

Draft New Zealand National Plan of Action for Sharks

Abstract

A draft New Zealand National Plan of Action-Sharks has been developed for consultation with New Zealand stakeholders and is attached. It documents New Zealand provisions to ensure the conservation and sustainable use of sharks and outlines proposed actions for the future. The document is still subject to revision to improve readability for a stakeholder audience and may well change again based on stakeholder input which will be gathered during July-August 2007.

Summary

New Zealand has developed a draft National Plan of Action for Sharks. The NPOA outlines New Zealand's preference for management based on output controls (total allowable catches) to ensure sustainability. Most shark fisheries of any scale are catch limited within New Zealand waters and a risk based approach has been developed to determine whether active management is required for individual shark species that remain outside of this management regime. One potential outcome of this risk based approach is 'protected species status' for particularly vulnerable species of sharks.

The draft NPOA-Sharks is provided for the information of members.

DRAFT NATIONAL PLAN OF ACTION FOR THE CONSERVATION AND MANAGEMENT OF SHARKS (NPOA-SHARKS)

EXECUTIVE SUMMARY

- 1 Sharks share a number of biological characteristics that make them susceptible to over-utilisation. To address global concerns about the management of sharks, the Food and Agriculture Organisation of the United Nations (FAO) organised experts to consult on an International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks). The overarching goal of the IPOA-Sharks is ‘to ensure the conservation and management of sharks and their long-term sustainable use.’
- 2 To achieve this goal the IPOA-Sharks suggests that member states of the FAO that conduct fisheries that either target sharks, or regularly take sharks as incidental catch, should develop a National Plan of Action for the Conservation and Management of Sharks (NPOA-Sharks).
- 3 Approximately 112 species of sharks have been recorded from New Zealand fisheries waters, of which in excess of 70 are taken by fishers. As a member state of the FAO, New Zealand has an international obligation to develop an NPOA-Sharks.
- 4 The IPOA-Sharks identifies management principles at a strategic level and proposes a suite of generic operational objectives for an NPOA-Sharks. The challenge for New Zealand is to ensure that management strategies for sharks are in place to ensure that the risk to not achieving these internationally-accepted goals for shark stocks is maintained within acceptable limits.
- 5 New Zealand has in place an advanced and comprehensive fisheries management system for managing extractive fisheries and for protecting threatened and endangered marine species from the effects of fishing. This system applies equally to shark species as it does to other forms of aquatic life. The NPOA-Sharks describes New Zealand’s fisheries management framework as it applies to shark species. The framework described is largely operational although there are several measures that are in varying stages of implementation.
- 6 The NPOA-Sharks also examines the alignment of New Zealand’s fisheries management regime, as it applies to the management of shark species, with the goals, principles and management objectives contained in the IPOA-Sharks. New Zealand’s fisheries management system is closely aligned with the IPOA-Sharks.
- 7 There remain, however, several areas that need to be addressed. A range of actions are proposed, including a review of the NPOA-Sharks, to ensure that New Zealand’s fisheries management regime satisfies our international obligations to ensure the conservation and management of sharks and their long-term sustainable use.

INTRODUCTION

Purpose

- 8 The purpose of the NPOA-Sharks is to ensure the conservation and management of sharks and their long-term sustainable use.

Scope

- 9 In the context of the NPOA-Sharks, 'sharks' are defined as all species in the class *Chondrichthyes* and include sharks, skates, rays and chimaeras.
- 10 The NPOA-Sharks applies to species that are found within New Zealand's EEZ and Territorial Sea, migratory species that frequent New Zealand's EEZ and Territorial Sea, and species taken by New Zealand-flagged vessels fishing on the High Seas.
- 11 The NPOA-Sharks is an operational plan. It is a record of both actions already underway and recommendations for actions that could enhance the conservation and management of sharks in New Zealand.
- 12 The impacts of fishing are likely to constitute the greatest threats to the sustainability of sharks and consequently they form the primary focus of the International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks). The impacts of fishing are also the primary focus of New Zealand's NPOA-Sharks at this time. The NPOA-Sharks will be further developed over time in response to new information including that obtained through implementation of actions detailed in this plan. Non-fishing related impacts on sharks, such as pollution, coastal development and land use change, and climate change, may be addressed in later versions of the NPOA-Sharks.
- 13 The NPOA-Sharks will be reviewed and revised periodically to ensure on-going effectiveness of New Zealand's efforts to address the conservation and management of shark species.

Background

- 14 Sharks share a number of biological characteristics that make them susceptible to over-utilisation. Sharks are predators and many are top-level carnivores. As a result their abundance is low compared with species at lower trophic levels. Additional aspects of shark biology that make them susceptible to overfishing include late onset of maturity, slow growth rates, low fecundity and reproductive strategies such as giving birth to live young or laying a small number of eggs.
- 15 To address global concerns about the management of sharks, the Food and Agriculture Organisation of the United Nations (FAO) organised experts to consult on an *International Plan of Action for the Conservation and Management of Sharks* (IPOA-Sharks). The IPOA-Sharks builds upon the FAO *Code of Conduct for Responsible Fisheries* and was endorsed by the FAO Council in June 1999 and subsequently adopted by the November 1999 FAO Conference.

16 The overarching goal of the IPOA-Sharks is;

‘to ensure the conservation and management of sharks and their long-term sustainable use.’

To achieve this goal the IPOA-Sharks suggests that member states of the FAO that conduct fisheries that either target sharks, or regularly take sharks as incidental catch, should develop a National Plan of Action for the Conservation and Management of Sharks (NPOA-Sharks).

17 Approximately 112 species of sharks have been recorded from New Zealand fisheries waters, of which in excess of 70 are taken by fishers. As a member state of the FAO, New Zealand has an international obligation to develop an NPOA-Sharks.

18 The IPOA-Sharks identifies management principles at a strategic level and proposes a suite of generic operational objectives for an NPOA-Sharks. The challenge for New Zealand is to ensure that management strategies for sharks are in place to ensure that the risk to not achieving these internationally-accepted goals for shark stocks is maintained within acceptable limits. New Zealand has in place an advanced and comprehensive fisheries management system for managing extractive fisheries and for protecting threatened and endangered marine species from the effects of fishing. This system applies equally to shark species as it does to other forms of aquatic life.

19 Part 1 of the NPOA-Sharks describes the shark species found in New Zealand waters.

20 Part 2 of the NPOA-Sharks describes New Zealand’s fisheries management framework as it applies to shark species. The framework described is largely operational although this section includes several measures that are in varying stages of implementation.

21 Part 3 examines the alignment of New Zealand’s fisheries management regime, as it applies to the management of shark species, with the goals, principles and management objectives contained in the IPOA-Sharks.

22 Part 4 proposes actions, including a review of the NPOA-Sharks, to ensure that the fisheries management regime described in Part 2 delivers on achieving the goals, principles and management objectives of the IPOA-Sharks discussed in Part 3.

23 A description of New Zealand’s shark fisheries and management is summarised in the appendices.

PART 1 NEW ZEALAND SHARK SPECIES¹

- 24 Approximately 112 species of sharks have been recorded from New Zealand waters, which constitutes approximately nine percent of the total number of shark species recorded worldwide. Of these approximately 14 are chimaeras, 73 are sharks, and 25 are skates and rays. Three of the chimaeras are endemic to New Zealand, and another seven also occur in Australia and/or New Caledonia. The remainder are widely distributed in the Pacific and other oceans. In contrast most sharks recorded from New Zealand waters are widespread species. Of these five are restricted to the western Pacific from Japan to Australia and New Zealand; and six are Southern Ocean species. Thirteen sharks are endemic to New Zealand, and 8 are restricted to Australasia. Endemicity is greatest among the skates and rays, with 18 species recorded only from New Zealand waters. This includes a number of skate species that have yet to be scientifically described. The remaining species are all widely distributed outside Australasia.
- 25 Diversity in New Zealand waters, as elsewhere, is greatest over the continental slope (200-2500 m depth). Only one species of chimaera, the elephantfish (*Callorhynchus milii*), can be considered a coastal species, all other chimaeras normally inhabit the outer continental shelf and slope.
- 26 Among the sharks 15 species inhabit the outer shelf and upper slope, and 32 are only found below the shelf break (c. 200 m depth). Only five species – rig (*Mustelus lenticulatus*), school shark (*Galeorhinus galeus*), carpet shark (*Cephaloscyllium isabellum*), spotted spiny dogfish (*Squalus acanthias*) and the broadnose sevengill (*Notorhynchus cepedianus*) - can be considered primarily shelf or coastal species. The Port Jackson shark (*Heterodontus portusjacksoni*) also falls into this group but has only been recorded once from New Zealand waters.
- 27 In addition there is a group of 11 coastal-pelagic sharks that tend to occur or aggregate seasonally in coastal habitats, either for breeding or feeding, and be found in offshore and oceanic habitats at other times of the year. Sharks in this group generally reach more than 2.5 m maximum length, and include several potentially dangerous species such as the white pointer shark (also referred to as the great white shark) (*Carcharodon carcharias*), tiger shark (*Galecerdo cuvier*), bronze whaler (*Carcharhinus brachyurus*) and hammerhead (*Sphyrna zygaena*), as well as the plankton-feeding basking shark (*Cetorhinus maximus*).
- 28 Eight shark species are primarily oceanic, most appearing to migrate seasonally to northern New Zealand from the subtropics and tropics during spring and summer. This ecological group includes the shortfin mako (*Isurus oxyrinchus*) and blue shark (*Prionace glauca*), and less well known species such as the oceanic whitetip (*Carcharhinus longimanus*), silky shark (*C. falciformis*) and the giant whale shark (*Rhincodon typus*).

¹ Information provided by C. Duffy and based on a list compiled by M. P. Francis and A. L. Stewart. The Francis and Stewart list was itself based on a world list of chondrichthyans prepared by L. J. V. Compagno and D. A. Didier.

- 29 Of the rays five species are largely restricted to the shelf (two species of stingray (*Dasyatis* spp.), eagle ray (*Myliobatis tenuicaudatus*), rough skate (*Dipturus nasuta*) and electric ray (*Torpedo fairchildi*)) and three are oceanic (the pelagic stingray (*Pteroplatytrygon violacea*) and two giant plankton-feeding species, the giant manta ray (*Manta birostris*) and the spine-tailed devil ray (*Mobula japanica*)). Of the remaining species 3 inhabit the outer shelf and upper continental slope and 14 are found on the continental slope. They include 15 species of skate and 2 small blind electric rays (*Typhlonarke* spp.).

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Part 2 MANAGEMENT OF SHARK FISHERIES IN NEW ZEALAND

30 Fisheries in New Zealand, including target shark fisheries and fisheries where sharks are taken as bycatch, are managed under the Fisheries Act 1996 (the Act). Provisions under the Act may apply both within New Zealand's Territorial Sea, Exclusive Economic Zone (EEZ), and to New Zealand vessels fishing on the High Seas.

31 The purpose of the Act is to provide for utilisation of fisheries resources while ensuring sustainability. In the context of the Act, ensuring sustainability means maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations, and avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment. Utilisation means conserving, using, enhancing and developing a fisheries resource to enable people to provide for their social, economic, and cultural wellbeing. Tools and processes defined under the Act are designed to meet the dual requirements of sustainability and utilisation.

32 The Ministry of Fisheries is the government department charged with providing advice to the Government on fisheries management. The goal of the Ministry of Fisheries is to maximise the value² New Zealanders obtain through the sustainable use of fisheries resources and protection of the aquatic environment. Policy and management frameworks are designed to achieve this goal.

33 It is explicit in the purpose statement, and in the overarching goal of the Ministry of Fisheries, that fishery resources in New Zealand are to be managed in such a way as to ensure that the benefits of their conservation, use, enhancement and development accrue to all New Zealanders, including both present and future generations.

34 Within New Zealand's overarching fisheries management regime are three complimentary management frameworks:

- a) Managing species where utilisation is prohibited
- b) Management under the Quota Management System (QMS)
- c) Management outside the QMS

The decision on the most appropriate management framework for a given species is derived from policy guidelines. Such policies are ultimately based on ensuring an acceptable level of risk to achieving the sustainability (including environmental) and utilisation objectives contained in the Act and the overarching goal of the Ministry of Fisheries.

35 The three complimentary management frameworks are at the heart of New Zealand fisheries management regime as shown in Figure 1. Within each of the three broad management frameworks are a range of more specific management options. Policies and standards define and support the operation of each of the management

² In this context, 'value' includes commercial profit and economic activity associated with harvest from commercial and amateur sectors such as employment, foreign exchange earnings and retail sales. Value also includes the non-market values held by amateur fishers, customary fishers and environmental groups. These may be associated with the ability to provide food for the table, values for customary practice and tradition and the pleasure of recreational fishing.

frameworks, and also inform decisions as to the most appropriate framework to apply to a given species. There are a range of statutory tools available to ensure that each framework operates effectively to meet the purpose of the Act.

