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**NEW ZEALAND MARINE DEPARTMENT**

**FISHERIES TECHNICAL REPORT**

**NO.12**

**EXPLORATORY TRAWLING OFF THE WEST COAST  
OF NEW ZEALAND JANUARY 1966**

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**WELLINGTON NEW ZEALAND 1966**

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A 126-foot steel trawler, the Thomas Currel, was chartered in January 1966 for 10 days exploratory bottom trawling in 70 to 100 fathoms, north of Cape Farewell. This area has been little, if ever, fished by New Zealand boats, being some distance from ports and exposed to the prevailing westerly winds. The weather was fine during the survey, with light to moderate south to southwest winds. Catches of fish were poor; the only commercial two-hour tow was a catch of 22 cases of sharks, tarakihi and mixed rounds.

Area Fished

Trawling was carried out between 70 and 100 fathoms, in a 3,000 square mile area extending south for 100 miles, from a point 60 miles west of New Plymouth to 12 miles north of Cape Farewell (Fig. 1).

Echo soundings were made while the ship was steaming and trawling, and the bottom over the whole area was found to be flat and smooth. Mud was found on the trawl doors after each tow.

Rough bottom in the form of deep trenches running east to west was located at over 90 fathoms in the western central area.

The surface water temperature was recorded at 16.5°C.

### Fishing Method

Trawl tows were spaced about 12 miles apart; each lasted two hours and covered a distance of 8 miles.

The trawl was a normal Granton trawl of synthetic material (kourlene) with a hemp cod end. It had a ground line of 126 feet and a headline of 79 feet. Twenty-five fathoms sweeps were fitted and a bag of 2-inch mesh was laid inside the 4-inch mesh cod end.

The fish from each tow were examined on deck. The number of each species was recorded and a representative sample of each commercially important species was weighed and measured. Most of the trawling was done during the day. Several night tows were made, but the only difference between the catches was an increase in the number of squid taken at night.

### Results

#### Total Catch

School sharks were the most abundant fish, by weight, over the whole area. Tarakihi were second, followed by barracouta and snapper. Seven other species made up the remainder of the catch (Fig. 2).

#### Catch Per Tow

Only tow No. 3 was commercially economic for the Thomas Currel, with 756 lb of tarakihi, 767 lb of shark and 732 lb

of other commercial varieties. The weight of each species of commercial and bait fish per tow is listed in Table 1 and 2.

#### Average Weight for One Hour's Trawling

The average weight of all fish for one hour's trawling from all the tows over the whole area at the time of the survey (January) was 405 lb or 4 cases. The three most abundant commercial species, tarakihi, snapper and shark, gave a total return of only 250 lb or 2½ cases per one hour's fishing. (Table 3).

#### Distribution of Species

##### Sharks

Sharks were widespread over the whole area. However, the best catches were made in the south in depths of from 35 to 96 fathoms and in one northern tow in 78 fathoms (Fig. 3). Catches were light in the rest of the area, varying from 50 to 250 lb per two hour tow.

##### Tarakihi

Tarakihi were taken in every tow, the poorest being No. 14 in 35 fathoms opposite Cape Farewell where only 5 lb were taken. The best catches were made in 80 to 90 fathoms on the northwest edge of the area with the heaviest concentrations in tow No. 3. Tarakihi were sparse elsewhere except for another small concentration of fish in the centre of the area (Fig. 4). Tarakihi in the north and centre ranged from 12 to 20 inches in

fork length, with a peak of abundance at 16 to 18 inches. Those in the south had a wider size range of from 10 to 22 inches and two peaks of abundance at 14 and 20 inches.

### Baracouta

Barracouta were present over the whole area except in trawls 2 and 4, but were most abundant in the south in 35 to 97 fathoms (Fig. 5).

### Snapper

Snapper were generally sparse, but were widely distributed at from 35 to 100 fathoms (Fig. 6). They were all of a large size ranging from 18 to 24 inches, with a peak abundance at 20 to 22 inches.

### Other Species

Some of the less abundant species were concentrated in certain areas (Fig. 7). Hake were restricted to the north in 73 to 100 fathoms, whereas mackerel were found in the centre and south-west. Groper were more abundant in the north and centre, and squid were most common in the south. Gurnard were most abundant in the south and in one tow (No. 3) in the north, but john dory were distributed over the whole area.

