

ON THE IDENTITY OF *PRODELPHINUS PETERSII* LÜTKEN, 1889  
AND RECORDS OF DUSKY DOLPHIN *LAGENORHYNCHUS OBSCURUS*  
(GRAY, 1828) FROM THE SOUTHERN INDIAN AND ATLANTIC OCEANS

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*Prodelphinus petersii* Lütken, 1889 from Amsterdam Island is assigned as a junior synonym of the dusky dolphin *Lagenorhynchus obscurus* (Gray, 1828). This identification and three confirmed sightings from near the Prince Edward Islands represent the first records of the dusky dolphin from the Indian Ocean. *L. obscurus* is documented also for the first time from the mid-Atlantic near Gough Island, and its much disputed occurrence off the Falklands Islands is confirmed. Possible sightings of *L. obscurus* from both the southern Indian and Atlantic oceans are reviewed. Available evidence supports a disjunct distribution for *L. obscurus* and the existence of discrete stocks confined to continental shelves and oceanic island groups. However, the taxonomic status of *Lagenorhynchus* species sighted in offshore tropical waters needs to be clarified.

*Prodelphinus petersii* Lütken, 1889 van Amsterdameiland word toegewys as 'n junior sinoniem van die donkerdolfyn *Lagenorhynchus obscurus* (Gray, 1828). Hierdie identifikasie en drie bevestigde waarnemings naby die Prince Edwardeilande verteenwoordig die eerste boekstawings van die donkerdolfyn uit die Indiese Oseaan. *L. obscurus* word ook vir die eerste maal uit die mid-Atlantiese Oseaan naby Gough-eiland aangeteken, en sy veel bevreemte voorkoms teenoor die Falklandeilande word bevestig. Moontlike waarnemings van *L. obscurus* uit sowel die suidelike Indiese as Atlantiese oseaan word in oorsig geneem. Die beskikbare feite steun 'n onderbroke verspreiding vir *L. obscurus* en die bestaan van aparte stapels wat beperk is tot vastelandplatte en oseaaniese eilandgroepe. Die taksonomiese status van *Lagenorhynchus*-spesies wat in afluende tropiese waters waargeneem is, verg opklaring.

In 1889, C. F. Lütken described a dolphin species *Prodelphinus petersii* on the basis of a complete skeleton mounted by J. Reinhardt and still housed at the Zoological Museum, Copenhagen, under specimen number UZMC-5. The dolphin was collected near Amsterdam Island (37°55'S, 77°40'E) in the southern Indian Ocean by S. Hits. The original description by Lütken (1889), translated from Danish by C. C. Kinze (Zoological Museum, Copenhagen), reads as follows:

“Its vertebral number (71) is not very different from several other forms with 70, 72, 73 or 74 etc.; but although it is of a young animal, it has longer flippers than any of them; its length [of the flipper] is not contained six times in the length of the whole skeleton. The regular shape of the braincase — length and width being of equal size — is perhaps only due to the youth of the individual. However, the lanceolate shape of the rostral part may rather be characteristic. The number of teeth is lower (32/28) than in all

other species known to me. They have a length of 9 mm, a diameter of 3 mm and with such a large space that only five cover a Danish inch [i.e. 26,16 mm]. The flat midjaw indicates that it is a female. The fact that the last cervical bears a 17 mm long rudimentary rib on each side can scarcely be viewed upon otherwise than as a peculiarity of the individual. What further gives the skeleton its own character, are the extended metapophyses and their short backward slanting neuropophyses.”

Lütken compared the skull of the specimen to that of *Prodelphinus styx*, a synonym of *Stenella coeruleoalba* (Meyen, 1833), but noted differences, for instance in the tooth count, which prevented him from assigning it to the latter species. The specimen was re-examined by Hershkovitz (1966), who synonymized *P. petersii* Lütken, 1889 with the striped dolphin *S. coeruleoalba*, but provided no evidence to support this argument. The taxonomic position of the specimen has not been the subject of any subsequent publication.

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Table 1: Cranial measurements and tooth counts of the *P. petersii* holotype, mature skulls of *L. obscurus* from south-western Africa (after Van Waerebeek 1992a) and three immature *L. obscurus* skulls from the Falkland Islands, held at the British Museum of Natural History (BMNH)