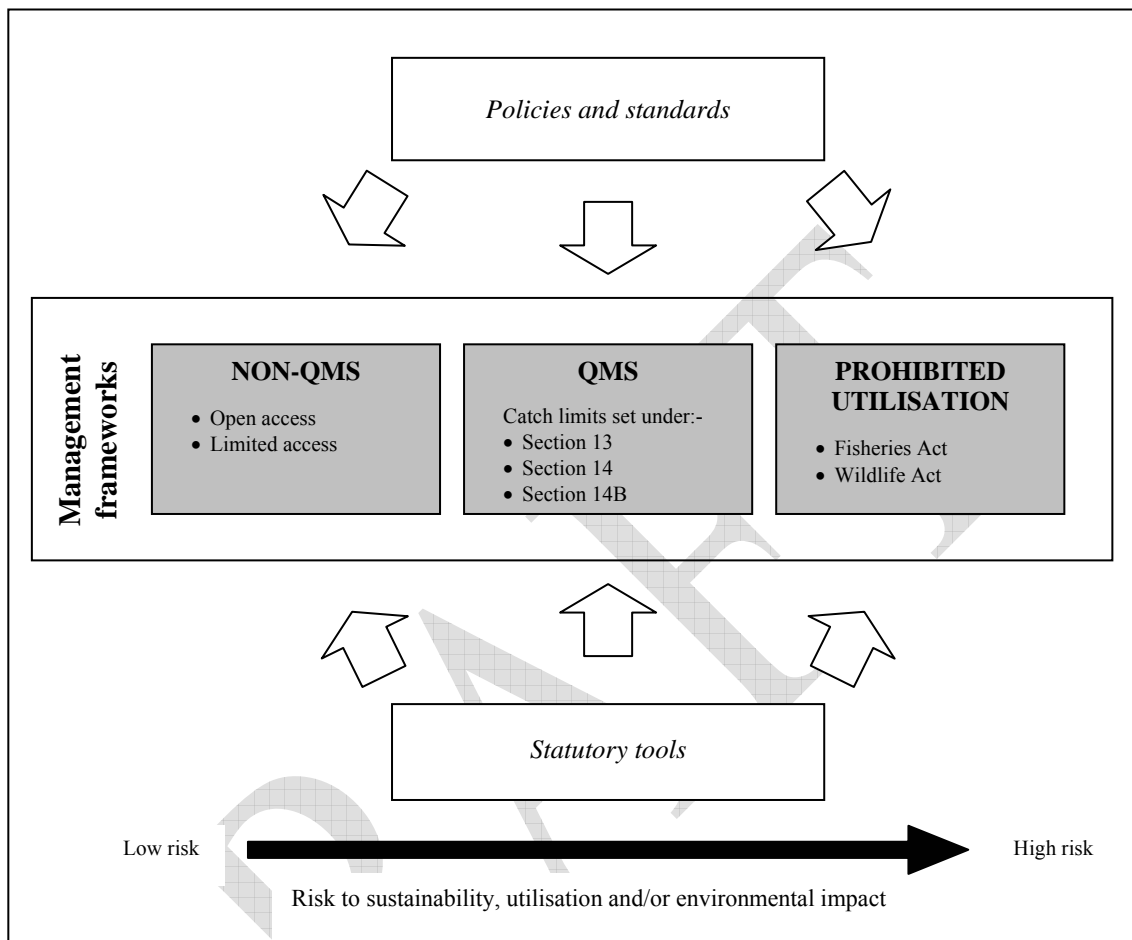


Figure 1. An overview of the New Zealand fisheries management framework.

36 The various components of New Zealand’s fisheries management framework are discussed in the following sections.

Management frameworks

37 This section discusses each of the management frameworks in turn and details the key statutory tools available under each one to address the sustainability of fish stocks.

Prohibited utilisation management framework

38 Prohibiting the utilisation of marine species, where sustainability concerns dictate limited or no opportunity for extractive use, is contemplated by the purpose of the Act which explicitly includes conservation under the definition of utilisation. Such a prohibition is also consistent with the goal of the Ministry of Fisheries to maximise value. Non-market values derived from the preservation of rare and endangered

species, and the maintenance of biodiversity, are maximised by protecting such species.

- 39 Where a species is threatened, endangered, or otherwise deemed unsuitable for any significant utilisation, taking and possession may be prohibited. Two statutes may be used to prohibit utilisation. These are -
- a) The Wildlife Act 1953 (the Wildlife Act) provides for both full and partial protection of species in New Zealand fisheries waters (including New Zealand's EEZ and Territorial Sea). Protected marine species are specified in Schedule 7A to the Wildlife Act. The white pointer shark was listed on Schedule 7A to the Wildlife Act from 1 April 2007.
 - b) The Fisheries Act provides for the protection of marine species through regulation. Such regulations may apply both to fishers operating within New Zealand fisheries waters, and to New Zealand vessels fishing on the High Seas. For example the taking of white pointer sharks by New Zealand vessels on the High Seas was prohibited on 1 April 2007.
(see Appendix 2 for details on the commercial catch of white pointer sharks prior to protection).
- 40 Both the Fisheries Act and the Wildlife Act provide for significant penalties if the prohibitions on the take of a species are breached. Both statutes also recognise that marine species for which utilisation has been prohibited may be taken inadvertently during the course of fishing operations and provide defences for such incidental capture, where fishers have returned the animals to the sea and reported the incident to the authorities.
- 41 The key statutory tools that may be used to ensure the conservation of protected shark species include -
- a) General provision of the Wildlife Act against the taking, procession and trading in all or parts of protected marine species;
 - b) Population Management Plans under the Wildlife Act;
 - c) Measures under section 15 of the Fisheries Act; and
 - d) Sustainability measures under section 11 of the Fisheries Act.
- 42 These management options and sustainability tools are considered in more detail below.

Key statutory tools for ensuring the sustainability of species for which utilisation has been prohibited

Provisions under the Wildlife Act

- 43 The inclusion of a marine species on Schedule 7A of the Wildlife Act means that any person taking, or attempting to take, any animals identified as having absolute protection is committing an offence against the Act. It is also an offence to buy, possess, possess for sale, sell or otherwise dispose of whole animals, or body parts, of these species.

- 44 Under the Wildlife Act a Population Management Plan (PMP) may be developed for protected species and the Minister of Conservation is responsible for the development of any PMPs that are produced. A PMP can include an assessment of the biology and status of the population, any known fisheries interactions and the degree of risk caused by fishing-related mortality and other human-induced sources of mortality of the species. A maximum allowable level of fishing-related mortality can be specified. The Minister of Conservation can make recommendations to the Minister of Fisheries on measures to mitigate the fishing-related mortality and the standard of information to be collected.
- 45 No population management plans have been developed for shark species.

Provisions under the Fisheries Act

- 46 Under section 15 of the Fisheries Act the Minister of Fisheries is required to take all reasonable steps to ensure that the maximum allowable fishing related mortality level stipulated in a PMP is not exceeded. The Minister may take additional action that he or she considers necessary to avoid, remedy, or mitigate any adverse effects of fishing on the relevant species. Such action may also be taken, in consultation with the Minister of Conservation, in the absence of a PMP.
- 47 Any of the sustainability measures set under section 11 of the Fisheries Act may be used to reduce a species fishing related mortality. The range of measures available under section 11 is discussed in more detail below in relation to the QMS and non-QMS management frameworks.

QMS management framework

- 48 The QMS is the preferred management regime to address sustainability and utilisation concerns for all fish species including sharks.
- 49 The primary management mechanism under the QMS is the setting of a total allowable catch (TAC). The TAC includes allowances for non-commercial take and other sources of fishing related mortality, and a total allowable commercial catch (TACC). The TACC is allocated to commercial fishers by means of an individual transferable quota system. Quota is a right which allows people to own a share of the commercial catch for a particular species in a defined area. Quota is owned in perpetuity and can be bought or sold. Each year quota is used to generate an annual catch entitlement (ACE)³ for its owner based on the TACC allowed for that particular stock. The QMS creates an incentive for sustainable fishing as the value of quota is, in part, influenced by the sustainability of the stock to which it relates i.e. the healthier the stock, the higher the catch limit, and the greater the ACE generated by a person's quota holding. Eleven species of shark, which account for between 84 and 89% by weight of sharks landed commercially over the last five fishing years, are now managed under the QMS (see Appendix 3 for details).

³ At the start of each fishing year quota holdings for a given QMS stock are used to generate annual catch entitlements (ACE) by dividing the TACC by the number of quota shares held. ACE is freely tradable and may be purchased either before or after fish are caught.

- 50 The TAC for each species managed under the QMS is set by the government and amended if required as new information comes to hand. The TAC must be set at a level that ensures the sustainability of the stock.
- 51 The Act includes three options under which a TAC may be set –
- a) Section 13;
 - b) Section 14; and
 - c) Section 14B
- 52 In addition to setting TACs, there are a range of additional tools within the QMS that may be used to ensure the sustainability of stocks. Key tools of importance to the sustainability of shark stocks include –
- a) Sustainability measures under section 11
 - b) Inclusion of the species on the Sixth Schedule; and
 - c) Commercial catch balancing
- 53 The options for setting TACs and associated sustainability tools are considered in more detail below.

Options under the QMS for setting TACs

Section 13

- 54 Of the eleven species of sharks currently managed under the QMS, eight have their TACs set pursuant to section 13 of the Act (see Appendix 3 for details).
- 55 Section 13 represents the default management option that is applied when setting a TAC for a stock within the QMS. Under section 13 there is a requirement to maintain the biomass of a fish-stock at, or above, a level that can produce the maximum sustainable yield (MSY), having regard to the interdependence of stocks.
- 56 MSY is defined, in relation to any fish-stock, as being the greatest yield that can be achieved over time while maintaining the stock's productive capacity, having regard to the stock's population dynamics and any environmental factors that influence the stock.
- 57 The obligation to have regard to the interdependence of stocks when setting a TAC requires consideration of the effects of fishing on associated stocks harvested with the target stock, and the role of the target stock in the food chain. This provision may be particularly relevant to shark species as they are, in many instances, top level predators and are frequently taken as a by-catch of other species managed under the QMS. By-catch of shark species may be managed under any of the four TAC setting options.
- 58 If a stock is currently below the target stock level, section 13(2)(b) requires a TAC that will result in the stock being restored to the target stock level (i.e. at or above a biomass that will support MSY) in a way and rate which has regard to the interdependence of stocks and within a period appropriate to the stock. Before determining the period within which the target stock level is achieved, the Minister is

to have regard to biological characteristics (including longevity and productivity) and environmental conditions (such as the effect of temperature on stock recruitment) affecting the stock.

- 59 If a stock is above the target level, there is a requirement to set a TAC that will result in the stock moving towards the target stock level, or alternatively remain above the target stock level, having regard to the interdependence of stocks (section 13(2)(c)).
- 60 Section 13(3) makes it explicit that for both a rebuild and a ‘fishing down’ of a stock, social, cultural and economic factors are relevant considerations in the determination of the way and rate of progress to the target level, rather than in the determination of the target stock level itself.
- 61 There is no set rate, or time frame, within which a rebuild or ‘fishing down’ of a stock must be achieved. However the progress of moving towards the target stock level must be suitable to the fishery in question.

Adaptive Management Framework

- 62 Stocks managed under section 13 may be managed under the adaptive management framework. The framework was developed as a basis for varying the TACs of fishstocks for which there is limited information on stock size. The framework has been developed to ensure that in taking decisions where information is limited, the Minister of Fisheries does not breach his/her statutory obligations to ensure stock sustainability.
- 63 This is achieved by establishing criteria for stocks that may be managed under the framework,⁴ defining the period for the TAC increase and providing rigorous reporting requirements and stock assessment, monitoring and decision rule criteria, which are regularly evaluated. The framework also provides additional monitoring and analyses to improve the assessment of stock status and estimates of sustainable yield.
- 64 MFish has recently signalled that adaptive management plans that are currently in operation will ultimately be replaced by Fisheries Plans. It is not anticipated that any new AMPs will be approved.
- 65 Stocks of school shark (SCH 3, 5, 7 and 8), elephant fish (ELE 3, 5) and rig (SPO 2) are currently managed under the adaptive management framework.

