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Preliminary Report of the Second Minke Whale Sighting Surveys in Low and Middle Latitudinal Waters in the Southern Hemisphere in 1988/89

Fujio Kasamatsu
Institute of Cetacean Research
Tokyo Suisan Build. 4-18 Toyomicho Chuo-ku Tokyo 104

and

Hirohisa Shigemune
Kyodo Senpaku Kaisha, LTD
2-8-3 Higashi-Nihonbashi, Chuo-ku Tokyo 103

Abstract

Systematic sighting surveys were conducted to investigate the distribution and abundance of minke whales in low and middle latitudinal waters in southern summer during the two periods of November 15 to December 16, 1988 and February 24 to March 13, 1989, as a part of the program for the 1988/89 research plan for the feasibility study of the Japanese scientific permit.

A total of six schools of southern form minke whales, two schools of diminutive form minke whales and seven schools of unidentified (unidentified which form) minke whales were observed in the first half during the middle of November to the middle of December. Among these sightings four schools had calves.

Only one 'like minke' whale was found in the second half during the middle of February to middle March.

Introduction

First systematic sighing surveys to investigate distribution of southern minke whales in austral summer in low and middle latitudinal waters were conducted in 1987/88 as part of Japanese Research Programme for southern minke whales (Kasamatsu, 1988). Most of search efforts in this survey were concentrated in north of 40°S. Second sighting surveys were planned to investigate the waters mainly south of 40°S. The surveys were conducted under the programme of 1988/89 Research Plan for the Feasibility Study on "The Programme for Research on the Southern Hemisphere minke whale and for Preliminary Research on the marine Ecosystem in the antarctic" (The Government of Japan, 1988) by two Japanese research vessels, *Shonan Maru (SM1)* and *Shonan Maru No.2 (SM2)*, during two periods of 15 November, 1988-16 December, 1989 and 18 (24) February-17 (15) March, 1989 in the waters west and southwest of Australia and Tasman Sea. This paper presents preliminary results of the surveys.

Planning of the Surveys

Two research vessels were provided by Japan for the 11th IWC/IDCR Southern Hemisphere Minke Whale Assessment Cruise for the period form Dec. 17, 1988 to Feb. 23, 1989. It was planned that the second systematic sighting surveys in low and middle latitudinal waters outlined in the Japanese Programme be carried out during off-duty of the IDCR reserach. West and southwest of Australia in Area IV and Tasman Sea in Area V in waters between 30°S-55°S was considered for main research area (Figs. 1-4). The area of Tasman Sea is approximately due north of the waters which is the subject of the Japanese Feasibility Study in 1988/89.

The surveyes were planned to be carried out in two periods of the late of Nov. to the middle of Dec. and the middle of Feb. to the middle of March. The first half period was suspected to coincides with period when southern minke whales may be migrating to the Antarctic. Timing of second half was considered to correspond to the latter half period of the minke whales's migration in the main feeding season in the Antarctic.

The research areas were to be surveyed along the predicided

tracklines at a speed of 11.5 knots. The tracklines were located in zig zag pattern and were surveyed in normal closing mode (close with sightings when sightings was made). It was requested to observe carefully the existence of white patches on flippers and immediately above shoulders of minke whales sighted for tentative identification between the diminutive form minke whales (Best, 1985; Arnold, Marsh and Heinsohn, 1987) and southern form minke whales.

Results

First half (15 Nov.-16 Dec.)

After passing the Lumbok Strait and coming out of the 200 n.mile zone of Indonesia, the *SM1* and *SM2* commenced their survey on 15 November. Surveys were conducting with night steaming until 30°S latitude and effort concentrations were made in the waters between 30°S and 45°S (Fig. 1).

The *SM1* encountered poor weather at around 35°S on 30 November, 41°15S on 5-6 December, 42°S on 8 December, 43°S on 10 December and 44°S-40°S on 12-14 December. Researches in these areas were, therefore, limited. The *SM2* encountered unfavorable weather, mostly in strong wind at edge of high pressure, almost throughout the surveys. Limited surveys were made on 22-24, 29-30 November, 1-3, 6-7, 9, and 13 December. Total research distances of the *SM1* and *SM2* were 2,479 n.miles and 2200 n.miles, respectively.

Both vessels entered port of Fremantle, Western Australia on 17 December to participate the 11th IWC/IDCR Southern Hemisphere Minke Whale Assessment Cruise.

Minke Whale Sightings

A total of two schools of diminutive form minke whale, six schools of southern form minke whale and 7 schools of unidentified minke whale were observed in the first half of the surveys during 15 November to 16 December. It was pointed out by the captains that because of poor sighting conditions (mainly strong winds) number of unidentified form minke whales was increased in this period compared to the previous surveys. Sighting positions were plotted in Fig. 3.

Four pairs of cow and calf of minke whale (one pair of diminutive form, one pair with another one adult animal of southern form and two pairs with another one animal of unidentified form minke whale) were seen (Fig. 3). Body lengths of these calves were estimated 3.5-4.0 meters. These pairs of cow and claf were observed in the waters between 27°S and 38°S. Clear photographs were taken against one pair of probable diminutive form minke whale (see Plates 1-2).

Another three 'like minke' whales (which were not positively identified) were seen.

Second half (24 Feb.-13 March)

The *SM1* departed port of Fremantle on 23 February after the 11th IWC/IDCR Southern Hemisphere Minke Whale Assessment Cruise and commenced surveys after coming out of 200 n.mile zone of Australia (Fig. 2). The *SM2* left Nisshin Maru No.3 on 16 February after refuelling and commenced research on 24 February in the waters just north of 55°S.

