DETAILS OF FIVE SNARES PENGUINS *EUDYPTES PACHYRHYNCHUS ROBUSTUS* FROM TASMANIA, 1978–2009

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ABSTRACT

Further details are provided for five Snares Penguins *Eudyptes pachyrhynchus robustus* from Tasmanian coasts. Two were mentioned in press reports; four of five briefly listed in birdwatching journals. Their years of occurrence range from 1978 to 2009, and their seasonal range from July to September and early February, with four in winter and one in summer. Identification was primarily based on head features and plumage, all individuals being readily recognisable. No observer or carer is known to have taken basic measurements, although all five penguins were well photographed. A portrait of each is included for validation, future identification and reference purposes. An estimate of age has been tentatively assigned to each individual; considered to be three 2nd year and two 3rd year penguins. A revised list of Tasmanian Snares Penguin records is provided.

INTRODUCTION

This paper is to confirm the identity of five penguins, place them on more public record, and also to present evidence enabling field observers to become more confident and to improve identity decisions based on external (phenotypic) characters.

This paper is a continuation of the author's long term review of the identity and occurrence of rare penguins located on the southern continental Australian coast, especiallythat of juvenile and 2nd year *Eudyptes* penguins. For review purposes, 'rare penguins' are considered to be all penguin species other than the resident breeding Little Penguin *Eudyptula minor novaehollandiae*. For further details see Simpson (2008a, 2008b). The Snares Penguin is here treated as a subspecies of the Fiordland Penguin *E. p. pachyrhynchus*, following Christidis & Boles (2008).

Institutional Abbreviations

BARC	Birds Australia Rarities Committee, Melbourne.
BOAT	Bird Observers' Association of Tasmania (now Birds Tasmania)
DPIPWE	Department of Primary Industries, Parks, Water & Environment

QVMAG Queen Victoria Museum and Art Gallery, Launceston

TMAG Tasmanian Museum and Art Gallery, Hobart and Rosny Park

TNPWS Tasmanian National Parks and Wildlife Service, Hobart (now part of DPIPWE)

Biological Abbreviations

BWDL Black/white demarcation line between throat and breast plumage

OUFP Observable Underflipper Pattern

SS/C Superciliary Stripe/Crest

RUFP Residual Underflipper Pattern

The alternative 'RUFP' appears when the penguin is dead and dehydrated, or is a study skin, representing only the degree and extent of black melanin pigment in the feathering of the distal underflipper, i.e. the normal underwing pattern of a seabird and the individual pattern of any particular penguin (Simpson 2007). It is not applicable to these five penguins but is included for completenes

ORIGINAL OBSERVATIONS and COMMENTARY ON EACH

The five Snares Penguins are described in sequence of initial reporting, with at least one photo of each. Four were submitted to BARC (September-October 2009) for ratification. Two records are fully verified sight reports. The other three penguins were taken into care; two were released when deemed fit. An injured penguin was put down after surviving for nine weeks in care.

All five penguins correspond with descriptions by Oliver (1953) and Warham (1974); also with Figures 1-3 and Plate 10 in O'Brien (1990); with Plate 20 in Robertson & Heather (1999); and with plates in all four current Australian field guides: Morcombe (2003), Pizzey & Knight (2007), Simpson & Day (2004) and Slater, Slater & Slater (2003).

1978 Snares Penguin

WINTER: 26 August 1978. 'Beach at Port Arthur', Tasman Peninsula, SE Tasmania (43º 7'S, 147º 50'E). Found alive on rocks, and reported to wildlife authorities by two 8 year-old boys, Roger McGinniss and John McPherson, as being 'in poor condition'. The penguin was then taken for observation and care.

An account of the penguin and a photo taken at Sandy Bay, Hobart, was published in the Hobart *Mercury* (Phillips 1978), in which David Rounsevell (TNPWS) discussed the bird, confirming its identity as a Snares Penguin. Rounsevell took the penguin to his home for care and release when ready.

It was subsequently listed or mentioned without significant detail by Thomas (1980), Wall (1980), Sharland (1981), O'Brien (1990) and Woehler (1992).

