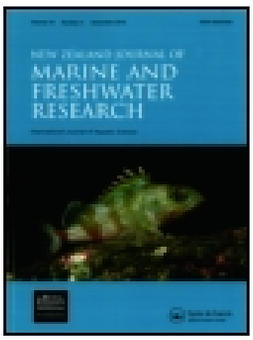

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SPERM WHALES STRANDED AT MURIWAI BEACH, NEW ZEALAND

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ABSTRACT

The composition and apparent social structure of a harem school of sperm whales *Physeter catodon* (Linnaeus 1758) is described from a mass stranding at Muriwai Beach, New Zealand, 29 October 1974. This school contained a total of 54 female whales accompanied by 17 immature males and a solitary full-grown bull.

Evidence is provided which supports the contention that sperm whales in this region of the Pacific reach the same lengths at sexual maturity and follow a similar breeding cycle to those found elsewhere in the southern hemisphere.

INTRODUCTION

On 29 October 1974 a stranding of 72 sperm whales *Physeter catodon* (Linn.) was found to have occurred at Muriwai Beach over a front of 3 km at about a point 35° 30′ S, 174° 16′ E, some 11.5 km from the southern entrance of Kaipara Harbour. Although it contained the highest number of individuals recorded in a single event in New Zealand, it was probably more significant in providing direct evidence of composition within a harem school.

Because of its isolation the stranding was unobserved, and first witnesses, at 1300 h, found the whales to be near exhaustion. Circumstantial evidence suggested the bulk of the herd beached during the previous high water, 0904 h, leaving bodies scattered near mean high water. Moderately rough weather prevailed on the day of stranding, with fresh south-west winds gusting to 65 km.h^{-1} (35 kn) assisting the build-up of a heavy surf. During the day of the stranding it was observed (Mr K. Lovell, Superintendent, Muriwai Domain, pers. comm.) that the tide did not recede below the mid-tidal level. A photograph taken of the stranding during the period of the succeeding low tide (Fig. 1) supports this observation, and water is seen washing bodies stranded near mean high water.

OBSERVATIONS

The herd was a typical harem school as described by Gaskin (1970), having a predominance of females ($n = 54$), accompanied by a full-grown bull and 17 immature males.

TABLE 1—Body measurements (m) of female sperm whales *Physeter catodon* from stranding at Muriwai Beach, 29 October 1974 (* = teeth not erupted; Lac. = Lactating; – = not measured; .. = not applicable; total length measurements supplied by G. van Andel)

TOTAL LENGTH (rostral tip to fluke tip)	FORK LENGTH (rostral tip to fluke notch)	LENGTH ROSTRAL TIP TO FLIPPER	FLIPPER LENGTH	FLIPPER WIDTH	FLUKES WIDTH (tip to tip)	FOETUS LENGTH♀♂ (rostral tip to fluke tip)
7.93*	–	–	–	–	–	..
8.08*	–	–	–	–	–	..
8.23*	–	–	–	–	–	..
8.23*	–	–	–	–	–	..
8.38*	–	–	–	–	–	..
8.54	–	–	–	–	–	..
8.69*	7.94	2.63	0.81	0.38	1.95	..
8.84	8.44	2.51	0.71	0.35	1.80	..
9.45	–	–	–	–	–	..
9.76 Lac.	–	–	–	–	–	..
9.91	–	–	–	–	–	..
10.06	–	–	–	–	–	..
10.21	–	–	–	–	–	..
10.37	–	–	–	–	–	..
10.37	–	–	–	–	–	..
10.52	10.20	3.28	0.98	0.44	2.56	..
10.52	–	–	–	–	–	..
10.67	10.02	3.57	0.89	0.46	2.63	..
10.67	–	–	–	–	–	..
10.67	–	–	–	–	–	..
10.67	–	–	–	–	–	2.74♂
10.67	–	–	–	–	–	..
10.67	–	–	–	–	–	..
10.67	–	–	–	–	–	..
10.67	–	–	–	–	–	..
10.85	10.13	3.59	0.94	0.44	2.53	..
10.85	–	–	–	–	–	3.05
10.85	–	–	–	–	–	..
10.85	–	–	–	–	–	..
10.85	–	–	–	–	–	..
10.85	10.14	3.63	0.86	0.51	2.48	..
10.85	–	–	–	–	–	..
10.85	–	–	–	–	–	3.66
10.98	–	–	–	–	–	..
10.98	–	–	–	–	–	..
10.98	–	–	–	–	–	..
10.98	–	–	–	–	–	..
11.28	–	–	–	–	–	..
11.28	–	–	–	–	–	..
11.28	–	–	–	–	–	..
11.28	–	–	–	–	–	..
11.28	–	–	–	–	–	..
11.45	11.09	3.38	1.13	0.42	2.74	3.50♀
11.59	–	–	–	–	–	..
11.59	11.03	3.92	0.98	0.49	2.70	..
11.59 Lac.	11.27	3.65	0.94	0.47	2.51	..
11.74	11.63	3.81	1.01	0.53	3.00	..
11.74	–	–	–	–	–	2.59
11.74	–	–	–	–	–	..
11.74	–	–	–	–	–	..
11.74 Lac.	–	–	–	–	–	..
11.74 Lac.	–	–	–	–	–	..
11.74	–	–	–	–	–	..
11.89	11.25	3.92	1.04	0.50	2.80	..