Parameter	Cranial measurements (mm) and tooth counts						
	<i>P. petersii</i>	<i>L. obscurus</i> (south-western Africa)			BMNH 1952.6.20.3	BMNH 1952.6.20.2	BMNH 1955.9.2.3
		Range	Mean	<i>n</i>			
Condylobasal length	373	342–386	356,8	34	365	357	364
Rostrum length	208	178–214	198,8	36	200	196	200
Rostrum width at base	88	75–107	97,7	39	91	89	95
Rostrum width at 60mm	62	59–75	67,8	40	*	61	63
Rostrum width at $\frac{1}{4}$ length	64	64–76	70,1	36	*	64	65
Rostrum width at $\frac{1}{2}$ length	55	54–68	60,2	36	56	53	56
Rostrum width at $\frac{3}{4}$ length	39	39–53	45,5	33	39	42	41
Premaxillae width at $\frac{1}{2}$ length	27	30–40	34,1	36	32	28	32
Preorbital width	150	151–169	159	32	151	153	158
Postorbital width	167	164–186	175,4	33	*	169	174
Zygomatic width	169	165–191	177,8	34	*	170	173
Parietal width	154	136–160	150,8	37	*	149	150
Greatest width of premaxillae	77	68–85	76	40	68	79	75
Temporal fossa length	75	59–78	69,6	36	64	65	66
Temporal fossa width	53	41–60	51,1	37	48	47	51
Orbit length	49	45–56	51	35	51	50	50
Antorbital process length	36	29–41	34,8	37	34	34	39
Internal nares width	46	47–57	52,4	37	51	55	50
Rostrum tip to external nares	245	214–250	237,3	35	245	235	242
Rostrum tip to internal nares	246	219–250	235,1	28	237	238	*
Upper tooth row length (left)	182	153–182	171,2	32	173	169	170
Lower tooth row length (left)	171	159–187	172,4	34	176	161	
Ramus length	308	286–330	308,6	32	309	296	
Ramus height	57	60–71	65,1	31	62	66	
Tooth count upper left	32	28–34	30,4	29	31	31	30
Tooth count upper right	32	27–33	30,2	30	–	32	29
Tooth count lower left	29	26–32	29,6	31	30	30	–
Tooth count lower right	29	27–34	29,6	32	29	30	–
Mean tooth width at midjaw	3,5	3,3–5,2	4,2	36	3,3	3,1	3,2
Height of braincase	115	99–119	107,1	37	109	107	101
Length of braincase	116	113–131	122,5	37	–	118	119
Height of crest	4,5	1–10	5,5	30	–	–	4

\* Damaged

– Not measured

## RESULTS

### *P. petersii* holotype specimen

PvB and KVV examined and measured specimen UZMC-5 at the Zoological Museum, Copenhagen. It had been re-labelled by W. F. Perrin as *Lagenorhynchus* cf. *obscurus*. The dolphin, of unknown sex, was recognized as physically immature because of the unfused vertebral epiphyses and (after the species

had been identified) the minimum standard length (*SL*) of the mounted skeleton (158 cm, not accounting for intervertebral discs). An original contour drawing of the fresh specimen by S. Hits (files of the Zoological Museum, Copenhagen) indicates a maximum body length (tip of underjaw to tip of flukes) of 2 *alen* 19 inches, which is equivalent to 67 Danish inches (1 inch = 2,616 cm) or 175 cm (C. C. Kinze, *in litt.*, 10 December 1993). Therefore, the actual *SL* of the fresh carcass would have been close to 165 cm. Also, seven relevant cranial sutures, as defined

Table II: Vertebral formula of the holotype of *P. petersii* compared to other specimens of *L. obscurus*. Populations *sensu* Van Waerebeek (1992a, 1993a)

Specimen	Collection	Population	Vertebral formula*						Comments
			Cv	Th	Lu	Ca	Lu + Ca	Total	
<i>P. petersii</i>	Zoological Museum, Copenhagen		(2) + 5	12	19	32	51	70	
A84	Otago Museum, Dunedin NZ	New Zealand	(2) + 5	12	–	–	52	71	
CU2002	Canterbury University, Christchurch, NZ	New Zealand	(2) + 5	12	–	–	52	71	6 pairs of double-headed ribs
NMNZ1669	Museum of New Zealand, Wellington	New Zealand	(2) + 5	12	–	–			Vertebrae missing
NMNZ1816	Museum of New Zealand, Wellington	New Zealand	(2) + 5	12	–	–			
NMNZ1911	Museum of New Zealand, Wellington	New Zealand	(2) + 5	12	19	34	53	72	
NMNZ1921	Museum of New Zealand, Wellington	New Zealand	(2) + 5	12	–	–			
NMNZ1924	Museum of New Zealand, Wellington	New Zealand	(2) + 5	12	18	35	53	72	
NMNZ1928	Museum of New Zealand, Wellington	New Zealand	(2) + 5	12	–	–	51+	70+	2–3 caudals missing
ZMA12889	Zoologisch Museum, Amsterdam	New Zealand	(2) + 5	12	–	–			11 double-headed ribs
ZMA14359	Zoologisch Museum, Amsterdam	New Zealand	(2) + 5	12	–	–	50	69	6 pairs of double-headed ribs
ZMA14818	Zoologisch Museum, Amsterdam	New Zealand	(2) + 5	12	–	–	51 +	70 +	Possibly 1–2 terminal caudals missing
ZMA14335A	Zoologisch Museum, Amsterdam	New Zealand	(2) + 5	12	–	–	52	71	5 pairs of double-headed ribs
USNM550144	U.S. National Museum, Washington	New Zealand	(2) + 5	13	–	–	43 ++		13 double-headed ribs
USNM395382	U.S. National Museum, Washington	Chile	(2) + 5	13	–	–	53	73	6 pairs of double-headed ribs
AJR059	CEPEC, Pucusana, Peru	Peru	(2) + 5	13	22	32	54	74	K. Van Waerebeek (unpublished data)

