



**REPORT ON THE SOUTH PACIFIC COMMISSION OUTER REEF
ARTISANAL FISHERIES PROJECT IN SOLOMON ISLANDS**

5 April 1977 —31 January 1978

by

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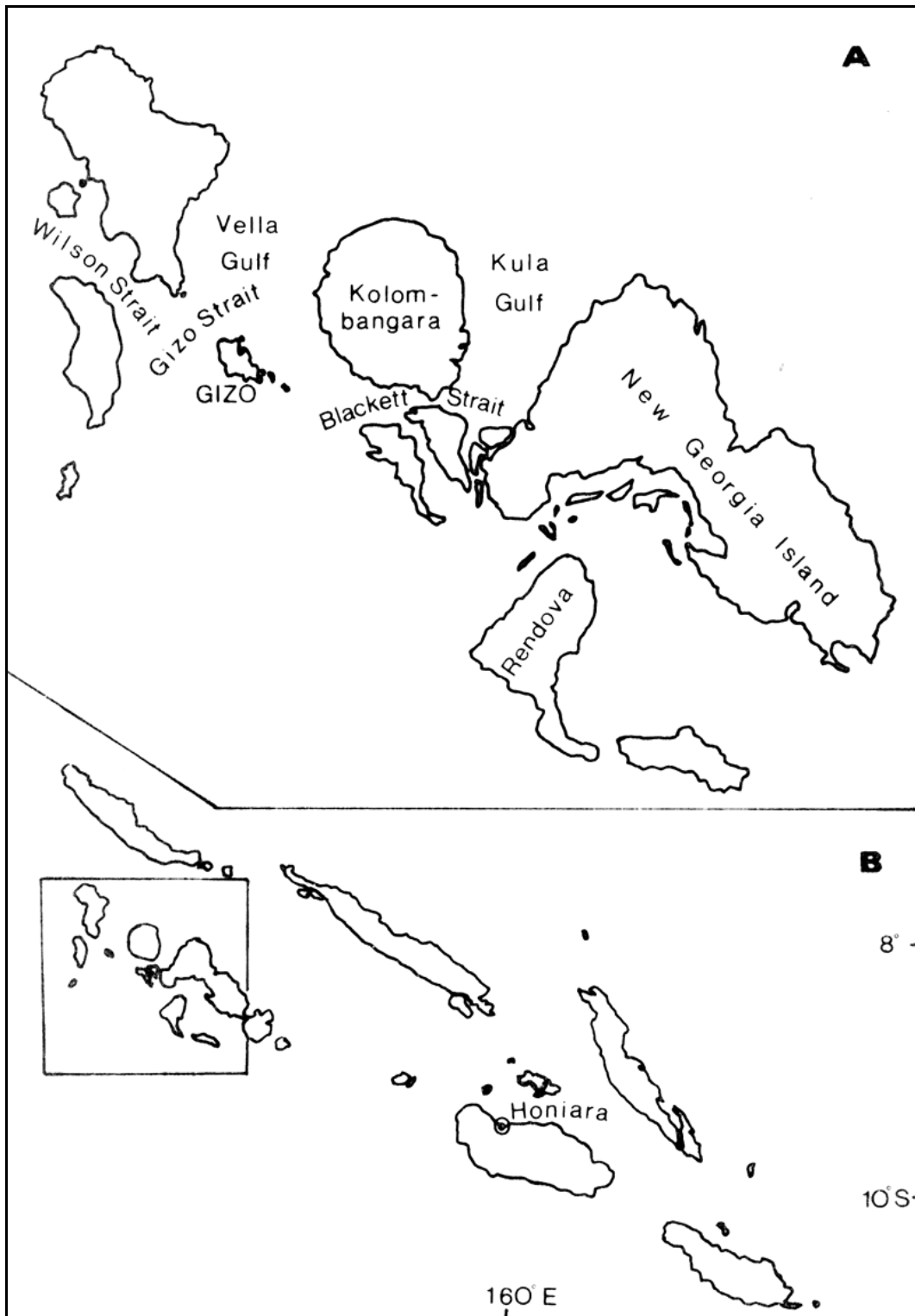


Figure 1: A: Area of operation of the Outer Reef Artisanal Fisheries Project at Gizo. B: Locality map.