Section 14

- 66 Section 14 prescribes an exception to setting the target stock level based on an assessment of the MSY for those stocks where one of a suite of criteria applies. Those relevant to sharks are where:
- a) it is not possible to estimate MSY because of the biological characteristics of the species; or

⁴ Current biomass should be greater than B_{MSY} and the new TAC should be likely to allow the stock to move towards a size that will support the MSY, or remain at or above the level that will support the MSY, over the period of the programme.

- b) a catch limit for New Zealand has been determined as part of an international agreement; or
- c) the stock comprises one or more highly migratory species.

67 Stocks that meet one of the above criteria are listed on the Third Schedule to the Act. For these Third Schedule stocks, a TAC may be set other than in accordance with the requirements stated in section 13, provided the TAC better achieves the purpose of the Act.

68 While any TAC must be set in a way that ensures use of the stock is sustainable, under section 14, there is no requirement to take into account or be guided by the need to manage in accordance with MSY. In contrast to section 13, section 14 provides significant flexibility as to the target level set for a stock.

69 Three highly migratory shark species are managed under section 14 (see Appendix 3 for details). For these species TACs have been set for that part of the stock found in NZ fisheries waters.

Sections 14A and 14B

70 A further exception to setting a TAC in accordance with the MSY is the management of a stock under s 14B of the Act. Under s 14B, a TAC is set at a level that allows a stock to be managed below the level that can support MSY in order not to constrain the taking of another stock. The stock managed under s 14B must however be maintained at a level that ensures its long term viability.

71 Additional requirements for a stock to be suitable for management under section 14B are detailed in section 14A. These include measures to ensure that information is sufficient to assess the impact of management action, that quota owners holding at least 95% of the quota for the stock must support the management under section 14B, the concerns of any dissenting quota owner(s) must be acknowledged and addressed, and that management under section 14B will have no detrimental effects on non-commercial fishing interests in the stock.

72 Section 14B has not been used to manage shark stocks and is unlikely to be used for the management of shark species in the future.

Key statutory tools for ensuring the sustainability of QMS species

Section 11 sustainability measures

73 Sustainability measures set under section 11 of the Act may apply to QMS, non-QMS and stocks where utilisation is prohibited. Such measures relevant to QMS stocks may relate to catch limits (i.e. the TAC), size limits, biological state, fishing seasons, method restrictions and closed areas and may be set by the Minister of Fisheries at any time. These measures may be implemented either to ensure sustainability of a target species or to restrict fishing of a target species to ensure sustainability of a bycatch species.

74 Sustainability measures currently in place for sharks relate to amateur bag limits and set net size. Under the Fisheries (South-East Area Amateur Fishing) Regulations

1986, and the Fisheries (Southland and Sub-Antarctic Areas Amateur Fishing) Regulations 1991, there is an amateur bag limit for rig (5), elephant fish (5), school shark (5), blue shark (1), mako shark (1), porbeagle shark (1), skates and rays (5), spiny dogfish (15). A minimum set net mesh size of 150mm is in place for elephant fish, rig, and school shark.

- 75 Under the Fisheries (Challenger Area Amateur Fishing) Regulations 1986, and Fisheries (Central Area Amateur Fishing) Regulations 1986, there is an amateur bag limit for rig, elephant fish and school shark of 20. A minimum set net mesh size of 150 mm is in place for elephant fish, rig, and school shark.
- 76 Under the Fisheries (Auckland and Kermadec Areas Amateur Fishing) Regulations 1986, rig, elephant fish and school shark are included in the combined daily bag limit of 20, and specific minimum net mesh size limits are in place for these species. A minimum set net mesh size of 150 mm is in place for elephant fish and 125 mm for rig and school shark.

Sixth Schedule

- 77 As a general rule, all species subject to the QMS must be landed if taken. An exception is provided through the use of the Sixth Schedule to the Act, which provides for the release of quota species listed on that schedule and details specific conditions under which such releases may occur. All catch released under these provisions must be reported and is counted against the TAC. As such discarding does not constitute a risk to the sustainability of the stock.
- 78 This provision has been applied to the highly migratory species (HMS) of sharks that are managed under the QMS (i.e. porbeagle, blue, and mako sharks) to provide for the release of juveniles and large sharks. It also applies to rough and smooth skates and spiny dogfish. Conditions require that the release of all these species, with the exception of spiny dogfish, must be undertaken as soon as practicable after capture and the individuals must be alive at the time of release and considered likely to survive on return to the sea. Spiny dogfish may be returned to the sea whether they are alive or dead.⁵

Commercial catch balancing

- 79 The catch balancing regime is a key fisheries management tool designed to encourage commercial fishers to balance all their annual catch of QMS fish stocks with ACE. The objective is to ensure that the TACC is not overfished in any one year. Under this regime, if a fisher does not hold sufficient ACE, they must pay a deemed value which is a financial penalty for taking any catch in excess of that fisher's ACE. The deemed value is set at a rate that aims to provide incentives for all catch to be covered by ACE. Deemed values have been set for all species subject to the QMS and are revised regularly to ensure they are set at an appropriate level.

⁵ Spiny dogfish are a low value species primarily taken as an unwanted bycatch. Their inclusion on the Sixth Schedule reflects the limited capacity of fishers to utilise this species and an agreement that unwanted spiny dogfish should be able to be returned to the sea as long as the catch is reported.

- 80 Permit suspensions prohibit fishers from fishing if deemed values in excess of \$1,000 are not paid within the required period of time. Fishing with a suspended permit is a criminal offence and attracts severe penalties.
- 81 Overfishing thresholds (specified as a percentage of ACE) apply to a few fishstocks where overfishing raises particular concerns, for example those species which are particularly at risk if they are overcaught. If an overfishing threshold is breached, the fisher is prohibited from continuing to fish in the area where the breach occurred for the remainder of the fishing year. No overfishing thresholds have been set for shark species.

Non-QMS management framework

- 82 There are in excess of 62 shark species⁶ taken by commercial fishers in New Zealand that are managed outside the QMS and these accounted for between 11 and 16% by weight of sharks landed commercially over the last five fishing years (see Appendix 4 for details). Within the non-QMS management framework, shark species may be managed in two ways –
- a) Open access; or
 - b) Limited access (species listing on Schedule 4C to the Act).
- 83 Measures to ensure the sustainability of stocks managed outside the QMS may be taken under section 11 of the Act.
- 84 These management options and sustainability tools are considered in more detail below.

Non-QMS management options

Open access

- 85 The majority of shark species managed outside the QMS are maintained in an open access environment.
- 86 All fishers require a fishing permit before they can fish commercially. For open access species the non-QMS framework does not ration commercial access to a fishery because fishing permits are granted upon request.

Limited access

- 87 Schedule 4C to the Act contains a list of species for which there is a moratorium on issuing fishing permits. Under the permit moratorium, fishers with existing permits for species listed on Schedule 4C may continue to fish for these species, but no new permits are able to be issued. For the last five fishing years less than 1% of the commercial shark catch has come from species listed on Schedule 4C.
- 88 Schedule 4C was created to ensure species identified as being subject to a sustainability risk in an open access environment were afforded protection prior to

⁶ Sixty two species have been reported over the last 5 years but the actual number of species taken is likely to be greater when catch reported against generic codes is considered.

more appropriate management action being taken. Schedule 4C was not intended to be a permanent management solution for these stocks or species, but no timeframe has been specified for the application of management options which better meet the requirements of the Act.

- 89 Basking shark, hammerhead shark, sevengill shark and whale shark are included on Schedule 4C. There are no existing permits that allow fishers to target these species and accordingly they may be taken only as bycatch.

Key statutory tools for ensuring the sustainability of non-QMS species

Section 11 sustainability measures

- 90 Section 11 of the Act outlines a number of potential sustainability measures, although the list is not exhaustive, that can be used by fisheries managers to ensure that species managed under a non-QMS regime can be managed on a sustainable basis. These measures can relate to catch limits, restrictions on size/sex/biological state of any species taken, and area, method and seasonal fishing restrictions. These measures may be applied by regulation to fishers operating both within New Zealand's EEZ and for New Zealand vessels fishing on the High Seas. The most appropriate sustainability measure to be set or varied will depend on the precise nature of the issue being addressed.
- 91 The non-QMS framework can restrain individual catch levels, and thereby manage stocks sustainably, through a combination of input controls and the ability to set a Catch Limit (CL) or Commercial Catch Limit (CCL) for individual species. These measures may be implemented to ensure either the sustainability of a target species or to restrict fishing of a target species to ensure sustainability of a bycatch species.
- 92 The only sustainability measures currently in place for sharks relate to amateur bag limits. Under the Fisheries (South-East Area Amateur Fishing) Regulations 1986 and the Fisheries (Southland and Sub-Antarctic Areas Amateur Fishing) Regulations 1991, there are amateur bag limits of one for bronze shark, hammerhead shark, seven gilled shark and thresher shark.

Generic supporting frameworks under the Act

- 93 In addition to the sustainability tools discussed above, there is also a range of supporting frameworks available under the Act to ensure that fish stocks are utilised sustainably. These are generic across all QMS and non-QMS stocks, and stocks where utilisation is prohibited.
- a) Reporting
 - b) Compliance
 - c) Observer programme
 - d) Research
 - e) Consultation

Reporting

- 94 New Zealand's current commercial catch reporting regime is comprehensive and has been in operation since 1989. Under this regime catch data are recorded within New Zealand's EEZ and Territorial Sea, and for New Zealand flagged vessels fishing on the High Seas that land their catch in New Zealand and elsewhere.
- 95 The reporting regime involves a series of interrelated reporting requirements from both commercial fishers and licensed fish receivers (LFRs). LFRs are the sole agents who can lawfully purchase fish from fishers.⁷ The various reports required from fishers and LFRs are reconciled and various data quality checks are performed to identify errors and maintain the integrity of the overall fisheries management regime. Reports are subsequently filed by a central agency (FishServe) to provide information to fisheries managers.
- 96 There are specific reporting requirements for different types of fishing such as tuna longlining and trawling. Regardless of the fishing method used, the various reporting requirements ensure that all catch is recorded to species level,⁸ including both QMS and non-QMS species, and whether the catch is landed, discarded, used as bait or eaten on board. The location of catches is available to at least the quota management area (QMA) level (or a generic fisheries management area (FMA) for non-QMS species).⁹
- 97 Data are typically available in greenweight,¹⁰ although for species processed onboard this is calculated through the use of conversion factors.¹¹

Compliance

- 98 To ensure compliance with the fisheries management frameworks, New Zealand undertakes comprehensive monitoring, control, and surveillance of fishing. This occurs both within New Zealand fisheries waters and extends to New Zealand vessels fishing on the High Seas, from capture, through the point of landing, to final destination. Such compliance measures allow analysis and comparison of data from a number of sources to confirm that fishers are complying with legal requirements. This has relevance to shark species to ensure that catch limits, when set, are adhered to and that reporting arrangements have integrity.
- 99 Compliance tools include-
- Fishing permits and vessel registers

⁷ Quantities less than 10 kg (greenweight) are allowed to be sold by fishers as wharf sales.

⁸ There are a number of generic codes that are available to fishers where they are unable to identify fish to species level.

⁹ Spatial management units for QMS species are referred to as QMAs and are determined when a species is introduced to the QMS. Each QMA typically encompasses a separate stock of the species to which it relates. Management decisions for species not in the QMS are based on a series of generic areas referred to as FMAs. Ten FMAs span New Zealand's EEZ.

¹⁰ Section 187 of the Act provides that all references to the weight of fish for reporting purposes are to be to the greenweight of fish (i.e. weight prior to processing).

¹¹ The Act provides for the use of conversion factors (CFs), as a ratio of processed weight to greenweight, to convert the weight of processed fish back to greenweight. Ministry of Fisheries observers collect CF data as part of their duties. The data are based on the species caught and the final product states of those species.

- A vessel monitoring system
- Vessel and gear marking
- Auditing of licensed fish receivers
- Monitored unloads of fish and control of transshipment
- Information management and intelligence analysis
- Boarding and inspection by fishery officers at sea
- Aerial and surface surveillance

Observer programme

- 100 A key component of the recording and compliance regimes is the observer programme. This programme was implemented in 1986 for the purpose of collecting reliable and accurate information for fisheries research, fisheries management, and fisheries enforcement. Each year, approximately 40 observers are deployed to monitor more than 6000 fishing days across a number of fisheries.¹²
- 101 Observers record detailed information on the catches, discards and landed state of all species including sharks. This information is critical for determining the impact of fishing on shark species of little or no commercial value which are typically discarded if caught. In addition, observers collect biological samples from sharks which are then used in subsequent studies. Observers are also used to monitor the unloading of catch in New Zealand ports, the transshipment of fish, and to inspect the holds of vessels for catch.
- 102 Observers are deployed on vessels operating within the New Zealand EEZ and on the High Seas, including under bilateral arrangements on foreign-flagged vessels in the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) area.
- 103 Observer coverage has been approaching 100% in the tuna longline charter fleet for several years and monitors the extent of shark bycatch caught in this fleet. As required by the Commission for the Conservation of Southern Bluefin Tuna (CCSBT), the Ministry of Fisheries also has a target of 10% observer coverage of the domestic tuna longline fleet during the southern bluefin tuna season. The continued review of the observer allocation in all fisheries results in on-going improvements in observer coverage.