The *SM1* encountered relatively good weather throughout the survey in the waters south of 40°S although this area was usually strong wind area. The *SM2* encountered bad weather on 24-25 February at 55°S-52°S and 1-2 March at 47°S-46°S while the *SM2* had relatively good weather in spite of bad weather periods.

The *SM1* completed her surveys at 200 n.mile zone of Indonesia on 15 March and the *SM2* finished her surveys at 35°S 165°E on 12 March. Total research distances of the SM1 and SM2 were 1,229 n.miles and 1,123 n.miles, respectively.

Minke Whale Sightings

Only one 'like minke' whale was seen by the *SM1* at 42°48S 112°00E on 26 February in this second half (Fig. 4). No minke sighting was made by the *SM2* in the waters north of 55°S.

Discussion

In the two seasons (1987/88 and 1988/89) a number of minke whales (both southern and diminutive form) was occurred in the low and middle latitudinal waters in the first half from the middle of November to the middle of December (Fig. 5) but very few minke whales were sighted in the second half from the middle of February to the middle of March (Fig. 6). This suggests that most of individuals have already migrated to south until February. From study of Williamson (1975) at Costinha in Brazil (7°S latitude) last minke whales leave this area in December. Within the Antarctic, the abundance of minke whales increases from November to a peak in late-January to early-February and then decreases in late February (Ohsumi, 1979). These may indicate that the last whales in low and middle latitudinal waters (between latitude 20°S and 55°S) migrate south in probably late December-early January.

According to Best (1982), the abundance of minke whales at Durban (29°53S 31°03E) increases from April to a peak in September, and there is a continual arrival of minke whales from the Antarctic during the months from June to September. From the observations at the Antarctic and Durban, the first minke whales leave Antarctic possibly in late February and another minke whales leaves gradually through March to early winter.

Most of sightings of minke whales seen by the surveys during November and December were solitary animals (53%) (see Table 1). Estimated body lengths of these animals were between 4.5 to 7.6 meters. Since sexual maturity of males and females of the southern form minke whales were estimated at 24.9 (7.6 meters) and 26.6 feet (8.1 meters), respectively (Best, 1982) while it is suggested that the diminutive form minke whales mature at body length of less 7.6 meters (Best, 1985), the southern form minke whales among these animals were thought to be immature. No larger animals than 7.6 meters in body length (except groups of cow-calf, and cow-calf with another one adult animal) was found in this period. In the Antarctic smaller animals of the southern form were predominant in early season (November). These may suggest that south migration season of immature animals (at least the southern form) are longer than of mature animals and mature animals have already migrated south until mid-December. In autumn, from observations at the Durban (Best, 1982), sexually immature animals were predominant in April and May, and mature males were predominating in June while the proportion of immature

animals rapidly declined after June. These evidence may suggest that mature animals leave Antarctic during relatively shorter period than immature animals and peak of the migration is in April-May (this probably lead increasing of abundance at Durban from June) although migration of immature animals are thought to be relatively long and possibly varied by individuals.

A total of four calves of minke whale were observed during late November to early December. According Ivashin and Mikhalev (1978) and Best (1982), peak of pairing season was August-September. This suggests that peak of calving is June-July under assumption of a gestation period of about 10 months. No pairs of cow-calf was observed in the second half (mid-February to mid-March). These may suggest that the majority of the cow-calf pairs must break down until the middle of December.

Distributions of both form of minke whales seems to be overlapping in the periods of November-December in low and middle latitudinal waters. From results of the Japanese feasibility study, it was observed that the both forms of minke whales are segregated in high latitudinal waters (south of 62°S where this latitudinal area was thought to be just Antarctic convergence) but are overlapped in the waters north of 62°S (Kato, Fujise, Yoshida, Nakagawa, Ishida and Tanifuji, 1989).

Sightings of minke whales in low and middle latitudinal waters in mid-summer was very few rather than expected. Kasamatsu and Miyashita (1983) estimated the abundance of minke whales in the waters 40°S-60°S in January-February by using sightings data obtained from scouting boats belonged to the Japanese whaling fleets. They indicated that relatively high density in the waters between 50°S-60°S but very few in the waters between 40°S-50°S. Kasamatsu and Miyashita (1983), however, noted that the estimates of densities were not obtained from systematic sighting surveys. Moreover, it was thought that the sighting efforts of the scouting boats of the whaling fleets were concentrated in area of whaling grounds for baleen whales. The results from the two season's systematic sighting surveys suggest that density of minke whales in the low and middle latitudinal waters in mid-summer is probably lower than expected while search efforts in the waters 55°S-50°S was limited. Similar low densities were also shown from the sightings in transit (the late of December and the early or the middle of February) of the IWC/IDCR Southern Hemisphere Minke Whale Assessment Cruises (Kasamatsu et al., 1988).

Sighting surveys in two seasons were conducted in the waters between 20°S-45°S during mid-November to mid-December and in the waters between 55°S-30°S during mid-February to mid-March. Amount of efforts were concentrated in the waters north of 45°S from the two seasons but limited efforts were made in the waters south of 45°S. If similar sighting surveys would be conducted in future, efforts should be concentrated in the waters between 45°S and 60°S in summer.

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Table 1. Sightings of minke whales observed in the second minke whale sighting surveys in low and middle latitudinal waters in 1988/89.

