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A REVIEW OF DEEPWATER HANDLINE FISHING IN PAPUA NEW GUINEA

BY

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## INTRODUCTION

Papua New Guinea (PNG) Fig. 1 is the largest island in the South Pacific Commission area with an estimated 10,500 kilometres 200 metres isobath running around the coast of the main island of PNG and around the islands of New Britain Fig. 1, Bougainville, New Ireland, Manus, the D'entrecasteaux and the Louisiade Archipelago. The total shelf area less than 200 metres is estimated to be 17,370,000 hectares (Munro 1976). This makes it one of the largest shelf area in the South Pacific Region, which supports marine resources important to the country.

Papua New Guinea unlike most Pacific Island countries, has other major resources like minerals, forest products, and primary products to generate revenue for the country. Politically, fisheries is third in the government developmental priorities according to the 1987 budget speech. Whilst the political will may be in this direction, the financial execution of the projects is often the failing factor.

During 1979, when the South Pacific Commission's Deep sea Development Project (SPC, DSDP) came to PNG to carry out a survey of the fin fish resources of the outer reef slope, near Kimbe (Fusimalohi and Crossland, 1980). Since then ten more survey lasting from one day to four years have been under-taken including Kupiano, (Cook unpublished, ) Milne Bay, Manus, Port Moresby, (Sundberg and Richard, 1984), Keita (Richard, 1985) Morobe (Richard, 1985 unpublished) Kavieng (Richards, 1987) Aitape (Chapau 1988 unpublished) Wewak (Chapau, 1986) and Wewak outer island (Lokani, unpublished). Results of species composition by weight and catch rates in kg/line hr are discussed in this report. Despite encouraging catch rates ranging from 1.2 kg/line hr. at Morobe to 4.9 kg/line hr. at Kimbe, the PNG Government has made very little attempt in encouraging local fishermen to actively exploit this very large unfished fin fish resources of the outer reef slopes. The one existing deepwater handline fishery in PNG has operated out of Wewak since 1983, (Chapau, 1986.) This report presents a review of the catch rates and species composition of this fishery and compares results within P.N.G. and other Pacific Island Countries.

## MATERIALS AND METHODS

Catch rates and species composition were obtained from survey reports carried out in PNG since 1979. The mean catch rates for 10 areas in PNG were used to estimate a mean value for PNG. Similarly total catch in kilogram and effort in line hours for each of this survey are presented. The thirteen most common species and four families from the study sites were used to indicate catch composition in PNG. The Wewak 1985 and 1986 catch and effort data are used to show catch against effort.