Fisheries research

- 104 The Ministry of Fisheries contracts a significant quantity of research, much of which is used to establish the status of fish stocks and to support the TAC setting process to ensure catch limits are set at sustainable levels. The research falls into six key areas each of which has its own specific goal. These research areas and associated goals are:

¹² Primarily orange roughy, oreos, hoki, southern blue whiting, ling, hake, scampi, squid, snapper, jack mackerel, tuna and toothfish.

- *Fisheries resources* - to provide the information on sustainable yields and stock status required for the sustainable utilisation of New Zealand's fisheries resources;
- *Harvest levels* - to determine the nature and extent of commercial and recreational catch, Māori customary take, and illegal catch and fishery induced mortality;
- *Aquaculture and enhancement research* - to provide information to ensure that aquaculture and enhancement activities are sustainable and to determine the effects on wild fisheries and the aquatic environment;
- *Aquatic environment research* - to determine the nature and extent of the effects of fishing on the aquatic environment and to assess the impact of diseases and exotic organisms on the sustainability of New Zealand's fishery resources;
- *Cultural, economic, and social research* - to provide information on cultural, economic, and social factors that may need to be considered in the management decision making process to enable people to provide for their social, economic, and cultural well-being; and
- *Traditional and customary research* - to provide information on the traditional and customary factors that may need to be considered in the management decision making process to enable the Minister to discharge her/his obligations to tangata whenua under the Deed of Settlement and the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 to enable Māori to provide for their traditional and customary well-being.

105 To review this research and identify any possible management concerns, the Ministry of Fisheries runs a working group process for a range of species groups including inshore, deepwater, and pelagic species. Currently 14 working groups meet throughout the year and, in addition to research providers, are composed of representatives from the recreational, commercial, customary sectors plus representatives from environmental interest groups. Sharks are considered within a number of these groups. The product of their deliberations is the annual Plenary Report which summarises the current state of knowledge for most important species. At the present time, summaries for the 11 species managed under the QMS are provided in the Plenary Report.

106 The Ministry of Fisheries also runs a research planning process along the same model as the working group process described above. The role of this group is to develop Medium Term Research Plans for various fisheries that describe research and research needs for target and bycatch species. These plans are reviewed and updated annually and form the basis for research into sharks.

107 Examples of the types of research undertaken on sharks include:

- Research trawl surveys
- Analysis of commercial catch and effort data
- Stock assessments
- Biological studies to determine productivity
- Characterisation of fisheries based on fisher and observer collected data

Non-fisheries research

108 In addition to research initiated by the Ministry of Fisheries there are a number of other programmes which may provide useful information to inform the management of shark stocks in New Zealand. Such programmes include:

The bigfish project¹³

The bigfish project aims to record sightings of whale sharks, basking sharks, white pointers, spine-tailed devil rays and manta rays found around New Zealand. The specific objectives of the project are:

- To determine the distribution and abundance of these species in New Zealand
- To determine where they originate from;
- To investigate where they go when they leave New Zealand.

Tagging programmes¹⁴

- Conventional tagging programmes have been carried out for rig, school shark and elephantfish;
- Shortfin mako and blue have been tagged by big game fishers;
- In 2005 electronic tags were used to track the movements of white pointer sharks

Additional research programmes¹⁴

Additional research programmes undertaken in New Zealand include research into sensory systems, the population structure and breeding migrations of the short tailed stingray, age and growth studies, reproductive biology of rig and porbeagle sharks, and global and regional genetic studies.

Consultation

Consultation among sectors within New Zealand

109 Prior to implementing any sustainability measures the Minister is required, under section 12 of the Act, to consult with those classes of persons having an interest in the stock or the effects of fishing on the aquatic environment in the area concerned (including, but not limited to, Māori, environmental, commercial and recreational interests).

110 Statutory consultation occurs after policy options have been developed. An initial position paper (IPP) provides stakeholders with the opportunity to comment on the various options. A final advice paper (FAP) provides advice to the Minister that takes into consideration the submissions received during consultation.

¹³ See www.bigfish.net.nz for further details

¹⁴ In Francis, M.P. 2006: Chondrichthyan research in New Zealand. *Oceania Chondrichthyan Society Newsletter* 3:6-7.

Consultation between states

- 111 The UN Fish Stocks Agreement¹⁵ designates Regional Fisheries Management Organisations (RFMOs) as the primary vehicle through which states shall cooperate to bring about the conservation and management of straddling stocks and highly migratory stocks. New Zealand actively contributes to the development and implementation of conservation and management measures addressed by the RFMOs of which it is a member. Consistent with the UN Fish Stocks Agreement, New Zealand also cooperates and acts consistently with the conservation and management measures agreed by RFMOs to which it is not a member.
- 112 New Zealand is a member of two RFMOs,¹⁶ is a cooperating non-member of another,¹⁷ and is a co-sponsor for the establishment of an RFMO in the South Pacific.¹⁸ New Zealand is also a member of the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) and is a signatory to the recently agreed South Indian Ocean Fisheries Agreement. Of these, decisions by the Commission for the Conservation of Southern Bluefin Tuna and the Western and Central Pacific Fisheries Commission can directly impact on the management of highly migratory shark species (or sharks taken in conjunction with fishing for other highly migratory species) found within New Zealand fisheries waters, and on the activity of New Zealand nationals fishing on the high seas for these species. The rules set by other RFMOs and CCAMLR affect the activities of New Zealand nationals fishing within the boundaries of the region to which they apply.
- 113 New Zealand became a party to the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) in 1989 and to the Convention on the Conservation of Migratory Species of Wild Animals (CMS) in 2000. Under these Conventions New Zealand can be bound to restrict access to, or fully protect, a particular species.

Additional statutory considerations under the Fisheries Act***Environmental Principles (section 9)***

- 114 The Act prescribes three environmental principles that the Minister must take into account when exercising powers in relation to utilising fisheries resources and ensuring sustainability;

Principle 1: Associated or dependent species should be maintained above a level that ensures their long-term viability

Principle 2: Biological diversity of the aquatic environment should be maintained

Principle 3: Habitat of particular significance for fisheries management should be protected.

¹⁵ Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 1995.

¹⁶ Commission for the Conservation of Southern Bluefin Tuna and Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean.

¹⁷ North-East Atlantic Fisheries Commission

¹⁸ South Pacific Regional Fisheries Management Organisation

- 115 The Act defines ‘associated and dependent species’ as any non-harvested species taken or otherwise affected by the taking of a harvested species. The term ‘long-term viability’ (in relation to a biomass level of a stock or species) is defined in the Act as a low risk of collapse of the stock or species, and the stock or species has the potential to recover to a higher biomass level. Where fishing is affecting the viability of associated and dependent shark species, there is therefore an obligation to take appropriate measures, such as method restrictions, area closures, and potentially adjustments to the TAC of the target stock.
- 116 The maintenance of biodiversity (including diversity within species, between species, and of ecosystems) needs to be considered in the context of the purpose of the Act, which is that, where possible, a resource should be used to the extent that sustainability is not compromised. Determining the level of fishing, or the impacts of fishing that can occur, requires an assessment of the risk that fishing might cause catastrophic decline in species abundance or cause biodiversity to be reduced to an unacceptable level.
- 117 Habitat is not defined in the Act, but the Ministry of Fisheries considers it to be ‘the place or type of area in which an organism naturally occurs’ (NZ Biodiversity Strategy). The maintenance of healthy fishstocks requires the mitigation of threats to fish habitat. Habitats of special significance to shark species should be protected and adverse effects on such areas must be avoided, remedied, or mitigated.

Information principles (section 10)

- 118 Section 10 of the Act¹⁹ requires decision makers to take into account a series of information principles. These apply to all decisions under the Act including the setting of a TAC or other sustainability measure. The information principles ensure that decisions are based on the best available information and that a cautious approach is taken when information is uncertain, unreliable or inadequate. Section 10 also ensures that decision makers are not prevented from taking action to give effect to the purpose of the Act due to the absence of information, or the uncertainty in, information.

Key policy frameworks

- 119 In combination with statutory requirements and measures, the Ministry of Fisheries has developed, or is in the process of developing, a number of policy initiatives designed to support fisheries management, some of which have direct relevance to the conservation and management of sharks. While such policies have no direct standing in law they are derived from relevant statutes and serve to provide guidance as to how statutory provisions are administered. These policies may provide guidance on the operation of specific management frameworks, detail how the decision as to the most appropriate management framework for a given stock or species is made, and address the statutory requirement to avoid, remedy or mitigate any adverse effects of fishing on the aquatic environment.

¹⁹ A review of section 10 is currently being undertaken to reflect better the internationally accepted definition of the precautionary approach in fisheries management.

120 Policy frameworks may be specific to individual management frameworks, or may be generic across all management frameworks. They may also guide how and when species may be moved between management frameworks. The key policy frameworks relevant to shark management form three broad groups. These policies are listed below and are shown diagrammatically in Figure 2:

- a) Fisheries Plans;
- b) Standards; and
- c) Environmental policies.

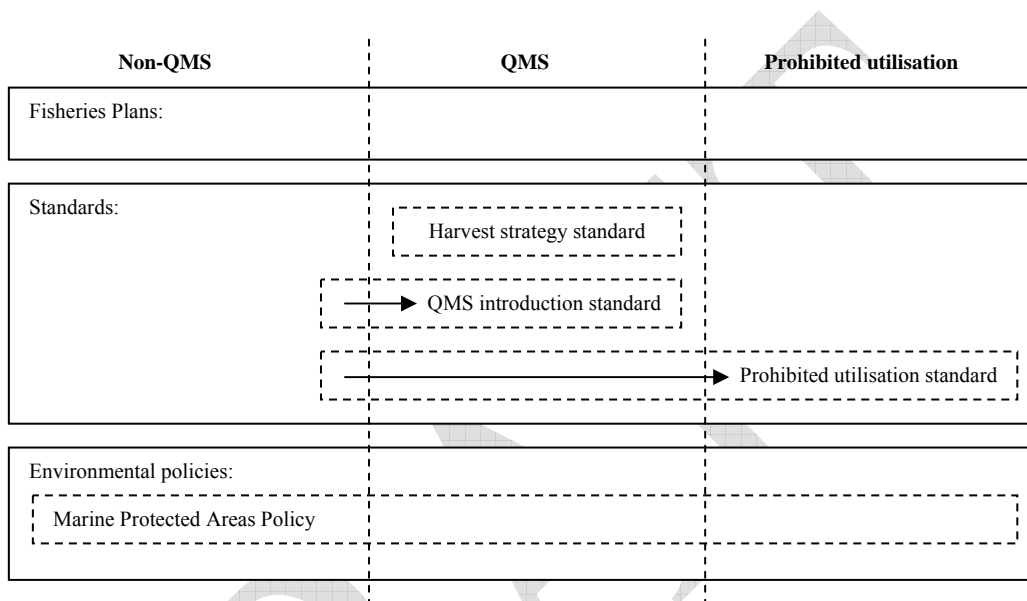


Figure 2. Policy frameworks contributing to each fisheries management framework. Arrows indicate policies that define movement of a species between management frameworks.

Fisheries Plans

121 The Ministry of Fisheries is moving towards developing Fisheries Plans for all commercial fisheries. Fisheries Plans will state explicitly what the Ministry of Fisheries and stakeholders want from a fishery, how these common objectives are going to be achieved, and how the state of a fishery in relation to achieving the objectives will be monitored. Fisheries Plans will tie together strategy with operational decisions.

122 A fisheries plan will ultimately be a formal agreement between parties to manage a given fishery in a particular way. It will guide the Ministry of Fisheries to provide services and to advise the Minister of Fisheries in a certain way on decisions that he/she must make, and once the Minister approves a plan, guides him/her in making decisions in accordance with the plan. They provide a formal opportunity for stakeholders to have an input at the earliest stage of development, rather than seeking views on proposals already well developed by the Ministry of Fisheries.

