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New Zealand National Plan of Action for the Conservation and Management of Sharks 2013

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Ministry for Primary Industries, the Department of Conservation, and the Ministry for Foreign Affairs and Trade

Ministry for Primary Industries
Manatū Ahu Matua

National Plan of Action for the Conservation and Management of Sharks 2013

Growing and Protecting New Zealand

Disclaimer

This National Plan of Action for the Conservation and Management of Sharks (NPOA-Sharks) 2013 was produced in accordance with New Zealand's obligations under the United Nations Food and Agriculture Organisation's International Plan of Action for the Conservation and Management of Sharks. The NPOA-Sharks 2013 was produced by the Ministry for Primary Industries, the Department of Conservation, and the Ministry for Foreign Affairs and Trade, following a review of New Zealand's NPOA-Sharks 2008, in collaboration with environmental and industry stakeholders and with input from a public consultation process.

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Publications Logistics Officer
Ministry for Primary Industries
PO Box 2526
WELLINGTON 6140

Email: brand@mpi.govt.nz
Telephone: 0800 00 83 33
Facsimile: 04-894 0300

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Foreword

Conserving and managing sharks taken in New Zealand fisheries

I am pleased to launch this comprehensive plan for the conservation and management of New Zealand's shark populations. This builds on New Zealand's proud history of balancing conservation and sustainable use of resources to ensure their long-term sustainability.

Sharks play a significant role in marine ecosystems and are also an important component of some commercial fisheries. Some shark species are also valued by customary fishers, recreational sports fishers, and other users such as tourism ventures.

The NPOA-Sharks 2013 outlines our goals and objectives for maintaining the biodiversity and long-term viability of all New Zealand shark populations. It is a comprehensive plan to focus our efforts and provides objectives to improve our research and information on shark populations, and base conservation and management actions on an assessment of risks.

Internationally there is increasing recognition that science-based catch limits, like those applied in New Zealand under the quota management system, are a key component of overall shark conservation and management. The NPOA-Sharks outlines proposed objectives to strengthen the knowledge base for setting catch limits and other management controls, such as protection, for shark species.

A cornerstone objective for the coming years is also to improve utilisation and minimise wastage in our shark fisheries. A key step in achieving this will be the elimination of shark finning in New Zealand by 1 October 2015 with the exception of the highly migratory blue shark, which will be implemented by 1 October 2016.

I would like to personally thank stakeholders that participated in the development of the draft plan and acknowledge the many submissions that contributed to the final product. I would also like to emphasise the importance of continued stakeholder engagement in the implementation stages of the NPOA-Sharks 2013. This will be critical to its success.

The NPOA-Sharks 2013 has set clear expectations for review and reporting against objectives. The NPOA-Sharks will be reviewed again in 2017, with the intention of issuing a revised NPOA in 2018.

Hon Nathan Guy
Minister for Primary Industries
9 January 2014

Executive Summary

New Zealand fisheries waters are home to at least 113[1] species of shark, of which more than 70 have been recorded in fisheries. The term *"shark"*, as used generally in this document, refers to all sharks, rays, skates, chimaeras and other members of the Class Chondrichthyes. Some of these species support significant commercial fisheries, are prized as recreational game fishing species, and/or are of special significance to Maori. Some are also recognised as regionally or globally threatened or endangered. Some shark species reside exclusively in our waters, while others also occur on the high seas and in other fisheries jurisdictions.

Sharks can play important roles in maintaining healthy ocean ecosystems. Sharks also share biological characteristics that can make them susceptible to over-fishing. Recognition of these characteristics led to global initiatives to improve the conservation and management of sharks, culminating in the United Nations Food and Agriculture Organisation (FAO)'s International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks). The overarching objective of the IPOA-Sharks is "to ensure the conservation and management of sharks and their long-term sustainable use." The IPOA-Sharks suggests that member states of the FAO that conduct fisheries either targeting sharks, or regularly taking sharks as incidental bycatch, should each develop a National Plan of Action for the Conservation and Management of Sharks (NPOA-Sharks).

The Ministry for Primary Industries (the Ministry) has produced this updated National Plan of Action for Sharks 2013 (NPOA-Sharks 2013) to continue to document New Zealand's planned actions for the conservation and management of sharks, consistent with the overarching goal of the IPOA-Sharks. The Ministry was assisted in developing the plan by other government departments including the Department of Conservation and the Ministry of Foreign Affairs and Trade, and by a range of stakeholders, all of whom have an interest in the conservation and management of sharks.

The purpose of the NPOA-Sharks 2013 is:

> To maintain the biodiversity and the long-term viability of all New Zealand shark populations by recognising their role in marine ecosystems, ensuring that any utilisation of sharks is sustainable, and that New Zealand receives positive recognition internationally for its efforts in shark conservation and management.

The NPOA-Sharks 2013 identifies goals and five-year objectives in the following key areas, as outlined in Table 1:

- Biodiversity and long-term viability of shark populations;
- Utilisation, waste reduction and the elimination of shark finning;
- Domestic engagement and partnerships;
- Non-fishing threats;
- International engagement;
- Research and information.

[1] This number differs from that published in Francis & Lyon 2012 as that list (119 species) includes four species of Antarctic skates, and two species which have since been identified as species already on the list.

Table 1: Goals and five-year objectives of the NPOA-Sharks 2013

Goal	Five-year objectives
Biodiversity and long-term viability of shark populations 1. Maintain the biodiversity and long-term viability of New Zealand shark populations based on a risk assessment framework with assessment of stock status, measures to ensure any mortality is at appropriate levels, and protection of critical habitat.	Objective 1.1 Develop and implement a risk assessment framework to identify the nature and extent of risks to shark populations. Objective 1.2 Systematically review management categories and protection status to ensure they are appropriate to the status of individual shark species. Objective 1.3 For shark species managed under the QMS, undertake an assessment to determine the stock size in relation to B_{MSY} or other accepted management targets and on that basis review catch limits to maintain the stock at or above these targets. Objective 1.4 Mortality of all sharks from fishing is at or below a level that allows for the maintenance at, or recovery to, a favourable stock and/or conservation status giving priority to protected species and high risk species. Objective 1.5 Identify and conserve habitats critical to shark populations. Objective 1.6 Ensure adequate monitoring and data collection for all sectors (including commercial, recreational and customary fishers and non-extractive users) and that all users actively contribute to the management and conservation of shark populations.
Utilisation, waste reduction and the elimination of shark finning 2. Encourage the full use of dead sharks, minimise unutilised incidental catches of sharks, and eliminate shark finning[2] in New Zealand	Objective 2.1 Review and implement best practice mitigation methods in all New Zealand fisheries (commercial and non-commercial). Objective 2.2 Minimise waste by promoting the live release of bycaught shark species, and develop and implement best practice guidelines for handling and release of live sharks. Objective 2.3 Develop and implement best practice guidelines for non-commercial fishing and handling of sharks. Objective 2.4 Eliminate shark finning in New Zealand fisheries by 1 October 2015, with one exception.
Domestic engagement and partnerships 3. All commercial, recreational and customary fishers, non-extractive users, Maori, and interested members of the New Zealand public know about the need to conserve and sustainably manage shark populations and what New Zealand is doing to achieve this.	Objective 3.1 Capture and reflect, through meaningful engagement, the social and cultural significance of sharks, including their customary significance to Maori, in their conservation and management. Objective 3.2 Communication and information sharing between government agencies and stakeholders is effective, with strategies developed and implemented to promote the conservation and sustainable management of shark populations. Objective 3.3 Encourage compliance with regulations, implementation of best practice (including catch avoidance and correct handling), and co-operation with ongoing research among commercial and non-commercial stakeholders. In particular, encourage reporting of any illegal practices (especially live finning) that may be observed.
Non-fishing threats 4. New Zealand's non-fishing anthropogenic effects do not adversely affect long-term viability of shark populations and environmental effects on shark populations are taken into account	Objective 4.1 Non-fishing anthropogenic and environmental threats to shark populations are understood and, where appropriate, managed.

[2] Shark finning is defined for the purpose of this NPOA as the removal of the fins from a shark (Class Chondricthyes – excluding Batoidea (rays and skates)) and the disposal of the remainder of the shark at sea. As such, removal of the fins from a shark where the trunk is also retained for processing is not defined as "shark finning".

Goal	Five-year objectives
International engagement 5. New Zealand actively engages internationally to promote the conservation of sharks, the management of fisheries that impact upon them, and the long-term sustainable utilisation of sharks.	Objective 5.1 New Zealand ensures that it meets its international obligations and receives positive recognition for its efforts in the conservation, protection and management of sharks through active engagement in international conservation and management agreements relevant to sharks. Objective 5.2 New Zealand actively investigates and decides whether to become a signatory to the Convention on Migratory Species (CMS) Memorandum of Understanding on the Conservation of Migratory Sharks (MoU) in advance of the next Meeting of Signatories in 2015. Objective 5.3 New Zealand collaborates with neighbouring countries to better understand the population dynamics of highly migratory sharks, protected sharks and any other shark species of special interest. Objective 5.4 New Zealand proactively contributes to and advocates for improved data collection and information sharing of commercial catches and incidental bycatch of sharks within relevant Regional Fisheries Management Organisations (RFMOs). Objective 5.5 New Zealand encourages fishing countries, coastal States, and other regional organisations to develop and implement best practice Plans of Action for conserving and managing sharks, where they have not already done so.
Research and information 6. Continuously improve the information available to conserve sharks and manage fisheries that impact on sharks, with prioritisation guided by the risk assessment framework.	Objective 6.1 Ensure information collection systems and processes are sufficient to inform management of shark populations Objective 6.2 Undertake a research programme, guided by the risk assessment framework, to increase understanding of and improve the management of shark populations. Objective 6.3 Implement research to inform the development of recovery plans appropriate to protected species

The NPOA-Sharks 2013 sets directions for the period 2013 to 2018 to ensure the conservation, management, and sustainable utilisation of sharks caught by New Zealand vessels and in New Zealand waters. Actions to meet the goals and objectives in the plan will be documented in national fisheries plans and associated annual planning documents, and progress against NPOA objectives reviewed annually. The NPOA-Sharks 2013 will be fully reviewed in 2017 and revised in 2018 to ensure the ongoing effectiveness of New Zealand's efforts to address the conservation of shark species and management of the fisheries that catch them.