KNGS commentary: [Plate 1]. A copy of the press article and photo was supplied to the author by Lesley Kurek on 29 May 2007. From that single head-on photo, just enough of the features of a Snares Penguin are visible to be certain of its identity. They are: black cheeks, position of the narrow anterior tip of the SS/C, large bill (length not visible), and a trace of white tissue in the gape and along the proximal portion of the left mandible. Quoted from the descriptive text for Snares Penguin: 'Viewed from the front, the superciliary stripes form a V diverging from the base of the bill' (O'Brien 1990). This feature is exemplified in the press photo. However, when similarly viewed, Fiordland Penguins have a similar V, so caution is advised on this point.

The OUFP on the right side of the bird indicates a black distal area, *typical of many* Snares Penguins (Simpson 2007). However, some Snares Penguins have a *smaller* black area, concentrated mainly toward the mid-line from the flipper tip, and *more nearly the typical pattern* of the 'average' Fiordland Penguin. For such an example, see the left OUFP of the 2009 Snares Penguin from Tasman Island and Anchor Rock (Plate 8). There can be considerable overlap between the two subspecies, so that OUFP and RUFP cannot be regarded as diagnostic of either subspecies, but rather as one more useful clue to identity.

A set of five photos of this penguin was also taken by Hans and Annie Wapstra, copies being received by the author on 4 July 2008. Hans was employed by TNPWS, and took over custody of this penguin from Rounsevell for a short period. The photos were taken at Blackmans Bay, Hobart, just before its release there in early September, although the precise date was not recorded.

Plate 1. Snares Penguin ('Oscar') found 26 August 1978. Note plain black cheeks, anterior point of origin of the narrow SS/C and its wide lateral separation on the head. A hint of white skin shows in the gape. Considered a 2nd year penguin (see Plate 2 for further details). Photo: Press photographer; copyright Hobart *Mercury*.

[Plate 2]. A right side-face view, and the right OUFP. The penguin has a glossy black chin, throat and face, with no hint of the dullness, greyness or pale cheek striations that might indicate a juvenile. The reddish-brown bill is relatively long and more 'ovoid' or 'elliptical' when compared to Fiordland Penguins judged to be of similar age (this review). Pale pinkish skin of the gape and along the lower mandible edge does not extend distally as far as might be expected; in all the Wapstra photos apparently not quite reaching the most anterior chin feathering. Iris colour was dark and difficult to distinguish from the photos. On the right side the OUFP again shows the large black distal patch of Plate 1. Plumage overall appears to be in good condition and the penguin healthy. As a wintering individual, there is no sign of moult.

The SS/C is pale yellow and on the basis of its total length it is considered to be a factor indicating a 2nd year penguin (this review), being short but well established. See general discussion on age below. From the sum of features available in Plates 1 and 2, the penguin is certainly *robustus*.

Plate 2. The same Snares Penguin at the release site, Blackmans Bay, Hobart, in early September 1978. Note long bill, bill colour, pale gape and mandibular skin, total length of SS/C and the right side OUFP. Photo: Copyright Hans & Annie Wapstra.

1997 Snares Penguin

WINTER: 30 or 31 July 1997. Beach near Little Henty River, [south of] Trial Harbour, central west coast, Tas. (41º 57'S, 145º 12'E). Penguin found and reported by a member of the public, as 'alive but injured'. Ranger Eddie Furphy (TNPWS) went out and collected the penguin.

Listed by Eades (1997): 'Also in August an injured Snares Penguin' was found at Trial Harbour, …'. This is *contra* the July date of Wakefield & Wakefield (1997): *viz*. 'The 7th record for the state was of a bird with a broken leg at Trial Harbour in July …'. No other details were provided by these authors. This was the total sum of public knowledge concerning this penguin until 2007.

KNGS commentary: The following additional information was gathered between September 2007 and August 2009. The penguin had been placed in care of Tomoko Chida, on 1 August 1997. At the time, her husband was a Senior Ranger with TNPWS, based at Queenstown, central west Tasmania. Evidence of the penguin is a set of full-colour photos by T. Chida taken whilst the penguin was alive. The penguin had a badly broken leg. With veterinary and home care, it survived for just over nine weeks. However, no serious improvement in condition could be achieved and it was euthanased on 6 October 1997.

Tomoko Chida had informed me during 2007 that the body had been sent to QVMAG. On the author's earlier request, the museum's register, the freezer and also the skin, spirit and osteology collections had *already* been examined when searching their collection for rare penguins in 2006 but this individual was not found. I met Chida for the first time at the International Penguin Conference in Hobart held on 3-7 September 2007, when she showed me the photos. On request she gave me copies of the five best, received 6 September 2007. After the conference a return visit was made to QVMAG when another search was made but without result. Neither was it obviously at the TMAG, where similar searches had also been made in 2006 and 2007.

