SQUID FISHING INVESTIGATIONS IN NORTHERN BASS STRAIT
FIRTA PROJECT NUMBER 86/43

FINAL REPORT TO FISHING INDUSTRY RESEARCH COMMITTEE

INTRODUCTION

The aim of this project was to investigate the commercial viability of catching squid in Bass Strait and marketing the catch, over a twelve month period.

The grant was sought to offset some of the operating expenses during exploratory fishing, especially during the winter and spring months when reported squid catches have been very low.

It was agreed at a meeting in Melbourne with Dr.Walker that squid fishing would be done in conjunction with shark fishing when squid catches were low, but it was expected that the boat would fish for squid full time when catches improved. It was agreed that squid fishing would take place on at least two fishing trips per month, weather permitting, for a twelve month period.

Notification that the Grant had been approved was received in late July 1986, and five automatic jigging machines were placed on the boat in August. With five machines, the shark gear can be left on the boat. At the end of November the boat went on the slip for its annual survey and maintainence and during this time the shark gear was removed and three more jigging machines were installed. The boat commenced full time squid fishing in mid-December 1986 and continued until May 1987 when catches dropped off significantly and shark fishing was resumed on a part time basis until the end of July 1987.

RESULTS

The Victorian Fisheries Division provided a squid log book that was completed each night. The following details were recorded; area, depth, surface water temperature, number of machines working, start and finish time, and catch.

Catch

Fishing was normally on a daily basis with the catch being unloaded every morning. The squid was weighed off the boat. Were fishing was for more than one night, the daily catch was estimated and the weighed trip total was also recorded.

A summary of catch and effort is shown in table 1.

The total catch over the 12 month period was 30,798 kgs, however 78% of the catch was taken in the two months of February and March, and 99% of the catch as taken in the five months from December to April.

The best catch on any one night was 1955 kgs in early March. The nightly average over the February/March period was 670 kgs, and the catch exceeded 1,000 kg on nine nights.

Catch Rate

The number of days fishing per month and the number of machines used varied throughout the year, so an average monthly catch rate has been calculated as the catch in kilograms per machine per hour of fishing. This shows that the best average catch rate was 9.8 kgs./machine-hour in March, followed by February (7.6), and January (5.1). Signifiant catches started in December and continued until April. The catch rates for the remaining months of the year were less than 1 kg/ machine-hour.

Areas Worked

The areas worked are shown in the attached figures 1-5.

Separate figures are given for the months December to April, showing the catch and the catch rates for each quarter degree square block.

Operations were based at Apollo Bay over summer/mid autumn and at Port Albert for the remiander of the year.

From the figures it can be seen that the most consistent catches were taken in the areas west to south west of Cape Otway, off Apollo Bay and Lorne.

Water Depth

Most fishing took place between 65 and 80 meters depth. There was no correlation between between catch and water depth over this range.

Water Temperature

During this program there were no catches greater than 250 kg per night when the surface water temperature was below 16.9 degrees C. However there does not appear to be any correlation between catch and water temperature above 16.9 degrees.
Catches of greater than one tonne were taken at temperatures ranging from 16.9 to 18.6 degrees, but there were many nights when very poor catches were taken when the temperature was in this range.

Moon Phase

It was observed that catches appeared to decline rapidly around the time of the full moon.

Overall during this program, good catches were far more likely to be taken around the time of the new moon and first quarter than around the full moon and last quarter, but there were some exceptions and further work would need to be done before any conclusive statement could be made.

Variation during the night

Data collected by the Fisheries Division in 1980 aboard the Japanese research vessel "Hoyo Maru 87" suggested that catch rates of squid increased during the night to a peak just before dawn when they decreased rapidly.

Catches during this program were estimated and recorded every two hours during the night and there is no evidence to suggest that the catch rate increased. On the nights when good catches were taken, the catch rate varied very little throughout the night.

PROBLEMS

Catches were not as good as was hoped for, and the following factors may have contributed to a poor season.

Barracouta

On a number of ocassions, particularly in early summer, catches were severly limited by barracouta attacking the jigs. Lines became tangled and jigs were bitten off, resulting in lost fishing time while jig sets were replaced

In an attempt to overcome this problem stainless wire traces were used between the jigs. This stopped the couta biting through the jig sets, but it also reduced the catch rate to a level where it was not worth fishing. The reason is thought to be that the squid can see the wire traces in the light and will not take the jigs.