INTRODUCTION

The objectives of the project agreed to by the South Pacific Commission, Fisheries Division, Solomon Islands and the Western Council were as summarised below:

1. To survey the deep-bottom fish resources within day fishing range of Gizo.
2. To investigate suitable methods for capture of the fish stocks.
3. To train local personnel in all aspects of deep-bottom fishing and boat operation.
4. To assess the commercial potential of the fish resources and the economic feasibility of a locally operated fishing venture.

The project transferred to Gizo from Tuvalu on 6 April 1977. Because of damage caused to the engines of the three project boats at Funafuti, it was not until 4 June that the first fishing trip was made with one of the boats. Further time was lost commissioning the other two vessels and it was the end of November before all were operational. The project terminated on 31 January 1978.

FEATURES OF GIZO

Gizo, the administrative headquarters for the Western Province of the Solomon Islands, situated at latitude 8°06'S and longitude 156°50'E, was chosen as the project site by the Solomon Islands government.

The project operated outside traditionally fished areas and customary fishing areas. Its area of operations included the Wilson Strait, Gizo Strait, Vella Gulf, Kula Gulf, Blackett Strait, and as far south as the north end of Rendova (Figure1).

Gizo proved to be an ideal choice as it has a well protected harbour and is near to a large area of fishing grounds with depths of less than 400 m. Shore facilities were good; electricity and fresh water were available at the sheds on the foreshore used by the project. Gizo has a daily air service and regular shipping services to Honiara, a slipway and small engineering works.

Weather is generally settled, although cyclones have occurred in the north westerly season of December to March. From April to November the winds are mainly from the south-east and seldom exceed 15 knots. The wind is strongest during the early afternoon and eases off at dusk Mornings are generally calm.

Statistics are not available for the quantity of fish landed and sold by local fishermen. Several families from Malaita Island are engaged in fishing full-time, but the people of Western Province prefer to fish parttime as they are also engaged in farming. Fishing effort is mainly concentrated on the shallow reefs near Gizo.

Fishing grounds exist on all sides of Gizo. To the north the bottom drops off rapidly to 400 m before rising steeply close to Kolombangara Island. East of Gizo there are large areas with depths of less than 400 m. Blackett Strait and Kula Gulf were the main areas fished and although Blackett Strait narrows to less than a mile, the tidal stream was seldom strong enough to interfere with fishing. There are approximately 65 square miles of fishing grounds between Blackett Strait, Ferguson Passage and the Kula Gulf with depths from 150—400 m. The area to the south and west of Gizo was generally too exposed to concentrate fishing effort there. However, good catches were made at times outside and close to the barrier reef off Gizo.

PROJECT PERSONNEL

The project team in Gizo was manager R. Eginton and boat skipper/fisherman P. Mead.

BOATS AND EQUIPMENT

The boats used by the project were:

- 1) *Norman Kirk*, a 7.4 m (24 ft) aluminium boat designed and built in New Zealand and powered by a Nissan diesel motor of 56 hp driving a Hamilton Model 1011 jet unit; top speed of 7 knots. The *Norman Kirk* forms a stable fishing platform and has ample working space aft with a good fish carrying capacity in four insulated fish boxes.
- 2) *Tangaroa*, a 7.4 m (24 ft) plywood dory, designed and built in American Samoa, and powered by a similar engine to the *Norman Kirk* but with a conventional shaft and propellor unit.
- 3) *Viking*, an 8.6 m (28 ft) V bottom timber dory built in Western Samoa to an FAO design, powered by a 35 hp Perkins diesel driving a conventional shaft and propellor. This vessel struck a reef on the night of 7 December and was out of commission for the rest of the project's stay.