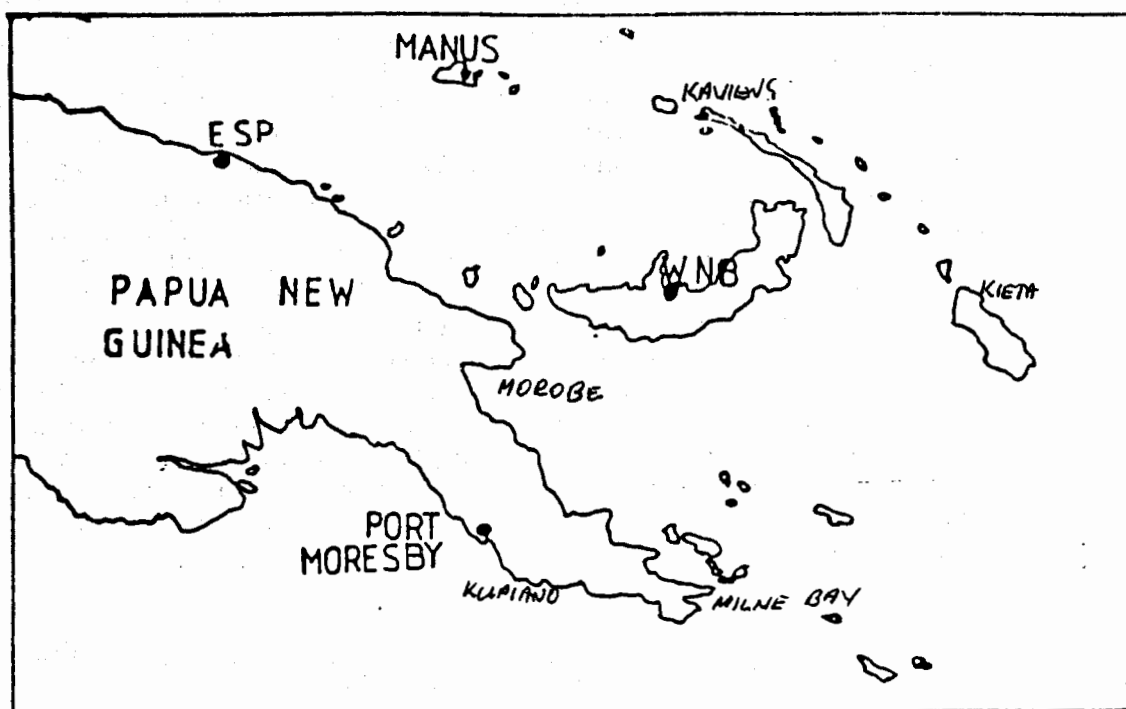


FIG 1. Map of Papua New Guinea, showing area visited by SPC (DSFDP) 1979 - 1982.

## RESULTS AND DISCUSSIONS

## Species Composition

The thirteen most common deepwater species representing two families, Lutjanidae (11) and Carangidae (2), from four study sites are used to compare similarities in catch compositions within PNG and the other Pacific island nations where deepwater handlining has been carried out. Sundberg and Richards 1982 did make a similar comparison and showed that catch composition was similar for the areas they studied. The results in Table 1 shows a change in composition of the subdominant group between fishing areas associated with a corraline type bottom, (mostly the island groups) and areas with mostly silt-sand substrate and possibly influenced by large river run-off. *Pristipomoides typus*, *Lutjanus sanguineus*, *Lutjanus erythropterus*, and *Caranx tille* makes up more than 50% of the catch composition by weight and number in the Wewak (PNG) area whilst in Kavieng and West New Britain, this group is substituted by *Pristipomoides filamentosus*, *P. auricilla*, *Etelis carbunculus*, and *Lutjanus bohar*. It has been statistically shown (Sundberg and Richards 1982) that various species can only be caught at certain depth ranges. Whilst this is generally true, the comparison of catches between Wewak Morobe, and West New Britain Kavieng shows a difference in the major species in the catch composition. This results will be confirmed later when the Wewak data is properly analysed for species distribution in relation to bottom type compared with other areas.

										SPECIES &		
FAMILY GROUPS		W N B		KAVIENG		WEWAK		MOROB				
				No	%Wt	No	%Wt	No	%Wt	No	%Wt	
<b>Pristipomoides multidens</b>				172	15.1	499	26.0	1745	14.0	22	12.6	
0	0.0	1	0.1	1703	11.6	36	15.7	<b>P. filamentosus</b>		373	28.9	
0.6	1	0.0	0	0.0	<b>P. auricilla</b>			198	16.6	0	0.0	
1	0.1	<b>Lutjanus erythropterus</b>			0	0.0	0	0.0	2163	21.2	0	0.0
<b>L. sanguineus</b>				0	0.0	0	0.0	719	8.1	0	0.0	
<b>L. malabaricus</b>				85	4.6	54	1.7	376	2.3	17	15.4	
<b>L. timoriensis</b>					0	0.0	49	1.8	656	4.4	16	8.4
23	2.5	89	6.0	52	0.9	1	1.2			<b>L. bohar</b>		
<b>Etelis carbunculus</b>				34	8.3	280	26.1	424	7.0	7	9.7	
<b>E. coruscan</b>				0	0.0	47	2.2	25	0.3	1	0.7	
0	0.0	0	0.0	1099	10.4	0	0.0			<b>Caranx tille</b>		
<b>C. sexfaciatus</b>				0	0.0	11	0.6	96	1.3	9	7.3	
<b>Lutjanidae</b>				56	4.2	222	11.8	339	5.2	3	2.4	
<b>Lethrinidae</b>				0	0.0	105	5.3	480	3.0	0	0.0	
<b>Serranidae</b>				4	0.2	101	9.7	350	3.7	9	11.4	
<b>Carangidae</b>				54	7.9	32	3.1	292	3.7	1	0.6	
<b>Other Family</b>				39	11.6	86	5.0	252	2.9	5	14.5	
<b>TOTAL</b>				1038		1599		10772		128		

TABLE 1. Species composition by weight (KG.) for deepwater handline for four study sites in Papua New Guinea (PNG) carried out between 1979 and 1986.