More recent discussion with Chida (2 August 2009), revealed that it had been kept in the TNPWS freezer in Queenstown, Tasmania, and was in good order. When opportunity offered during late 1997, she and her husband had driven the penguin's body to Launceston and handed it in to QVMAG. Since 1997 it has apparently not been sighted.

Discussions were then held with QVMAG staff Tammy Gordon (Technician) and Judy Rainbird (Collections Manager), on 14 and 18 August 2009, respectively. Further searches are to be initiated. A new curator (not a vertebrate specialist) had been appointed to the museum for a short time in that same 1996-1998 period approx. and it is not known how the penguin was treated after receipt.

[Plates 3 and 4]. Apart from its leg injury, the penguin was in excellent winter plumage. All features as described for the 1978 Port Arthur penguin (above) are similar in this penguin. Bill *length* is emphasised in Plate 3; Plate 4 gives a better idea of its real depth. To appreciate bill length, depth, and elliptical shape of sub-adult Snares Penguins, in comparison with the stubbier bill of a 2nd year Fiordland

Penguin, see also the side-face studies in Plates 2, 3 and 5 of Simpson (2008a), and compare them with the bills of the five penguins in this paper.

Plate 3. Left facial study which emphasises the length of the bill but not its true depth. Detail of anterior SS/C and dull red eye are well displayed. Considered a 3rd year penguin. Photo: Tomoko Chida.

Plate 4. Standing, showing right side. Note the better view of the bill, showing its depth, and also eye colour, the considerable development of the SS/C, and the distal blackness of the OUFP. Photo: Tomoko Chida.

It was initially estimated, from comparison of its relative SS/C plume length with other Snares Penguin photos and with photos of museum skins, to be in its 2nd year; *just possibly* in its 3rd year. The SS/C droops further down the side of the neck than those depicted in Plates 2 and 5; but is very similar in length to the two penguins in Plates 6, 7 and 8. No measurements seem to exist. Based on Plates 3 and 4, the penguin is certainly *robustus*. Based on the lengtn of the SS/C in particular, I now believe it to be a 3rd year penguin.

1997 Snares Penguin

WINTER: 31 August to 1 September 1997. Seen at two adjacent localities in the Eaglehawk Neck area, eastern side of Tasman Peninsula, SE Tas. (43º 03'S, 147º 57'E). The penguin was located from a boat chartered for pelagic birdwatching on 31 August 1997, just north of Waterfall Gully, and 3-4 km south of the Pirates Bay jetty. Observers were Chris Lester, John Barkla, W. (Bill) Wakefield, and eleven other birders. Sight record; excellent photos taken.; reported as '... a healthy bird in Waterfall Bay, … present at the Blow Hole the following day'.

On 1 September 1997, it was relocated by Mike Carter, John Males and Tony Palliser, having moved about 1.5 km further north to the Blowhole nearer to Pirates Bay (43º 02'S, 147º 57'E). Observed initially from the boat, then on land from a rock shelf. Sight record, with further good photos (Plate 5). There was rapid agreement among all observers in the field as to the penguin's identity. On 2 September 1997, Peter Lansley and Phil Macumber failed to find it.

Listed by Eades (1997), as being 'in immaculate adult plumage'. He considered it to be '*circa* the 7th Tasmanian Snares Penguin record'; report includes a photo by T. Palliser; listed also by Wakefield & Wakefield (1997).

KNGS commentary: The record was submitted to BARC by J. Barkla, C. Lester, and W. Wakefield on 23 June 2001, accompanied by three field sketches (head, leg and foot, and underflipper pattern); BARC Case no. 317. I redefined it in an unpublished report to BARC in July 2001 as 'sub-adult', based on SS/C length and other details. Record accepted as a Snares Penguin; notification given by Palliser (2002). A much reduced field note sketch by Barkla of this penguin's OUFP was reproduced in a poster presentation (Simpson 2007). In October 2007, the age of the penguin was provisionally revised to being in its 2^{nd} year.