Each boat was fitted with two electric snapper reels¹ mounted on the stern. The reels had a capacity of 600 m of 1.2 mm stainless steel wire (breaking strain 125 kg). Each vessel was equipped with a Furuno FM 22 echo sounder with a range of 0—750 m, and the two 7.4 m vessels with Furuno SSB radio telephones. Trolling lines, hand lines and monofilament gill nets were also brought with the project, but the nets were not used to avoid any possibility of conflict with traditional fishermen.

A Resco block icemaker with a capacity of 450 kg of ice every 12 hours was used to supply the ice required. Originally powered by an 8 hp Petter diesel engine, this was converted to electric drive in Gizo. An 18 m³ Soconair modular walk-in freezer was used to store the catches. Because of the poor condition of this freezer sectional construction was not possible so it was assembled on a permanent basis and the refrigeration unit converted to electric drive. Two domestic deep freeze chests were also used, mainly to store the bait.

FISHING OPERATIONS

The project concentrated almost exclusively on deep-water drop-line fishing using the electric reels. Attached to the stainless steel main line by a swivel was a nylon monofilament leader, 20—30 m long, with a breaking strain of 115 kg. This gave stretch to the line. At the bottom end of the monofilament leader a terminal rig as shown in Figure 2 was clipped on. It was necessary to use wire terminal gear to avoid fish being lost. Sinkers of about 1.5 kg were made by pouring cement mixed with iron filings into soft drink cans and embedding eyes.

Generally the deeper the gear was fished the larger the hooks used. When different sized hooks were used on the terminal rig, the largest was attached highest from the bottom.

Hand-reels were used for a limited period but the trials were too short to allow comparison with the electric reels.

All bottom fishing was done at anchor, the wind and current dictating the areas to be fished. The vessels searched for a suitable bottom area using the echo sounders; when one was found the anchor was dropped in shallow water and the anchor rope paid out until the boat drifted out to the desired fishing depth. Vessels changed areas if fishing was slack, but generally fish could be caught in most places.

¹ Obtained from Atlantic and Gulf, 591 SW 8th Street, Miami, Florida 33130, U.S.A.

Most fishing was done at night. Fish seemed to bite better then and also weather conditions were more suitable, cooler and with less wind. Night fishing also gave more hours on the fishing grounds as it was necessary to navigate in and out of Gizo's fringing reef during daylight.

The depths fished ranged from 75—370 m, with most effort in the 150—220 m range. Deeper than 220 m the catches tended to be small.

Trolling was only done on an opportunist basis while steaming to and from fishing grounds as experience showed it was uneconomic in the Gizo area compared to bottom fishing.

All catches were stored in ice in insulated boxes as soon as possible after capture. On return to the project base fish were sorted into kinds, counted, weighed and then gutted for sale.

Weather and sea conditions during the project's stay were atypical and adverse. However, due to the sheltered areas fished the conditions did not unduly affect the project.

Nine fishermen were selected to work with the project. They were all from Western Province, but from different islands. Fisheries Division supplied up to four trainees at one period to work with the project. Of the nine selected trainees, three had previous sea-going experience and held 3rd class coxswain's tickets. All trainees were keen and showed good aptitude in learning the techniques of deep-bottom fishing. The three with coxswain's tickets were appointed boat skippers on completion of training Mr A. Naruo from Palau in the Trust Territory of the Pacific Islands was also attached to the project during its stay in Solomon Islands.

RESULTS

Altogether 106 fishing trips were made and a total of 12,004 kg of fish was caught, excluding shark. The average catch per trip, 113 kg (249 lb), and the average per reel per hour, 5.7 kg, were higher than from other places the project had visited (Table 1).

The catch composition (Table 2) shows that fishes of the family Lutjanidae (snappers) contributed 73% of the catch by weight, with the rosy jobfish *Pristipomoides* sp. making up almost half (47.8%). Other important contributors were fishes of the families

1. Synonym *Aprion microlepis*

Serranidae (groupers and cods) 10.5% and Sphyraenidae (barracudas), 7.6%. An interesting catch were several specimens of an unknown fish which was later identified by scientists at ORSTOM Noumea as *Lipocheilus carnolabrum*, a species fairly recently first identified and previously known only from the Philippines and the New Hebrides.

