



Birds Australia Rarities Committee Unusual Record Report Form

Full Name: Phil Jones; Fabio Olmos (FO); TASPAWS ranger Chris Howard; Ra a W. Ste henson RWS); Nikolas K. Haass	Office Use
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Address NKH :	Phone No: Fax/Email:
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Species Name: Macaroni Penguin	Scientific Name: <i>Eudyptes chrysolophus</i>
Date(s) and time(s) of observation:	15 November 2014; 6pm
How long did you watch the bird(s)?	5 minutes
First and last date of occurrence:	15 November 2014
Distance to bird:	10 m

Site Location: Sandy Bay, Macquarie Island, TAS.

Habitat: Subantarctic beach, see attached pictures.
Sighting conditions: Overcast, see attached pictures.
Optical aids used: Leica 12x50 BA, Canon PowerShot D10 (NKH); Canon 5D mk3, Canon 400 mm, f5.6L (RWS); Canon 7D, Canon 100-400mm zoom (FO)

Were other observers present? Do any of the other observers disagree with your identification? Adam Walley and Jim Holmes saw the bird from a greater distance. See detailed discussion about identification.
To your knowledge, is the species seen frequently at this site? If accepted, this will be the 2 nd record for Australia away from Heard Island. The 1 st record was in December 1957 on Macquarie Island (MARCHANT & HIGGINS 1990). For movements around their breeding colonies see Fig. 17.
Did you use a field guide? The bird was instantly identified in the field without using a field guide. References used subsequently to prepare this report were: BERRUTI (1981): The status of the Royal Penguin and Fairy Prion at Marion Island, with notes on Feral Cat predation on nestlings of large birds. <i>Cormorant</i> 9: 123-128. • DAVIS, L.S. & M. RENNER (2003): Penguins. New Haven, London. • DEHNHARD, N., K. LUDYNIA & A. ALMEIDA (2012). A Royal Penguin <i>Eudyptes schlegeli</i> in the Falkland Islands? <i>Marine Ornithology</i> 40: 95-98. • ENTICOTT, J. & D. TIPLING (1997): Seabirds of the World. London. • FALLA, R.A. (1937): Birds. B.A.N.Z. Antarct. Res. Exped. 1929-1931. Rpt Ser. B2: 1-288. • FALLA, R.A., R.B. SIBSON & E.G. TURBOT (1966). A Field Guide to the Birds of New Zealand. London. • HARRISON, P. (1983): Seabirds, an Identification Guide. Beckenham. • HARRISON, P. (1987): Seabirds of the World. A Photographic Guide. London. • DEL HOYO, J., A. ELLIOTT & J. SARGATAL (eds) (1992): Handbook of the Birds of the World. Vol. 1. Barcelona. • HULL, C.L. & A. WILTSHIRE (1999): An apparent hybrid Royal × Rockhopper Penguin at Macquarie Island. <i>Australian Bird Watcher</i> 183: 95-100. • MARCHANT, S. & P.J. HIGGINS (eds) (1990). Handbook of Australian, New Zealand and Antarctic Birds. Volume 1: Ratites to Ducks. Melbourne. • MURPHY, R.C. (1936): Oceanic birds of South America. • Petersen, S. (2002): Plumage variations in Macaroni Penguins <i>Eudyptes chrysolophus</i> breeding on Marion Island. <i>Bird Numbers</i> 11: 12-14. • DE ROY, T., M. JONES & J. CORNTHWAITE (2013): Penguins, Their World, their Ways. CSIRO. • SHAUGHNESSY, P.D. (1975): Variation in facial colour of the Royal Penguin. <i>Emu</i> 75: 147-152. • SHIRIHAI, H. (2007, 2 nd ed.): A Complete Guide to Antarctic Wildlife. London. • SIMPSON, K.N.G. (1985): A Rockhopper × Royal Penguin hybrid from Macquarie Island. <i>Australian Bird Watcher</i> 11: 35-45. • WARHAM, J. (1975): The Crested Penguins. In: STONEHOUSE, B. (ed.) (1975) <i>The Biology of Penguins</i> , pp. 189-269. London. • WHITE, R.W. & A.P. CLAUSEN (2002). Rockhopper <i>Eudyptes chrysolophus</i> × Macaroni <i>E. chrysolophus</i> Penguin hybrids apparently breeding in the Falkland Islands. <i>Marine Ornithology</i> 30: 40-42. • WOEHLER, E.J. & C.A. GILBERT (1990): Hybrid Rockhopper-Macaroni Penguins, Interbreeding and Mixed Species Pairs at Heard and Marion Islands. <i>Emu</i> 90: 198-201. • WOEHLER, E.J. (1995): Bill morphology of Royal and Macaroni Penguins, and geographic variation within eudyptid penguins. In: DUNN, P., I. NORMAN & P. REILLY (eds) (1995) <i>The penguins: Ecology and Management</i> , pp. 319-330. Chipping Norton.
How confident are you of your identification? See discussion below.

