

SOUTH PACIFIC COMMISSION

REPORT ON A ROCK LOBSTER SURVEY
IN THE GILBERT ISLANDS

(26 April - 5 May 1977)

by

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1. INTRODUCTION

The South Pacific Commission Fisheries Adviser and the SPC Lobster Project Officer arrived in the Gilbert Islands on 23 April, 1977. On 25 April a meeting was held with the Chief Fisheries Officer and the Assistant Secretary for the Ministry of Commerce and Industry. At the meeting it was decided that the SPC Project Officer would visit Abaiang, Abemama, and Butaritari atolls with the following objectives:

- To dive on the reefs during daylight hours and look at habitat suitability for the double-spined rock lobster, Panulirus penicillatus, and to a lesser extent, Panulirus versicolor.
- To dive at night with underwater torch lights and count the rock lobster seen in the area surveyed during the day (records of the number of each species of rock lobster were kept as well as the number of man-hours diving, and the state of the sea, tide, moon, etc.)
- To make a rough estimate of the resource potential in each area, using the information obtained by the above methods.

2. SURVEY PROGRAMME

Details of the programme's operations are given below in diary form.

26/4/77 - The SPC Fisheries Adviser and the SPC Project Officer and Fisheries Division personnel left Tarawa for Abaiang aboard the F.V. Ang Rerei. The eastern side of the atoll (Area 1, Fig. 1) was surveyed by diving in daylight and again at night from 20.50-21.20. A more extensive night survey was decided against because of difficult diving conditions and numerous stinging medusae.

27/4/77 - Using the Fisheries Division's fast runabout, an area of reef approximately 2 kilometres long on the western side of Abaiang atoll (Area 2, Fig. 1) was surveyed by daytime diving. A smaller section of the same reef was surveyed again that night from 20.40 to 21.55 hours.

28/4/77 - The group returned to Tarawa where a meeting was held with the Minister for Commerce and Industry, the Secretary and Assistant Secretary of the same Ministry, and the Chief Fisheries Officer. There were discussions on the work of the SPC Lobster Project in the Solomons and its regional importance, the objectives of the current survey, and the minimum size limit regulations being implemented in the Gilberts.

29/4/77 - The SPC Project Officer departed for Abemama accompanied by the Senior Fisheries Field Assistant. Upon arrival at Abemama arrangements were made for road transportation with the Island Executive Officer and attempts were also made to arrange for a boat. The northern side of the atoll (Area 3, Fig. 2) was surveyed both during the day and again from 21.00 to 22.00.

30/4/77 - The reef on the eastern side of the government station was surveyed southward for approximately 1 kilometre (Area 4, Fig. 2) by day and a small section again at 22.00 to 22.45.

1/5/77 - Boat transport was unavailable so no further areas were visited.

2/5/77 - We travelled as far south as the road would permit, walked across one island and surveyed a reef (Area 5, Fig. 2) during the day. We departed for Tarawa in the afternoon.

3/5/77 - We left for Butaritari in the early morning. Upon arrival we attempted to arrange the use of the Medical Department's runabout to reach the northern reef which was regarded locally as the best area for lobsters. Unfortunately, no fuel was available on the island. The reef on the south-eastern side of the atoll adjacent to the government station (Area 6, Fig. 3) was surveyed by day and again at night from 19.20 to 19.50. Rough conditions and the absence of lobsters brought an early end to the diving.

4/5/77 - We attempted unsuccessfully to charter the Cooperative launch; a sailing canoe was chartered for the following day.

5/5/77 - We visited and surveyed by day the northern side of the Butaritari reef (Area 7, Fig. 3). An attempt to dive at night at this location was curtailed early when diving became hazardous due to a strong current running across the reef into the open sea.

3. SURVEY RESULTS

Each of the areas surveyed by diving at night, with the exception of Areas 2 and 6, had a relatively high population density of P. penicillatus. The lobsters were evenly distributed along the reef as there was enough shelter, i.e. caves and overhangs, all along the reef. Area 2 was a suitable habitat for P. penicillatus but shelter was extremely limited. All the P. penicillatus seen on this reef were scattered over a small area where there was some shelter available. P. versicolor, a less shade-loving lobster, were found under Acropora coral formations, and were distributed more evenly along the reef. The low number of P. versicolor seen on the reef was principally due to the fact that the divers were concentrating more on looking for P. penicillatus in slightly shallower waters.