Two transparencies received from Mike Carter, dated 1 September 1997, very clearly show that the bill is bright red, the SS/C richly yellow and consistent in length to a 2^{nd} year Snares Penguin. The tail is fully developed.

The observation by Eades (1997) that it was 'in immaculate adult plumage' is at apparent odds with the evidence. The photo by Tony Palliser in Eades (1997), shows less of the penguin's breast, and is a slight variant of the photos (Plate 5a and 5b), which show disturbed ventral feathering of the upper breast, with stains below that. These stains seem to emanate from a possible double puncture, better seen in Plate 5b. Any sign of disturbed contour feathering in wintering penguins usually indicates an external or internal injury, and may account for its presence on shore.

Plate 5a (left). Snares Penguin stretching, showing right OUFP. In both photos note a possible injury, with staining to the upper breast, 1 September 1997.

Plate 5b (right). The same Snares Penguin in a typical hunched attitude, displaying evenly-coloured red bill, pale gape, the total length of its bright yellow SS/C and long tail. Considered a 2nd year penguin. Photos: Copyright Mike Carter.

2008 Snares Penguin

WINTER: 12 July 2008. Eaglehawk Neck Beach, Tasman Peninsula, Tas. (43º 01'S, 147º 55.5' E). Found by W. (Bill) Wakefield, Els Haywood, Ruth Brozek and her son Milosh, also Hans and Ruth Steinhauser. Two photos were taken on the beach by Wakefield. Collected from the beach by David Irvine (DPIPWE), and taken to the veterinary practice of Dr. Barry Wells, Kingston Beach, Hobart, for assessment and treatment. The penguin had a deep cut to its back, and was reported as emaciated.

It was placed in care of David Pemberton (DPIPWE) and 'given a few weeks rehabilitation' in his backyard. Prior to release, two photos by a press photographer were published in the Hobart *Mercury* on 16 August 2008, with a short article (Glaetzer 2008). The penguin had originally been scheduled for release on 14 August 2008, but bad weather held it over until some time in the following week. Therefore, place of release and precise date is not known.

KNGS commentary: A copy of Wakefield's photo of this penguin (not published here) shows it on the beach in ankle-deep water. It is standing upright (slightly more so than the posture of the penguin shown in Plate 5b). The bill is red. No pale skin of gape or mandible is visible. There is no sign of the back injury in this photo. The SS/C is yellow and because of posture and possibly a controlled retraction of the plumes, it seems comparable with the SS/Cs shown in Plates 2, 5a and 8, *perhaps* a few millimetres longer and there fore a likely 2nd year penguin. The tail is long, as it should be by mid-year.

The selected photo (Plate 6) shows the important Snares Penguin features, including a well developed and drooping SS/C, leading to the author's previous expectation from Wakefield's photo of another 2nd year penguin, but *just possibly* a 3rd year penguin. The OUFP is extensive and extremely black; the pinkish central underflipper is the result of recent exercise. Although a sub-adult this penguin very clearly exhibits the 'adult' appearance of the typical Snares Penguin.

Plate 6. Snares Penguin with full 'adult' features on display despite being sub-adult. This penguin therefore obeys the observation by Warham (1974), that the 2nd years '… at about 15 months [of age] become indistinguishable from adults'. It holds true in this case, since it is considered to be a 3rd year penguin. The pinkish central underflipper area is flushed with blood from recent exercise; it would disappear with return to inactivity. Press photo by Sam Rosewarne: copyright Hobart *Mercury*.

However, a head photo, not illustrated here, taken at the Snares Islands, is clearly labelled in the caption as a 3rd year penguin (Warham 1974; his Fig. 3b) in which the SS/C length is almost identical with this paper's Plates 4 and 6. This virtually confirms the penguin from Eaglehawk Neck Beach being in its 3rd year, as also the Trial Harbour penguin (Plates 3 and 4).

2009 Snares Penguin

SUMMER: 6 to 14 February, 2009. Landing and haulage site, NE Tasman Island, and also immediately offshore on Anchor Rock, Tasman Peninsula, SE Tas. (43º 14.5’S, 148º 05’E). First sighted from an eco-tour boat, the penguin was photographed by Angela Anderson, with skipper Craig Parsey, other crew members and the passengers present. She also reported a ‘technical’ argument on the boat as to whether it was a Snares or Fiordland Penguin. For several days after the 6th February, further photos were taken by other observers from the same boat.