Physical Description (see also Figures 1-12)

(1) **Number:** One individual was observed. There was also an immature black-faced Royal/Macaroni-type penguin, which was not identified at species level as morphological parameters cannot be used in young penguins with still growing bills (Figure 13).

(2) **Age, sex:** Adult, based on length of crest; female based on culmen length and bill depth.

(3) **Size and shape:** Conspicuously smaller than accompanying Royal Penguins *E. schlegeli*. The bill appeared shorter and more slender in comparison to accompanying Royal Penguins. For analysis of photographs and discussion see below.

(4) **Plumage colour and pattern:** Despite being overall similar to dark-faced Royal Penguin, this bird stood out of the crowd by being smaller (see above) and conspicuously blacker. Head, face, chin and throat were black. Throat and lower face, however appeared to be more reflective than face mask and crown and hence the 'blackness' changed with observation angle and light (see photographs by FO & RWS below and movie by NKH here: <http://www.adarman.com/Trips/New-Zealand/Subantarctic-Islands/Macquarie-Island/i-gXTdWZ5/A>). Even when facing away, the bird was clearly recognizable in the field by its smaller size and blacker upperparts. The yellow-orange crest, which merged on the forehead in a Royal/Macaroni fashion, appeared more 'orderly' than in the accompanying Royal Penguins.

(5) **Colour of bill, eyes and legs/feet:** Eye colour red.

(6) **Calls:** None heard.

(7) **Behaviour, movements, flight pattern, feeding, interactions with other birds, comparisons with other species:** Nothing to support specific identification.

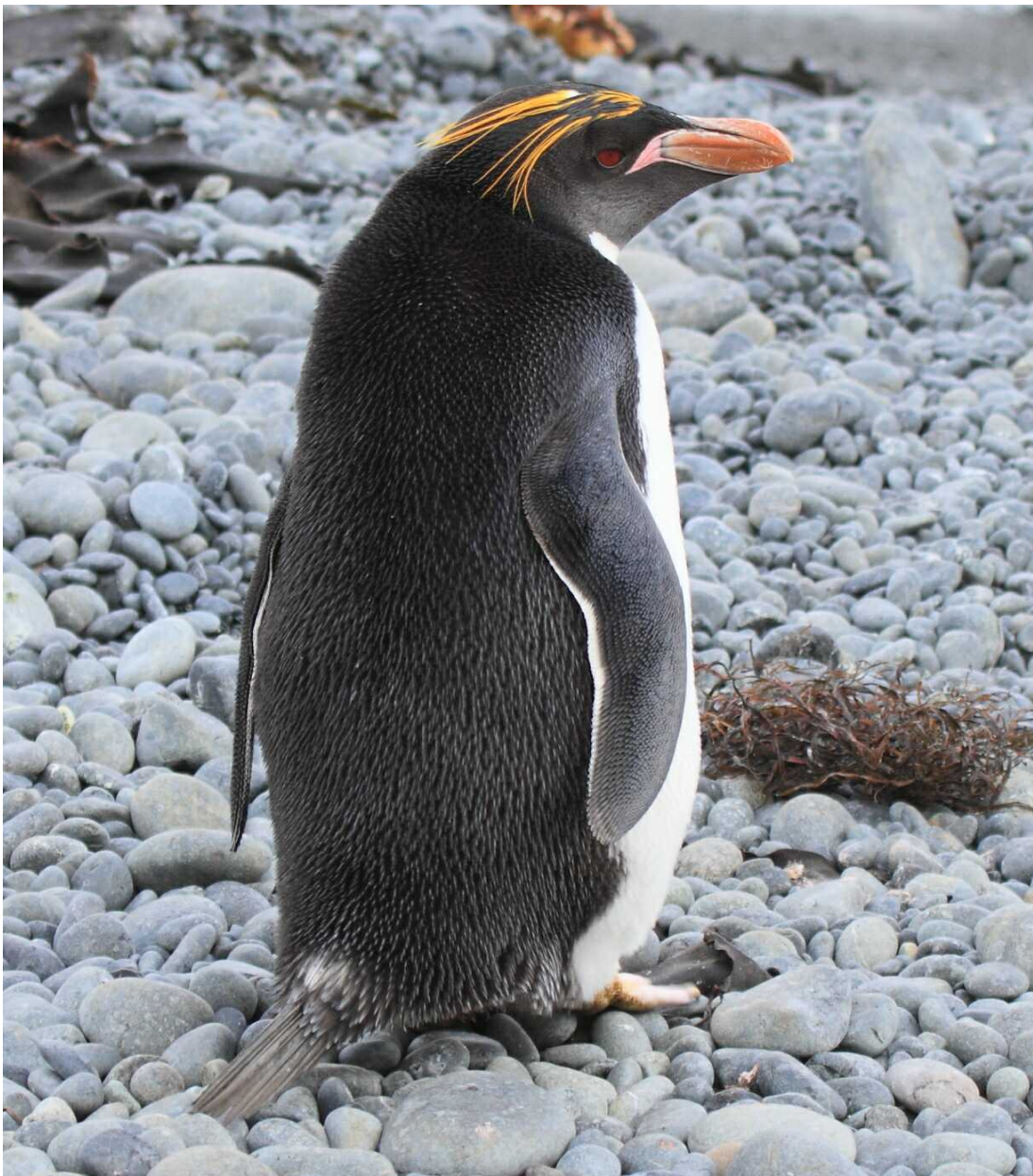


Figure 1: Macaroni Penguin at Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photograph: Fabio Olmos.