FIG. 1—Part of school of sperm whales *Physeter catodon* stranded along Muriwai Beach, 29 October 1974. Scale: the vehicle tracks in foreground are about 1.0–1.4 m apart.

Photo: N.Z. Herald

The sizes of females (Table 1) ranged in total length from 7.93 m to 11.89 m. On the basis of length data, given by Best 1968, 43 females (76%) with total body lengths over 10.39 m would have attained sexual maturity; this probably underestimates the situation since one specimen of 9.76 m was found to be lactating.

Amongst these females, five pregnancies were determined from the later recovery of aborted foetuses, total lengths 2.59–3.66 m (Table 1), each of which could be paired with its respective mother. An additional male foetus, 2.28 m total length, was found stranded near the southern end of the main herd, and, although its mother was not identified, it is probable evidence of a sixth pregnancy. Foetal lengths lie within the range of sizes previously recorded from South African waters during the same month (Mathews 1938, Best 1968), suggesting a similar periodicity of the reproductive cycle. In addition they provide direct evidence of protracted mating in this region of the Pacific, as proposed by Gaskin (1972).

Some four females were lactating and it is probable (Best 1968) that they were still nursing calves. No young calves were found in the stranding and the smallest juveniles 7.93–8.84 m (teeth not erupted) would have been approaching the end of their first year. These circumstances give further support to the suggestion (Best 1968) of a prolonged weaning. A former whaler, who also examined the stranded whales,

TABLE 2—Body measurements (m) of male sperm whales *Physeter catodon* from stranding at Muriwai Beach, 29 October 1974 (* = teeth not erupted; – = not measured; total length measurements supplied by G. van Andel.)

TOTAL LENGTH (rostral tip to fluke tip)	FORK LENGTH (rostral tip to fluke notch)	LENGTH ROSTRAL TIP TO FLIPPER	FLIPPER LENGTH	FLIPPER WIDTH	FLUKES WIDTH (tip to tip)
8.38*	–	–	–	–	–
8.54*	–	–	–	–	–
8.54*	8.32	2.95	0.78	0.38	2.12
8.99	–	–	–	–	–
9.15*	–	–	–	–	–
9.60*	9.40	3.09	0.81	0.36	2.40
10.67	–	–	–	–	–
10.98	10.76	3.62	1.84	0.41	2.20
11.28	11.03	3.50	1.01	0.46	2.32
11.28	–	–	–	–	–
11.74	–	–	–	–	–
11.74	–	–	–	–	–
11.74	–	–	–	–	–
11.89	–	–	–	–	–
11.89	–	–	–	–	–
11.89	–	–	–	–	–
12.04	–	–	–	–	–
16.31	15.33	7.53	1.50	0.71	4.42

made a pertinent observation: "Females of lengths 8.23, 8.38, and 11.74 m were stranded together . . . in a huddled fashion. The larger was lactating and the two smaller had a striking resemblance . . . the group could well be mother and twin daughters" (G. van Andel, Orewa, pers. comm.).