123 Fisheries Plans are designed to produce results and improve fisheries by providing for greater certainty, better management, more effective controls, less conflict, and

provide a vehicle for the effective planning of fishing activities and business. They will form the key mechanism to incorporate formally the views and objectives of property rights holders and other legitimate stakeholders, into the management decisions for fisheries.

- 124 Management of shark fisheries will also be addressed through the development of Fisheries Plans. Target species may be the focus of individual Fisheries Plans and a stakeholder lead plan has already been developed for the Challenger rig fishery (SPO 7).²⁰ As most sharks are taken as bycatch however, the majority of shark species will be incorporated in the relevant target species fisheries plan, or in a fisheries plan relating to a complex of fisheries in which a shark species is taken.

Standards framework

- 125 The main purpose of fisheries standards is to establish clear, specific, measurable statements of results required to achieve fisheries outcomes. Standards fulfil three main functions:
- *Guidance* – each standard will outline the Government’s position on the minimum level of performance expected from a fishery and the processes used to manage fisheries
 - *Consistency* – standards will ensure a consistent approach is taken across fisheries
 - *Monitoring* – standards will enable both Government and stakeholders to track the performance of management strategies
- 126 Standards may be set for ecosystems and fisheries, as well as for management activities. They may be expressed as a qualitative description, or a number, or as criteria to determine how a numerical value will be arrived at.
- 127 Standards do not have the weight of law, but rather are statements of policy by the Minister of Fisheries on how legal obligations can be met. Standards will be a critical element in ensuring consistency across the range of Fisheries Plans that are being developed over the next few years.
- 128 The Ministry of Fisheries is developing two types of standards:
- *Process standards* – primarily define the minimum acceptable practice for processes to achieve desired outcomes
 - *Performance standards* – set the minimum level of performance in respect of specified components of ecosystems
- 129 Standards will be reviewed periodically to ensure that they are set at an appropriate level of detail and are only as restrictive as is necessary. However, where a standard is defined by statutory requirements, the standard cannot be altered without legislative change.

²⁰ Fisheries Plan for the Management of Rig (*Mustelus lenticulatus*) in Quota Management Area 7 (SPO7). This plan was formally approved by the Minister of Fisheries in mid 2006 and can be found at <http://www.fish.govt.nz/en-nz/Fisheries+Plans/Stakeholder-led+fisheries+plans/Rig+management/default.htm>

- 130 To date three draft standards relevant to shark management have been developed. These standards relate to harvest strategies, consultation, and QMS introduction. A standard on the identification of marine species for which a prohibition on utilisation should be considered is proposed for development in 2007. These standards are discussed further below.

Harvest Strategies Standard²¹

- 131 The Ministry of Fisheries is consulting on a Harvest Strategy Standard to guide the setting of catch levels for QMS stocks. This standard requires the setting of target, threshold, and limit reference points for all QMS fishstocks. It prescribes the performance levels that must be met but is relatively flexible about assessment of the range of possible factors that might contribute to a particular target level for an individual stock.
- 132 Application of the Harvest Strategy Standard will provide for greater consistency and transparency in the management of New Zealand fisheries and will also inform the public about the state of fishstocks. For the seafood industry there will be greater long-term certainty on which to plan business decisions. A standards-based approach will also enhance the likelihood of more New Zealand fisheries being able to be certified as environmentally sustainable.
- 133 The Harvest Strategy Standard provides an opportunity to increase the level of confidence that fishstocks, including those of shark species, are being managed sustainably. It reflects a growing trend internationally in favour of managing fishstocks at higher biomass levels by shifting the balance between sustainability and short-term economic gain. The application of the proposed standard will promote a more cautious approach and may result in reduced catch limits in some instances. It will however increase the likelihood that fishstocks are sustainable in the long-term – even in the face of possible, as-yet-unknown, environmental changes.

QMS introduction standard²¹

- 134 Section 17B of the Act requires stocks or species to be introduced into the QMS if the existing management framework is not ensuring sustainability or is not providing for utilisation, unless the purpose of the Act would be better met by setting one or more sustainability measures under section 11.²² To meet its legislative obligations, and as part of its strategic direction, the Ministry has a policy preference for addressing sustainability and utilisation concerns through QMS introduction.
- 135 The Ministry of Fisheries uses a risk-based approach to generically assess non-QMS species against the sustainability and utilisation criteria for QMS introduction. The QMS introduction standard sets out an annual process for the Ministry of Fisheries to identify stocks or species managed outside the QMS for which there are sustainability or utilisation concerns. These stocks are subsequently considered for introduction to the QMS by the Minister of Fisheries.

²¹ <http://www.fish.govt.nz/en-nz/Consultations/Fisheries+Standards/default.htm>

²² It is of note that, when considering the introduction of species listed on Schedule 4C to the QMS, the Minister may decide to introduce these species regardless of whether or not (s)he is satisfied of the statutory tests relating to sustainability and utilisation.

- 136 The QMS introduction standard has been developed taking into account relevant obligations, including the provisions of section 17A of the Act (which relates to highly migratory species taken outside New Zealand fisheries waters), and will contribute to the development of objectives-based fisheries management as described in the Ministry of Fisheries Statement of Intent 2006-2011. The standard defines a process that considers risks to achieving the following three generic objectives:
- To maintain the potential of the stock to meet the reasonably foreseeable needs of future generations.
 - To avoid remedy or mitigate any adverse effects of fishing on the aquatic environment.
 - To provide access that enables social, cultural and economic well-being.
- 137 This risk assessment is performed on all non-QMS species that satisfy one or more of a suite of broad criteria. These criteria are inclusive and have been developed to identify species that may exhibit sustainability, utilisation and/or environmental concerns. Species identified by these criteria are referred to as candidates for QMS introduction.

Prohibited utilisation standard

- 138 A prohibited utilisation standard is proposed for development. Although the details of this standard have yet to be determined, it is anticipated that this standard will describe the process for generically assessing all species to identify those where no level of take is considered to be sustainable. Appropriate measures to prohibit utilisation will be determined subsequent to the operation of this standard.
- 139 As in the QMS introduction standard, assessment is likely to be risk based with a suite of appropriate criteria established against which stocks will be assessed on an annual basis. Criteria are likely to be informed, at least in part, by processes that have already been established.
- 140 Such processes may include a classification system²³ developed by the Department of Conservation (DoC) which classifies species (including marine species) according to their threat of extinction. Shark species for which a prohibition on utilisation is considered appropriate may also be identified by their inclusion under international conventions to which New Zealand is a party – primarily the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) and the Convention on the Conservation of Migratory Species of Wild Animals (CMS). Under these conventions New Zealand can be bound to restrict access to, or fully protect, a particular species.
- 141 Currently white pointer, whale and basking sharks are listed in various appendices of these two conventions. White pointer and basking sharks are listed on Appendix 1 of the CMS. From 1 April 2007 white pointer sharks were fully protected within New Zealand waters (under the Wildlife Act) and from New Zealand vessels on the high

²³ Molloy, J.; Bell, B.; Clout, M.; de Lange, P.; Gibbs, G.; Given, D.; Norton, D.; Smith, N.; Stevens, T. 2002: Classifying species according to threat of extinction. A system for New Zealand. *Threatened species occasional publication* 22, 26p.

seas (under the Fisheries Act). In the near future, consultation will occur on full protection for basking shark. Whale shark is listed on Appendix 2 of both CITES and CMS and is currently being considered for protection under the Wildlife Act.

- 142 Three other shark and rays species are presently being considered for protection under the Wildlife Act as part of the Department of Conservations review of the schedules of that Act. The species are the deepwater nurse shark²⁴ and two species of manta rays.

Environmental policies

- 143 In addition to the policies and initiatives directly supporting management of fishstocks, there are also specific policies proposed for development which will address the statutory requirement to avoid, remedy or mitigate any adverse effects of fishing on the aquatic environment. Although the detail has yet to be formalised it is intended that this work will address the impacts of fishing on habitats critical to marine species including sharks.
- 144 A number of initiatives already under development may also provide complimentary protection for particular sites of importance to sharks, although this is not their primary focus. Such initiatives include:

Marine Protected Areas Policy

- 145 A key policy is the Marine Protected Areas Policy Statement and Implementation Plan (MPA Policy) which was developed to protect marine biodiversity. The MPA policy is designed to meet the objectives of the New Zealand Biodiversity Strategy which reflect the commitment by the Government of New Zealand, through its ratification of the international Convention on Biological Diversity, to help stem the loss of biodiversity worldwide.
- 146 The MPA Policy is intended to guide the development of a representative network of MPAs using a number of marine management tools. The objective of the MPA Policy is to:

Protect marine biodiversity by establishing a network of MPAs that is comprehensive and representative of New Zealand's marine habitats and ecosystems.

- 147 In this context a MPA is defined as:

An area of the marine environment especially dedicated to, or achieving, through adequate protection, the maintenance and / or recovery of biological diversity at the habitat and ecosystem level in a healthy functioning state.

Benthic Impact Strategy

- 148 The primary objective of the Benthic Impacts Strategy, which is currently under development, is to develop standards that, when met, will avoid future adverse effects

²⁴ New Zealand's deepwater nurse shark is the same species as Australia's threatened gray nurse shark.

and remedy or mitigate any past or present adverse effects of fishing on the benthic environment.

- 149 The Benthic Impacts Strategy will set out the process for developing such Habitat Standards which will define the permissible level of impact on each broad habitat type found in New Zealand fisheries waters, based on an assessment of risk to the habitat type in question. Determining risk and significance of impact will be based on analysis of vulnerability of each habitat, and will incorporate the relative resilience of biological and physical components of each habitat, the reversibility of the impact and, the relative importance of the habitat to ecosystem function.
- 150 By way of implementation, a number of options are available for limiting the bottom impacts of fishing and to ensure that Habitat Standards are met. Possibilities include modification of gear to ensure that impact does not exceed the permissible level on that habitat type, or closing one or more areas of that habitat to fishing methods that have an undesirable effect.

DRAFT

PART 3 ALIGNMENT OF FISHERIES MANAGEMENT IN NEW ZEALAND WITH THE IPOA-SHARKS

151 The IPOA-Sharks specifies three levels of objectives:

- a) The overarching goal;
- b) The guiding principles; and
- c) The proposed objectives for an NPOA-Sharks.

152 The following discussion examines the alignment of fisheries management in New Zealand with the IPOA-Sharks.

IPOA-Sharks overarching goal

153 The overarching goal of the IPOA-Sharks is to ensure the conservation and management of sharks and their long-term sustainable use. This goal is closely aligned with New Zealand's fisheries management regime. The Ministry of Fisheries believes that New Zealand's current management regime for sharks, as summarized in Appendix 1 of this NPOA-Sharks, satisfies the overarching goal of the IPOA-Sharks.

IPOA-Sharks guiding principles

154 To achieve the overarching goal at a national level, the IPOA-Sharks defines three guiding principles for the development of an NPOA-Sharks. These are:

- i) **Participation-** states that contribute to fishing mortality on a species or stock should participate in its management.
- ii) **Sustaining stocks-** management and conservation strategies should aim to keep total fishing mortality for each stock within sustainable levels by applying the precautionary approach.
- iii) **Nutritional and socio-economic considerations-** management and conservation objectives and strategies should recognise that in some low-income food-deficient regions and/or countries, shark catches are a traditional and important source of food, employment and/or income. Such catches should be managed on a sustainable basis to provide a continued source of food, employment and income to local communities.

Participation

155 New Zealand is committed to the sustainable management of fish stocks and actively manages New Zealand's fisheries resources using numerous management mechanisms as outlined in Part 2. This includes the management of shark species that are taken within our Territorial Sea and Exclusive Economic Zone (EEZ), and participation in the management of highly migratory species taken in our waters and by New Zealand-flagged vessels on the High Seas.

Sustaining stocks

- 156 The primary focus of New Zealand's fisheries management system is to ensure stocks are harvested sustainably. This is achieved through setting limits on Total Allowable Catches (TACs) for most important species under the Quota Management System. Where species are not introduced into the QMS a variety of management controls are available.
- 157 Regardless of the framework under which a species is managed, section 10 of the Act requires that decision makers exercise caution when making management decisions relating to the sustainable utilisation of a fisheries resource when faced with uncertain, unreliable or inadequate information.
- 158 Where analysis determines that the nature of a stock or species is such that no active utilisation is desirable, measures can be put in place to prohibit, or severely limit, harvest of that stock or species under the Fisheries Act or conservation legislation such as the Wildlife Act.

