SHORT NOTE

A yellow-footed pink-footed shag: an unusual Stewart Island Shag at Taiaroa Head

As part of a study on the behaviour and phylogeny of New Zealand shags, one of us (MK) has been videotaping the colony of Stewart Island Shags (*Leucocarbo chalconotus*) at Taiaroa Head, Otago. On 29 June 1993, he saw an unusual shag with yellow feet, rather than the expected pink. The bird has not been seen since.

Stewart Island Shags are polymorphic in plumage, being typically of one or other of the bronze and pied morphs. The proportions of these two morphs differ quite markedly between Foveaux Strait and Otago populations (Lalas 1983). The bronze morph is completely black with a bluish-green metallic sheen, whereas the pied morph is black with a blue sheen above and white below (O'Brien 1990). Although these morphs predominate, a few shags have intermediate plumages, somewhere in between the bronze and pied morphs (Lalas 1983, O'Brien 1990). In spite of this polymorphism, there appears to be no sexual dimorphism in the species (O'Brien 1990). The legs and feet of Stewart Island Shags vary slightly in colour during life, being dark grey in the downy young, flesh-coloured in juveniles, and pink or dull pink in adults (O'Brien 1990).

We were therefore surprised to see a Stewart Island Shag with striking yellow feet. At first we thought that we may have seen a stray Spotted Shag (*Stictocarbo punctatus*). The video footage clearly showed, however, that the bird was not this species. Because of the distance from the observatory to the nest sites (c.80 m) it was not implausible that the strange foot colour had been caused by mud or some other extraneous deposit, so approximately 20 minutes of video footage was taken of the bird. Viewing of the video tape showed conclusively that the shag did have yellow feet. The colour was quite clear and consistent over both the feet and legs of the shag. It was of intermediate morph, being similar to the bronze morph but with extensive scattered white feathers on the abdomen. The bird appeared to be in breeding condition with a pronounced crest. Apart from its foot colour the bird was similar to others in the colony, in which breeding behaviour had been occurring since early May. It was standing on a nest, although it was not seen to be paired during the 90-minute period of observation.

Stewart Island Shags typically have their legs and feet some shade of pink (see Falla 1932, Voisin 1973, Lalas 1983, O'Brien 1990). This foot coloration is typical of the blue-eyed shags, genus *Leucocarbo* (see Falla 1932, Voisin 1973, O'Brien 1990), and was regarded by Falla (1932) as one of the group's distinguishing characters. Voisin (1973), in proposing that *Leucocarbo* be given the rank of a full genus, considered that foot colour was "... one of the most constant features of the group." None of these references mention that the so-called blue-eyed shags may have yellow feet.

The three genera of the Phalacrocoracidae in New Zealand can for convenience be differentiated by foot colour: species of *Phalacrocorax* have black feet, those of *Stictocarbo* have yellow feet and those of *Leucocarbo* have pink or flesh-coloured feet (Lalas 1983, O'Brien 1990). It is particularly

interesting, though perhaps merely a coincidence, that the "wrong" colour in this bird is right for another group of species.

One possible explanation is that the unusual appearance of yellow is an atavism. This explanation would imply that the ancestral foot-colour of blue-eyed shags was yellow. The most recent phylogeny of the Phalacrocoracidae is that of Siegel-Causey (1988), which has the yellow-footed shags (*Stictocarbo*) as the most derived monophyletic group (see Fig. 1). the group to which the Stewart Island Shag belongs (for which Siegel-Causey uses the genus *Euleucocarbo,* implicitly treated as a synonym of *Leucocarbo* by Turbott 1990) is a sister group of *Stictocarbo.* Nevertheless, the placing of other species of *Leucocarbo* (not New Zealand species) shows that the pink foot-colour is likely to be an ancestral state. Thus, yellow foot colour as an atavism is inconsistent with Siegel-Causey's phylogeny. We suggest, therefore, that foot colour may need to be used with caution as a systematic character in the Phalacrocoracidae.

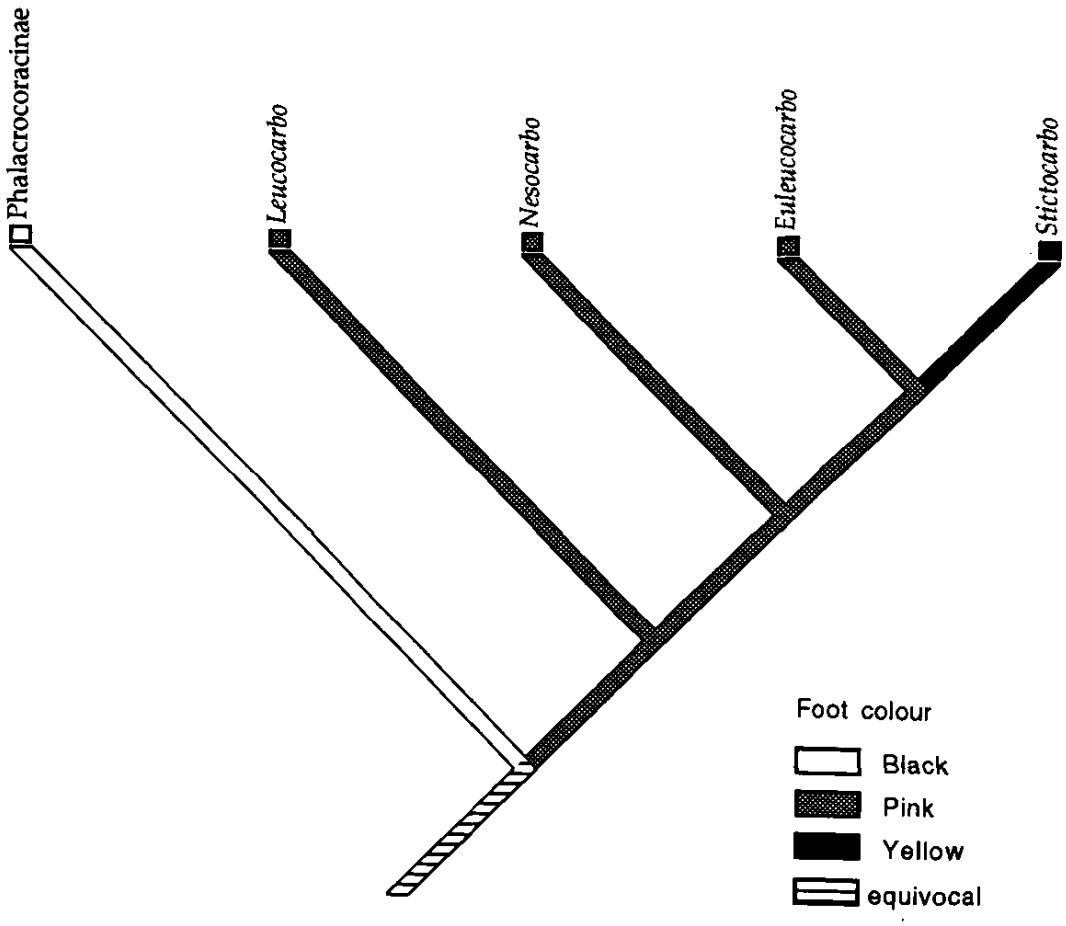

FIGURE 1 — The phylogeny of the New Zealand genera of the Phalacrocoracidae, modified from Siegel-Causey (1988). This author classifies the New Zealand blue-eyed shags in *Euleucocarbo* and *Nesocarbo,* which Turbott (1990) treats as synonyms of *Leucocarbo.* We follow the latter treatment in the text.

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