

**NATIONAL PLAN OF ACTION FOR THE CONSERVATION AND
MANAGEMENT OF SHARKS IN THE COOK ISLANDS, 2012
“COOK ISLANDS NPOA-SHARK 2012”**



**MINISTRY OF MARINE RESOURCES
2012**

Executive Summary

The Cook Islands has one of the largest Exclusive Economic Zone areas in the Western Central Pacific Ocean of 2.0 million square kilometres.

The Cook Islands Ministry of Marine Resources (MMR) is responsible for the management, monitoring and research of marine resources. Cook Islands fisheries include tuna longlining within the EEZ and the Western and Central Pacific Fisheries Commission (WCPFC) area, as well as the Eastern Pacific and Indian oceans; and trawling in the Southern Indian Ocean.

Section 1 of this report contains an assessment required by the International Plan of Action (IPOA)-Sharks developed by Food and Agriculture Organization of the United Nation (FAO). This assessment includes information on the Cook Islands marine environment, its fishing fleets and activities, shark species present in the region and their stock status, and fishery management systems and measures implemented by the Cook Islands. It concludes with a set of seven issues to be addressed by the NPOA-Sharks which comprise: 1) measures in support of international listings of shark species of concern; 2) protection of species for which there is regional evidence of population impacts and/or high risk; 3) prevention of shark targeting and excessive bycatch; 4) encouraging full utilisation of dead or damaged sharks caught incidentally; 5) combatting illegal, unreported and unregulated fishing of sharks; 6) eliminating data gaps on shark species composition, catches and survival rates; and 7) continuing to gather information on other human interactions with sharks.

The National Plan of Action (NPOA)-Sharks itself is contained in Section 2. It defines the objective of the Cook Islands in implementing the NPOA-Sharks, in accordance with its Marine Resources Act of 2005, as “seeking and promoting a rational approach, based on scientific evidence and application of the precautionary principle, to the conservation and management of shark resources in order to maintain stocks at sustainable levels and protect the biological diversity of the marine environment”. It then specifies management; monitoring; research and policy development; and education and awareness raising actions to be implemented to fulfil this objective. Key features of the Plan include strict protection of CITES-listed species; protection of reef species through area closures; a list of other species for which retention is prohibited; a ban on shark finning requiring that fins remain naturally attached to the carcass; a prohibition on shark targeting; observer coverage level targets; improved reporting of catch and biological data; establishment of a Shark Advisor; and creation of a portal for shark information sharing on the MMR website.

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1. Shark Assessment Report

1.1. Introduction

Global concern about the impact of fishing activities on sharks is reflected in the development by the Food and Agriculture Organization of the United Nations (FAO) of the International Plan of Action for Conservation and Management of Sharks (IPOA-Sharks¹) and adoption by 47 countries of National Plans of Action (NPOA)-Sharks². The IPOA-Sharks includes provisions calling for:

- States to carry out regular assessment of the status of shark stocks subject to fishing so as to determine if there is a need for development of a National Plan of Action for conservation and management of shark stocks; and
- States to adopt a National Plan of Action for conservation and management of shark stocks if their vessels conduct directed fishing for sharks or if their vessels regularly catch sharks in non-directed fisheries.

The framework for an ecosystem approach to large pelagic fisheries management for the Cook Islands has determined that shark mortality from fishing is a Medium Risk Category Issue which requires consideration of a management response. The basis for this determination is that while shark products are of minor economic value to the Cook Islands, there are national, regional and global concerns about the status of shark stocks and the impacts associated with tuna fisheries. In addition, while the framework considered only fishing within Cook Islands waters, Cook Islands vessels also operate outside Cook Islands waters on the high seas and in waters under the jurisdiction of other states, where there may be additional issues and specific requirements relating to management of fishing activities affecting sharks.

The Western and Central Pacific Commission (WCPFC) first adopted at its December 2006 meeting a Conservation and Management Measure (CMM) for sharks, which among other things resolved that:

“Commission Members, Cooperating Non Members and participating Territories (CCMs) shall implement, as appropriate, the FAO International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks); and CCMs shall advise the Commission (in Part 2 of the annual report) on their implementation of the IPOA-Sharks including, results of their assessment of the need for a National Plan of Action and/or the status of their National Plans of Action for the Conservation and Management of Sharks.”

¹ The IPOA-Sharks uses the term “shark” to refer to all species of sharks, skates, rays and chimaeras (Class Chondrichthyes). The same definition is adopted for this document unless otherwise indicated.

² Fishcher, J., K. Erikstein, B. D’Offay, M. Barone and S. Guggisberg. 2012. Review of the Implementation of the International Plan of Action for the Conservation and Management of Sharks. Fisheries and Aquaculture Circular 1076. FAO, Rome.

While the WCPFC shark CMM was updated in 2008, 2009 and 2010 (the active measure is currently CMM 2010-07), this text has been retained in each version. It should be noted, however, that the language of the measure in the section referring to the NPOA-Sharks implies a voluntary commitment by CCMs rather than a mandatory one.

The Cook Island Ministry of Marine Resources (MMR) produced a draft NPOA-Sharks in 2008 and subsequently updated it based on the results of a public consultation held in June 2012. The NPOA-Sharks is one means of demonstrating the commitment of the Government of the Cook Islands to responsible management and development of its fisheries in general and to shark management and conservation in particular.

1.2. The Cook Islands

The Cook Islands consists of 15 islands that extend over 1,500 km of ocean in a north-south direction (Figure 1). The country is located from 156°-167°W longitude and from 8°-23° S latitude (central Polynesia), and has a 200-mile exclusive economic zone (EEZ) of 1,970,000 km². The 15 islands have a total land area of 237 km². The largest island is Rarotonga (67 km²). The islands of the northern group are coral atolls, as is Manuae in the southern group. The rest of the southern group islands, including Mauke, Mitiaro, Mangaia, and Atiu, are raised islands with encircling reef platforms. Aitutaki is part volcanic island and part atoll, with an enclosed lagoon. Rarotonga is a volcanic island with a narrow fringing reef. The EEZ contains numerous seamounts. The northern EEZ (north of 15°S) is dominated by a large, centrally-located submarine plateau, broadly bounded by the islands of Nassau, Pukapuka, Rakahanga and Manihiki. The plateau rises from a depth of over 4,000 m to approximately 2,000 m. The southern EEZ (south of 15°S) has fewer seamounts, with most of the area comprising water with depths of >3,000 m.

It is thought that the Cook Islands have been populated for approximately 2,000 years, a relatively short period of time compared with many other Pacific islands.

At the end of 2011, the population stood at 19,400 with approximately three-quarters of the population residing on Rarotonga. The Gross Domestic Product (GDP) in 2010 was estimated at NZ\$293 million and GDP per capita of NZ\$15,795. Tourism is the key economic driver with direct receipts accounting for 50% of GDP. Although the country has a relatively vibrant economy the primary dependence on tourism makes it extremely vulnerable to external shocks. The Cook Islands has succeeded in raising the overall standard of living as measured by some of its key social indicators, and is on track to achieve the Millennium Development Goals (MDGs) by 2015

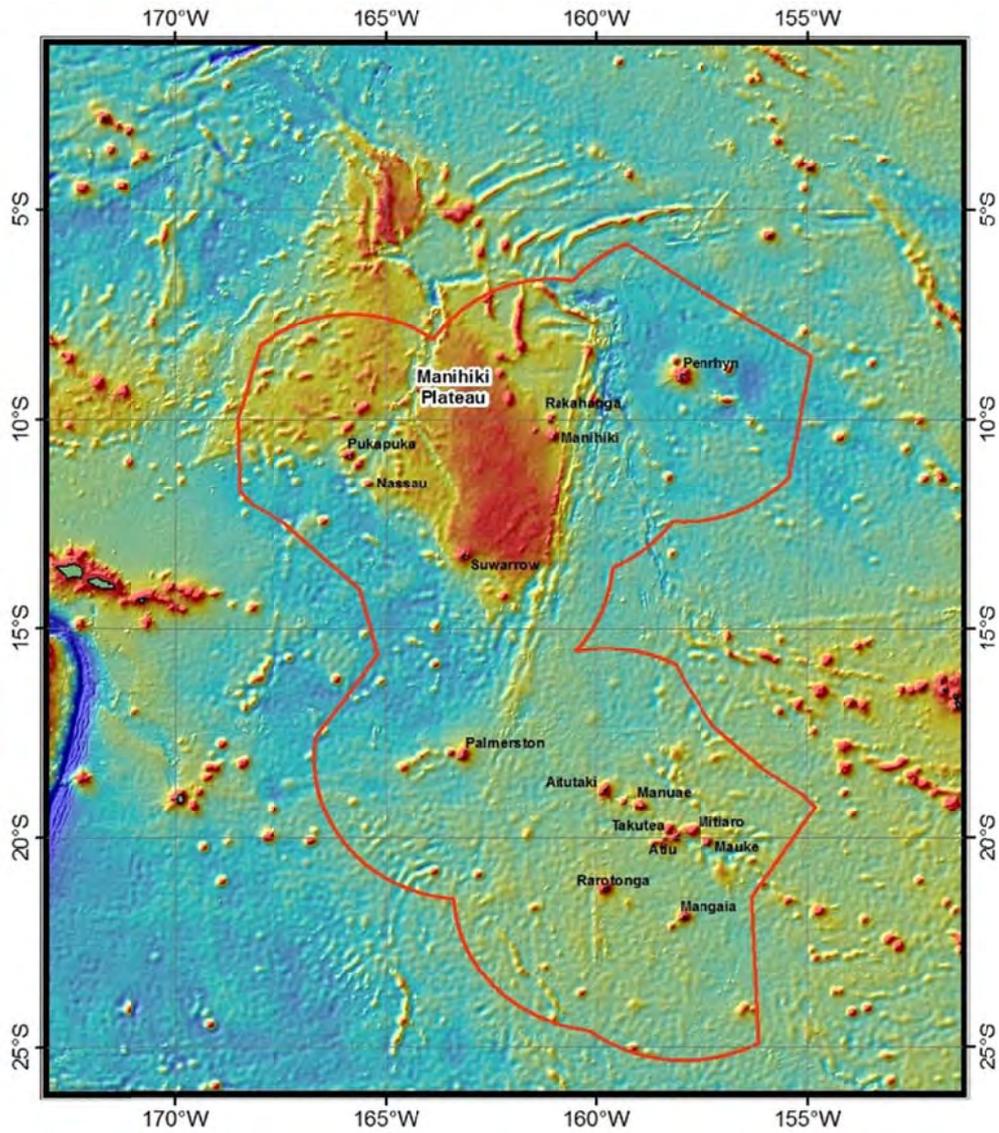


Figure 1. The Cook Islands Exclusive Economic Zone and surrounding national waters and high seas areas.