\* Cv = cervical, Th = Thoracic, Lu = Lumbar, Ca = caudal

by Van Waerebeek (1992a, 1993a), were in the early fusion state. *P. petersii* has a long dome-shaped or lanceolate rostrum and a somewhat elongated, rectangular neurocranium, which is in accordance with the description and drawing by Lütken (1889). These characteristics differ from those of *Lagenorhynchus australis* and *L. cruciger*, both having a square-shaped neurocranium and a relatively short, triangular rostrum (see illustration in Gray 1846, Kellogg 1941, Fraser 1966). In the specimen, the premaxillaries barely stand out from the maxillaries, termed “flat midjaw”, a feature which differs from the cranial morphology of *S. coeruleoalba*, which has a rather triangular rostrum, a neurocranium which, seen from above, is typically rounded or oval in shape and premaxillaries which rise markedly above the level of the maxillaries (e.g. Plates 14–15 of True 1889, p. 456 of van Bree et al. 1969, Plate 4 of Van Utrecht and Husson 1968). Further, *S. coeruleoalba* has substantially more teeth (40–55 pairs) in the upper and

lower jaws than has *P. petersii* (van Bree et al. 1969, Leatherwood and Reeves 1983). It is therefore concluded that the identification of Hershkovitz (1966) was incorrect.

By contrast, the cranial features and the vertebral formula of *P. petersii* (Tables I, II) fully agree with those of the dusky dolphin *Lagenorhynchus obscurus* (Gray, 1828), to which species this specimen should be assigned. The flat midjaw is a species-specific feature, not sex-linked as believed by Lütken (1889). As *L. obscurus* has negligible cranial dimorphism (Van Waerebeek 1992a, 1993a), the skull cannot be sexed, although the estimated *SL* of the specimen suggests that it was probably sexually immature. While the *P. petersii* specimen has a surprisingly long rostrum, with correspondingly high scores for (par)axial cranial measurements, it compares favourably with the mature *L. obscurus* from south-western Africa (Table I), geographically the nearest population. Nevertheless, additional specimens are needed

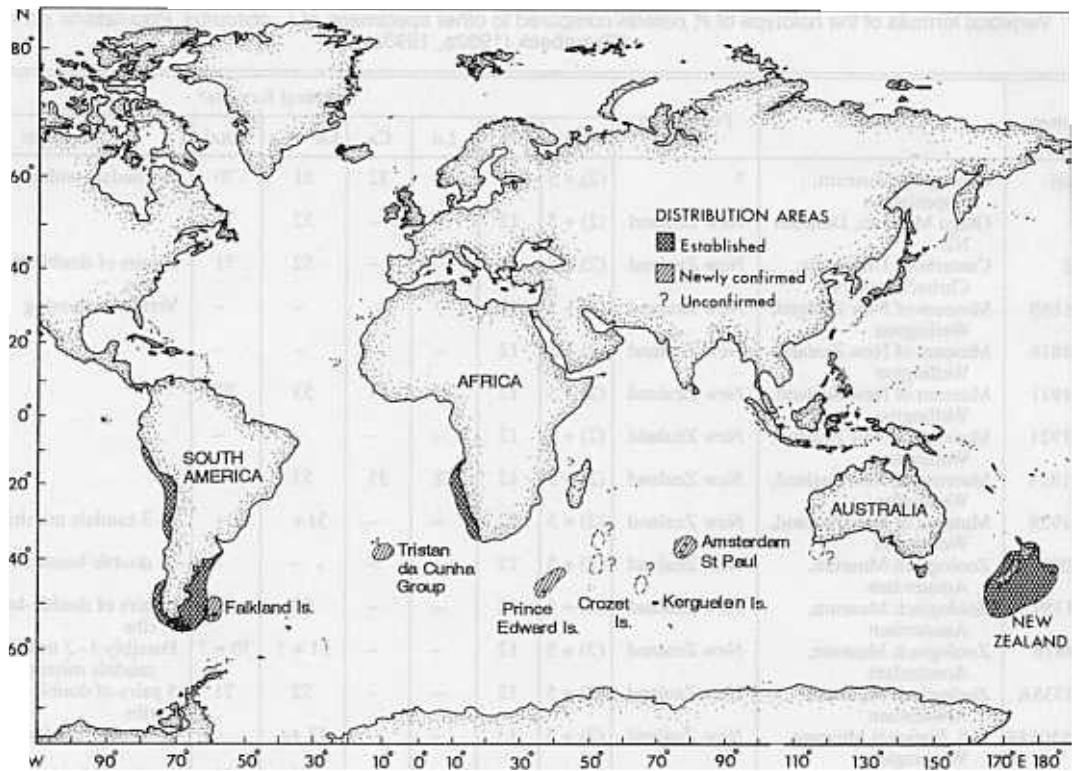


Fig. 1: Established (cross-hatched) and newly confirmed (hatched) distribution areas and unconfirmed records (?) of dusky dolphins *L. obscurus* in the Atlantic Ocean, Indian Ocean, off New Zealand and off South America