MARKETING

The sale of fish was initially handled exclusively by the local fish marketing company in Honiara. Fish was shipped there weekly by freezer cargo and realised 30c per lb ex quay Gizo. After requests from the Western Council, fish were later sold in Gizo, and only the surplus was sent to Honiara. A small fish market planned by the Fisheries Division was completed in October 1977. The project used this facility as did the local canoe fishermen. Ungutted fish were initially sold at 20c per lb; this was later raised to 25c. The sales in Gizo were carefully adjusted so as not to affect the local fishermen's livelihood. Trial shipments of boneless fillets were sent to Huniara and sold for 80c per lb, but only 30% of whole fish was recovered as fillets.

Some species of fish caught by the project were previously unknown to Gizo fishermen and consumers. However, all species except sharks¹ proved popular, particularly the rosy jobfish.

Ciguatera poisoning is unknown in Gizo and all species could be marketed.

ECONOMICS OF THE GIZO OPERATION

The closeness of large areas of sheltered fishing grounds and the good catch rate has led the Solomon Islands government to consider deep-bottom fishing operations to be commercially viable in Gizo.

The following annual budget is based on the operation of an 8.6 m (28 ft) V bottom FAO design boat similar to the *Viking*, bought new for \$10,000 and depreciated over five years.

Earnings	SI \$
Sale of fish: 113kg/trip, 4 trips/week, 40 weeks ² /year, 66c/kg.	11,933
Sale of other products and other earnings.	1,000
Total earnings	12,933

¹ Solomon Islanders do not eat shark, but some was sold to the local Gilbertese population.

² Based on 6 weeks lost to maintenance, 4 weeks for weather and 2 weeks for holidays.

Expenses	SI
Depreciation of boat	2,000
Fuel (4 l/hr, 25 l/trip, 160 trips/yr, 17 c (1).	680
Lubricating oil and grease	200
Maintenance and repair costs (labour)	400
Engine spare parts	500.
Depreciation of spare engine 7.5 hp cost \$400	200
Fishing gear replacement	800
Licences ¹ and sundries	200
Ice {5 c/kg, 500 kg/	1,000
Bait ² (\$2/trip)	320
Insurance	625
Interest on loan for boat and spare engine	220
Wages (based on direct share of earnings)	
Skipper 13%, 2 crew 10% each	4,290
<hr/>	
Total expenses	11 435
Balance	1. 498

The Solomon Islands national development plan envisages the development of small scale commercial fisheries. Because of the interest of both fishermen and consumers in the project the Solomon Islands government has taken over the equipment of the SPC Outer Reef Artisanal Fishing Project for operation on a commercial basis (see Appendix).

ACKNOWLEDGMENTS

The SPC Outer Reef Artisanal Fisheries Project team acknowledges the friendly and helpful assistance accorded them by all their friends in the Solomon Islands.

Our thanks go to Mr Jerry Btmre, President of the Western Council all its members, in particular the member for Gizo, Mr Roy Kelosi and the clerk to the council, Mr Stewart Harbinsom The member of the National Parliament for Gizo, Mr Laurie Wickham also deserves thanks, as does the

¹ Fishing licence \$15, Safety Certificate and Marine Survey fee \$50.

² Mackerel tuna *Euthynnus affinis* purchased from Solomon Taiyo Ltd. at 22c/kg.

Government Agent for West, Mr M. Gina, and his successors. The Minister of Natural Resources, Mr P. Tovua, showed a personal interest in the project which assisted us greatly, as did his staff, particularly the Permanent Secretary, Mr Isaac Qoloni. Close collaboration and an excellent working relationship were struck with the Fisheries Division without whose active support the project would not have functioned so smoothly; special thanks should be given to Mr Brian Mander (Fishery Officer, West), who helped greatly in making arrangements prior to the project's arrival. The Solomon Islands Trading Company proved excellent agents, and of the business community special thanks are due to Mr Phil Palmer, Mr Brian O'Keefe, Mr Doug Lovatt, Solomon Island Airways Ltd and Coral Seas Shipping Company.

