AUSTRALIAN PARTICIPATION IN TUNA HANDLINE/POLE FISHERY QUEENSLAND

FINAL REPORT; CONCLUSION OF PROGRAMME

FOREWORD

This report was prepared to summarize the yearly activities of Australian participation in the tuna handline/pole fishery in the coral Sea adjacent to Cairns over the period 1981 to 1983. The final reports for the years 1981, 1982, and 1983 are included as attachments 1, 2 and 3 respectively.

INTRODUCTION

On 28 July 1981 the Minister for Primary Industry, on the recommendation of FIRC, approved the expenditure of $100,000 from FIRTA to encourage Australian participation in the tuna fishery off Cairns. This resource had been fished by the Japanese since 1965.

In 1981, following the calling for applications from interested owner operators, grants totalling $80, 278 were made to six fishermen to cover

- purchase of relevant fishing gear
- conversion of vessels to facilitate catching and handling tuna, and
- for assistance towards the cost of fuel and bait.

On 11 August 1982 a further grant of $83,435 was approved from FIRTA for

- the construction and laying of two fish aggregating devices (FAD'S)

- fuel and bait assistance, and

- experimental handling and packaging of tuna for the sashimi market.

The use of local Queensland prawn vessels proved inadequate for a proper assessment of the prospects for a tuna fishery in the area.

In view of this the Minister approved $342,760 to extend the project in 1983, principally for the charter of a specialized SBT pole fishing vessel to make a more comprehensive assessment of the potential of the fishery.

LOCATION OF FISHERY

The area fished in 1981 was located about 90 nautical miles north-east of Cairns, 50 nautical miles seaward of the Great Barrier Reef, in a position approximately centred on $15^{o}40'S$, $146^{o}50'E$. This area was known from previous observations on board Japanese longliners and from their reports to the Australian Coastal Surveillance Centre. In 1982 the fish congregated a greater distance from Cairns (north of Cooktown) and practically no fishing was carried out in the area fished the previous year.

LOCATING THE FISH

Attempts were made to locate the fish from the air as in the SBT fishery. This proved unsuccessful, but the aircraft was able to locate tidal lines. Japanese longliners were always fishing in the vicinity of these lines and associated temperature fronts.

Once vessels were in the general area continual watch was kept for birds feeding near rising fish.

None of the local vessels had sonar equipment, however, the Catriona B, which won the tender for the survey in 1983, was fitted with a new colour sonar.

Generally several schools of fish would appear on the surface at the same time and consequently it was not difficult to find a suitable patch to fish.

Observations in 1981 indicated water temperature to be important, the ideal being 26-27^{o} Celcius. Sudden fluctuations tended to indicate a tidal front had been reached and this appeared to be where most fish congregated.

BAIT

It was initially believed that catch rates achieved by the Japanese could be improved with the use of live bait.

- efforts to obtain live bait proved difficult in 1981'82 as suitable baiting areas were not known locally, and more importantly, baiting operations often seriously curtailed fishing time for the local vessels which were poorly equipped for bait fishing.

- frozen blue pilchards were purchased for bait. This was used frozen as it was quickly realized that it floated on the surface longer and kept the tuna up.

- in 1983 Catriona B caught bait pilchards on the way up the east coast and had little difficulty obtaining excellent bait with a beach seine net once suitable baiting areas had been located. (See Attachment 3).

VESSELS

In 1981 six vessels received grants for this fishing program. In addition, a further three boats were independently engaged in the operation (see Attachment 1).

The six vessels operated again in 1982 and operating costs were paid from the grant.

The Eden vessel Catriona B was chartered in 1983 because it was believed such a vessel would have considerable advantage over the smaller local vessels to more accurately assess the tuna pole fishery potential (see Attachment 3).

HISTORY

Following allocation of monies from FIRTA in 1981 work commenced on re-rigging the six local prawn vessels for tuna poling operations. On 2 October 1981 the first vessel put to sea but did not reach the grounds due to adverse weather conditions. In all, four abortive attempts were made by the fleet to reach the grounds.

Fishing commenced on 20 October 1981 and continued until the season closed on 22 November 1981. This resulted in 81 tonnes of tuna being caught during the period (see Attachment 1).

The local vessels proved unsuitable for tuna poling operations as space was restricted on most and carrying and holding facilities were inadequate

- their small size limited the number of poles which could be worked

- their small size prevented them carrying sufficient tuna to be economically viable at the prices offered for fish for canning.

- fish holding facilities on most boats were unsatisfactory for sashimi quality tuna

Therefore it was decided that in 1982 emphasis would be placed on handlining for larger sashimi quality fish for export to Tokyo.

In 1982 most boats fished more days than the previous year. This, in addition to the fish being further offshore produced increased costs.

In spite of the additional operating time mush less fish was landed in 1982. Only 6.5 tonnes was sold for canning and 1.4 tonnes (41 fish) was exported as sashimi quality. The concentration on handlining contributed much to the low catch rate. However, it did appear that the tuna were much harder to induce to the surface than the previous year. The season ended on 6 December 1982.

The charter of the Catriona B commenced at Cairns on 17 August 1983 and ended on 6 December 1983. In all 54 days were spent fishing (see Attachment 3). During the period she caught 46.130 tonnes of tuna. However, it was estimated that it should be possible to pole between 80 to 120 tonnes with a boat of this size in the season.

SUMMARY

Because of their small size the local north Queensland prawn vessels proved unsuitable for tuna poling operations for canning quality fish

. they are unable to carry an effective quantity of live bait

. the small size limits the number of poles which can be operating

  - maximum is four but when double poling only two hooks can be in the water at the one time

  the small capacity meant continuously returning to Cairns to unload, often during fine weather

  - higher costs (fuel, time)

- lost fishing time

. the small size prevents them carrying sufficient tuna to be economically viable at the prices offered for fish for canning.

On board handling was acceptable for fish destined for the bulk market, however, if larger numbers were caught the refrigeration would probably need to be upgraded. There is difficulty in maintaining the quality control necessary for sashimi product.

The Cairns based shore facilities were inadequate both in terms of unloading and freezing/storage. It was not possible to freeze ashore for canning and facilities for storing for sashimi were unacceptable. This lack of facilities was particularly frustrating

. unloading and handling the catch proved very time consuming and resulted in considerable loss of fishing time.

. the very high ambient temperature further exacerbates the handling problems.

The cost of transporting bulk fish to southern canneries is extremely high and reduces the profit margin

. Heinz subsidized 50% of these costs for the trial shipments.

Local fishermen engaged in this program, while being experienced prawn fishermen had no experience of tuna fishing. This was reflected in their whole operation. The skipper and crew of Catriona B also claimed that yellowfin/big-eye tuna displayed different behaviour to SBT and that they too experienced some difficulty catching the fish (see attachment 3).

The lack of sonar equipment was a handicap to the local vessels. However, it is doubtful whether the small holding (and hence earning) capabilities of these vessels would warrant expenditure on sophisticated eletronic fish finding equipment.

Due to the very short yellowfin/big-eye tuna season (approximately 2 months) in the north Queensland fishery it is more likely that a viable operation, based on the sashimi market, could be developed on an 'off season' basis for existing prawn trawlers rather than having specialised tuna vessels based in Cairns.

- a specialized vessel may only be able to fish for tuna for about half the year, and unless put to other uses, would probably be uneconomic.

CONCLUSIONS

The reports indicate that there is quite a good tuna resource available in the Coral Sea that could be exploited by Australian vessels. Unfortunately it is impractical to use the small local vessels to take tuna for the southern canneries and it is presently uneconomic for specialized tuna pole boats to either remain in Cairns and freight fish south or come up from southern grounds and transport the catch back. The Japanese have an advantage whereby with their large vessels they are able to remain on the grounds following the tuna and freezing the catch while the season lasts. Also they can quickly return to their main activity of longlining outside the restricted area if the handline fishery is unprofitable

It seems there is good potential for forwarding tuna to the sashimi market. However, the handline method may be uneconomic due to the generally lower catch rates. Evidence suggests that the longline system as employed by Australian boats for yellowfin/bigeye off southern NSW may prove fruitful. Unfortunately longlining is at present prohibited in the Coral Sea. This regulation, which was directed at Japanese

operations should be reviewed as there could be considerable benefits for local fishermen and the economy generally if tuna longlining in the area by Australians were permitted.

RECOMMENDATIONS

It is recommended

. that endeavours be made to apply the longline technology developed for sashimi quality tuna in southern NSW to this area

  - The quality of the tuna (oil content) needs to be high to be considered for export as sashimi product.

    .. early reports appear favourable but in some years there may be early spawning activities which is detrimental

  - long lining could be adapted to boats without much alteration to deck layout

    .. linehauler and branch line coiler would have to be added

  - tuna may be available to the long line method outside the known handline (Japanese) season.

. to this end, that the present ban on longlining in the Coral Sea be examined with a view to permitting Australian vessels to operate subject to:

  - any Black Marlin caught to contribute to a tagging programme to further knowledge of the population dynamics of these species

  - the longlining prohibition be reviewed after twelve months in the light of this data.

. operations should be directed towards fresh chilled sashimi for airfreight to Japan as provision of -60° C freezing facilities, both on board and on shore would be impractical.

  - because of the very high seawater and ambient temperatures experienced in the area, specialized handling procedures must be employed to maximise tuna quality.

. that a sashimi tuna training course be conducted to demonstrate the correct handling procedure to local fishermen

  - this being very important due to the adverse environmental conditions.

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FISHING INDUSTRY RESEARCH TRUST ACCOUNT

QUEENSLAND TUNA HANDLINE/POLE FISHERY

REPORT ON OPERATIONS DURING 1981 SEASON

Following advertisements placed in Cairns and Townsville newspapers on 8 August 1981 six vessels were selected to participate in the above project and subsequently received Grants totalling $80,278.

The vessels and owner operators were as follows:-

AJAX II	D. McATAMNEY	CORAL SEA	N. WADE
CONNAUGHT	G. REISENWEBER	OLDE COLONY	J. WILLIAMSON
SOUTHERN OCEAN	L. LYFORD	MANX I	T. KINNARD & I. JONES

Of these vessels both the Ajax II and the Manx I had been tuna vessels prior to being converted to prawn trawling.

A considerable amount of structural work had to be undertaken on each vessel before they were suitable for tuna fishing. This involved the removal of deck boxes from the after deck (where possible) to provide a clear space for working, removal of some winches and gear used in prawn trawling and modifications to some freezers to a spray brine system where possible. Installation of fishing racks and a spray system for surface agitation were also required.

Most vessels commenced work on these modifications prior to the receival of the Grant money. The alterations took up to four weeks to complete and the Manx I was the first vessel completed and put to sea before the actual commencement of the Grant period.

