

FISHERIES MANAGEMENT OF
FIJIAN TUNA FISHERIES

A REPORT TO
CHIEF FISHERIES OFFICER
FISHERIES DIVISION
MINISTRY OF AGRICULTURE AND FISHERIES
FIJI

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SUMMARY AND RECOMMENDATIONS

Development Strategy

1. The Fiji Government's Development Strategy is soundly based and should produce a viable industry and a major income earner to Fiji. Resource surveys by SPC indicate significant unfished skipjack tuna resources in Fiji's 200 mile EEZ. Diversification of fishing methods such as purse-seining, deployment of FAD's and set netting should continue to increase production, extend the fishing season and areas fished, supply further raw material to the PAFCO Cannery and additional employment and revenue to Fiji.

2. Pole and Line Fishery - Every endeavour should be made by the Government to encourage and ensure the profitability of IKA Corporation operations by:
 - (i) encouragement of fleet replacement with more reliable and suitable vessels
 - (ii) continued access to Japanese expertise where relevant and to request top calibre fishermen to fish on local vessels and train crews.
 - (iii) continuing to ensure access to baiting grounds by education and goodwill and that permits and fees be avoided if at all possible,
 - (iv) granting Hokuku vessels joint venture permits with Ika Corporation.
 - (v) reinvesting any revenue gained from J.V. or FFV licence fees into the tuna fishery for the time being by giving these to Ika as a Development Grant.
 - (vi) continuing investigations and development into live bait culture as an adjunct to wild bait,
 - (vii) encouraging pole and line operators to deploy rafts to increase fishing production
 - (viii) at all times encouraging co-operation within the fishery between pole and line and purse-seine operations.

3. Coastal Purse Seining The present operation has demonstrated the purse-seine method is successful when based on FAD's and the Government should now ensure the operation has every chance to refine these methods and prove economic viability by:

- (i) Allowing unrestricted access for these vessels within Fiji's 200 mile EEZ.
- (ii) Maintaining a two year exclusive access to the Nelson Fishery Seiners.

4. Pole and line/Purse Seine Method Conflicts - All endeavours should be made to encourage co-operation and to get the two fleets to fish side by side. Benefits to be gained by this outweigh the small gains of possible harmony by isolating the two methods. These benefits include -

- (i) Deployment and maintenance of rafts by Nelson Fisheries for use by Ika and other local vessels at no cost to Fiji interests
- (ii) Then feasibility study of purse seining will prove inconclusive if restricted to waters outside the Territorial Sea.
- (iii) More fish to PAFCO and increased profitability for Ika due to greater production by both purse-seiners and Ika vessels fishing rafts in known fishing grounds and fishing in co-operation (e.g. sharing sightings information, seiners setting on pole boats during daytime).

Conflicts on the grounds would be alleviated by:

- (i) Ika Corporation and local vessels to fish any rafts.
- (ii) Nelson Fishery Seiners to fish only their own rafts or, upon invitation only, around pole boats.
- (iii) Hokuku joint venture vessels to fish only their own rafts. However, following agreement with other raft owners (e.g. Ika, Nelson Fisheries, Fiji Government) they may fish other rafts and pay a levy (e.g. of 10% of the landed value of fish caught) to the raft owner.
- (iv) Schools not associated with rafts would of course be available to all on the basis that local boats have first rights.
- (v) MAF should carry out studies to establish the extent of any interactions between pole and line and purse-seine vessels on the grounds. These studies should include consideration of: competition for resource and fishing space;

studies into the alleged changes in schooling and biting behaviour induced by purse-seiners and studies on fish behaviour around the rafts (e.g. distances fish travel from the raft and back). Management decisions should be altered accordingly.

- (vi) MAF should arrange for a meeting of all the fishing vessel skippers (Ika, Hokuku and Nelson Fisheries) to go over the management conditions and their rationale and to enable them to meet and air their differences.