### Catch Rate for PNG

Since 1979, eight surveys and two deepwater handline projects have been undertaken in PNG to date. The results of these studies are shown in Table 2. The catch rates ranged from 1.2 Kg/line hr. at Morobe (Richards unpublished) to 4.9 Kg/line hr. for West New Britain (Fusimalohi and Crossland 1980). It was felt that most of the mean catch rates were similar and that the data be pooled to calculate a mean for PNG. By treating the data this way, a mean of 3.3 Kg./L X Hr. was arrived at with a standard deviation of 1.08 and N = 10. This mean catch compares well with results of deepwater handline studies carried out in other Pacific Island Countries by the South Pacific Commission Deep sea Development Project (Crossland & Grandperrin 1980).

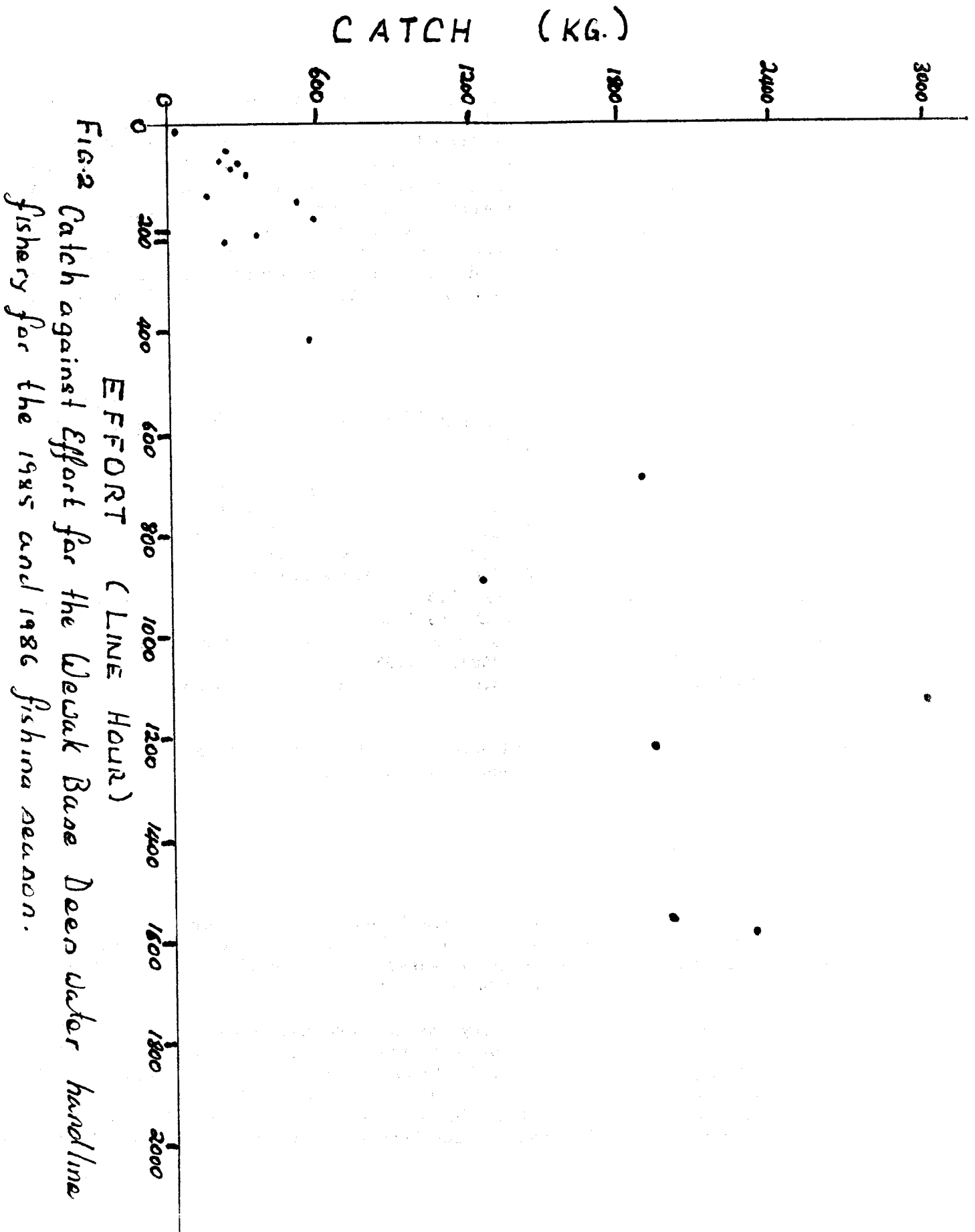
EFFORT	CATCH	CATCH RATE	SOURCES OF INFORMATION	Line Hrs.	KG.	STUDY AREA
						Kg/L X Hr.
W.N.BRITAIN	668	2711	4.9	Fusimalohi 1979		
MANUS	61	280	4.6	S & RICHARDS 1982		
MILINE BAY	65	163	2.5	S & RICHARDS 1982		
PORT MORESBY	41	165	4.0	S & RICHARDS 1982		
KIETA	150	346	2.6	A.H.RICHARDS 1987		
KUPIANO	536	1838	3.4	D.D.COOK	unpub	KAVIENG
1995	6158	3.1	A.H.RICHARDS 1984			
MOROB	261	349	1.2	A.H.RICHARDS	unpub	WEWAK
6597	15975	3.7	M.R.CHAPAU 1986			
WEWAK OUTER IS.	1931	4255	3.0	P.LOKANI	unpub	