### Fish Sizes

All the fish were of a large commercial size; their average fork length was as follows:

<u>Species</u>	<u>Length in Inches</u>
Tarakihi	17
Snapper	21
Barracouta	30
Gurnard	18
Mackerel	18
John Dory	18
Groper	27
Squid	19
Shark	56
Hake	30

### Spawning

Snapper, gurnard, mackerel and john dory had ripe or spawning roe, and tarakihi and groper had resting mature roe.

### DISCUSSION

#### Commercial Prospects

Only one tow by the survey boat took a commercial catch of 2,111 lb of fish. The next best catch was 910 lb, and only 5 of the remaining 13 tows took more than 500 lb of fish per tow.

It is doubtful if it would be profitable for 50 to 60 foot trawlers to work this area at this time of the year. Catches would probably be smaller than those taken by the survey boat because of the use of smaller trawls. Even if catches were similar the distance of the grounds from port, the depth of water to be fished, and the poor weather conditions in this area would lessen the chances of making the fishing operations a financial success.

However, the commercial prospects of the area, at this time of the year, would have to be assessed by each fisherman who would have to take into account his expenses and the size of the catches from his normal fishing grounds.

#### Probable Reason for Lack of Fish

The most probable explanation for the lack of fish when the survey was made, is that this ground is seasonal. The whole area had a barren appearance. There were no birds or surface fish, and the water was very clear with no visible surface plankton. Experienced fishermen on the survey, stated that poor catches are taken from the traditional trawling grounds when similar conditions prevail.

The shallow water ground inside the survey area is most productive in the winter from June to August and this may also apply to the area surveyed.

### Conclusion

It is important to determine if the fishery is seasonal or if the area is a barren ground, as it is one of the few remaining trawling grounds under 100 fathoms, unfished by New Zealand boats. The area is of a large size with a suitable trawling bottom and if productive, would be most valuable to the fishing industry.

A further survey should be carried out, preferably during June and July, to determine the potential of the area in the winter.



Table 1: Weight of Commercial Species in each Trawl Tow

Trawl No.	Tarakihi	Snapper	Shark	Hake	Groper	John Dory	Gurnard	Total lb
1	150	48	105	32	0	12	0	347
2	284	36	120	56	12	42	3	553
3	756	120	767	112	96	152	108	2,111
4	164	0	60	4	0	0	6	234
5	250	18	90	40	12	16	21	447
6	113	8	110	27	0	8	6	272
7	30	42	210	0	12	0	33	327
8	150	24	105	0	24	20	0	323
9	373	80	260	16	56	0	22	807
10	87	70	465	0	0	0	30	652
11	66	12	330	0	0	0	4	412
12	150	138	360	0	12	12	3	675
13	104	108	500	0	24	84	90	910
14	5	12	420	0	0	60	138	635
15	49	100	70	0	0	16	4	239
Totals	2,732	816	3,972	287	248	422	468	8,944

Table 2: Weight of Bait Species in each Trawl Tow

Trawl No.	Barracouta	Mackerel	Squid	Skate	Total lb
1	48	0	5	0	53
2	0	3	50	0	53
3	44	0	0	100	144
4	0	0	2	0	2
5	64	0	3	60	127
6	38	2	66	14	120
7	96	84	10	0	190
8	48	3	1	20	72
9	88	20	3	0	111
10	240	36	65	20	361
11	300	1	8	66	375
12	120	410	20	0	550
13	128	16	25	0	169
14	320	33	0	60	413
15	400	0	167	0	567
Totals	1,934	608	425	340	3,307

Table 3: Total Weight of all Species and Average Weight per One-hour Trawl Tow

Species	Total Weight lb 30 hours' Trawling	Average Weight lb. one hour's Trawling
Shark	3,972	132
Tarakihi	2,732	91
Barracouta	1,934	64
Snapper	816	27
Mackerel	608	20
Gurnard	468	15
Squid	425	14
John Dory	422	14
Skate	340	11
Hake	287	9
Groper	248	8
	12252	405 Total

Appendix 1.