Figure 2: Macaroni Penguin with Royal Penguins at Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photograph: Fabio Olmos.



Figure 3: Macaroni Penguin with Royal Penguins at Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photograph: Fabio Olmos.



Figure 4: Macaroni Penguin with Royal Penguins at Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photograph: Fabio Olmos.

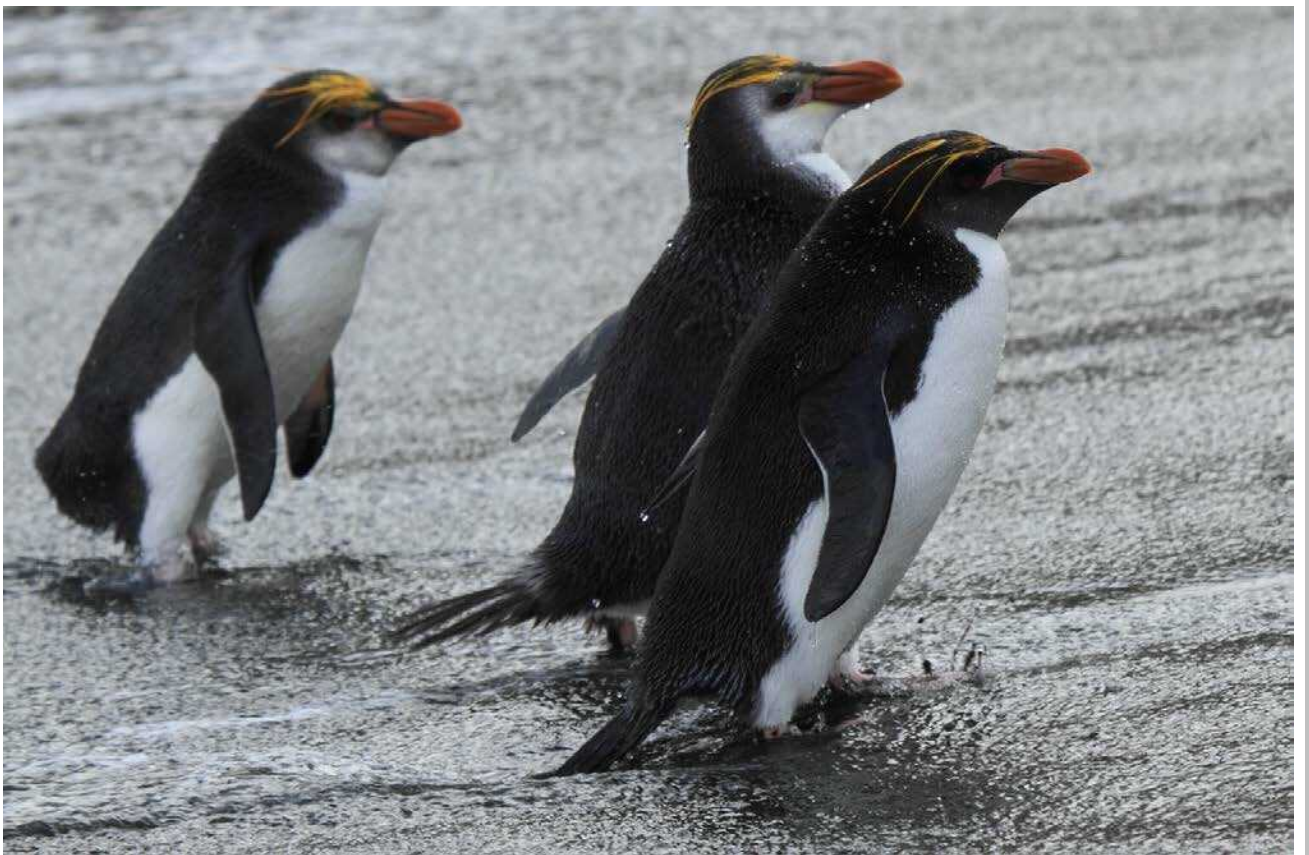


Figure 5: Macaroni Penguin with Royal Penguins at Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photograph: Fabio Olmos.



Figure 6: Macaroni Penguin at Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photograph: Fabio Olmos.



Figure 7: Macaroni Penguin with Royal Penguins at Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photograph: Fabio Olmos.



Figure 8: Macaroni Penguin with Royal Penguins at Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photographs: Raja Stephenson.



Figure 9: Macaroni Penguin with Royal Penguin at Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photograph: Raja Stephenson.