1 Introduction

1.1 NATIONAL AND INTERNATIONAL CONTEXT

New Zealand fisheries waters are home to at least 113 species of shark, of which more than 70 have been recorded in fisheries. In this National Plan of Action for the Conservation and Management of Sharks (NPOA-Sharks) 2013, the term *"sharks"* generally includes all species in the Class Chondrichthyes, which includes all cartilaginous fish such as sharks, skates, rays, and chimaeras. Where the term "shark" is used in a narrower sense, this refers to the "true" sharks that most people identify from the distinctive torpedo-shaped body and fin structure.

There have been significant developments relating to shark populations since the adoption of New Zealand's first NPOA-Sharks in 2008[3]. Amidst concerns about declining shark populations, shark conservation has emerged as a new "iconic" marine conservation issue, and many countries have revisited their national policies to reflect the international momentum towards more comprehensive shark conservation measures. At the same time, pressure on shark populations has continued to mount, with an expanding shark liver oil market and increasingly affluent markets ready to pay significant prices for shark fins.

Key issues in the management of shark fisheries, both in New Zealand and internationally, include the overall sustainability of shark fishing, and issues related to the use of sharks. In response to these concerns, New Zealand has protected several species of shark identified as particularly vulnerable, and this plan establishes processes for continuing to identify any species requiring additional protection.

International and local attention has focussed in particular on the issue of shark finning – the removal of fins from the shark before returning the carcass to the sea (either dead or alive[4]). Shark finning is defined for the purposes of the NPOA-Sharks 2013 as the removal of the fins from a shark (Class Chondricthyes – excluding Batoidea (rays and skates)) and the disposal of the remainder of the shark at sea. As such, removal of the fins from a shark where the trunk is also retained for processing is not defined as "shark finning". Shark finning can raise concerns about animal welfare, sustainability, and waste. Objectives to address each of these concerns are outlined in the NPOA-Sharks 2013, and are intended to complement existing management provisions.

The NPOA-Sharks 2013 establishes the direction and management principles to guide New Zealand's management of sharks, using the existing fisheries management system. This comprehensive system provides for managing extractive fisheries (for sharks and other aquatic species) and for protecting threatened and endangered marine species and important habitats from any adverse effects of fishing. The management system remains largely as described in the first NPOA-Sharks 2008, although adaptation and adjustment of management settings is ongoing.

Fundamental to the NPOA-Sharks 2013 is a risk-based approach to management, so that resources can be directed to those shark populations most in need of active management (whether that management is through absolute protection; robust, science-based catch limits; tools to reduce incidental catches; or other methods). The following sections provide some

[3] http://www.fish.govt.nz/en-nz/Environmental/Sharks.htm
[4] The finning of sharks and returning them to sea alive constitutes an offence under the Animal Welfare Act 1999.

background information on shark populations and fisheries in New Zealand, which provides the context for the objectives outlined in section 4.

Figure 1 shows how the NPOA-Sharks 2013 establishes a purpose, goals, and five-year objectives that will be implemented, including through fisheries planning processes co-ordinated by the Ministry, and conservation planning processes coordinated by the Department of Conservation (DOC). These processes are discussed in more detail in Section 5.

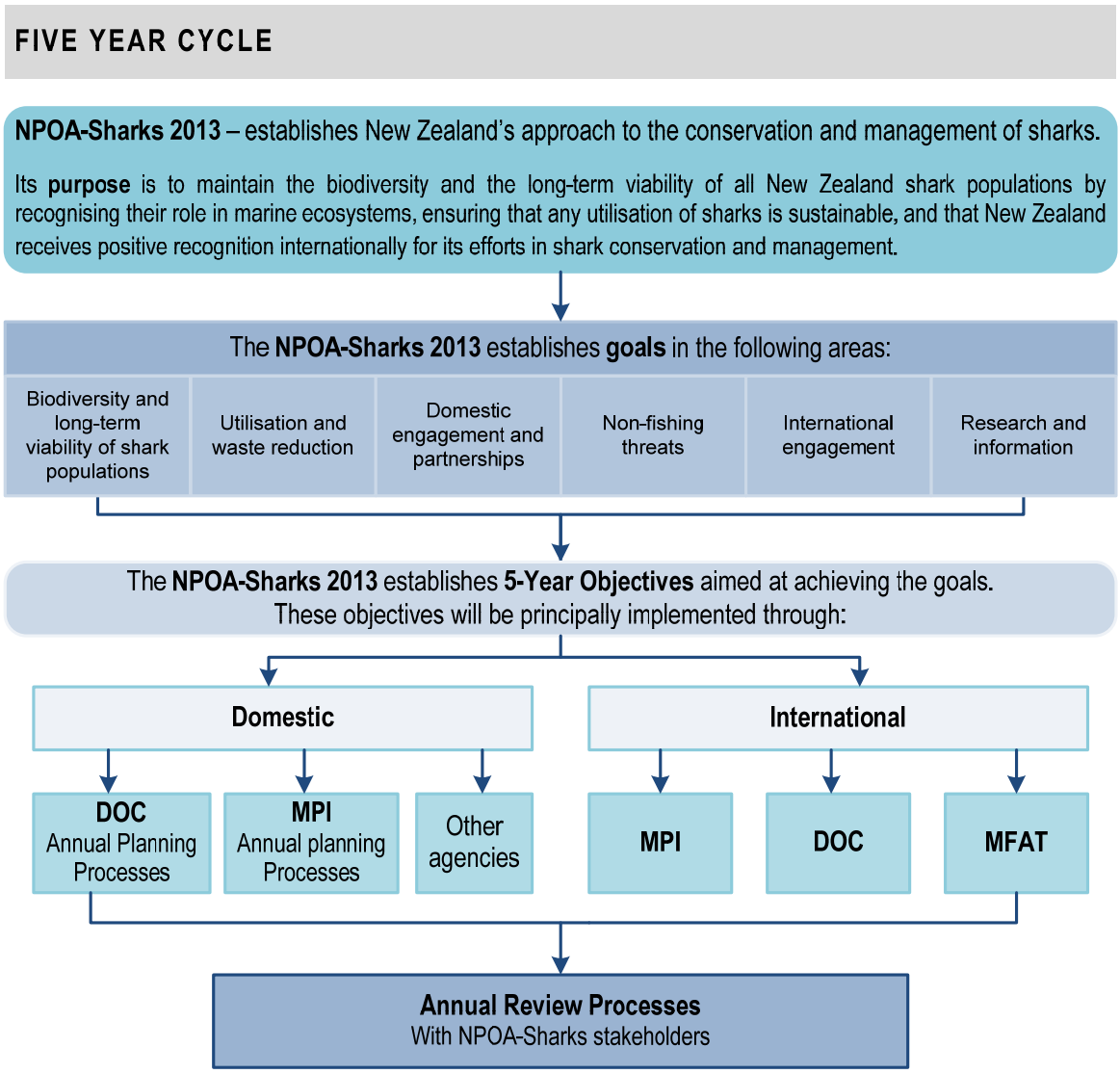

Figure 1: Diagram showing how the NPOA-Sharks 2013 will be implemented

1.1.1 Terminology

A clear definition of "bycatch" is needed to avoid confusion and the most appropriate framework for definition is clearly that developed by the United Nations Food and Agriculture Organisation (FAO). The FAO recommends a generic approach to applying a bycatch definition[5], as in *applying to that part of the catch made up of non-target species or species assemblages*. This generic definition can then be further defined or sub-divided. Following this approach, the following definitions have been used for the NPOA-Sharks:

[5] http://www.fao.org/docrep/w6602e/w6602e03.htm

- Total catch – the summed catch of all target[6] and non-target organisms.
- Target catch – the catch of the species or species group that is the principal intended catch, sometimes including adjustment for regulatory requirements (e.g. not to keep individuals below minimum sizes).
- Retained bycatch – that part of the total catch that is not the target that is kept (landed) for economic or regulatory reasons.
- Discarded bycatch – that part of the total catch that is not the target that is returned to the sea dead or alive. Note that some apparent target catch can be discarded as, for example, if the individuals are below or above size limits or if there is no market for a particular size, but these are then effectively redefined as non-target catch and are thus bycatch.
- Released bycatch – that part of the total catch that is not the target and that is returned to the sea alive. As for discards, under some circumstances, this can include what would at first appear to be target catch.
- Incidental bycatch – that part of the total catch that is not the target. This includes all retained, discarded and released bycatch, including all non-target organisms (e.g. fish, seabirds, marine mammals).

Some of the definitions above intentionally differ somewhat from those normally used in New Zealand; however, these definitions are used here specifically to retain strong links between the NPOA and the IPOA as developed by FAO.

1.2 THE INTERNATIONAL PLAN OF ACTION FOR THE CONSERVATION AND MANAGEMENT OF SHARKS (IPOA-SHARKS)

As a nation with significant shark catches, New Zealand has a responsibility to act in accordance with the objective of the IPOA-Sharks, which is **to ensure the conservation and management of sharks and their long-term sustainable use**. This goal is consistent with the purpose of the Fisheries Act 1996, which is to "provide for the utilisation of fisheries resources while ensuring sustainability". New Zealand's first NPOA-Sharks 2008 concluded that there was close alignment between our fisheries management system and the goals, principles, and management objectives contained in the IPOA-Sharks, and this conclusion remains valid.

In addition to its overall objective, the IPOA-Sharks recommends the following 10 aims that each State should include in its NPOA-Sharks:

IPOA(1)	Ensure shark catches from directed and non-directed fisheries are sustainable
IPOA(2)	Assess threats to shark populations, determine and protect critical habitats and implement harvesting strategies consistent with the principles of biological sustainability and rational long-term use
IPOA(3)	Identify and provide special attention, in particular, to vulnerable or threatened shark stocks
IPOA(4)	Improve and develop frameworks for establishing and co-ordinating effective consultation involving all stakeholders in research, management and educational initiatives within and between states
IPOA(5)	Minimise unutilised incidental catches of sharks
IPOA(6)	Contribute to the protection of biodiversity and ecosystem structure and function
IPOA(7)	Minimise waste and discards from shark catches in accordance with article 7.2.2.(g) of the Code of Conduct for Responsible Fisheries (for example, requiring the retention of sharks from which fins are removed)
IPOA(8)	Encourage full use of dead sharks
IPOA(9)	Facilitate improved species-specific catch and landings data and monitoring of shark catches
IPOA(10)	Facilitate the identification and reporting of species-specific biological and trade data

[6] Note that 'target' may include multiple species, and is not limited to the species recorded as the "target" on catch effort reporting forms.

