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Feasibility Study on the Development of Sport Fishing In Cook Islands



A report by Etienne Picquel and Michel Blanc
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Etienne Picquel* and Michel Blanc**

* Sport Fishing Guide and Trainer, Blue Caledonie Fishing Trips

** Nearshore Fisheries Development and Training Adviser, SPC

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Summary

This study on the feasibility of developing sport fishing in Rarotonga and Aitutaki was undertaken by the Secretariat of the Pacific Community (SPC) in response to a request for technical assistance from the Cook Islands Ministry of Marine Resources (MMR).

Consultant Etienne Picquel, accompanied by Michel Blanc, Head of the SPC Nearshore Fisheries Development and Training Section, spent two weeks in Cook Islands (14–27 April 2009) carrying out the study. Logistical support (travel, boats, meetings with local people) was organised by MMR staff on Rarotonga and Aitutaki.

After observing the fishery resource during several fishing trips (five on Rarotonga and 11 on Aitutaki), assessing the state of tourism infrastructure including hotels, and hearing the commitment to development expressed by all political leaders and fishery officers and operators, we can conclude that there are promising prospects for development of sustainable sport fishing in Cook Islands. There are opportunities for diversifying existing activities on Rarotonga and developing new ones on Aitutaki.

Technical and financial support for local fishing guides will be required initially until they can operate on a self-supporting basis. Establishing a sustainable sport fishing sector in Cook Islands will also be made easier if there is active cooperation between fishers, MMR, the Cook Islands Tourism Corporation and local government right from the start of the development process.

We have put forward a number of suggestions and a costed action plan, including relevant training activities and resource management prospects. The suggested action plan revolves around the diversification of sport fishing activities on Rarotonga and the development of a number of 'products' or opportunities on Aitutaki, including fly-fishing for bonefish. This highly specialised activity, with its potential for generating considerable income and creating jobs, will require a resource assessment, management plan and specific marketing.

Introduction

For the past 20 years or so, ocean sport fishing has been a growing activity in many countries of the world. Sport fishing enthusiasts seek memorable and often extreme experiences and tend to use new gear and techniques, which are constantly being improved to provide better results. Based on the 'catch-and-release' principle, sport fishing is an environmentally friendly pursuit and often follows a participatory resource management plan. Some countries can boast an impressive resource in terms of both abundance and variety of fish, while others are seeing their stocks shrink and even disappear. In countries where abundant resources are still on offer, sport fishing tourism can attract well-travelled fishers, both men and women, who are prepared to go thousands of kilometres to indulge their passion, visit 'exotic' locations and stay in environmentally integrated and genuinely local accommodation.

Currently, three major techniques are used in sport fishing centres:

- Fly-fishing with very specific tackle (rod, reel, flies) targeting many species, including bonefish, permit, trevally and, more recently, some of the larger ocean species.
- Big game fishing, a very long-standing activity usually involving large boats capable of fishing offshore. This is a trolling activity targeting tuna, marlin, mahi-mahi and other oceanic species.

- Casting and jigging, which involves fast-developing techniques that are used in coastal (lagoon and outer reef slope) areas and also offshore, often around fish aggregating devices (FADs). These methods use ultralight, light, medium or heavy equipment and a wide range of lures (softbaits, stickbaits, hard plastic lures, poppers, jigs). Targets include many species of all sizes: small emperor and snapper, cod and trevally in lagoons, giant trevally and blue trevally, deep-water grouper, Pacific amberjack and dogtooth tuna in reef passages, and tuna and other offshore species around FADs.

Certain sport fishing destinations boast an iconic fish (Christmas Island bonefish, for example), which generates specialist tourist traffic. Other destinations such as New Caledonia, Fiji and Hawaii focus on a broader range of fishing techniques and activities.

Socio-economic background to sport fishing in Cook Islands

1. Rarotonga

Rarotonga is a high island with a population of about 14,000 people who mostly live around the coast. The northern part of the island is bordered by a fringing reef, while a narrow lagoon (Muri lagoon) abuts the southern coast. The total length of the barrier reef is some 34 km and the total surface area of the lagoon is 3 km².

With between 80,000 and 100,000 visitors annually, tourism is the leading economic activity and largest source of revenue for Cook Islands, far ahead of marine resource exploitation (fishing, including fishing licences, pearl farming and aquaculture). The highly developed hotel sector is matched by the presence of qualified staff and the traditional hospitality and friendliness of the local community. The island features a number of up-market hotels (Pacific Resort, Rarotongan Resort, Edgewater) as well as many motels and guesthouses.

The Cook Islands Tourism Corporation is determined to diversify the present range of tourism products so that it can promote the Cook Islands destination more effectively on the international tourism market. At present, most visitors are New Zealanders or Australians, with relatively few American or European tourists.

MMR is responsible for the conservation, management and development of coastal and oceanic marine resources in Cook Islands. In Rarotonga, the fisheries sector is diverse, with a fleet of small longliners targeting various species of tuna for local and export markets, artisanal fishers mainly using FADs deployed for them by the MMR (five at the time of our study), culturally important subsistence reef fishing, which is declining because ciguatera poisoning has become increasingly acute over the past 10 years, and lastly traditional fishing for 'maroro' (flying fish), which is still carried on by a few fishers. A traditional and participatory system of managing coastal marine resources, known as 'raui', is used on Rarotonga where various reserves have been set up. These are respected to varying degrees. According to the information gathered during the study, it seems possible that sport fishing in the 'raui' could be managed on the condition that the fish were released after capture.

In terms of sport fishing, a dozen charter operators offer big game troll fishing, mostly to tourists but less frequently to enthusiasts coming to Cook Islands specifically for big game fishing. The standard and size of the boats used vary and clients are usually taken to FADs, tuna holes or well-known fishing spots off points. A small number of operators offer deep fishing on the outer reef slope, known as deep bottom fishing. Casting and jigging are not used on Rarotonga, either within or beyond the lagoon. An incomplete list of charter operators is provided in Annex I.