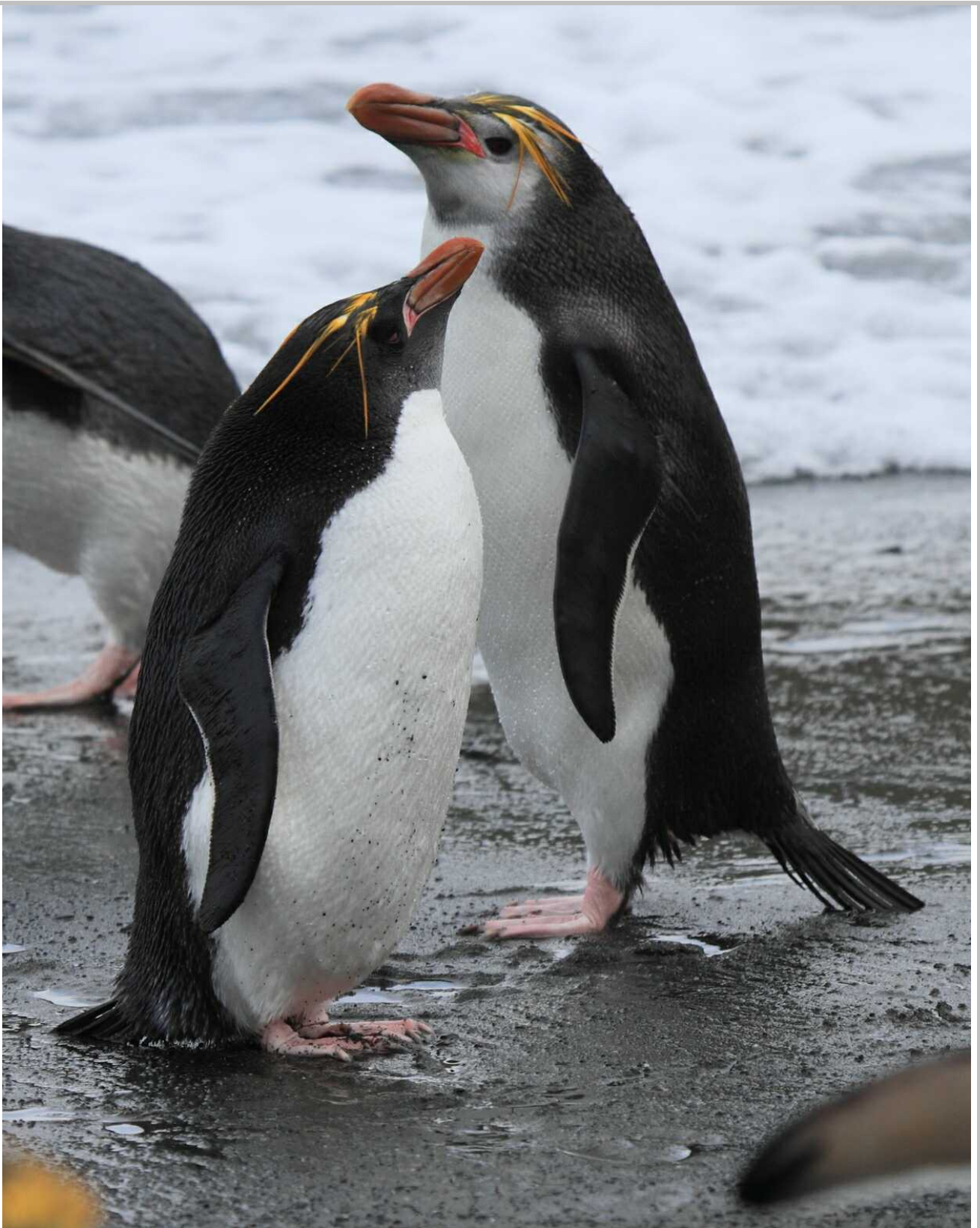


Figure 10: Macaroni Penguin with Royal Penguins at Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photograph: Fabio Olmos.



Figure 11: Macaroni Penguin at Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photographs: Raja Stephenson.



Figure 12: Macaroni Penguin at Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photograph: Raja Stephenson.



Figure 13: immature dark Royal/Macaroni-type penguin for comparison, Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photographs: Raja Stephenson.



Figure 14: intermediate Royal Penguins for comparison, Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photograph: Raja Stephenson.



Figure 15: intermediate and pale Royal Penguins for comparison, Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photograph: Raja Stephenson.



Figure 16: intermediate Royal Penguins for comparison, Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photograph: Raja Stephenson.