to determine whether dusky dolphins from Amsterdam Island (and presumably from nearby St Paul Island) belong to the south-western African coastal population (Findlay *et al.* 1992, Van Waerebeek 1992a, 1993a) or to a separate southern Indian Ocean insular stock.

#### Other *L. obscurus* records from the Indian Ocean

Reports of the occurrence of *L. obscurus* in the Indian Ocean have been confounded by unsubstantiated and erroneous records. The following records (illustrated in Figure 1) are critically reviewed.

- (i) Brownell's (1974) pictorial indication that dusky dolphins were "seen frequently" off the South African coastline from about 20° to 28°E was based on an incorrect interpretation of one reference (Tayler and Saayman 1972) and a personal communication from J. H. Prescott

that the latter can no longer recall (Findlay *et al.* 1992). A sighting of alleged dusky dolphins at 35°57'S, 18°49'E illustrated by Brownell (1974) from Lillie (1915) was not well substantiated by Lillie's Plate 8, which illustrated a rather long-beaked dolphin with a possible "saddleback" colouration (cf. *Delphinus*). All sightings of dusky dolphins documented by Findlay *et al.* (1992) form part of the south-western African stock, which is found west of 19°E.

- (ii) On 1 February 1988, four groups of dusky dolphins were sighted from the R.V. *Shonan Maru 2*, north of the Prince Edward Islands (Kasamatsu *et al.* 1990): one school of 50 specimens at 42°34'S, 40°47'E, another of similar size at 42°42'S, 40°46'E, accompanied by a large number of yellow-nosed albatrosses *Diomedea chlororhynchos* and white-chinned petrels *Procellaria aequinoctialis*, and schools of 200 and 300 specimens at 42°34'S, 40°48'E



Fig. 2: Dusky dolphins speeding alongside the R.V. *Shonan Maru 2* north of the Prince Edward Islands in the South-West Indian Ocean on 1 February 1988 (Record Number ii). This is the first authenticated sighting of dusky dolphins from the Indian Ocean (photograph courtesy P. Ensor)

and 42°34'S, 40°49'E respectively (IWC/IDCR files, International Whaling Commission (IWC) Secretariat, Cambridge). A photograph of two jumping dolphins taken from one of these four schools, identified as *L. obscurus* (P. Ensor, *in litt.* to PBB, 5 July 1994), is shown in Figure 2. The similarities between the key external features of the dolphins in this photograph and those illustrated in Figure 3a confirm these sightings as being of *L. obscurus*. All sightings were made within a short period between 17:40 and 18:36, suggesting that the dolphins probably belonged to a single supergroup of the same species.

- (iii) According to Le Barbier (1908), cited by Bierman and Slijper (1947), dusky dolphins have been observed off the south-west coast of Madagascar. Le Barbier (1908), however, listed Heaviside's dolphins (*Cephalorhynchus heavisidii*), which are endemic to the Benguela system, and narwhals (*Monodon monoceros*), which only occur in Arctic regions, from the same locality, and therefore this record cannot be considered as reliable.
- (iv) On 4 February 1988, J. Joyce and B. Troutman sighted and photographed three dolphins, which they presumed to be *L. obscurus*, from

south of Madagascar (31°46'S, 49°18'E) in 25°C water (IWC/IDCR files, IWC Secretariat, Cambridge, Kasamatsu *et al.* 1990). This temperature is considerably above the upper limit of about 18°C documented for this species (Würsig and Würsig 1980, Van Waerebeek 1992b). Joyce (*in litt.* to PBB, 18 August 1994) made the following log entry:

“The Dusky's were very hard to identify — only 3 and they actively avoided the ship. We chased & it was very hard to get a good look. Also, their coloration was pretty strange — the back more gray than black, the side pattern a very indistinct hourglass pattern. But saw the snout & absence of any real beak.”