AJAX II

The major alterations to this vessel involved the removal of the deck box and the installation of a spray brine refrigeration system. Once the deck box was removed the deck was cleared and divided into pounds by the installation of 12 inch wooden planks. The dry freezer hold was converted to spray brine and the room was divided into six individual pounds by the installation of wooden slats.

Initially some problems were experienced with the spray equipment. The brine became too cold and the holes blocked with ice. This was overcome by drilling larger holes.

Racks were constructed of galvanised steel, with ARC mesh flooring and hung to reach the waterline. They were made portable to facilitate easy movement around the vessel.

Sprays were fitted to the sides of the vessel from the trawl booms aft and around the stern. These consisted of 2 inch PVC piping fastened to the gunwhale with spray holes drilled at intervals. Water was supplied by a 2 inch Ajax pump driven by a 8 h.p. Lister diesel. Initially it was believed this would be adequate, however, later use proved this incorrect and they were replaced by a 1 inch pipe with less holes drilled in it. This increased the pressure and delivered a harder, finer spray that proved much more effective.

A Dyter sea water temperature unit was also installed.

Initially considerable time was spent on preparations for obtaining live bait. Two large hoop nets which in turn were replaced by a small purse seine net were constructed and a number of forty-four gallon drums were fitted with valves, etc., to enable sea water to be pumped through them to serve as live bait tanks.

The gear proved adequate. However, after considerable time and effort failed to procure any quantity of live bait, the idea was abandoned as it was eroding vital fishing time and it had been proved that the fish could be caught reasonably with the frozen bait provided.

The Ajax II was ready and put to sea on Friday, 2 October.

CONNAUGHT

It was not possible to remove the deck box on this vessel and as the vessel was to operate with the usual brine tanks, which already contained enough refrigeration coils, little structural work had to be carried out. However, the boat was slipped and a Dyter sea water temperature gauge was installed through the hull and the poli[illegible] racks were constructed and fitted.

Initially the racks constructed were too large and were consequently cut in half.

The spray system on the Connaught consisted of water pumped through the pipe frames of the racks which had been drilled with holes. The power for the pump came from the auxiliary motor.

Because it was impossible to remove the deck box, the booms were removed from the vessel to facilitate the fishing operation.

The vessel Connaught was ready to depart the first week in October.

The other four vessels underwent similar alterations and additions.

FISHING OPERATION

The Ajax II put to sea on 2 October and endeavoured to obtain live bait that evening, however this proved unsuccessful. This was the first of four abortive attempts to reach the grounds, all of which were prevented by the unseasonably bad weather.

The vessels Connaught, Coral Sea and Southern Ocean were also unable to reach the grounds on three occasions.

Eventually the bad weather abated and fishing commenced towards the middle of October. While the total amount of fish taken (81 tonnes) was disappointing, there were a number of minor factors which hampered operations in addition to the weather.

(I) LOCATION OF FISHERY

The general area of the fishery was known from previous observations on board Japanese longliners and from their reports to the Australian Coastal Surveillance Centre. Their reports were closely monitored in the weeks prior to the beginning of October.

Initial contact was made with the Japanese vessels the last week of September in an area slightly to the north and east of where they had commenced fishing in previous years.

Generally, the area was around $15^{o}40'S$, $146^{o}50'E$. This put the vessels 90 nautical miles north-east of Cairns and 30 nautical miles south-west of Bouganville Reef or 50 miles outside the edge of the Great Barrier Reef east of Cruiser Passage.

During the two months fishing, the fish moved approximately 80 nautical miles south-east in a strip 15 to 20 miles wide at the most, the last major catch being made 75 nautical miles east of Cape Grafton.

It appears that the fish may tend to school up and feed in an area of approximately only 1600 square miles. However, environmental conditions may vary from year to year.

(II) LOCATING FISH

Prior to the vessels departing Cairns attempts were made to spot the fish from the air as is done in the southern bluefin fishery. This did not prove very successful, however, the aircraft was able to locate tidal lines and it happened that the Japanese were always fishing in the vicinity of these lines.

Once the vessels were in the general area a watch was kept for flocks of birds and fish rising.

There were generally several schools of fish in an area and no trouble was experienced in finding a suitable patch to fish.

From our previous observations it was known that the water temperature was important. The ideal water temperature appeared to be $26-27^{o}$ Celsius. Sudden fluctuations in water temperature were clearly evident in certain areas and when the temperature rose or fell suddenly it was a clear indication that the tidal front had been reached.

This appeared to be where the fish congregated and therefore reduced the effort of locating schools of fish.

Late in November when the water temperature over the whole area rose above 28°C, fishing stopped completely.

(III) FISHING METHOD

The skippers of the vessels involved in the project realized that much was to be gained from their own observations of the Japanese approach and spent the first day or two closely watching their "modus operandi". From these observations the following plan of approach was adopted:-

1. A school or schools of fish were located from observations of bird activity, etc.

2. Whilst steaming towards the fish it was noted in which direction the fish were travelling while feeding, thus indicating the head of the school.

3. The vessel was then positioned about 50 metres ahead of the school, the engines were cut, the sprays activated and chumming commenced. (On the Ajax II everything on the vessel, except the small motor driving the sprays, was able to be shut down and this proved advantageous. Other vessels had to keep a large auxiliary running to drive the pumps.)

3. The fish then always approached the vessel from the bow, being led astern by chumming.

(IV) BAIT

It was first believed that the catch rate the Japanese achieved could be improved on by the use of live bait and some considerable effort was made to obtain adequate quantities for the Australian vessels. These efforts proved futile because suitable bait was not readily available and, more importantly, because baiting operations curtailed fishing time.

Frozen blue pilchards were bought to use as bait. At times local bait, including goat fish, etc., was used for chumming, however this was found to be less successful than pilchards.

Initially the bait was thawed before use, however, it was later realized that if the bait was used frozen it floated on the surface much longer and kept the fish up. This was particularly important when the fish were flighty and reluctant to come to the surface. If thawed bait was used on these occasions, it sank quickly and took the fish even deeper.

It was also found that when using baited hooks the frozen bait stayed on better. Both lures and baited hooks were used, with the baited hooks providing the bulk of the catch.

The majority of the fish caught were yellow fin tuna with a small scattering of big eye. The size of the fish ranged between 20 and 30 kgs, with some fish up to 80 kgs.

HANDLING AT SEA

Due to the high ambient temperatures during daylight throughout the fishing operations, it was necessary for the fish to be placed in refrigeration as quickly as possible. Generally this was achieved and most fish were of good quality and at least case hardened when unloaded at Cairns at a temperature of around -5°C. Little damage to the flesh or outward appearance of the fish occurred.

GEAR

The gear employed was that recommended by tuna operators in the south and proved suitable with some slight modifications.

Although much gear was purchased locally, stores had only a very limited quantity of the type of gear required. Poles and pouches, for example, were brought from the south.

The major problem experienced initially was that the original gear purchased proved far too light. Eventually the best setup was found to consist of a 6 to 7 foot pole rigged with 700 lb lines with wire traces and size 8 to 10 live bait hooks.

Various types of squids were tried. Those purchased initially were also found to be too small and the fish were spitting them out. Eventually the best lures proved to be size 7 to 10 mustard squid-hooks. The best colour squid appeared to be the red and white feathered type.

Most of the fish were of a large size and double poling proved to be the only practical way of landing them. Consequently, at most times there were effectively only two lures or hooks in operation.

No vessel was really adequtely equipped with handline gear. Once again the small amount of this gear that was purchased initially proved far too light, consequently very few fish were landed this way and considerable loss of gear occurred.

Generally, handlining was adopted when the fish were reluctant to come to the surface (the fish being located by sounder) and the fish that were caught were generally much larger than those which came to the surface.

WEATHER

The weather proved to be a major setback to the program. Normally during October/November near doldrum-like conditions could be expected in the area prior to the north westerlies and the wet season. However, in 1981 strong high pressure systems in the Great Australian Bight directed strong south-east winds on to the north Queensland coast throughout October.

Four abortive attempts were made to reach the grounds from 2 October to 20 October and each time this was prevented by S.E. winds of up to 25 knots.

A study of previous Japanese reports indicated that the best fishing occurred five days prior and five days after each full moon in October and November. The full moon in October fell on the 13th during the rough weather, thus precluding our vessels fishing during this prime fishing period. Predictably, a much larger total catch should have been possible.

GENERAL COMMENTS

Whilst the amount of fish caught was disappointing, only 81 tonnes in all, considering the fact that few involved in the project had participated in this type of fishing previously, the end result was satisfactory and much was learnt that can be put to use in the future.

VESSELS

The vessels that operated on the project last year are not the ideal type, being too small and designed basically for prawn trawling, however, they worked reasonably well after the necessary alterations.

Because of their size the vessels are hampered by adverse weather conditions and are severely restricted in the amount of product they can hold. This necessitates frequent returns to port to unload, thus losing fishing time.

However, as the initial idea was to get the local vessels into the fishery, we should persevere with this type of vessel for the time being.

Refrigeration was a minor problem on some vessels and, if frequent turnarounds are required, some will have to upgrade their capabilities. Very few fish unloaded would meet export standard requirements.

The fishery was contained in an area that could not be described as extensive in 1981 and if this continues, there may be a necessity to monitor any major increase in vessels to the fishery.

GENERAL COMMENTS AND CONCLUSIONS

Most skippers have to learn how to operate in the fishery as regards locating and working each individual patch of fish for the benefit of all.

Also, unlike prawn trawling, vessels cannot steam into and around patches of fish while they are being worked by other vessels as they will sound immediately.

With the absence of adequate shore-based freezing facilities at Cairns, it is in the best interests that all fish be frozen when unloaded. Some of the vessels that may be tempted to enter the fishery would be incapable of delivering satisfactory product.

To this end, it seems advisable that a meeting attended by Department of Primary Industry and the major buyers be held in Cairns during August/September to explain to any interested fishermen the handling requirements.

Those involved in the fishery last year have already learnt a method of fishing that appears to work quite adequately and will presumably further improve their techniques with increased experience.

Unfortunately, due to the comparatively small vessels with small crews, only four people can pole fish at any one time and when double poling is required, effectively, there are only two hooks fishing. This appears inadequate for holding the fish in a state of frenzied feeding and the school working properly. This may be alleviated if the vessels installed at least one automatic poling machine and trials with a machine are recommended.

GEAR

After experimentation, the gear being used generally appeared to be adequate, however, insufficient experimentation with the use of lures was undertaken. At least one poler should continue to fish using lures and experimenting while the others fish with baited hooks. A record of the comparative catch rates thus achieved would be helpful for future planning.