Scientific names of fish referred to in the Text

School Shark	<u>Galeorhinus australis</u>
Tarakihi	<u>Cheilodactylus macropterus</u>
Barracouta	<u>Thyrssites atun</u>
Snapper	<u>Chrysophrys auratus</u>
Mackerel	<u>Trachurus declivis</u>
Gurnard	<u>Trigla kumu</u>
Arrow Squid	<u>Notodarus sloanii</u>
John Dory	<u>Zeus faber</u>
Skate	<u>Raja nasuta</u>
Hake	<u>Jordanidia solandri</u>
Groper	<u>Polyprion oxygeneios</u>

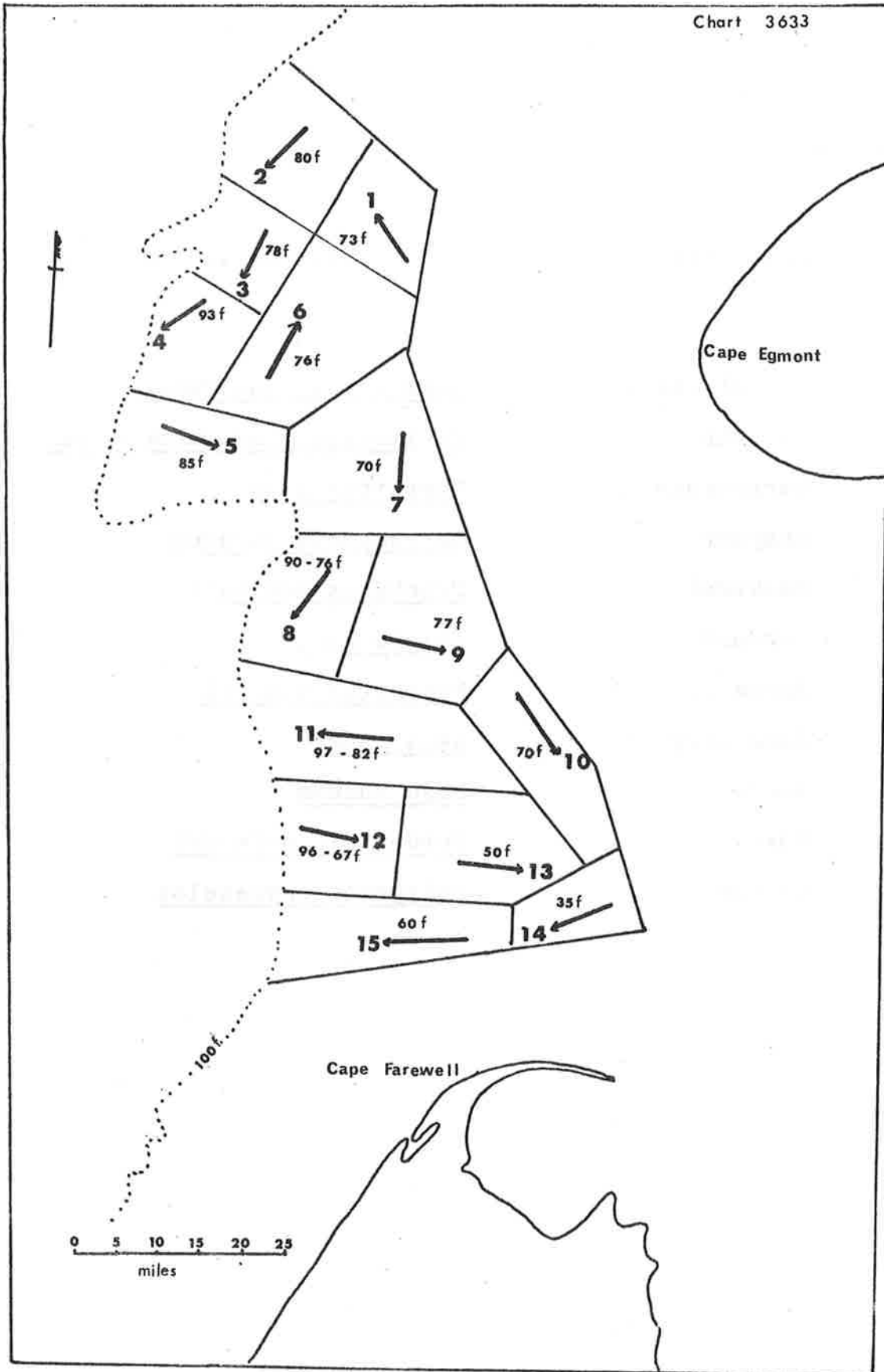
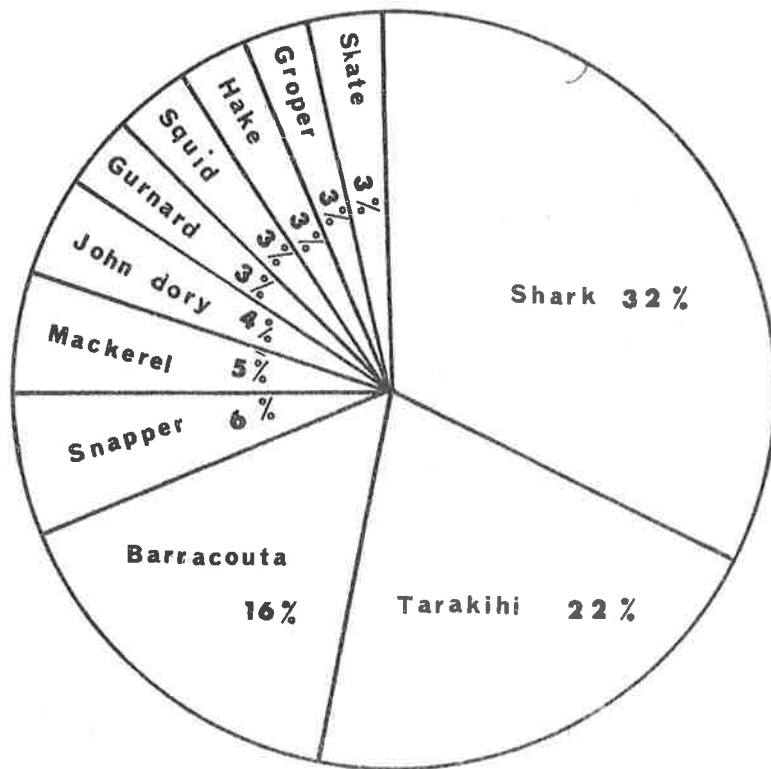
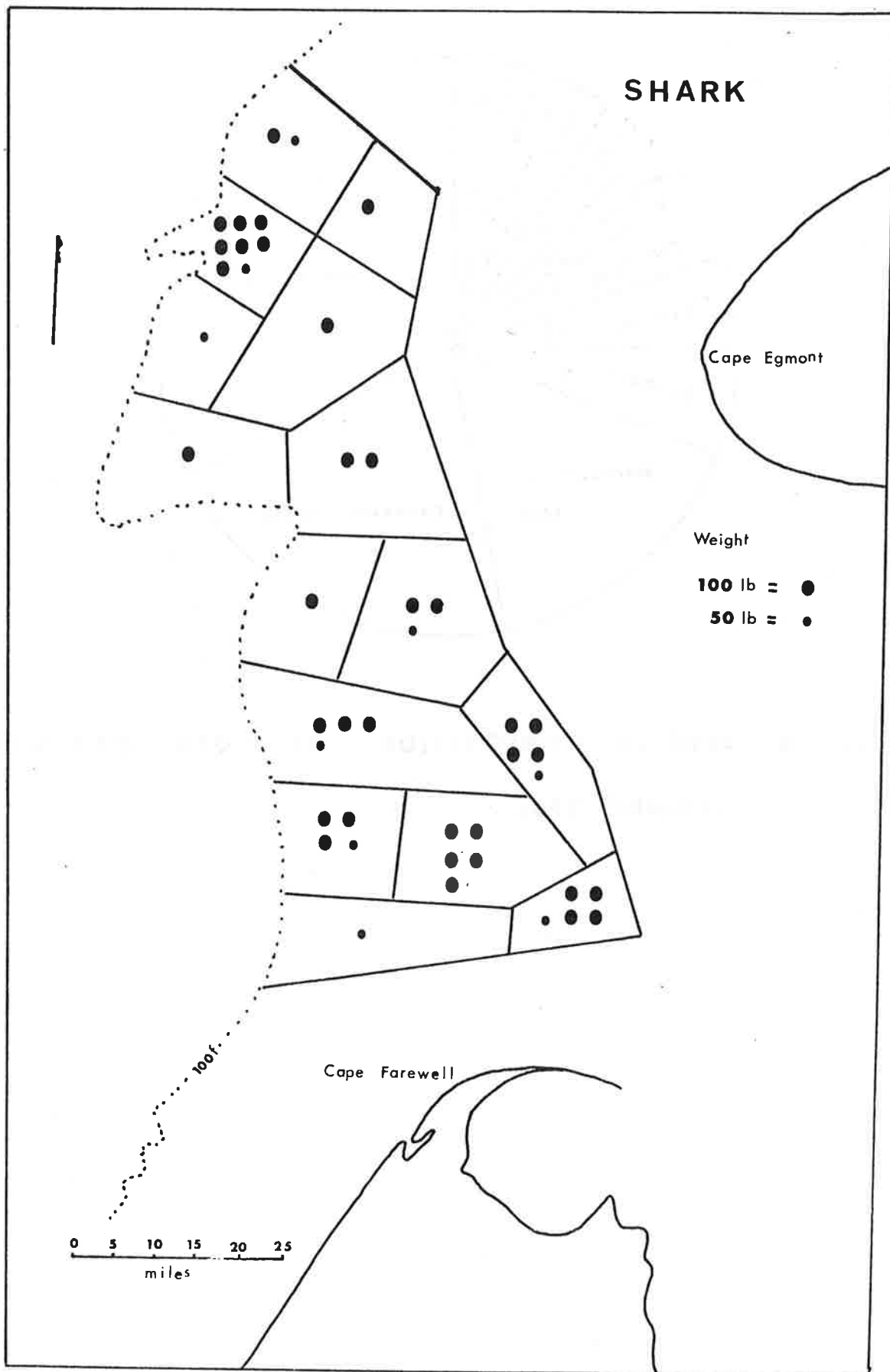