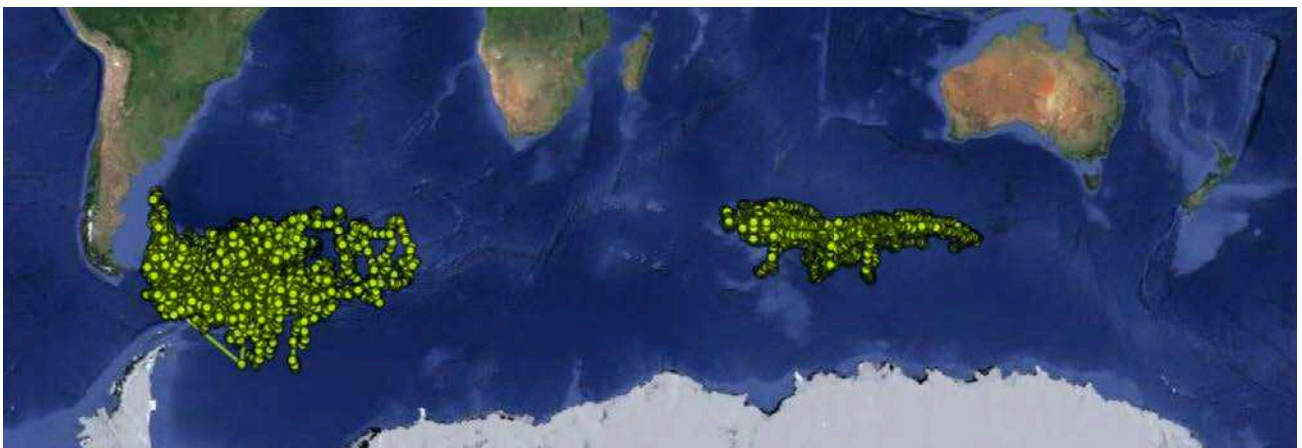


Figure 17: Macaroni Penguin tracks from some colonies in South Georgia and the Kerguelen Islands. Source: BirdLife International, Seabird Tracking Database (<http://www.seabirdtracking.org>)

Other species seen:

5000+ Royal Penguins *Eudyptes schlegeli* and 5000+ King Penguins *Aptenodytes patagonicus*. Nearby, we saw 32 Gentoo Penguins *Pygoscelis p. papua* and 350 Eastern Rockhopper Penguins *Eudyptes [chrysocome] filholi*.

Other species with which you think it might be confused and how these were eliminated?

There is only one other species it might be confused with: the closely related Royal Penguin *Eudyptes schlegeli*.

Discussion

Facial colour: Dark morph Royal Penguin with sooty grey throat and cheeks resembles Macaroni Penguin (e.g. MARCHANT & HIGGINS 1990; SHIRIHAI 2007; DE ROY *et al.* 2013). SHAUGHNESSY (1975) studied the facial colour variation at 11 Royal Penguin colonies on Macquarie Island and divided them into three groups: white, intermediate and dark. However, each of the three groups had considerable colour variation with only the darkest of the dark group Royal Penguins being as dark as a Macaroni Penguin, but they were not very common (SHAUGHNESSY pers. comm.). While facial colour was independent of age, there was a higher frequency of dark-faced females than males in each colony (SHAUGHNESSY 1975). The age-independence is *contra* FALLA (1937) but the correlation of sex with facial colour confirms FALLA *et al.* (1966). White-faced birds were more common at the east coast and dark-faced bird more common at the west coast (SHAUGHNESSY 1975). Often Macaroni Penguins are said to have a jet-black face and throat, but our analysis of photographs of this taxon reveals that birds with a facial pattern very similar to identical to the bird reported here is common (HARRISON 1987; SHIRIHAI 2007; DEHNHARD *et al.* 2012; DE ROY *et al.* 2013; <http://www.arkive.org/macaroni-penguin/eudyptes-chrysolophus/>). Moreover, there are descriptions of completely white-faced individuals among Macaroni Penguins (BERRUTI 1981; PETERSEN 2002).

Measurements: Although Royal Penguin is in average larger and heavier-billed than Macaroni Penguin, there is considerable overlap – especially between female Royal Penguins and male Macaroni Penguins (MARCHANT & HIGGINS 1990). According to WOEHLER (1995) for Royal Penguins the mean culmen length in males (64.75 mm) is 13% greater than in females (57.26 mm) and the mean bill depth in males (32.88 mm) is 19% greater than in females (27.61 mm); for Macaroni Penguins the mean culmen length in males (61.36 mm) is 14% greater than in females (53.74 mm) and the mean bill depth in males (27.50 mm) is 14% greater than in females (24.04 mm) (Table 1).

	<i>M</i> Royal (CL 64.75 mm; BD 32.88 mm)	<i>F</i> Royal (CL 57.26 mm; BD 27.61 mm)	<i>M</i> Macaroni (CL 61.36 mm; BD 27.50 mm)	<i>F</i> Macaroni (CL 53.74 mm; BD 24.04 mm)
<i>M</i> Royal (CL 64.75 mm; BD 32.88 mm)		CL +13%	CL +6%	CL +20%
<i>F</i> Royal (CL 57.26 mm; BD 27.61 mm)	BD +19%		CL -7%	CL +7%
<i>M</i> Macaroni (CL 61.36 mm; BD 27.50 mm)	BD +20%	BD +0.4%		CL +14%
<i>F</i> Macaroni (CL 53.74 mm; BD 24.04 mm)	BD +37%	BD +15%	BD +14%	

Table 1: Differences in mean culmen length (CL) and mean bill depth (BD) in male (*M*) and female (*F*) Royal and Macaroni Penguins (data from WOEHLER 1995). In the pairs measured in this BARC submission the Royal Penguin had a 21.5% longer culmen and a 23% deeper bill. Thus culmen length fits best female Macaroni but bill depth female Royal or male Macaroni Penguin (see also Figure 21).

