



REPORT ON THE SOUTH PACIFIC COMMISSION DEEP SEA FISHERIES

DEVELOPMENT PROJECT

IN AMERICAN SAMOA

(28 March —2 June 1978)

by

Paul Mead
Master Fisherman

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SUMMARY

The South Pacific Commission Deep Sea Fisheries Development Project was based in American Samoa from 28 March 1978 to 2 July 1978.

Until the arrival of the project, bottom fishing in American Samoa was carried out by handlines only, mostly in depths of 120 m or less.

The main aims of the project were to improve catches and fishing efficiency by the introduction of new ideas, methods and gear, and to encourage a better harvest of fish from the 120—300 m depth range, previously a relatively untouched resource.

From 12 April until 31 June the project's two boats made a combined total of 36 trips and caught 3,022 kg of marketable fish (mean 84 kg/trip). Western Samoan type hand reels were used to handle the lines. The mean catch rate per reel per hour was 4.4 kg.

Because of the type and condition of the boats used, all fishing was carried out within 15 nautical miles of the main island of Tutuila.

BOATS AND EQUIPMENT

Two privately-owned dories were made available through arrangements made by Mr Henry Sesepasara, Director of Marine Resources. Marine Resources supplied both fuel and bait for the dories during the time they were fishing for the project. All fish caught were the property of the dory owners.

The dories were skippered by two very capable fishermen, Mr Lamuelu Kitona and Mr Esera Touli. Both dories were approximately five years old, and in rough but usable condition. Each was of plywood construction, 7.3 m (24 ft) long, and powered by a 56 hp Nissan Chrysler diesel engine driving a Volvo Penta sterndrive unit.

Bottom fishing, especially on the outer reef slope, is much more effective if done from an anchored position. Both boats were equipped with 350—730 m (300—400 fathoms) of polypropylene rope, two 1.5 m (5 ft) lengths of 10 mm (3/8 inch) chain, and a simple grapnel anchor of 12 mm (1/2 inch) reinforcing rod.

As has been stated, one of the main aims of this project was to increase exploitation of the outer reef slopes. To accomplish this some form of mechanical means was needed to retrieve the down line. The old method of hand-lining is both physically demanding and very slow, especially in deep water. Because of its simplicity and low cost the Western Samoan type hand-reel as described by Gulbrandsen¹ was chosen as being most suitable. Two of these reels, fitted with 500 m of 113 kg test monofilament line, were mounted on each dory. A terminal rig as shown in Figure 1 was used.

¹. Outer reef fishing in Western Samoa. Working Paper 25, Ninth Regional Technical Meeting on Fisheries, Noumea, 24—28 January 1977. Noumea, South Pacific Commission.

The locating of the outer reef slope on most fishing trips is a time-consuming procedure. The usual method is to measure the depth with a handline. The handline is let down until the weight touches bottom. The fathoms are then counted as the line is hauled back aboard. The boat then moves further inshore or offshore depending on the depth measured. This procedure is repeated until the desired depth is found. On some occasions hours of valuable fishing time are wasted.

With the use of a small, relatively inexpensive echo-sounder, the location of the desired fishing depth is less demanding in physical energy and time. The project used a J.M.C. model 707 A/B echo-sounder, which can be run off either D size torch batteries or a regular 12 V system. The transducer was mounted on a 1.2 m (4 ft) piece of 36 mm (1 1/2 inch galvanized pipe and usually held over the side when used. When not in use both the sounder and the transducer were stored in a safe place on the boat.

FISHING PROCEDURE AND RESULTS

On most fishing trips wind direction dictated the area fished, as an off-shore wind was usually essential to fish the outer slope. If possible the anchor was dropped in shallow water. The anchor rope was then paid out until a suitable fishing depth was reached (Figure 2).

During April and the first week of May, the wind was light and fairly constant from the north-east. As a result there were excellent sea conditions for deep water bottom fishing along the outer slope to the south of the island. Strong south-east trades Began in the second week of May, limiting most fishing to the northern side of the island.

Current direction was much harder to use than the wind when positioning the boat for fishing. Current direction and strength seemed to be influenced not only by tide and wind, but also by water depth and the distance from shore. Fishing was generally much better if a steady current was running.

A summary of the types and amounts of fish caught is given in Table 1, and details of the individual trips in Table 2.

Fishing along the off-shore edge in 200—300 m during the day gave the Best catches of *Etelis carbunculus*, *E. oculatus* and *Aphareus furcatus*. The two species of *Etelis* made up only 15.8 per cent of the catch by numbers, but 51.5 per cent by weight. Night fishing in deep water gave poor catches, but in shallower depths (70—100 m) good catches of Lethrinidae and *Lutjanus* spp were taken. Lethrinids were easily the dominant type of fish by numbers (44.0 per cent), but not by weight (23.0 per cent). Daytime fishing in depths of less than 100 m was usually very poor.