Promotion of big game fishing is done directly on the wharf in the port of Avatiu as well as through hotels and the local tourism office. Some operators have websites and receive bookings directly from overseas, mainly from New Zealand. At least one operator works with the New Zealand owner of his boat, and this includes marketing. A number of Rarotonga charter operators regularly advertise in specialist New Zealand magazines. Generally speaking, however, overseas promotion of Cook Islands as a sport fishing destination is still very low-key. The lack of diversity of the sport fishing opportunities on offer and the lack of an iconic fish are probably the reasons for this.

Problems with the availability of fishing tackle were raised a number of times. Fishers have no specialist store on the island and often have to wait for friends or family members visiting from New Zealand to bring fishing gear, which remains not very varied and sometimes of mediocre quality. At least one of the operators we met during the study orders some of his gear (hooks) directly from the United States.

MMR, which is supervised by the same minister as the Tourism Corporation, sees sport fishing as an opportunity to make the country better known internationally and to thus contribute to the sustainable and economically useful development of the fishery resource. The support provided to the consultant during the study trip is ample demonstration of MMR's commitment to this concept.

2. Aitutaki

Aitutaki lies 140 nautical miles north of Rarotonga. The islands are connected by several daily flights operated by the local airline, Air Rarotonga. Aitutaki is 16.8 km² in area and has a population of 2,000. It is situated in the northern half of a large, triangular-shaped lagoon that covers 70 km² and has many 'motu' along the barrier reef. The total length of the barrier reef is approximately 44 km.

Local tourism is growing fast on Aitutaki with the recent construction of a number of hotels, including some in the luxury class. There are also many motels and guesthouses, giving the island a broad range of accommodation and enabling visitors to find something to suit their budget. Approximately 20% of tourists visiting Cook Islands spend some time on Aitutaki and this amounts to some 20,000 visitors annually. The quality of its hotel sector and the beauty of its lagoon mean that Aitutaki is rightly considered one of the pearls of the Pacific. However, the presence of sandflies in some parts of the island can leave some visitors with unpleasant and often painful memories!

MMR has a long-standing presence on Aitutaki with the giant clam hatchery that it has managed since 1989 (Aitutaki Marine Research Centre – AMRC). The three staff of the hatchery play an active part in the development of tourism and marine resources on Aitutaki.

In addition to its role as a research and aquaculture centre and as a link between central government and Aitutaki fishers, some of AMRC's activities are directly linked to local tourism. These activities include daily free visits to the nursery, management and grow-out of a giant clam broodstock in one part of the lagoon, which tourists can visit on snorkelling tours, coral farming in the coral garden, and participation in beach and 'motu' clean-ups. It is thus quite natural that AMRC supports and encourages the development of sport fishing on Aitutaki. AMRC also manages the local FAD programme, which had four devices in place when this report was written. Aitutaki, like Rarotonga, uses a system of traditional community management. There are four 'raui' accounting for a total area of 8.6 km², or 12% of the total lagoon surface area. MMR, through AMRC, is responsible for managing natural resources outside 'raui' reserves.

The fishery sector continues to be based on a major subsistence fishery despite a recurrent problem with ciguatera fish poisoning, mainly in the eastern part of the lagoon and barrier reef. Two 10-metre boats occasionally go out tuna longlining. Three operators offer big game fishing charters, mainly around FADs. One of these operators sometimes organises spear-fishing trips and another offers casting trips outside the lagoon, around the reef passages and along the barrier reef. Two people cater for and guide the few tourists who are keen on fly-fishing for bonefish. A list of these operators is given in Annex I.

[The fishery resource](#)

1. Rarotonga

Exploratory fishing was carried out on Rarotonga between 15 and 18 April 2009 in unfavourable conditions. A tropical depression on 15 April drove yellowfin tuna and other pelagics away from the FADs where they had been present in considerable numbers. The phase of the moon (third quarter) was not ideal either. Details of these fishing trips are given in Annex 2.

We made five fishing trips – two in the island's southern lagoon and three in the open ocean or along the barrier reef. Although the trips were disappointing in terms of catch, information gleaned from local fishers enabled us to draw the following conclusions:

- The island's southern lagoon contains worthwhile amounts of small or medium-sized reef fish.
- The outer reef featuring various narrow passages is seen as offering a relatively abundant fish resource.
- The FADs are regularly visited by local fishers and are often very productive.

Of the main species caught or observed on Rarotonga, the following deserve special attention:

- In the lagoon, island trevally (*Carangoides orthogrammus*), brassy trevally (*Caranx papuensis*), bluefin trevally (*Caranx melampygus*) and goatfish (*Parupeneus* sp.).
- Off the reef passages and on the outer reef slope, bluefin trevally and dogtooth tuna (*Gymnosarda unicolor*). Several young specimens of dogtooth tuna were caught using the jigging method.

According to local fishers and MMR specialists, some species are seasonal. The best periods are said to be as follows:

- Giant trevally (*Caranx ignobilis*) April–May
- Black trevally (*Caranx lugubris*) November–December
- Dogtooth tuna, April–May (small specimens) and from September to November (larger specimens)
- Wahoo (*Acanthocybium solandri*) during the cold season, from May to September
- Yellowfin tuna (*Thunnus albacares*), present all year round intermittently and in association with its forage fish

2. Aitutaki

Exploratory fishing on Aitutaki was carried out from 19 to 24 April. Favourable weather conditions enabled us to adequately survey the main habitat types and potential fishing grounds. Eleven trips were made including seven outside the lagoon. Two areas of flats were visited and two light casting trips in the lagoon were also carried out. In general, we recorded bigger catches than on Rarotonga, but the brevity of the study and the varying environmental conditions during the two sets of trips made it difficult to compare the relative abundance of

sport fishing target species on Rarotonga and Aitutaki. Details of these fishing trips are in Annex II.

The Aitutaki fishing trips enabled us to make the following assessment:

- The lagoon offers abundant fish and diverse types of habitat (mangrove, coral outcrops, flats, 'motu').
- The long outer reef is divided by various narrow passages near which some fine fish were caught by casting.
- There are three main points suitable for trolling or jigging.
- There are some productive FADs close to the reef (less than one nautical mile).