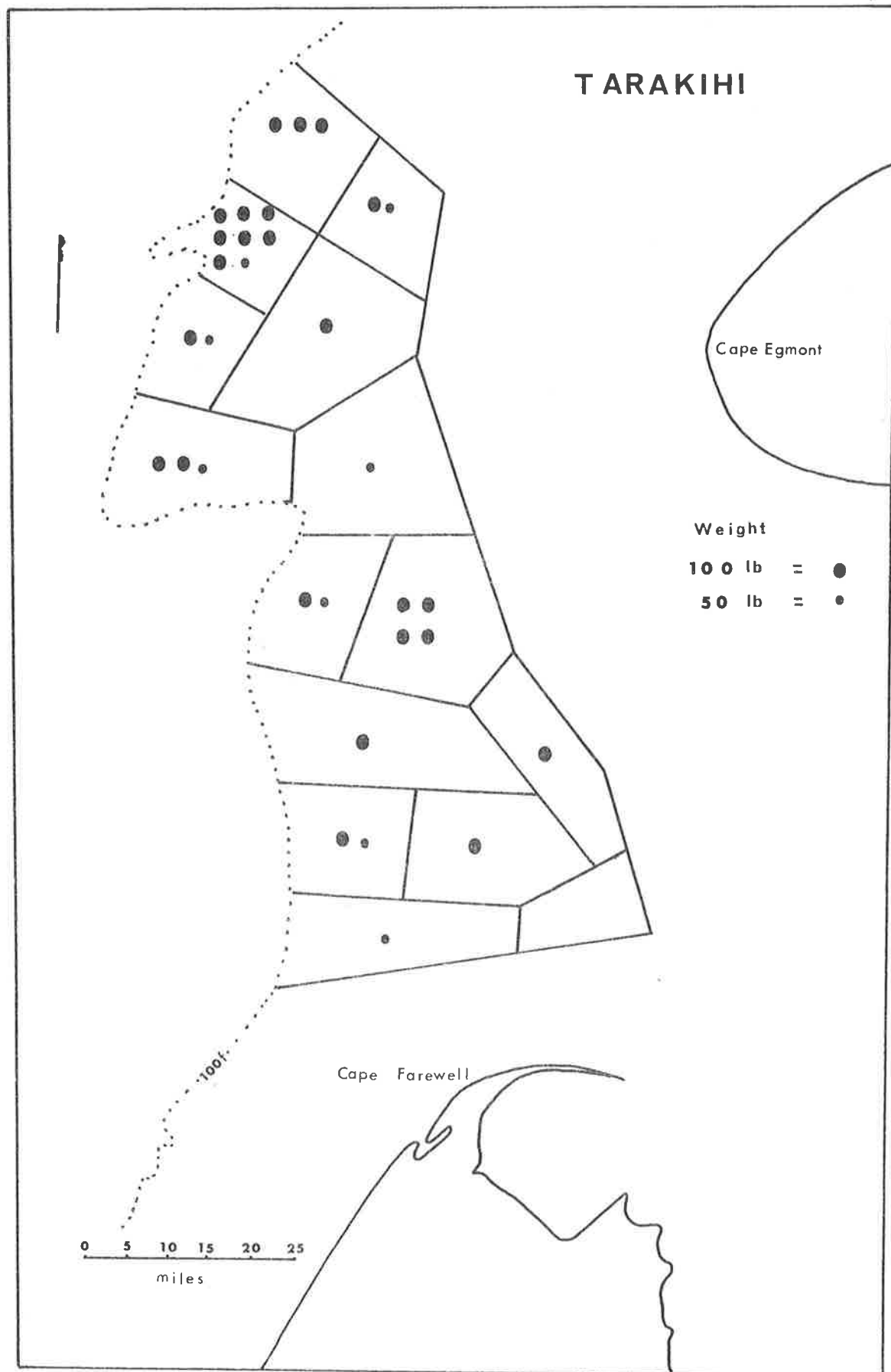
FIG. 1. POSITION OF TRAWL TOWS: WEST COAST OF NEW ZEALAND AREA IS DIVIDED INTO SECTORS AND DEPTHS IN FATHOMS.