Date	Ship	latitude	Longitude	Form[1]	Number	Estimated length (meter)	Number calf
=First Half=							
20 Nov.	SM2	26°51S	106°56E	D	2	7.0, 7.0	-
	SM2	26°52S	106°56E	U	3	7.5,5.0,3.5	1
	SM2	27°01S	106°51E	LM	1	-	
26 Nov.	SM2	36°50S	106°25E	S	3	8.0,7.0,4.0	1
29 Nov.	SM2	39°26S	101°10E	U	1	6.4	-
	SM2	39°30S	101°00E	S	1	7.6	-
	SM1	33°56S	97°40E	S	1	7.2	-
	SM1	34°13S	97°19E	D	2	8.5,3.5	1
	SM1	34°37S	96°52E	U	3	-	
30 Nov.	SM2	39°36S	100°47E	U	1	7.3	-
2 Dec.	SM1	36°42S	94°15E	LM	1	-	
3 Dec.	SM2	41°24S	102°46E	S	1	6.0	-
	SM1	38°09S	92°25E	U	3	8.5,8.3,4.0	1
	SM1	38°15S	92°17E	LM	1	-	
6 Dec.	SM1	41°17S	92°32E	U	1	7.0	-
	SM1	41°16S	92°28E	U	1	6.0	-
	SM1	41°15S	92°37E	S	1	4.5	-
12 Dec.	SM1	44°47S	99°31E	S	2	7.0,7.5	-
=Second Half=							
26 FEb.	SM1	42°48S	112°00E	LM	1	-	-

Remarks; 1;S-southern form minke whale which has not white patches on the flipper and immeadiately above shoulder, D-diminutive form minke whales and U-unidentified form minke whales and LM-like minke whales.

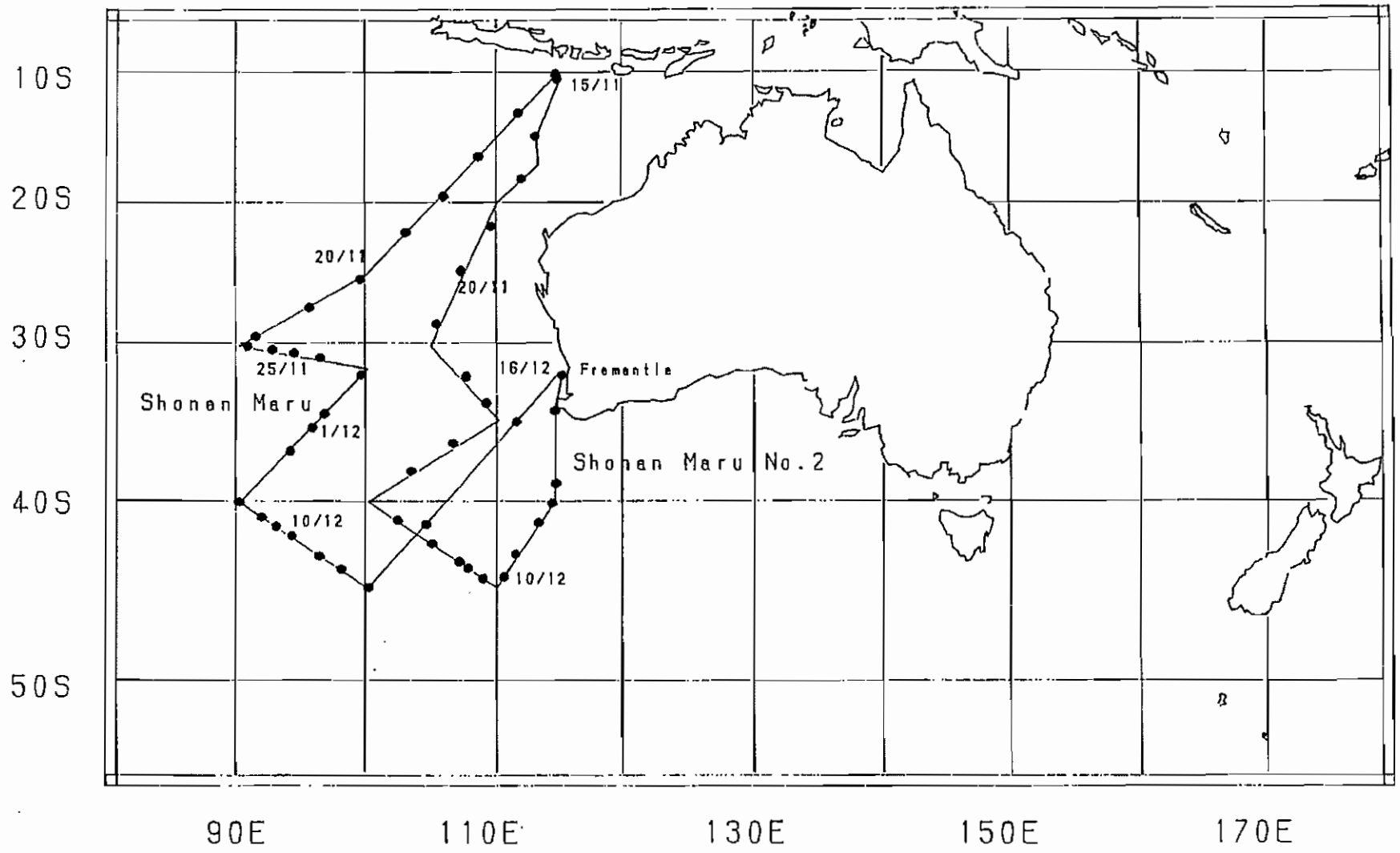

Fig. 1. Cruise tracks and noon positions of Shonan Maru and Shonan Maru No.2 in the first half (15 Nov.-16 Dec.)

