

TROLLING RESULTS OF F. R. V. "TAGULA" IN PAPUAN WATERS FROM AUGUST, 1957, TO FEBRUARY, 1959.

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INTRODUCTION

SINCE its acquisition in September, 1957, by the Division of Fisheries, Department of Agriculture, Stock and Fisheries, of the Territory of Papua and New Guinea, the 60-foot F.R.V. *Tagula* has been engaged mainly on trolling investigations in Papuan waters. Besides the *Tagula*, two 16-foot motor tenders have been used. The *Tagula's* complement comprises a European fishing master, a biologist or technical assistant, and eight native fisheries trainees.

For the purpose of comparison, the region investigated may be divided into three areas:—

Area 1. Inshore reefs and coastal waters between Port Moresby and Samarai.

Area 2. Shoal and reef waters and open sea east of Samarai, but excluding Misima Island where no work was carried out. The Sunken Barrier Reef which extends from Suau Island, 30 miles to the west of Samarai, to Quessant Island has been included in this area.

Area 3. The reefs, coastal stretches and open sea north of Samarai including the north-east Papuan coastline as far as the New Guinea border. The Trobriand and Woodlark Islands are not included as no investigations were undertaken there.

These areas are shown in Figure 1.

In the 18 months to February, 1959, 26 fishing voyages were made. Of these, 14 were restricted to trolling investigations and four comprised trolling in conjunction with long-lining. The duration of the fishing voyages ranged from nine days to four weeks.

FISHING METHODS

Gear

During trolling, the *Tagula* carried two 18-foot trolling booms each with two troll lines and generally three troll lines from the stern. Each dory normally carried one fisheries trainee trolling with one line, although, in some cases, two trainees trolled one line each.

The troll lines comprised approximately 60 to 150 feet of No. 210, 240 or 300 seine cotton thread attached through two swivels, and a half-pound trolling sinker to 15-26 feet of wire trace. Depending on whether artificial lures or bait were used, either one or two 12/0 trolling hooks were attached to the end of the wire trace. In the latter case, the eye of the second hook was fitted over the barb and shank of the first and allowed to swing free. On all occasions, rubber shock absorbers were used to lessen the initial tension on the lines after strikes.

At the start of the investigations, 20-gauge piano wire with packing case wire to connect the two swivels through the sinker and small brass box swivels were used. With this gear, many strikes, believed to be large dog-toothed tuna, were lost. The improved gear and that at present in use is either 12 mm. heavy brass swivels or 4/0 or larger brass box swivels, and either preformed five cwt. aircraft control cable or 0.045 trolling wire for traces with the sinker moulded onto the trace. This gear has held mackerel weighing 95 lb., trevally 90 lb., and dog-tooth 'tuna' exceeding 100 lb. (cleaned weights). Green braided nylon fishing line was tried for troll lines, but proved unsatisfactory owing to its tendency to fray when hauled over the stern of the *Tagula*.

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Lures and Bait

Three different types of lures or bait, depending on availability, were used when trolling.

(a) Artificial Lures

These comprised pieces of coloured rope, shaped into the form of a squid and the white sheaths of swamp lilies cut into the shape of a fish.

(a) Garfish

At the commencement of operations, this bait was generally used. The point of the trolling hook was passed through the body of the fish and the eye of the hook tied with wire to the head in the vicinity of the mouth. A second hook was allowed to hang free from the shaft of the embedded hook.

(c) Belly strips of Mackerel and Tuna

The hook was attached in a similar way to garfish. It was found that, whereas occasionally fair catches of paradise fish and trevally were taken on artificial lures, the best results were obtained from garfish and belly strips. It is possible that fast-moving fish such as mackerel and tuna can smell the bait before striking and, if it is not attractive to them, will not strike.

Garfish and belly strips gave similar catch results when used as bait. The latter had the added advantage of being able to be used more than once, whereas the garfish was usually bitten in two and had to be replaced after each strike.