Listed by Dooley (2009), who noted: ‘a Fiordland Penguin of the Snares race *robustus* was sighted on the Tasman Peninsula throughout early March’ (*contra* February dates reported).

KNGS commentary: Initial information was received from Bill Wakefield, 27 March 2009, with two photos. Contact was made with Angela Anderson on the same day. She crewed regularly on the boat from which all sightings were made; had taken the two photos sent on by Wakefield and those later supplied.

Observations and deductions made from the set of photographs identify the bird as a typically-plumaged Snares Penguin with clearly defined bill and facial features. Little sign of potential moult was initially visible, but close examination indicates an apparent ‘paling’, a ‘greyness’, on the left dorsal flipper surface (Plate 7), plus a small patch of uneven contour feathering on the abdomen. The second photo (Plate 8) shows uneven contour feathering of the back and on the dorsal right flipper. Penguin flippers in fresh or little-worn condition are reflective in certain lights (c.f. Plate 4), but, as they become dull prior to annual moult, begin to lose that same intensity of reflection. I believe the penguin is just entering that condition, the earliest stage of moult, and the ‘greyness’ is not entirely a trick of the light.

In the photos, the SS/C is well developed and plumes certainly long enough to represent another 2nd year penguin (c.f. Plates 4 and 6). Prior to moult, SS/C feathers loosen (as do all the feathers) and are progressively pushed out, briefly increasing their apparent length and distorting any age determination. The tail is still longer than it would be immediately after a moult as moulted penguin tail feathers (rectrices) grow back slowly. The fact that the penguin was ashore in early February but not well into moult also indicates that the penguin is beyond its juvenile year. It is therefore a 2nd year, which after two or three weeks would become a 3rd year on completion of the moult. The dates that this penguin was ashore therefore fits neatly into the following summary of moult.

Plate 7 (LHS). Snares Penguin on rocks, with indications of pending moult in dorsal feathering of left flipper and loosening of white abdominal feathers. SS/C length is similar to two other penguins (Plates 1, 2, and 5), and is now considered a 2nd year penguin on the verge of moulting to 3rd year. Photo: Angela Anderson.

Plate 8 (RHS). The same Snares Penguin on rocks with its flippers extended. The OUFP has a lesser black area, which is concentrated in the distal flipper midline. By comparison, the other four penguins being discussed show a larger area of black. Considered a 2nd year penguin. Photo: Angela Anderson.

According to Warham (1974), most juveniles ('yearlings') at the end of their 1st year return to the breeding colonies in mid-November to December, and commence moulting on the Snares Islands during early January, with most completed by the end of January and departing by the first week of February. After that moult, the now 2nd years, at about '15 months [of age] become indistinguishable from adults' (based on Warham 1974; also summary in O'Brien, 1990). Most 2nd years on the Snares Islands commence moulting at some time during February, and leaving for sea again before or by the end of March.

IDENTIFICATION

Features of Snares Penguins beyond juvenile (1st) year

Medium-sized penguins (c. 51-60 cm; 3.5 to 4 kg). Stonehouse (1971) states: ‘Adult [body] proportions are reached in yearlings, except in bill; adult size of bill probably achieved in both sexes during 3rd or 4th years’ (see also summary in O’Brien 1990).

Head

Normally a uniform glossy black crown, throat, chin, face and nape, giving a virtually ‘hooded’ head. Rarely do white facial streaks or mottling persist after the juvenile year. Warham (1974) points out that ‘some breeding adults exhibit a similar condition and may reveal cheek stripes during threat displays’ and notes that such streaks are useful field characters but not absolutely reliable.

Eye

Iris colour changes from reddish to dull red as progression from immature to adult occurs (brown in juveniles). Penguin eyes are not very reflective and it is difficult to determine true colours from most field photos.

Bill

Bills are prominent, longer by comparison with Fiordland Penguins and larger in males. They are elliptical or oval-shaped when viewed laterally, the degree and length of dorsal curvature of the culminicorn from feathering of the frons to bill tip (the bill profile) reflects the upper portion of that long elliptical or oval shape, assisting discrimination between Snares and Fiordland Penguins. From 2nd year they are evenly reddish or red-brown in colour; occasionally described as ‘orange-red’.