In the southern group, temperatures range from 16°C in August to 32°C in January with an annual average of 25°C. In the northern atolls, temperatures range from 20°C to 37°C averaging 29°C. Rainfall can vary considerably from year to year, but 200 cm per year is considered normal. Winds are predominantly from the southeast, with average speeds of about 15 km hour⁻¹. Cyclone season in the Cook Islands is from November to April.

Details of the oceanography of the Cook Islands EEZ are provided in National Tuna Fishery Status Reports, the most recent of which was published in 2011³. These reports have revealed that one of the most significant features of the Cook Islands EEZ is its low primary and secondary production relative to the surrounding tropical Pacific Ocean. However, it was found that surface waters in the northeast portion of the Cook Islands EEZ (north of approximately 10°S) become relatively productive during the second and third quarters of some years. This is particularly true in years under the influence of La Niña, due to the extension of the nutrient-rich 'cold tongue' from the upwelling system in the equatorial eastern Pacific. These nutrient rich waters are thought to support the relatively high catch rates of albacore and other fishes in the northern EEZ. However, the influence of the cold-tongue on the productivity of the waters of the northeast Cook Islands EEZ is reduced during strong El Niño periods.

Oceanographic conditions vary widely within the Cook Islands EEZ due to its wide latitudinal range. The northern EEZ is characterized by relatively high sea surface temperatures (SSTs) that display little variation. The northern EEZ is also characterised by a generally westerly flow of water due to the influence of the south equatorial current. Usually, only moderate current flows are reported along a north-south axis. In contrast, the southern areas of the EEZ display stronger seasonality than the northern areas. SSTs show strong seasonal fluctuations between approximately 24°C and 28°C and large differences in water temperatures at the surface and at depths greater than 150 m. In contrast to the northern EEZ, the southern EEZ typically displays easterly current flows due to the influence of the south tropical counter current. Similar to the northern EEZ, north-south current flow is generally weak.

1.3. Characterization of the Fisheries

1.3.1. Cook Islands EEZ Longline Fishery

Fleet Development

The fleets from the distant water fishing nations (DWFNs) of Japan, Korea and Taiwan fished in the vicinity of most Pacific Island countries and territories before the implementation of the United Nations Law of the Sea (UNCLOS) and the 200 nautical mile EEZs. From 1972 to 1976 DWFN fleets set an average of 3.5 million hooks annually in the vicinity of the Cook Islands and had an average annual catch of just over 2,000 t. The average catch per unit effort (CPUE) for these years was 58 kg per 100 hooks. Most of this catch was albacore tuna, followed by yellowfin and bigeye tuna. Only a small proportion of the catch was swordfish.

The Cook Islands domestic longline fishery began in 1994, with foreign fishing vessels licensed to local operators who were involved in joint venture partnerships with foreign partners. Vessels licensed in 1994–1997 were based in Rarotonga and fished almost exclusively in the southern group. From 1998 onwards the fishing fleet consisted mainly of foreign fishing vessels based in

³ OFP/MMR (Oceanic Fisheries Programme/Ministry of Marine Resources). 2011. Cook Islands - National Tuna Fisheries Status Report No. 24. Secretariat of the Pacific Community, Nouméa, New Caledonia.

Pago Pago, American Samoa, that targeted albacore for the canneries and fished almost exclusively in the northern group (north of 15°S).

In 2000, the Government of the Cook Islands put a halt to all fishing operations within the EEZ and implemented legislation to develop the domestic longline fleet. The fishery was re-opened in 2001. Several shore-based packing and processing operations opened up in Rarotonga in the early 2000s as well. The fleet grew considerably from only 4 licensed vessels in 2001 to 17 vessels in 2002 and 51 vessels in 2003. However, in 2004 the fleet began to decline from 40 vessels licensed in 2004, 27 in 2005 and 30 in 2006. Much of the decline was due to the Rarotonga based longliners abandoning fishing in the southern waters due to strong seasonality of catch. Since 2009 there has been a consistent increase in catch landed. The main target species is albacore tuna which is sourced for the cannery in Pago Pago.

In 2010 the MMR has launched an exploratory fishing program to diversify its fishery and target the big eye tuna and swordfish. These vessels are prohibited from targeting sharks as a condition of their one-year permits.

The MMR has a cap of 50 vessels licensed to fish inside the EEZ of the Cook Islands under the designated longline fishery and twenty fishing vessels authorised to fish under the exploratory fishery. All Cook Islands flagged fishing vessels are authorised to fish on the high seas.

Catches and Catch Rates

Longline catches from the Cook Islands EEZ have been highly variable among years since 1990 (Figure 2) and correspond to variations in total effort. Total catches from the EEZ did not exceed 1,000 t prior to 2002, although logsheet coverage rates were uncertain for this period and catches are likely to be underestimated. Since 2002, estimated annual catches increased and reached 6,000 t in 2009. Highest catches have been reported from the northern EEZ.

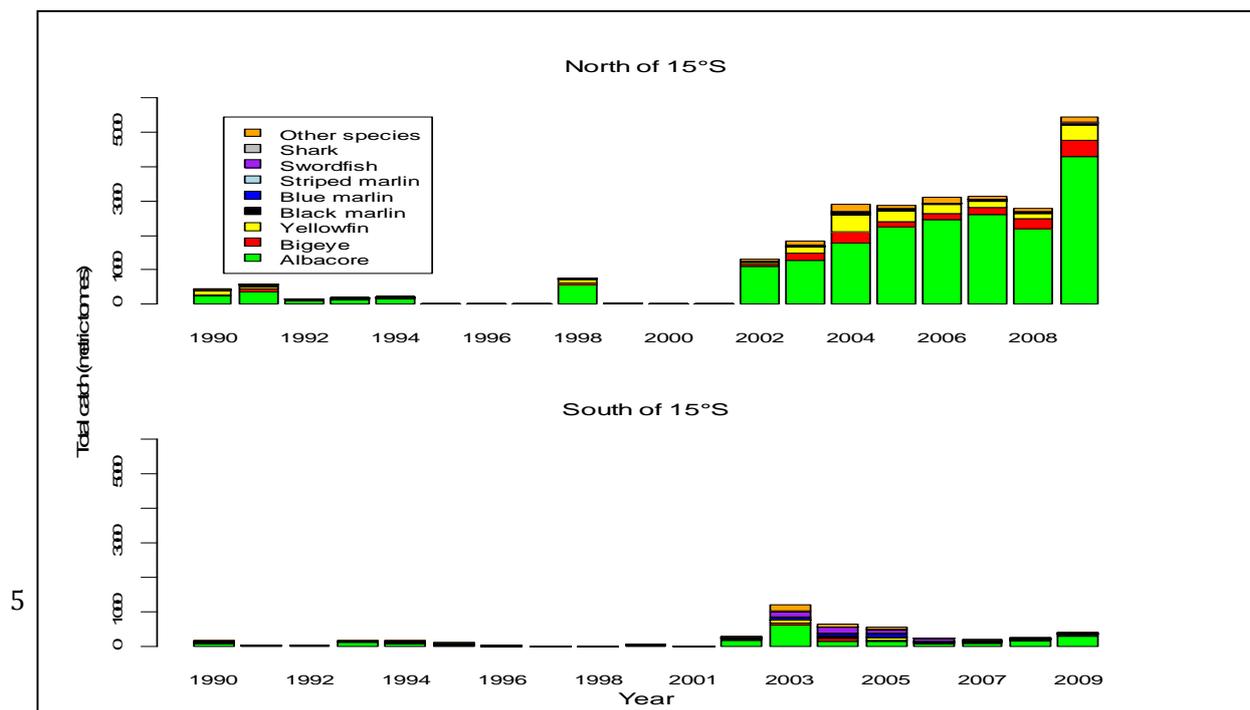


Figure 2. Estimates of catches (t) by the longline fishery in the Cook Islands EEZ, 1990–2009 (based on logsheet data held by SPC). Estimates are based on unraised logsheet data. (Source: OFP/MMR (2011))

Catches by the longline fishery in both the northern and southern EEZ have been dominated by albacore tuna (60-80% since 2002) regardless of the total level of catches. Bigeye and yellowfin tuna have represented a much smaller proportion of longline catches, each accounting for approximately 10% of total catches since 2002, and mostly reported from the northern EEZ. Catches of other species accounted for less than 10% of total longline catches in the northern and southern EEZ. Total shark catches as reported on logsheets are shown in Table 1.

Table 1. Shark catch in the Cook Islands EEZ as reported on logsheets by all vessels 2002-2006. (Source: OFP/MMR (2011))

	Hundred Hooks	T	Number	Kg per hundred hooks	Number per hundred hooks
2002	7,978.81	6.65	185	0.83	0.023
2003	39,260.93	42.99	1,406	1.09	0.036
2004	37,184.43	27.22	1,088	0.73	0.029
2005	25,936.37	26.18	779	1.01	0.030
2006	30,348.07	3.304	109	0.11	0.003

Observers were placed on a total of 17 trips and observed 131 sets operating in the Cook Islands EEZ between 1995-1996 and 2002-2008 (there were no observers deployed between 1996 and 2002). A total of 43 taxa were reported by observers between 1995 and 2008 including ten shark and ray species (Table 2). Overall, albacore (>70%), yellowfin (<5%), bigeye (<5%) and wahoo (2%) were the major species reported; all shark and ray species represented <1% of the catch. This contrasts with recent estimates for the WCPO as a whole which found that in longline fisheries shark and ray species represent approximately 30% of the catch⁴.