Among the main species caught or observed on Aitutaki, special attention should be paid to the following:

- Snapper, cod and trevally (brassy and bluefin) caught with ultralight and light casting techniques along beaches and in the lagoon.
- Giant and bluefin trevally and yellowlip emperor caught with poppers and swimming fish lures near the reef passages.
- Dogtooth tuna caught by jigging on the outer slope, although a number of large specimens could not be reeled in.
- Yellowfin tuna and wahoo caught by trolling around FADs and by jigging in the waters off points.

When the study was carried out, the bonefish (*Albula glossodonta*) was attracting very keen interest from the Aitutaki community. It is covered in the following chapter.

3. Bonefish

Fly-fishing for bonefish is currently one of the most popular sport fishing activities worldwide. Many destinations cater for fly-fishers specialising in bonefish, most of whom are American or European. In countries such as Cuba, Seychelles Islands, Mexico and the Bahamas, tourism has developed around fishing for this species, bringing in foreign currency and creating well-paid jobs in the communities concerned, including direct employment for local fishing guides and indirect jobs in the catering and hotel sectors. In the Pacific Islands, fly-fishing for bonefish is practised commercially in New Caledonia and on Christmas Island (Kiribati) where weekly charter flights from Hawaii enable fly-fishing enthusiasts to tackle a world famous resource. On Christmas Island, some 20 professional local guides work full-time in this sector.

Some bonefish fly-fishing destinations have introduced strict management measures. For example, other tourism operators may not be allowed to use the best fishing grounds, subsistence exploitation of bonefish may be restricted and supervised, and guides may have to receive specific training.

Specialist bonefish enthusiasts are today seeking new destinations offering guarantees that they will be able to catch many good-sized specimens. An 'exotic' natural environment and high-quality tourism infrastructure are also important. Aitutaki seems ideal in meeting these criteria. A unanimous desire on the part of local government, the municipal council, hoteliers and MMR to develop sport fishing and tourism around the bonefish resource is clearly a guarantee for success. We did not stay on Aitutaki long enough to enable an assessment of the true potential for the development of this activity. However, the two trips on the island's flats, and confirmation by our contacts that there are massive aggregations of bonefish at certain times of the year, suggest that an abundant resource is present with good-sized specimens. Photos of fish weighing over 5 kg were displayed in the restaurant of one of the island's hotels.

The action plan outlined below takes into consideration the need to develop the activity gradually. It includes an assessment of the bonefish resource and the potential fishing effort it could support, the development of a participatory management plan and suggestions for some practical training to help set up a few local guides.

The issue of the existing gillnet fishery was raised regularly during the study trip. It seems obvious that this competing fishery, which often does not comply with local legislation on mesh and net size, is a serious threat to the species because of the massive catches taken by local fishermen during bonefish aggregation periods from September to December. Rather than trying to resolve the issue by force (for example, by banning net fishing or imports of nets), it would seem wiser to provide fishers with information on the damage caused by their techniques and to give them an incentive to respect the legislation and even more importantly become involved in the development of bonefish guiding. These fishers have the best knowledge of bonefish habits, which is an essential quality for a good fishing guide! The net fisherman we met during our visit said that he understood this issue and was interested in the possibility of becoming a guide.

Summary of Cook Islands' assets and constraints in relation to the sport fishing market

Assets:

- Well-developed tourism sector, and officials and operators anxious to broaden the range of tourism products on offer.
- Easy access to Rarotonga and Aitutaki (direct flights from Auckland and Los Angeles and soon from Honolulu, plus four domestic flights daily to and from the two islands).
- Wide range of high-quality hotels.
- Appeal of Cook Islands as an exotic destination, together with its tradition of friendliness and hospitality.
- Core group of sport fishing charter operators is well established on Rarotonga and beginning to develop on Aitutaki.
- Sustainable FAD programmes effectively managed by MMR on Rarotonga and Aitutaki.
- Availability of boats suitable for big game fishing around the FADs.
- Commitment to developing sport fishing and tourism in all sectors of fisheries and tourism (MMR, local government, longlining industry, hotel owners, charter operators and small fishers).
- The same government minister covers both the fisheries and tourism sectors.
- Good working relationship exists between an involved and efficient MMR and fishers on Rarotonga and Aitutaki.
- Fishing Club of Rarotonga chaired by a former officer of MMR, who is a professional fisherman and big game fishing guide.
- Resource is limited but considered adequate to permit the introduction of the main modern sport fishing techniques in a tropical environment.
- The presence of an iconic fish, the bonefish, which can generate a specific, top-of-the-range sport fishing activity.

Constraints:

- Sport fishing equipment is hard to find and relatively costly.
- Apart from rare exceptions, local boats are unsuitable for coastal sport fishing using casting and jigging techniques. Boats with a deck and central console are recommended for the comfortable and safe use of these fishing techniques.
- Relatively restricted fishing grounds on Rarotonga mean that the number of operators must be limited and catches must be released if the resource is to be managed sustainably.
- There is the possibility of conflict on Aitutaki between the various users of the bonefish resource (fishing guides, net fishers and operators of other tourism activities on the lagoon).
- Aitutaki's sandflies and mosquitoes (this situation could be improved by eradication programmes including regular sand churning).

Suggestions for Cook Islands' sport fishing activities

1. Rarotonga

Big game fishing charter activities seem sustainable and sufficiently well developed. They rely on a network of FADs efficiently managed by MMR.

There are prospects for diversifying the range of sport fishing activities on Rarotonga by introducing casting and jigging techniques. The limited area of the available fishing grounds, either within the lagoon to the south of the island or on the barrier reef or outer reef slope, would not allow major development of these techniques but would make it possible to diversify the activities of some of the smallest big game fishing operators with boats suitable for using the techniques safely. During the study we identified three such operators, who were interested in being able to offer alternative activities to their clients when there were no fish around the FADs.