Gape and mandibular skin

Fleshy pink or white skin occurs at the gape (rictus) and a narrow, well defined line of prominent pinkish to white skin along the edge of the lower mandible (ramicorn). This is the feature considered diagnostic in the field for all practical purposes, from 2nd year on, when decisions have to be made between Snares and Fiordland Penguins, the latter having brown skin at the gape and lower mandible edge. Note that beyond the juvenile year (when there is brown to dark skin in all *Eudyptes*), Erect-crested Penguins *E. sclateri* and Eastern Rockhopper Penguins *E. chrysocome filholi* also have prominent pink to white skin in the gape and edging the mandible.

SS/C

In Snares, Fiordland and Erect-crested Penguins, the pale to bright yellow, silky-textured SS/C, is separated to each side of the head. All three Rockhopper Penguin subspecies also have such an arrangement, except that the SS/C is fibrous-textured and differently positioned anteriorly.

In Snares Penguins the anterior tip of the SS/C is positioned just back from the extension of the lores between culminicorn and latericorn. A few millimetres of it (c. 3-6 mm) parallels the upper half of the proximal end of the latericorn, separated from it by a narrow, well-defined gap (c. 3-4 mm) of short glossy black feathers (see Plates 2, 3, 6, 7).

The Snares Penguin SS/C may usefully be divided into four sections:
(1) narrow anteriorly, with its tip behind and parallel to the upper portion of the latericorn,
(2) then widening very slightly before the eye,
(3) narrowing again above the eye, and
(4) again widening to become the loose plumes that separate posteriorly, drooping a little to the side of the head. These lengthen with age; and from approx. late 2nd to 3rd year dangle spectacularly to the side of the neck and nape (Plates 4, 6). The head-on photo (Plate 1) also shows the shorter feather sections (1) to (3) on each side of the head. The different disposition of section (4), where the predilection of the longer plumes is to turn outward is clearly seen (also Plate 4).

'Observable' underflipper pattern

Common to all *Eudyptes* penguins, the underflipper pattern of these five Snares Penguins is regarded (this review) as being in the 'observable' or normal field condition, as it appears when the penguin is alive, active or quiescent. It is also present in dead but still 'wet' penguins, i.e. on a beach, frozen when fresh or when preserved in spirit. It represents the aggregate of fluids within the flipper tissue, *plus* the normal melanin of the feather pattern, and shows as a strongly blackish blurred area or pattern within the distal third of the underflipper. It is the 'OUFP' of Simpson (2007), as demonstrated here in Plates 1, 2, 4, 5, 6 and 8. The effect will be reduced slightly again by inactivity on land (Plate 7).

AGES

This review of Australian rare penguins has so far provided evidence that the majority of all taxa, species or subspecies, found here are 'young', i.e. ranging from their juvenile wintering and yearling moulting periods to about their 3rd-year and possibly their 4th. This is generally consistent (mirroring) with other seabird genera and species – the 'young' travel widely, sometimes erratically, and many come to grief.

When Australian observers are faced with a young vagrant *Eudyptes* penguin, there is often confusion not only between the identity of Snares and Fiordland subspecies but also their changing appearance with increasing age. It is almost akin to the dilemmas facing observers in the 1940s, 50s and 60s as they struggled with identity and moults of the juvenile and immature charadriiform waders.

Estimates of age of *Eudyptes* beyond the juvenile year remain somewhat problematical, unless the moult of individuals, from juvenile to 2nd year, or 2nd to 3rd year is actually witnessed and recorded. Reference points are required. It is one thing to stand in an overseas *Eudyptes* breeding colony and decide on penguin ages, but average Australian observers will encounter perhaps only one or two such penguins in a lifetime. To try to determine the age of one in the field is a challenge.

The recording period for wintering juvenile *Eudyptes* penguins of all species and subspecies in Australia is from early June until approximately mid-to late September. During their first winter foraging period, none are anywhere near being considered yearlings, let alone birds with dark faces, evenly-coloured reddish-brown bills, and respectably developed SS/C plumes. The wintering juveniles of both subspecies are about five to eight months of age (June to September). They become potential 'moulters' and hence yearlings at about eleven to twelve months. Any that do come ashore may appear from about mid-November and into December, and would be expected to moult in January.