A separate analysis of the economics of this type of fishing has not been made because of lack of detailed information on the cost and depreciation of the boat to be used and the local wage rates. However, it is hoped that the relevant details given in the various tables: catch rates, fuel consumption, bait used, equipment required, etc., will allow individual fishermen to make their own assessment of the viability of deep bottom lining in American Samoan waters.

ACKNOWLEDGEMENTS

The Deep Sea Fisheries Development Project acknowledges the friendly and helpful assistance of the Director of Marine Resources, Mr Henry Seseapasara, Master Fisherman, Paul Pedro, and the entire staff of the Office of Marine Resources. The project also thanks the two dory skippers, Mr Lamuelu Kitiona and Mr Esera Touli, and their crews, who enthusiastically fished long hours under strenuous conditions.

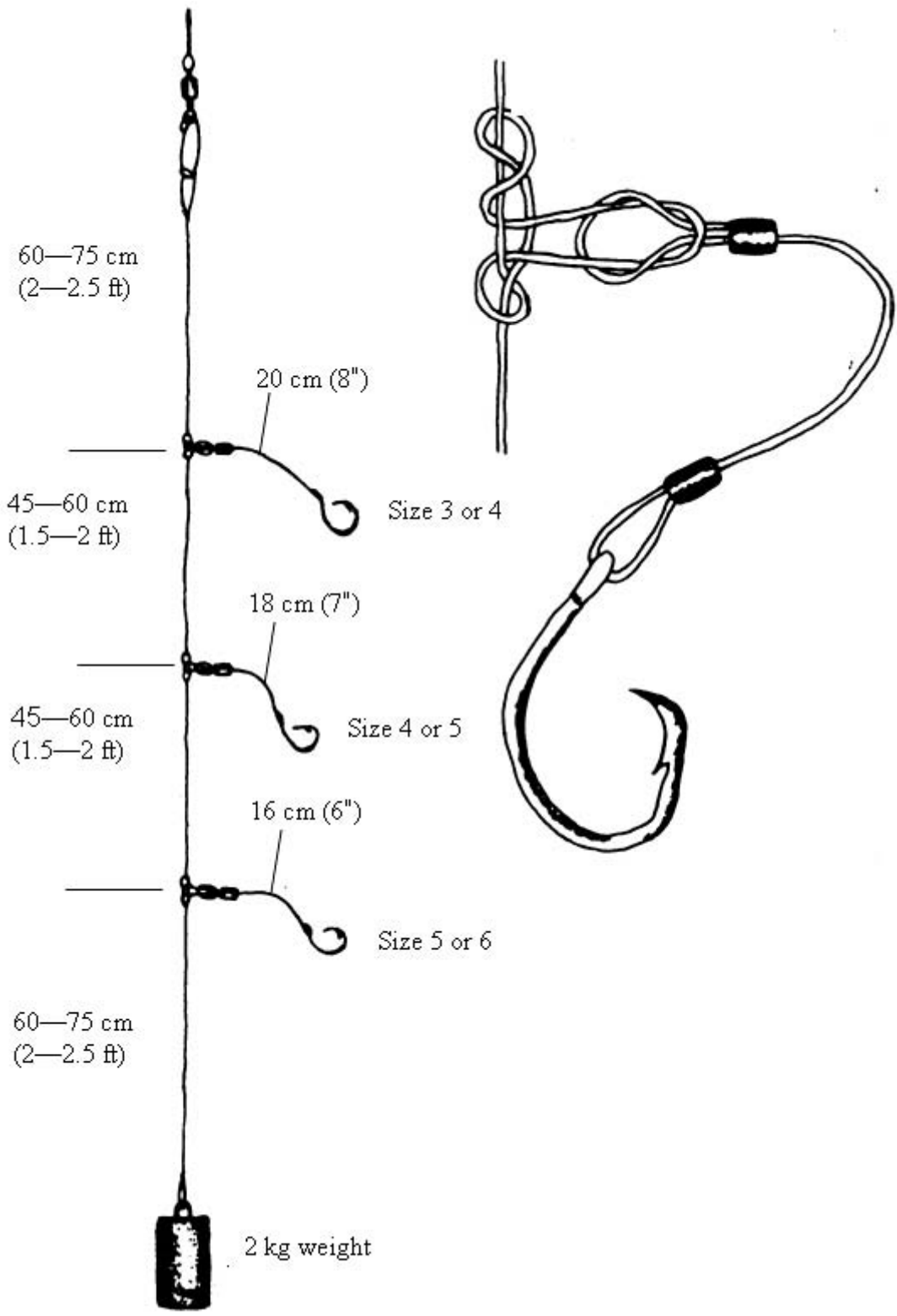


Figure 1: Terminal rig used in depths over 180 m. Coast lock swivels were used and Mustad tuna circle hooks. In shallower depths a similar rig was used but with a 1 kg weight, and with smaller hooks (top hook, size 6; others size 10).