In addition, two tourism operators from the southern part of the island expressed interest in ultralight casting in Muri lagoon. Experimental fishing in the lagoon shows the potential for this type of gear, provided fishing effort remains limited and catches, especially of smaller trevally, are released. Ultralight casting can be done on foot or from a small boat or fishing kayak.

To sum up, the following sport fishing activities are suggested for Rarotonga:

A. Jigging on the outer reef slope and around the FADs

Target species: dogtooth tuna, black trevally, yellowfin tuna.

Suggested fishing effort: intermittent, with two or three operators.

Clientele: tourists all year round and specialist fishers during the good fishing seasons (November to December for black trevally and September to November for dogtooth tuna).

B. Medium to heavy casting along the barrier reef near the passages and around the FADs

Target species: giant trevally, bluefin trevally, yellowfin tuna, wahoo.

Lures used: poppers, stickbaits, swimming fish lures, softbaits.

Suggested fishing effort: intermittent, with two or three operators.

Clientele: tourists all year round and specialist fishermen during the good fishing seasons (April to May for giant trevally, May to September for wahoo).

C. Ultralight casting in Muri lagoon

Target species: island trevally, bluefin trevally, brassy trevally, goatfish, small cod.

Lures used: small metal spoons, small poppers, softbaits.

Suggested fishing effort: two operators, guiding on foot or by boat (traditional outrigger canoes or fishing kayaks).

Clientele: tourists all year round.

2. Aitutaki

Development of the sport fishing sector on Aitutaki will benefit from the more varied and abundant resource in comparison to Rarotonga. Two iconic fish emerged from the experimental fishing done during the study: bonefish inside the lagoon and dogtooth tuna on the outer reef slope, in particular at the south-eastern point of the barrier reef where some very big specimens seem to have been found, although none could be landed.

Bonefish fly-fishing can attract a specialist tourist clientele and therefore very worthwhile benefits for fishing guides (direct benefits) and the community as a whole (indirect benefits). Further study of the resource and the introduction of a participatory management plan will be necessary before Aitutaki bonefish fly-fishing opportunities can be marketed.

Sport fishing using casting and jigging techniques outside the lagoon could be developed to supplement the gear currently in use, which basically involves trolling around FADs. Dogtooth tuna seem to be abundant and large, making them potentially attractive to 'trophy' fishermen specialising in jigging. The dogtooth tuna is not, as its name might suggest, a migratory species. It does not move around much and the biggest specimens must be very old. This fish is sensitive to intensive fishing effort so catch and release should be the method of choice to avoid depleting the resource.

The Aitutaki lagoon is an ideal venue for ultralight and light casting methods, which can be done on foot along the beaches of the main island and the 'motu', or aboard light craft or even from a fishing kayak.

In summary, the following sport fishing activities are suggested for Aitutaki:

A. Fly-fishing for bonefish

Target species: bonefish, bluefin trevally, brassy trevally.

Suggested fishing effort: to be defined after a comprehensive resource assessment.

Clientele: specialist fishers all year round but also during the best fishing season, which has yet to be defined.

B. Jigging on the outer reef slope and around FADs

Target species: dogtooth tuna, yellowfin tuna.

Suggested fishing effort: two or three operators.

Clientele: tourists and specialist fishers all year round.

C. Medium to heavy casting along the barrier reef, near the passages and around FADs

Target species: giant trevally, bluefin trevally, emperor, yellowfin tuna, wahoo.

Lures used: poppers, stickbaits, swimming fish lures, softbaits.

Suggested fishing effort: two or three operators.

Clientele: tourists all year round.

D. Light casting in the lagoon

Target species: brassy trevally, bluefin trevally, emperor, small grouper.

Lures used: small metal spoons, small poppers and stickbaits, softbaits.

Suggested fishing effort: two or three operators initially, on foot guiding or on-board guiding (light craft or fishing kayaks), guiding also possible from beaches and 'motu'.

Clientele: tourists all year round.

Action plans for the development of sport fishing in Cook Islands

In this section, we suggest actions that could be taken by institutions and fishers interested in the development of sport fishing in Cook Islands. As far as possible, the suggested action is accompanied by an approximate budget, sometimes given in more detail in an annex (III to VI). A possible chronological order is put forward. For clarity, the action plans for developing (a) bonefish fly-fishing and (b) other sport fishing techniques are presented separately. A summarized version of the action plans is presented in Annex VII.

A. Bonefish

1. Resource assessment and development of a management plan for bonefish fishing

Method:

The study will be carried out jointly by SPC, MMR, local fishers and a specialist in bonefish fishing and tourism. The management plan will be prepared in a participatory manner (also involving other tourism service providers) after the resource study has been completed. Amongst other things, it should accurately define fishing zones and periods, the potential number of local guides and the role of other lagoon and resource users (tourism service providers and fishers).

Cost:

SPC would fund the participation of its own staff in this work. The cost of involving an international tour operator specialising in bonefish fly-fishing is estimated at NZ \$14,450. A detailed budget is given in Annex III.

2. Training prospective fly-fishing guides

Method:

Training will be provided by the bonefish fishing specialist, at the same time as the resource assessment referred to in item 1 of the action plan. The specialist will explore suitable fishing grounds (flats) with future local guides who will need to be previously identified by local officials, preferably from the group of fishers currently using gillnets. In the absence of accurate resource information, it would be preferable to initially restrict the number of guides to three or four.

Cost:

Daily allowances payable to training participants have yet to be defined. The cost of the bonefish fishing specialist is included in the budget in item 1 of the action plan.

3. Coordination and monitoring of bonefish fly-fishing and subsistence fishing activities

Method:

If the guiding activity develops on Aitutaki, there would be merit in establishing an association of bonefish fishing guides, preferably with a part-time executive officer. This person would be responsible for coordinating bookings and communicating with clients (or international tour operators), hotel owners and fishing guides. Another recommendation is to identify a person to be responsible for monitoring bonefish fishing within the community to ensure that the rules laid down in the management plan are being followed. This person would be the contact point between the guides, net fishers, MMR and local government.