On examination of the two slides provided by Joyce (one showing the upper half of the animal, but not the head), we believe the identification as dusky dolphins to be doubtful because of the lack of affinity between the following characteristics and those considered to be authentic for dusky dolphins (described in square brackets, see Van Waerebeek 1993c): sinusoid cape contour anterior to dorsal fin [arched or straight]; fairly light, brown-grey cape [black or dark-

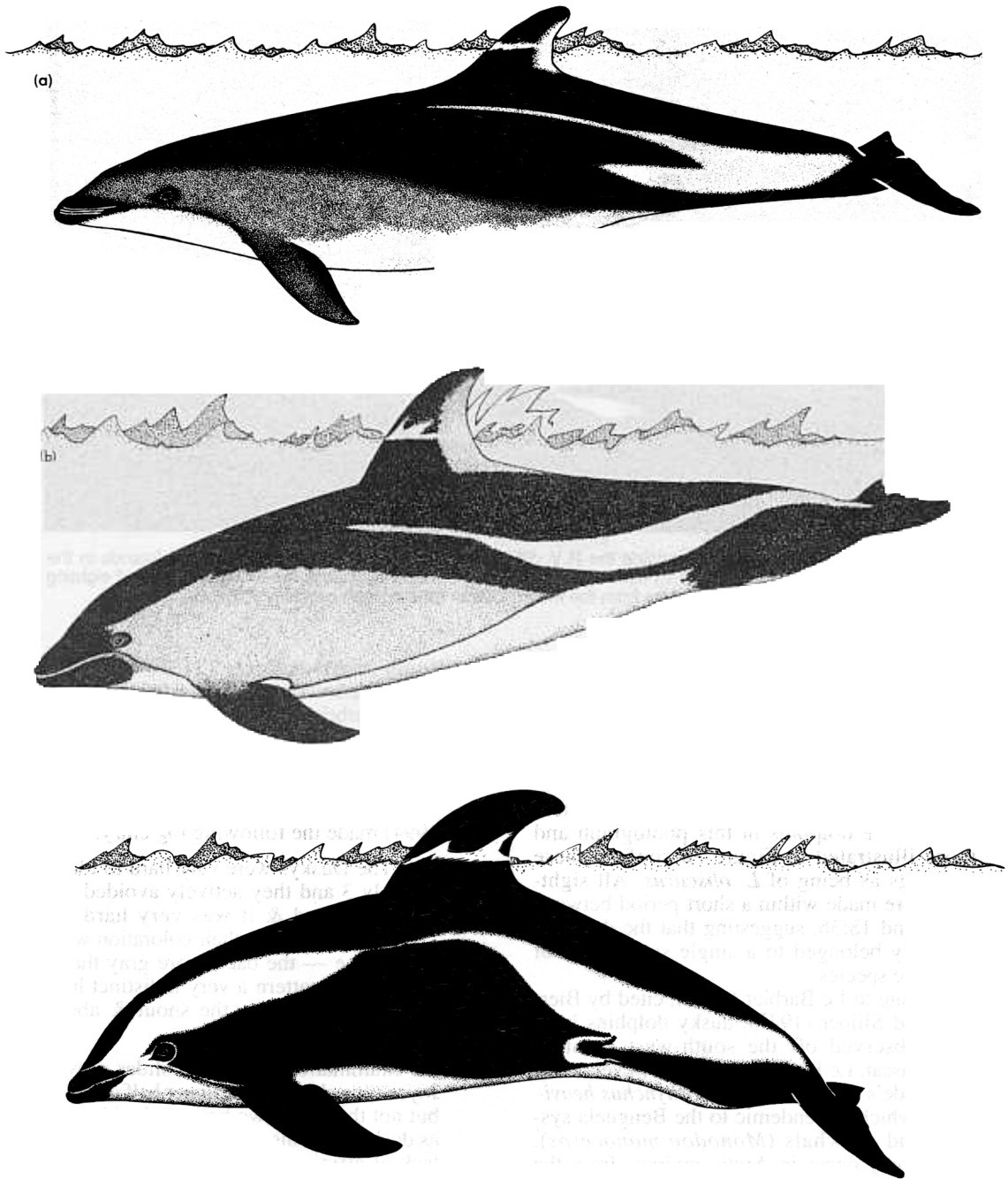


Fig. 3: External appearance of the three known southern hemisphere species of the genus *Lagenorhynchus* (Delphinidae), (a) dusky dolphin *L. obscurus*, (b) Peale's dolphin *L. australis*, (c) hourglass dolphin *L. cruciger*

grey cape]; no hint of a flank patch [flank patch visible at mid-flank]; dorsal flank blaze absent [except in some melanized specimens, it is always present]; uniformly dark and triangular dorsal fin [typically falcate dorsal fin with clear fin blaze]. No definite alternative identification can as yet be assigned to these dolphins and both an undescribed *Lagenorhynchus* form and some other delphinid are considered possible.