Nutritional and socio-economic considerations

- 159 New Zealand is not a low income or a food deficient region, however shark catches are an important source of employment in some areas and some species of shark are utilised locally as a source of food. Examples include targeted fisheries for school shark and rig.
- 160 Historically some shark species have formed a food source for Māori in a number of areas in New Zealand, and they were also used for trade between tribes and later with European settlers. While shark catch is no longer a significant food source for Māori, there remains some customary interest in a number of shark species.
- 161 The allocation of the catch of QMS species under the Act requires that an allowance is made for customary fishing that should fully satisfy customary interests. The customary fishing regulations (Fisheries (South Island Customary Fishing) Regulations 1999 and the Fisheries (Kaimoana Customary Fishing) Regulations 1998) do not provide for the Crown to place limitations on customary fishing, apart from to ensure the sustainability of a particular stock. Shark species for which an allowance has been provided for customary take include elephant fish, school shark, spiny dogfish and rig. Small allowances have also been made for rough and smooth skate and blue, mako and porbeagle sharks.
- 162 Customary take is regulated through the authorisation system in the customary regulations that requires all customary fishing to be undertaken in accordance with tikanga (custom) and the overall sustainability of the fishery.
- 163 Shark species for which a recreational allowance has been made include elephant fish, school shark, spiny dogfish, blue shark, mako shark, thresher shark, and rig. Small allowances have also been made for rough and smooth skate.
- 164 Some shark species are important game fish in New Zealand waters. These include mako sharks which are highly prized as a game fish and to a lesser extent blue and porbeagle sharks which are the primary target game fish in southern New Zealand. Sharks are mostly released on capture and many are tagged on release as part of an

opportunistic game fish tagging programme to provide information on the distribution and movement of key shark species.

Proposed objectives of an NPOA-Sharks

165 At a more specific level, the IPOA-Sharks proposes a suite of ten objectives for the development of an NPOA-Sharks. These ten objectives are;

- 1) *Ensure that shark catches from directed and non-directed fisheries are sustainable.*
- 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 economic use.*
- 3) *Identify and provide special attention, in particular to vulnerable or threatened shark stocks.*
- 4) *Contribute to the protection of biodiversity and ecosystem structure and function.*
- 5) *Minimise unutilised incidental catches of sharks.*
- 6) *Minimise waste and discards from shark catches in accordance with article 7.2.2.(g) of the Code of Conduct for Responsible Fisheries.*
- 7) *Encourage full use of dead sharks.*
- 8) *Facilitate improved species-specific catch and landings data and monitoring of shark catches.*
- 9) *Facilitate the identification and reporting of species-specific biological and trade data.*
- 10) *Improve and develop frameworks for establishing and co-ordinating effective consultation involving all stakeholders in research, management and educational initiatives within and between States.*

166 The Ministry of Fisheries considers that, while the ten objectives vary in their relevance to New Zealand fisheries, they may be usefully grouped into four broad categories: sustainability, utilisation, environmental and additional considerations. These are discussed below.

167 As discussed, New Zealand's fisheries management regime has a number of legislative and policy tools, and reporting and consultation requirements, that address sustainability, utilisation and environmental considerations. Many of these tools are already used in the management of shark stocks.

Sustainability

168 Three of the IPOA-Sharks objectives can be grouped into the sustainability category:

- i) Ensuring that target and incidental take is sustainable (IPOA-Sharks objectives 1 and 2)
- ii) Assessing threats to shark populations (part of IPOA-Sharks objective 2)

iii) Protecting threatened and endangered shark species (IPOA-Sharks objective 3)

169 As noted in Part 2, the goal of fisheries management in New Zealand is the sustainable utilisation of fisheries resources. Target stocks and commercially valuable bycatch stocks are typically managed under the QMS and eleven shark species are currently managed in this way. Species that are infrequently encountered by fishers typically remain in an open access environment; however these species are still subject to some reporting requirements and other management tools short of full introduction to the QMS. Where no utilisation is deemed appropriate some species may be actively protected.

170 Decisions on which of the three general management approaches (QMS, non-QMS or prohibited utilisation) is appropriate for different shark species is prompted by an assessment of the threats to shark populations. This process does not involve a specific assessment of the status of all shark species. The assessment of shark species is however captured in generic processes for assessing appropriate management intervention for aquatic species; this includes provision for protection of endangered or threatened shark species.

Utilisation

171 Four of the IPOA-Sharks objectives can be grouped into the utilisation category:

- i) Implement harvesting strategies consistent with the principles of rational long term use (part of IPOA-Sharks objective 2)
- ii) Minimise unutilised incidental catches of sharks (IPOA-Sharks objective 5)
- iii) Minimise waste and discards from shark catches in accordance with article 7.2.2 (g) of the Code of Conduct for Responsible Fisheries²⁵ (IPOA-Sharks objective 6)
- iv) Encourage full use of dead sharks (IPOA-Sharks objective 7)

172 It is explicit in the purpose statement of the Act that the sustainable utilisation of fish stocks is a long term goal that incorporates the requirement to meet the needs of future generations. The primary components of the QMS, associated management controls, and the harvest strategies described in Part 2 are all intended to ensure the rational long term use of New Zealand's fishery resources.

173 The remaining three components of the utilisation objective relate to waste minimisation. There are two aspects to the consideration of waste minimisation in shark fisheries. Firstly, there is a general conservation ethic expressed in the desire to maximise the use of natural resources, and secondly, and more specifically related to sharks, there is concern over the inherently wasteful practice of shark finning. An additional consideration in relation to shark finning, which is not addressed in the

²⁵ 7.2.2(g) states that management measures should be adopted that ensure that; *'pollution, waste, discards, catch by lost or abandoned gear, catch of non-target species, both fish and non-fish species, and impacts on associated or dependent species are minimized, through measures including, to the extent practicable, the development and use of selective, environmentally safe and cost-effective fishing gear and techniques'*.

IPOA-Sharks objectives, is the cruelty caused by removing fins from a live shark. These are discussed in more detail below.

Conservation of natural resources

- 174 Both the IPOA-Sharks and the FAO Code of Conduct for Responsible fisheries encourage full utilisation. New Zealand agrees that minimising waste from the use of natural resources is to be encouraged, and considers that this position is compatible with the overarching goal of fisheries management in New Zealand to maximise the value New Zealanders obtain through the sustainable use of fisheries resources.
- 175 New Zealand has implemented a reporting system that allows the amount of wastage to be assessed. The percentage of utilised product varies between shark fisheries, and ranges from the near full utilisation of certain species, to the disposal of whole sharks in the case of others. A specific provision of the Act (the Sixth Schedule) applies to pelagic shark species to allow fishers to discard live sharks without having these catches recorded against ACE. This provides for the release of juveniles in particular but is also intended as a bycatch management tool.
- 176 Analysis suggests that between 21-27% of total shark catch²⁶ in New Zealand is reported as discarded dead at sea. Between 68-73% of the total shark catch is landed as processed meat with the remaining parts of the body (except fins) discarded. Approximately 7% of the total shark catch is reported as being landed as fin only (see Tables 1 - 4 in Appendix 5).
- 177 There are no specific legislative requirements to fully utilise, or to minimise the waste from, the harvest of shark species in New Zealand. The Ministry of Fisheries considers that there is a risk in regulating to avoid waste in that such regulations may merely transfer the disposal site from the sea to the land (i.e. unwanted product is landed and discarded in land dumps). There are however incentives inherent in New Zealand's property rights regime for commercial fishers to minimise waste. By providing quota holders with the secure ownership of a portion of a natural resource, the QMS provides fishers with incentives to invest in the development of markets for a wider range of products derived from their catch. It also eliminates a 'race for fish' mentality whereby fishers are encouraged to exploit high value and easily extracted components of a resource rather than adopt a more measured approach to the full utilisation of fish stocks.
- 178 While New Zealand supports and encourages the minimisation of waste, it is a secondary consideration to ensuring that total extraction from a fishery is sustainable. Consequently, regardless of the percentage of individual sharks that are retained by commercial fishers, it is vital that the total tonnage of animals removed from a stock is reported and used as the basis for deriving sustainable catch limits.
- 179 Discards and landed state of the commercial shark catch for the 2004/05 fishing year are shown in Tables 5 and 6 of Appendix 5. Of the catch that is discarded dead at sea, approximately 87% is attributable to spiny dogfish. Although this species is subject to the QMS, special provision has been made under the Sixth Schedule that allows it to be discarded. A special reporting code which applies only to this species ensures that

²⁶ These data are from the 2003/4 and 2004/05 fishing years.

catch is counted against quota. The amount discarded reflects the low capacity of fishers to utilise unwanted bycatch of this species.

- 180 Section 187 of the Act requires that all references to the weight of fish are to be to the greenweight - that is the weight before any processing commences. In order to convert the weight of processed fish back to greenweight, the Act provides for conversion factors to be set as a ratio of processed weight to greenweight. For most shark species, the conversion factor from the wet fin processed state back to greenweight is 30, although some shark species have different conversion factors – for instance, porbeagle (45) blue (48) and mako (59) sharks.
- 181 In addition, as fins taken from sharks have variable moisture content (which declines over time at a rate dependent on how the fins are stored), separate conversions factors for wet and dried fins have been provided for mako, blue and porbeagle sharks. As no conversion factors for dried fins have been provided for other species of shark, greenweight may be underestimated when sharks of other species are landed as fins only. In addition, for those species where specific conversion factors do exist for dried fins, these may not be used by fishers, possibly because to do so would increase substantially the amount of ACE required to cover landings.
- 182 The Ministry of Fisheries acknowledges that there is inherent difficulty in setting and applying these types of conversion factors. If dried fins are recorded as wet fins, there may be inaccuracies in reported landings which have the potential to compromise assessments of shark catch and, ultimately, the sustainability of shark stocks. On balance however the Ministry of Fisheries considers that the reporting framework is operating effectively to support the management and monitoring of shark stocks. Issues surrounding the accuracy and use of appropriate conversion factors are addressed in Part 4 of the NPOA-Sharks.

Finning and animal welfare

- 183 Under the Animal Welfare Act 1999 it is an offence to wilfully ill-treat an animal. The practice of removing the fins from a live shark fits within the definition of wilfully ill-treating an animal.
- 184 While the Animal Welfare Act only applies within New Zealand's Territorial Sea, the offence of wilfully ill-treating an animal can extend beyond the Territorial Sea. This is because that offence must be taken by indictment, which means the offence is considered to be a crime under the Crimes Act 1961. Under section 8 of the Crimes Act, the jurisdiction in respect of crimes on ships is extended beyond New Zealand territorial waters.

Environmental considerations

- 185 Two of the IPOA-Sharks objectives can be grouped into the environmental category:
- i) Determine and protect critical habitats (part of IPOA-Sharks objective 2)
 - ii) Contribute to the protection of biodiversity and ecosystem structure and function (IPOA-Sharks objective 4)
- 186 As described in Part 2 ensuring sustainability while providing for utilisation is the overarching purpose of the Fisheries Act. The definition of 'ensuring sustainability'

includes 'avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment'. Section 9 of the Act also prescribes three environmental principles that the Minister must take into account when exercising powers in relation to utilising fisheries resources and ensuring sustainability.

- 187 There is a range of tools available under section 11 of the Act that may be applied to meet New Zealand's statutory environmental obligations. Section 11 specifically provides for the setting of sustainability measures after taking into account the effects of fishing on the aquatic environment. Such sustainability measures may relate to limits on the size, sex and biological state of individuals that may be taken, catch limits and area, season and method restrictions.
- 188 New Zealand also undertakes a suite of research programmes linking conservation, environment, fisheries and biodiversity under a single New Zealand Biodiversity Strategy (NZBS). This Strategy contributes to Government's strategic goals of halting the decline of New Zealand biodiversity and of protecting and enhancing the environment. Funds provided under the NZBS support research programmes investigating marine biodiversity and marine ecosystem function within the New Zealand EEZ and New Zealand's Antarctic dependency in the Ross Sea.
- 189 Development of the Marine Protected Areas Policy is a further initiative to protect New Zealand's marine biodiversity. Implementation of this Policy will establish a network of marine protected areas that is comprehensive and representative of New Zealand's marine habitats and ecosystems. This network of marine protected areas may make significant contributions to protecting critical shark habitat, the protection of shark biodiversity and overall ecosystem structure and function.

Additional Considerations

Reporting

- 190 There are two IPOA-Sharks objectives that relate to the reporting requirements;
- i) Facilitate improved species-specific catch and landings data and monitoring of shark catches (IPOA-Sharks objective 8)
 - ii) Facilitate the identification and reporting of species-specific biological and trade data (IPOA-Sharks objective 9)
- 191 New Zealand's reporting regime is in accordance with these objectives and has been discussed in Part 2 of the NPOA-Sharks.