5. Small Scale Subsistence and Commercial Fisheries - MAF should continue to encourage these small boat fisheries to fish for tuna and other pelagic species associated with the rafts by:

- (i) Supplying fishing equipment, techniques and encouragement
- (ii) encouraging the use of rafts deployed by Nelson Fisheries, Ika or Hokuku.
- (iii) encouraging fishermen to deploy more rafts themselves or with assistance from MAF.
- (iv) maintaining rafts on a fee basis for the industrial fisheries or even deploying them and obtaining a levy from the larger vessels for fish caught,
- v) sending fishermen to the Phillipines to learn how to make, deploy and fish on rafts - particularly hand lining for tuna.

6. Offshore Tuna Fishery Exploration: The potential of harvesting further skipjack and yellowfin in offshore areas not presently being fished should be investigated. Feasibility studies could be carried out at no risk to Fiji with gains of fisheries information, licence fees fish to PAFCO, additional rafts deployed and providing revenue.

7. Tuna Cannery: The PAFCO Cannery in Fiji and its markets is a key to the viability of the tuna industry which cannot be over emphasised. Product quality, market access and prospects for expansion are unique in the South pacific and the envy of neighbouring countries developing their tuna fisheries. The Government should give consideration to increasing the supply of tuna to PAFCO from sources outside Fiji Fiji waters by:

- (i) encouraging the buying of tuna from countries with developing fisheries (e.g. Australia, New Caledonia, New Zealand, Tuvalu, Vanuatu)
- (ii) improving the wharf and handling facilities at Levuka to allow fish to be landed off larger vessels (e.g. reefers, super-seiners) and from refrigerated containers
- (iii) encouraging USA flag super-seiners now fishing in the western Pacific to land fish at Levuka (and gain services and provisions in Fiji), particularly "independent" vessels
- (iv) increasing the supply of albacore from New Zealand EEZ by buying from N.Z. local industry and requesting better access for Fiji-based vessels into N.Z. waters.

The Government should also pursue the proposed mackerel cannery as a source of employment, revenue to the economy and as a potential to further increase tuna canning in the future.

MAF's Role - With the declaration of Fiji's 200 mile exclusive economic zone and the new responsibilities involved, MAF will be required to take a more active role in the management of tuna fisheries. It is suggested that:

- (i) Resources be allocated within Fisheries Division to continue to collect and compile tuna fisheries information and to take an active interest in the fishing and fishery matters and to develop the fishery with decisive management strategies.
- (ii) Concise and accurate documentation be kept for resource and management - related meetings between MAF and the industry and so to avoid "changes of heart" after verbal discussions. All attempts should be made to consult with and inform the industry of management decisions.
- (iii) MAF maintain a higher profile in the fishery by (for example) some observer presence on vessels. These could act to collect needed fisheries information, enforce the fisheries laws and act as informed arbitrators in case of disputes.

(iv) MAF establish a programme to more closely monitor the developing tuna fishery, in particular

- catch, catch per unit of effort and areas fished by each fleet
- establish a FAD log-scheme to monitor the placement and production of each raft set out.
- examine the profitability and possible competition of the various fleets with respect to imposed fisheries management measures.

9. Fiji's Options include a international development strategy that could benefit Fiji and the South west Pacific region by encouraging negotiations and co-operation between neighbouring countries developing and wishing to develop tuna fisheries. Fiji is centrally located and others needed fish processing and marketing facilities. Neighbouring countries could be encouraged to co-operate at all levels of fishing and management including issuing of joint licences, joint surveillance and enforcement.

INTRODUCTION

1. The Fishery

Fiji has a steadily developing fishery for skipjack tuna based on live bait and pole fishing methods. Following promising surveys, the Government-owned Ika Corporation was set up in 1975 to develop the Fishery and supply tuna to the Pacific Fishing Company's cannery in Levuka. The Ika fleet (composed of local vessels and chartered Japanese vessels) has grown steadily from 2 vessels in 1976 to 13 vessels in late 1981 with their catch increasing from 59 to 5,229 tonnes over the same period.