Table 2. Summary of catches of shark and ray species reported by observers on domestic longline vessels in the Cook Islands EEZ, 1995–2008 based on observer data held by SPC. Observer data were from 17 trips representing 131 sets and 234,309 hooks. (Source: OFP/MMR (2011))

Species	Number Observed	Proportion of Total (%)	Proportion Retained (%)	Proportion Alive at Haulback (%)
Longfin mako (<i>Isurus paucus</i>)	53	0.98	58	87
Blue (<i>Prionace glauca</i>)	43	0.79	23	84
Shark (unidentified)	35	0.64	26	87
Oceanic Whitetip (<i>Carcharhinus longimanus</i>)	20	0.37	21	68
Pelagic thresher (<i>Alopias pelagicus</i>)	16	0.29	0	88
Pelagic stingray (<i>Pteroplatytrygon violacea</i>)	6	0.11	0	100
Silky (<i>Carcharhinus falciformis</i>)	4	0.07	0	100
Shortfin mako (<i>Isurus oxyrinchus</i>)	3	0.06	67	67

⁴ Clarke, S.C. and Harley, S.J. 2010. A Proposal for a Research Plan to Determine the Status of the Key Shark Species. WCPFC-SC6-2010/EB-WP-01. Accessed online at <http://www.wcpfc.int/node/2950>

Bigeye thresher (<i>Alopias superciliosus</i>)	1	0.02	100	100
Galapagos (<i>Carcharhinus galapagensis</i>)	1	0.02	0	100

There is a large difference in the species composition between the first and second periods of observer data, most likely due to the fact that fishing effort and catch in 1995-1996 was focused in the southern EEZ close to Rarotonga where billfish were targeted, while fishing effort in the 2002-2008 period was focused in the northern EEZ where albacore was the main target species (Figure 3). The larger difference in species composition between logsheet and observer data for the 1995-1996 period is most likely due to the small number of sets (and catch) observed in this period compared with 2002-2008.

Data for other species regularly captured by the longline fishery in the Cook Islands EEZ, including sharks, were limited. Generally catch rates for these species were on the order of <2 kg per hundred hooks, and were higher in the southern EEZ than in the northern EEZ, for all single species groups, especially since 2002. Catch rates of these species also displayed strong seasonal variation, particularly spearfish and other fishes. The greatest spatial extent of high shark catch rates were reported south of 15°S throughout the year (Figure 3). However, up until 2011 all species of sharks were generally reported on logsheets in a single category and any long-term or seasonal trends in catch rate data are likely to be confounded with changes in the species composition of catches. Since 2011, separate reporting for the WCPFC key shark species has been required.

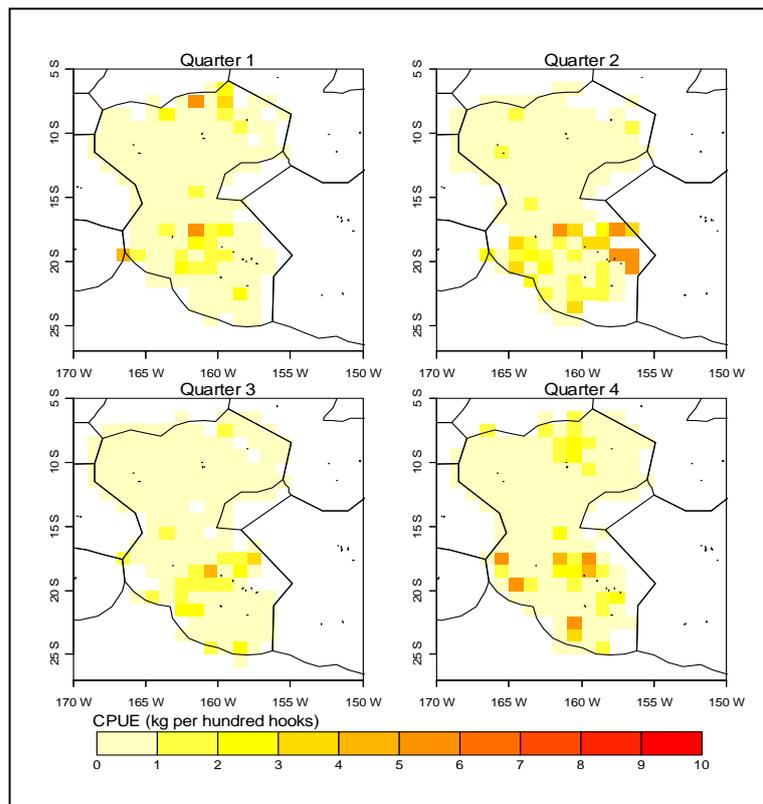


Figure 3. Quarterly shark catch rates (kg per hundred hooks) by the longline fleets in the Cook Islands EEZ, 2002-2009 based on logsheet data held by SPC. (Source: OFP/MMR (2011))

Comparisons between catch rates reported by vessels operating in the Cook Islands EEZ and other fleets operating in other parts of the WCPO were undertaken for the main target species. Catch rates of sharks and rays were too low to allow for valid comparison between areas.

1.3.2. Purse Seine Fishery

Low levels of purse seine effort have been reported in the Cook Islands EEZ, north of 15°S in all years since 1994 by US purse seine vessels operating under the multilateral U.S Fisheries Treaty. The relatively infrequent occurrence of purse seining in the Cook Islands is due to the easterly and southerly position of most of the Cook Islands EEZ, which is away from the main centre of purse seine fishery in the WCPO. Since 1988, purse seine effort in the Cook Islands EEZ has been less than 50 days per year, except in 2002 when there were 221 purse seine fishing days. Total annual purse seine catches in the Cook Islands EEZ have been very low, with the highest annual catch reported in 2002 at nearly 4,000 t. However in 2011 there has been a spike of increased effort in the Cook Islands waters which has yet to be aggregated and reported. Purse seine catches are dominated by skipjack tuna (90%) with yellowfin and bigeye tuna representing around 10% and 1% of catches, respectively. Similar to recent findings for the WCPO as a whole⁵, catches of sharks and rays as reported by observers in purse seine fisheries operating in the Cook Islands EEZ comprise <1% of the total purse seine catch.

1.3.3. Artisanal Fishery

Artisanal fishing is a socially and economically important activity in the nearshore waters in the Cook Islands, yet relatively little is known about the levels of catch and effort in these fisheries. MMR commenced a data collection programme for the artisanal fisheries in 2000. Catch and effort data have been collected for the islands of Aitutaki, Atiu, Mangaia, Manuae, Mauke, Mitiaro, Nassau, Pukapuka, Rakahanga, Rarotonga and Takutea, although the coverage of the data varies between islands and over time. A wide range of gear types, predominantly trolling and droplining, are used by fishers to target tuna and other pelagic species, mostly within 12 nm of the islands. The game fishing charter vessels are mainly limited to Rarotonga and Aitutaki. Although the data is incomplete it is apparent that the species composition of the catch is mainly dominated by yellowfin tuna on all islands (>60% of the total reported catch). The importance of other species varied among islands but no shark or ray species were reported. The MMR has launched a new catch reporting program to collect an accurate analysis of artisanal and game fishing sector.

1.3.4. High Seas and Distant Water Fisheries

Since the mid-1990s Cook Islands flagged fishing vessels have operated beyond Cook Islands waters in the Pacific, Indian and Atlantic oceans. It is amongst the founding members of the

⁵ Clarke and Harley (2010). Op cit.

Western Central Pacific Fisheries Commission (WCPFC) and the South Pacific Regional Fisheries Management Organization (SPRFMO). In addition the Cook Islands is an acceding state to the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), a cooperative non-contracting party to the North East Atlantic Fisheries Convention (NEAFC), and a cooperating non-member to the Inter-American Tropical Tuna Convention (IATTC). The Cook Islands has also submitted its instrument of accession to the South Indian Ocean Fisheries Agreement (SIOFA), which governs the management of deep-sea fisheries in this area. For the near future, it is anticipated that Cook Islands vessels will continue to operate in the WCPFC, SPRFMO, IATTC, IOTC and SIOFA regions and will look to further develop fisheries in the CCAMLR regions.

Some information on Cook Islands-flagged vessels' catches of shark and rays in the South Indian Ocean (the SIOFA area) is available from an FAO-sponsored study of a 49-day trip aboard the F/V Will Watch conducting deepsea "aimed tow" trawling in June-July 2009⁶. This study found that during the observed fishing trip elasmobranch and chimaerid (chondrichthyan) fishes comprised only 0.41% of the total catch, but approximately one-third of the discarded catch. The main chondrichthyan species encountered were New Zealand lanternshark (*Etmopterus baxteri*, 77% of total chondrichthyans), roughskin dogfish (*Centroscyrnus owstoni*, 12%) and *Centroselachus* sp. (possibly *Centroselachus crepidater*, 5%). Other species observed included *Hydrolagus* sp. (possibly pointy nosed blue chimaera, *Hydrolagus trolli*), *Apristurus* sp., *Deania* sp., *Centrophorus* sp., kitefin shark (*Dalatias licha*), McMillan's cat shark (*Parmaturus macmillani*), Plunket shark (*Proscymnodon plunketi*) and velvet dogfish (*Zameus squamulosus*). The total amount of sharks caught over the course of the trip was 4,769 kg representing 2,099 individuals. This study cited crew reports that there are some vessels in the fishery targeting deepwater sharks with gill nets but it is not known whether these are Cook Islands-flagged vessels.