Measurements following WARHAM (1975) were taken using the line tool in Photoshop in Figures 18-20.

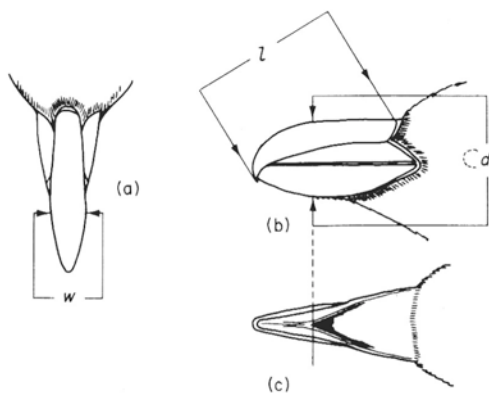


Figure 10.4 Methods used for bill measurements: (a) culmen width (*w*), (b) culmen length (*l*) and bill depth (*d*), (c) underside of bill showing point just behind mandibular symphysis at which depth was measured

Reproduction of Figure 10.4 from WARHAM (1975) to demonstrate how culmen length and bill depth were measured. Note: As we did not catch the bird, we took only relative measurements on photographs. No bill width measurements were taken, as no photographs were available to allow for this.



Figure 18: Macaroni Penguin with Royal Penguin at Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photograph: Raja Stephenson. Note: The numbers indicate arbitrary units measured using the line tool in Photoshop. These numbers were used for the calculations in the measurement paragraph of the discussion.

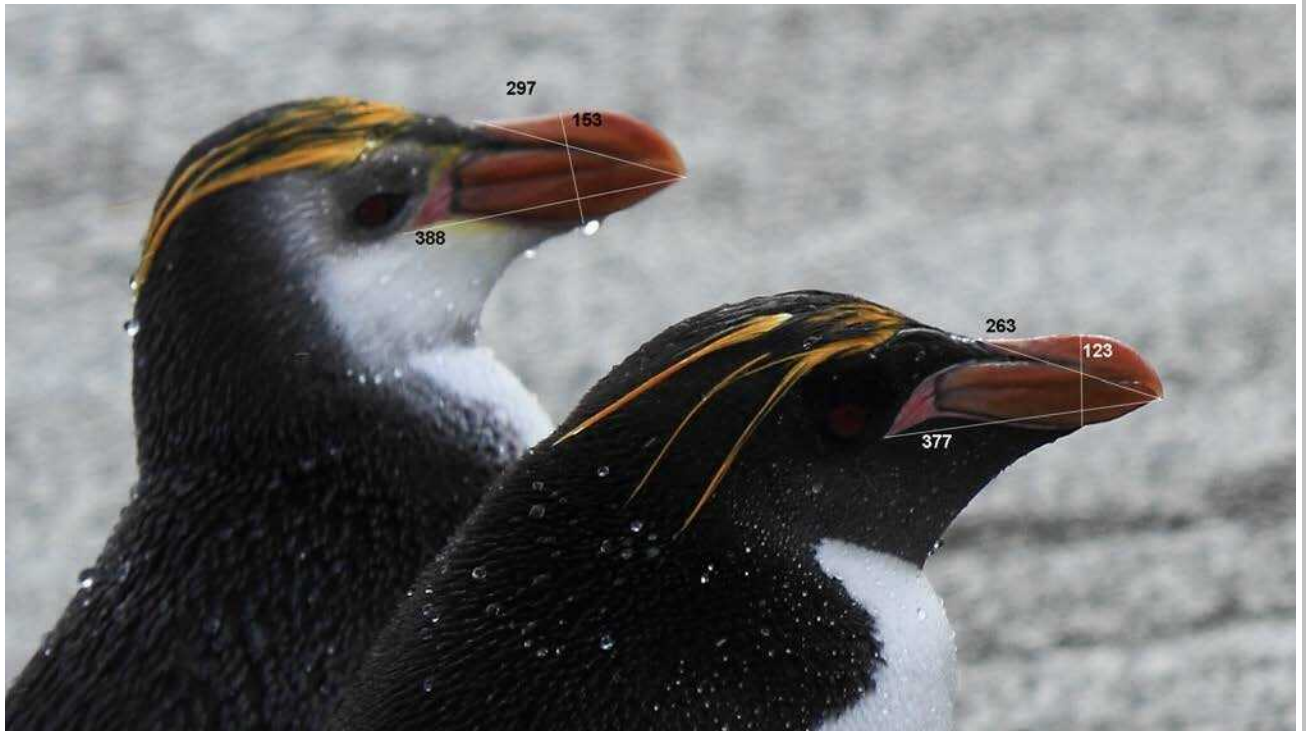


Figure 19: Macaroni Penguin with Royal Penguin at Sandy Bay, Macquarie Island, TAS, 15th November 2014. Photograph: Fabio Olmos. Note: The numbers indicate arbitrary units measured using the line tool in Photoshop. These numbers were used for the calculations in the measurement paragraph of the discussion.