The pole and line fishing is completely dependent on an adequate supply of suitable live bait and in some years this has proved to be a major constraint on the development of the skipjack industry. Seasonalities in both bait and skipjack supplies further reduce the potential production from the fishery as most of the Fiji pole and line fleet tie up several months each year. Consequent to this the Fiji Government has granted licences to purse-seiners (1 in 1980 and 2 in 1981) to test the feasibility of purse-seine fishing for tuna in Fiji waters. Production to date is extremely promising, based on setting on schools of tuna attracted to anchored rafts or fish aggregation devices (FAD'S). Further trials are needed to prove economic viability but catches to date have yielded quantities of yellowfin as well as skipjack. As well, the FAD's show promise of extending the skipjack season for both pole and line and purse-seine vessels.

2. Canning Facilities

In addition Fiji is fortunate among Pacific Countries in having a tuna Cannery and access to good markets. Pacific Fishing Company Limited (PAFCO) is a joint venture between a Japanese company (C. Itoh Co Ltd) and the Fiji Government (25% ownership) and has facilities to can up to 14000 tonnes of tuna annually. Tuna supplies come from Ika Corporation, Taiwanese and Korean Longliners, private Fijian vessels and 2 Foreign purse-seiners. Landings are below capacity at present (8284 tonnes in 1980, 8872 tonnes to Sept 1981) and the Government is undertaking

programmes to increase the supply of raw material.

3. Terms of this study

Unfortunately, however, conflict has arisen between the two fishing fleets of Ika Corporation (operating the pole and line vessels) and Nelson Fisheries (operating purse-seine vessels). The Fiji authorities, concerned that the industry may be faced with a setback unless the conflict, both actual and potential, is resolved immediately sought ways to overcome it. The Fiji Fisheries Division in attempting to work out an effective means of developing an amicable and co-operative working relationship between the two parties requested New Zealand's assistance in investigating the feasibility of zoning local waters. The investigation was to:

1. Study the current status of the Tuna industry;
2. identify the problem areas;
3. advise on the relationship between pole and line and purse-seine operators;
4. analyse critically the tuna industry and the proposed zoning developing.

TUNA AND BAITFISH RESOURCES

1. Skipjack Tuna resource around Fiji is thought to be large with South Pacific Commission (SPC) estimates from tagging studies of up to 140,000 tonnes at times. Skipjack occur around Fiji throughout the year but the most productive fishing season to date has been during the January to June period. Catch variations throughout the year probably reflect fluctuations in the available resource size with SPC figures indicating resource size of 3,000 to 140,000 tonnes and corresponding harvest rates of .2% to 12%. Overall present harvest rates are probably less than 3% per month of the available stock given the highly migratory nature of skipjack, their past growth rates and high rate of turnover (estimated at 20% per month throughout the SPC region). The present harvest rates are therefore small relative to total population turnover.

MAF, Fiji, has estimated an optimum yield from skipjack of 15,000 tonnes per annum. This should be viewed as a very conservative yield given the dynamic nature of the resource and that skipjack can probably be taken virtually year round in Fiji waters. It serves as a useful development catch target. In all probability economic and other fishing constraints will limit catches before any biological yield limits are reached.

Catches of tuna in Fiji waters are detailed in Table 1. It is apparent that the skipjack resource could support substantially larger catches than at present, by at least a 250% increase (to reach MAF's optimum yield of 15,000 tonnes).

2. Yellowfin Tuna resource size is unknown at the present time although limited data on migration and growth is available from SPC Tagging studies. Yellowfin only comprise about 10% of the pole and line catch to date as the schools are at greater depth than skipjack during the day. However, the experimental purse-seine fishing on FAD's is proving to catch substantial proportions of yellowfin. Catches by purse-seine may well prove to take increasing quantities of this as yet virtually unfished resource.

TABLE 1: APPROXIMATE ANNUAL CATCHES OF TUNA FROM FIJI WATERS*.