1.3.5. Utilisation of Sharks in the Cook Islands

The Cook Islands does not have a history of fishing for sharks or rays. Even in the developing domestic longline fishery, these species are not targeted and are considered to have no utility if caught, as most Cook Islanders are repelled by the ammonia content of the meat. There is no local or export market for fins nor meat. In the past the only local use of sharks was for the skin to make drums, but even this limited use has been superseded with much easier to obtain goat skin.

As a tourist destination the Cook Islands attracts more than 110,000 visitors annually and as many as 8,000 of these dive on sites around the main islands of Aitutaki and Rarotonga. Sharks and visiting humpback whales are major attractions. In the northern islands, reef sharks are abundant and are treated with respect particularly when in close proximity while spearfishing. Despite the abundance of sharks, particularly in northern island lagoons, attacks are not common. The last reported incident was in 2007 when a shark bit a fisherman holding a string of fish.

⁶ Sanders, J. 2011. Report on bottom trawling in the southern Indian Ocean for orange roughy (*Hoplostethus atlanticus*) F/V Will Watch, Trip 36, June-July 2009. Food and Agriculture Organization, Rome. (Unpublished report)

1.4. Status of Shark Stocks in the Cook Islands

1.4.1. Local Species of Concern

The Cook Islands Biodiversity and Natural Heritage Database lists 23 species of sharks and rays found in Cook Islands waters⁷. In addition to those species listed in Table 2, these species include:

- Nurse shark (*Nebrius ferrugineus*)
- Whale shark (*Rhincodon typus*)
- Silvertip shark (*Carcharhinus albimarginatus*)
- Gray reef shark (*Carcharhinus amblyrhynchos*)
- Blacktip reef shark (*Carcharhinus melanopterus*)
- Tiger shark (*Galeocerdo cuvier*)
- Lemon shark (*Negaprion acutidens*)
- Whitetip reef shark (*Triaenodon obesus*)
- Scalloped hammerhead shark (*Sphyrna lewini*)
- Bluntnose sixgill shark (*Hexanchus griseus*)
- Prickly shark (*Echinorhinus cookei*)
- Cookiecutter shark (*Isistius brasiliensis*)
- Bluespotted stingray (*Dasyatis kuhlii*)
- Pink stingray (*Himantura fai*)
- Giant reef ray (*Taeniura meyeri*)
- Spotted eagle ray (*Aetobatus narinari*), and
- Manta ray (*Manta birostris*)

It is likely that other species of sharks and rays also occur in Cook Islands waters but have not yet been documented. Many of the species listed above are reef-associated or otherwise do not interact with the main commercial fishery in the Cook Islands, i.e. the longline fishery. Of those species which are known to interact with the longline fishery in Cook Islands waters (Table 2), seven of the nine were designated as “key species” by the WCPFC in 2008-2009 and are currently the subject of study under the WCPFC’s Shark Research Plan (blue; shortfin and longfin mako; oceanic whitetip; silky; and pelagic and bigeye thresher sharks). The scalloped hammerhead (listed above) was designated as a WCPFC key species in 2010 but is not currently included in the Shark Research Plan. Assessments of these species in specifically in Cook Islands waters have not been conducted. However, as they are pelagic species, they are wide-ranging and in most cases their stock status can be characterised at the regional level. The following summaries are excerpted from the stock status findings from the WCPFC Shark Research Plan work programme, 2010-2012, with specific

⁷ Accessed online at <http://cookislands.bishopmuseum.org/default.asp>

reference, where possible, to Regions 4 and 6 (the east-central WCPO which encompass the northern and southern portions of the Cook Islands EEZ, respectively)⁸.

1.4.2. Blue Shark

Blue shark is known as one of the most prolific shark species and is distributed throughout the WCPO, including tropical waters. Adult blue sharks are generally found at lower latitudes with higher proportions of juveniles found at higher latitudes. Region-wide catch rate analyses have identified areas off Japan and south of New Zealand as centres of abundance for blue shark (Figure 4). The blue shark is probably the most common, but not the most vulnerable, of pelagic sharks. It was categorized as being at “medium” ecological risk for deep longline sets and “medium-low” ecological risk for shallow longline sets in the Pacific. It is classified by the IUCN Red List as “Near Threatened”.

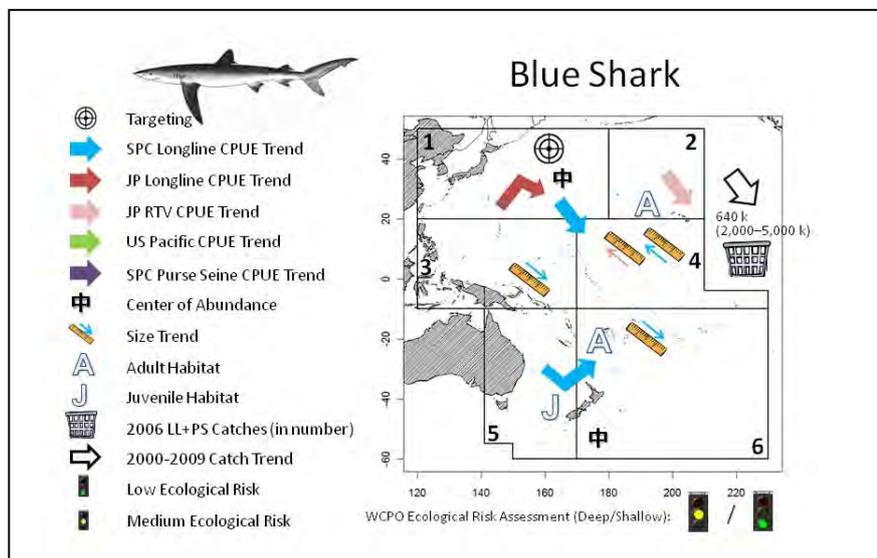


Figure 3. Status snapshot for blue shark (*Prionace glauca*) produced under the WCPFC Shark Research Plan in 2011 (Source: Clarke (2011)).

In the South Pacific blue shark catch per unit effort (CPUE) trends declined until 2003 and then increased to mid 1990s levels. Trends in median sizes were decreasing in some areas but increasing in others. Stock assessments to date, including those using Pacific data through 2002, have not indicated overfishing or an overfished state. However, more recent North Pacific analyses indicate substantial recent catch rate declines in four different datasets, perhaps due to shark targeting in the northwest Pacific, suggesting that the North Pacific stock may no longer be above

⁸ Clarke, S. 2011. A Status Snapshot of Key Shark Species in the Western and Central Pacific and Potential Management Options. WCPFC-SC7-2011/EB-WP-04. Accessed online at <http://www.wcpfc.int/doc/eb-wp-04/status-snapshot-key-shark-species-western-and-central-pacific-and-potential-mitigation->

its maximum sustainable yield biomass level. A South Pacific stock assessment is yet to be conducted under the WCPFC Shark Research Plan.

1.4.3. Mako Sharks

The shortfin mako is found over a similar range as the blue shark but at much lower abundances; the longfin mako is less well-studied but is believed to have a more tropical and offshore distribution. Few adult makos were identified in the North Pacific, and few adult females were identified in the South Pacific. High proportions of juveniles were found in the Tasman Sea with a centre of abundance for the species identified off northeast New Zealand (Figure 5). The shortfin and longfin makos were categorized as being at “medium” ecological risk for both deep and shallow longline sets in the Pacific and are classified by the IUCN Red List as “Vulnerable”.

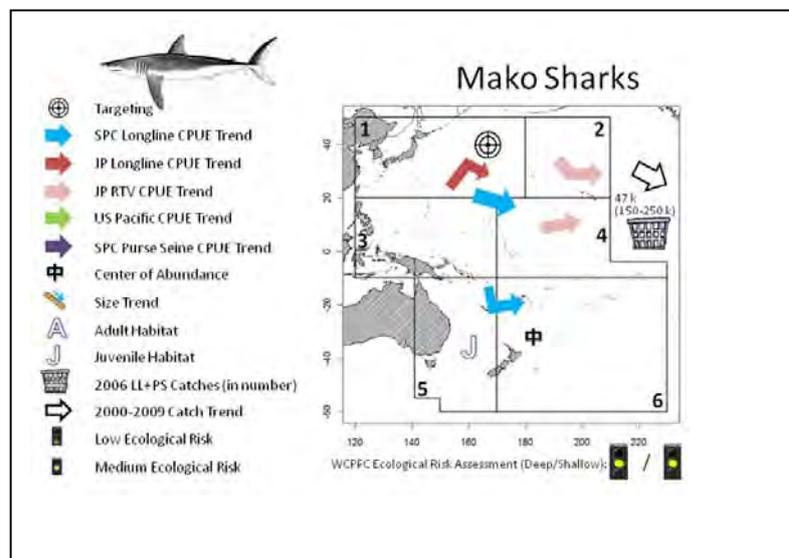


Figure 5. Status snapshot for mako sharks (*Isurus* spp.) produced under the WCPFC Shark Research Plan in 2011 (Source: Clarke (2011)).

Recent abundance indices and median size analyses for shortfin mako in the WCPO have shown no clear trends. The only South Pacific catch rate analysis showed a nearly flat trend in recent years and there were no significant size trends identified for makos. Stock assessment studies for these species in the Pacific are limited but a Northwest Pacific stock assessment based on virtual population analysis found a downward trend in spawning potential ratio and concluded that the stock “might have been overexploited”, recommending a reduction in current fishing effort of 32%. In contrast, other research from the North Pacific suggests that shortfin makos’ productivity may be higher than previously thought. The status of longfin mako stocks is unknown for the WCPO and worldwide.

1.4.4. Oceanic Whitetip Shark

Oceanic whitetip sharks were found to interact with fisheries between 30°N and S latitude with larger individuals, i.e. near or at the length at maturity, taken by the longline fishery and mainly juveniles captured by purse seine gear. Juveniles were usually found in equatorial waters to the west; adults appear to predominate more to the southwest near the identified centre of abundance (10°S, 190°E; Figure 6). This species was categorized as being at “medium” ecological risk for both deep and shallow longline sets in the Pacific. The oceanic whitetip is classified with the makos as “Vulnerable” by the IUCN Red List.