Table 1: Comparative catches of the Outer Reef Artisanal Fisheries Project in different countries in the South Pacific.

	kg/trip	kg/reel/hour
New Hebrides	71	3.5
Western Samoa	83	4.1
Cook Islands	72	3.5
Tuvalu	53	2.5
Solomon Islands	113	5.7

Table 2: Composition o the catches while the Cuter Reef Artisanal Fisheries Project was based in Gizo

Scientific name	English name	Number	Weight (kg)	Percent by weight
SERRANIDAE				
Epinephelinae	groupers, cods	170	1264	10.5
CARANGIDAE				
<i>Seriola purpurascens</i>	amberjack	19	170	1.4
Unidentified spp.	trevallies	13	49	0.4
LUTJANIDAE				
<i>Aphareus rutilans</i>	smalltooth jobfish	57	242	2.0
<i>Aprion virescens</i>	green jobfish	9	29	0.2
<i>Etelis carbunculus</i>	squirrelfish snapper	168	815	6.8
<i>E. oculatus</i>	deep snapper	17	76	0.6
<i>Lutjanus bohar</i>	red bass	124	482	4.0
<i>L. argentimaculatus</i>	mangrove jack	62	340	2.8
<i>L. malabaricus</i>	scarlet seaperch	479	829	6.9
<i>L. sebae</i>	red emperor	3	15	0.1
<i>Paracaesio xanthurus</i>	southern fusilier	55	179	1.5
<i>Pristipomoides</i> sp.	rosy jobfish	2,119	5,742	47.8
<i>Tropidinius zonatus</i>	flower snapper	35	32	0.3
NEMIPTERIDAE				
Unidentified sp.	threadfin bream	1	2	*
LETHRINIDAE				
<i>Lethrinus miniatus</i>	longnosed emperor	12	43	0.4
SPHYRAENIDAE				
Unidentified spp.	barracudas	199	915	7.6
SCOMBRIDAE				
<i>Acanthocybium solandri</i>	wahoo	2	20	0.2
<i>Euthynnus affinis</i>	mackerel tuna	5	4	*
<i>Gymnosarda unicolor</i>	dogtooth tuna	2	30	0.2
<i>Katsuwonus pelamis</i>	skipjack	57	163	1.4
<i>Scomberomorus commerson</i>	spanish mackerel	19	106	0.9
<i>Thunnus albacares</i>	yellowfin tuna	2	12	0.1
GEMPYLIDAE				
Unidentified sp.	snake mackerel	1	3	*
MIXED SPECIES		175	442	3.7
Totals			3,805	12,004