YEAR	METHOD	LANDINGS (TONNES)
1976	Pole and Line	680
1977	" " "	1710
1978	" " "	2525
1979	" " "	3450
1980	" " "	2239
	Purse Seine	0
1981 (to and Sept)	Pole and Line	5272
	Purse Seine	418 +

Species composition approximately 90% skipjack 10% yellowfin for pole and line vessels, slightly greater proportion of yellowfin for purse seine catches.

* Excludes any catch within Fiji waters by PAFCO-based longliners.

+ 1981 Purse Seine catch estimated at 900 tonnes by Nelson Fisheries. Additionally an alleged 350 tonnes were caught by US Seiner "Ti Fai Moana" during November-December period.

Sources: Fisheries Division MAF Annual Reports and PAFCO.

3. Baitfish resources, their species compositions and abundance fluctuations have been well studied by both MAF and SPC. It is apparent that variations in availability of live bait will continue to be a feature of the fishery although at this stage there is no evidence that low abundances of baitfish are resultant from fishery-induced changes. Studies from SPC's Skipjack Survey and Assessment Programme concluded: "The large number of islands in the (Fiji) group contain over 100 baiting sights, only a few of which the fleet presently utilises. The species supporting the fishery consist mostly of sardines and sprats. With proper management, the resources should be adequate to support a reasonable increase in baitfishing effort.

1. Present development aims

During the early 1970's efforts by the Fijian Government to establish a local tuna fishery resulted in the formation of the wholly Government owned Ika Corporation to fish for skipjack tuna and supply these to PAFCO's Cannery at Levuka. Ika was authorised to contract foreign vessels to fish for skipjack in Fiji waters to meet the Government's obligations to PAFCO. Cabinet further decided "that private local interests be encouraged to enter the industry (though not via charter of Foreign vessels which will be reserved for the Ika Corporation)".

Over the present five year development plan (DP8) the objectives for the Fisheries Section are to increase local production to satisfy local demand for fish and fish products to increase the production of fish and fish products for export and to increase local value added in the fisheries sector. The major economic potential in fisheries is seen to lie in the development of tuna fisheries and an important objective of DP8 is to consolidate and expand as rapidly as is economically feasible tuna fishing operations in Fiji waters. With the declaration of exclusive rights over the 200 mile EEZ, Fiji recognises the obligation to develop fisheries and manage the resources in their zone to optimum sustainable yields. Further, in the expansion of its tuna fisheries, the Fijian Government regards continued foreign involvement as essential but there is considerable scope for significant localisation of the foreign charter and contract vessel operations and continued development of the local tuna industry.

With certain constraints appearing in the further development of the pole and line fishery the government policy is to increase fish production, and thence supply tuna to PAFCO, by:

- (i) Further developments in pole and line fishing e.g. bait culture, improved vessel design and use of FAD'S.
- (ii) Diversification of the inshore fisheries by trial fishing of methods such as purse seine and gill netting, extending the seasons, areas fished and species caught.
- (iii) Possible offshore feasibility fishing studies using Foreign Fishing vessels.

Further plans are; to increase fish processing capabilities by a 25% expansion of PAFCO's cannery capacity, possibly build a second cannery (initially to can mackerel) to gain additional supplies of raw material (tunas and mackerel) from outside Fiji.

Such strategies are laudable, not only from Fiji's point of view but also from the regional aspect. Given such developments, Fiji may well grow to become a leading processor and marketer of tuna (and possibly mackerel) with benefits to all neighbouring countries wishing to develop fisheries within their 200 mile zones.

2. Management in the EEZ Regime

However, such developments to encompass the 200 mile zone are not to be expected without cost or added responsibilities. The Government obviously understands its obligation to harvest and manage its newly acquired resources and to allow foreign vessels to have access to any "surpluses". This is further complicated in the case of tunas as they are highly migratory fish and a truly international resource that Fiji shares with most other countries in the western Pacific. This is a difficult obligation to impress clearly upon local tuna fishing interests. Most will have difficulty in seeing the resource as anything but "their fish" and in "their country". This management obligation of the Government under the Law of the Sea, should be clearly, and repeatedly if necessary, explained to Fiji interests.