Finding the squid

One problem in trying to develop this fishery is that one boat working on its own has great difficulty in locating good concentrations of squid. It is well known that the foreign vessels work co-operatively to locate the squid, and boats will move and fish near the boat that is catching the most.

Fishing time is lost when the boat moves during the night. The parahute anchor has to be retrieved and machines brought in, and by the time the boat moves a few kilometers and starts fishing again an hour or two has been lost. Therefore, if a boat is working on its own, it is not worth moving unless the catch rate is almost nil because there is no way of knowing if catches will be any better at another location. A number of boats working co-operatively are far more likely to get good catches

Weather

There was a long run of bad weather with very strong winds during the peak of the season, and this was thought to be worse than normal. This may have contributed to the poor season.

On some nights it was too rough to work at all, but on others, although it was rough - winds up to 30 knots - the boat still worked with half the machines turned off to help prevent tangles. However, it is thought that the machines do not fish as well in rough weather because the jigging action is upset by the rolling of the boat and the lights are not as effective because the angle at which they shine over the side is always changing.

MARKETING

Almost all the catch was sold to SAFCOL for processing at Millicent in South Australia. A fixed price of $1.20 per kg, on the wharf at Apollo Bay, was paid for the whole season, and this was considered to be reasonable.

It had been hoped to supply a number of different outlets but this did not happen for a number of reasons

- catches were far less than hoped for, and there was not enough product to go around

  some buyers were not prepared to pay a reasonable price

- it was considered crucial for the development of the fishery to develop a processing outlet. From experience the previous season, good prices (up to $2.00 per kg.) can be obtained at the Melbourne Fish Market but only a limited quantity can be handled each week. There were nights when fishing had to stop because the market would not have been able to handle all the catch. Also the market only operates five days a week.

  A processor is able to take large quantities of squid if fishing is good and arrangements can be made to fish any day of the week. SAFCOL were prepared to set up a squid processing plant and pay a fixed price for the whole season, and it was felt that they should be supported in the interests of developing the fishery. SAFCOL were hoping to receive about 400 tonnes for the season when they decided to set up for processing squid.

FINANCES

If it had not been for the $30,000 grant from FIRTA the boat would have made an overall loss for the twelve month period.

Income from squid fishing was approximately $37,000 over the five months from December to April. There was virtually no income from squid fishing from May to November, and the FIRTA grant was mostly used to offset operating costs and to pay the crew over this period.

Febraury and March were the only commercially viable months. January was marginal, and athough there were some catches in December and April operations were not profitable during these months this season.

Financial statement forms, Schedules B-D have been completed and are attached.

CONCLUSIONS

1. Fishing this season tends to confirm previous evidence that a squid fishery in Bass Strait will be very seasonal. Unless squid can be caught off South Australia or off Eastern Victoria/NSW either earlier or later than in Bass Strait, the squid fishery will be very much a part time fishery.

2. A price of $1.20 per kg. is marginal. It would be unprofitable to fish for a lower price. Fishermen really need $1.50 kg to make a reasonable return from squid fishing during the season.

3. There needs to be more boats working to prove the viability or otherwise of a squid fishery in Bass Strait. One boat working alone has great difficulty in searching for and locating good concentrations of squid. The failure of one boat to get good catches of squid does not necessarily mean that there was no squid in the region.

   Although the applicant's second boat, the "Gumleaf", worked with the "Pamanell" for two months it had a number of problems and only fished alongside "Pamanell". It did not search for squid independently.

   It is well recognized that foreign boats work co-operatively to locate squid, and local boats will need to do likewise.