These aims are incorporated, as appropriate, into the objectives for shark conservation and management identified in section 4.

1.3 PROGRESS TO DATE ON THE ACTIONS UNDER THE NPOA-SHARKS 2008

The NPOA-Sharks 2008 included a list of eleven specific actions aimed to ensure that fisheries management in New Zealand satisfies the objectives of the IPOA-Sharks. Progress on these actions is outlined in a companion document along with updated tables of catch statistics at http://www.fish.govt.nz/en-nz/Environmental/Sharks.htm.

Overall, there has been progress against the eleven actions specified in the first NPOA. Four actions are considered completed and will not be carried over into the NPOA-Sharks 2013. One action – the development of a prohibited utilisation standard – will be replaced by a risk assessment framework and routine review of shark stock status to determine the most appropriate conservation and management approaches for stocks. The remaining six actions have been incorporated into the development of goals and objectives for this version of the NPOA-Sharks.

A review of shark-related science reported since the NPOA-Sharks 2008 was commissioned to inform the development of the NPOA-Sharks 2013.[7] This review detailed and summarised 107 studies completed on sharks since 2008. It also made recommendations for future research, which can be read in the source document at: http://www.fish.govt.nz/en-nz/Environmental/Sharks.htm.

A short summary of the outcomes of the science review has been prepared as a further source document for interested stakeholders. This companion document "Summary of: Review of research and monitoring studies on New Zealand sharks, skates, rays and chimaeras, 2008-2012" can be found on the same web page as this document at http://www.fish.govt.nz/en-nz/Environmental/Sharks.htm.

These recommendations have been incorporated into the objectives identified for management of sharks under the NPOA-Sharks 2013, and are discussed in more detail below.

[7] Francis, M. P., Lyon, W. (2012). Review of research and monitoring studies on New Zealand sharks, skates, rays and chimaeras, 2008−2012.*New Zealand Aquatic Environment and Biodiversity Report No. 102.* 74 p. http://www.maf.govt.nz/news-resources/publications.

2 Scope

Taking account of the information available on the harvest and bycatch of sharks in New Zealand fisheries, the characteristics of shark species, and the scheme and purpose of the conservation and management systems available, the scope of the NPOA-Sharks includes:

i. all species of cartilaginous fish (Class Chondrichthyes) including harvested and protected species;

ii. all waters under New Zealand's fisheries jurisdiction;

iii. New Zealand domestic legislation (Fisheries Act 1996, Wildlife Act 1953 and Animal Welfare Act 1999);

iv. all fisheries and methods (recreational, customary, commercial) that interact with sharks;

v. New Zealand vessels operating in high-seas fisheries that interact with sharks;

vi. participation in and adherence to any obligations from regional fisheries management organisations (RFMOs) and international agreements relevant to shark conservation and management;

vii. impacts on and protection of habitats of significance to sharks; and

viii. non-fishing anthropogenic and environmental impacts on sharks.

3 Background

3.1 NEW ZEALAND'S FISHERIES MANAGEMENT SYSTEM

All marine fisheries in New Zealand are managed under the Fisheries Act 1996 and associated regulations. This includes all commercial and non-commercial fishing during which sharks are either the target species or are caught incidentally as bycatch. More detail on the system is provided in the NPOA-Sharks 2008.[8]

The Wildlife Act 1953 outlines provisions for the conservation and protection of wildlife, including marine species, and can be used to protect specific shark species where required.

In the New Zealand fisheries management system, shark species fall into one of several categories as shown in Table 2.

Table 2: Management categories and species in each category (as of July 2013) (including species listed on Schedule 6 of the Fisheries Act)

Protected (species for which utilisation is not considered appropriate)	Schedule 4C of the Fisheries Act 1996 (may not be targeted)	Quota Management System (90% of all catch)	Open Access (species not included in QMS or on Schedule 4C)
Basking shark (*Cetorhinus maximus*) Whale shark (*Rhincodon typus)* Oceanic whitetip shark (*Carcharhinus longimanus*) White pointer shark (also known as the white or great white shark; *Carcharodon carcharias*) Deepwater nurse shark (*Odontapsis ferox*) Manta ray (*Manta birostris*) Spinetail devil ray (*Mobula japanica*)	Hammerhead shark (*Sphyrna zygaena*) Sharpnose sevengill shark *(Heptranchias perlo)*	Spiny dogfish (*Squalus acanthias*)* Dark ghost shark (*Hydrolagus novaezelandiae*) Pale ghost shark *(H. bemisi)* Smooth skate *(Dipturus innominatus)** Rough skate *(Zearaja nasutus)** School shark *(Galeorhinus galeus)** Elephantfish (*Callorhinchus milii*) Rig (spotted dogfish; *Mustelus lenticulatus*)* Mako shark *(Isurus oxyrinchus)** Porbeagle shark *(Lamna nasus)** Blue shark *(Prionace glauca)**	All others not listed elsewhere in this table

* Species is listed on Schedule 6 of the Fisheries Act

More than seventy species of shark have been reported as caught in New Zealand's commercial fisheries. The eleven shark species managed under the Quota Management

[8] http://www.fish.govt.nz/en-nz/Environmental/Sharks.htm

System (QMS) make up 90% of total shark catches (Figure 2). Most of the remainder of the catch is made up of relatively small catches of a large number of shark species that are currently not managed within the QMS.

Shark species identified as being unable to sustain any utilisation can be protected under the Wildlife Act 1953 and the Fisheries Act 1996 (this currently applies to white pointer or great white shark, basking shark, and oceanic whitetip shark), or under just the Wildlife Act (deepwater nurse shark, whale shark, and manta and devil rays). The Wildlife Act protects species in New Zealand fisheries waters, whereas the powers of the Fisheries Act can be applied to New Zealand-flagged fishing vessels and nationals to extend protection to the high seas.

In general, total allowable catches (TACs) are set for QMS species in a manner that will maintain, or move, the stock towards a biomass at or above B_{MSY} (the biomass that can support harvest at the maximum sustainable level). For highly migratory sharks (mako, porbeagle, and blue shark) TACs are set at a level the Minister considers appropriate to achieve the purpose of the Act (i.e. to enable utilisation while ensuring sustainability). The biological characteristics of sharks, including their typically long time to mature and low reproductive rates, have been taken into account in the setting of catch limits.

Varying levels of information are available for different shark species, necessitating different approaches for monitoring and assessing stocks. Of the eleven shark species in the quota management system, comprising 27 management units or "stocks", a full quantitative stock assessment, integrating information on catch, catch rates, age, and length data into an assessment model, is available for one shark stock. Less data-intensive assessments using standardised catch-per-unit-effort analyses are available for 15 stocks. Unstandardised catch-per-unit-effort analyses are available for highly migratory shark species (3 stocks), and New Zealand participates in international processes to monitor and manage these species. Trawl survey information is available for 11 stocks. Annual Plenary reports are compiled that review the latest information and catch trends for all stocks.

This NPOA-Sharks 2013 contains objectives aimed at improving the information available to ensure that catch limits are set appropriately.

A snapshot of what is currently known about stock status for the eleven QMS species is available at http://www.fish.govt.nz/en-nz/Environmental/Sharks/.

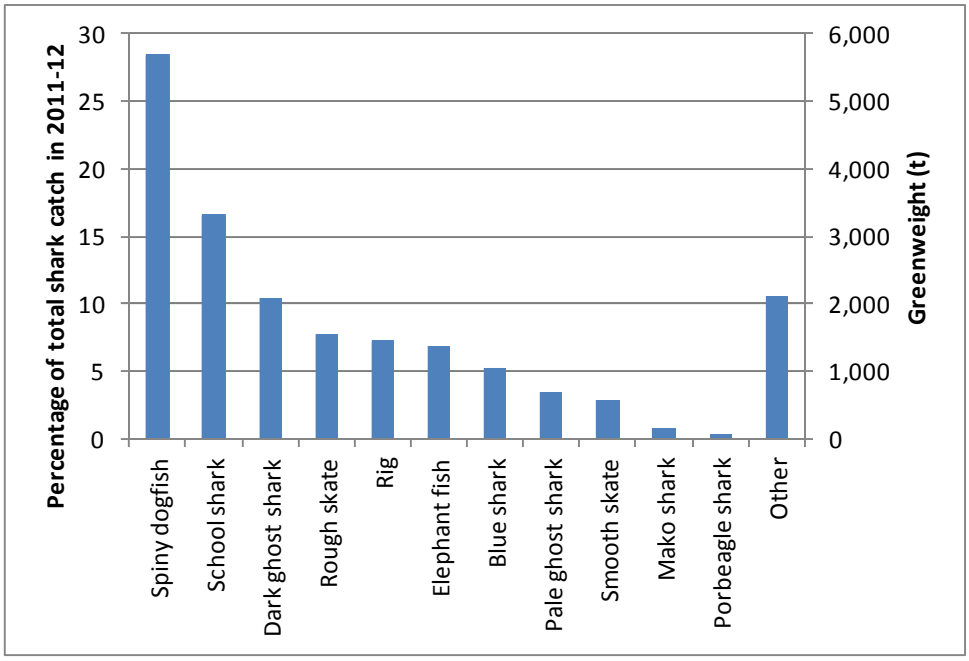

Figure 2. The catch of QMS (89.5%) and 'other' sharks as a percentage of the total reported shark catch in 2011-12 (total 20 165t). The 'Other' category includes 40 shark species, some reported under generic codes and is likely to under-represent removals to some extent due to unrecorded discarding of minor species (non-QMS stocks may legally be returned to the sea).

The QMS includes a comprehensive catch-balancing regime and reporting requirements that help to create an auditable and species-specific trail of commercial catch from the point sharks are caught to the point where they are processed and sold for export or into the domestic market.

With some exceptions, all catches of QMS species must be landed. One specific exception is for species that are listed on the 6th Schedule of the Fisheries Act, which may be returned to the sea (if alive and likely to survive[9]) (see Table 2 for species that are listed on the 6th Schedule as at July 2013). Where processing occurs, conversion factors are used to convert weights to the unprocessed or 'green' weight, which is used for accruing catch against quota, as well as for scientific purposes. Figure 3 shows the proportions of shark catch that are discarded; released (released alive under the provisions of the 6th Schedule); retained (except for sharks for which only the fins are retained); and landed catches where only the fins are retained ("fin only").