The Government may well benefit Fiji by managing the tuna fisheries on a optimum yield or "best use" basis rather than by aiming to maximising sustainable catches. On this basis ingredients other than total catch are important in deciding on the participants in the fishery. Such factors could include the:

1. Optimum numbers of vessels the fishery can support on a profitable basis
2. Optimum combination of method types and fleet proportions
3. Optimum return to Fiji in terms of revenue, employment, training, landings of fish

4. The "best use" of the resource in Fiji waters in Fiji terms
5. The levels of competition or conflict acceptable between Fijian and Foreign interests in pursuit of the resources.

Under the EEZ regime, management objectives and criteria are under a different order. Thus previous objectives and contracts may need review. Specifically the Cabinet decision that the rights to charter foreign vessels be reserved for Ika Corporation may need re-consideration. Further, the concept that Ika has the rights of management of the tuna fishery vested with them, has also changed with the declaration of the 200 mile zone.

numbers of vessels allowed into Fiji waters etc will still rest with the Fiji Government. Licences could be issued on an annual basis and thus the Government maintains ability to manage the fishery. Issuance to Ika of joint venture permits for vessels other than those of Hokuku Marine Products should be taken each case on its merits. Licence fees from Joint Ventures could be made payable directly to Ika as a development grant.

5. Use of Licence Fees If at all possible, fees gained from licencing foreign and joint venture vessels should be retained in the fisheries sector. One method of administering such funds would be to establish a Fisheries Development Fund into which all licence revenue are lodged. This could be jointly administered by MAF and Finance Revenue. Obviously, possible areas to benefit from such revenue are many including; development of existing or new fisheries projects, deployment of FAD's, training, market research and surveillance and enforcement of the 200 mile EEZ.

If such a fund is established consideration should be given to a substantial portion being reinvested in Ika Corporation as a development grant (e.g. to construct new vessels or facilities, development of live bait culture, deployment of aggregation rafts).

6. Bait Culture Although live-bait culture techniques to date have generally not proven cost effective proposed developments into the culture of live bait supplies as an adjunct to wild bait could prove worthwhile. Fiji has already many of the ingredients lacking in other areas where live bait culture has been attempted - including capital invested in suitable vessels and fishing equipment, a fishery already based on good supplies of live bait in season, high levels of technical abilities within Fiji, internal sources of food for cultivation.

7. Deployment of FAD's In discussions with skippers of several pole and live vessels there is general agreement that fishing around FAD's can be very productive. Given the promise these FAD's show of increasing fishing production and lengthening the fishing season, further encouragement should be given to pole and line operators to deploy rafts.

8. Co-operation between Fleets Every encouragement should be given to get fishermen to co-operate on the grounds, particularly between different methods. Given the highly mobile nature of tuna and the large areas that must be covered to search for fish it stands to reason that the more pairs of eyes looking the greater the chance of more productive fishing for all. The proposal by Graham Southwick (to Miecckle) that each seiner fish in conjunction with a pole boat is an excellent example how both could benefit by association. Should the seiner be able to set on the pole boat while it "holds" the school they both stand to catch more fish - the seiner being unable to fish by day and the pole boat by getting a substantially greater proportion of the school.

Co-operation in all phases can also be encouraged by on-board observers.