All standardized catch rate trends from longline and purse seine fisheries in the WCPFO were clear, steep and downward with this species rarely recorded after 2005. In addition, all median size trends were declining until samples became too scarce for analysis, and several of these size trends were significant in the core habitat areas. Under the WCPFC Shark Research Plan, a 2012 stock assessment for oceanic whitetip found that biomass had decreased by 86% from 1995 to 2009, and that overfishing is occurring ($F_{\text{current}}/F_{\text{MSY}} = 6.5$) and the stock is in an overfished state ($SB_{\text{current}}/SB_{\text{MSY}} = 0.153$).

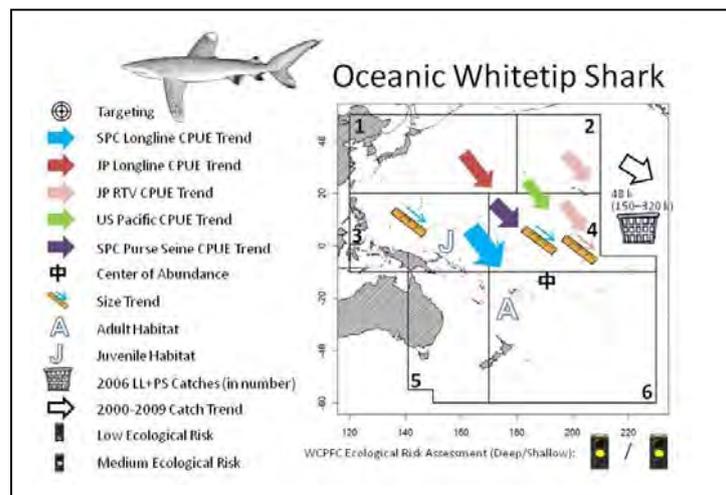


Figure 6. Status snapshot for oceanic whitetip sharks (*Carcharhinus longimanus*) produced under the WCPFC Shark Research Plan in 2011 (Source: Clarke (2011)).

1.4.5. Silky Shark

Silky sharks have a restricted habitat range compared to the other WCPFC key species, mainly between 20°N and S latitude, but within this range they dominate both longline and purse seine catches. Catches of juveniles dominated both gear types. In contrast to oceanic whitetip sharks which also have core habitat in tropical waters, silky sharks’ centre of abundance is located more to

the northwest (0°, 165°E; Figure 7). Silky sharks were categorized as being at “medium” ecological risk for both deep and shallow longline sets in the Pacific. The IUCN Red List ranks silky sharks as “Near Threatened” globally but “Vulnerable” in the eastern central and southeast Pacific.

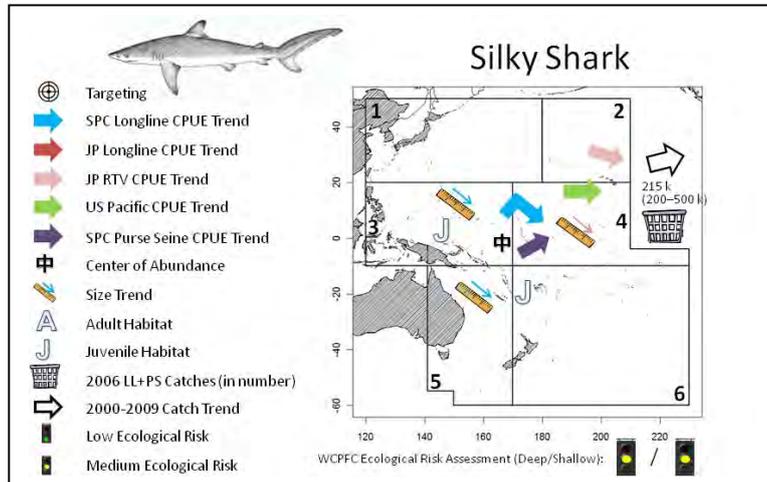


Figure 7. Status snapshot for silky sharks (*Carcharhinus falciformis*) produced under the WCPFC Shark Research Plan in 2011 (Source: Clarke (2011)).

Silky shark catch rates showed no strong trends in any of the longline datasets, but slightly declining trends were noted in recent years. Increasing catch rate trends were identified in standardized purse seine data through 2008. Median lengths were always decreasing and trends were often significant for both sexes in longline and purse seine observer data from the core habitat areas. Preliminary work on a silky shark stock assessment undertaken by IATTC found that standardized catch rates for the Eastern Pacific purse seine floating object sets from 1994-2004 declined by 60-82%. Under the WCPFC Shark Research Plan, a 2012 stock assessment for silky shark found that biomass had decreased by 62% from 1995 to 2009, that overfishing is occurring ($F_{\text{current}}/F_{\text{MSY}} = 6.4$), and the stock is in an overfished state ($SB_{\text{current}}/SB_{\text{MSY}} = 0.66$) though not as severe as that estimated for the oceanic whitetip.

1.4.6. Thresher Shark

The three species in the thresher family have divergent, but not necessarily distinct, distributions and interact with longline fisheries throughout the WCPO. Thresher sharks, mainly bigeye thresher, were most often observed from deep longline sets in east-central areas of the tropical WCPO. High proportions of juveniles were found near the estimated centre of abundance (15°N, 170°E; Figure 8) and few adults were identified in tropical waters. All three threshers were categorized as being at “medium” ecological risk for both deep and shallow longline sets in the Pacific, and by the IUCN Red List as “Vulnerable”.

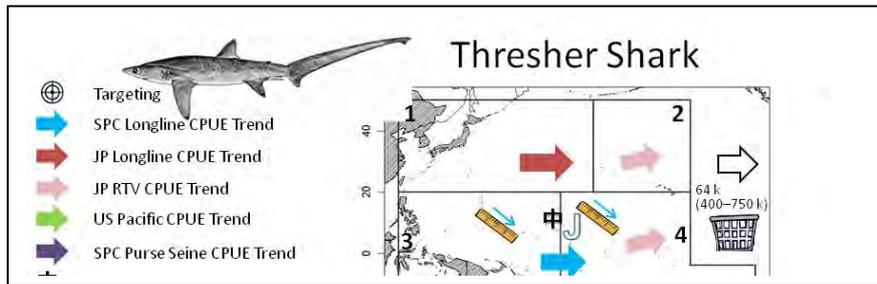


Figure 8. Status snapshot for thresher sharks (*Alopias* spp.) produced under the WCPFC Shark Research Plan in 2011 (Source: Clarke (2011)).

Threshers are poorly studied as a group, and even more poorly known on a species-by-species basis. Nevertheless data limitations including problems with species identification led to grouping these species for analysis. No strong trends in standardized catch rates were found for threshers analysed as a group. Decreasing size trends were identified in tropical regions in two data sets, but while one attributed these to bigeye threshers, the other which analysed both bigeye and pelagic threshers found that only pelagic thresher sizes declined. Two recent studies for the northwest Pacific presented the first integration of thresher life history traits with measures of fishing pressure in the WCPO. The first study used a spawning per recruit analysis to assess pelagic threshers concluding that the stock was slightly over-exploited and a reduction in fishing effort was needed. An update to this study applied a stochastic stage-based model, concluded that the stock is over-exploited and recommended nursery closures and/or size limit management. Further research into better analytical methods, in parallel with species-specific data improvement, was suggested for all three thresher species.

1.4.7. Other Species with Longline Interactions

Little is known about the stock status of the other species recorded as interacting with longline fisheries in the Cook Islands EEZ: pelagic stingray and Galapagos shark (Table 2).

A Regional Plan of Action-Sharks (RPOA-Sharks) prepared for the Forum Fisheries Agency (FFA) in 2009 reports that pelagic stingray comprises 4% of the longline catch in Pacific Island countries and territories⁹. It also cites a study which estimates an increase in catch rates in the north-central Pacific Ocean since the advent of commercial fishing, as well as one which shows a steady decline since the mid 1990s which may be attributable to the fact that this fishery targets waters deeper than the pelagic stingrays' preferred habitat. The IUCN Red List categorizes the pelagic stingray as "Least Concern".

Galapagos sharks appear to be more often reef-associated than pelagic and thus they interact relatively less frequently with longline gear. However, this shark is sometimes confused with the silky shark and thus catch records may reflect species mis-identification. This species is

⁹ Lack, M. and Meere, F. 2009. Pacific Islands Regional Plan of Action for Sharks: Guidance for Pacific Island Countries and Territories on the Conservation and Management of Sharks. Accessed online at <http://www.ffa.int/sharks>

categorized by the IUCN Red List as “Near Threatened” globally, but “Data Deficient” for the southwest Pacific region.

1.4.8. International Species of Concern

There are several systems which identify shark and ray species of concern and highlight the need for their global, regional and local conservation and management. These systems include the Convention on International Trade in Endangered Species (CITES), the Convention on Migratory Species (CMS), and the IUCN Red List. Comparison of shark and ray species listed by these systems and those species observed in the Cook Islands can be used to identify priority species for inclusion in the NPOA-Sharks.

Ten shark and ray species are listed on CITES: the great white (*Carcharodon carcharias*), basking (*Cetorhinus maximus*) and whale (*Rhincodon typus*) sharks on are Appendix II (trade allowed with some conditions) and seven species of sawfishes (rays of the genera *Pristis* and *Anoxypristis*) are listed on Appendices I (no trade allowed) and II¹⁰. Neither the sawfishes nor the basking shark ranges overlap with the Cook Islands EEZ. The whale shark is reported from Cook Islands waters and the great white is not reported but may occur.