**FIG. 2. SPECIES COMPOSITION OF TOTAL CATCH:  
JANUARY 1966.**

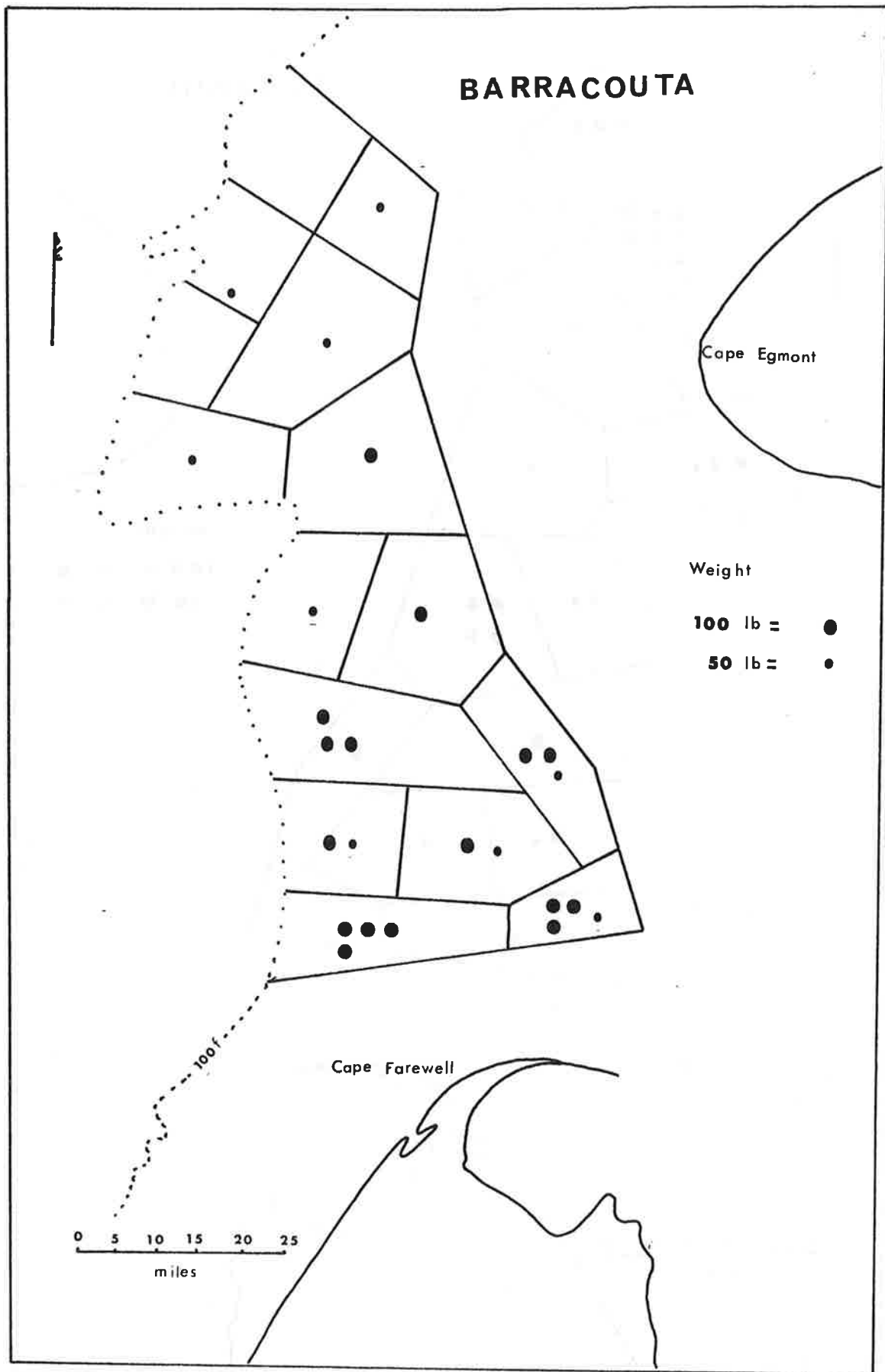


**FIG. 3. DISTRIBUTION AND WEIGHT OF SCHOOL SHARK PER TWO-HOUR TOW: JANUARY.**



**FIG. 4. DISTRIBUTION AND WEIGHT OF T A R A K I H I PER TWO-HOUR TOW: JANUARY.