The gear used in handlining has to be improved and not enough emphasis was placed on this facet of the fishery. However, already one of the vessels involved last year is to install a new sounder and an electric handline machine will be installed on the bow of the vessel.

BAIT

The use of live bait will have to be researched further. The attempts by two of the vessels in particular to procure live bait was quite extensive, however without success.

Cost of purchasing quality bait for chumming is going to be high in the years ahead and experimentation must take place with bait obtained locally. Most of the vessels are endeavouring to keep some trash fish from their prawning activities with this in mind.

If any further Grant money is obtained, perhaps some should be set aside to involve a vessel in fishing for both live and frozen bait.

HANDLING AND STORAGE

Generally the handling of the fish at sea was good, however the actual unloading and handling of the product ashore was disastrous.

The refrigeration systems adopted by the vessels was only just adequate for the amount of fish caught each trip. However, if larger amounts are caught, which appears possible, the capacity of the refrigeration on some vessels will have to be increased or offloading at sea into some acceptable form of refrigerated transport facilitated.

Hopefully during the peak fishing periods in 1982 the vessels will be able to fill up in one day but with only an overnight return to Cairns it is extremely doubtful if the fish would be adequately frozen by the time it was unloaded.

UNLOADING

Unloading of the fish at Cairns was a major headache. At best the facilities available could be described as poor. At this time of year the fishermen's wharf complex is packed with laid-up prawn trawlers and it is practically impossible to find a berth let alone find one where it is suitable to unload. As it is, unloading over the main wharves can be quite dangerous at low tide, as the method of unloading involved the actual manhandling of each fish from the vessel up onto the wharf.

The storage of the fish at Frigmobile was also beset by problems. The complex in Cairns is an Export Registered Establishsment and the Company may be risking the loss of this registration if part-frozen fish is delivered to the complex.

The complex has a holding capability only and is not capable of freezing product to the required temperature as quuickly as is needed under the Exports (Fish) Regulations. Consequently, the first major concern should be to ensure satisfactory freezing arrangements are available.

Whilst the initial advertisements stated that the matter of handling and marketing was to be left in the hands of the fishermen in 1981, this may not necessarily be in the best long term interests of the development of the fishery and this aspect should be resolved as soon as possible.

It has been proved that Australian fishermen are capable of catching the fish, however, handling procedures must be improved or the fishermen will be seriously frustrated and fishing operations unnecessarily restricted.

Although the fishermen involved proved that they are quite capable of catching the fish, it still remains to prove the viability of the fishery. Also, some definite idea must be obtained as to the size of the stock available and a decision made as to whether pole vessels alone are capable of exploiting the resource or whether it is large enough to support one or more purse seine vessels. From observations made in 1981, the resource could stand a purse seine operation (Japanese vessels took 686 tonnes) but chumming of the fish would seem necessary. Also, a large deep purse net appears essential as a large part of the schools remain well below the surface even when the surface fish are feeding.

RECOMMENDATIONS

1. It is recommended that further funds be allocated from the Fishing Industry Research Trust Account during 1982 on a similar basis to 1981.

2. At least one fish aggregrating device (FAD) be constructed and placed on the seamount east of Cairns in an attempt to attract and hold tuna, thereby lessening the vessel's searching time. Successful use has been made of these devices in Western Australia and overseas.

3. Further attempts should be made to obtain a supply of suitable live bait in order to undertake trials to ascertain whether the yellowfin can be led by a moving vessel similar to southern bluefin as much improved catches would result.

4. A proficient tuna pole fisherman from the bluefin tuna fishery be employed during the most productive period to assist with the live bait trials.

5. A recommendation be made to the processing/marketing sector of the industry that improvement in unloading facilities is necessary as delays in unloading vessels is significantly detrimental to the catching sector.

6. An automatic poling machine be installed on a suitable vessel and trials conducted.

Fisheries Division
Department of Primary Industry
CANBERRA ACT

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FIRC 23
23-25 March 1982
CANBERRA

Preliminary Report

Tuna Handline/Pole Fishing - Qld 1981

Background

- Subsequent to FIRC recommendation Minister for Primary Industry approved expenditure of $100,000 from FIRTA on 28 July 1981
  - to encourage Australian participation in the tuna fishery off Cairns fished previously by Japanese since1965.
- Grants totalling $80,278 were made to six fishermen following the calling for applications from interested owner operators, and covered
  - the purchase of relevant fishing gear
  - the conversion of vessels to facilitate catching and handling tuna, and
  - for assistance towards the cost of fuel and bait.
- Three independent fishermen also operated in the fishery
  - outside the grants.

Results

- Adverse weather conditions seriously hampered Australian operations during October-November
  - this was completely the reverse of the 1980 season when observers on the Japanese vessels reported a "glassy calm" throughout the period.
- Fishing commenced on 19 October in company with five Japanese vessels
  - having missed the full moon of 13 October due to adverse weather
    - reportedly the most productive period.
- On 22 November the surface water temperature rose to 28.2°C and only five further fish were caught.

- A total of 81.4 tonnes of yellowfin and big eye tuna was landed
  - and sold to Heinz and Safcol
  - at $550 per tonne.
- Japanese vessels (5 to 12) took 598 tonnes
  - over a slightly longer period,7 October to 24 November and without interruption by weather conditions.
- The fishermen concerned have indicated their interest in the future fishery by forming the North Queensland Tuna Fishermen's Association (NQTFA).
- Reports from three fishermen are attached.
  - requests have been made to the remaining three to ensure all reports are received by 31 March in line with the FIRTA requirements.

Future Prospects

- A significant fishery obviously exists some 50 to 90 n. miles east of Cairns between September and December each year.
- Fish appear to be continually congregated in the vicinity of a seamount which rises to within 40 metres of the surface at 16° 13.14'S 147° 09.6'E.
- Although not yet proven viable Australian fishermen can participate in this fishery provided
  - weather conditions are favourable
  - ample frozen/live bait is available
    - .. large quantities of bait appears essential
    - .. 4400 kgs of frozen pilchards was supplied
  - on the last 3 days of fishing, when conditions were favourable, 16 tonnes was taken from five patches of fish.

Further Assistance

- It is proposed that at least one fish aggregrating device (FAD) be placed on the seamount east of Cairns
  - to endeavour to hold fish in a more confined area and for a longer period

.. a classic situation for a FAD

- as a marker for the Australian vessels

.. the area is out of radar range for small vessels

.. none of the vessels is equipped with satnav although DPI installed the Division's instrument aboard one vessel for the period.

. Further funds should be provided for

- a vessel to concentrate on catching live bait to supply the fleet

.. preferrably not a tuna catching vessel

- a proficient pole fisherman to endeavour to further test the possibility of employing the live bait method as used in the SBF fishery as opposed to the stationary/passive method employed by the Japanese

.. this was also mainly used by the Australian fishermen

- assistance with fuel costs and the supply of some frozen pilchards for vessels which participated last year (9)

- close supervision by technical staff.

Estimated Costs - 1982	$
. FAD each	2,000
plus placement & recovery	1,000
. Charter of vessel to catch live bait (28 days)	28,000
. Fuel assistance (9 boats x $2,500)	22,500
. Tuna Fisherman	1,130
. Bait	4,000
. Supervision	5,000
. Contingencies	6,000
Total	$68,630

Application for Funds

. The Fisheries Division will make application for funds of the above order for continuation of the project in 1982

- when financial statements have been received from all six fishermen who received grants in 1981 (31 March 1982)

- if the Committee sees justification for continuation and is prepared to consider an application at a later date

- and provided funds are available.

. A film of the operation has been prepared by DPI and is available for viewing.

Fisheries Division
Department of Primary Industry
CANBERRA
March 1982

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QLD TUNA PROJECT

FINAL REPORT (1982)

Introduction

Because of the type of boats engaged in the fishery for the last two tuna seasons off Cairns it was decided to concentrate on catching tuna for the sashimi market in Japan.

It was clearly demonstrated in 1981 that the small size of the boats operating made it impossible for them to carry sufficient tuna to become viable at prices offered for fish for canning.

It was known that prices paid in Japan for chilled tuna were far in excess of the Australian price and it was therefore considered essential to gain access to the sashimi market. Unfortunately the main emphasis was placed on catching tuna by handline by the fishermen to fulfil this requirement. Although this attitude was not intended it led to lack of poling activity and consequently no income from this source. There was no restriction on poling except that the tuna were less active at the surface this year and required more concentration of effort and bait to attract them to the boats. Due to this and because larger fish, more suitable to the sashimi market, could be caught by handline the fishermen favoured handlining, but as it turned out, with comparatively little success.

At no time was it intended that the fishermen give up poling altogether in favour of handlining and it was felt that if even 20% of the total catch could be sold as sashimi viability would have been improved substantially. It was intended that all large yellowfin and bigeye should be exported and the remainder sold locally.

FISHING OPERATIONS

Most boats have fished more days (one double) than last year and the fish were congregated a greater distance from Cairns (north of Cooktown). This has increased costs such as fuel, ice, etc.

However, in spite of the additional operational time very much less fish has been landed. Only 6.5 tonnes (approx) of tuna has been sold for canning and 41 fish (1.395 tonnes) were exported to Japan for the sashimi market.

Much of the low catch rate was due to the fishermen concentrating effort on handlining rather than poling, however, it does appear that tuna have been more difficult to bring to the surface this year and without the aid of sonar the Australian boats are disadvantaged to the extent of not knowing where the fish have congregated below the surface, often at 60-80 fathoms. Having this knowledge the Japanese are able to follow the mid-water schools, chumming continuously, and eventually attracting the tuna to the surface where they may be poled. Handlining into the subsurface school also assists in bringing the school to the surface.

Surface water temperatures have been considerably different in both pattern and movement this year, at least until 6 December. The vessels arrived back in Cairns on 6 December and reported the water temperatures high from Cooktown south to Cairns. Also, the Japanese vessels had moved further north to north east of Osprey Reef.

Practically no fishing has been carried out in the area fished in 1981.

All fishing terminated on 6 December 1982.

A separate report by one fisherman who undertook some live bait catching is at Appendix "D".

Fishing Gear

The first 4.5 tonnes of tuna landed in late September was caught by poling.

Since that time practically all fish were handlined although drop lines and trotlines were tried to some extent. The main reason for this change in fishing method was due to the emphasis placed on tuna for the sashimi market even though some poled fish could have been suitable.