Seven shark species are listed on CMS: the three CITES-listed shark species plus shortfin mako (*Isurus oxyrinchus*), longfin mako (*Isurus paucus*), porbeagle (*Lamna nasus*) and spiny dogfish (*Squalus acanthias*)¹¹. As discussed above, of these species only the whale shark, and the shortfin and longfin makos have been observed in Cook Islands waters, but the great white shark may occur here. The known ranges of the basking shark, porbeagle and spiny dogfish are not thought to overlap Cook Islands waters.

There have been 1,083 shark and ray species assessed for the IUCN Red List and of these 181 have been classified in the “threatened” categories of Critically Endangered, Endangered and Vulnerable. According to the FFA’s RPOA-Sharks, two of the Endangered species (great hammerhead (*Sphyrna mokarran*) and scalloped hammerhead), and 16 of the Vulnerable species (basking, bigeye thresher, common thresher (*Alopias vulpinus*), dusky (*Carcharhinus obscurus*), great white, longfin mako, oceanic whitetip, pelagic thresher, porbeagle, sandbar (*Carcharhinus plumbeus*), school (*Galeorhinus galeus*), shortfin mako, smooth hammerhead (*Sphyrna zygaeanus*), spiny dogfish, whale shark and zebra shark (*Stegostoma fasciatum*) have been observed in the WCPO¹². Five of these species have been observed interacting with longline fisheries in the Cook Islands EEZ including bigeye thresher, longfin mako, oceanic whitetip, pelagic thresher and shortfin mako (Table 2). The other species either have not been reported from Cook Islands waters (eleven species), or are found here but have not been observed to interact with longline gear (two species).

¹⁰ <http://www.cites.org/eng/resources/species.html>

¹¹ http://www.cms.int/pdf/en/CMS1_Species_5lng.pdf

¹² Lack and Meere (2009). Op cit.

1.4.9. Species of Concern in Distant Water Fisheries operated by Cook Islands' Vessels

The only distant water fishery for which the species composition of shark catch is known is the small deepwater trawl fishery operating in the SIOFA. Stock status of the species encountered in that fishery is unknown, but deep-sea sharks have particularly low reproductive potential, making them intrinsically vulnerable to overexploitation and population depletion¹³. It is therefore important to continue to gather data on catches and to consider ways of assessing stock status.

1.5. Fishery Management System and Management Measures

1.5.1. Legal and Administrative Framework

Domestic

The conservation, management and development of Cook Islands fisheries is governed by the Ministry of Marine Resources Act of 1984, the Marine Resources Act of 2005, the Marine Resources (Licensing) Regulations 2012, and the Marine Resources (Large Pelagic Longline Fishery) Regulation 2012.

The principal objectives and functions of the Ministry as set out in the Ministry of Marine Resources Act of 1984 are:

- To seek and promote a rational approach to the development, exploitation, management and conservation of all living and non-living resources that are found in waters under Cook Islands jurisdiction, and to exploit such resources in a manner that will ensure maximum benefits accruing to the people of the Cook Islands;
- To increase self-sufficiency in fish and protein production at the household levels;
- To rapidly expand development in areas offering the greatest potential for export or import substitution or both;
- To assess and introduce cost-effective fisheries technology appropriate to the Cook Islands and to ensure that such technological innovations are primarily geared to assist subsistence, artisanal and full-time fishermen;
- To develop the exploitation of marine resources in the Outer Islands that offer opportunities for self-employment thereby raising the standard of living and slowing down emigration;
- To work in close cooperation with those in Government and in the private sector that are involved in the development of marine resources of the Cook Islands.

¹³ Kyne, P.M. and C.A.Simpfendorfer. 2007. A collation and summarization of available data on deepwater chondrichthyans: biodiversity, life history and fisheries. IUCN SSC Shark Specialist Group, 11 April 2011. Accessed online at: <http://www.flmnh.ufl.edu/fish/organizations/SSG/SSG.htm>

The principal objective of the Marine Resources Act of 2005 is to provide for the sustainable use of living and non-living marine resources for the benefit of the people of the Cook Islands. All persons exercising or performing functions, duties or powers provided for in both sets of legislation are required to do so in a manner consistent with the Cook Islands international and regional obligations relating to the conservation and management of living and non-living resources in the fishery waters. Principles established by the Marine Resources Act of 2005 include:

- Decisions should be based on the best scientific evidence available;
- The precautionary approach should be applied;
- Impacts of fishing on non-target species and the marine environment should be minimised; and
- Biological diversity of the aquatic environment and habitat of particular significance for fisheries management should be protected.

Other legislation that impacts on the management of marine resources includes the Environment Act of 2003, the Prevention of Marine Pollution Act of 1998, and the Ship Registration Act of 2007 which sets out the requirements for a vessel to be registered as a Cook Islands vessel.

Under section 6 of the Marine Resources Act the pelagic longline fishery has been designated as a fishery and is regulated under the Marine Resources (Large Pelagic Longline Fishery) Regulation 2012 and Marine Resources (Licensing) Regulation 2012. The regulations seek:

- To provide for the sustainable use of large pelagic fish resources for the benefit of the people of the Cook Islands;
- To ensure the long-term sustainability of the Longline Fishery;
- To mitigate the impact of fishing on non-target species;
- To develop and maintain the economic viability of the Longline Fishery and associated fishing industry, including the development of the Cook Islands domestic fleet and onshore processing in the Cook Islands;
- To ensure that Cook Islands meets its international environmental and fisheries obligations;
- To strengthen the exercise of Cook Islands sovereign rights and ensure that its special requirements as a Small Island Developing State are appropriately taken into account in regional tuna management, and position Cook Islands for equitable participation in the regional tuna fisheries;
- To protect traditional and small scale commercial inshore fishers;
- To protect the integrity of government revenue; and
- To fulfil the purposes and principles in the Act.

In order to achieve these objectives, the regulations contain measures which:

- Establish licensing arrangements that encourage fishing operations to provide greater benefits to Cook Islands, particularly through the landing, value adding and processing of fish in Cook Islands;

- Limit the size of the large pelagic longline fleet in the fishery waters to avoid local depletion particularly of albacore;
- Provide secure access with transparent procedures that encourage investment in tuna longline fishing and processing;
- Require the use of fishing gear and methods that reduce the impacts of fishing on non-target species;
- Monitor fishing operations and catches, particularly through vessel monitoring systems, onboard observers and port sampling;
- Collect other scientific and fisheries information on the tuna longline fishery, including collection and analysis of daily catch and effort information;
- Combat IUU fishing and ensure compliance with laws, regulations, licence conditions and provisions of the Fishery Plan; and
- Implement relevant measures of the WCPF Commission and the relevant provisions of the WCPF Convention and other relevant international fisheries and environmental instruments.

The specific measures implemented under the Regulations are described in Section 1.5.2.

International

The Cook Islands is a party to the following international agreements that relate to fisheries conservation and management:

- 1979 South Pacific Forum Fisheries Agency Convention (FFA) Convention;
- 1982 UN Convention on the Law of the Sea;
- 1989 Convention for the Prohibition of Fishing with Long Drift Nets in the South Pacific;
- 1991 Regional Treaty on Cooperation in Fisheries Surveillance and Law Enforcement;
- 1993 FAO Compliance Agreement;
- 1995 UN Fish Stocks Agreement;
- Western and Central Pacific Fisheries Convention;
- US/Cook Islands Agreement on Cooperation in Joint Maritime Surveillance Operations; and
- Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR).

The Cook Islands is not a party to the Convention on International Trade in Endangered Species (CITES) but became a party to the Convention on Biological Diversity in April 1993 and acceded to the Convention on Migratory Species in August 2006.

Regarding international agreements specific to sharks, first in December 2006 and most recently in December 2010, as a party to the WCPF Convention, the Cook Islands adopted the Conservation and Management Measure for Sharks in the Western and Central Pacific Ocean (currently CMM 2010-07). The CMM calls for the prohibition of shark finning (i.e. removal of fins and discarding of the carcass) by imposing a limit to the amount of fins retained on board, transhipped, landed or traded of not >5% of retained shark carcass weights. WCPFC members are bound to implement this

measure however an allowance is made for coastal States to apply alternative measures for the purpose of exploring, exploiting, conserving and managing sharks in their own national waters. The Cook Islands has implemented the overarching shark CMM (2010-07) through license conditions. Under other provisions of membership of the WCPFC, the Cook Islands reports annual catches by species, and catch and fishing effort statistics by gear type, to the Commission under the WCPFC Data Rules and cooperates in the WCPFC Shark Research Plan through the Commission's Scientific Committee. In addition to the overarching shark CMM (2010-07), the WCPFC adopted a no-retention policy for oceanic whitetip sharks at its Eighth Commission Meeting in March 2012.

1.5.2. Monitoring, Control and Surveillance

Monitoring of fishing activity and enforcement of fisheries management legislation relating to offshore fishing is the responsibility of the Offshore Fisheries and the Legal and Policy divisions within MMR. The Ministry is assisted in this function by the Ministry of Police, Maritime Surveillance Division which operates the patrol vessel *Te Kukupa* and the Crown Law Office which conducts prosecutions. In addition, periodic air and surface surveillance patrols are provided by the New Zealand, France, Australia defence forces and the U.S Coast Guard.

Licensing and Authorization

The Marine Resources Act of 2005 establishes that all fishing vessels 10 metres or more in length are required to be licensed to fish in the EEZ. All charter licenses are issued subject to there being in place an access agreement which sets out the terms and conditions for fishing access. These terms and conditions follow regionally agreed minimum terms and conditions and include requirements relating to the maintenance of catch logs, reporting requirements, Vessel Monitoring Systems (VMS), observers and closed areas. All vessels are required to be registered on the FFA Regional Vessel Register.

Section 35 of the Marine Resources Act of 2005 requires that any Cook Islands flag vessel that intends to fish beyond areas of national jurisdiction, be authorised to do so. Flag vessels that operate in areas managed by RFMOs are required to be listed on the appropriate RFMO list of authorised vessels. In addition, Cook Islands vessels that operate in the FFA region are required to be in good standing on the FFA Regional Vessel Register. MMR maintains a vessel register of all vessels licensed to fish in national waters and authorised to fish in areas beyond national jurisdiction.