Use of Tagula and Tenders

The *Tagula* has a top speed of $8\frac{1}{2}$ knots and during trolling operations best results have been obtained when cruising at this speed. The top speed of the two dories is about five knots and, although they are able to troll shallow reef waters, the low catches of dog-tooth tuna and other fast-moving species would indicate that a higher speed is required.

Echo Sounder

This instrument has proved invaluable for locating the Sunken Barrier Reef, which extends from Suau Island to Quessant Island, and shoal waters some distance from land. It has enabled the *Tagula* to follow this barrier closely except in very bad weather, and has resulted in some high catches. When trolling close to reefs, navigation is generally done by eye from the flying bridge so that the troll lines are kept in as shallow water as possible.

FISHING GROUNDS

Past Survey Findings

Prior to the survey by the M.V. *Fairwind* from 1948 to 1950, there was no available information on the distribution of pelagic species in Papuan waters, although both in pre- and postwar periods there were reports of Japanese tuna vessels operating with long-line gear near the off-shore New Guinea Islands. *Fairwind* daily troll catches in Papuan waters were only fair, the best results being obtained at Cannac Rock (Latitude 9 degrees 15 minutes, Longitude 153 degrees 30 minutes) (570 lb.) and Jomard Entrance (490 lb.). No further investigations were undertaken in Territorial waters until the inception of a Division of Fisheries in 1954. In 1955, a survey of the fishing potential of the Coral Sea and southern and eastern Papua was undertaken (Rapson, 1955). Once more, the shoal and reef waters east of Samarai yielded the best results—129 lb. per trolling hour having been taken at Kosmann Reef.

Present Survey Findings

Previous investigations were essentially surveys and time did not permit a concentrated study in any one region. With the *Tagula* in operation, intensified investigations of promising areas could be undertaken. The troll catches of the more important species over an 18-month period in each of the three areas are detailed in Appendix I and dissected in Appendix II. Examination of these indicates that the best trolling grounds are found east of Samarai. The catches, both when steaming from one locality to a different one and when trolling productive reefs, were far higher than for either of the other two areas. The catch per *Tagula* troll line hour and dory troll line hour on every voyage in Area 2 (Appendix III) exceeded the catch rates in Area 1 and Area 3.

Daily troll catches exceeding 500 lb. were recorded on 39 occasions (Appendix IV). On 11 days the total weight of fish taken was in excess of 1,000 lb. and with one exception these high catches were recorded in Area 2. Catches greater than 10 lb. per troll line hour were taken in this area only.

It is clear that the Sunken Barrier Reef and the reefs and shoal waters as far east as Duchateau Island, including Anchorage and Long Reefs, Bramble Haven and Jomard Entrance and