At Butaritari, Area 6 and southward to the southern end of the island, the reef was very different from all others surveyed. Reef formation and wave action appeared to favour the presence of P. penicillatus, but only one was seen during the night dive. People from the village claimed that few are ever caught in this area. This may be due to fresh-water run-off from the island causing a change in salinity which P. penicillatus cannot tolerate.

Shown in Table 1 below are the total number of rock lobsters of each species observed, and the number of rock lobsters observed per man-hour of diving for each area where a night dive was made.

TABLE I Number of rock lobsters observed per man-hour of diving.

Island and Area No.	P. penicillatus		P. versicolor	
	Total No.	No. per M/H	Total No.	No. per M/H
Abaiang - No. 1	12	8	0	-
No. 2	32	6.4	12	2.4
Abemama No. 3	40	20	0	-
No. 4	32	21.3	0	-
Butaritari - No. 6	1	.6	0	-
No. 7	1*	-	0	-

*Diving stopped as soon as habitat was reached because of hazardous conditions.

Although the numbers of lobsters seen in most areas appeared quite high, they were concentrated in a very restricted habitat - that of the shallow reef around the reef crest. The population is necessarily limited by the available shelter in this restricted area. Although there are very large reef flats where the lobster travel at night to feed, they do not permanently inhabit the reef flat.

The rock lobster's behaviour observed in the Gilberts was very different from that seen by the Project Officer in areas of the Solomons where fishing pressure has been fairly heavy. When confronted by a diver in the Gilberts, the rock lobster did not seek shelter by moving into a hole or tail-flipping away. This, and the generally large size (observations only) suggest that there has been a very low level of exploitation in the areas surveyed.

4. CONCLUSIONS

4.1 At the present time the rock lobster resources of the Gilbert Islands are being under-utilized.

4.2 A large-scale industry dependent solely on rock lobsters for revenue and involving the purchase and maintenance of sophisticated shore-based freezers and freezer-equipped vessels is not feasible.

4.3 The resource could be exploited by a small-scale, "cottage-type", industry with considerable cash benefit to the fishermen involved. Existing means of transportation within the Gilbert Islands could handle a substantially increased catch. On Tarawa and nearby atolls (Abaiang, Marakei, Maiana), local shipping and in some cases even sailing canoes could transport living rock lobsters to market. Many of the more distant atolls could be serviced by aircraft.

4.4 The rock lobster fishery could be developed simultaneously with fin fish fisheries as more sophisticated freezing facilities become available ashore and on shipboard.

5. RECOMMENDATIONS

5.1 As the local market for rock lobsters in the Gilbert Islands is very limited, a stable overseas market should be sought. The export market should not be dependent upon relatively small consumer markets, such as Nauru, which are not particularly stable. It should be noted that other Pacific territories are also interested in Nauru as an outlet for their own rock lobsters.

5.2 A high quality product must be ensured by regulations to prohibit the processing of dead rock lobsters and to impose a minimum size limit on the catch. The Fisheries Division should train interested fishermen in handling techniques, including catching, live storage, and live transport.

5.3 Restrictions on the catching of females carrying eggs externally (berried females) may put an unnecessary restriction on the developing fishery and should be considered very carefully before implementation for the following reasons:

a. Female P. penicillatus become sexually mature at approximately 50 mm. carapace length, and reproduction is continuous in larger individuals of at least 80mm. carapace length and larger. A minimum size limit should ensure that enough females of reproductive size are left to maintain a local breeding stock. One could suggest a minimum size of around 90mm. carapace length, which corresponds approximately with a 250mm. total length.

b. In a sample of 1,480 P. penicillatus caught over a 14-month period in the Russell Islands (Solomons), 34.8% of the total catch was berried females. This is a high proportion of the total population. It is therefore suggested that in order for sufficient numbers of lobsters to be legally available for capture, the capture of berried females should not be totally prohibited.