Sharks caught in New Zealand fisheries include:

- target fisheries (e.g. school shark and rig fisheries);
- non-target catch that is a valued component of the overall catch (e.g. mako shark);
- non-target catch for which there are no or limited markets (e.g. deepwater dogfish and blue shark, for which markets for trunks are currently limited).

[9] Spiny dogfish are included on Schedule 6, but have a specific provision allowing them to be returned to the sea either alive or dead. All discards of spiny dogfish are counted against a fishers ACE.

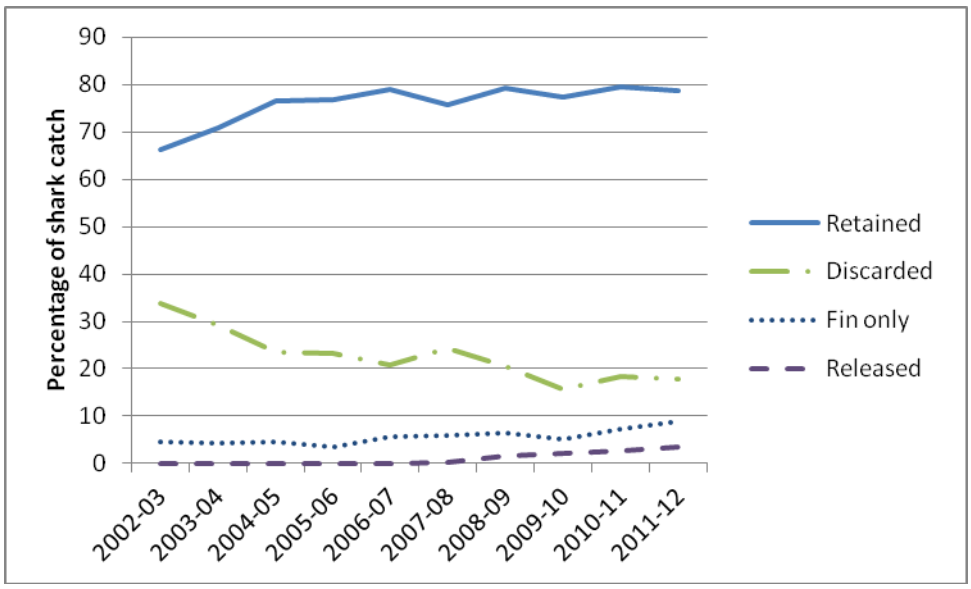

Figure 3. Catch from 2002 to 2012 by means of utilisation. Retained includes all landings that are not reported with fins as the primary landed state, including those processed for livers (1% of 2011/12 catches). Discarded refers to non-QMS species that are not processed at all or spiny dogfish discarded under Schedule 6 provisions (which may be alive or dead). Fin only is those landings reported with fins as the primary landed state. Released refers to live animals released under Schedule 6 provisions. These data are self-reported and are likely to overestimate utilisation, but are the only data available that covers all fisheries.

3.2 NEW ZEALAND SHARK SPECIES AND FISHERIES

Sharks are taken as a target or bycatch in a range of fisheries. For the purposes of fisheries management planning (i.e. setting fisheries objectives, determining fisheries services, monitoring fisheries performance), New Zealand fisheries are grouped into three areas (Figure 4). These are the deepwater and middle-depth fisheries (referred to collectively as the "deepwater fisheries"), the inshore fisheries, and fisheries for highly migratory species (HMS).

Each fisheries grouping has unique characteristics with respect to sharks, which supports the adoption of targeted responses to shark conservation and fisheries management issues associated with each grouping, through deepwater, inshore, and HMS fisheries plans. Often, species distributions overlap fisheries plan jurisdictions, however, pragmatic responses to overlapping issues can generally be found. A summary of the characteristics of each grouping is provided below. Further detail can be found in national fisheries plans and supporting documents.[10]

[10] http://www.fish.govt.nz/en-nz/Fisheries+Planning/default.htm?WBCMODE=PresentationUnpublished

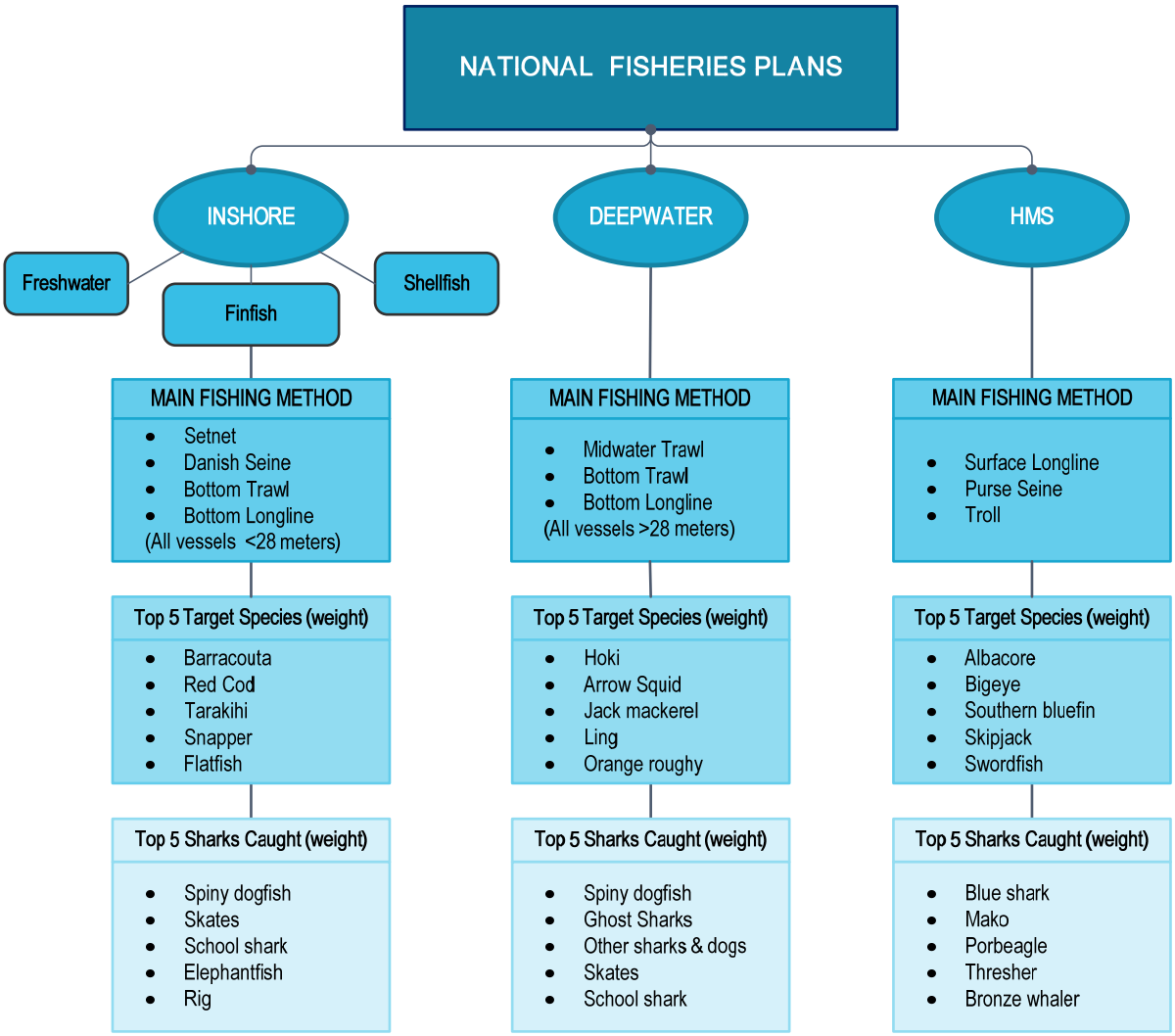

Figure 4. National fisheries plan groups – inshore, deepwater, and highly migratory species. Note that some sharks may also be caught as bycatch in other inshore fisheries, e.g. using the method of potting, which may be included in the inshore shellfish fisheries plan.

3.2.1 Social, cultural and economic values of sharks

Social

Public perceptions of sharks have undergone a change over time, and their important role in marine ecosystems is increasingly recognised, alongside an understanding that sharks can be vulnerable to human impacts and therefore require careful management and conservation. Social values associated with sharks include recognition of their intrinsic value, as well as use values. With regard to use values, some sharks are favoured recreational species, including as gamefish. Species of particular interest to recreational fishers include inshore species such as rig, school shark, and elephant fish, and gamefish including mako shark.

Cultural

Some sharks are known to have particular cultural significance, especially to Maori. For example, some species may be kaitiaki (guardian species) for specific iwi or hapu. Sharks were historically an important source of food for Maori. For example, dried shark (hung under a tree for several weeks) and sharks liver are traditional delicacies. Maori also used sharks' teeth for jewellery, and shark liver oil for paint, and as a cosmetic.

Economic information

Sharks provide a range of usable products including meat (fillets), fins, liver, skin, and cartilage. Sharks caught in New Zealand fisheries are sold through both domestic and export markets. A figure of $18 million has been provided for domestic sales of shark fillets in the 2012-13 fishing year.[11]

Exports of shark products from New Zealand are reported in more detail than the information that is compiled in international trade statistics. New Zealand exports are recorded to the species level for five species, along with an "other" category; three product types are also specified. A code to report dried shark fin has recently been added, but does not include species identification. The international trade system at present only includes two categories that include sharks, and no identification at a species or specific product type level. There is currently a proposal from the FAO to modify international reporting codes to allow for the identification of some species and specific products like shark fins.

In 2012, exports from New Zealand identified as shark products realised a total value of NZ$30.1 million. Of this, 60.4 tonnes of dried shark fins were exported for a total value of NZ$1.7 million. A closer investigation of the value of exports to particular countries indicates an additional 125.4 tonnes of product not specifically identified as shark fins but likely to be frozen shark fin, realising a value of NZ$3.2 million. Shark fin exports include those landed as a secondary product along with shark trunks, adding to the utilisation of those species.

Preliminary figures for 2013 suggest a substantial decline in shark fin exports. The decline is thought to reflect decreased demand, especially from China. For example, in the 6 months to June 2013 a total of 4.8 tonnes of dried shark fins was exported for a total value of $216,000 – a more than 90% reduction in the quantity of dried shark fin exported in the same period in 2012.