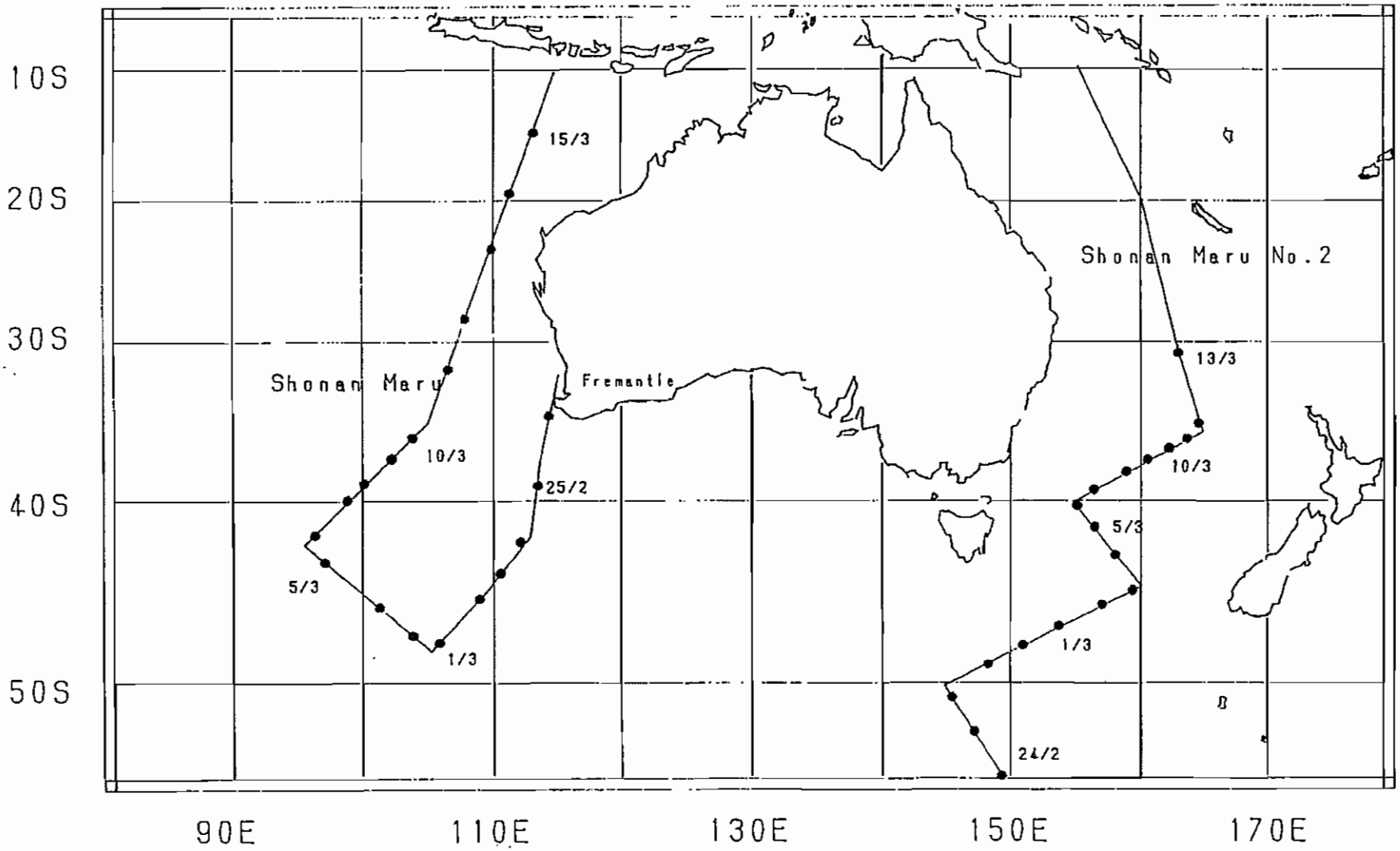

Fig. 2. Cruise tracks and noon positions of Shonan Maru and Shonan Maru No 2 in the second half (24 Feb.-15 March)