Consultation

- 192 There is one IPOA-Sharks objective that relates to the consultation requirements;
- i) 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-Sharks objective 10)
- 193 New Zealand's consultation processes are in accordance with this objective. Details of how New Zealand facilitates consultation with stakeholders in New Zealand, and between States, have been discussed in Part 2 of the NPOA-Sharks.

PART 4 PROPOSED PLAN OF ACTION

194 Based on our current knowledge and the discussion in Parts 2 and 3 of the NPOA-Sharks, a number of actions are required to improve the conservation and management of shark species in New Zealand waters. While significant improvements have occurred in shark management in recent years, it is also considered appropriate to undertake a review of the effectiveness of these existing and proposed measures in the medium term.

195 Proposed actions consist of the following;

a) *Production of a field identification guide*²⁷

Production of a draft field identification guide for all QMS and other fish species (including sharks) commonly caught in commercial and non-commercial fisheries by late 2007.

b) *Reduce use of generic shark reporting codes*²⁷

Reduce the percentage of the total commercial shark catch recorded against generic codes to below 1% by 1 October, 2010.

c) *Initiate a research and monitoring programme*²⁸

The programme will address:

- effectiveness of conversion factors in achieving accurate greenweight;
- monitoring of wastage in shark fisheries;
- assessment of measures to promote improved utilisation; and
- identification of areas of habitat of particular significance to shark species (e.g. spawning, pupping and nursery grounds)

d) *Participate in relevant Regional Fisheries Management Organizations (RFMOs) and other relevant international fora*²⁹

Support initiatives by other organisations/agencies to collect information on the distribution and abundance of shark species; and actively participate in the research and management of shark species which are managed through RFMOs of which New Zealand is a member.

e) *Development and implementation of a prohibited utilisation standard*

The standard will be used to identify marine species where no level of utilisation is considered to be sustainable. It has been discussed at length in Part 2 of this paper.

²⁷ The identification guide and reduction in the use of generic codes will directly contribute to meeting the IPOA-Sharks objectives relating to reporting (objectives 8 and 9). It will also make a significant contribution to meeting the IPOA-Sharks objectives relating to sustainability, utilisation and environmental considerations (objectives 1-7).

²⁸ The research and monitoring programme will directly contribute to meeting the IPOA-Sharks objectives relating to utilisation (objectives 5,6 and 7). The assessment of the effectiveness of conversion factors will make a significant contribution to meeting the IPOA-Sharks objectives relating to sustainability and reporting considerations (objectives 1-3 and 8-9).

²⁹ New Zealand participation in relevant International fora will directly contribute to meeting the IPOA-Sharks objective relating to consultation (objective 10).

f) *Protect Basking Shark*

As basking shark is listed on Appendix 1 of CMS, New Zealand has an obligation to provide protection for this species in New Zealand waters and from New Zealand vessels fishing on the High Seas.

Fish identification guide

- 196 Many sharks are of low economic value compared to other species and are therefore primarily non-target species. This, in conjunction with the wide-ranging behaviour typical of shark populations, has meant that fishers in New Zealand have a low encounter rate with many shark species and fishers consequently have difficulty in accurately identifying landed sharks to species level. While the reporting regime is comprehensive, accurate information on the commercial take of shark species depends on the ability of fishers to identify shark species; this has led to many fishers reporting shark catch by the various generic codes available to them.³⁰
- 197 The Ministry of Fisheries propose to address this issue through the production of an updated and comprehensive fish identification guide. While a number of identification guides are available both in New Zealand³¹ and internationally³² that address components of New Zealand's shark fauna, there is currently no single guide suitable for fishers to identify easily and accurately the full range of shark species that they may encounter in their day-to-day fishing operations.
- 198 An identification guide for all fish species (including sharks) taken in commercial fisheries is currently under development. The guide will complement existing guides for deepsea invertebrates³³ and offshore crab species.³⁴ It will be in the form of a pictorial field guide with images and information also held in a national database that permits electronic access. Ultimately the guide will cover all QMS species, species that are commonly confused with QMS species, species common in bycatch, and species that may be vulnerable to overexploitation in bycatch. The first iteration of the guide will prioritise species typically encountered in commercial fisheries.³⁵

Generic codes

- 199 Appendix 6 shows that the percentage of commercial shark catch that has been reported against generic codes for the last five fishing years has remained relatively stable at a about 4-5%. This is dominated by the code OSD which consists of sharks

³⁰ Generic codes include CHI (chimaera), DWD (deepwater dogfish), OSD (other sharks and dogfish), OSK (other skates), RAY (rays) and SKA (skates).

³¹ 'Ministry of Fisheries observer programme biological data collection manual' Ministry of Fisheries (2002); 'An identification guide for deepwater shark species', NIWA (2002), and 'Sharks and Rays of New Zealand', Cox and Francis (1997).

³² 'Marine species identification manual for horizontal longline fishermen', Secretariat of the Pacific Community (2006) and 'A handbook on sharks caught in SBT fishing grounds', Commission for the Conservation of Southern Bluefin Tuna (2003).

³³ Tracey, D.M.; Anderson, O.F.; Clark, M.R.; Oliver, M.D. (2005). A guide to common deepsea invertebrates in New Zealand waters. *New Zealand Aquatic Environment and Biodiversity Report No.1*. 160 p.

³⁴ Naylor, J.R.; Webber, W.R. and Booth, J.D. (2005). A guide to common offshore crabs in New Zealand waters. *New Zealand Aquatic Environment and Biodiversity Report No.2*. 47 p.

³⁵ A list of species to be included in the first iteration of the guide is currently being finalised but is likely to include over 75% of the shark species taken by fishers in New Zealand waters. The remaining species will be included in future iterations of the guide.

and dogfish not otherwise specified by the reporting regulations. While the use of this code, and to a lesser extent the other generic codes, is limited, their use compromises the ability of the reporting framework to reflect accurately the take of individual shark species, particularly for lesser known or infrequently encountered species. Introduction of the identification guide discussed above will increase the ability of fishers to identify such species and should decrease the use of the generic codes over time.

- 200 Regardless of the effectiveness of the proposed guide it is not possible, nor desirable, to eliminate generic codes altogether. If a fisher is unable to identify a shark, it is preferable that it is recorded against a generic code rather than recorded against an incorrect code. Maintaining these codes will ensure that the efficacy of the guide can be monitored through the use of generic codes on an ongoing basis, and will help to ensure that the take of a species is not inflated by misreporting of an unidentified shark species against another species code.
- 201 The percentage of shark catch recorded against generic codes will be monitored with the aim of reducing their use to below 1% of the total shark catch by 1 October, 2010.

Research and monitoring programme to allow review of the effectiveness of management of sharks

- 202 Research and monitoring measures (i.e. the reporting and record keeping framework) are an integral component of fisheries management and ensure that timely and appropriate action is taken when sustainability concerns arise. Such action may include instigating improved management measures for a particular shark species within its existing management framework, the movement of a shark species from non-QMS to QMS management in response to sustainability and/or utilisation concerns under an open access regime, or the provision of a prohibition on utilisation when no or only limited take is considered sustainable.
- 203 This section provides details of the types of activities that will be undertaken to allow for the review of the effectiveness of management in achieving the objectives of the IPOA-Sharks. It does not describe all activities that may be undertaken. It is anticipated that management measures in place for all sharks species would be reviewed every 3-5 years on the basis of such research and monitoring.

Aim

- 204 The primary aim of the research monitoring programme is to collect information to allow evaluation of the effectiveness of current management measures in achieving the purpose of the NPOA-Sharks, and the objectives of the IPOA-Sharks;

Method

- 205 In Part 3, the objectives of the IPOA-Sharks were grouped under the following headings:
- a) Sustainability
 - b) Utilisation

- c) Environmental considerations
- d) Additional considerations

The activities to be undertaken as part of the research and monitoring programme are discussed below within these groupings.

Sustainability

206 The efficacy of management measures to ensure sustainability will be determined through the collection and analysis of data from various sources:

- i) Trends in abundance as estimated from research surveys, observer data, commercial catch and effort, and other sources (e.g. tag-recapture or recreational fishing data)
- ii) Trends in catches, e.g. are catch limits being regularly exceeded or substantially undercaught
- iii) Trends in the sizes and maturity stages of sharks taken based on observer data
- iv) Characterisation of the nature of shark catches in various fisheries, e.g. target versus bycatch, to assess risks to shark populations
- v) Stock assessments will be undertaken for those species for which sufficient data exist
- vi) Biological studies to obtain or refine estimates of the productivity of shark populations

207 In the case of HMS or straddling stocks, the data collection may be undertaken by multiple states, with analyses undertaken in regional fora, e.g. RFMOs.

Utilisation

208 The efficacy of management measures to ensure utilisation will be determined through the collection and analysis of data from various sources:

- i) Analysis of observer and fisher collected data on the fate of sharks (e.g. retained versus discarded)
- ii) Analysis of the effectiveness of Sixth Schedule provisions for shark species
- iii) Review of conversion factors used to convert processed weight to greenweight
- iv) Monitor the use of processed states over time to determine trends in utilisation

Environmental considerations

209 Analysis of environmental considerations will be based primarily on data collected by scientific observers and through dedicated research programmes such as:

- i) Analysis of diet data
- ii) Effects of fishing research programmes

Additional considerations

- 210 The efficacy of reporting measures will be determined through monitoring of the use of 'generic' shark codes and the comparison of fisher and observer reports.

Output

- 211 The results of research and monitoring may identify instances where current management measures are not adequately meeting the objectives of the IPOA-Sharks. If such gaps are identified, new or modified management measures will be put in place, with additional monitoring to determine their effectiveness.

Participation in relevant RFMOs and other relevant international fora

RFMO's

- 212 As noted previously, some of the shark species taken within New Zealand waters are highly migratory in nature and furthermore New Zealand-flagged vessels are involved in fisheries outside of New Zealand waters in which sharks are sometimes encountered as bycatch.
- 213 New Zealand will work with members of the relevant RFMOs to ensure that the principles of the IPOA-Sharks are being advanced. In particular, New Zealand will seek improved reporting of shark catches and collaborative research amongst members leading to full stock assessments for key shark species through the Ecologically Related Species Working Group of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT-ERSWG) and the Scientific Committee of Western and Central Pacific Fisheries Commission (WCPFC-SC).

CITES

- 214 The listing of species on Appendix II to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) allows commercial trade to take place accompanied by CITES export permits. Basking shark and whale shark were listed on this appendix in 2002 and white pointer shark was included in 2004. Subsequent to the basking shark listing taking effect, New Zealand has issued permits allowing the export of basking shark fins Singapore from sharks taken as by-catch. Export permits have also been issued for jaws and teeth of white pointer sharks caught before that species was listed on CITES.
- 215 Germany, on behalf of the EU, has submitted a proposal for porbeagle shark and spiny dogfish to be listed on Appendix II of CITES to the June 2007 meeting of the CITES Conference of the Parties. Following consultation with stakeholders New Zealand has forwarded its comments on the proposal to the range states indicating that it sees the concerns regarding the conservation of these species more as a fisheries management problem in the northern hemisphere than a problem caused by international trade. An Australian proposal to list the snaggletooth shark was not proceeded with following consultation with range states, including New Zealand.
- 216 New Zealand will continue to engage in CITES processes.

CMS

- 217 At present the Convention on Migratory Species (CMS) lists on its appendices the basking shark (Appendix I & II), white pointer shark (Appendix I & II) and whale shark (Appendix II). In November 2005, New Zealand co-sponsored with Australia and the Seychelles a proposal to develop a global instrument under CMS for the improved conservation of highly migratory shark species.
- 218 A meeting to identify and elaborate an option for international cooperation on migratory sharks under the CMS will be held in December 2007. New Zealand will be represented at the meeting, which will examine the:
- conservation status of sharks defined as migratory under CMS,
 - existing international, regional and other initiatives to improve the conservation status of migratory sharks, including lessons learned, and
 - options for international cooperation under CMS,
- 219 A particular aim of the meeting is to seek a clear agreement amongst the key Range States, fishing countries and exporting countries as to whether there should be a legally or non-legally binding migratory sharks instrument under CMS and what its scope should be
- 220 New Zealand will continue to engage in CMS processes.

APPENDIX 1

New Zealand shark fisheries

221 A description of New Zealand's shark fisheries and management is summarised below.

Quota Management System

222 There are currently 11 species managed within the QMS and these account for approximately 80% of the commercial take of shark species in New Zealand. Details of the commercial landings of QMS species are given below along with, where applicable, information regarding recreational and customary use. Commercial catch information for QMS species is summarised in Appendix 3.