3.2.2 Inshore fisheries

New Zealand's inshore commercial fisheries employ a wide range of fishing methods to target a variety of species throughout inshore waters. Some shark species are targeted by inshore fisheries, mostly by set net and also taken as bycatch in inshore trawl, Danish seine, and bottom longline fisheries. The main inshore shark species taken are rig or spotted dogfish, school shark, and elephant fish, which made up approximately 30% of all sharks caught in all New Zealand fisheries in 2011-12 (Figure 2). The inshore fisheries took more than 96% of the total catch of these species. These species are highly valued and are processed for domestic and international markets.

Catches of these sharks are managed under the QMS, and catch limits are reviewed and adjusted according to the best available information to ensure sustainable harvesting. Inshore mixed species fisheries are characterised by complex interactions, and various management tools are used to support sustainable management and enable fishers to optimise value from their catches. This includes allowing commercial fishers to return rig and school sharks to the sea if likely to survive.

There is also a substantial bycatch of spiny dogfish in some inshore trawl fisheries. Spiny dogfish have a low or no market value, and the management system allows for this species to be returned to the sea either alive or dead, as long as the catch quantities are reported so that fisheries can be monitored and counted against annual catch entitlements (ACE). In 2011-12, spiny dogfish alone made up about 28% of all sharks caught in all New Zealand fisheries, and

[11] Source: submission of Talley's Group Ltd on the draft NPOA-Sharks 2013.

the inshore fisheries took approximately 40% of that catch (Figure 2). Spiny dogfish is also caught in deepwater fisheries. Some of the catch is returned alive under the Schedule 6 provisions. Monitoring shows the amount of spiny dogfish discarded is declining slowly.

The bycatch of other shark species, including those not managed under the QMS, is retained according to market availability or returned to the sea. Carpet shark (*Cephaloscyllium isabellum*)[12] and northern spiny dogfish (*Squalus griffini*) are the main species caught. Carpet shark is a species with significant fin-only landings (32% of inshore catches).

Shark species such as rig, school shark, and elephant fish are also important for customary and recreational fishers in some areas. Any large inshore sharks such as bronze whalers (*Carcharhinus brachyurus*) taken by non-commercial fishers are generally released alive.

3.2.3 Deepwater fisheries

The deepwater fisheries principally target a range of white fish in large volume bottom and mid-water trawl fisheries and smaller scale, bottom longline fisheries. The main target species by volume are hoki (*Macruronus novaezelandiae*), arrow squid (*Nototodarus gouldi, N. sloanii*), jack mackerel (*Trachurus* spp.) and ling (*Genypterus blacodes*). Sharks are caught only as bycatch in the deepwater fisheries and do not form a large proportion of the overall catch. Shark species most often captured in deepwater fisheries include spiny dogfish, ghost sharks (chimaera – *Hydrolagus* spp.), a mixed species group reported under a generic code ('other sharks and dogs' – OSD), rough and smooth skates and school sharks. Deepwater fisheries caught 34% of the total shark catches in the 2011/12 fishing year of which 65% were fully utilised (including processing to fishmeal and skates for wings) or released alive.

The vast majority of sharks taken in the deepwater trawl fisheries die during capture, but utilisation of retained sharks is high. In the 2011/12 fishing year 70% of all QMS species caught by the deepwater fleet were fully utilised or released alive. Excluding spiny dogfish, 97.4% of QMS sharks were fully utilised or released alive. Half of all deepwater spiny dogfish catch was fully utilised, with the remainder returned to the sea under Schedule 6 provisions.[13] The proportion of Schedule 6 returns of spiny dogfish alive is unknown but is unlikely to be zero. The total deepwater catch of non-QMS sharks is relatively small; of this, the majority of non-QMS species caught were reported under generic codes. Overall, around 45% of non-QMS shark species caught in deepwater fisheries were fully utilised (species range from 28%-90% fully utilised). Two of the non-QMS species commonly caught are seal shark (*Dalatias licha*)[12] and shovelnose dogfish (*Deania calcea*) which are often processed for livers.

3.2.4 Fisheries for highly migratory species

New Zealand HMS fisheries target large tuna (principally bigeye tuna – *Thunnus obesus* and southern bluefin tuna – *T. maccoyii*) and swordfish (*Xiphias gladius*) by longline; skipjack (*Katsuwonus pelamis*) by purse seine; and albacore (*T. alalunga*) by trolling. The tuna longline fishery has the most significant bycatch of highly migratory sharks (blue shark, mako sharkand porbeagle shark). This fishery also has a high proportion of landings with fins as the primary landed state (on average 67% for blue shark, 38% for mako and 61% for porbeagle). A significant proportion of highly migratory sharks taken in tuna longline fisheries arrive at the vessel alive, particularly blue sharks (around 90%). The three highly migratory shark species made up around 7% of the national shark catch in 2011-12 (Figure 2). Sharks and

[12] Seal shark and carpet shark are currently (2013) under consideration for introduction to the QMS.
[13] Schedule 6 of the Fisheries Act lists species which may be returned to the sea or other waters in accordance with stated requirements. For all shark species other than spiny dogfish, the requirements are that the animal is likely to survive on return to the water and that the return takes place as soon as practicable. For spiny dogfish, they may be returned to the sea either alive or dead but all catches are balanced against a fisher's ACE.

spine-tailed devil rays are an occasional bycatch of purse seine fisheries for skipjack and a rare bycatch of albacore trolling.

Highly migratory shark species spend only part of their time in New Zealand waters, and may migrate over considerable distances. New Zealand cooperates with other countries to manage these species, notably through Regional Fisheries Management Organisations including the Western and Central Pacific Fisheries Commission (WCPFC) and the Commission for the Conservation of Southern Bluefin Tuna (CCSBT). This collaboration is important to ensure New Zealand's conservation and management efforts are not undermined. Comprehensive management arrangements are required for the high seas and other national jurisdictions that take into account the individual characteristics of highly migratory sharks.

Highly migratory sharks are subject to conservation and management measures determined by the WCPFC. New Zealand's management is consistent with those measures. Most target and bycatch species (including sharks) taken in the HMS longline fisheries were introduced into the QMS in 2004, resulting in a rationalisation of the pelagic surface longline fleet. This rationalisation saw vessel numbers decline from approximately 140 to between 30 and 40.

The catch limits for porbeagle, mako, and blue sharks were initially set at levels intended to allow only for historical bycatch rather than any target fishing. As expected following the rationalisation of the longline fleet catch limits were substantially under-caught. In 2012 the catch limits for porbeagle and mako shark were significantly reduced to reflect both the vulnerability of these species and to maintain apparent trends of increasing abundance of mako shark. There are no indications of declining abundance of blue sharks in New Zealand waters, and a review of the blue shark catch limit was deferred pending a regional assessment of this species proposed by WCPFC to commence in 2013.

4 Objectives

New Zealand has a comprehensive reporting and management system in place to ensure the sustainability of key shark species, but there is room for improvement. The following goals and objectives have been developed to provide direction for management actions to improve the conservation, protection and management of sharks over time.

The purpose statement of the NPOA-Sharks 2013 sets out the desired future state for shark conservation and management in New Zealand. Underlying this, goals have been developed for a range of areas where improvements in current management arrangements can be achieved. Five year objectives are aligned to each of the goals. These objectives are intended to be achieved within the five year lifespan of this plan (with specific timelines identified for some objectives where progress is anticipated to be more rapid), but it is acknowledged that some may flow through to subsequent versions. Figure 1 in the introductory section shows how the purpose, goals, and five year objectives of the NPOA-Sharks 2013 will be implemented through agencies' planning processes. However, implementation may not be limited to government agencies and may, in fact, be undertaken in partnership with industry, environmental stakeholders, non-extractive users or Treaty partners.

Purpose Statement

To maintain the biodiversity and the long-term viability of all New Zealand shark populations by recognising their role in marine ecosystems, ensuring that any utilisation of sharks is sustainable, and that New Zealand receives positive recognition internationally for its efforts in shark conservation and management.

Sharks fill a variety of ecosystem roles ranging from apex predators such as great whites to plankton feeders such as basking shark, and benthic feeders such as rough skate. These roles should be recognised in management arrangements, which should be tailored to species-specific biological characteristics, and the vulnerability of a species to fishing impacts. Where a population or stock of a shark species cannot sustain any harvesting, protection must be considered. Where sharks are used in fisheries, their use should be optimised and must be sustainable. The Fisheries Act 1996 defines 'sustainability', and the Harvest Strategy Standard and Guidelines provide operational guidance on how to ensure this. Non-extractive uses such as tourism and shark research should also be a consideration in the management arrangements for sharks. Recognising that some species of sharks found in New Zealand range outside our waters, New Zealand should actively engage internationally to promote the conservation of these sharks and management of fisheries that impact upon them. International engagement should also focus more generally on encouraging shark conservation and management in other jurisdictions where appropriate.

4.1 GOALS AND FIVE-YEAR OBJECTIVES

4.1.1 Biodiversity and long-term viability of shark populations

1 Maintain the biodiversity and long-term viability of New Zealand shark populations based on a risk assessment framework with assessment of stock status, measures to ensure any mortality is at appropriate levels, and protection of critical habitat.

Objective 1.1

Develop and implement a risk assessment framework to identify the nature and extent of risks to shark populations

Rationale

In order to most appropriately prioritise research, management, and compliance, it is necessary to understand the impact of both extractive and, where possible, non-extractive users on populations as well as the resilience of populations to those impacts. A risk assessment framework will be developed and implemented for all shark species, including QMS, non-QMS, and protected species. The risk assessment will take account of any available information including species' characteristics, conservation status, and biology. Risk assessment will form the basis of management action, allowing a focus on high risk species. Given the reliance of other objectives on the completion of the risk assessment, the aim is to complete this by December 2014. This objective contributes to IPOA Aims 2 and 3.

Objective 1.2

Systematically review management categories and protection status to ensure they are appropriate to the status of individual shark species.

Rationale

The primary tool to manage extractive use and ensure the sustainability of stocks is the QMS. Where shark stocks are particularly vulnerable or have declined to levels where populations may be at risk, protected status should be considered. A routine assessment process is required to evaluate the placement of shark stocks on the management gradient ranging from full protection, through catch limits under the QMS, to open access. Consistency with New Zealand's international obligations will form an important component of this evaluation.

It is the aim to complete an initial review for all shark species within one year of completing the risk assessment (i.e. by December 2015), with annual review or as required thereafter.

This objective contributes to IPOA aims 2 and 3.

Objective 1.3

For shark species managed under the QMS, undertake an assessment to determine the stock size in relation to B_{MSY} or other MSY-based reference points and on that basis review catch limits to maintain the stock at or above these targets.