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Table 1: Summary of Catch and Effort

MONTH	DAYS	MACHINES	HOURS	CATCH (kgs)	CATCH RATE (kgs/mach-hr)
Aug'86	2	5	15	8	< 1
Sep'86	6	5	54	15	< 1
Oct'86	5	5	41	20	< 1
Nov'86	4	5	21	21	< 1
Dec'86	4	8	27	720	3.3
Jan'87	13	8	79	3,280	5.1
Feb'87	15	10	128	9,732	7.6
Mar'87	21	8	182	14,330	9.8
Apr'87	7	10	60	2,410	4.0
May'87	6	10	45	110	< 1
Jun'87	4	5	26	69	< 1
Jul'87	5	5	35	155	< 1
Total	92			30,798	

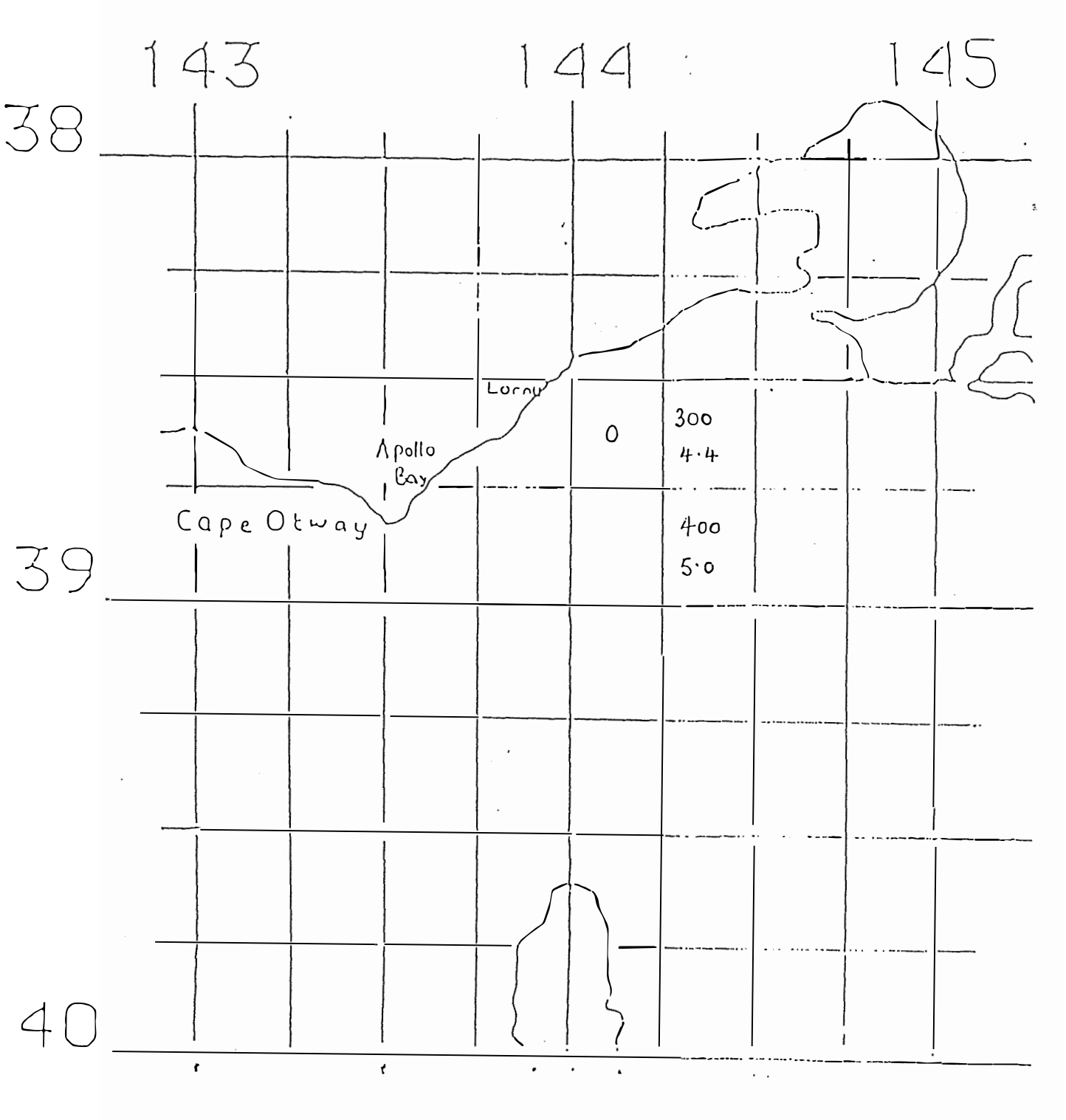

FIG 1: DECEMBER 1986 Catch (kgs) and catch rate (kgs/machine-hour) by one quarter degree square blocks

"0" denotes blocks where fishing took place but catch rates were less than 1 kg/machine-hour.