The length frequencies of males fell into two distinct groups (Table 2), those in the range 8.38–12.02 m total length, and a solitary large specimen 16.31 m total length. On the basis of criteria established by Nishiwaki (1955) and Best (1969), only the largest male would have reached sexual maturity. Within the complex of smaller sizes, four individuals 11.9–12.0 m could be considered (Best 1969) as maturing whales. The presence of this group is somewhat atypical in a harem school (Gaskin 1970), though similar sized individuals were found in a later harem stranding at Gisborne where a mature bull was absent (Robson & Van Bree 1971). According to Best (1969), these whales would have reached a size at which they would be segregating from females. A difference in the technique of length measurement between total length, taken here, and that of fork length presumably used by Best (1969), would make the present series appear comparatively larger. Thus these males may lie closer to a pre-pubertal rather than pubertal status.

Individuals of the herd appeared to be quite healthy and no external parasites were found in a close examination of nine whales. However, healed scars, especially in the region of the mouth (Fig. 2), were noticed

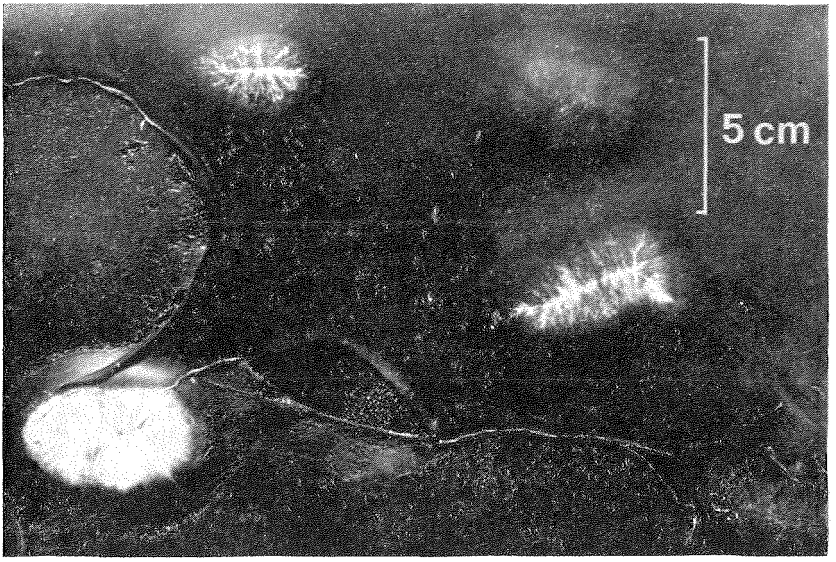

FIG. 2—Healed body scars on buccal region of head of female sperm whale *Physeter catodon*, total length 10.85 m, from stranding at Muriwai Beach, 29 October 1974.

on some larger adults. These indicate (Mathews 1938) migration from warmer water; in fact the herd was approaching the southern distribution limit (Gaskin 1970) of harem schools.

DISCUSSION

Sperm whales have frequently stranded about our coasts, as summarised by Gaskin (1968). Robson & Van Bree (1971) report a mass stranding at Gisborne, and since that time two events not recorded in zoological literature are known to have occurred: 26 May 1972 at Great Barrier Island, 30 individuals, females and calves; 22 June 1972 at South Head, Kaipara Harbour, 14 whales, sex not determined. With respect to the general pattern throughout New Zealand, the Kaipara region has a high incidence of strandings. To date six events in a total of 23 strandings have been recorded here. A treacherous shifting sand bar extending 3–7 km seaward of the Kaipara Harbour entrance and strong surf assisted by prevailing westerly winds are the probable local factors likely to disrupt near-shore migration. However these conditions are not unique, similar situations occurring off most other west coast harbours, and the problem of accounting for a high density of whales moving inshore especially along the Kaipara coast remains unsolved.

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