**





**FIG. 5. DISTRIBUTION AND WEIGHT OF BARRACOUTA PER TWO-HOUR TOW: JANUARY.**

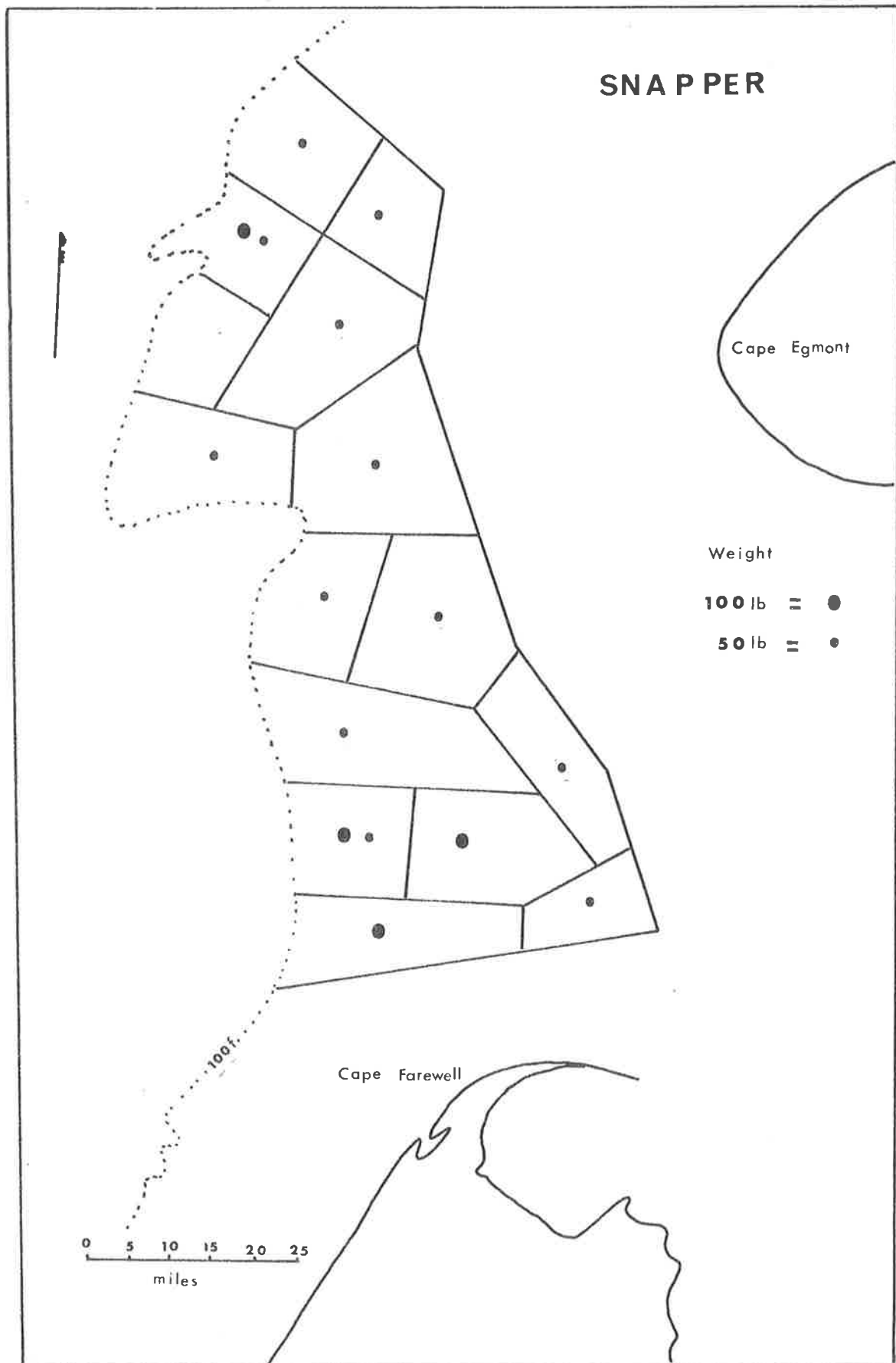


FIG. 6. DISTRIBUTION AND WEIGHT OF SNAPPER PER TWO-HOUR TOW : JANUARY.