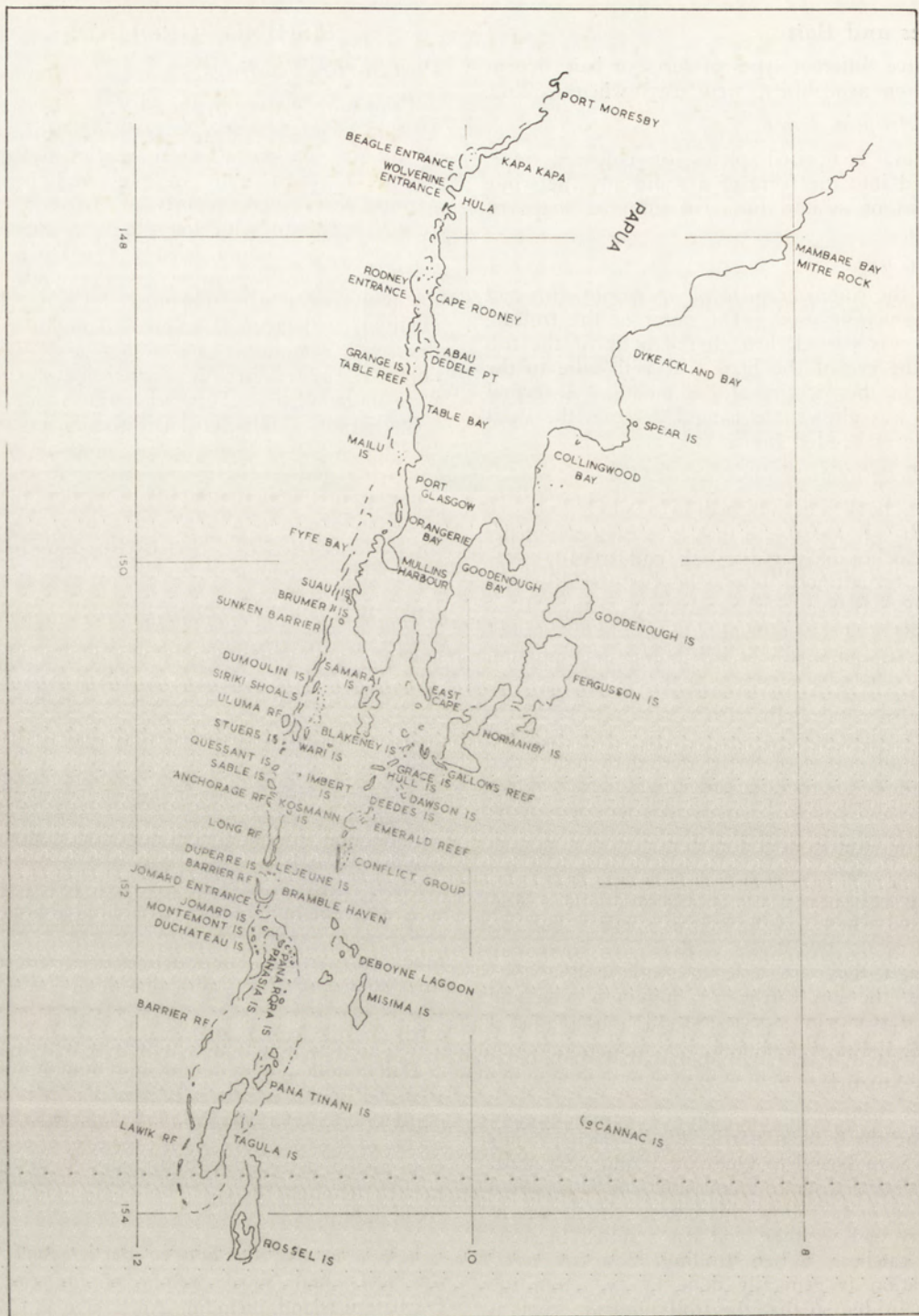


FIG. 1.—Eastern Papua.

Panasai and Pana Rora Islands are the most productive found to date in Papuan waters. This locality was fished periodically throughout 1958 and good catches were always recorded. These findings confirm the existence of productive trolling grounds in reef waters east of Samarai, as indicated by the surveys of 1948-50 and 1955. In addition, they show that in these waters good catches may be expected throughout the year. In contrast, fishing the fringing reefs of Tagula and Rossel Islands gave poor results.

The most productive reef in Area 1 was Table Reef, where the highest daily catch was 356 lb. The absence of off-shore reefs and shoal waters may account for the low catch figures in this area.

Fair results were obtained by trolling the Dawson, Boirama, Hull and Grace Island group (Area 3). The highest daily catch there was 1,008 lb. in May, 1958, but at other times catches were much lower. The daily catch for this area when trolling proven reefs averaged 380 lb. and the daily catch when steaming and trolling averaged 50 lb. Trolling the inshore reefs of Goodenough, Fergusson and Normanby Islands and the north-west coastline of Papua gave poor results. However, insufficient data are available to draw accurate conclusions of the trolling potential of seasonal species in this area.

Trolling proven reefs in Area 2, of the total catch (38,515 lb.) approximately one-tenth was taken by the dories. This low figure was due to their low operational trolling time, caused by inclement weather and, to a lesser extent, to their slower trolling speed, which resulted in very small catches of dog-tooth tuna. However, under optimum conditions, the catch per dory line hour greatly exceeded the catch per Tagula line hour. Additional dories with a higher trolling speed are therefore recommended.