The age estimates given here for the five Snares Penguin individuals were arrived at from several points:

(a) knowledge that none show any juvenile characteristics (see paragraph above);

(b) guidance from the extent and degree of blackness of the OUFP (and RUFP when applicable); there is great individual variation in the extent and degree of black in the underflipper patterns of *Eudyptes* penguins (this is a hallmark of the genus);

(c) bills are well and uniformly coloured with no patchy dark areas;

(d) the gape and mandibular skin is pale, not brown;

(e) a visual comparison of SS/C plume length in a range of photographs (including books) of other living Snares Penguins from Australia and New Zealand;

(f) by direct plume measurement of a small number of skins in Australian museums (n = approx. 20 to date) in the hope of applying it satisfactorily to many more examples; that technique is described below.

Total SS/C length

A straight-line measurement is made from the anterior tip of the SS/C just behind the latericorn, along the side of the head to the tip of the longest plume feather, then repeated for the opposite side of the head. Two such measurements are therefore required per penguin, and similarly for the successive measurements below. Minor variation in results is frequently found on the same penguin, and needs to evaluated carefully as it may be affected by the operator's technique (Figure 1a).

SS/C plume length

The straight length of the lateral SS/C plumes is measured from approx. 1 cm above and behind the eye, that point being centrally placed within the SS/C plumes. Duroselle & Tollu (1997) describe this point as being "at the root of the tassel". The measure extends from there to the tip of the longest plume feather present (Figure 1b).

Tentative age determination

The plume is pulled gently downward to an angle of 45º from the horizontal, toward the B/WDL between between throat and uppermost white feathering of the breast, and the distance from the same postorbital point is measured. Increasing age decreases the distance from plume base to demarcation line. Longer plumes reaching beyond that line normally suggest a 3rd to 4th year Snares Penguin (Figure 1c).

Rationale

The longer SS/C plume measurements when wintering or as pre-moult penguins (up to the time plume feathers commence to be pushed out), and again in post-moult, is deemed to provide an approximation of age. It is arbitrary, not definitive. Optimistically it may become one more useful indicator of relative age when compared with some other laterally- crested *Eudyptes* penguins of the same species or subspecies, whether in life, from skins or from photos. To date, I have attempted it with Snares and Fiordland Penguins, and with Eastern and Moseley's Rockhopper Penguins, *E. c. filholi* and *E. c. moseleyi*, respectively. No attempt has yet been made to try it with Erect-crested Penguins *E. sclateri*, or with the frontal crested Royal Penguin *E. chrysolophus schlegeli* or Macaroni Penguin, or nominate *E. c. chrysolophus*.

SEX

Without bill measurements, no critical attempt to nominate sex for these five Snares Penguins was contemplated.

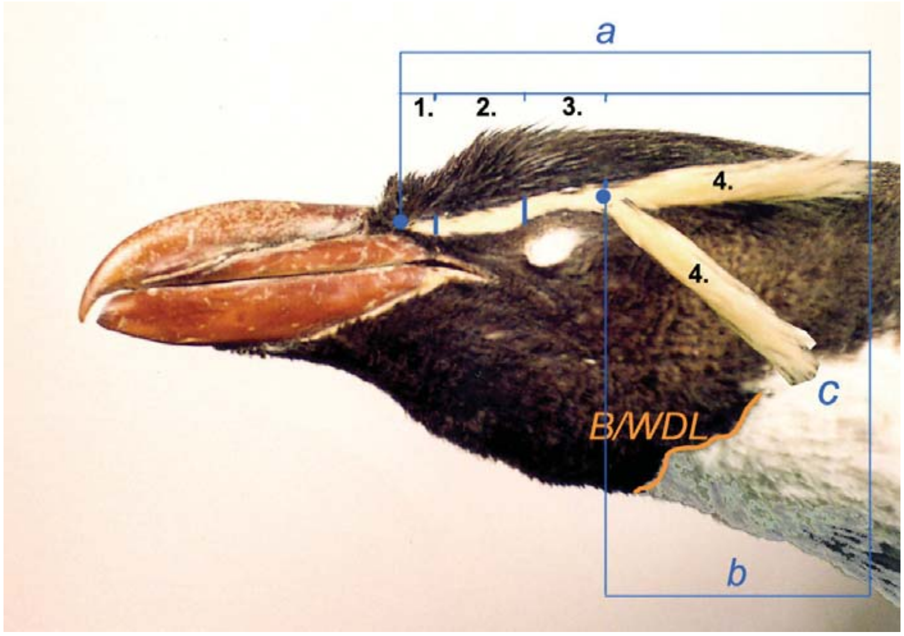

Figure 1. Plume measurement technique.

a = total length of SS/C in straight line.

b = total length of plume from feather base.

c = loose plume drawn down to 45 deg. toward or over B/WDL.