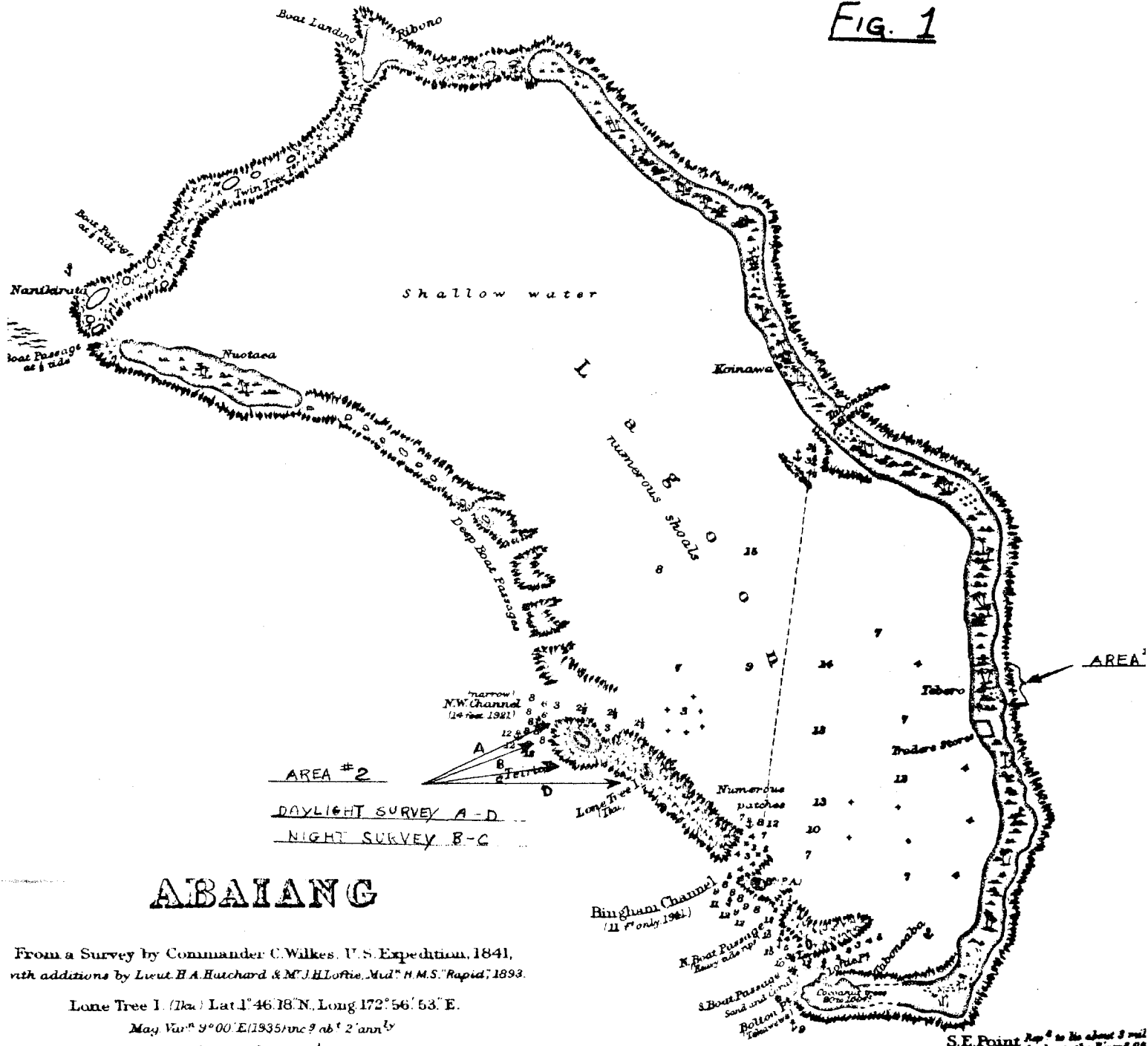
c. Palinurid rock lobster larvae have long planktonic lives during which they drift great distances. It is possible that a high proportion of the larvae produced in the Gilbert Islands are not recruited into the Gilbert Islands fishery. The reduced larvæ production resulting from the taking of berried females may have some small effect regionally.

d. During live storage experiments in the Solomon Islands, berried females (P. penicillatus) have shed all eggs during the course of the six-week experiments. Rapid external egg development and shedding have been observed over short periods of six to nine days. It is assumed that larvae hatched from eggs carried by live-stored females stand the same chance of survival as larvae hatched from eggs carried by females in their natural habitat. Females carrying eggs when captured could be stored for short periods to allow the eggs to hatch. This would probably contribute a small amount to the total larvae production in the Gilbert Islands.

5.4 Panulirus versicolor, seen in quite high numbers in Abaiang, should also be exploited. This is a smaller resource than P. penicillatus, but could add to the total catch, particularly during periods of strong trade winds when it might be too rough to fish for P. penicillatus.