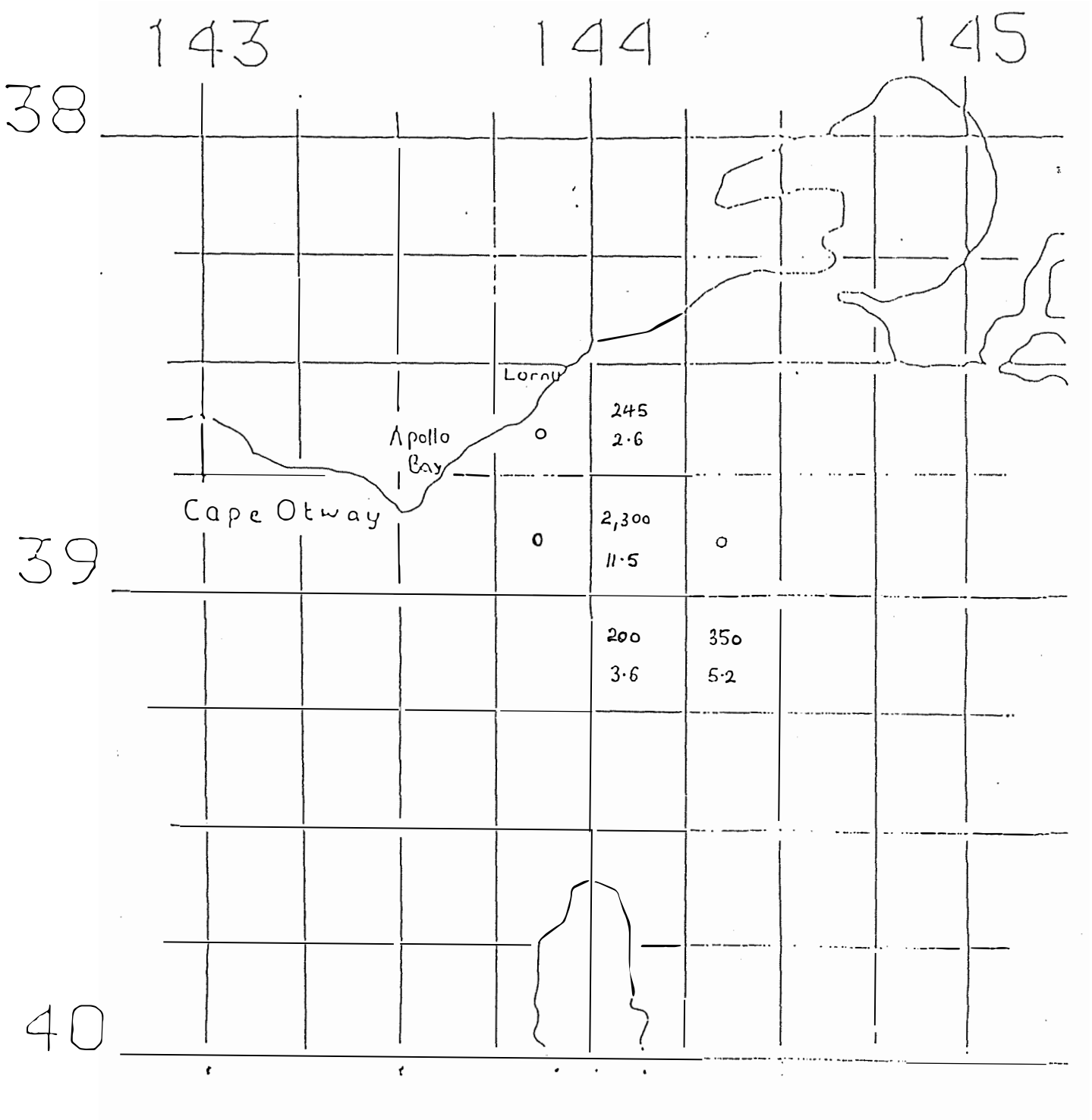

FIG 2: JANUARY 1987 Catch (kgs) and catch rate (kgs/machine-hour) by one quarter degree square blocks

0" denotes blocks where fishing took place but catch rates were less than 1 kg/machine-hour.