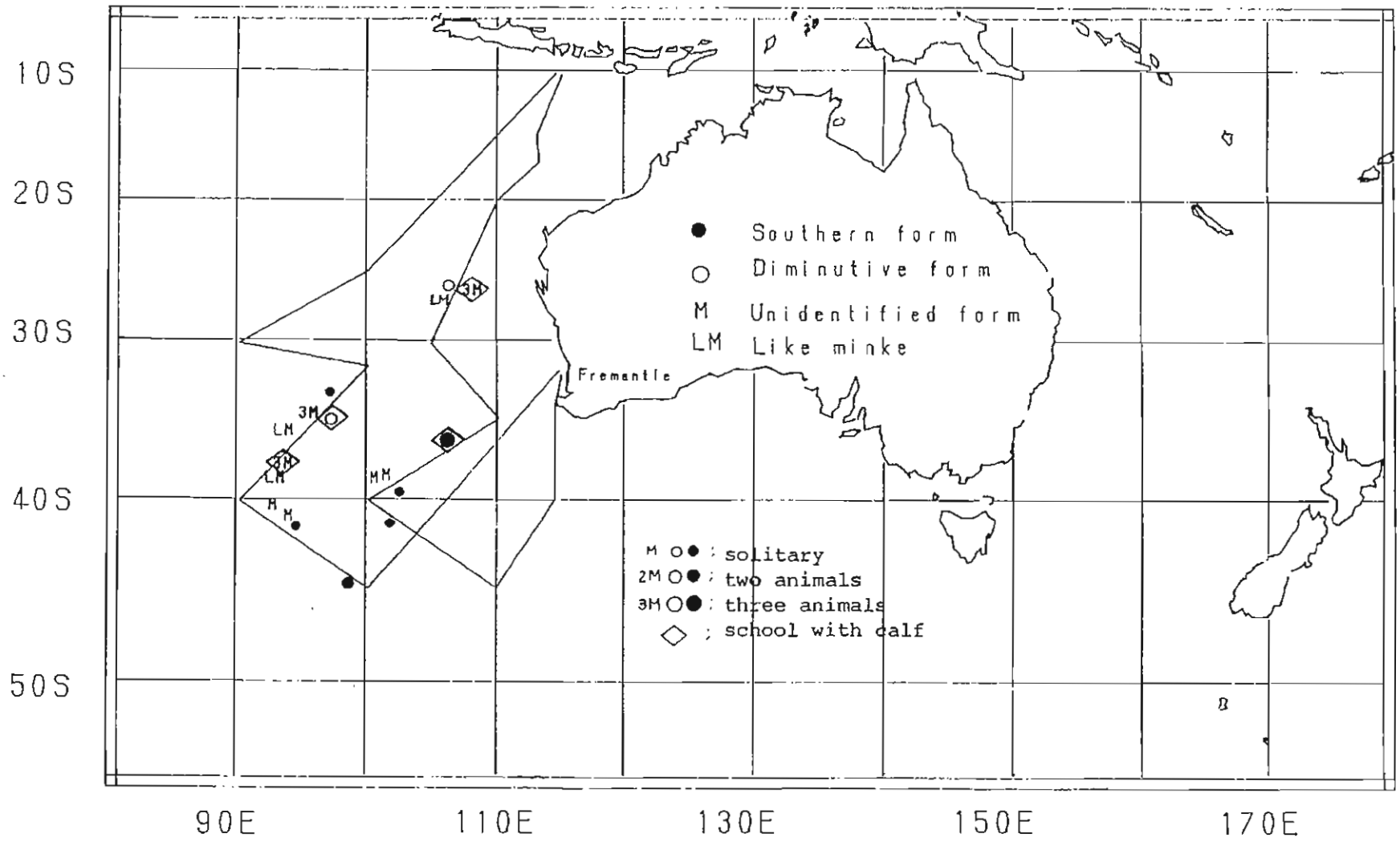

Fig. 3. Cruise tracks and sighting positions of minke whales in the first half (15 Nov. -16 Dec.)