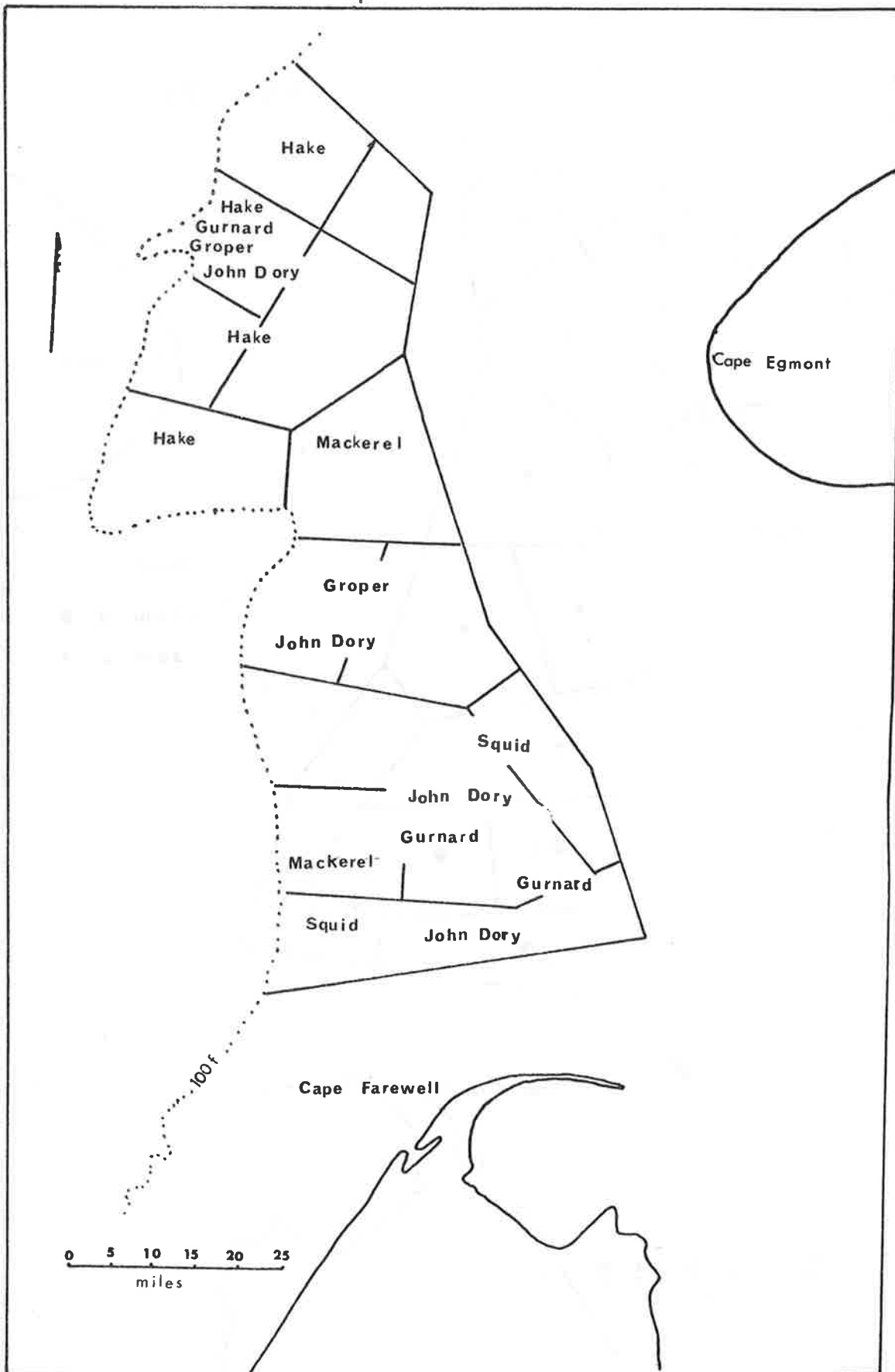


FIG. 7. DISTRIBUTION OF LESS ABUNDANT SPECIES;  
JANUARY.

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