The white-faced Royal Penguin on the right in Figure 18 (presumably an adult male) had a 31% greater culmen length and 30% greater bill depth than the bird reported here on the left of Figure 18. Assuming an average or maximum male Royal Penguin culmen length of 64.75 or 68.6 mm, respectively (WOEHLER 1995) for the right bird, the culmen of the left bird would be 49.15 or 52.08 mm, respectively. Assuming an average or maximum male Royal Penguin bill depth of 32.88 or 36.1 mm, respectively (WOEHLER 1995) for the right bird, the bill depth of the left bird would be 25.33 or 27.81 mm, respectively. Taking Figure 19 for the calculations, culmen length would be 57.34 or 60.75 mm and bill depth 26.43 or 29.02 mm. (Note: Initially we had included measurements taken on Figs. 9 & 10 but decided to take them out as the bill of the bird in question was either slightly opened, Fig. 9, or not parallel to the observer, Fig. 10). Both culmen length and bill depth fall within the range of both female Macaroni and female Royal Penguins, but are too small for males of either species (Figure 20). Unfortunately, the photographs do not allow calculation of the full Bill Shape Index (BSI: (Culmen length x culmen width x bill depth)/10; WARHAM 1975; WOEHLER 1995).

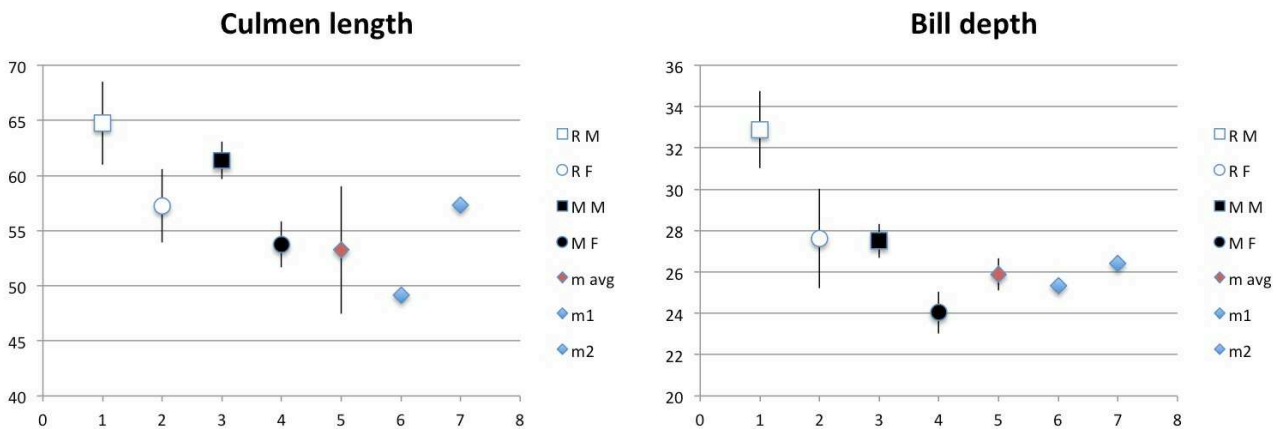


Figure 20: Culmen length (left panel) and bill depth (right panel). RM=male Royal, RF=female Royal, MM=male Macaroni, MF=female Macaroni (average and standard deviation; all data from WOEHLER 1995). Red diamond: Average measurements of the bird reported here (from Figures 18 & 19, based on assuming that the reference Royal Penguin was an average male according to WOEHLER 1995) including standard deviation (error bars). Blue diamonds (m1, m2) represent the individual measurements of the bird reported here (m1 from Figure 18, m2 from Figure 19, based on assuming that the reference Royal Penguin was an average male according to WOEHLER 1995). Note: Interestingly, in Figure 19 the bill of the Royal Penguin appeared genuinely short and stubby, resulting in a relative longer culmen length of the reported bird.

Vagrancy: Despite multiple claims of Macaroni Penguins on Macquarie Island only one – in December 1957 – has been documented in the literature (MARCHANT & HIGGINS 1990). An immature male Royal Penguin has been reported from New Island, Falkland Islands (DEHNHARD et al. 2012), implying that the reverse could be possible too.

Hybrids: Not much is known about hybridization of eudyptid penguins. Both hybrid Macaroni x Rockhopper Penguin as reported from Heard Island and the Falkland Islands (WOEHLER & GILBERT 1990; WHITE & CLAUSEN 2002) and Royal x Rockhopper Penguin as reported from Macquarie Island (SIMPSON 1985; HULL & WILTSHIRE 1999) can be excluded as in the bird reported here the yellow-orange crest merged on the forehead in a Royal/Macaroni fashion. It remains unclear, however, if and how the unlikely case of a Macaroni x Royal hybrid can be excluded.