Rationale

Management targets for shark species should be reviewed and catch limits set at appropriate levels. The absence of stock assessments introduces risk and uncertainty to management. Quantitative assessments are best practice and should be applied for all species in the QMS, especially those identified as high risk. For those species where adequate information can be obtained within the period of the plan, quantitative stock assessments will be undertaken. A

timeline will be developed for evaluating which QMS sharks are likely to have appropriate data to enable a quantitative stock assessment to be attempted in the future, to identify other species where data gaps could be relatively easily filled to enable quantitative stock assessments to be attempted, and to identify species where other indices and lower-information assessment methods will need to be used. The risk assessment will be used to inform development of this timeline, and to prioritise resources between assessment of QMS and other species, specifically those identified by the risk assessment as higher risk.

Within the period of the plan, a semi-quantitative stock assessment is a minimum requirement for those species where information is lacking and not able to be obtained in the short term. Semi-quantitative assessments mean stock assessments that may not be fully quantitative, and rely on an assessment of key indicators of stock abundance to determine the status of the stock for management purposes. Achievement of this objective will require engaging internationally to advocate for and support stock assessments for highly migratory species of sharks.

This objective contributes to IPOA aim 1.

Objective 1.4

Mortality of all sharks from fishing is at or below a level that allows for the maintenance at, or recovery to, a favourable stock and/or conservation status giving priority to protected species and high risk species.

Rationale

Catch limits, mitigation, and avoidance techniques can be used to ensure that shark populations are maintained at appropriate levels. For protected species and species that have been identified as high risk this may mean avoiding any mortalities, whereas for other species minimisation of incidental captures may be the most appropriate response. This objective includes assessing the status of protected sharks and applying management measures aimed at moving them to a more favourable conservation status (including, where appropriate, by the development of recovery plans). This objective contributes to IPOA aims 1 and 3.

Objective 1.5

Identify and conserve habitats critical to shark populations

Rationale

Management action is needed to ensure that significant habitats for sharks, like pupping and nursery grounds, are identified and the attributes and functions of those habitats are appropriately protected. Management measures may include temporal and/or spatial closures, restrictions on gear, vessel type and other human activities. This may also include actions under other legislation (e.g. Resource Management Act 1991 and the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012). This objective contributes to IPOA aims 2 and 6.

Objective 1.6

Ensure adequate monitoring and data collection for all sectors (including commercial, recreational and customary fishing, and non-extractive users) and that all users actively contribute to the management and conservation of shark populations.

Rationale

To ensure proper conservation and management of shark populations there must be adequate information about catch and effort in all sectors, as well as information on other potential impacts on shark populations. Priority should be given to filling those information gaps for

the high-risk species. All users (including commercial and non-commercial fishers) should understand any risk their activities pose to sharks and be engaged in minimising those risks. To support this objective, relevant organisations should be encouraged to support and promote best practice mitigation and live release where appropriate. This objective contributes to IPOA aims 4 and 9

4.1.2 Utilisation, waste reduction and the elimination of shark finning

2 Encourage the full use of dead sharks, minimise unutilised incidental catches of sharks, and eliminate shark finning[14] in New Zealand

Objective 2.1

Review and implement best practice mitigation methods in all New Zealand fisheries (commercial and non-commercial)

Rationale

Avoiding or minimising captures of protected, high-risk, and other non-target shark species is important to minimise waste and reduce the impact of fishing activities on shark populations. No official best practice guidelines or requirements currently exist in New Zealand for avoiding the capture of shark species, and such guidelines or requirements need to be developed and implemented in all fisheries. In some cases, development of these guidelines may be a case of documenting already known mitigation methods while in others, more research may be required.

This objective contributes to IPOA aim 5.

Objective 2.2

Minimise waste by promoting the live release of bycaught shark species and develop and implement best practice guidelines for handling and release of live sharks

Rationale

Where full utilisation is not taking place, enable and encourage the live release of sharks (where live release is consistent with legislation). This will help to minimise waste. In order to facilitate this, best practice guidelines for handling and live release of sharks should be developed and disseminated for the circumstances that bycaught shark species are taken despite best efforts to minimise their capture (this includes the incidental catch of protected species). Actions should also include allowing for the live release of additional shark species under Schedule 6 of the Act where appropriate. Allowing the release of live sharks under Schedule 6 so that fishers can release juveniles or pregnant females may benefit the population. This objective contributes to IPOA aim 7.

Objective 2.3

Develop and implement best practice guidelines for non-commercial fishing and handling of sharks

Rationale

Non-commercial fishers, both recreational and customary, catch sharks, some of which are kept while others are returned to the sea (alive or dead). Best practice guidelines for the

[14] Shark finning is defined for the purpose of this NPOA as the removal of the fins from a shark (Class Chondricthyes – excluding Batoidea (the rays and skates)) and the disposal of the remainder of the shark at sea. As such, removal of the fins from a shark where the trunk is also retained for processing is not defined as 'shark finning'.

handling and release of live sharks as well as humane harvesting should be developed and made available to non-commercial fishers. This objective contributes to IPOA aims 5 and 6.

Objective 2.4

Eliminate shark finning in New Zealand fisheries by 1 October 2015, with one exception

Rationale

Recognising that the primary sustainability tool for shark species managed within the QMS is the catch limit, measures to improve the utilisation of sharks, within the established sustainability bounds of the QMS, are now required in order to more closely align New Zealand management arrangements with the aims of the IPOA-sharks.

By 31 March 2014, strategies will be developed for all fisheries complexes for implementation over a two year period commencing 1 October 2014. By 1 October 2014, a regulatory framework for the implementation of these strategies will be established and finning prohibitions applied to a first tranche of species. A second tranche, completing implementation for all sharks with one exception, will then be implemented for 1 October2015. Finning will be eliminated in blue shark fisheries by 1 October 2016 at the latest.

Each strategy should include a detailed analysis of factors that contribute to the practice of shark finning, main impediments to its elimination, identify species for each tranche of implementation, and be focussed on addressing the issues specific to that fishery complex. The strategies will be developed in a collaborative process with industry and environment stakeholders.

Strategies should detail any regulatory changes required to remove incentives for the landing of fins only, and/or impediments to improved utilisation. Where no such incentives or impediments exist, early actions should be proposed to remove wasteful fishing practices or prevent them from developing. Where such incentives or impediments do exist, they may need to be addressed before measures to prohibit shark finning can be successfully implemented. The form of shark finning prohibitions should take into account the specific characteristics of the fishery.

Strategies will be implemented through the annual operational plans for HMS, Deepwater and Inshore fisheries, and progress against the deliverables outlined in the strategies will be reported annually to ensure that timeframes are being met and measurable progress is being made towards the elimination of shark finning in all New Zealand fisheries by 1 October 2015 (with the exception of blue sharks, for which shark finning will be eliminated by I October 2016).

4.1.3 Domestic engagement and partnerships

3 All commercial, recreational and customary fishers, non-extractive users, Maori, and interested members of the New Zealand public know about the need to conserve and sustainably manage shark populations and what New Zealand is doing to achieve this.

Objective 3.1

Capture and reflect, through meaningful engagement, the social and cultural significance of sharks, including their customary significance to Maori, in their conservation and management

Rationale

Some sharks are known to have particular social and cultural significance, including to Maori. For example, some species may be kaitiaki (guardian species) for specific iwi or hapu. This dimension should be better understood, incorporated into information that is disseminated in New Zealand, and reflected in the conservation and management of sharks in New Zealand. Gaining a greater understanding of the social and cultural significance of sharks will need to occur through active engagement with Maori and other stakeholders.

Objective 3.2

Communication and information sharing between government agencies and stakeholders is effective, with strategies developed and implemented to promote the conservation and sustainable management of shark populations.

Rationale

All commercial, recreational and customary fishers and interested members of the New Zealand public have a role in the conservation and management of sharks in New Zealand. Information sharing amongst relevant agencies and stakeholders should be enhanced and promoted. In addition, information about the importance of shark conservation should be available to stakeholders and the public. Findings of all relevant research including international developments should be interpreted and disseminated to the fishing industry and general public in a manner which facilitates uptake, including the use of factsheets, workshops and mentor programmes. This will facilitate the uptake of ideas such as best practice mitigation and live release and allow fishers to be better informed on the need for shark conservation and management. Information on best practice also extends to non-extractive uses such as tourism (i.e. cage diving).

This objective contributes to IPOA aim 4.

Objective 3.3

Encourage compliance with regulations, implementation of best practice (including catch avoidance and correct handling), and co-operation with ongoing research among commercial and non-commercial stakeholders. In particular, encourage reporting of any illegal practices (especially live finning) that may be observed.

Rationale

Clear communication with commercial and non-commercial fishers and non-extractive users regarding regulations, research they can participate in (e.g. tagging programmes), best practice methods, and the importance of reporting non-compliant at-sea behaviours is central to the conservation and management of sharks. For example, the co-operation of fishers with

tagging programmes and other research initiatives is important, and is easier to achieve where fishers are informed as to the aims and objectives of all relevant research, as well as the outcomes. Likewise, the development of best practices, including on avoiding catches of sharks and minimising mortality amongst sharks that are captured, need to be effectively communicated to fishers to encourage uptake.

Live finning is identified as a particular focus for this objective because of the animal welfare concerns associated with this practice. However, the objective also advocates a broader focus on compliance with regulations, including protection under the Wildlife Act or any regulations related to non-extractive use. This would encompass all finning once the regulatory framework to prohibit shark finning has been put in place.

This objective contributes to IPOA aim 4.

Non-fishing threats

4 New Zealand's non-fishing anthropogenic effects do not adversely affect long-term viability of shark populations and environmental effects on shark populations are taken into account.

Objective 4.1

Non-fishing anthropogenic and environmental threats to shark populations are understood and, where appropriate, managed.

Rationale

Non-fishing anthropogenic and environmental impacts on shark populations are not currently well understood. Based on the risk assessment, a research programme should be set up to investigate such impacts and better understand their potential effects on shark populations (refer research and monitoring section below). Where appropriate, management measures should be put in place to ensure that threats to shark populations are minimised.

International engagement

5 New Zealand actively engages internationally to promote the conservation and protection of sharks, the management of fisheries that impact upon them, and the long-term sustainable utilisation of sharks.

Objective 5.1

New Zealand ensures that it meets its international obligations and receives positive recognition for its efforts in the conservation, protection and management of sharks through active engagement in international conservation and management agreements relevant to sharks.