Handlines and droplines were made up of lengthened trotline branchlines to enable sub-surface fish to be reached. The most successful method employed this year was a buoyed dropline which could be used as a handline when fish were attracted to the surface. Once a fish was hooked it was allowed to run and the remainder of the dropline or handline was thrown overboard along with one or two buoys to be picked up later. Any number of these lines could be used as the fish were hooked. On some occasions a further line from the buoys to the boat was used to retrieve the fish after it had tired from towing the buoys. However, there was a limit to the number of lines that could be used in this manner, particularly if it was necessary to move the boat to follow the fish.

Japanese gear supplied by Mr Mike Rowley and by Geo. Kinners & Sons was used where possible and proved reasonably satisfactory. The line supplied by Geo. Kinners was old longline type gear with wire traces and was not similar to that currently being used by the Japanese handline vessels

operating in the Coral Sea. On the other hand the gear supplied by Mr Rowley, while somewhat inadequate in terms of strength, was the latest Japanese gear and the same as being used by the Japanese on the Cairns grounds.

Full details of this gear appear at Appendix 'A'.

Sashimi Tuna

The most important development this year was the handling and marketing experience gained from three shipments of tuna to the Japanese tuna market.

The accepted method of killing, bleeding and gilling and gutting of tuna for this market was demonstrated to fishermen involved by Mr Mike Rowley of Nelson Bay, NSW who has been to Japan and has made shipments of yellowfin tuna to Tokyo for sashimi over several years.

Mr Rowley was employed on this year's project as a consultant. He not only demonstrated the desirable handling method but also explained the marketing requirements and the necessary criteria for selection of fish to maximise monetary returns. He is preparing a manual on all aspects of handling chilled tuna for the sashimi market.

An export licence for chilled gilled and gutted tuna was taken out by Toros Sea Foods Exports Pty Ltd (Mr John Bissell) of Cairns.

Mr Bissell undertook the icing, packaging, transport arrangements, and necessary documentation for the tuna shipments.

The same Japanese marketing agent as used by Mr Rowley, (Daito Gyorui Kabushiki Kaisha) was engaged to market the consignments at Tokyo. All costs associated with the first shipment are at Appendix 'B'. However, it must be remembered that the freight rates listed were not the best available as original rates were based on 'container rate' which is considerably cheaper. The difficulty was that insufficient fish were available for shipment. This was a major problem this year, as mentioned earlier, and will be further elaborated on later in this report.

Conclusions

Considering that the Japanese vessels caught approximately 720 tonnes over an eight week period while the total Australian catch (6 boats) was less than eight tonnes for almost the same period serious consideration must be given to the reasons for the extremely low local catch, particularly as the Australian catch last year was in the vicinity of 80 tonnes.

Some of the more obvious reasons and points of interest are listed below.

1. The Japanese vessels are very much larger. This gives them the advantage of remaining on the fishing grounds the whole time fish are present.

2. The Japanese vessels are all equipped with sonar whereby they are able to remain in contact with fish schools over longer periods and to locate/relocate schools more easily and more rapidly than the Australian boats which participated and which have no sonar assistance.

3. The several methods of catching tuna which have been tried have all proved satisfactory to varying degrees, depending on the fish behaviour at the particular time. For instance, when the tuna occur at the surface poling is most efficient however, when they remain below the surface handlining and/or trot lining is more efficient.

4. The efforts by the fishermen this year were most disappointing and unsatisfactory. The main reason appears to be that they were expecting grants which they could spend as they wished, particularly on vessel equipment, removing and replacing prawning equipment etc. Most fishermen envisaged fully subsidised operations and have submitted an application for additional funds to QDPI along these lines. Also, they requested the IAC to recommend to the Commonwealth Government that, inter alia, "Fishermen involved in exploratory work for the benefit of all can be more fully compensated, extending assistance under the appropriate schemes to meet the true costs of such involvement". There was an obvious reluctance to participate fully in the project this year due, apparently, to the requirement that the fishermen contribute to the project.

5. It appears the degree of participation was directly related to their financial situation. Reports from all fishermen indicate that much more tuna was in the area off Cairns this year.

6. The fish aggregating devices (FADs) placed on the seamount north east of Cairns are working very well and many species of pelagic fish have been caught in the vicinity e.g. - tuna, dolphin fish, wahoo, rainbow runner, marlin, mackerel, and black tip shark. Reports indicate that large schools of fish erupt at the surface from time to time during the day and night, something that did not occur last year. Copies of echograms on the seamount are at Appendix 'C'.

7. The trial shipments of tuna to the Japanese sashimi market were quite successful and proved that it offers a considerably better return than the local canning market and with larger shipments freight costs could be reduced significantly. (Container rate is 89 cents/kg and requires 1400 kgs - actual cost for a shipment of 300 kgs is $2.87/kg).

8. In spite of some difficulties experienced by the fishermen since the commencement of this project in 1981 it has become clear that the attempt to utilise prawn trawlers and inexperienced fishermen in this fishery, although theoretically desirable from the local viewpoint, has been completely impracticable.

9. Because of the current local price for canning tuna and the freight and on shore freezing costs involved it is unlikely the catching of tuna for this market alone would be attractive, particularly to southern boats with access to the southern bluefin fishery. It appears, therefore, that participation in the Japanese sashimi market is essential if a viable fishery is to be established.

10. The congregation of tuna off Cairns each year appears to be associated with spawning as most fish caught this year (1982) were in advanced spawning stages with ripe gonads in females and males running with milt when landed. Also, from available Japanese records it appears that annual catch fluctuations are to a large extent directly related to the number of vessels operating in each particular season. Considering the short time span of the season this indicates a large resource is available in most years.

Recommendations

Because of the inability of the fishermen and vessels engaged in the tuna handline fishery over the last two seasons to achieve a desirable catch level the only course open appears to be to return to the original DPI proposal for the employment of a comparatively large specialised tuna boat.

The advantages of this approach will be as follows:-

1. Large carrying capacity (80 to 100 tonnes)

2. Significantly increased endurance (longer time on the fishing grounds and better able to follow the fish)

3. Capability to handle both frozen and chilled tuna (for canning and sashimi)

4. Skipper and crew experienced in pole and live bait method of fishing.

5. Capability to catch, hold and fish using live bait (possibly further increasing catch rates)

6. Increased opportunity to catch larger quantities of tuna for both canning and sashimi markets.

7. Increased viability due to greater possibility of larger consignments of tuna to the Japanese sashimi market.

In order to facilitate a supply of tuna for this market on a prearranged basis during the height of the 1983 tuna season, October/November, it is recommended that a second boat, suitable for catching tuna and carrying chilled fish from the larger vessel also be employed in the project. This will allow the larger specialised vessel to remain on the grounds over longer periods and continue fishing.

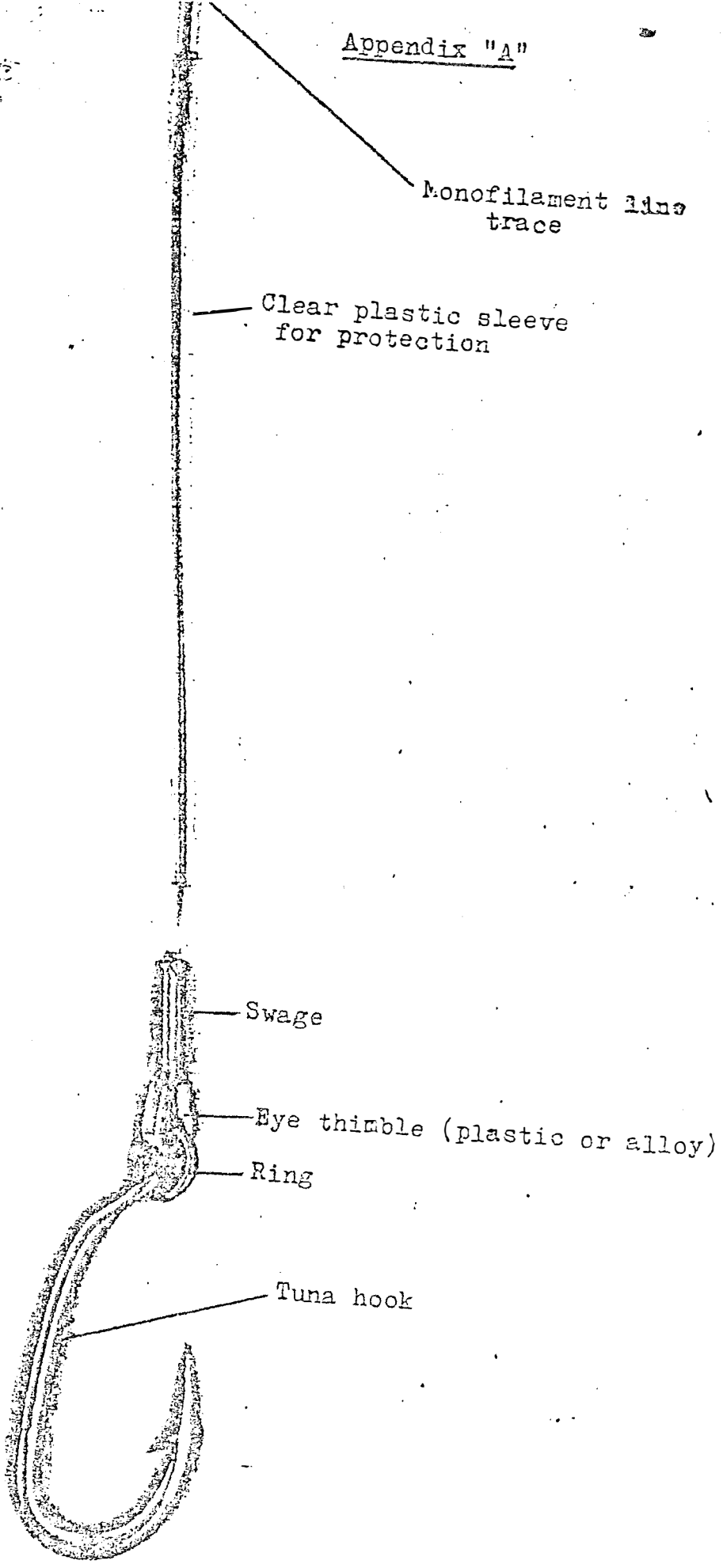
In this way it should be possible to finally assess the economics of Australian participation in the tuna fishery off the north Queensland coast.