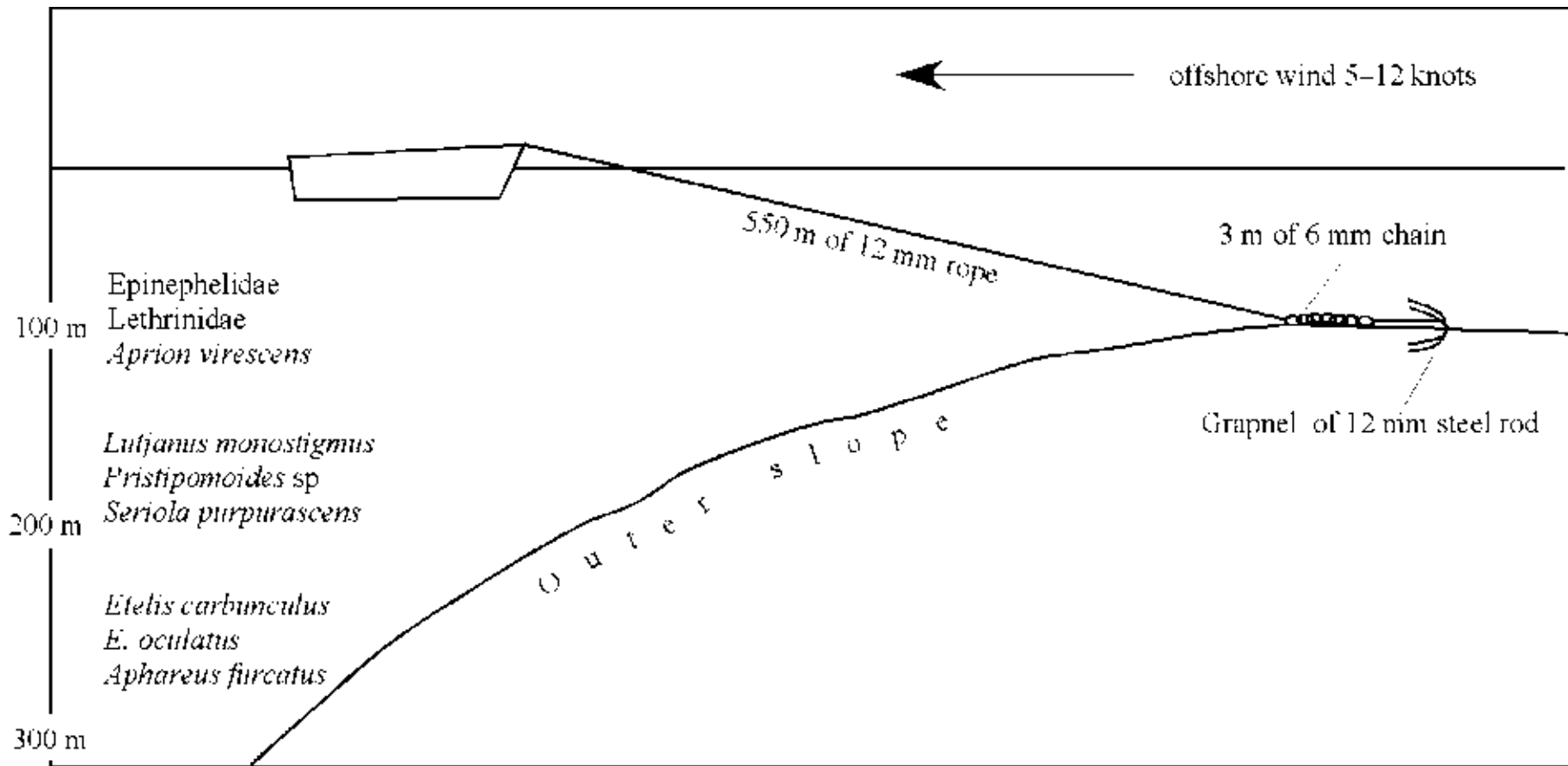


Figure 2: Diagrammatic representation of the anchoring method for fishing the outer slope, and the approximate depths where the principal fish species were found.

Table 1: The fishes caught: species, numbers, weights (kg), and percentages (* = less than 0.1%). 356 kg of *Lutjanus bohar* (10.6% of total by weight) were also caught, but not landed, as this species is frequently poisonous in American Samoa.