TABLE 2. Catch rates and catch and effort for 10 study sites in Papua New Guinea between 1979 and 1986.

### Catch and Effort for Wewak

The catch and effort presented in figure 1 show the situation for the Wewak deep sea handline fishery during the 1985 to 1986 fishing season. The points on the graph show that catch increases with increasing effort. This a typical situation for a new fishery.

The highest effort for this fishery was in 1985 when a total of 7,560 line hours, and a monthly mean effort of 630 line hours and a range of 18 line hrs. in February to 1647 line hrs. in August, were recorded. Although 8 to 10 semi-full fishermen fish throughout the year 95% of this effort was recorded between June and November. The reason for this was due to the north west monsoon which began in late November 1984 and persisted till May of 1985.



During the same year 19.4 metric tones was landed throught the government fish depot of which we able to measure and weight 14.1 tones.

In 1986, effort drop by about 60 % of that recorded in 1985 and similarly 4.4 tones were recorded.

#### References

- CHAPAU M R(1986)  
Development of deep sea fishing in the East Sepik Province, Papua New Guinea.  
The Procceding of The First Asian Fisheries Forum Manila 1986 p 357-359
- CROSSLAND S & R. GRANDPERRIN (1980)  
The development of deep bottom fishing in the Tropical Pacific.  
South Pacific Commission Occassional paper No.17 Noumea, New Caledonia
- FRIELINK A B Jr. (1983).  
Coastal fisheries in Papua New Guinea, the current situation.  
Department of Primary Industry, Report No. 83-10 Kanudi, Port Moresby
- FUSIMALOHI T & J CROSSLAND (1980).  
The South Pacific Commission country Report on the Deep sea development project survey in West New Britain 1979.  
South Pacific Commission Country Report Noumea, New Caledonia.
- RICHARDS A H & P SUNDBERG (1984)  
A variation in dropline catch rates and average fish weights of deep water demersal reef fish in Papua New Guinea, as a function of time of day and depth.  
Department of Primary Industry. Fisheries Research Report No. 84-16.  
Kanudi, Port Moresby.
- SUNDBERG P & A H RICHARDS (1984a)  
Deep sea bottom handline fishing in Papua New Guinea : A pilot study.  
Papua New Guinea Journal of Agriculture, Forestry and Fisheries. 33(1&2), 55-62.  
Konedobu, Port Moresby.
- SUNDBERG P & A H RICHARDS (1984b)  
Deep water demersal handlining in Papua New Guinea, an ordination study of species assemblages.  
Department of Primary Industry, Fisheries Report No. 84-17  
Kanudi, Port Moresby.