Cost:

Through the DEVFISH project, SPC could assist in establishing a fishing guides' association. Ultimately, the position of executive officer would have to be jointly funded by the service providers involved in bonefish tourism. With regard to monitoring bonefish subsistence fishing in the community, this role could be included in the duties of an existing position within the local government.

4. Marketing Aitutaki bonefish fly-fishing

Method:

International tour operators will be invited to Aitutaki to test bonefish fly-fishing, the standard of local guides and the quality of the accommodation. This step in the process will make it possible to advertise Aitutaki as a destination in the world of saltwater fly-fishing. The tour operators should only be invited after the first three stages of the action plan have been completed to ensure that they are hosted under the most favourable conditions possible. The fly-fishing guides association could also set up a website to promote and market its members' services.

Cost:

The cost will need to be negotiated on a case-by-case basis with tour operators interested in an exploratory visit to Aitutaki. Services such as accommodation and guiding could be offered free of charge to tour operators, but the cost of air fares would be their responsibility. The Cook Islands Tourism Corporation, whose main responsibility is to promote tourism in Cook Islands, could be approached to assist in organising and funding such visits.

Advice on the management of bonefish fishing activities

- Inform net fishermen of the destructive impact of some of their practices and of the potential offered by bonefish fly-fishing in terms of income, tourism development and jobs.
- Review and ensure compliance with local legislation on net fishing.
- Protect the bonefish during the reproduction period;
- Encourage tourism service providers/boat operators to avoid bonefish fishing areas.

B. Casting and jigging

1. Multidisciplinary training for sport fishing guides specialising in casting and jigging

Method:

The purpose of this training is to prepare guides for a commercial sport fishing activity. An introductory course comprising a first aid certificate, small enterprise management, hospitality and tourism skills and safety at sea will be organised on Rarotonga, where there are suitable training agencies. The role of MMR will be to coordinate the development of a multidisciplinary training module with these various bodies. To facilitate participation by aspiring guides, the training programme and its delivery will need to be adapted to the local context and fit with participants' other commitments. After this first stage, practical training in casting and jigging fishing techniques will be organised by a professional fishing guide. This one-week course will include tackle use and maintenance, the preparation and supervision of a guided trip, and some sea fishing trips around FADs, along the barrier reef and inside the lagoon. Ultralight, light, medium and heavy casting techniques and the jigging method will be used and the fish caught will be released. The total number of participants should be limited to six (three from each island) with candidates being selected by the Ministry on the basis of professional experience, ability and motivation.

Cost:

The total cost of this training has yet to be estimated. It will depend on a number of factors including the duration of the multidisciplinary module, the fees requested by training agencies, the number of participants and their attendance allowances and whether or not participants from Aitutaki attend the training module on casting and jigging (this module could also be delivered on the island). The cost of the one-week casting and jigging training module is estimated at NZ \$13,600. This cost includes the outlay associated with the trainer and the purchase of fishing tackle and fuel for the boats. A detailed budget is given in Annex IV.

2. Demonstration 'casting and jigging' gear and tackle for local fishing guides

Method:

Although most sport fishing enthusiasts travel with their own equipment (rods, reels and lures), some are reluctant to do so and expect local guides to supply gear suitable for local conditions and species. Occasional fishing tourists, who currently account for the majority of clients in Cook Islands, also tend to use the equipment found on board the boat. Casting and jigging equipment is expensive and virtually non-existent on Rarotonga. MMR could acquire a few sets of rods, reels and lures. This equipment could be rented out on a daily basis to guides who have completed the training described in item 1 and who wish to diversify their sport fishing activity. One set of gear and tackle for each type of fishing should be made available on Aitutaki under the control of AMRC staff.

Cost:

The approximate cost of the equipment recommended for light casting (three sets of rods and reels), medium casting (two sets of rods and reels) and heavy casting (combining casting and jigging: two sets of rods and reels) is NZ \$17,940. Detailed costs of the various kinds of fishing gear and tackle involved are given in Annex VI.

3. Upgrading local sport fishing boats

Many of the boats specialising in big game fishing are equipped with the electronic safety equipment required for sport fishing tourism. However, some boats, particularly the 'poti marara', are underequipped from this point of view. The operators concerned should therefore invest in safety equipment that meets the latest small boat safety regulations (these are currently being reviewed). Some operators may also choose to fit their vessel with a high-quality echo sounder, which will make it much easier to undertake jigging activities. The

purchase of rod harnesses, gloves and rod holders would also be required for some of the boats.

4. Creating a communication network and monitoring 'casting and jigging'

Method:

An informal network already exists through the good relations that the MMR maintains with charter operators. The Friday night gatherings on the deck at the ministry help keep up a close bond between fishers and MMR officers and ensure a continuous two-way flow of information. A slightly more formal network, in the form of an email network or Internet discussion group, could be set up by the ministry. This would make it possible to involve all sport fishing tourism development partners, including hoteliers, the Cook Islands Tourism Corporation, the Fishing Club of Rarotonga and of course the MMR and charter operators.

On Aitutaki, if casting and jigging develop, the MMR, through the AMRC, could assist local casting and jigging guides and monitor the guiding activity as it already does with tuna fishers. To ensure the effectiveness of this supervision, it is suggested that the manager of AMRC be sent on a training attachment with a professional fishing guide overseas.

Cost:

The cost of sport fishing training over a two-week period for the AMRC manager is estimated at NZ \$5,250. A detailed budget is given in Annex V.

5. Marketing of 'casting and jigging'

Method:

In the same way as suggested for Aitutaki bonefish fly-fishing, when the trained guides have obtained some experience with these new fishing methods and have obtained the necessary high-quality equipment, overseas tour operators could be invited to Cook Islands. In contrast to bonefish fly-fishing, which could prove popular with fishers from as far afield as Europe, it is likely that casting and jigging will mainly interest fishers from the Pacific region, particularly from New Zealand and Australia and possibly from Hawaii and the west coast of the USA. The main tour operators in these countries could be invited to Cook Islands to test and possibly promote this new fishing destination. The presence of contrasting fishing venues on Rarotonga and Aitutaki might make it possible to offer operators multi-themed fishing trips. For example, one trip could combine various opportunities such as trolling around FADs, ultralight casting in Muri lagoon, and fishing for black trevally off Rarotonga using medium jigging gear, and for large dogtooth tuna off Aitutaki using heavy jigging. Promotion of these sport fishing opportunities could also be done by hotel owners and the local tourism office.