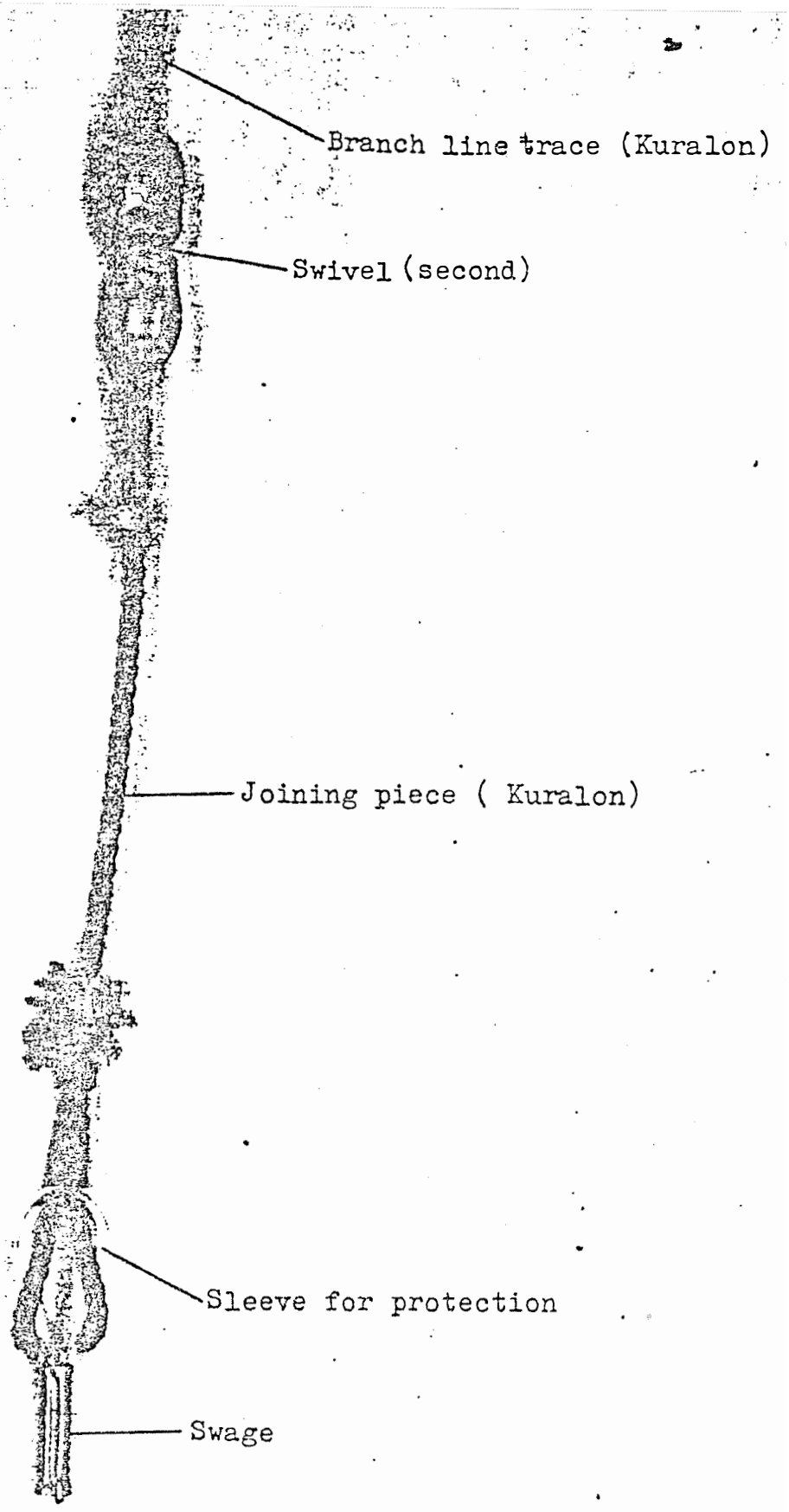
It has been established that a large resource of big-eye and yellowfin tuna exists in the area generally over a 2 month period, at which time the catch rate is comparatively high and with the use of live bait may be even higher. Also, it is possible to obtain good returns from consignments of tuna to Japan for the sashimi market.

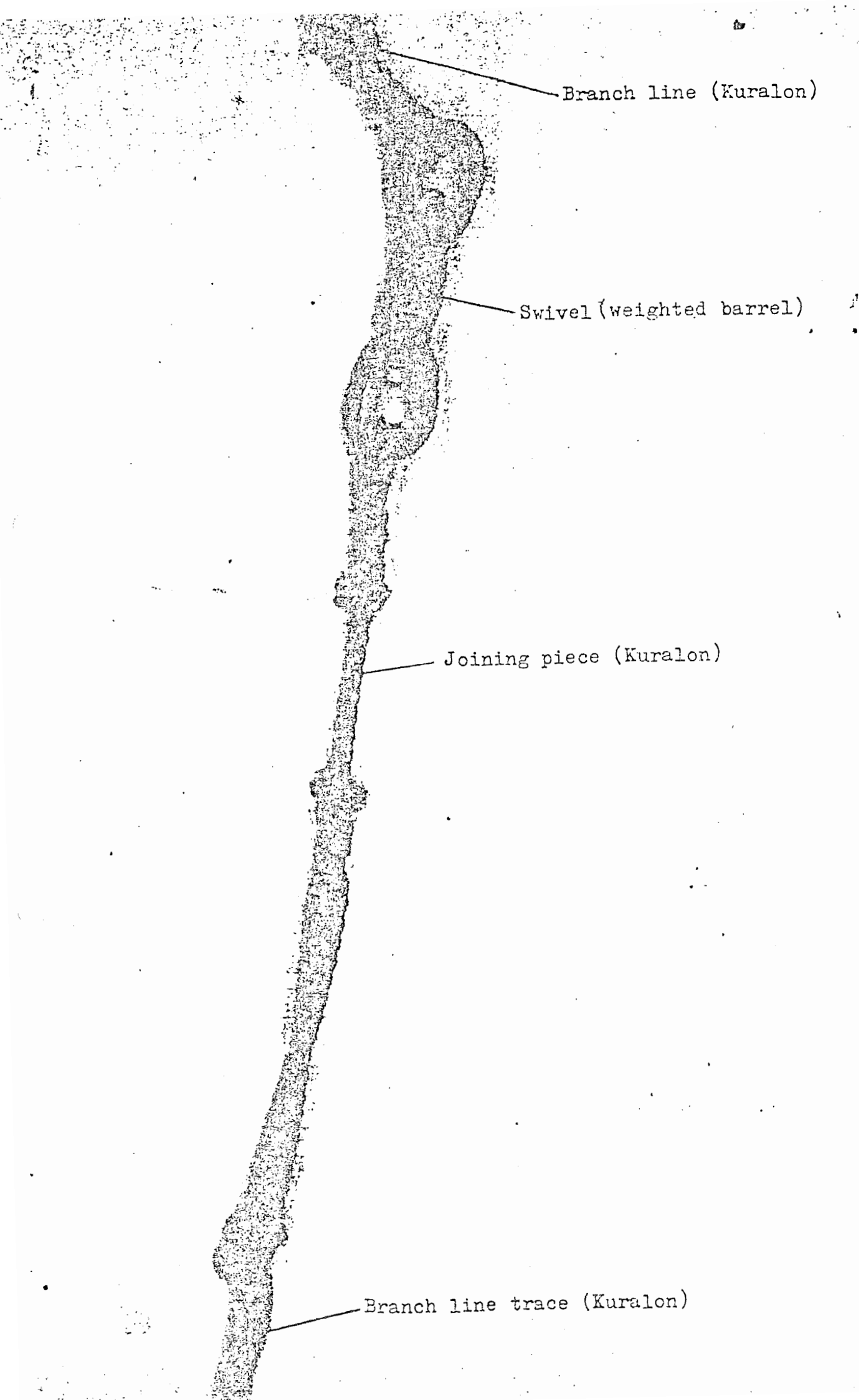
A substantial resource of longtail tuna also occurs in the inshore waters of northern Queensland in late winter and spring and could well prove to be worth exploiting. With the possibility of extending the known yellowfin/bigeye tuna fishing season in both area and time this could provide a viable tuna fishery from July to December inclusive.

The only point which remains unanswered is the total catch potential for suitable Australian vessels. This has not been possible to assess to date due to the use of unsuitable vessels manned by inexperienced crews.

Appendix "A"


Monofilament line trace
Clear plastic sleeve for protection
Swage
Eye thimble (plastic or alloy)
Ring
Tuna hook


Branch line trace (Kuralon)
Swivel (second)
Joining piece (Kuralon)
Sleeve for protection
Swage
Monofilament line trace
(115 -150 kgs, bs.)


Branch line (Kuralon)
Swivel (weighted barrel)
Joining piece (Kuralon)
Branch line trace (Kuralon)

Appendix'D'

LIVE BAIT FISHING FOR N/QUEENSLAND TUNA PROJECT

FV Southern Ocean departed Cooktown 15th Sept 1982 for Hope Islands, arriving at 1800 hrs on the same day. Strong S/E winds blew in the area for the next 2 days and bait fish could be seen, but due to the strong winds the net proved to be unmanagable. Conditions eased on the third day and the net was shot off the beach around a large school of sardines resulting in 120 kg of fish, the bulk of which were frozen down. Some fish were kept alive in plastic baskets in shallow water on the beach. They did not show any signs of distress for the period they were observed (6 hrs) but upon transferring them to a plastic garbage bin filled with water they all died before they could be ferried out to the Southern Ocean.

The next day a smaller school of sardines was netted (20 kg) and a attempt was made to tow the net out to the Southern Ocean. This resulted in a 50% mortality rate, the balance of the fish being transferred to the live bait tank. The fish stayed very active all day in spite of some circulation problems. As night fell a light was turned on in the tank but this excited the fish and they tended to congregate around the light in large numbers. Further tests were carried out at night with the light off. The fish became very docile and did not panic even when the tank was struck a sharp blow on the side with a hammer. A further 2 days was spent collecting fish for frozen bait. Fishing was stopped when 350 kg of sardines was on board.

The following conclusions to be drawn,

(1) Live bait is easily obtainable by netting off beaches.

(2) Some method such as a floating wire cage is required to transport the fish to the boat.

(3) Circulating systems on the Southern Ocean need further work.

(4) Unlit dark tanks will keep the sardines quiet.

(5) Observed biomass of sardines would not support a live bait and frozen bait fishery for the present fleet. Further stocks would need to be found, however this was not practicable with the limited time available.

(6) Further work is required to establish a viable live and frozen bait fishery.