Scientific Name	English Name	Samoan Name	Number Caught	Percent by Numbers	Weight Caught	Percent by Weight
<i>Acanthocybium solandri</i>	wahoo	pa'ala	1	*	17	0.6
<i>Aphareus furcatus</i>	smalltooth jobfish	palu sina	24	1.0	88	2.9
<i>Aprion virescens</i>	green jobfish	'utu	62	2.7	154	5.1
Carangidae	trevallies, jacks	malauli, ulua	38	1.6	118	3.9
Epinephelinae	groupers, cods	gatala, ata ata	45	1.9	40	1.3
<i>Etelis carbunculus</i>	deep snapper	palu malau	137	5.9	626	20.7
<i>Etelis oculatus</i>	deep snapper	palu loa	229	9.9	947	31.3
Gempylidae	snake mackerels	palu kumoro	1	*	8	0.3
<i>Gymnosarda nuda</i>	dogtooth tuna	tagi	3	0.1	28	0.9
Holocentridae	squirrel fishes	malau	3	0.1	2	*
Lethrinidae	emperors	filoa	1017	44.0	695	23.0
<i>Lutjanus monostigmus</i>	black-spot snapper	taiva	1	*	1	*
<i>Lutjanus malabaricus</i>	scarlet seaperch	mala'i	255	11.0	145	4.8
<i>Lutjanus kasmira</i>	blue-lined seaperch	savane	451	19.5	97	3.2
<i>Pristipomoides</i> sp.	rosy jobfish	palu pa'epa'e	13	0.6	13	0.4
<i>Seriola purpurascens</i>	amberjack	palu kata	8	0.3	25	0.8
Sphyraenidae	barracudas	sapatu	2	*	8	0.3
<i>Tropidinius zonatus</i>	flower snapper	palu sega	21	0.9	10	0.3
Total			2311	Total	3378	

Table 2: Individual trip records

Trip	Number of fish	Catch (kg)	Total hours	Fishing hours	Engine hours	Fuel in V.S. gallons	Bait (kg)	Number of crew
1	33	23	16	13	4	7	7	2
2	52	128	19	17	4	6	9	5
3	27	110	18	16	2	4	8	5
4	82	89	18	10	5	6	6	2
5	30	120	19	7	3	4	7	4
6	23	110	20	12	2	4	7	4
7	129	90	17	10	4	10	8	2
8	18	120	20	10	2	6	9	4
9	92	51	18	9	8	25	8	2
10	100	63	18	11	6	12	8	3
11	93	100	19	13	6	10	12	4
12	25	120	7	5	2	6	9	5
13	206	126	17	12	6	20	16	4
14	64	45	17	11	6	25	13	2
15	311	230	18	15	3	5	20	5
16	28	60	17	14	3	4	11	3
17	42	20	18	7	3	25	5	2
18	90	45	18	8	6	20	7	4
19	18	67	3	1	2	4	9	2
20	139	76	17	9	5	10	10	2
21	2	17	3	1	2	4	2	2
22	51	161	9	7	2	5	11	4
23	95	77	17	9	5	10	14	2
24	70	100	18	9	6	6	13	5
25	25	102	10	7	4	8	14	2
26	8	41	7	5	2	5	9	3
27	16	19	9	4	4	6	10	2
28	60	80	19	11	4	10	8	5
29	49	180	19	10	4	8	12	3
30	35	154	11	6	2	4	16	2
31	60	45	12	9	4	10	11	2
32	36	28	11	11	4	8	8	4
33	95	47	18	10	3	8	15	4
34	44	60	26	12	11	20	17	4
35	34	52	30	13	12	24	17	2
36	29	66	18	13	4	7	9	4
Totals	2311	3022	571	342	155	356	375	118
Means	64	84	15.9	9.5	4.3	9.9	10.4	3.3

Mean weight caught per reel per fishing hour 4.4 kg
Mean weight caught per crew member per fishing hour 2.7 kg
Mean weight caught per crew member per fishing trip 25.5 kg
Kg of fish caught per kg of bait used 9.6

APPENDIX

BASIC FISHING GEAR REQUIRED FOR OUTER SLOPE DEEP SEA FISHING

1. Mustad tuna circle hooks quality No. 39960ST size No. 3, 5, 7.*
2. Sleeves Sevenstrand stock No.A7 or equivalent.*
3. Turimoto No.29 longline wire or equivalent (three stranded, three wires per strand, 120 kg test).
4. 136 kg (300 lb.) test swivels.
5. 500 m of 113 kg (250 lb.) test monofilament line.
6. Western Samoan type handreel.
7. 1 kg and 2 kg weights.
8. 600—800 m of polypropylene rope (rope size depends on the size of the boat).
9. Grapnel anchor and chain, also depending on boat size.

TOOLS REQUIRED

1. Pair of standard pliers.
2. Pair of sidecutters.
3. Pair of crimping pliers.
4. 15 cm (6 inch) bait knife.

* These items were obtained from Atlantic and Gulf, 591 S.W. 8th Street, Miami, Florida 33130, U.S.A.