falls outside of the small overlap range shared by Fea's and Zino's Petrels. This Fea's was confidently identified in the field before consulting the photographs of it.

However, at long distance (within reason), I am confident only with identification of comparatively robust Fea's Petrels and comparatively lightly-built Zino's Petrels. My confidence levels are based on identification of birds at long distance, subsequently confirmed or refuted with close views or with photographs. In this respect, it is helpful to introduce into the process of ID the head, neck and body structure. Identifiable Fea's have a largish head, fairly long thick neck, full chest, plump belly, and broad hips; identifiable Zino's have a smallish head, short thick neck, flat chest, thin belly, and slim hips. For example, the birds in Figures 7 & 8 can be identified at range, either from a boat with binoculars, or through a telescope on a seawatch. The same is true for Zino's with a diagnostic score 4 in the underwing-coverts, and a near-diagnostic score 3 supported by a lightly-built structure. I am therefore of the opinion that some birds seen from headlands can be identified as Fea's Petrel or Zino's Petrel.

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