- (v) A group of 20–25 dolphins, identified as *L. obscurus*, was sighted travelling east at 36°08'S, 52°52'E on 13 August 1994 by C. Verheyden (Centre d'Études Biologiques de Chizé, CNRS, Beauvoir-sur-Niort, France, *in litt.* to KvW, 10 November 1994). Although Verheyden is an experienced observer and familiar with all southern hemisphere *Lagenorhynchus* (see section on Falkland Islands), it is our opinion that good photographs are necessary before alleged sightings of *L. obscurus* in the south-western Indian Ocean can be verified (*viz.* [iv] above).
- (vi) On 20 March 1976, ornithologist P. Frost sighted a group of nine possible *L. obscurus* some 300 nautical miles north of the Crozet Archipelago at 41°06'S, 52°09'E in 13,3°C water. This tentative determination was based principally on the observation of bi-coloured dorsal fins (Frost and Best 1976). However, whereas the North Pacific white-sided dolphin *L. obliquidens* can be excluded on strictly geographical grounds, this is not the case for Peale's dolphin *L. australis*, which also may show a crescent of light grey on the trailing edge of its otherwise dark dorsal fin (Webber and Leatherwood 1990). *L. australis* occurs in coastal waters off southern South America and is unknown from the Indian Ocean, but a species resembling *L. australis* was sighted and photographed at Palmerston Atoll in the tropical western South Pacific at about 18°10'S, 163°21'W (Leatherwood *et al.* 1991), far outside the normal distributional range of this species. Although the Frost and Best (1976) interpretation of the species concerned is probably correct, their record is unsubstantiated and needs confirmation.
- (vii) Stahl (1982) recorded four sightings of *L. obscurus*, totalling 44 individuals, between 36°51'S and 48°16'S in the south-western Indian Ocean in 6°–16,1°C water. Three of these sightings were made between Crozet and Kerguelen islands and one in "subtropical waters". Unfortunately, there are no further details regarding the localities of these sightings and no supporting evidence to substantiate the identifications.
- (viii) Paulian (1953) collected a skull of a juvenile dolphin in the Baie du Morbihan, Kerguelen Islands (about 49°30'S, 70°E), which subsequently was identified by F. C. Fraser as *L. obscurus*. The calvarium is currently kept at the Musée Nationale d'Histoire Naturelle, Paris (specimen number MNHN-AC 1952–197) and was later identified by Robineau (1989) as a young *Cephalorhynchus commersonii*. Re-examination of the specimen by PvB confirmed the latter identification. The relative rostrum length of 0,43 (100 mm v. condylobasal length [CBL] of 230 mm) in Paulian's dolphin is shorter than in juvenile dusky dolphins (a minimum of 0,46 in one skull with a CBL of 225 mm; range 0,51–0,56 for 17 larger immature specimens, all from the south-western African stock). In *L. obscurus*, the main axis of the temporal fossa is oblique, but it is horizontal in *C. commersonii* (personal observations, Robineau 1989).
- (ix) Undocumented sightings off southern Australia by Lillie (1915) have been repeatedly reviewed and generally considered as unconfirmed (Leatherwood and Reeves 1983, Webber 1987, Van Waerebeek 1993b). A skull catalogued as *Lagenorhynchus* sp. at the Tasmanian Museum, Hobart, and long referred to as *L. obscurus*, was recently re-identified as *Lissodelphis peronii* (Van Waerebeek 1993b).
- (x) One herd of 70 dolphins, identified as *Lagenorhynchus* sp. and believed by the observers to be dusky dolphins, was sighted on 5 March 1993 off south-western Australia from the R.V. *Shonan Maru 2*. The ship's noon position was 35°25'S, 117°36'E and the sea temperature was 18,7°C (J. Bannister, Western Australian Museum, Perth, *in litt.*, 22 July 1994). If confirmed, that sighting would represent the first record of *L. obscurus* from western Australia. Other, so far unconfirmed, sightings from southern Australia (Kangaroo Island) were reportedly made by W. H. Dawbin (J. Bannister, *in litt.* to KvW, 22 July 1994).

In conclusion, *P. petersii* Lütken, 1889 is considered by the present authors to be a junior synonym of *L. obscurus* (Gray, 1828) and the first substantiated record of the dusky dolphin from the Indian Ocean.

Additional confirmed records, such as (ii) above, suggest that perhaps dusky dolphins are not rare visitors to the south-western Indian Ocean.