Rationale

New Zealand actively engages in international conservation and management agreements, including RFMOs, the FAO, the Convention on the Conservation of Migratory Species of Wild Animals (CMS), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) to promote the conservation and protection of sharks, the management of fisheries that impact upon them, and the long-term sustainable utilisation of sharks. This engagement should include the promotion of New Zealand's management framework. This objective contributes to IPOA aim 4.

Objective 5.2

New Zealand actively investigates and decides whether to become a signatory to the Convention on Migratory Species (CMS) Memorandum of Understanding on the Conservation of Migratory Sharks (MoU) in advance of the next Meeting of Signatories in 2015.

Rationale

As a State party to CMS, New Zealand participated in the negotiation of the CMS MoU on the Conservation of Migratory Sharks, but a decision on whether or not to become a signatory has not yet been made[15].

In the period leading up to the next Meeting of Signatories, anticipated for 2015, New Zealand will decide whether or not to become a signatory to the MoU. As part of this assessment process, careful consideration will be given to the obligations associated with becoming a signatory; the range of benefits to New Zealand's shark conservation and management efforts that might be forthcoming; any resource implications and a stocktake of how the CMS MoU interfaces with other international fora and discussions on shark conservation and management.

The Convention on Migratory Species (CMS) is an intergovernmental treaty under the United Nations Environment Programme. The CMS Memorandum of Understanding on the Conservation of Migratory Sharks was finalised on 1 March 2010. The First Meeting of Signatories was held in September 2012.

Objective 5.3

New Zealand collaborates with neighbouring countries to better understand the population dynamics of highly migratory sharks, protected sharks, and any other shark species of special interest.

Rationale

Given the shark conservation and protection initiatives of some Pacific island countries and the movement of highly migratory sharks between the waters of Pacific countries and New Zealand, ensure that information is shared and conservation and management measures are complementary to (and do not undermine) those applied more generally in the Pacific. Co-operation with coastal State members of RFMOs in the Southern Hemisphere is also required to address protected and other shark species of special interest. This objective contributes to IPOA aims 4, 9 and 10.

Objective 5.4

New Zealand proactively contributes to and advocates for improved data collection and information sharing of commercial catches and incidental bycatch of sharks within relevant Regional Fisheries Management Organisations (RFMOs).

Rationale

Multinational organisations are often hindered in their efforts to assess populations because of data limitations. Several RFMOs have recently amended reporting requirements to begin requiring member States to strengthen their shark catch data reporting. New Zealand is one of the few countries that is already doing so, and should continue to provide high-quality

[15] The text of the MOU can be found at http://www.cms.int/species/sharks/sharks_mou.htm. A Sharks MOU website (http://sharksmou.org/) provides further detail on the MOU and its associated conservation plan.

information to all RFMOs as well as continuing to encourage other States to collect and report more detailed shark catch data. This objective contributes to IPOA aims 4, 9 and 10.

Objective 5.5

New Zealand encourages fishing countries, coastal States, and regional organisations to develop and implement best practice Plans of Action for conserving and managing sharks, where they have not already done so.

Rationale

Some New Zealand sharks are highly migratory and are found within the fisheries waters of many other countries where they are fished by a variety of nations. New Zealand needs to work with other fishing nations, coastal states, and regional organisations, particularly our Pacific neighbours, to conserve these sharks and ensure their survival. New Zealand can and should continue to play an active role in regional and global shark conservation and management in a range of international fora. New Zealand's role in the Forum Fisheries Agency is an important example of such work.

4.1.4 Research and information[16]

6 Continuously improve the information available to conserve sharks and manage fisheries that impact on sharks, with prioritisation guided by the risk assessment framework.

Objective 6.1

Ensure information collection systems and processes are sufficient to inform management of shark populations.

Rationale

The conservation and management of sharks must be supported by effective and efficient data collection and monitoring processes that provide robust information. Systems in place should be reviewed to ensure that all necessary information is collected, including:

- *Observer coverage is sufficient to monitor compliance, verify catch information, and collect scientific data for all New Zealand commercial fisheries that take sharks. At-sea monitoring is at a level sufficient to provide statistically robust monitoring of progress towards achieving the objectives of the NPOA-Sharks.*

Information collected at sea is vital to the conservation and management of sharks. At-sea monitoring will be informed by the risk assessment and tailored to fishery-specific and scientific needs.

- *Where observer coverage is not adequate or physically possible, new methods are researched, developed and implemented.*

The Ministry's observer programme provides the most comprehensive at-sea information, with the ability to record accurate measurements of catches and detailed biological information. However, not all vessels are able to carry observers for safety reasons, and achieving high levels of observer coverage can be difficult on some fleets. In these situations,

[16] Planning and prioritisation processes are already in place for allocating resources for research and monitoring, and this section does not seek to duplicate existing or future processes. Rather, it feeds into existing processes by providing guidance on how shark research should be considered and prioritised.

electronic monitoring may provide some information on catch levels of shark species. There may be situations where information cannot be provided by electronic monitoring; in this case, alternative forms of monitoring should be actively investigated.

- *Catch reporting is accurate and at an appropriate level of detail*

Commercial catch reporting needs to be accurate and provide sufficient detail to inform management and allow for the monitoring of commercial fisheries and fishing behaviour. Relevant inputs like conversion factors, Schedule 6 provisions[17], and availability and use of reporting codes may require further scrutiny to ensure accuracy of catch reporting.

- *Use of generic reporting codes is minimised through education programmes and better tools for identification of shark species*

Better reporting includes a reduction in the use of generic reporting codes (in particular OSD – Other sharks and dogfish and DWD – Deepwater dogfish), both by observers and commercial fishers. Generic codes do not provide sufficient species resolution to allow for monitoring of catch levels. Educational materials and guides have already been produced and distributed to fishers[18]. Additional methods to improve shark identification should be explored to facilitate a reduction in generic reporting code use, with the aim of reducing the use of generic codes to <1% of total shark catch in the next five years. To facilitate this, yearly reviews of generic code usage should be completed to identify areas needing focussed attention.

- *Historical catch data for shark species is compiled and available to inform management*

Some fisheries that catch sharks have lengthy histories in New Zealand. For example, school shark fisheries were estimated to have begun in the 1940s. Information on historical catches in some of these fisheries is not readily available, but is important to understand population dynamics and stock status. This information should be compiled and made available for any assessments of the status of relevant shark populations.

- *Information on non-commercial shark catch and its importance to the sectors is available for management*

Many sharks are caught by non-commercial fishers, both accidentally and as a valued target species. Little information is available on the level of these catches, and the value to non-commercial fishers of this catch. Information is also lacking on the values of broader non-extractive uses like tourism. Programmes should be considered to collect information on non-commercial shark catch and its importance to the various sectors.

This objective contributes to IPOA aims 4, 9 and 10.

[17] This includes the review of Schedule 6 provisions for spiny dogfish to ensure that reporting has improved and is robust under the current provisions.
[18] New Zealand Aquatic Environment and Biodiversity Reports 68,69 and 78 available at http://fs.fish.govt.nz/Page.aspx?pk=61&tk=209

Objective 6.2

Undertake a research programme, guided by the risk assessment framework, to increase understanding of and improve the management of shark populations

Rationale

The conservation and management of sharks must be supported by a robust research programme to effectively interpret, analyse, and explore data and information to inform management decisions, best practice guidelines, and the conservation of sharks. Research topics are broad and projects will be prioritised based on the risk assessment, scale of relevant fisheries and within the priorities for each fisheries complex. This research programme should cover shark populations and biology; stock assessment; habitats of significance to fisheries management; mitigation/avoidance of non-target catches; handling and live release; non-fishing anthropogenic impacts; and market opportunities.

The first area of focus is on **shark populations and biology**. This includes continued collection of biological information on all shark species to better understand shark populations and biology. The science review recommended expanded dietary studies for some sharks and the continuation of trawl surveys.

The second area of focus is on the **assessment of shark populations**. The science review[19] indicated a need to identify species that are amenable to stock assessment, and to investigate new assessment methods or indicators that may provide information on stock status of shark species for which there is limited information. Knowledge of the status of shark stocks is key to ensuring appropriate management, but it is important for approaches to be pragmatic and cost effective. The completion of these assessments will contribute to meeting the objectives 1.3 to 1.5.

The third area of focus is on **habitats of significance to fisheries management**. Several studies have been completed looking at habitats that are critical to the survival of certain species of sharks (e.g. pupping and nursery grounds). This research should be continued and consolidated, as well as expanded to identify significant habitats for more shark species. This research will also facilitate identification of threats to these habitats, guiding management measures to conserve the attributes and functions of the habitat (as outlined in Objective 1.6).

The fourth area of focus is **mitigation/avoidance of non-target catches**. For shark species that are not commercially fished but incidentally caught during fishing operations, including protected and high risk species, catches should be minimised and avoided wherever possible. With an initial focus on avoiding protected species captures, mitigation and avoidance technique need to be investigated, tested and implemented across New Zealand's fisheries. This may include novel methods to better identify sharks on vessel echosounders and identification of spatial and/or temporal factors that indicate a higher risk of protected species interactions. For non-protected species, efforts to minimise catch of species that are not saleable are important to maintain viable populations and minimise waste from fisheries. This research area contributes to Objectives 2.1, 2.2, and 2.3 on utilisation and waste reduction.

The fifth focus area is **handling and live release of sharks**. Of the eleven species of sharks managed through the QMS, eight are currently listed on Schedule 6 of the Fisheries Act (see Table 2). For seven of these, Schedule 6 allows them to be returned to the sea if they are alive, likely to survive upon their return to the water, and the return to the sea takes place as soon as practicable after the shark is caught. There is little information available on the actual survival

19 Francis, M. P., Lyon, W. (2012). Review of research and monitoring studies on New Zealand sharks, skates, rays and chimaeras, 2008−2012.New Zealand Aquatic Environment and Biodiversity Report No. 102. 74 p. http://www.maf.govt.nz/news-resources/publications

of sharks that are released alive back into the sea under this provision. There may be some unseen mortality of these sharks (i.e. cryptic mortality) and research is required to quantify this including whether the handling techniques used by fishers may contribute to some mortality or injury to the sharks. This research area contributes to Objective 2.2.

The sixth focus area expands the scope of the NPOA-Sharks 2013 to include research into **non-fishing anthropogenic impacts** on shark populations (see Objective 1.4). Research is needed to identify potential non-fishing anthropogenic effects, environmental conditions, and non-extractive uses on shark populations, including effects from non-extractive uses like tourism and diving that may impact shark behaviour.