Advice on the management of jigging and casting guiding activities

- Gradually develop the guiding activities so as to avoid overfishing the best grounds (passages, points) and depleting the resource.
- Promote the catch and release concept and inform or train guides in best practices for the handling and releasing of catches (landing, hook release, piercing the swim bladder, returning the fish to the water, etc.).
- Avoid excessive targeting of large dogtooth tuna and apply best handling and releasing practices due to the fragility of this resource.
- Keep the community informed about the development of sport fishing, especially if activities are authorised in 'raui'.

Conclusion

This study showed that Cook Islands has potential for diversification of sport fishing opportunities on Rarotonga and their development on Aitutaki. The study also found that there is a shared commitment to development both within political circles and by players in the fisheries and tourism sectors.

On Rarotonga, current activities focus on big game fishing around FADs. These could be diversified to include other opportunities such as ultralight casting in Muri lagoon and medium and heavy casting and jigging close to reef passages, on the outer reef slope and around FADs. These opportunities would supplement trolling around FADs which, although possible all year round, depends on target species that are present only intermittently. The small area of the fishing grounds around Rarotonga means that the precautionary principle should be applied; that is, these fishing techniques should be applied sparingly, with the use of catch and release techniques and limits on the number of local guides.

On Aitutaki, a large lagoon and very extensive barrier reef open up prospects for developing casting (in and beyond the lagoon) and jigging techniques. The presence of large dogtooth tuna suggests that the destination could be a very attractive one for jigging specialists.

The bonefish could become the iconic fish for Cook Islands sport fishing. However, before that can happen, a further assessment of the bonefish resource, identification and training of local guides and the introduction of a management plan for resource and guiding activities will be required.

Close cooperation between MMR and the Cook Islands Tourism Corporation will be needed to successfully implement this ambitious project for developing sport fishing tourism in Cook Islands.

COOK ISLANDS FISHING CHARTER OPERATORS

As of April 2009 (may not include all operators or details)

On Rarotonga

- “Seafari Charters” = BGF* on board 34’ MV Seafari
(contact Jason and Sunshine, phone: 55096, 55698, www.seafari.co.ck)
- “Vakatini Marine Charters” = BGF on board 40’ FV Delano
(contact Junior, phone: 72630, delano@oyster.net.ck)
- “Akura Charters” = BGF on board 50’ FV Akura
(contact George, phone: 54355, fax: 24446, fish@akura.co.ck)
- “Pacific Marine Charters” = BGF on board 31’ FV Reel Time
(contact Wayne, phone: 55239, 21237, fax: 25237, pacmarine@cookislands.co.ck)
- “SeaHunter Deep Sea Fishing Charters” = BGF
- “Raro Sport Fishing Tours” = BGF on board 27’ Blackwatch
(contact Brad, phone: 55388)
- Steven Kavana (Moko) = small-scale BGF and some bottom-fishing from a 7.5m Stabicraft
- Pupuke Robati Jnr = small-scale BGF and some bottom fishing from a modified ‘poti-marara’ (flyingfish boat), phone: 54475)
- Teariki Buckley = small-scale BGF and some bottom fishing from a modified ‘poti-marara’
- Ina Kaikura = small-scale BGF and some bottom fishing

On Aitutaki

- “Baxter’s Fishing Charters” = BGF, livebait fishing at FAD and some casting/jigging on the outer reef from a 10m longliner
(contact Clive, John or Mark, phone: 31025, 31088, email baxter@aitutaki.net.ck, www.baxterfishing.com)
- “Aitutaki Sea Charters” = BGF on board 10m Boatmaster, FV Foxy Lady III
(contact Jason, phone: 31281, 50934, deepsea@aitutaki.net.ck)
- “Black Pearl Fishing Charters” = BGF, lagoon tours, snorkeling outside reef, deep blue spearfishing
(contact Mike Tekotia)
- “Aitutaki Blue Lagoon Flyfishing” = flyfishing for bonefish
(contact: Leon Butch)
- “Jubilee Reu Flyfishing” = flyfishing for bonefish
(contact Jubilee Reu)

* BGF = big game fishing

DETAILS OF FISHING TRIPS UNDERTAKEN DURING STUDY

On Rarotonga

Trip#1: 14 April 09, afternoon, full moon +4

Ultralight casting in **Muri lagoon** (from the beach)

First location: ¾ h; 1 island trevally, 2 cornetfish, 2 labrids, 1 cod (*C. argus*)

Second location: ½ h; 7 island trevallies, 1 goatfish, 1 cornetfish, 1 triggerfish

Trip#2: 15 April 09, morning, full moon +5

Trolling at FADs: 3½ h; no fish caught, one big strike

Heavy casting on outer reef, near passages: 1½ h; 1 bluefin trevally (3kg), 1 dogtooth tuna (1 kg)

Trip#3: 17 April 09, morning, last quarter -1

Ultralight casting in **Muri lagoon** (from small kayaks): 2 h; 7 brassy trevallies, 2 goatfish, 2 triggerfish, 1 cornetfish

Trip#4: 17 April 09, afternoon, last quarter -1

Offshore trolling, jigging and medium/heavy casting on outer reef: 2 h; 2 dogtooth tuna (1 kg each), few missed strikes

Trip#5: 18 April 09, morning, last quarter

Offshore trolling at FADs: 1 ½ h; 1 yellowfin tuna (3 kg)

Medium/heavy casting on outer reef: 1 h; 1 mackerel tuna (1 kg)

Jigging on outer reef slope: 1 h; 3 dogtooth tuna (1 kg each), 1 dogtooth tuna (4 kg)