The Marine Resources (Large Pelagic Longline Fishery) Regulations 2012 limits the number of tuna longline licenses to 50 vessels for the entire EEZ. If total commercial longline catches in waters north of 15°S exceed 8,000 t in any four quarter period, the Secretary of Marine Resources may amend these license limits.

Through the Treaty on Fisheries between the Governments of Certain Pacific Island States and the Government of the United States of America (commonly known as the US Tuna Treaty), Cook Islands allows purse seine vessels licensed under this Treaty to fish in its' EEZ. These vessels are

monitored by FFA and on the 30 July 2012, there were 39 purse seiners licensed for the 25th Licensing Period (15 June 2012 – 14 June 2013).

Vessel Monitoring System

Under section 60 of the Marine Resources Act 2005, each fishing vessel licensed to fish shall install, maintain and operate a registered automatic location communicator (ALC) at all times while in the fishery waters. MMR operates two VMS systems: the regional VMS administered by FFA that tracks all vessels listed on the Regional Vessel Register and the domestic VMS which monitors Cook Islands-owned vessels and Cook Islands-flagged vessels authorised to fish in areas beyond national jurisdiction. Like the FFA system, the national VMS is Inmarsat C based. Under a regional VMS arrangement Cook Islands, Samoa and Niue have agreed to allow one another access to in-zone FFA VMS tracking information.

Observers & Port Sampling

As a condition of access, all licensed vessels are required to carry observers as determined by MMR. Vessel operators are required to cover the cost of the observer placement. Observer reports follow the regional standard. Observers are debriefed upon task completion and reports are copied to SPC for further analysis. Currently the Ministry has access to 14 observers that have completed the FFA/SPC regional observer training programme. Observer coverage as of 2011 has exceeded 10% coverage but a target of 20% coverage has been set.

Port sampling for catch verification and scientific analysis is undertaken for vessels that land catch in Rarotonga. The aim is to have complete coverage of all licensed vessels including those that land in Pago Pago. The recruitment of additional manpower is underway in order to monitor Rarotonga landings. For landings that occur in Pago Pago, a formal cooperative arrangement with American Samoa is being pursued as part of the MOU with the United States “Concerning Mutual Cooperation in the Sustainable Management and Conservation of Western Central Pacific Fishery Resources”.

Surveillance

Surface surveillance is the responsibility of the Ministry of Police, Maritime Surveillance Division which operates the patrol vessel *Te Kukupa*. Periodic patrols of the EEZ are conducted based on fishing vessel activity information provided by MMR. These patrols are coordinated with aerial patrols conducted by the New Zealand and France defence forces. In recent years, joint surface operations have been undertaken with neighbouring countries including Samoa, Kiribati and US and supported by the New Zealand, Australian and French Defence Forces.

1.5.3. Shark Related Prosecutions

In June 2005, the United States National Marine Fisheries Service (NMFS) assisted the government of the Cook Islands in the investigation of a Cook Islands licensed fishing vessel suspected of violating a condition of its license related to the taking of sharks. In the Cook Islands, if a licensed longline fishing vessel catches a shark and chooses to keep the shark fins, the carcass must be

retained. In this case the vessel's master was only retaining the shark fins, not the carcasses. The breach was detected, in the Cook Islands, by a NMFS Special Agent while he was conducting dockside fishery enforcement training with a group of Cook Islands Fisheries Officers.

In July 2005, NMFS investigated a foreign flagged fishing vessel that offloaded a bag of dried shark fins, weighing approximately 40 pounds. The dried fins were landed without corresponding carcasses and were intended for sale in the Cook Islands.

In October 2008, a surveillance patrol by a US Coast Guard vessel with a Cook Islands authorized officer on board detained a US vessel operating in the Cook Islands, because it was carrying shark fins. Under the Shark Finning Prohibition Act of 2000, it is illegal for a US vessel to have shark fins on board.

1.6. Gaps in Management to be Addressed by a NPOA - Sharks

The preceding assessment has identified a number of gaps between policies espoused by the Cook Islands government and the implementation of measures to conserve and manage its shark resources. In addition to this assessment, a consultation exercise was held in June 2012 to seek public comment on shark issues and the content of the NPOA-Sharks. Information from the assessment and the consultation was combined to highlight key issues and to determine that an NPOA-Sharks would be a useful means of formalizing and articulating Cook Islands shark policy.

It is recommended that, where possible, the Cook Islands NPOA-Sharks (Section 2 of this document) identify specific management; monitoring; research and policy development; and education and awareness activities to form a comprehensive shark conservation and management strategy. Some activities are currently in place, e.g. in the form of license conditions, whereas others would be designed to respond to new information on the status of shark populations. Similarly, some activities would be included to support international and regional shark initiatives whereas others would reflect national or local concerns in the Cook Islands itself.

While specifics are given in Section 2, the assessment and consultation have highlighted the following issues to be considered in the formulation and periodic revision of the Cook Islands NPOA-Sharks:

- Implement national measures in support of international listings of shark species of concern. This would include consideration of CITES and CMS-listed species, and recently adopted WCPFC measures for the oceanic whitetip shark.
- Ensure that species for which there is regional evidence of population impacts and/or high risk are protected from adverse impacts. This would take into consideration, *inter alia*, recent WCPFC Shark Research Plan assessment results, IUCN Red List data, and threats posed by trade.
- Reduce the risk of overfishing all sharks by preventing targeting and excessive bycatch. Since there are no vessels currently known to be targeting sharks in Cook Islands waters, these measures would simply formalize existing practice.

- Encourage full utilisation of dead or damaged sharks caught incidentally. Consistent with the IPOA-Sharks, waste and discards should be minimised while at the same time avoiding unnecessary mortality. Relevant issues are shark finning and post-capture release methods.
- Combat opportunities for illegal, unreported and unregulated fishing of sharks. This issue can be addressed through monitoring, control and surveillance (MCS) activities such as observers and transshipment notification/monitoring.
- Eliminate data gaps on shark catch rates, species composition and survival rates. Better data on shark stocks from observers and logbooks will lead to more informed management.
- Continue to gather information on other human interactions with sharks. Although there is the greatest interaction between sharks and longline and purse seine fleets, potential impacts associated with recreational, artisanal and deep sea fisheries, as well as ecotourism activities, should be explored.

An NPOA-Shark which identifies actions addressing each of these issues is provided in the following section.

2. Cook Islands National Plan of Action - Sharks

2.1. Status of Shark Stocks, Fisheries and Management Framework

The assessment in Section 1 of this document summarises available information on the regional status of shark stocks, characterises the Cook Islands fisheries, and describes the legislative, administrative and Monitoring, Control and Surveillance (MCS) frameworks applicable to sharks. Key points are excerpted as follows.

2.1.1. Status of Shark Stocks

Twenty-three species of sharks and ray have been recorded in the waters of the Cook Islands and it is likely that others occur but have not been documented. Seven shark species which frequently interact with longline and purse seine fisheries are being studied under the WCPFC's Shark Research Plan. Preliminary results from this programme suggest that the oceanic whitetip and silky shark stocks are overfished and that overfishing is occurring. In contrast, the abundance of blue and mako sharks appears to be increasing in the southern portion of the Western and Central Pacific, and no strong trends were found for thresher sharks. Pelagic stingrays and Galapagos sharks are reported to interact with fishing vessels in Cook Islands waters in low numbers and little is known about their population status. Some species listed on international conventions and threatened species lists occur in Cook Islands waters including the whale shark, the scalloped hammerhead, the makos and the threshers. While these species are of concern on a global level, the listings are based on assessments conducted in other areas¹⁴. For some of these species, such as the makos and the threshers, recent data from this region indicate that population abundance is

¹⁴ IUCN Red List, accessed online at <http://www.iucnredlist.org/details/39341/0> and <http://www.iucnredlist.org/details/60225/0>

increasing or stable. Deepwater sharks are caught incidentally by at least some of the Cook Islands-flagged vessels that fish the deepwater trawl fishery of the southern Indian Ocean, but the status of their stocks is unknown.

2.1.2. Characterization of Fisheries

The Cook Islands fishing fleet consists of up to 70 longline vessels fishing in the Cook Islands EEZ, and presently there are 16 Cook Islands-flagged vessels fishing, including mid/deep water trawl fishing vessels. US-flagged purse seiners may operate in the Cook Islands EEZ under the terms of the US Tuna Treaty but historically the level of effort has been low. The fishing effort by artisanal and game fishing fleets has been poorly recorded but records dating back to 2000 indicate a relatively low level of effort which mainly utilises trolling and dropline fishing to target yellowfin tuna

The greatest number of shark interactions are reported from the longline fishery. However, sharks and rays are not targeted by the domestic longline fishery and exploratory fisheries conducted by foreign-flagged, distant water longline vessels are prohibited from targeting sharks as a condition of fishing license. The most commonly caught species by the longline fishery are longfin mako, blue, “unidentified”, oceanic whitetip and pelagic thresher sharks. Based on observer data, these five categories together comprise only about 3% of the total catch weight.

2.1.3. Management Framework

The conservation, management and development of Cook Islands fisheries is governed by the Ministry of Marine Resources Act of 1984, the Marine Resources Act of 2005, and the Marine Resources (Large Pelagic Longline Fishery) Regulations 2012. In addition, the Cook Islands is party to a number of international agreements that relate to fisheries conservation and management and to the Convention on Biological Diversity and the Convention on Migratory Species. The Cook Islands issues fishing licenses for one-year periods after which the fishing vessel must reapply to renew its license. All licenses apply regional harmonised minimum terms and conditions which include maintenance of catch logs, catch reporting, operation of a Vessel Monitoring System (VMS), placement of observers and observance of closed areas. A target of 20% observer coverage has been set.