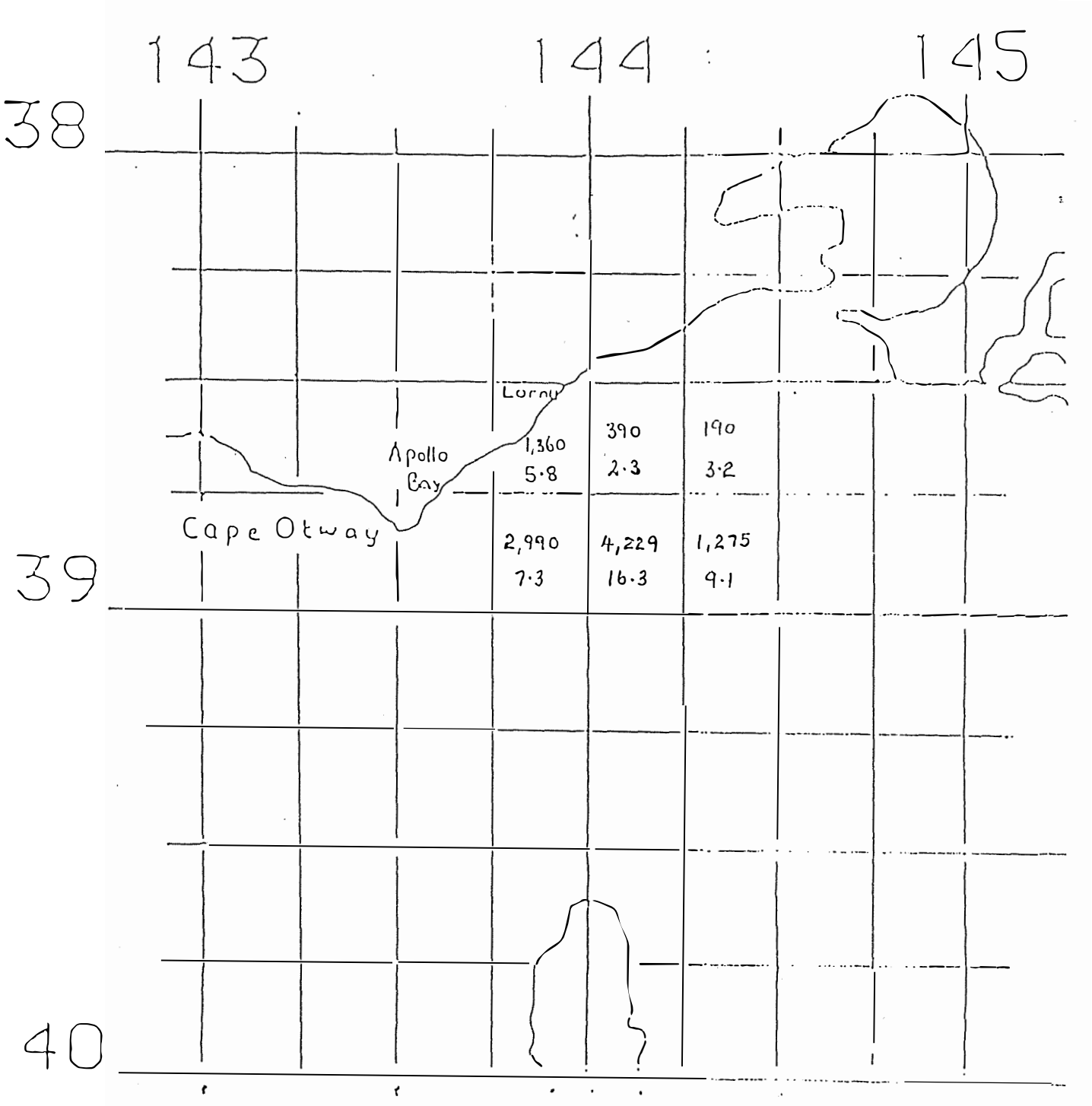

FIG 3: FEBRUARY 1987 Catch (kgs) and catch rate (kgs/machine-hour) by one quarter degree square blocks

"0" denotes blocks where fishing took place but catch rates were less than 1 kg/machine-hour.