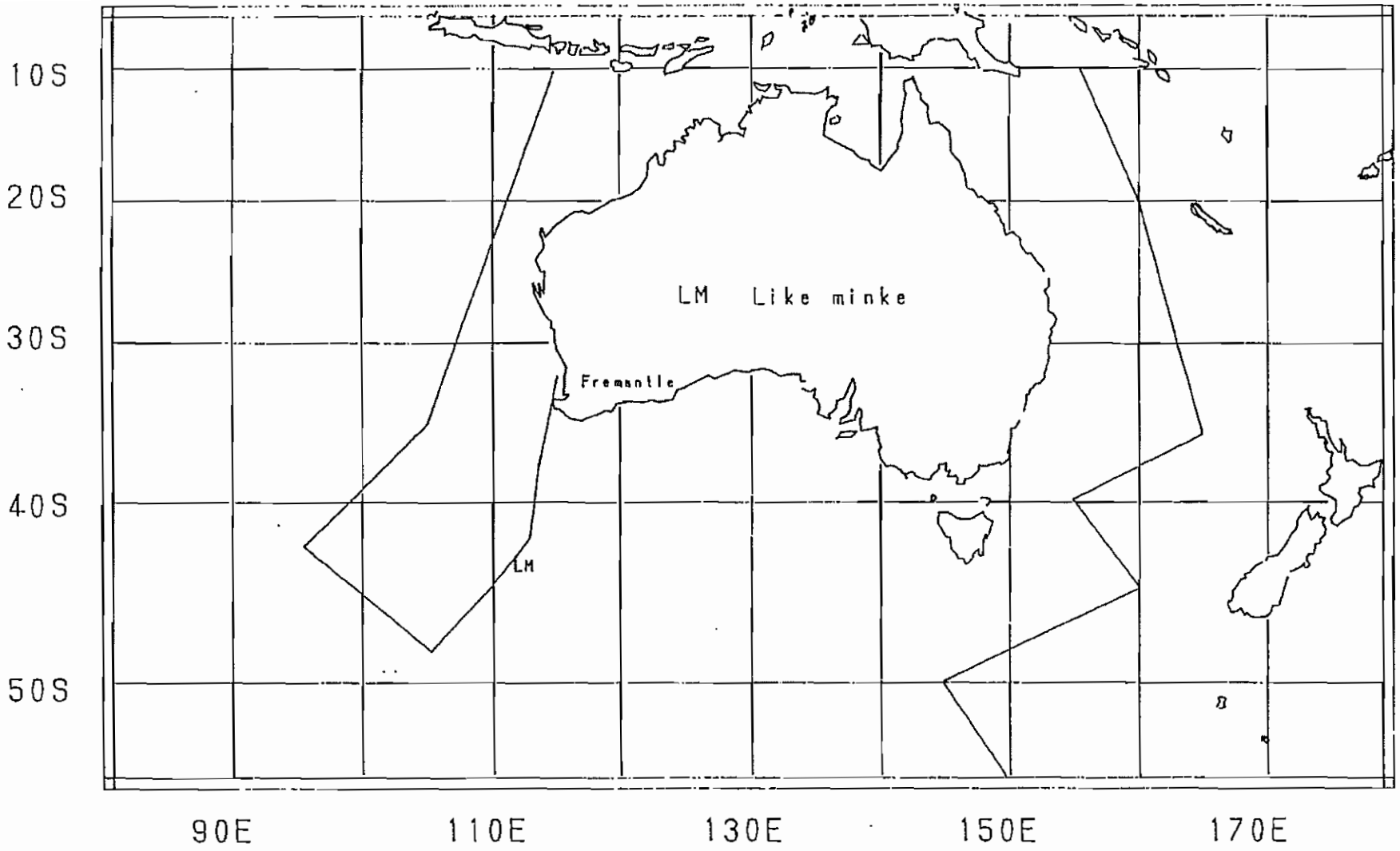

Fig. 4. Cruise tracks and sighting position of minke whales in the second half (24 Feb.-15 March)

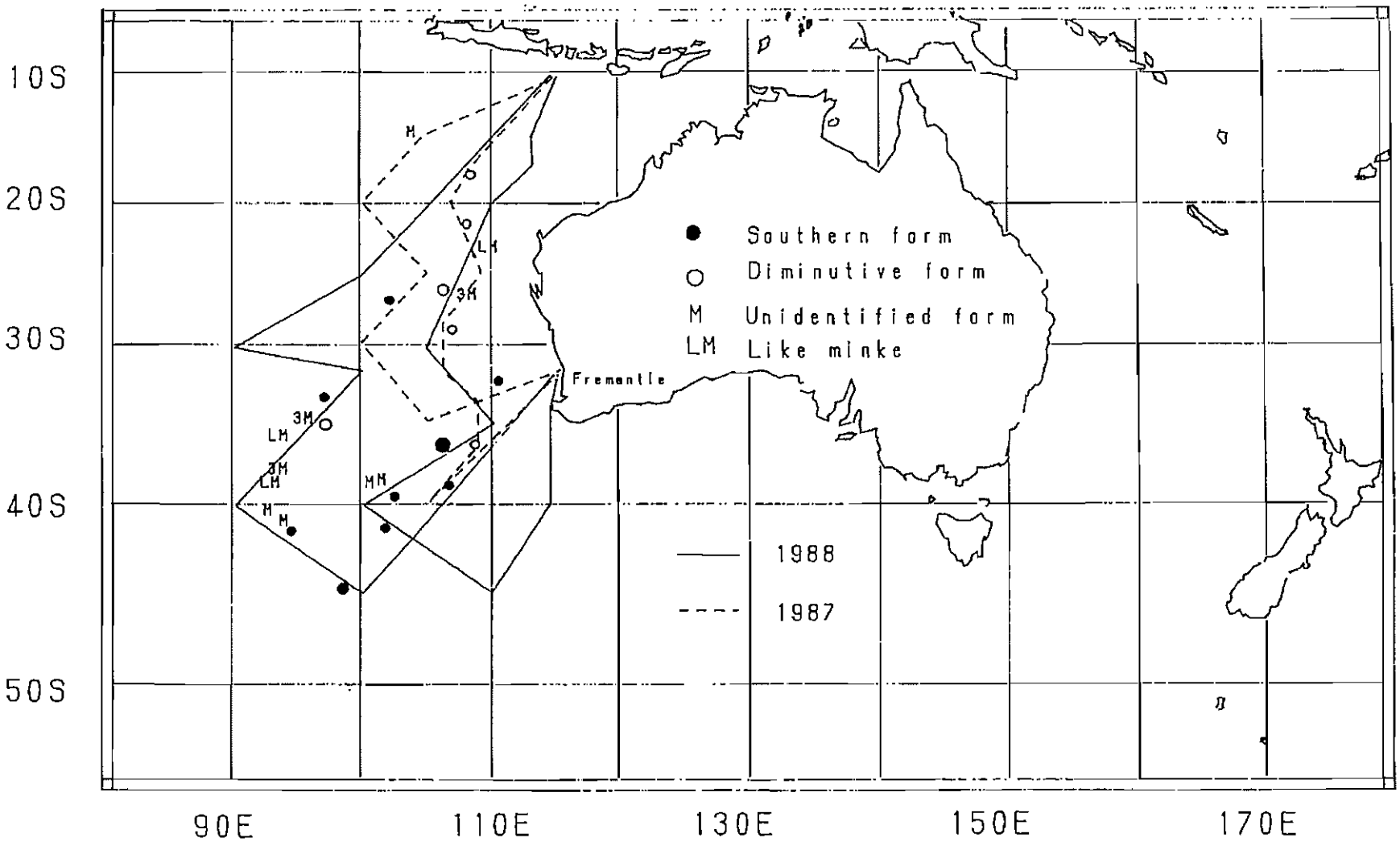

Fig. 5. Cruise tracks and sighting positions of minke whales in Nov.-Dec. in the last two seasons