Other confusion species: All other *Eudyptes* were easily ruled out by combination of plumage pattern, bill and crest shape.

Comments: Three eudyptid penguin experts saw this report.

Nina Dehnhard (before she saw the measurements): ‘I think that it is a Macaroni Penguin, based on differences in size and especially bill size’

Nina Dehnhard (after she had seen the measurements): ‘I still think it's a very good candidate for a Macaroni, even though the measurements don't make it 100% sure.’

Eric Woehler would not accept any claims of Macaroni in the absence of empirical bill metrics.

Peter Shaughnessy: ‘It sure looks like a Macaroni to me; it even looks uncomfortable among the pale faced Royals. But I'm with Eric, bill measurements are necessary for the record to be convincing.’ However, in Peter Shaughnessy's study (SHAUGHNESSY 1975) only the darkest of the dark group Royal Penguins being as dark as a Macaroni Penguin, but they were not very common (SHAUGHNESSY pers. comm.).

Summary: We believe that it is important to document all Macaroni-phenotype penguins outside their range carefully to provide a reference for future sightings. Obviously, we recommend – the appropriate ethics approval provided – to catch the bird in question and to take the measurements suggested by WARHAM (1975) and WOEHLER (1995) and to calculate the Bill Shape Index.

The bird reported here certainly falls into Shaughnessy's dark group, in fact the dark end of the dark group, and was conspicuously smaller than the present Royal Penguins. NKH's conclusion: These two differences *combined* with the measurably short culmen and slender bill depth are in favour of a female Macaroni Penguin (although neither the plumage alone nor the measurements alone would be sufficient to exclude a dark female Royal Penguin). Phil Jones and Fabio Olmos, the two observers who had seen it well and had previous experience with the species, are convinced that the bird reported here was a Macaroni Penguin.

Although the immature penguin in Figure 13 also falls into Shaughnessy's dark group and the bill is even shorter, we are not able to identify this bird down to species level, as the bill at this age (2nd or max. 3rd year) is still growing.

Was the description written from notes and/or sketches made (tick box):

during the observation or; shortly after the observation or; from memory; with the aid of the photographs; with the aid of measurements

Please indicate supportive evidence available.

Was the bird: photographed, taped or video taped? If yes to any of these, by whom? FO, RWS (photographs) & NKH (video). For more of RWS's photographs and for NKH's movie of the Macaroni Penguin see here:

<http://www.adarman.com/Trips/New-Zealand/Subantarctic-Islands/Macquarie-Island/>

What experience have you had with the species in question?

NKH (nhaass@yahoo.com) has extensive experience with seabirds having been pelagic trip leader on many trips off New South Wales, Tasmania, California, New Jersey/New York and Delaware/Maryland and having participated on many pelagic trips off North Carolina, Galapagos, Queensland, New Zealand and the Sub-Antarctic. NKH has been an active member in the Rare Birds Committees of New Jersey (USA), Hessen and Schleswig-Holstein (both Germany). Following IOC 5.1, NKH has seen 10 penguin species around the world and 5 in Australia. NKH has never seen a Macaroni Penguin before. NKH wrote this report.

RWS (raja@adarman.com) has extensive experience with seabirds having participated on many trips off New Jersey/New York and Delaware/Maryland, North Carolina, New South Wales, Tasmania, Queensland, New Zealand and the Sub-Antarctic. Following IOC 5.1, RWS has seen 9 penguin species around the world and 5 in Australia. RWS has never seen a Macaroni Penguin before.

Phil Jones (philjones@beamingbroadband.com) is a bird bander and an international bird guide. He used to lead fulltime for Ornitholidays which is one of the largest four birding travel companies in the UK. He has seen Macaroni Penguins previously. Phil is convinced that the bird reported here is a Macaroni Penguin.

Fabio Olmos (fabio.olmos@permianglobal.com) is a biologist, environmental consultant and avid birder. He has extensive experience with birds of the South Atlantic, where he has seen Macaroni Penguins previously. Fabio is convinced that the bird reported here is a Macaroni Penguin.

Chris Howard (Chris.Howard@aad.gov.au) is a TASPAWS ranger on Macquarie Island and has extensive experience with Royal Penguins. He has seen many dark-faced Royal Penguins and thinks that the bird reported here was a very good candidate for a Macaroni Penguin.

Adam Walley (a_walley@yahoo.com) is an international bird guide (including on this Heritage expedition trip). He has seen all penguin species. Adam saw the bird from further away.

Jim Holmes (jfholmes@ucdavis.edu) is an experienced world birder. Jim saw the bird from further away.

Nina Dehnhard (nina.dehnhard@web.de), **Eric Woehler** (eric.woehler@gmail.com) and **Peter Shaughnessy** (Peter.Shaughnessy@samuseum.sa.gov.au) are eudyptid penguin experts who commented on this report (see comments).

Signature:



Date: 26th January 2015