### *L. obscurus* from the Falkland Islands

In a brief note, Brownell (1965) reported that the British Museum (Natural History) — BMNH — specimens of *L. obscurus* were from “the Cape of Good Hope, Falkland Islands and the coast of Chile (Fraser, *in litt.*, 5 May 1965)”. However, in his in-depth discussion of the southern *Lagenorhynchus* species, Fraser (1966) recorded *L. australis*, but not *L. obscurus*, as occurring near the Falkland Islands. The authoritative review by Brownell (1974) referred only to the study by Hamilton (1952) on the cetaceans of the Falkland Islands in considering those islands as being within the distributional range of *L. obscurus*. Popular reviews then apparently repeated this reference (Leatherwood and Reeves 1983, Evans 1987), but the Argentinian guide by Lichter and Hooper (1984) did not. Webber (1987) questioned the interpretation of Hamilton’s paper, and more recent reviews (Webber and Leatherwood 1990, Klinowska 1991, Jefferson *et al.* 1993) no longer include the Falkland Islands as being within the distributional range of *L. obscurus*. In fact, Hamilton (1952) did not report *L. obscurus* (which he seemed to recognize from earlier work in South Africa) from the Falkland Islands, but collected a decomposed dolphin with longitudinal stripes (which he considered to be reminiscent of *Delphinus delphis*), that he identified as *Lagenorhynchus thicolea*. Hamilton reportedly deposited the skull from that carcass at the BMNH, without a description or reference. KvW and curator M. Sheldrick tried without success to locate the skull in 1991. It is the present authors’ opinion that the carcass was probably that of a southern right whale dolphin *Lissodelphis peronii*, considering the holotype of *L. thicolea* is a specimen of *Lissodelphis* spp. (Mead and Brownell 1993). While searching among the BMNH collections, KvW discovered three sub-adult dusky dolphin skulls from the Falkland Islands (Table I), which, according to BMNH archives were collected by Hamilton (presumably after his 1952 paper had been published). These skulls were briefly mentioned by Van Waerebeek (1993a), and they represent conclusive evidence that *L. obscurus* occurs in waters around the Falkland Islands.

C. Verheyden observed three groups of dusky dolphins near the Falkland Islands from the S.V. *Antarctica*: four animals on 13 August 1991 at 49°56’S, 58°51’W (depth 200 m); a pod of 11 animals at 51°08’S, 56°51’W (depth 128 m) and two animals at

51°05’S, 56°57’W (depth 135 m) on 30 August 1991 (*in litt.* to KvW, 5 November 1991 and 10 November 1994). Although no photographs were taken of the dolphins, *L. obscurus* was distinguished from *L. australis* and *L. cruciger* (the three species were sighted 9, 11 and 10 times respectively on the same voyage) by the presence of a flank patch with two blazes, the dorsal blaze stretching far forward onto the back, and by the observation of a white chin as opposed to the dark chin of *L. australis*. *L. australis* was sighted only inside the Fuegian canals in very shallow water. All sightings were made at short distance and are probably reliable.

### Dusky dolphins from the southern mid-Atlantic Ocean

The distribution of the coastal south-western African population of *L. obscurus* (*sensu* Van Waerebeek 1992a, 1993a) extends from False Bay, South Africa (about 19°E) in the south to Lobito Bay, Angola (12°S) in the north (Findlay *et al.* 1992). The following information on two confirmed sightings (Numbers 1 and 2) and 23 probable sightings (Numbers 3–25) indicates that *L. obscurus* also occurs around Gough Island (c. 40°19’S, 9°56’W) in the southern mid-Atlantic Ocean.

1. J. Glass, a resident of Tristan da Cunha, sighted and photographed a group of at least five dusky dolphins off Gough Island (c. 1980). Three colour prints of these dolphins, which were later given to PBB, showed clearly the major external characteristics of *L. obscurus* (see Van Waerebeek 1993c): ploughshare beak with distal dark lip patches and light throat; falcate dorsal fin with light fin blaze; tapered and curved flippers coloured light grey dorsally; light thoracic patch; and typical forked white flank patch/dorsal flank blaze complex.
2. On 12 November 1985, about 15–20 dusky dolphins were sighted by PBB from the M.V. *S.A. Agulhas* while approaching Transvaal Bay, Gough Island, at 10:15 (SST was 10.2°C at 10:00). They came close to the ship, moving fast and erratically, and one or two appeared to backflip or somersault. Two photographs taken at distance by PBB showed characteristic *Lagenorhynchus* body shape, pointed flippers and falcate dorsal fin, a light flank patch and a lowly placed light-coloured thoracic patch. These features exclude all species except *L. obscurus* and, to a lesser extent, *L. australis*. Somersaulting is a typical *L. obscurus* behaviour (see also below). Trista-