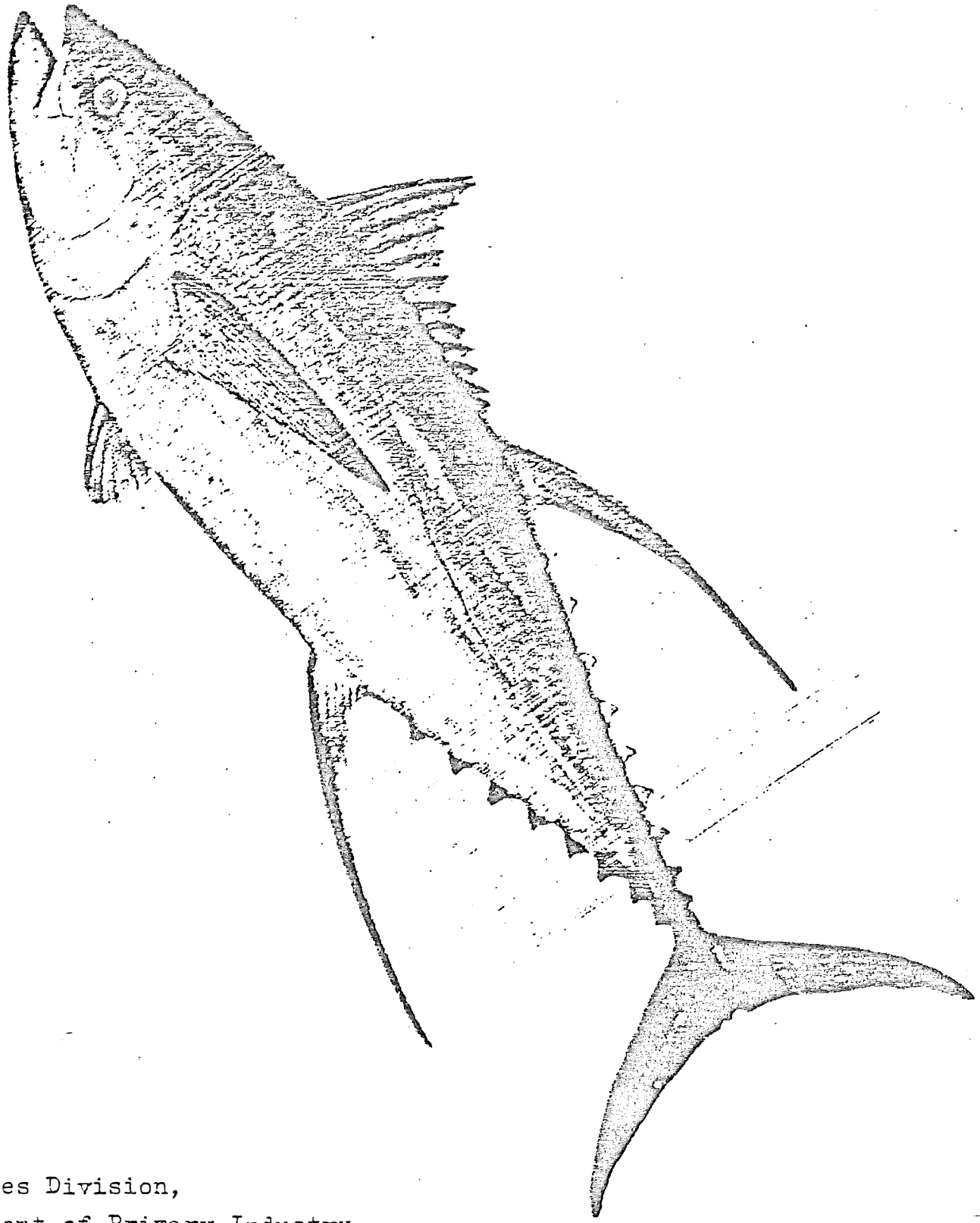
(7) Providing stocks of sardines at Hope Islands are carfully managed there is no need to set up holding pens for live bait in that area; the fish can be caught as required.

5341p

NOTE: Appendicies B & C on file 83/13

APPENDIX 3.

QUEENSLAND TUNA SURVEY.



Fisheries Division,
Department of Primary Industry,
CANBERRA. A.C.T.

Foreword

Because of the type of boats employed by Australian fishermen during the last two tuna seasons off Cairns it appeared a specialised tuna vessel with experienced crew may have considerable advantage over the smaller prawn trawlers. For this reason it was decided to make application to the Fishing Industry Research Trust Account (FIRTA) for funds for the charter of a southern tuna vessel.

Subsequently the Minister for Primary Industry approved a FIRC recommendation that $342,760 be allocated to the project during 1983.

The Fisheries Division wishes to acknowledge the co-operative efforts of Mr Broder and the crew of the Catriona B during the charter period.

This report was prepared by Mr Broder in conjunction with officers of the Industry Technology and Liaison Section of the Fisheries Division.

Introduction

Tenders were called for a suitable vessel by the Purchasing Division of the Department of Administrative Services and the lowest tender of $1270 per day was accepted for the vessel Catriona B. The cost of fuel was met by the charterer.

The Catriona B has a long history in the tuna fishery off southern Australia and the Master, Frank Broder, who has fished for tuna for 35 years, is highly regarded throughout the industry.

The charter commenced at Cairns on 17 August 1983 and terminated at Cairns on 6 December 1983. In addition the vessel spent six days baiting and searching on the voyages to and from Cairns.

During the period of this charter there were 54 days spent fishing.

Baiting took place during bad weather and occupied 10 days.

There were 33 days spent alongside the wharf due to adverse weather conditions and 12 days sheltering at various anchorages.

Time was lost owing to lack of shore facilities for tuna handling (weekend unloading proved particularly frustrating).

Vessel Description

Catriona B was built at Fremantle W.A. in 1962 by Southern Cross Shipyards specifically for tuna pole fishing.

The general description and specifications are as follows:-

Length	22.86m
Beam	6.15m
Draught	2.59m
Construction material	Steel
Main engine	Caterpillar 353 268kW @ 1200RPM. Reduction gear 3.3: 1 Propeller 1422 x 1245mm Number of blades 3
Auxiliary engine	Gardner 6LX 60kW @ 1000RPM Alternator McFarlane 3 phase 76 K VA
Stand by Auxiliary	Perkins 27kW @ 1500RPM Alternator 3 phase 27kW
Refrigeration (Refrigerated salt water-RSW)	Hall thermotank Compressors 1 .25 tonne 27kW 2 .12 tonne 15kW
Hold capacity	50 tonnes
Hydraulics	four auto pole machines
Electronics	Codan HF radio AWA VHF radiofone Skipper echo sounder Furuno colour sonar Furuno 72 n. mile radar Robertson auto pilot Walker satellite navigator Taiyo Weatherfax

Comments

Northern Bluefin

According to local fishermen the Catriona B arrived in the Cairns area too late to catch any quantity of northern bluefin. Shortly before her arrival there were numerous reports of good schools of fish in the Princess Charlotte Bay area, Portland Roads and earlier still around Dunk Is. However, despite air search and boat search no quantity could be found and this was unfortunate as it is impossible to make any assessment of catch potential. That they are good free biting fish has been amply demonstrated and if tuna boats were there at the appropriate period then significant catches should result.

Yellowfin, Bigeye Tuna

Apart from possibly 2000 kilos of tuna handlined the fish caught by Catriona B were poled using live bait. In October small feeding schools were easily approached. They responded well to live bait and bit freely. They were all in schools of less than five tonnes and were mostly fished out by the Catriona B except for a couple of occasions when the Japanese came in and helped themselves to a few. Small fish around 2 kilos in weight seemed to be prevalent in every school and may prove troublesome if a fishery develops although they were not a usual feature of the fishery in the previous two seasons. Apart from this the fishery appears well suited to the live bait pole method with auto poles giving excellent service. It was not possible to gauge the entire area of fish at any one time, enough to keep the vessel busy being located within sight of the Japanese fleet in most instances.

In November, fishing was very light with the eight or nine Japanese vessels covering just about everything that showed. Effort was directed towards fishing for the Sashimi market and long periods were spent handlining for a few large fish. Poling was used on several schools but it became evident that the fish caught this way were generally unsuited for the higher priced market. The volume of fish caught handlining did not inspire great hopes as the yellowfin were in poor condition and mostly too small for use as Sashimi.

Bigeye, which the market favours, had almost disappeared from the small schools (less than 1 tonne) and did not respond to bait nearly as well as they had in October. Toward the end of November the whole fishery collapsed and all that was evident were schools of very small striped tuna about 1 kilo in size. By December they too had almost disappeared and all that could be located were dolphin fish under feeding birds.

The Japanese, having worked this fishery for almost 20 years, can be expected to have developed considerable expertise in their operations. With fast, highly manouverable, comfortable large vessels, their searching methods fully integrated, they are able to exploit the fishery to the limit of their processing capacity and their catch may be considered to be a measure of the fishery abundance, or at least a guide. In this context the season would appear to have been very poor. If this is used as an indication, had the Catriona B or any vessel of her type been fishing in 1980, 1981 or 1982 there should have been some interesting catches and it points the way for the future. It offers an attractive option to the N.S.W. bluefin fishery at present undergoing a prolonged series of poor seasons.

Catching For Bulk Market.

There are a number of factors which have a bearing in this regard when the catch of Catriona B is considered, the most important of which would be inexperience and ignorance of local conditions by skipper and crew. With hindsight, almost certainly in September when there were 11 calm hot sunny days there should have been an area of fish yielding at least one good catch and for the 1983 season about 15 tonnes would seem reasonable. The lack of shore facilities, lack of communications, attention to sashimi and shore side handling problems probably cost another 15 or 20 tonnes as time was lost when good weather prevailed in October and November. Had the boat been fishing entirely for the bulk market it could have been expected that something between 80 and 120 tonnes could have been caught. Add this and a possible catch of 50 tonnes of northern bluefin and a reasonable result, even in a bad year, could have been possible. A fleet of boats working in the area should return some respectable tonnages and the installation of shore facilities to handle and store their catch might then be justified.

Sashimi Market.

It was most unfortunate to experience a lean season as it was impossible to develop any great expertise in what is a most exacting fish handling concept. To use pole fishing to take tuna for the sashimi market appeared unworkable so efforts were directed to the handlining method. Catches were low for the time expended and whether this was a feature of the season or the technique, or both, it certainly was not an economic success, particularly as most yellowfin were in poor condition.

The gross average price obtained in Tokyo for a shipment of 469 Kgs was A$5.50 which is insufficient for viable operations. However, it must be understood that freight rates are high for shipments of less than 1400 Kgs and the current rate for consignments in excess of 1400 Kgs can be less than A$1.00 per kilo which is acceptable.

Baiting requirements are less exacting for handlining in that dead bait, ground up bait or live bait may be used. Although catches of tuna may be small, labour is surprisingly intensive. Because of the hot conditions it is necessary to provide shade over the fish processing area to mininise drying of the fish. There is need for some pre-chilling arrangements in which the catch may be chilled to storage temperature before being packed in ice which minimises chafing while at sea. This is much more difficult to provide than the convenient refrigerated salt water method.