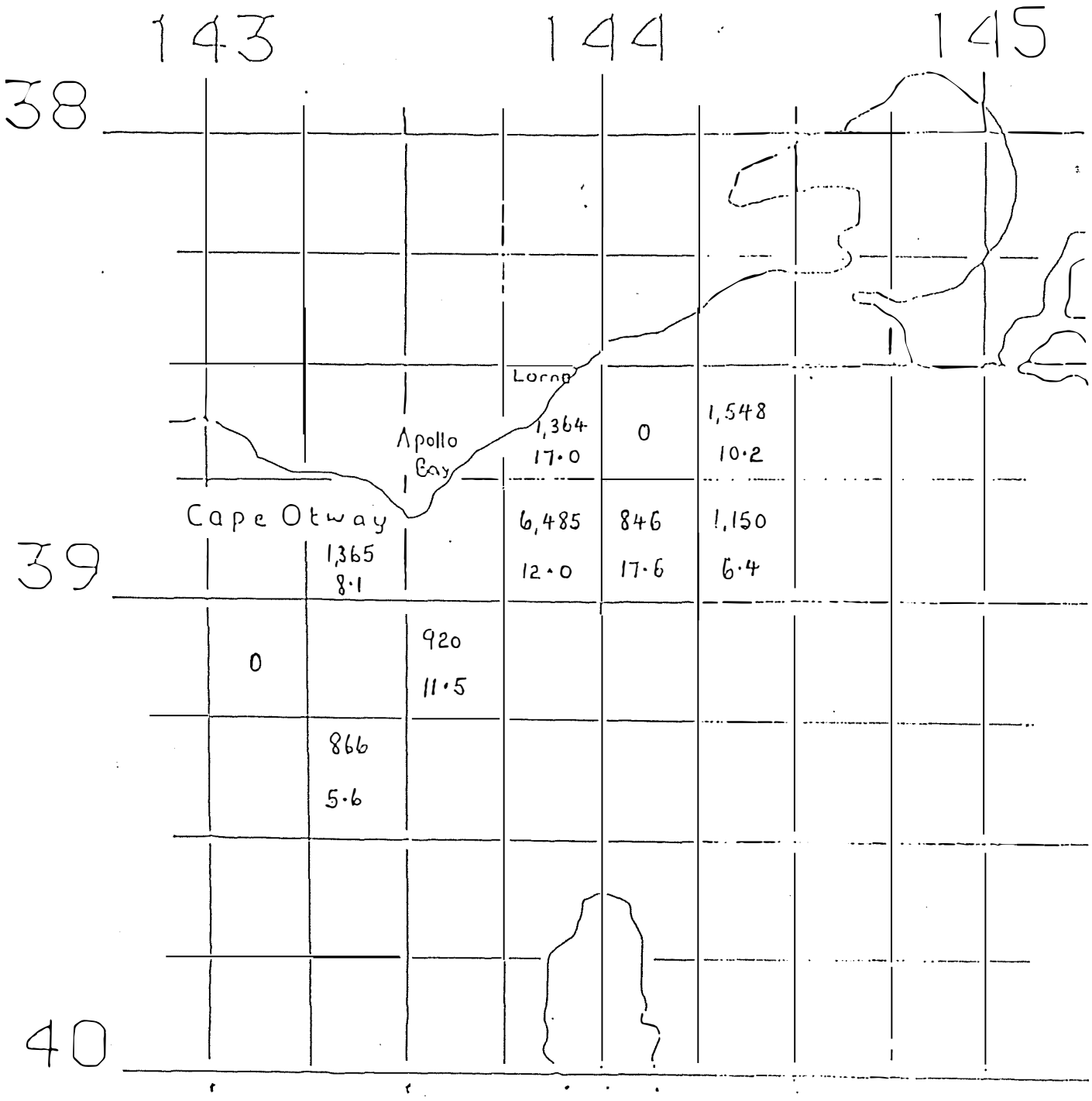

FIG 4: MARCH 1987 Catch (kgs) and catch rate (kgs/machine-hour) by one quarter degree square blocks

"0" denotes blocks where fishing took place but catch rates were less than 1 kg/machine-hour.