COASTAL PURSE SEINE FISHERY

The present purse-seine feasibility trials have demonstrated the success of purse-seining for tuna in association with FAD's. This study should be continued with the aims of refining the methods and of proving economic viability:

1. Benefits to Fiji from such an operation include
 - (i) More fish to PAFCO - estimated at up to 4,000 tonnes per year.
 - (ii) The feasibility testing of a new method at no cost or risk to Fiji.
 - (iii) Numerous rafts deployed (at Nelson Fisheries expense) to aggregate fish which are fishable by Ika vessels as well as by local subsistence and commercial vessels. Approximately 100 rafts have been deployed to date with 33 in place as at 21 December '81.
 - (iv) Shore side spending by Nelson Fisheries is significant. For example providing, raft equipment, shipyard work and repairs. MAF estimates \$½ million operating funds have been invested in Fiji to date including \$200,000 on materials and supplies purchased in Fiji.

- (v) Increased employment opportunities - 12 Fijian citizens are currently directly employed by Nelson Fisheries, a further 150 full time jobs are predicted at Levuka to process the 4000 tonnes catch and numerous people are employed from time to time in repairs/servicing capacities.
 - (vi) Training of Fijians in fishing operations.
 - (vii) The development of another tuna fishery based on the yellowfin resource. Encouragement could be given to Nelson Fisheries to pursue yellowfin preferentially by refining fishing methods (e.g. - use of lights on rafts). Incentives could be given by preferential pricing of yellowfin or by different licence fees (per tonne of fish caught) for skipjack and yellowfin.
- Encouraging the purse-seiners to catch yellowfin has the double benefit of exploiting another resource while (conspicuously) removing some of the competition for skipjack with pole and line vessels and hopefully some of the conflict pressures.
- (viii) For the future there is the obvious benefit of the possible options of a second cannery and vessel construction in Fiji.

2. Merits of Unrestricted Access

In order to have any real worth as a feasibility trial, the purse-seiners should have unrestricted access to Fiji's 200 mile zone. To restrict their operation to outside some (or all) of the known grounds, will make the trial worthless from Fiji's point of view. In New Zealand, by political decree, all joint venture and foreign fishing vessels are restricted to fish outside 12 miles. While this may have merit with fisheries based on sedentary species it has little merit for highly migratory species. Thus, the joint venture seiners brought into N.Z. to prove the feasibility of the skipjack fishery are, on average, restricted to fish outside of the main fishing areas every second year as the bulk of the skipjack resource has been found inside 12 miles, on average, every second year. Consequently, although we have deployed a fleet with capacity to catch up to 20,000 tonnes during a season, the maximum catch to date is slightly less than half this. The local N.Z. vessels have

their access to the resource well assured: during the 1980-81 season there were less fish seen than during the previous five season and more joint venture vessels in the fishery - but the N.Z. vessels had their greatest catch to date. Nevertheless, some N.Z. vessel operators still complained about joint venture presence!! The conflict is psychological and not based on any real competition for resources.

3. Exclusive access by Nelson Fisheries for the two year trial period would help to assure a chance at profitability during this period. If further purse seine licences were issued for the same waters these could lead to competition for space and resource and conflict over use of rafts between seiners as they appear to be totally dependent on rafts for fish. Also further vessels from other companies or countries will exacerbate any present conflicts between pole and line and purse-seine fleets.

This should be reviewed after the end of 1983 in conjunction with a review of the performance of the Nelson Fisheries venture and in the light of other applicants and their desirability.

POLE AND LINE/PURSE-SEINE CONFLICTS

- i. The Conflicts are largely on a "them and us" basis with little real competition for fish or fishing space. Conflicts, particularly those in the mind of the local fishermen concerned, are probably inevitable where local vessels fish in conjunction with foreign boats. These are, exacerbated in this case by the age old conflict between purse-seiners verses the established pole and line vessels. This conflict is well known in the local fleets of both western USA and home-water Japanese fisheries and doubtless has occurred elsewhere. It will probably never be solved equitably and to everyones satisfaction. The main rational claim the pole and line vessels have against fishing in conjunction with purse-seiners is that purse-seiners can adversely affect pole and line vessels catch by disturbing the fish so that they sound or stop taking the lures. This activity should be investigated by MAF as to its occurrence, frequency and any measurable or real effect on catches. The argument becomes somewhat academic if purse-seiners

are restricted to fish only their own rafts, thus their "own" fish.