Another problem encountered was the high ambient temperature, 28°C at 0400 hours, when packaging the catch for air freighting. It indicated a need for some cooling in the onboard packaging area. With these points in mind, the survey results indicate that a vessel may be restricted to one method of fishing or the other. Pole fishing for the bulk market could prove to be the more lucrative, particularly if export of the catch from Cairns in high quality condition for overseas canning could be arranged.

Bait

The first catch of bait pilchards (Sardinops neopilchardus) was made at Jervis Bay. They were unusually hardy and no losses occurred in putting bait on board, on the trip north, or in the hot muddy water of the Cairns harbour. However the pilchards lost condition very rapidly and were nearly all dead from starvation after the third week. (This is poor by comparison, the same condition occuring after 2 1/2 months in southern waters).

A lot of time was spent looking for bait supplies which by all accounts are quite prolific in the area. However,there are some formidable hazards to avoid, including tide around the reefs, the presence of niggerheads and extremely soft muddy bottom in some areas. These problems may be alleviated by the development of a net based on the Japanese "Bouke-ami" system but the purse-seine presently used by Australian tuna fishermen should permit better catches. Bait was caught around the reefs in two places but it was found they were extremely delicate and suffered a very high mortality rate on being placed in tanks. The clupeiod species suffered almost 100% mortality, and scad and mackerel about 60% mortality over a week. They seem to be fairly prolific and it is possible this fragility is seasonal.

Bait species caught in the Cairns region were:-

- Round Herring or Sprat
  Family Dussumieriidae

- Sharp-Nosed Sprat
  Dussumieria acuta

- Mackerel Scad (363 Munro-PNG)
  Decapterus pinnulatus

- Striped Mackerel (335 Munro PNG)
  Rastrelliger kanagurta

Time was also spent looking for gold spot herring which from the air appear to occur around sandy beaches on the offshore islands and cays. It was found instead they occured over heavy coral bottom and that the clear sandy beaches observed from the air were nothing but an illusion. As far as netting in this area was concerned, each bait shot necessitated a lot of time freeing the net from the coral which protruded through the sand and an even longer time repairing the rather extensive damage. Fortunately no fishing time was lost due to baiting operations as weather patterns provided sufficient bad weather for this to be carried out at that time.

Gold spot herring proved to be an ideal bait, with low mortality. They are very strong swimmers and made the tuna very excited.

Weather Conditions

No account of fishing is complete without reference to weather and in this particular case there were some intriguing aspects during the 1983 season. It was either calm for extended periods or windy for extended periods with no inbetweens. From 15-30 knots it would drop to less than five knots, staying calm for 11 days in one stretch before blowing again. An unusual feature was that all the calm spells concurred with the new moon and the rough spells came in around the full moon which is opposite to the preceding years.

The best fishing occured on days when the sun seemed exceptionally hot.

Later, when the sun was directly overhead, on the days of hot sunshine the sea surface temperatures went through fluctuations in excess of 1°C, from 27.5 to 29.5 on occasions, which was not the normal situation of 27 to 28°C. During the later stages it held near 30°C and the thermograph presented a featureless unchanging line.

Another aspect of weather was the extremely high ambient temperature of Cairns and environs. It is little surprise to find most local vessels are air conditioned and any southern ships contemplating a trip to the area can take due warning. The heat of the sun on decks, particularly steel decks, is quite a problem and water cooling necessary. To leave fish exposed to the sun for more than ten minutes is inviting trouble and a deck hose delivering water at 30°C does not do much to cool them down. Needless to say the rate and severity of deterioration is extreme and the stench of dead bait 12 hours old in the tanks is quite nauseating.

CONCLUSIONS

Resource

A reasonable quantity of yellowfin and big-eye tuna occurs in the area offshore from Cairns during the period September to early December. Northern bluefin tuna occur inshore north of Cairns about July and early August, particularly in the Princess Charlotte Bay area.

Bait

Quantities of excellent bait are available, although some difficulty and damage to nets was encountered.

Bulk Fishing

The resources of northern bluefin, yellowfin and bigeye tuna appear well suited to the live bait pole fishing method and respectable tonnages should be possible for well equipped commercial vessels.

Fresh Sashimi Market

Without further development of handling and fishing techniques the pole fishing method is not well suited to taking tuna for the fresh sashimi market. Tuna long-lining, and when appropriate handlining, from small and preferably fast vessels would appear to be the more suitable approach for catching tuna for this market. At present long-lining for tuna in the area is prohibited and it is recommended that consideration be given to permitting Australian vessels to long-line in the area provided any billfish caught are released or tagged and released.

Handling

A small fleet of pole fishing vessels and long-line/handline vessels could be expected to take reasonable catches from the fishery and this would warrant development of shore facilities for handling, holding and transporting to sashimi and canning markets

Log of the Survey

Aug 6. Departed Eden

7. Arrived Jervis Bay 0230. Attempted baiting but unsuccessful

8. Baiting- Jervis Bay. 400 scoops pilchards taken. Arrived Sydney 2000

10. Departed Sydney 1330

17. Arrived Cairns having tried for bait off N.E. Islet and Dunk Island unsuccessfully

18. Cairns, aerial search for northern bluefin to Princess Charlotte Bay and return.

20. Departed Cairns 0603
Searched for northern bluefin. Anchored Low Islet 1830. Some hardihead and blue scad showed under bait light.

21. Departed Low Islet 0600
searching inshore and offshore.
Anchored Arlington Reef 1630

22. Departed Arlington Reef 0700
No bait appeared during night, searched to FAD area. No results from chumming around FAD's
Anchored on seamount 1800

23. Wind freshened to better than 20kn
Departed FAD area 0600
Found small schools of Skipjack in area about 16°30's; 146° 40'E and off reef between Grafton and Trinity Passages, but they did not respond to bait. Headed into Trinity Passage.
Wind freshening.

24. Anchored Lizard Island 0800
Wind S.E. 25-30kn

25. Departed Lizard Island 0800
Searched north and anchored Stanley Is. (Flinders Group) 2100. No schools sighted.

26. Departed Stanley Is. 0700
Searched through Princess Charlotte Bay.
Sighted only a few small patches of mackerel tuna not responsive to bait
Anchored Flinders Group 1900

27. Departed Flinders Group 0300.
Searched Princess Charlotte Bay.
Poled 200 kgs. northern bluefin and 600kgs of trevally.
Anchored Flinders Group 1700

28. Departed Flinders Group 0545
Searched Princess Charlotte Bay.
Nothing but a few trevally which were not interested in bait.
Anchored Flinders Group 1400

29. Departed Flinders Group 0900
Nothing sighted inshore
Cleared Melville Passage 1400
Nothing sighted, wind 25-30 kn S.E.
Set course for Cairns 1530

30. Arrived Cairns 1500.

31. Departed Cairns 1730
Anchored Fizroy Is. 1945 for baiting.

Sep.1 Baiting very poor with strong current throughout night
Departed Fitzroy Is 0645
Searched around shoals for northern bluefin without any sightings
Anchored Frankland Group 1030
Sighted schools of bait in shallow water but they did not appear under light during the night.

2. Departed Frankland Group 0700
Searched inshore without any sightings
Arrived Cairns 1100

3. Aerial search for bait from Snapper to Dunk Is.

4. Aerial search for bait and northern bluefin Shellbourne Bay area. Constructed beach seine to take gold-spot herring.

5. Departed Cairns 1230
Searched for bait in Fitzroy Is. area

6. Departed Fitzroy Is. 0600
Sighted scattered small skipjack 16°35'E; 146°32'S.
Searched FAD area (16°33'S; 147° 10'E)
Chummed several schools in area for about 1/4 tonne
Anchored FAD area 1800

7. Weighed anchor 0600
Searched to Holmes Reef and anchored at 1400
Some birds showed north of the reef in late afternoon.

8. Searched in vicinity of Holmes Reef from 0800 to 1830
Several 1/2 tonne schools of small yellowfin near reef in morning.
Poled one 30kg yellowfin tuna from about 12 fish that came to bait late afternoon
Weather moderated during day

9. Weighed anchor 0600, Calm weather
Took 1 yellowfin about 15kg from some breaking fish north east of the reef
Set course for Bougainville Reef at 0900
Caught perhaps 1/4 tonne of skipjack 4 to 8 kgs and 6 yellowfin 2 to 15 kgs at 16°14'S; 147°48'E
A number of very small scattered schools of skipjack in area, but not interested in bait.
Hove to at 2400, position 14°40'S; 147°12'E

10. Commenced searching 0500 towards Osprey Reef
Small patches of very small skipjack sighted all through the morning but not interested in bait
Nothing interesting in vicinity of Osprey Reef.
Anchored at 1700

11. Weighed anchor at 0730. Weather fair.
Several schools of very small skipjack did not respond to bait.
Set course 163° at 1530, position 13°42'S; 146°04'E.
Water temperature up to 26° then back to 25.4°C. Continued till 2300 then hove to

12. Commenced steaming 0700, position 15°45's; 146°25'E, course S.E.
Looked at 2 schools under birds, all small fish. Did not pole them although they did come to the bait.
At position 16°1'S; 146°37'E took 1/4 tonne of very small yellowfin on poles . Similar schools at 16°25'S; 147°03'E hove to at 1730

13. Worked back toward FAD area at 0700
took a few small skipjack at 16°33'S; 147°12'E
nothing around FAD's
set course for Cairns
Arrived Cairns 2130

14. Cairns. Refrigerated catch for storage and unloaded. Completed nets for onshore baiting.

18. Departed Cairns 0700
Searching for bait at High and Russel Islands.

19. Returned to Cairns. Strong S.E

20. Strong S.E. Departed Cairns 1100 and anchored Low Isles for baiting but none showed.

21. Weatherbound, Low Isles

22. Weather unworkable, returned to Cairns 1430

23-24 Weather unworkable.

25. Departed Cairns 0600
anchored Hope Islands for baiting.

26. Finally took 320 scoops of gold spot herring inshore and manoeuvred it out to the boat in the purse seine
Weather still strong S.E.

27. Assessed gold spot herring quantities at Hope Islands. Baiting would not affect them in any way. Weather remains strong S.E.

28-29 Hope Islands to Batt Reef. Weather unsuitable for tuna fishing

30. Returned to Cairns

Oct.1-2 Cairns. Strong S.E. weather

3. Departed Cairns in moderating S.E. at 1330,
Anchored Arlington Reef 1730

4. Departed Arlington Reef 0645
Sighted small area of fish under birds at 16°30'S; 146°40'E none taken
Anchored FAD area 1800. Strong current running to the S.W.