- nians on board, who observed the dolphins from close range, were shown the photos of Sighting 1 and said they were the same animal. It is therefore concluded that these were dusky dolphins.
3. R. Furness and P. Foden reported to PBB that they sighted three dolphins from the M.V. S.A. *Agulhas* at 13:05 on 24 November 1985 approximately 4 miles from Gough Island. SSTs of 11,1 and 11,5°C were recorded at 12:00 and 14:00 respectively. No photographs were taken of these dolphins, but the description of centrally placed, hooked dorsal fins and "some white on side and back" suggests that they were probably *Lagenorhynchus* sp.
  4. G. Espatier-Noel sighted about five small (4–5 ft) dolphins from the M.V. S.A. *Agulhas* at about 40°00'S, 07°44'W at 18:40 on 24 November 1985 (SST at 18:00 was 11,5°C). His description of them (relayed to PBB) reads: "... dorsal fin rounded at top and hooked, in middle of body. Coloration not properly seen because of glare."
  5. At 06:00 on 21 December 1986, a large school of dolphins was spotted from the meteorological base at Gough Island (reported by S. Jackson, Percy Fitzpatrick Institute for African Ornithology, University of Cape Town). The dolphins were frequently jumping clear of the water, and were identified as Pacific white-sided dolphins *L. obliquidens*, but no photographs or descriptions were provided. For inexperienced observers, the difference between this species and dusky dolphins is not always obvious.
  - 6, 7. On a voyage to Gough Island and Tristan da Cunha in September/October 1987, V. M. Peddemors (Natal Sharks Board) recorded two sightings of dusky dolphins. The first was on 22 September, when about 30 animals were encountered in the vicinity of Penguin Island (40°18'S, 09°53'W) riding the ship's bow wave for about five minutes, but the identifying characteristics were not recorded. The second sighting was at 40°04'S, 10°02'W at 18:15 on 24 September, as the ship left Gough Island for the open sea. About 15 *L. obscurus* were observed riding the beam waves and occasionally jumping clear of the water. The SST rose sharply from 10 to 11,5°C just before the sighting. Again, no identifying characteristics were given and the sighting therefore remains unconfirmed.
  - 8–25. Between February and August 1988, shore-based researchers on elephant seals on Gough Island reported 18 sightings (February [3]; March [3]; April [5]; May [6]; June [1]) of unidentified dolphins. All but two sighting statements reported jumping. School sizes were classified as "large"

(three schools of 50, 50 and 75 animals), "very big" or "huge" on 11 occasions, "fairly large" or "medium" (including one school of 30 animals) on three occasions and "small" on one occasion.

The two substantiated records, compatible reported external traits, and pods of up to 75 individuals involved in what appears consistent aerial behaviour in nearshore water of 10,2–11,5°C sea surface temperature suggest that at least some, and possibly all, sightings could be ascribed to the dusky dolphin. However, dedicated cetacean surveys around Gough Island are needed to shed further light on the matter.

## DISCUSSION

In an analysis of the records collected on 10 annual International Decade of Cetacean Research (IDCR) cruises for all sectors of the Antarctic, Kasamatsu et al. (1990) reported 27 sightings of *L. obscurus*, all encountered while in transit between home ports and the Antarctic. Although most of the searching effort on those cruises was south of 60°S, and therefore outside the normal distributional range of dusky dolphins, it is noteworthy that most of the sightings were made in the vicinity of continents or oceanic islands. This contrasts with sightings of *Lissodelphis peronii*, a species which also normally does not extend as far south as the main IDCR searching area, but which was frequently seen in the open ocean north of 60°S. Lack of *L. obscurus* sightings in the open ocean therefore does not indicate lack of searching effort. Further, in three voyages of 2 500 km from Cape Town to the mid-oceanic islands of Tristan da Cunha and Gough, dusky dolphins have only been seen in the vicinity of Gough Island and not in transit. A comprehensive review of records in the eastern South Pacific showed that dusky dolphins were linked to the coastal branch of the Humboldt Current, with an offshore range extending to about 80 km (Van Waerebeek 1992b). None was sighted during extensive cruises east from the New Zealand archipelago to longitude 140°W, in SST and latitudes apparently favourable to the species (Gaskin 1968).

*L. obscurus* has now been positively recorded from the vicinity of oceanic island groups in all three oceans: Campbell, Auckland and Chatham islands in the western South Pacific (Webber 1987); Gough Island and the Falkland Islands in the South Atlantic; and Amsterdam Island and the Prince Edward Islands in the southern Indian Ocean (Fig. 1). As it is also known to occur over the continental shelves of southern South America, southern Africa and New

Zealand, the species appears to have a disjunct distribution with discrete stocks confined to oceanic island groups and continental shelves. The marked geographical variation exhibited by coastal populations of *L. obscurus* (Van Waerebeek 1992a, 1993a, c) supports this conclusion. The species may possibly be limited to water shallower than 2 000 m.

All sightings of *L. obscurus* on the IDCR cruises were in surface temperatures of 10–16°C (except for the unconfirmed sighting south of Madagascar in 25°C water; at Gough Island the temperature range was 10.2–11.5°C). The southern limit of the distribution of *L. obscurus* may be the subtropical convergence, where SST decreases of up to 9°C in 8–10 km can be encountered (Deacon 1984). However, the sightings of a *Lagenorhynchus*-like dolphin in the vicinity of subtropical Madagascar, of possibly *L. australis* near the Cook Islands (Leatherwood *et al.* 1991) and a group of *Lagenorhynchus* sp. in the eastern tropical Pacific (Van Waerebeek 1992b) are puzzling, because they would suggest that southern hemisphere *Lagenorhynchus* species may occasionally move into warmer, deeper water than is typical of their natural habitat. The identifications may, however, be incorrect, and a previously undescribed form may be involved.

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