* Less than 0.1%

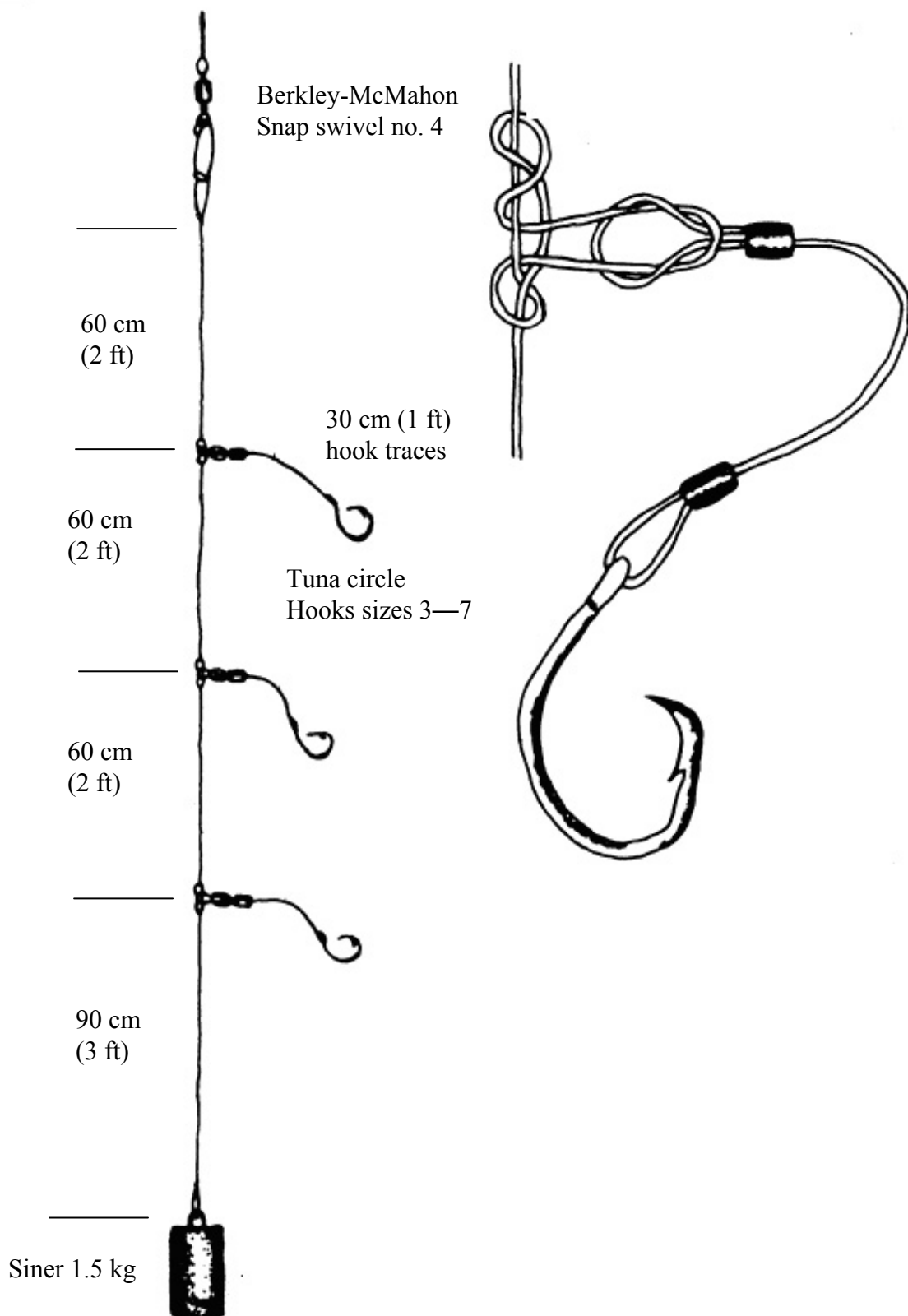


Figure 2: Terminal rig used for deep-bottom fishing at Gizo. Turimoto No. 30 longline wire was used.

APPENDIX

REPORT ON THE TAKEOVER OF THE SPC PROJECT

Following the recommendation of the Ninth SPC Technical Meeting on Fisheries, and as amended by the subsequent Directors of Agriculture and Fisheries Meeting and the SPC Planning and Evaluation Committee Meeting the project was terminated after completion of its work in Gizo on 31 January 1978.

Winding up moves were first planned in September 1977 during a visit to Gizo by the SPC Fisheries Adviser. Subsequent discussions between the SPC Secretary-General and Finance Officer and the Solomon Islands government finalised the arrangements which were formalised by a letter of 9 January 1978 as follows:

- (a) The three serviceable fishing boats were to be sold complete with all gear to the fishermen originally employed by the project for a total of SI \$3,240. These vessels were then to be operated as a private business by these fishermen.
- (b) Solomon Islands government was to pay SPC a total of SI \$500 for the shore facilities as left. From this base it was thought possible to continue to support the privately owned fishing vessels.