DETAILS OF FISHING TRIPS UNDERTAKEN DURING STUDY

On Aitutaki

Trip#1: 19 April 09, morning, last quarter +1

East side

Offshore trolling/jigging at FADs: 2h; no fish caught

Medium/heavy casting on outer reef, near passages: 2 h; 1 cod (*C. argus*) 1 kg, 1 bluefin trevally (3 kg), 1 yellowlip emperor (*L. xanthochilus*) (4 kg)

Trip#2: 19 April 09, afternoon, last quarter +1

AMRC

Ultralight casting from AMRC beach: 1½ h; 10 cod (*E. merra*), 5 snapper (*L. fulvus*), 1 emperor (*Lethrinus* sp.), 1 goatfish, 1 triggerfish, 1 brassy trevally (2 kg)

Trip#3: 20 April 09, afternoon, last quarter +2

Papau pass

Medium/heavy casting on outer reef: ¼ h; strike giant trevally

Jigging on outer reef slope: 2 h; 2 dogtooth tuna (3 kg, 6 kg), 1 giant trevally (10 kg), 2 cod (*C. argus* - 0.5 kg, 1.5 kg), 1 triggerfish, 1 red-mouth emperor (*L. miniatus* - 2.5 kg), 1 small-tooth job fish (*Aphareus furca* - 1 kg)

Trip#4 21 April 09, morning, last quarter +3

East side and south-east point

Offshore trolling at FAD: ¾ h; 6 yellowfin tuna (3-4 kg each)

Jigging on outer reef slope (**Shark Point**): 2h; 1 cod (*C. argus* – 0.5 kg), 1 lyre-tail grouper (*Variola louti* – 2 kg), 4 strikes of massive dogtooth tuna

Trip#5 21 April 09, afternoon, last quarter +3

East lagoon

Ultralight casting in lagoon (from boat): 1 ½ h; 1 brassy trevally (2 kg), 2 snappers (*L. fulvus*)

Trip#6 22 April 09, morning, last quarter +4

South-west side

Offshore trolling at FAD: 1 h; 3 yellowfin tuna (3 kg each)
Heavy casting on outer reef: 1 h; 1 bluefin trevally (7 kg)
Jigging on outer reef slope: ½ h; 1 lyre-tail grouper (1 kg)

Trip#7 22 April, afternoon, last quarter +4

East lagoon flats

Bonefish exploratory trip (wading) + light casting: 2 h; spotted 3 large bonefish plus one school of 8-10 smaller fish; 1 brassy trevally (4 kg)

Trip#8 23 April 09, morning, new moon -2

Northern point

Trolling: 1 ½ h; 4 yellowfin tuna (6 kg, 6 kg, 7 kg, 20 kg), 1 wahoo (6 kg)
Jigging: ½ h; 1 yellowfin tuna (10 kg), 1 wahoo (6 kg), 1 lyre-tail grouper (1 kg), 1 small-tooth jobfish (0.5 kg)

Trip#9 23 April 09, afternoon, new moon -2

Northern point

Trolling: ¾ h; no fish (big strike, wahoo?)
Jigging on outer reef slope: ¼ h; 1 dogtooth tuna (15 kg)

Trip #10 24 April 09, morning, new moon -1

Northern point

Trolling: ¾ h; no fish (big strike, large yellowfin tuna?)
Jigging on outer reef slope: 1 cod (1 kg), 1 small-tooth jobfish (0.5 kg), 1 yellowfin tuna (6 kg)

Trip#11 24 April 09, morning, new moon -1

South-west lagoon flats (near MMR clam broodstock area)

Bonefish exploratory trip (wading) + light casting: 2 h; spotted half a dozen bonefish, 8-10 smaller fish; 1 island trevally, 1 emperor

RESOURCE ASSESSMENT & 'BONEFISH' MANAGEMENT PLAN
(BUDGET in NZ\$)

- Visit by an international bonefish fly-fishing specialist (2 weeks) \$14,450
 - 1. Airfare 4,000
 - 2. Per diem 3,450
 - 3. Fee 7,000
- In-country assignment for two SPC staff \$13,000

“CASTING & JIGGING” GUIDES TRAINING
(BUDGET in NZ\$)

- Visit by sport fishing guide/trainer (1 week) \$10,600
 - 1. Airfare \$3,000
 - 2. Per diem \$2,000
 - 3. Fee \$5,600
- Consumables (gear and tackle) \$2,000
- Fuel for fishing trips \$1,000
- Multidisciplinary training module (to be negotiated by MMR) (to be negotiated by MMR)

“CASTING & JIGGING” TRAINING ATTACHMENT FOR AMRC STAFF
(BUDGET in NZ\$)

- Attachment to a commercial sport fishing operator (2 weeks) \$5,250
 - 1. Airfare \$3,000
 - 2. Per diem \$2,250

EXAMPLES OF ASSORTED SPORT FISHING GEAR SETS & TACKLE (BUDGETs in NZ\$)

1. Light casting for lagoon fishing (3 rod/reel sets): \$3,430

BRAND	Item/Model	Specs	Unit price	Quantity	Total price
ILLEX	Ashura Shooting rod		200	3	600*
DAIWA	Catalina 2500 reel		300	3	900*
ILLEX	Stickbait lure (surface)		35	12	420
	Spinnerbait lure (sinking)		17	20	340
	Sofbait (pack)		17	20	340
SMITH	Split rings	10 lbs	1.5	100	150
		20 lbs	1.5	100	150
OWNER	Treble hooks ST 56 et 66 (pack)	n° 4	10	5	50
		n° 2	10	5	50
		n° 1/0	13	5	65
STREN	Braided line (spool)	15/100 1200 m	240	1	240
Fisherman	Shock leader	20 lbs	20	1	20
		40 lbs	30	1	30
ILLEX	Split ring pliers		75	1	75
TOTAL					\$ 3,430

*Suitable but less durable rods and reels for light casting can be obtained for about half the above listed prices.