CATCH STATISTICS AND FISHING SEASONS

In Appendix I the proportions of the more important troll species taken during the investigations are given. Listed in order of importance the species are Narrow-barred Spanish Mackerel, *Cybius commersoni* (Lacepede), 46.4 per cent.; Tuna, mainly dog-tooth, *Gymnosarda nuda* (Günther), but including Yellow-fin Tuna, *Neobunnus macropterus* (Schlegel), Mackerel Tuna, *Euthynnus alletteratus* (Rafinesque), Striped Tuna, *Katsuwonus pelamis* (Linnaeus),

and Big-eye Tuna, *Parathunnus mebachii* (Kishinouye), 17.4 per cent.; Trevally (*Caranx* sp.), 13.3 per cent.; Paradise Fish, *Aprion virescens* Valenciennes, 12.6 per cent.; Pike, *Sphyræna* sp., 9.9 per cent.; Red Bass, *Lutjanus coatesi* Whitley, 0.4 per cent.

Small quantities of the following species were also taken :—

Coral Trout, *Variola louti* (Forsk.).

Shark Mackerel, *Grammatocynus bicarinatus* (Quoy and Gaimard).

Runner, *Elegatis bipinnulatus* (Quoy and Gaimard).

Reef Cod, various species of Epinephelidae, etc.

Wahoo, *Acanthocybium solandri* (Cuvier).

Leather-skin, *Chorinemus lysan* (Forsk.).

Dolphin, *Coryphaena hippurus* Linnaeus.

Shark, various species.

The majority of the less-abundant species were taken when trolling reef and shoal waters. However, the yellow-fin tuna, wahoo and dolphin were also caught some distance from reefs, indicating that they do move out to deeper waters.

Comparison of the catch percentage of the more important individual troll species for each of the three areas (see Appendix II) shows that the highest proportion of mackerel, pike and trevally was taken in Area 1 and paradise fish and tuna in Area 2. Paradise fish were not taken in Area 1 and, compared with areas 2 and 3, catches of tuna were very poor.

The highest percentage (66.4) of Spanish mackerel was taken in May when this species was shoaling in the region of Boirama, Blakeney, Hull and Grace Islands (Appendix V). Trolling from Samarai to Bramble Haven in June yielded the highest percentage of pike (15.9). In November, 17.9 per cent. of the total catch was trevally, the troll catches for this month being the lowest recorded for the year. Dog-tooth tuna accounted for 33.3 per cent. of the total catch in the reef waters east of Samarai in March, with corresponding decrease in the relevant percentage of other species. This high figure was due to the discovery of a tuna

spawning ground in March, 1958, when large catches of running ripe dog-tooth tuna were made on successive days. On no occasion were large catches of red bass taken. In July 21.6 per cent. of the total troll catch comprised paradise fish taken in Area 2 mainly along the Sunken Barrier.

The above figures indicate where the highest percentage of any one species may be expected in any one month. However, over the full period of investigations, the highest average catch and the highest catch rates for all species were always recorded in Area 2, the best months being December to March, and August to September.

ECONOMICS AND FUTURE DEVELOPMENT

The high average daily catch of 700 lb. taken over a 45-day period (Appendix VI) when trolling reef and shoal waters east of Samarai, for a period of 10 or more hours a day points to the possibility of establishing a commercial trolling enterprise based at Samarai. To fill a vessel with a freezer capacity of 20,000 lb. would require 30 days' trolling out of Samarai. Such a catch would consist of approximately 8,400 lb. mackerel, 3,800 lb. tuna, 3,000 lb. paradise fish, 2,800 lb. trevally, 2,000 lb. pike and 20 lb. red bass. Present Port Moresby fish prices of 2s. 6d. per lb. for mackerel, 2s. for paradise fish and 1s. 6d. for the remainder would return £2,000 net. However, it is unlikely that Port Moresby could absorb catches of this magnitude and the bulk would have to be sent to either Sydney or Brisbane for sale. Transportation under refrigeration would cost 3d. per lb. and there would be no market for trevally, tuna or red bass and only a restricted market for pike. The return from mackerel sold in Australia would approximately equal its return in Port Moresby.