2. Management aims should be fourfold:

- (i) To avoid (or at least reduce) conflicts between the fleets.
- (ii) To maintain catch levels within sustainable limits.
- (iii) To ensure maximum returns to Fiji from the fishing operations.
- (iv) To ensure the fisheries operations are profitable;

Thus while it is important that pole and line vessels and purse-seine vessels learn to fish and exist side by side it may well be that some level of conflict will always exist. Providing that fishing pressures are not greater than the resources can stand the fishery is well managed if fishing operations are profitable to those concerned and of maximum benefit to Fiji. These benefits can be in a variety of forms including direct revenue, employment, training, added value to product, overseas funds and technical knowledge. In overall terms then, managed on the basis of the "Best Use" to Fiji.

3. Management Options in the present fishery include:

- (i) Co-operation and integration between the two fleets
- (ii) Separation by area on a seasonal basis
- (iii) Separation by area year round.

Fiji has the most to gain by encouraging co-operation and allowing the fleets to fish unrestricted except that, to alleviate conflicts on the grounds, conditions be imposed:

- (i) Ika Corporation and local Fiji vessels be able to fish any rafts.
- (ii) Nelson Fishery Seiners to be able to fish only their own rafts or, upon invitation only, around pole vessels.
- (iii) Hokuku joint venture vessels to fish only their own rafts. However, following agreement with other raft owners (e.g. Ika, Nelson Fisheries, Fiji Government) they may fish other rafts and pay and levy to the raft owner (e.g. of 10% of the landed value of fish caught).

Management option (ii) would be the second choice based on the conditions:

- (i) Ika Corporation vessels (including Hokuku Marine joint venture vessels) be able to fish unrestricted.
- (ii) Ika Corporation vessels be able to fish any rafts but Hokuku fish only their own rafts (or upon agreement fish other rafts on payment of a levy to the raft owner).
- (iii) Nelson Fishery's Seiners be able to deploy rafts anywhere in Fiji waters but be generally restricted to fish outside the territorial zone marked on Figure 1 during 1 January - 30 June inclusive.
- (iv) Nelson Fishery's Seiners be able to fish inside Sectors of this zone from time to time on their own rafts at the request of Chief Fisheries Officer.

The main disadvantages of this option are:

- (i) Nelson Fishery Seiners would not "prove" the viability of the fishery.
- (ii) The pole and line boats (and local vessels) would probably lose out on rafts to fish on as these would most likely be removed from the closed zone during January - June.
- (iii) If this were the case there would be little point in asking the Seiners in as they would not have rafts available to them.
- (iv) Also it requires a greater degree of control and more resources than MAF currently is using on the fishery.

Management option (iii) would be to exclude the Seiners from this zone year round and would seem an extreme measure in order to reduce conflicts in the fishery. The benefits to be gained by encouraging the fleets to exist in the same waters far outweigh the small gains of possible harmony offered by isolating the two methods.

OFFSHORE TUNA FISHERY EXPLORATION

The potential of harvesting further skipjack and yellowfin tunas in offshore areas not presently being fished should be investigated. One such approach would be to license a small number of vessels (e.g. purse-seiners from USA or Japan) as foreign fishing vessels to fish such areas. Initially such areas could take in all those waters outside the Territorial Sea but within the 200 mile EEZ, north of 15°S, west of 176°E and South of 20°S. Conditions could include -

- (i) Vessels to land all (or part) of their catch in Fiji
- (ii) Vessels pay a licence fee to Fiji Government of (say) 5% if no fish landed or 2% if whole catch landed.
- (iii) Vessels be allowed to deploy rafts
- (iv) Vessels must keep MAF logs and supply all fishing details to MAF.

Offshore exploration around Fiji could be carried out in conjunction with simultaneous access to zones of neighbouring countries for licensed vessels with any fish caught being landed at Levuka with obvious benefits to all parties.

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