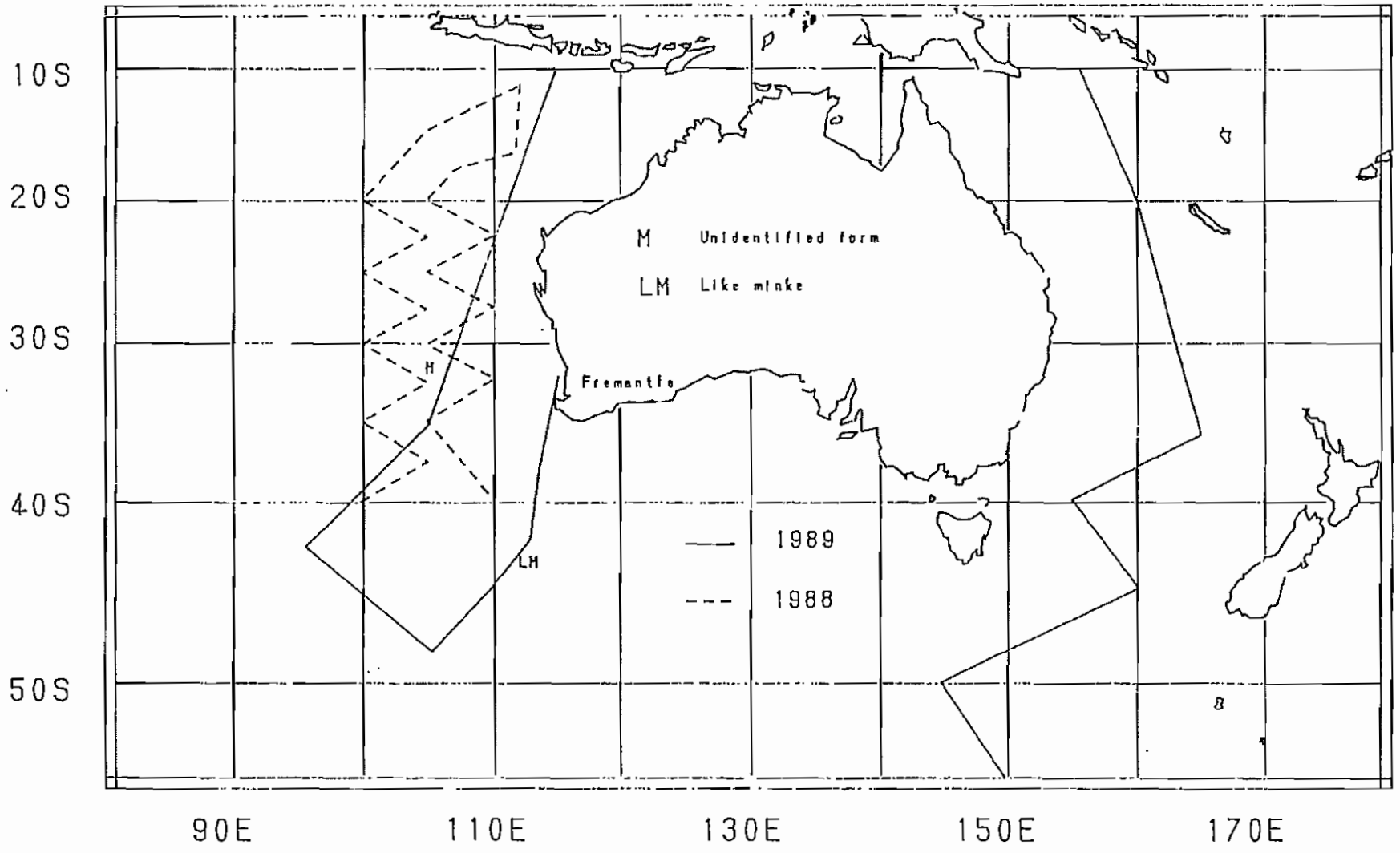

Fig. 6. Cruise tracks and sighting positions of minke whales in Feb.-March in the last two years