Thus, briefly, for a vessel equipped with two motor tenders, 30 days' trolling could be expected to net no more than £2,000. An additional 10 days must be allowed for unloading of fish, repairs, maintenance, refuelling and inclement weather. The catch could be placed in a shore-based freezer erected at either Samarai or Sariba Island and shipped to either Port Moresby or Australia on the M.V. *Bulolo* which calls at Samarai every six weeks.

Commercial trolling in Area 2 would not involve any encroachment on native fishing rights, as there is no fishing by local indigenes in any of the reef and shoal waters where the best catches may be expected.

SUMMARY

Spanish mackerel is the most abundant troll species in Papuan waters. The catch during the period of investigations amounted to 46.4 per cent. of the total.

Dog-tooth tuna, which accounted for 17.4 per cent. of the total catch, schools and spawns in the vicinity of Bramble Haven waters in March, when they will readily take a fast-moving lure.

Belly strips of mackerel and tuna are the most satisfactory bait and the best trolling speed for fast-moving species appears to be in excess of five knots.

Troll catches between Port Moresby and Samarai were poor. Fair results were obtained in some reef waters north of Samarai and along the north-west New Guinea coastline, although insufficient investigations were carried out over a period to draw accurate conclusions. Very good results were generally obtained east of Samarai and along the Sunken Barrier where proven fishing reefs and shoals yielded consistently high catches. In this area, 150 miles of highly-productive trolling reefs extend from Suau Island along the Sunken Barrier Reef to Duchateau Island.

Off-shore reefs and shoal waters in each of the three areas always gave better results than fishing in-shore mainland reefs and reefs enclosing larger islands.

The results to date indicate that a profitable commercial trolling enterprise could be developed by fishing with a vessel of low overhead and running costs in waters east of Samarai, with headquarters based at Samarai or Sariba Island. Additional dories with a trolling speed in excess of five knots would result in greatly increased catches during favourable weather.

REFERENCE

- RAPSON, A. M. (1955). Survey of fishing potentialities of the Coral Sea and southern and eastern Papua in 1955. *Papua-New Guinea agric. J.* 10: 31-42.

APPENDIX I.—Proportions of Troll Fish taken by F.R.V. *Tagula* from 4th September, 1957, to 28th February, 1959

Fishing Voyage No.	Area	Duration	Weight (lb.)						TOTAL
			Mackerel	Pike	Trevally	Tuna	Red Bass	Paradise	
1	Port Moresby—Samarai	4.9.1957 to 20.9.1957	559	46	81	6	...	...	692
2	Port Moresby—Samarai	26.9.1957 to 8.10.1957	1,031	287	171	72	56	...	1,617
3	Port Moresby—Samarai	14.10.1957 to 26.10.1957	572	165	109	50	...	...	896
4	Port Moresby—Samarai	4.11.1957 to 14.11.1957	176	19	178	85	...	...	458
7	East of Samarai	29.12.1957 to 18.1.1958	1,804	480	539	517	...	406	3,746
12	East of Samarai	18.2.1958 to 3.3.1958	1,532	396	545	577	...	381	3,431
13	East of Samarai	14.3.1958 to 23.3.1958	1,180	176	484	1,128	52	363	3,383
14	N. and N.W. of Samarai	25.4.1958 to 15.5.1958	1,523	52	65	642	...	...	2,282
15	N. and N.W. of Samarai	29.5.1958 to 19.6.1958	1,223	343	158	160	...	258	2,142
16	Port Moresby—Samarai	1.7.1958 to 10.7.1958	181	26	6	33	...	...	246
17	Port Moresby—Samarai	17.7.1958 to 25.7.1958	376	...	267	32	...	28	703
17	East of Samarai	18.7.1958 to 31.7.1958	928	292	285	515	...	664	2,684
17	N. and N.W. of Samarai	3.8.1958 to 16.8.1958	473	97	38	99	...	...	707
18	N. and N.W. of Samarai	22.8.1958 to 25.8.1958	17	22	...	...	...	...	39
18	East of Samarai	26.8.1958 to 30.8.1958	1,590	204	750	440	...	792	3,776
18	N. and N.W. of Samarai	5.9.1958 to 6.9.1958	70	21	57	44	...	...	192
19	N. and N.W. of Samarai	10.9.1958 to 15.9.1958	92	35	8	28	...	6	169
19	East of Samarai	17.9.1958 to 22.9.1958	1,803	363	763	1,126	...	692	4,747
20	East of Samarai	26.9.1958 to 29.9.1958	1,108	219	339	219	...	323	2,208
21	East of Samarai	19.10.1958 to 24.10.1958	1,109	382	367	410	18	511	2,797
22	Port Moresby—Samarai	21.11.1958 to 22.11.1958	164	...	...	...	...	...	164
22	East of Samarai	26.11.1958 to 29.11.1958	192	83	13	128	...	32	448
23	East of Samarai	2.12.1958 to 21.12.1958	2,760	614	581	1,461	36	801	6,253
26	East of Samarai	5.2.1959 to 28.2.1959	1,471	250	483	404	19	591	3,218
TOTAL			21,934	4,572	6,287	8,176	181	5,848	46,998
Percentage			46.4	9.9	13.3	17.4	0.4	12.6	...