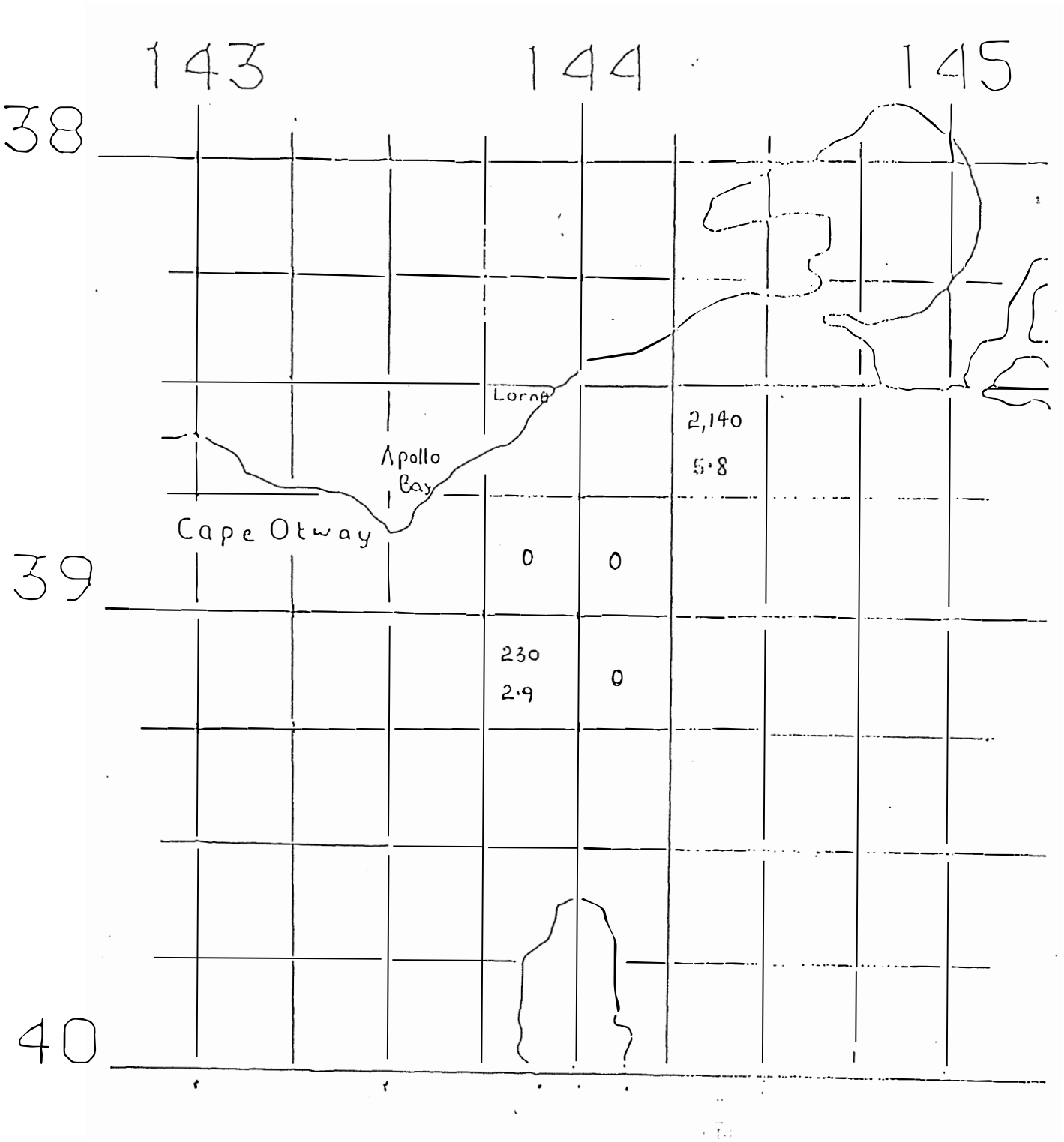

FIG 5: APRIL 1987 Catch (kgs) and catch rate (kgs/machine-hour) by one quarter degree square blocks

"O" denotes blocks where fishing took place but catch rates were less than 1 kg/machine-hour.