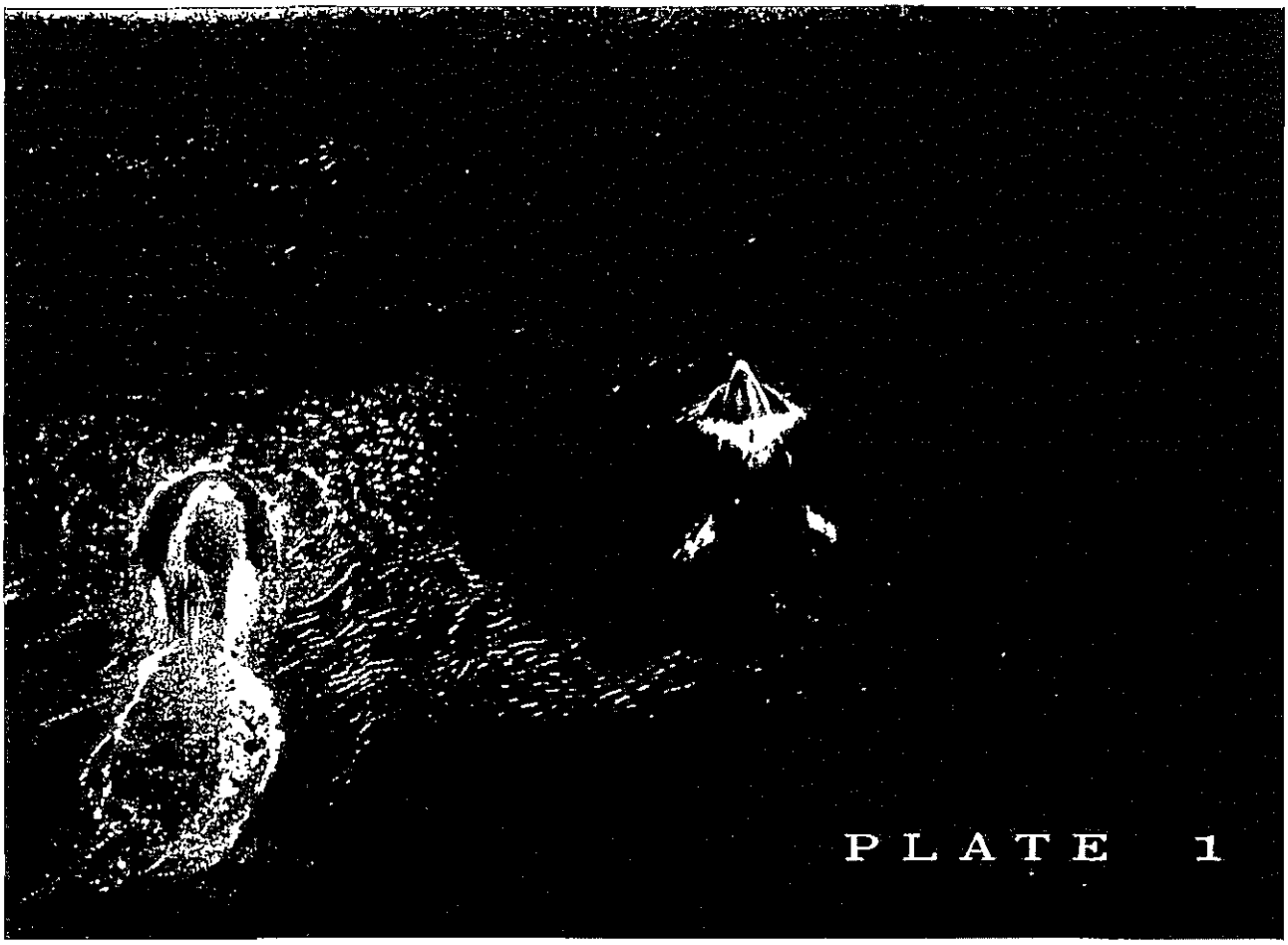

PLATE 1

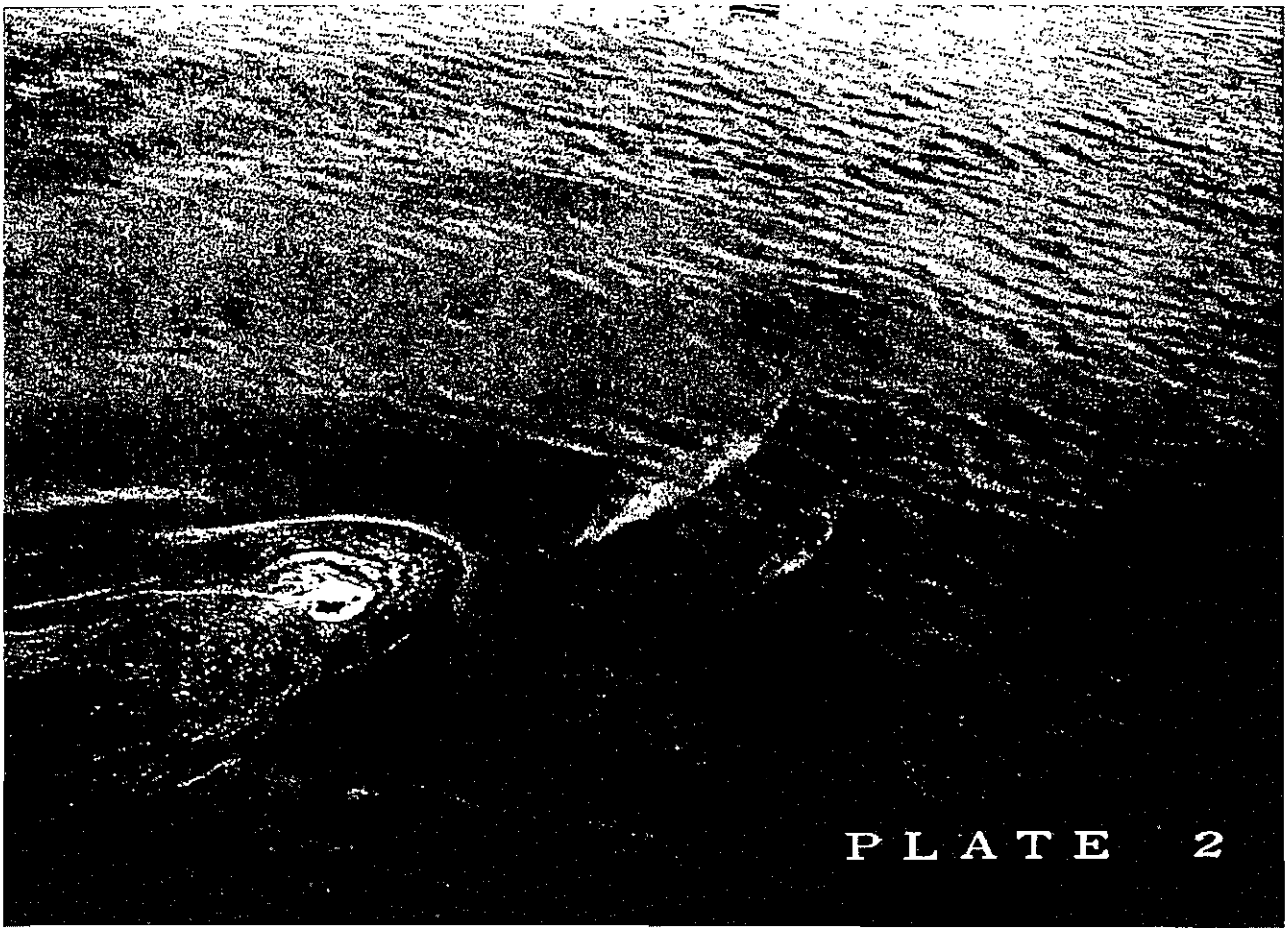

PLATE 2