APPENDIX II.—Percentage Catch of Individual Troll Species in each area

AREA	LOCALITY	SPECIES (%)					
		Mackerel	Pike	Trevally	Tuna	Red Bass	Paradise
1	Port Moresby—Samarai	64.0	11.1	17.0	1.2	0.6	....
2	East of Samarai	42.3	9.6	14.0	18.9	0.1	15.1
3	North and north-west of Samarai	61.7	10.3	5.7	17.5	....	4.8

APPENDIX III.—Catch rates per fishing line hour on fishing voyages of F.R.V. *Tagula*
September, 1957 to February, 1959

Fishing Voyage No.	Area	"Tagula" Catch/ Troll Line Hour (lb.)	Dory Catch/Troll Line Hour (lb.)
1	Port Moresby—Samarai	1.3	3.1
2	Port Moresby—Samarai	2.5	5.4
3	Port Moresby—Samarai	2.7	7.2
4	Port Moresby—Samarai	1.4	1.1
7	East of Samarai	4.8	....
12	East of Samarai	5.7	13.0
13	East of Samarai	14.9	7.4
14	North and north-west of Samarai	2.9	....
15	North and north-west of Samarai	1.9	....
16	Port Moresby—Samarai	0.6	....
17	Port Moresby—Samarai	0.6	1.0
17	East of Samarai	10.3	40.8
17	North and north-west of Samarai	2.7	....
18	East of Samarai	13.7	14.5
18	North and north-west of Samarai	1.1	....
19	East of Samarai	12.5	....
19	North and north-west of Samarai	1.1	....
20	East of Samarai	9.2	....
21	Port Moresby—Samarai	0.7	2.0
21	East of Samarai	8.0	12.5
22	East of Samarai	6.2	....
23	Port Moresby—Samarai	0.5	....
23	East of Samarai	11.6	....
26	East of Samarai	5.9	....

APPENDIX IV.—Daily Troll catches in excess of 500 lb. taken by the F.R.V. *Tagula*
from 4th September, 1957 to 26th February, 1959

Fishing Voyage No.	Date	Locality	Catch (lb.)	Remarks
7	14.1.1958	Calvados Chain—Bramble Haven	730	Dories not trolling.
7	15.1.1958	Bramble Haven—Dumoulin Island	1,181	Dories not trolling.
12	24.2.1958	Quessant Island—Anchorage Reef	886	Dory catch 431 lb. <i>Tagula</i> catch 455 lb.
12	25.2.1958	Anchorage—Long Reef	1,330	Dory catch 516 lb. <i>Tagula</i> catch 814 lb.
12	26.2.1958	Bramble Haven—Sable Island	954	Dory catch 347 lb. <i>Tagula</i> catch 607 lb.
13	18.3.1958	Samarai—Jomard Entrance	626	Dory catch 129 lb. <i>Tagula</i> catch 497 lb.
13	19.3.1958	Jomard Entrance—Pana Rora Island	1,379	Including 320 lb. taken in 1½ hours by <i>Tagula</i> .