Numbers 1, 2, 3, 4 refer to the sections of the SS/C as described above.

Photograph by K.N.G. Simpson.

Illustrated in Figure 1 is the "root of the tassel", the point from which loose plume feathers begin to spread or droop. Using the orbit as a clockface, the pivot point appears approximately at 1300 hrs on the left side of the penguin's face and 1100 hrs on the right side.

The penguin chosen for the line drawing is South Australian Museum skin B1071, the Snares Penguin from Cape Banks, S.A., 8 January 1914, the first Snares Penguin identified in Australia (Simpson & McEvey 1971). Culmen length is 56.5 mm. The dorsal curvature of culminicorn represents the 'bill profile'. It is considered to be a 2nd year penguin just entering moult, as the dorsal plumage of the flippers is already brown and semi-transparent and the penguin has an overall brown hue as the old contour feathering is pushed out. The SS/C length is comparable to that of the Tasman Island/Anchor Rock penguin (Plates 7 and 8).

CONCLUSIONS

From the evidence presented, no problem exists with the identity of these five penguins, as each clearly exhibits the facial and other characteristics of typical *E. p. robustus*. All are beyond their yearling summer moult. Three are considered to be 2nd year penguins [1978 Port Arthur, 1997 Eaglehawk Neck, and 2009 Tasman Island/Anchor Rock] and two of them [1997 Trial Harbour and 2008 Eaglehawk Neck Beach] to be 3rd year penguins.

The age of the Snares Penguin from Safety Cove Beach (Simpson 2008a), has been retained as a 2nd year bird, as has the 1951 Seven Mile Beach Snares Penguin skin TMAG B2637 (Simpson & McEvey 1972; Simpson 2008a).

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APPENDIX 1: A REVISED LIST OF SNARES PENGUINS CONSIDERED CONFIRMED FOR TASMANIA

Woehler (1992), summarising as many Tasmanian rare penguin records as he could at the time, listed six Snares Penguins. One, 15 December 1977, alive at South Bruny Island, listed by Wall (1980), was later rejected by BOAT, through lack of supporting evidence (Patterson 1982). For the same reasons, BARC rejected the 29 January 1987 penguin from Seven Mile Beach, Hobart, despite it being reported (Woehler 1992) as rehabilitated and released on 16 April 1987.

In this paper the author also rejects, from the original list, the 1985 Snares Penguin from Safety Beach, Port Arthur, on the similar grounds of insufficient supporting evidence. Enquiries since 2006 have not produced any concrete evidence concerning these 1985 and 1987 penguins. If this can be found, and is correct, they will certainly be re-instated. Therefore, at least for the present, Woehler's 1992 list is reduced to just three valid Snares Penguins, numbers 1-3. The other five were found later than 1992. It would be premature to try fixing a final number for Snares Penguin records in Tasmania at present. Several more have been located, two of which are currently in preparation for publication.

No.	**Date**	**Locality**	**Nature of record**	**Published or Submitted to BARC**
1	27 Aug. 1951	Seven Mile Beach, Hobart	Specimen TMAG (B2637)	Simpson & McEvey (1972)
2	26 Aug. to early Sept., 1978	Beach at Port Arthur	Sight/Care/Photos	Submitted to BARC
3	June 1979	Okehampton/ Triabunna	Specimen QVMAG (1979-2-338)	Green (1980)
4	30/31 July, to 6 Oct. 1997	Trial Harbour, W coast	Sight/Care/Photos	Submitted to BARC
5	31 Aug. to 1 Sept. 1997	Eaglehawk Neck (Waterfall Bay/Blowhole)	Sight/Photos	Accepted by BARC, Case 317 Palliser (2002)
6	6 to 17 to 20 Sept. 2000	Safety Bay/Port Arthur	Care/Photos/ Specimen TMAG C02432	Simpson (2008a) Submitted to BARC
7	7 to 12 July 2008	Eaglehawk Neck Beach	Sight/Care/Photos	Submitted to BARC
8	6 to 14 Feb. 2009	Tasman Island/ Anchor Rock	Sight/Photos	Submitted to BARC