2. Medium casting/jigging for outer reef (2 rod/reel sets): **\$5,090**

BRAND	Item/model	Specs	Unit price	Quantity	Total price
ILLEX	Ashura Tyrant XH rod		640	2	1,280*
DAIWA	Catalina 4500 reel		810	2	1,620*
ILLEX	Stickbait lure (surface)		35	12	420
	Hard plastic lure (sinking)		35	12	420
	Popper		31	10	310
SMITH	Split rings	60 lbs	1.5	100	150
		100 lbs	1.5	100	150
OWNER	Treble hooks ST 56 et 66 (pack)	n° 4	10	5	50
		n° 2	10	5	50
		n° 1/0	13	5	65
STREN	Braided line	25/100 1200 m	440	1	440
Fisherman	Shock leader	40 lbs	30	1	30
		60 lbs	30	1	30
ILLEX	Split ring pliers		75	1	75
TOTAL					\$5,090

*Suitable but less durable rods and reels for medium casting/jigging can be obtained for about half the above listed prices.

**3. Heavy casting/jigging for outer reef fishing & FAD fishing (2 rod/reel sets):
\$9,418**

BRAND	Item/model	Specs	Unit price	Quantity	Total price
ILLEX	Waiefu (rod)	popping/jigging rod	1,300	2	2,600*
DAIWA	Saltiga Z 6500 GT (reel)	popping/jigging reel	1,800	2	3,600*
STREN	Stealth TY braided line	30/100 (80 lbs) 1200 m	440	1 spool	440
Fisherman	Shock leader	140 lbs (50 m) 200 lbs (50m)	30 34	2 spools 2 spools	60 68
SMITH	Split rings	150 lbs 200 lbs	1.6 1.6	50 100	80 160
OWNER	Treble hooks ST 66 (pack)	n° 3/0 n° 4/0 n° 5/0	16 16 16	5 5 5	80 80 80
Fisherman	Rings	400 lbs	0.6	100	60
ORION	Poppers		60	10	600
Fisherman duel Williamson	Jigs	80 to 300 gr	16	30	480
Berkley	Sofbait (packs)	10 to 15"	16	20	320
Fisherman	Jigging tackle : Assist hooks Swivels	n° 7/0 n° 11/0 200 lbs	2.4 3 2	10 10 10	24 30 20
ILLEX	Tackle bags	Bakkan 33 Bakkan 40	56 60	1 1	56 60
SMITH	Gloves Split ring pliers		80 70	3 1	240 70
Fisherman	Fighting belt		70	3	210
TOTAL					\$9,418

* Suitable but less durable rods and reels for heavy casting/jigging can be obtained for about two thirds of the above listed prices.

SUMMARY OF ACTION PLANS FOR SPORT FISHING DEVELOPMENT IN THE COOK ISLANDS

ACTION	COST	NOTE
BONEFISH FLY-FISHING DEVELOPMENT		
1. Resource assessment and 'bonefish' management plan	\$14,450	SPC to contribute staff inputs. Cost given is for visit by specialist in bonefish fly-fishing tourism. Management plan to be developed in participatory way, i.e. involving all lagoon users.
2. Training of local fly-fishing guides	NA	Specialist training provided as part of action#1 above. Generic training (small business skills, tourism and hospitality, first aid) available in Rarotonga as necessary but costing not included in this table.
3. Coordination and monitoring of bonefish fishing	?	Assistance is possible through the DevFish project for setting-up 'fly-fishing association' . Aitutaki's local government and/or MMR may assist with monitoring of bonefish fishing by allocating human resource.
4. Marketing of Aitutaki bonefish	?	Cost of visits by tour operators will vary. MMR and Cook Islands Tourism Corporation may have to bear these costs initially.
CASTING AND JIGGING DEVELOPMENT		
1. Multidisciplinary training for 'casting and jigging' charter operators	\$13,600	Cost given is for the specialist-skills component of a training programme for 'casting and jigging' charter operators. Generic training (business management, first aid, sea safety, hospitality and tourism) can be delivered by a combination of Rarotonga-based institutions. MMR inputs are required to facilitate the latter.
2. Demonstration 'casting and jigging' gear and tackle	\$17,940	The cost given (indicative only) is for high quality, durable reels and rods, but cheaper equipment is also available. This equipment may be rented by MMR to trained local charter operators. ARMC-Aitutaki to possess and monitor one set of each gear type.
3. Upgrading of fishing boats	variable	Cost will differ for each charter operator. Upgrading of sport fishing boats is the owners' responsibility.
4. Communication network and monitoring of the 'casting and jigging' activity	\$5,250	Setting-up a sport fishing communication network will require a joint commitment and sharing of resources. In Aitutaki, MMR can monitor the activities of 'casting and jigging' charter operators and provide technical support. The cost given is for training one AMRC staff member to carry out this responsibility.
5. Marketing the 'casting and jigging' product	?	Promotion of sport fishing in Cook Islands requires shared efforts from stakeholders including charter operators, hotels, Cook Islands Tourism Corporation and MMR. Visits by international tour operators will assist in promoting the Cook Islands destination.

ILLUSTRATIONS



Fig 1 & 2:
Purpose-made sport fishing “poti-marara” (7 m)



Fig 4: Light casting from a kayak in Muri lagoon (Rarotonga)



Fig 5: Typical big game charter boat from Rarotonga



Fig 3: Avatiu-based wooden ‘poti-marara’ used as small-scale big game charters





Fig 6:
Assortment of large poppers and stickbaits



Fig 7:
Pepe Pepe in action with a 2.4m heavy casting rod



Fig 8:
Blue trevally caught with pink popper (Aitutaki)



Fig 9: Assortment of jigs



Fig 10: Richard Story in action with 1.6m jigging rod



Fig 11: Giant trevally caught with grey jig (Aitutaki)



Fig 12:
Fighting belt and gloves



Fig 13:
Split-ring and de-hooking pliers



Fig 14:
Small tackle boxes



Fig 15:
Brassy trevally caught on light casting rod jig (Rarotonga)



Fig 16:
Yellowfin tuna caught on blue jig in open waters



Fig 17:
Dogtooth on pink



Fig 18:
Doogtooth on jig (Aitutaki)



Fig 19:
Bluefin trevally caught on heavy casting rod (Rarotonga)



Fig 20: Richard and Pepe on the MMR skiff (Aitutaki)