5. Weighed anchor 0700
Worked towards Holmes Reef
Tried numerous patches of small skipjack and yellowfin without result. No quantity in the schools.
Caught about 10 small skipjack from a small school just before anchoring at Holmes Reef at 1740

6. Departed Holmes Reef 0700. wind S.E. at 8kn
Took 100kg of skipjack from 2 to 7kg and 5 yellowfin from 2 to 12 kg
Worked 20 miles east and back, but sighted only very small schools of skipjack working under birds, no quantity at all.

Water temperature ranged from 25°.4C to 26°.6C
Anchored Holmes Reef 1800

7. Weighed anchor 0630. Weather calm
Searched north to 16°00'S. then west to 16°06'S; 146°43'E
Sighted nothing. No birds. Water temp. 26.5°C
Hove to at 1700
Commenced searching to north and west at 0600.
Turned S.E at 1300 and searched until 1700.
Water temp. 26.2°c to 26.9°C
Position at 1300, 16°06'S; 146°05'E
Worked small patch of skipjack and yellowfin for 100 kg at 16°42'S; 146°30'E
Anchored Arlington Reef 1900

9. Weighed anchor 0530 and searched to E.S.E. until 1000. Wind E.S.E. 15kn, most difficult spotting conditions
Headed into Fitzroy Is. and anchored at 1500

10. Departed Fitzroy Is. 0630 Wind E.S.E. 15kn
arrived Cairns 0930

11. Departed Cairns 1400. Weather calm and hot, hove to 2020, position 16°10'S; 146°33'E

12. Commenced searching 0600
Sighted area of small yellowfin and bigeye at 16° 07'S; 146° 32'E
Found good fish at 16°02'S; 146°35 'E and by 1100 had 3 tonnes on board.
Worked through the afternoon on schools of mostly small fish with some larger bigeye and yellowfin amongst them.
Four Japanese vessels operating in area
Took 4 to 5 tonnes from each of two schools and last fish was taken at 1745.
Approximately 18 tonnes for the day.
Of the fish taken about 60% were large bigeye, 5% large yellowfin and 35% small fish. For the most part the fish bit well but there were no large schools.
Hove to at 1900. Weather calm

13. Commenced searching 0500
Worked area from 16°05'S; 146°30'E to 15°30'S; 146°20'E in competition with 6 Japanese vessels. Plagued by numerous small schools of 2kg yellowfin. One school contained approximatly 20 tonnes of good sized Bigeye and yellowfin plus perhaps 5 tonnes of small yellowfin. Stopped fishing this school because of high catch rate of small fish.

Approximately 10 tonnes of tuna of same mixture as yesterday were taken.
Weather E, 12kn at 0600 with overcast and rain; E, 6kn at 1200; calm late afternoon

14. Started 0230 and jogged into slop
Weather hot, clear with light easterly.
At 0800 sighted 8 Japanese vessels to the west. Searched N and N.W. but nothing showing. At 1000 8 Japanese were working on one school at 15°53'S; 146°30'E but unable to compete.
Found good fish about 6 miles NNW and took about 12 tonnes during afternoon of mostly 25 to 30kg bigeye.
while working the best school found to date a Japanese vessel came close by and took away part of the school resulting in a rapid decline in catch rate.
Auto-poling machines have proved to be very good on these fish.
Tuna have all been full of feed and no big schools. All are less than 20 tonnes and most are less than 10 tonnes. Headed slowly with slop until midnight then hove to.

15. Commenced searching from position 15°52'S; 146°28'E towards the north at 0800. No sightings other than very small schools of skipjack. Turned south at 1200 and caught 250kg small fish amongst the Japanese vessels which were searching over a wide area during most of the day
Found one rippling school late in afternoon and poled about 3 tonnes.
Hove to 1800

16. Started for Cairns 0600
Arrived Cairns 1330

17-21 Cairns. Unloading and service. Strong S.E. on 21st

22. Departed Cairns 1000 arrived Hope Is. for baiting 1800. Wind S.E. at 25 kn

23. Anchored Hope Is. Wind 15 to 20kn

24. Anchored Hope Is Wind 15 to 20kn
Took on full load of bait and let 100 scoops go although only shot in a small part of the bait present
Baiting took from 0900 to 1500, a slow process.

25. Departed Hope Is 0700. S.E. moderating, arrived Cairns 1600

26. Aerial spotting in vicinity of Japanese boats, were not catching much and little fish showing. Wind S.E. 12 to 15kn

27-28 Cairns. Wind S.E. 15 to 20kn outside reef.

29. Departed Cairns 1330. Wind E.S.E. 20kn
Anchored Arlington Reef 1730

30-31 Anchored Arlington Reef. Wind S.E. 20kn

Nov 1. Wind dropped at 1000. Departed Arlington Reef 1100. Wind increased to 20km
Returned to anchorage 1400

2. Departed anchorage 0600
Searched N.E. and north. Position 15°55'S; 146°32'E at 1400
A few small schools of small skipjack showed little response to bait. Searched towards the east but very quiet. At 1700 commenced steaming very slowly into swell.
Weather calm with persisting swell and slop.

3. Commenced searching 0600. Small school of skipjack sighted 16°04'S; 146°45'E.
Japanese vessels fishing at 16°04'S; 146°45'E.
Worked in area and took 1/2 tonne yellowfin 15 to 45 kg
Hove to 1830

4. Searched from 0600. No activity and Japanese very quiet. Steamed to FAD area. Poled about 150kg of 10 to 20 kg yellowfin, most with jaws torn off.
Anchored FAD area at 1800

5. Commenced searching 0700, nothing in area so returned to area worked the previous morning. Japanese catching some large tuna.
Numerous schools chummed with little result.
About 500kg of large fish taken for sashimi, one 100kg Bigeye, a magnificent fish
Hove to 1900 at 16°42'S; 146°56'E

6. Started searching 0600. Worked area 16°51'S; 146°57'E to 16°40'S; 147°06'E during day
Small patches of 20 to 30kg tuna with some 7 to 8 kg bigeye in area; Took some large yellowfin and big-eye by pole and handline but mostly handline. Best run on poles was 1 1/2 tonnes of tuna from 10 to 40kg. Japanese vessels seemed to be doing about the same on handlines
Set course for Cairns at 1900

7. Alongside Cairns at 0430
Organised details to ship sashimi tuna

8. Unloaded 490kg tuna for Japan

9. Unloaded remainder of catch for holding ashore
Departed Cairns 1900. Anchored Fitzroy Island 2130. No bait showed.

10. Weighed anchor 0700 and moved to area 12 miles south of the FAD's.
Fished in area from 1400 to 2000. Took 3/4 tonne of canning fish and 1/2 tonne of sashimi tuna from one school, otherwise fairly quiet.
Japanese vessels all around.
Weather calm and hot. Hove to at 16°40'S; 147°04'E

11. Tuna under the boat at 0500 so commenced chumming and took 3/4 tonne of small fish and a few large enough for sashimi. Commenced searching to N.W. at 0700 and found another small school with similar results. Remainder of day was quiet with little fish caught and only small, wild schools of small skipjack showing. Japanese vessels steaming about but catching very little.

12. Commenced searching at 0500. All boats steaming around searching. Worked 8 miles east, then 10 miles north west and returned to 16°41'S; 147°07'E. At 1330 searched 25 miles south east and back, hove to at 1900.

Only small schools of wild skipjack sighted all day. One Japanese vessel observed taking a few 10kg yellowfin. Weather looked like a change with a cool breeze blowing. Tuna appear to show better under hot, calm conditions with wind less than 5kn

13. Wind and sea increased by 0330. Weather deteriated so set course for Cairns 0730. Japanese vessels all together at 16°41'S; 146°48'E
Arrived Cairns 1430

14-15 Cairns. Received advice on fish consigned to Japan and decided not to send any more Freezing catch for unloading

16. Unloaded about 3 tonnes of tuna.
Departed Cairns 1630. Anchored Ball Reef for baiting at 2030

17. Set bait net at 0430 for 80 scoops of large scad and pilchards
Weighed anchor 0700, arrived Hope Island 1300, searched for bait.

18. Set bait net at 0430 on 50 to 100 scoops of small yellowtail and pilchards without success.
Weighed anchor at 0730 and searched outside reef then east and south to 16°12'S; 146°42'E.
small patches of skipjack, about one per 5 miles, and one very small school of small yellowfin sighted. Hove to 1830. Weather hot and humid, wind E.N.E.

19. Commenced searching in general area 0600. No sign of any Japanese vessels. Sighted small schools of feeding Skipjack, 1 to 2 kg. At 1800, position 16°39'S; 147°23'E, decided to head slowly west. Wind freshening from S.E.

20. At daylight 12 miles off Euston Reef. Wind S.E. 20kn. Headed for Cairns. Arrived Cairns 1000.

21-24 Cairns. Weather Adverse. Japanese vessels reported to have returned to long lining

25. Departed Cairns 0330. Arrived Hope Island for baiting 1230. Weather S.E. 15 to 20kn with gusts to 30kn

26. Two sets for bait at Hope Island, filled up with gold spot herring. Tore net badly on coral.

27. Weather still bad. Repaired net.

28. Departed Hope Island at 1100.
Searched outside reef and sighted lots of small feeding skipjack. At 1700 returned inside reef and anchored at 15°20'S; 145°45'E with game boats who reported no sightings of yellowfin

29. Departed anchorage 0700. Searched N.E. and SE. Sighted a few small patches of very small skipjack at 15°00'S; 146°25'E and along outside of reef. Hove to off Bougainville Reef at 1830

30. Tried chumming around boat at 0530 without result. Commenced searching at 0700 but same as previous day, only very small patches of skipjack feeding. Glassy calm all day.

	Headed for Cairns at 1000. Sighted further patches of very small skipjack off Trinity Passage. Arrived Cairns 2230
Dec 1.	Departed Cairns 2330 to service and repair FAD's
2.	Arrived FAD's 0900. Service carried out Departed FAD's 1150. Arrived Cairns 2200 nothing sighted, no signs of tuna. Weather calm until 1500 when N.E. came in at about 15kn.
3-5	Cairns. Loading gear and preparing for trip south.
6.	Departed Cairns 1000 and headed south
7.	Anchored Hayman Is. at 1700. Waiting for weather to improve so a search can be made outside reef.
8.	Moved south to Scawfell Is. Arrived 2115 Wind too strong to search outside reef.
9.	Scawfell Is. Wind SE, 25 to 30 kn
10.	Weighed anchor at 0900 and proceeded to N.E. Island. Anchored 1900. Winds to 30kn.
11.	Decided it was pointless waiting for weather to abate sufficiently to search outside reef. Weighed anchor at 0700 and headed south.