5.5 Ray Cross (Gilbert Islands Fisheries Division) reports catching some Panulirus ornatus in tangle nets set in Tarawa Lagoon. Experimental tangle netting for this species could be tried in other large lagoons.

FIG. 1



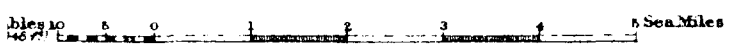
ABAIANG

From a Survey by Commander C. Wilkes, U.S. Expedition, 1841,
with additions by Lieut. H.A. Huchard & Mr. J.H. Loftie, Mid. H.M.S. "Rapid", 1893.

Lone Tree I. (Is.) Lat. 1° 46' 18" N., Long 172° 56' 53" E.

Mag. Var. 9° 00' E. (1935) inc 9 ab 2' ann^{ly}

Natural Scale 1:46,600
(at Lat. 1° 50' N.)



Increasing about 3' annually **Mag. Va**

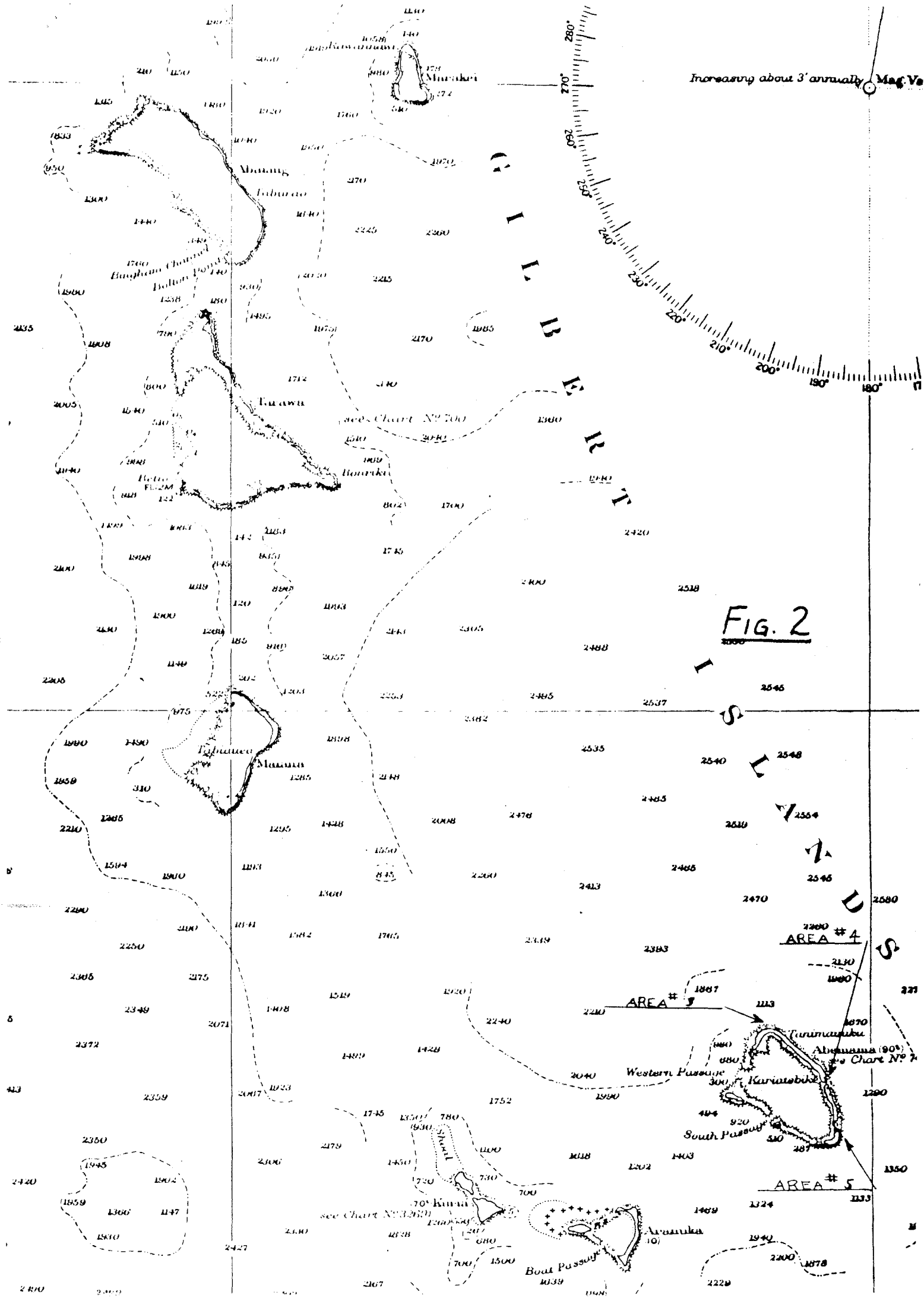


FIG. 2

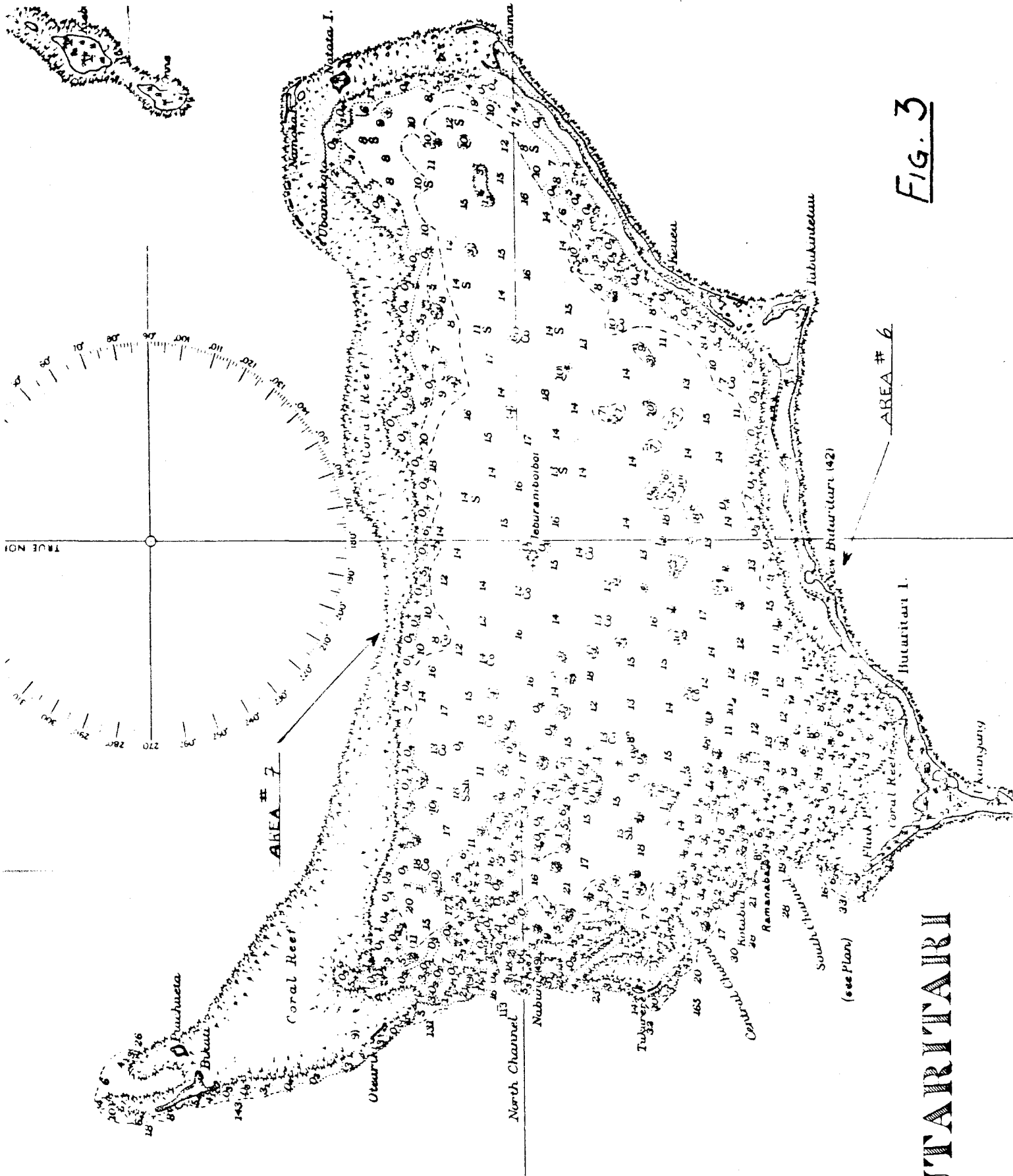


FIG. 3

BUTARITARI

(see Plan)