The seventh focus area is the exploration of **market opportunities** for sharks. This includes research and development of new markets or processing techniques to increase the level of utilisation of sharks. It also includes investigation of non-extractive uses like tourism that may provide additional value to New Zealand from shark populations. This research area will contribute to meeting the objectives on waste and utilisation (Goal 2), and may be an area of research that is led by industry rather than the Crown.

This objective contributes to IPOA aims 1, 2, 3, 9 and 10.

Objective 6.3

Implement research to inform the development of recovery plans appropriate to protected shark species

Rationale

Recovery plans provide a framework for the conservation of threatened species by focusing on goals and objectives for management. Where deemed appropriate through risk assessment, research projects (on issues such as population demographics, distribution and threats) should be undertaken to inform the development of plans appropriate to the successful recovery of a protected species. In the instances where species are migratory and their distributions extend beyond New Zealand waters, New Zealand should cooperate with other range States to ensure opportunities for collaboration and information sharing are maximised, to better inform any recovery plan.

5 Implementation of the NPOA-SHARKS 2013

The main mechanism through which the NPOA-Sharks 2013 will be given effect is the national fisheries planning process. The three plans of primary relevance are the National Fisheries Plan for Deepwater and Middle-Depth Fisheries, the National Fisheries Plan for Highly Migratory Species and the National Fisheries Plan for Inshore Finfish (which is currently under development). Sharks may also be taken as occasional bycatch by some fishing methods such as potting that are also used to take species covered by the Inshore Shellfish Fisheries Plan. These plans set five-year objectives for management of the respective fisheries. When existing national fisheries plans are updated, they will incorporate specific objectives relating to the NPOA-Sharks 2013.

Fisheries plans are implemented through an annual process outlined in Figure 5. The key components are an annual review of progress against objectives; and development of an annual operational plan. Actions to implement the objectives in national plans are identified annually in annual operational plans. Annual operational plans will also incorporate actions to implement the NPOA-Sharks 2013. In this way the fisheries managers accountable for the achievement of the objectives in the national fisheries plans will also be accountable for the achievement of the objectives in the NPOA.

Ministry science planning processes generally operate on an annual cycle. Inshore and HMS fisheries planning processes include a Research Advisory Group that meets annually to advise on research activities required to fulfil the information needs identified for each fishery complex (including any information needs related to implementation of the NPOA-Sharks). Deepwater fisheries research is mostly contracted through a 10 Year Research Programme, but there is capacity for additional research each year. Additional research is also undertaken in the areas of Aquatic Environment, Biodiversity, Antarctic, and Recreational research funds. These are designed to capture issues that are excluded from (Antarctic fund), or cut across (the remaining funds), fisheries plans. Proposals for Aquatic Environment research may also arise from the fisheries planning process.

Similarly, during DOC's Conservation Services Programme (CSP) planning process, protected species priorities identified in the NPOA-Sharks will be fed into the CSP-Research Advisory Group (RAG) where research programmes will be developed and prioritised. A draft annual plan will subsequently be developed and consulted on before implementation. Towards the end of each research cycle, Annual Research Summaries will be produced and reported on in order to inform the next annual cycle (Figure 5). This process is detailed in the Conservation Service Programme Strategic Statement 2013.

These annual processes can also take account of new information regarding the sustainable use of sharks with a view to continuous improvement in the different fisheries. A prioritisation step is involved and actions not prioritised for the next financial year are carried over for consideration in the following year or alternative actions are agreed to fill the gap. The national fisheries plans and annual operational plans are all available on the Ministry's website.[20]

Progress against deliverables in strategies to achieve the objectives of the NPOA-Sharks is to be reported in the annual review reports produced by the Ministry for each fisheries plan grouping, and in annual research summaries produced by DOC. Overall progress at a national

[20] http://www.fish.govt.nz/en-nz/Fisheries+Planning/default.htm

level will be reviewed as part of the annual review proposed to monitor progress against objectives contained in the NPOA-Sharks 2013 (refer Governance section below).

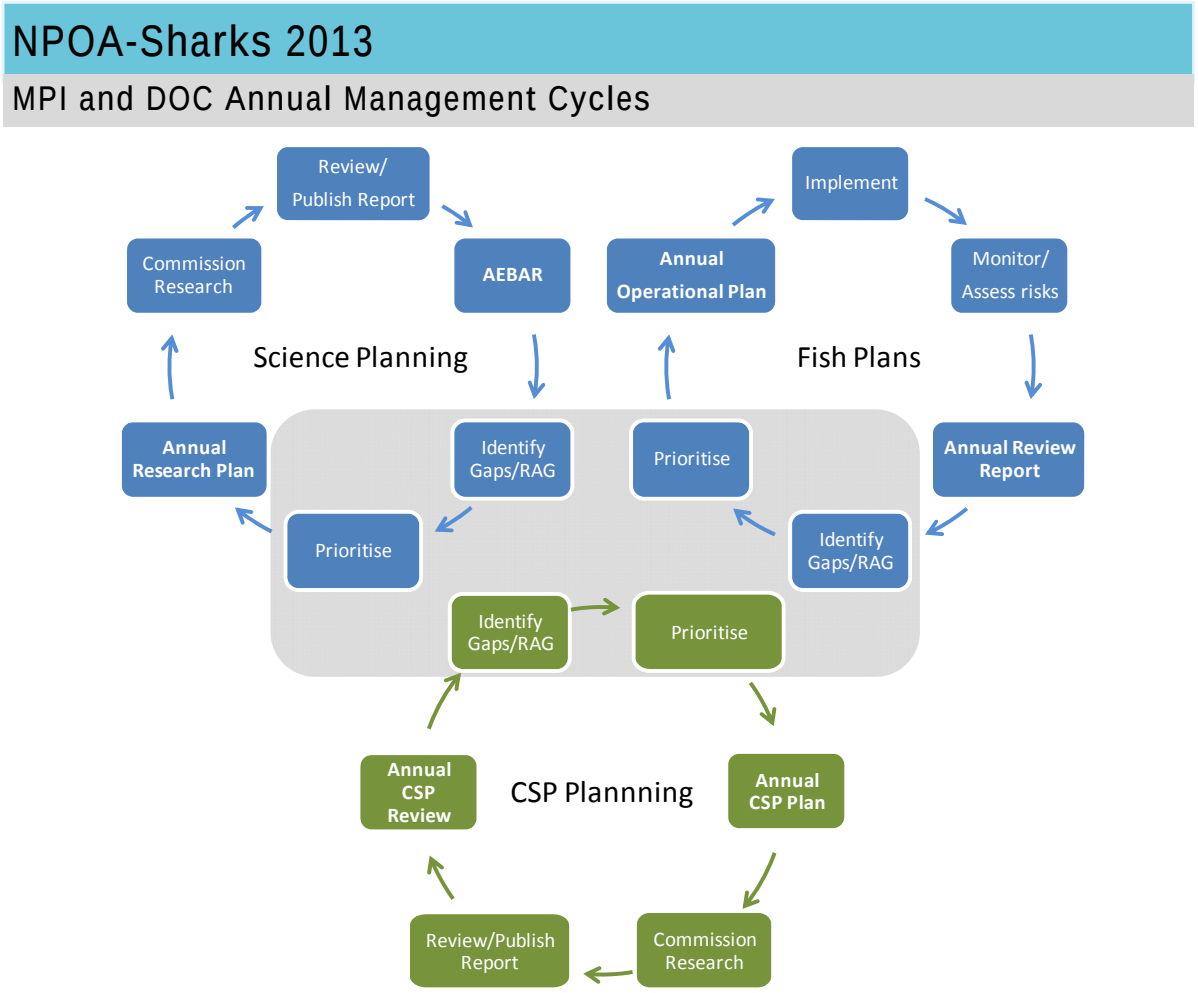

Figure 5: A schematic of the annual planning processes run by DOC (green) and MPI (blue). The shading indicates where communication and alignment exists between DOC and MPI processes. Fisheries stock assessment planning and delivery are included as an integral part of the Fish Plan process. CSP – Conservation Services Plan, AEWG – Aquatic Environment Working Group, RAG – Research Advisory Group, and AEBAR – Aquatic Environment and Biodiversity Annual Review.

The risk assessment proposed in Objective 1.1, in better defining the nature and extent of risk, will assist in informing both the priority of research and management actions to be undertaken as well as identifying the agency or organisation best placed to undertake the work. Implementation may not be limited to government agencies and in some instances there will be partnerships with industry (both extractive and non-extractive), environmental organisations and Treaty partners.

5.1 CO-ORDINATION

Actions necessary to address the directions of the NPOA-Sharks 2013 may require the co-operation of various Government agencies, industry, environmental organisations and other partners. This is particularly the case in relation to protected shark species and the process to extend protected status to other vulnerable species, and New Zealand participation in international conservation and trade forums.

The implementation of the NPOA-Sharks 2013 involves many different aspects of New Zealand legislation and regulatory tools which cross over between government agencies. The three main agencies involved, and working closely together, are the Ministry, DOC, and the Ministry of Foreign Affairs and Trade (MFAT). The Ministry is responsible for administration of the Fisheries Act and management of New Zealand's fisheries resources, and represents New Zealand at international fisheries meetings, including RFMOs. DOC is the agency responsible for the administration of the Wildlife Act 1953, under which some shark species are afforded absolute protection. MFAT has overall carriage of New Zealand's international engagement and represents New Zealand interests at a range of international fora where shark issues are on the agenda. [21]

5.2 GOVERNANCE

The national fisheries planning process and DOC CSP processes are central to the implementation of the NPOA-Sharks 2013, and it is essential that all interests have appropriate opportunities to contribute to that process. While forums have been established to engage with all relevant interests in the fisheries planning and CSP processes, a national governance process is proposed for the NPOA-Sharks 2013 in order to monitor and assist its implementation. An annual review of progress, to be conducted jointly with stakeholders, is proposed in order to achieve this and to maintain the momentum required to achieve the objectives proposed. A comprehensive review of the NPOA-Sharks 2013 is planned to commence in 2017, with release of a revised NPOA-Sharks in 2018.

[21] International fora where shark issues are considered include: UN General Assembly (UNGA), FAO, RFMOs, the Convention on the Conservation of Migratory Species of Wild Animals (CMS), Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES), and trade fora.