APPENDIX IV—continued

Fishing Voyage No.	Date	Locality	Catch (lb.)	Remarks
13	20.3.1958	Pana Rora Island—Panasai Island	1,481	Including 425 lb. taken in 1½ hours by <i>Tagula</i> .
14	10.5.1958	Blakeney Island—Dawson Island	710	Dories not trolling.
14	12.5.1958	Gallows Reef—Hull Island	1,008	Dories not trolling.
14 ...	13.5.1958	Hull Island—Samarai	562	Dories not trolling. This catch taken between 0610-1145 hours.
15	15.6.1958	Long Reef	641	Dories not trolling.
16	17.6.1958	Long Reef—Sunken Barrier—Suau Island	626	Dories not trolling. Seas rough and most mackerel small and taken in deep water.
17	25.7.1958	Fyfe Bay—Sariba Island	637	Seas rough and dories not trolling.
17	28.7.1958	Long Reef—Pana Tinani Island	982	Seas rough and dories trolled for only 1½ hours each.
17	29.7.1958	Jomard Area	745	7 hours' trolling.
17	30.7.1958	Jomard—Anchorage Reef	562	Bright sun.
18	26.8.1958	Dumoulin Island—Quessant Island	1,245	Seas rough and dories not trolling. 1,000 lb. taken by <i>Tagula</i> in 5 hours.
18	27.8.1958	Quessant Island—Pana Tinani Island	822	Dory catch, 3 hours—75 lb.
18	28.8.1958	Pana Tinani Island—Sunken Barrier	1,209	Seas rough and dory trolling time limited.
18	29.8.1958	Pana Tinani Island—Quessant Island	554	Seas rough and dories not trolling.
18	30.8.1958	Quessant Island—Samarai	580	Dories not trolling, bright sun, seas glassy, calm.
19	17.9.1958	Samarai—Sunken Barrier—Quessant Island	1,138	Dories not trolling. 10 hours' trolling by <i>Tagula</i> .
19	18.9.1958	Quessant Island—Pana Rora Island	653	Dories not trolling.
19	19.9.1958	Pana Rora Island—Jomard Entrance	1,119	Including over 400 lb. in 1 hour by <i>Tagula</i> . Dory troll time small. Both booms broken.
19	20.9.1958	Duchateau Island—Jomard Entrance	642	Dories not trolling. Echo sounder broken down.
20	26.9.1958	Samarai—Sunken Barrier	731	Dories not trolling.
20	28.9.1958	Stuers Island—Sable Island	727	Dories not trolling.
21	20.10.1958	Long Reef—Pana Rora Island	572	Good trolling weather. Dory trolling time small.
21	21.10.1958	Pana Rora Island—Jomard Island	797	Dory catch 406 lb. <i>Tagula</i> catch 391 lb.
23	2.12.1958	Samarai—Long Reef	678	Dories not trolling. Unsuitable trolling weather.
23	5.12.1958	Long Reef—Pana Rora Island	687	Dories not trolling. Unsuitable trolling weather.
23	8.12.1958	Pana Rora—Jomard Island	895	Dories not trolling. Unsuitable trolling weather.
23	9.12.1958	Jomard Island—Stuers Island	652	Dories not trolling.
23	10.12.1958	Stuers Island—Suau Island	1,053	Dories not trolling. Good trolling weather.
23	11.12.1958	Suau Island—Sunken Barrier	1,032	Dories not trolling.
23	12.12.1958	Brummer Island—Samarai	629	Dories not trolling. Afternoon weather unsuitable.
26	20.12.1958	Stuers Island—Suau Island	823	Dories not trolling. Trolling Sunken Barrier.
26	21.2.1959	Suau Island—Samarai	560	Dories not trolling.