2.2. Objective

In accordance with the Cook Islands Marine Resources Act of 2005, the objective of the Cook Islands National Plan of Action-Sharks is to:

Seek and promote a rational approach, based on scientific evidence and application of the precautionary principle, to the conservation, management and optimal utilisation of shark resources in order to maintain stocks at sustainable levels and protect the biological diversity of the marine environment.

2.3. Strategies for Achieving the Objective

2.3.1. Management

The following management strategies are adopted:

- a. In order to afford strict protection to species listed by CITES, there shall be no take of whale sharks, basking sharks or great white sharks, and no deployment of fishing gear (e.g. purse seine sets) when these species are known to be in the vicinity of fishing operations, by vessels fishing within the national waters of the Cook Islands or by Cook Islands-flagged vessels fishing outside of national waters. If a whale, basking or great white shark is observed interacting with fishing gear after the gear has been deployed, all reasonable steps should be taken to ensure its safe release and the incident shall be reported to MMR including details of the species (if known) and number of individuals, location and date of the interaction, steps taken to ensure safe release, and an assessment of the life status of the animal on release (including, if possible, whether the animal was released alive but subsequently died)¹⁵.
- b. In order to protect populations of reef sharks, current prohibitions on commercial fishing within 12 nautical miles of the outer reef of any island of the Cook Islands and 24 nautical miles from Rarotonga shall be maintained.
- c. In order to conserve species for which there is regional or local evidence of population impacts, and/or a high risk of population impacts based on studies elsewhere and an absence of regional or local evidence to the contrary, the following species shall not be retained under any circumstances:
 - a. All species of rays (Pristiformes, Myliobatiformes, Torpediniformes and skates (Rajiformes));
 - b. Oceanic whitetip shark (*Carcharhinus longimanus*);
 - c. Silky shark (*Carcharhinus falciformis*); and
 - d. Hammerhead sharks (*Sphyrna* and *Eusphyrna* spp.).

Any shark or ray species which cannot be positively identified by the crew must not be retained.

- d. In order to facilitate compliance with the WCPFC prohibition on shark finning¹⁶, all sharks which can be legally retained must be retained whole with fins naturally attached to the carcass (fins may be partially cut to allow folding over the carcass). All shark and ray species which are either prohibited to retain, or otherwise caught incidentally and not

¹⁵ Provisions mirror those in WCPFC CMM 2011-03 Conservation and Management Measure for Protection of Cetaceans from Purse Seine Fishing Operations

¹⁶ WCPFC CMM 2010-07 Conservation and Management Measure for Sharks

required for food or other purposes¹⁷, are to be released alive promptly, i.e. the leader (or trace) is to be cut while the shark remains in the water, the shark shall not be gaffed, etc. Sharks which are found dead upon gear retrieval, and for which retention is not prohibited and onboard limits are not exceeded (see Item e below), may be retained and fully utilized, to minimize waste.

- e. In order to prevent targeted shark fishing by any vessel within the national waters of the Cook Islands or by Cook Islands vessels fishing beyond national waters:
 - i. The use of shark lines (short, baited lines attached to the floats of a standard longline set) and shark baits (baits designed to attract sharks, e.g. shark parts) are prohibited;
 - ii. The use of wire leaders (also referred to as wire trace) is prohibited unless the Secretary of Marine Resources grants an exemption, on the basis of sufficient evidence provided as part of the permit application, that the use of wire leaders is necessary for fishing of authorized target species;
 - iii. No vessel shall retain onboard more than 20 sharks, regardless of species, at any one time. In the case of vessels which do not tranship catch, this would equate to 20 sharks per trip¹⁸. In the case of vessels which tranship their catch, this assumes that transshipment would take place no more frequently than once per week, in which case the allowance would be a maximum of 3 sharks per day (i.e. per set) which equates to approximately 1 shark per 1,000 hooks, i.e. the incidental catch rate of sharks reported by observers in the Cook Islands domestic longline fishery, 2008-2011¹⁹. Once the onboard limit is reached, all sharks must be released alive promptly and without ill-treatment.
- f. In order to operationalize these management measures, all commercial licenses shall explicitly reference, and make binding upon the licensee, the requirements contained in this NPOA-Sharks.

2.3.2. Monitoring

The following monitoring strategies are adopted:

¹⁷ Reflects language in WCPFC CMM 2010-07 Conservation and Management Measure for Sharks

¹⁸ This is the limit that has been set in the Australia Eastern Tuna and Billfish Fishery (see AFMA (Australian Fisheries Management Authority). 2008. Australian Tuna and Billfish Longline Fisheries Bycatch and Discarding Workplan. November 1, 2011 to October 31, 2013. Accessed online at <http://www.afma.gov.au/wp-content/uploads/2010/06/Bycatch-Work-Plan-2011-13-FINAL.pdf>

¹⁹ These limits are based on a total fleet size of 50 vessels in the domestic longline fishery, 20 vessels in the exploratory fishery, and a negligible level of purse seine effort. Any substantive changes in the size of any of these fleets may warrant revisiting of the limits.

- a. In order to ensure appropriate shark species-specific catch data are available for ongoing assessment, updated WCPFC shark species-specific logsheet reporting formats shall be made a condition of all fishing licenses.
- b. In order to support the timely and comprehensive assessment of shark stocks under the WCPFC Shark Research Plan, MMR will provide all relevant catch, biological and other data to the WCPFC in accordance with established WCPFC Data Rules annual submission deadlines. MMR will in addition also conduct its own annual assessments on shark bycatch.
- c. In order to prevent circumvention of Cook Islands fisheries management measures through transshipment in international waters, the provisions of WCPFC CMM 2009-06 Conservation and Management Measure on Regulation of Transshipment should be referenced in all commercial licenses and made binding upon the licensee.
- d. In order to provide sufficient scientific and compliance monitoring of shark interactions in the commercial large pelagic longline fishery, the target observer coverage of 20% for the pelagic longline fisheries, should be attained no later than as of 1 January 2013 and maintained at the target level or higher in each subsequent calendar year. Opportunities to expand observer coverage through electronic/ remote monitoring should be pursued whenever practical.
- e. In order to monitor practical and effective compliance with release requirements for non-retained shark and ray species, observers should be encouraged to annotate notes on release methods on their observer data sheets and summarize their experience in observer reports. MMR should work with and encourage SPC to develop more specific shark fate and condition codes, based on these notes, which provide more detail on shark handling practices and their effects.
- f. In order to generate more data for future assessment of the effects of deepwater trawling on deepsea sharks, MMR should specify catch and biological data reporting requirements for these fisheries and undertake periodic assessment of the data with particular reference to whether the fishery is being operated in a sufficiently precautionary manner.

2.3.3. Research and Policy

The following research and policy development strategies are adopted:

- a. In order to provide guidance to MMR on its shark conservation and management policies a Shark NPOA-Advisor will be established. The Secretary of MMR will appoint the Shark NPOA-Advisor: The Shark NPOA-Advisor may wish to engage a shark advisory board comprising of an independent Chairperson with experience in shark conservation science and policy as well as fisheries management; an MMR representative; and representatives from local non-governmental organizations and fishing industry representatives.
- b. The Terms of Reference for the Shark Adviser are as follows:

- i. Meet annually to review 1) a summary of shark catch and biological data, and 2) any new scientific findings such as stock assessments, to be prepared by MMR for the preceding year; and prepare a short report on the effectiveness of the NPOA-Sharks and any recommendations to MMR;
 - ii. Perform a mid-term review of this NPOA-Sharks after two years have elapsed since implementation and, if necessary, revise the NPOA-Sharks on the basis of that review;
 - iii. Consider whether the management and monitoring of the commercial fisheries are consistent with the objectives and strategies contained in the NPOA-Sharks;
 - iv. Consider whether additional strategies/components should be added to the NPOA-Sharks or otherwise undertaken including e.g. monitoring or research on the artisanal and/or recreational fisheries; guidelines for local ecotourism activities involving sharks; monitoring of trade products or patterns; or other areas of interest to the SAB members or the general public;
 - v. Consider whether any other activities should be undertaken to conserve and manage sharks 1) in the national waters of the Cook Islands or 2) affected, or potentially affected by, the fishing activities of Cook Islands-flagged vessels outside of national waters;
 - vi. Advise, after the fourth year of implementation of the NPOA-Sharks, whether the plan should be re-authorized, with or without amendment.
- c. In order to support stock assessment of shark species which straddle national and regional boundaries, MMR will cooperate with the WCPFC and IATTC, directly or through SPC and/or FFA, to provide input to the development and review of shark stock assessments, reference points and appropriate management plans and mitigation measures. Opportunities to develop national capacity to undertake basic shark-specific analyses and assessments will be pursued.

2.3.4. Education and Awareness Raising

The following education and awareness raising strategies are adopted:

- a. In order to expand awareness of shark conservation and management issues among fishing industry participants, shark materials and content will be added to annual awareness workshops conducted for sea turtles. These workshops are required to be attended by all vessel operators based in the Cook Islands and Pago Pago, and should be attended by fishers from other fleets, observers, MCS personnel and other interested parties as practicable.
- b. In order to increase knowledge among fishermen, MMR staff and observers, and members of the general public, shark species identification guides produced by SPC and/or others should be publicized and made available either in printed or digital format.

- c. In order to educate and inform the general public on matters of shark conservation interest, as well as to increase transparency in fisheries management in the Cook Islands, a shark portal will be developed on the MMR website containing links to this NPOA-Sharks, relevant WCPFC Shark Research Plan documents, other publications of scientific or policy interest, and any local news items. Opportunities to allow for feedback from stakeholders on issues of relevance will also be pursued.

2.4. Implementation of the NPOA-Sharks

This NPOA-Sharks shall become effective as of October 2012. It will undergo a mid-term review after two years have elapsed since implementation and may be revised on the basis of that review. Whether or not revised, the NPOA-Sharks will expire four years from December 2012 unless it is re-authorized for a further period, with or without amendment.