APPENDIX V.—Monthly total weights and percentages of the different troll species taken by
F.R.V. *Tagula* from 4th September, 1957, to 28th February, 1959

Month	Mackerel		Pike		Trevally		Tuna		Red Bass		Paradise		Total Weight All Species
	Wt. (lb.)	%	Wt. (lb.)	%	Wt. (lb.)	%	Wt. (lb.)	%	Wt. (lb.)	%	Wt. (lb.)	%	
January	1,804	48.1	480	12.8	539	14.4	517	13.8	....	....	406	10.9	3,746
February	3,003	45.2	646	9.8	1,028	15.5	981	14.7	19	0.2	972	14.6	6,649
March	1,180	34.9	176	5.2	484	14.3	1,128	33.3	52	1.5	363	10.8	3,383
April	....	....	....	....	....	....	....	....	....	....	....	....	....
May	1,503	66.4	52	2.3	55	2.8	642	28.5	....	....	....	....	2,262
June	1,243	57.5	343	15.9	158	7.3	160	7.4	....	....	258	11.9	2,162
July	1,384	39.2	318	9.0	558	15.8	580	16.4	....	....	692	21.6	3,532
August	2,080	45.9	323	7.1	788	17.4	539	12.0	....	....	792	17.6	4,522
September	3,729	46.0	684	8.4	1,248	15.4	1,423	17.6	....	....	1,021	12.6	8,105
October	2,615	55.8	547	11.7	476	10.2	460	9.8	74	1.6	511	20.9	4,683
November	532	49.7	102	9.5	191	17.9	213	19.9	....	....	32	3.0	1,070
December	2,760	45.7	614	10.2	581	9.6	1,461	24.2	36	0.6	591	9.7	6,043
TOTAL	21,833	....	4,285	....	6,116	....	8,104	....	181	....	5,638	....	46,157

APPENDIX VI—Trolling catches to the east of Samarai

Fishing Voyage No.	Duration	Fishing Period (days)	Areas Trolled	Total Catch Trolled (lb.)
7	29.12.1957 to 18.1.1958	3	Samarai—Dumoulins—Conflicts—Deboyne—Pana Tinani—Rossel—Tagula—Bramble Haven—Samarai	1,940
12	18.2.1958 to 3.3.1958	4	Samarai—Wari Island—Quessant Island—Anchorage Reef—Long Reef—Bramble Haven—Sable Island—Samarai	3,799
13	14.3.1958 to 23.3.1958	3	Samarai—Long Reef—Pana Rora—Panasai Island—Samarai	3,486
15	29.5.1958 to 19.6.1958	3	Samarai—Long Reef—Bramble Haven—Samarai	1,611
17	17.7.1958 to 16.8.1958	1	Samarai—Quessant Island—Bramble Haven—Anchorage Reef—Samarai	477
18	22.8.1958 to 6.9.1958	5	Dumoulins—Quessant Island—Bramble Haven—Anchorage Reef—Samarai	4,336
19	10.9.1958 to 22.9.1958	6	Samarai—Sunken Barrier—Wari Island—Long Reef—Bramble Haven—Duchateau Island—Samarai	5,071
20	26.9.1958 to 29.9.1958	4	Samarai—Suau—Stuers Island—Long Reef—Anchorage Reef—Stuers Island—Samarai	2,259
21	30.9.1958 to 4.11.1958	6	Samarai—Long Reef—Anchorage Reef—Jomard—Stuers Island—Samarai	3,646
22	17.11.1958 to 30.11.1958	2	Emerald Reef—Conflicts—Siriki Shoals—Samarai	395
23	2.12.1958 to 21.12.1958	7	Samarai—Sunken Barrier—Pana Rurawara Island—Jomard—Stuers Island—Suau—Samarai	5,626
26	5.2.1959 to 26.2.1959	5	Samarai—Dumoulins—Kosmann Island—Duchateau Island—Jomard—Long Reef—Stuers Island—Sunken Barrier—Samarai	2,406
	TOTAL	49	TOTAL	35,052