223 Six species or groups of species, of sharks have dominated commercial landings: spiny dogfish, school shark, rough and smooth skate, ghost sharks, rig and elephant fish. These constitute approximately 85% of total shark landings. They are caught primarily as bycatch although target fishing does occur for some species. These species are all managed under section 13 of the Act which requires that these species are managed at or above a biomass that can support the maximum sustainable yield (MSY).

224 Three other species are primarily taken as bycatch in the tuna longline fisheries in New Zealand fisheries waters. These are blue shark, mako shark and porbeagle shark and are all highly migratory species. These species are managed under section 14 of the Act which allows for the setting of a catch limit other than through an assessment of MSY. Although there was no information to suggest an immediate sustainability concern for any of these three species within New Zealand fisheries waters, they were introduced into the QMS on the basis that some features of these fisheries suggested the need for active management. These issues related to regional sustainability concerns, biological characteristics of the species that make them vulnerable to overfishing, the high proportion of finning taking place and the high proportion of juvenile catch of these species within New Zealand fisheries waters.

225 When blue, mako and porbeagle sharks were introduced into the QMS, catch limits were set at a level of assessed bycatch to prevent an escalation in future catches. Further, while a general rule of the QMS is that all catch must be landed, in the case of pelagic sharks specific provisions were made to allow for their release, subject to them being likely to survive. This allows for the release of sharks too large to handle or too small to have a market value, thereby reducing wastage and increasing effective utilisation.

226 The stock status of all sharks managed within the QMS is reviewed annually, or as new information comes to hand. The stock status of the 11 QMS shark species is discussed in more detail below.

Ghost Shark (*Hydrolagus spp.*)

227 Two species (dark and pale ghost sharks) make up virtually all the commercial ghost shark landings. Dark ghost shark (*Hydrolagus novaezelandiae*) was introduced into

the QMS on 1 October 1998 and pale ghost shark (*Hydrolagus* sp. B2) was introduced into the QMS on 1 October 1999.

- 228 Both ghost shark species are taken almost exclusively as a bycatch of other target trawl fisheries. In the 1990s, about 43% of ghost sharks were landed as a bycatch of the hoki fishery, with fisheries for silver warehou, arrow squid and barracouta combining to land a further 36%. The two ghost shark species were seldom differentiated on catch landing returns prior to the start of the 1998–99 fishing year. Estimated landings of both species by foreign licensed and joint venture vessels over the period 1 April 1978 to 30 September 1983 averaged 491 t. Landings by domestic (inshore) vessels would have been negligible during this time period. Since introduction into the QMS, estimated landings of dark ghost shark averaged 2092 t from the years 1998–99 to 2002–03, over which time the TAC reduced from 2963 t for the period 1998–00 to 2943 t for the period 2000–03. Landings for pale ghost shark averaged 1719 t in the fishing years 2000–01 to 2002–03, which significantly exceeded the TAC of 803 t.

School Shark (Galeorhinus galeus)

- 229 This moderate-sized shark has supported a variety of fisheries around New Zealand from the early 1940s onwards and was introduced into the QMS on 1 Oct 1986. Landings rose steeply from the late 1970s until 1983 with the intensification of setnetting for this and other species, and a general decline in availability of other, previously more desirable, coastal species. However, because of earlier discarding and under-reporting, this recorded rise in landings does not reflect an equal rise in catches. After a small decline in 1984–85, catches decreased by about 50% from 1986 onwards because of reduced quotas within the QMS. From 1987–88 to 1991–92 total reported landings were around 2200–2500 t. In 1995–96 total landings increased markedly to 3387 t and the total TACC (3107 t) was exceeded for the first time. Landings have remained around the TACC level since 1995–96.
- 230 During the period of high landings in the mid 1980s set netting was the main method, providing about half the total catch, with lining one-third, and trawling the remainder. There were large regional variations.
- 231 School shark are also caught by the foreign licensed fleet of tuna longliners fishing offshore in the EEZ to well beyond the shelf edge and above 4000 m bottom depths.
- 232 Although school shark is a game fish and is regularly caught by recreational fishers, it is not considered to be a particularly desirable target species. Recreational catch records have been estimated at approximately 200 t from diary surveys undertaken in 1999 and 2000.

Skates (Raja nasuta and R. innominata)

- 233 Two endemic species of skate, rough skate (*Raja nasuta*) and smooth skate (*R. innominata*), are fished commercially in New Zealand and both were introduced into the QMS on 1 October 2003. Smooth skates, which are also known as barndoor skates, grow considerably larger than rough skates, but both species are landed and processed. Two other species of deepwater skate (*Bathyraja shuntovi* and *Raja*

hyperborea) are large enough to be of commercial interest but are relatively uncommon and probably comprise a negligible proportion of the landings.

- 234 Skate flesh ammoniates rapidly after death, so the wings are removed at sea, and chilled or frozen. On arrival at the shore factories, the wings are machine-skinned, graded and packed for sale. Most of the product is exported to Europe, especially France and Italy. Skates of all sizes and of both species are processed, though some factories impose a minimum weight limit of about 1 kg (200 g per wing).
- 235 Rough and smooth skates occur throughout New Zealand, but are most abundant around the South Island in depths down to 500 m. Most of the catch is taken as bycatch by bottom trawlers, but skates are also taken by longliners. Significant longline bycatch has been reported from the Bounty Plateau. There is no clear separation of the depth ranges inhabited by the two species, and both species are often caught in the same trawl tows; however smooth skate tend to occur slightly deeper than rough skate.
- 236 Many fishers and processors do not distinguish rough and smooth skates in their landing returns, and code them instead as SKA ('skates'). Because it is impossible to determine the species composition of the catch from landings data, all historical data reported here consist of the sum of the both species. New Zealand annual skate landings, estimated from a variety of sources, averaged 2898 t from 1998-99 to 2002-03. The combined TAC is 2882 t.

Rig (Mustelus lenticulatus)

- 237 Rig was introduced into the QMS on 1 October 1986 and is caught in coastal waters throughout New Zealand. Most of the catch is taken from water less than 50 m deep during spring and summer, when rig aggregate inshore. Before the introduction of the QMS, 80% of the commercial catch was taken by bottom set net, and most of the remainder by trawl. Since then, a larger proportion has been taken by trawlers as bycatch, but the exact split by method is unknown.
- 238 Total reported landings of rig increased rapidly during the 1970s, and averaged about 3200 t per year during the late 1970s and early 1980s.
- 239 Following introduction to the QMS, landings declined to less than half those of the previous decade. Since 1986-87, landings have generally increased in response to TAC increases although this trend has declined in recent years. The reported landings of rig in the fishing years 1998-99 to 1999-00 has averaged 1653 t at a TAC of 1888t. The TAC was increased to 2034 t in 2000-01 and reported landings in the fishing years 2000-01 to 2002-03 averaged 1490 t.
- 240 Rig are caught by recreational fishers throughout New Zealand. Recreational landings between 1991 and 1994 comprised only a small proportion (<15%) of the total rig harvest in all fishstocks. Estimates of recreational landings obtained from the 1999 and 2000 surveys estimate a catch of 86-190 t.
- 241 Māori fishers traditionally caught large numbers of 'dogfish' during the last century and early this century. Rig was probably an important species within the general definition of 'dogfish', although spiny dogfish and school shark were probably also

included under this general terminology. The early practice of having regular annual fishing expeditions, during which thousands of dogfish were sun-dried on wooden frames, has died out. However, rig is still caught in small quantities by Māori in parts of the North Island, especially the harbours of the Auckland region. Quantitative information on the current level of Māori customary take is not available.

- 242 A Fisheries Plan has been developed for the management of Rig in Quota Management Area 7 (SPO 7). This plan was formally approved by the Minister of Fisheries in mid 2006.

Elephant Fish (Callorhinchus milii)

- 243 From the 1950s to the 1980s, landings of elephant fish of around 1000 t were not uncommon. By contrast, landings from 1982–83 to 1994–95 were generally lower (between 500 and 700 t). This species was introduced into the QMS on 1 October 1986 and initial catches were 500-600 t. However, since 1995–96 total landings of elephant fish have increased markedly, and landings in 2000–01 (1207 t at a TACC of 1040t) were the highest since 1964, in 2001–02, they decreased slightly to 1052 t at a TACC of 1057 t.
- 244 Most of the recent increase in catch from the fishery has been taken as a bycatch of the red cod trawl fishery. During the 1989–90 to 1997–98 period, the level of elephant fish bycatch from the red cod fishery increased from around 50 t to 300 t. There was also a steady increase in the level of elephant fish bycatch from the flatfish trawl fishery, with catches increasing from around 50 t in 1994–95 to 150 t in 1997–98.
- 245 Catches of elephant fish by recreational fishers are low compared to those of the commercial sector. Three recreational fishing surveys carried out by the Ministry of Fisheries suggest that recreational catch is somewhere in the region of 2000 - 4000 fish.

Blue Shark (Prionace glauca)

- 246 Blue shark is caught commercially as a bycatch by tuna longliners. There are no target fisheries for blue shark in New Zealand, but the choice of fishing gear can influence the retention of sharks once caught through the use of steel traces.
- 247 Reported landings increased during the late 1990s peaking at 1416 t in 2000-01. This is thought to result from an increase in domestic tuna longline fishing effort and improved reporting. Reported landings progressively declined between 2002 and 2004 when blue shark was introduced into the QMS. This was probably due to declining effort as the surface longline fishery restructured prior to the expectation that some tuna species were to be introduced to the QMS.
- 248 The TAC for blue shark is 2080 t with 1860 t of this being allocated to the commercial sector. An allowance of 190 t is provided for other sources of fishing related mortality.
- 249 Although not highly regarded as a game fish, blue sharks are caught in relatively large number by game fishers, particularly in southern New Zealand where they are the primary target. Each year several hundred individuals are routinely tagged and

released (2,689 between 1994 and 2004) although the total recreational catch is unknown. The annual recreational allowance is 20 t.

- 250 There is no indication of the importance of blue shark to customary Māori fisheries. However, sharks in general are known to be important and within that category there must be a take of blue shark. An allowance of 10 t is provided to account for customary take.

Mako Shark (Isurus oxyrinchus)

- 251 Mako shark is an unavoidable bycatch in tuna longline fisheries, trawl and bottom longline fisheries. There are no target fisheries for mako shark in New Zealand, but in the longline fisheries the choice of fishing gear can influence the retention of sharks once caught through the use of steel traces. In New Zealand, mako shark recruits to commercial fisheries during their first year, and much of the commercial catch is immature.
- 252 The TAC for mako shark is 512 t with 406 t of this being allocated to the commercial sector. Reported landings increased during the late 1990s peaking at 319 t in 2000-01. This is thought to result from an increase in domestic tuna longline fishing effort and improved reporting. Reported landings progressively declined between 2002 and 2004 when mako shark was introduced into the QMS. This was probably due to declining effort as the surface longline fishery restructured prior to the expectation that some tuna species were to be introduced to the QMS. An allowance of 46 t is provided for other sources of fishing related mortality.
- 253 There is a significant recreational catch of mako shark and it is highly prized as a game fish. Several hundred mako sharks per year are reported landed by big game fishing clubs, but many more are tagged and released (6963 between 1993 and 2004), or caught by fishers not belonging to one of these clubs. The New Zealand Big Game Fishing Council (NZBGFC) contends that club records indicate a disturbing trend in the recreational catch of mako shark, total reports dropping in 2000-01 to one quarter of the total reports in 1994-95. This is most notable in the number of mako sharks tagged and released, especially in the 20-60 kg weight range. NZBGFC submits that the commercial tuna long line fishery has had an adverse effect on the recreational catch of mako shark, particularly in the Gisborne and Napier areas. The annual recreational allowance is 20 t.
- 254 There is no indication of the importance of mako shark to customary Māori fisheries. However, sharks in general are known to be important and within that category there must be a take of mako shark. An allowance of 10 t is provided to account for customary take.

Porbeagle Shark (Lamna nasus)

- 255 Porbeagle shark is an unavoidable bycatch in trawl and longline fisheries. There are no target fisheries for porbeagle shark in New Zealand, but in the longline fisheries the choice of fishing gear can influence the retention of sharks once caught through the use of steel traces.

- 256 The TAC for porbeagle shark is 249 t with 215 t of this being allocated to the commercial sector. The majority of catch is taken in the surface longline fishery, but substantial amounts are also taken by midwater trawl, mostly the hoki fishery off the north-west South Island and the southern blue whiting fishery around the Auckland Islands. Reported landings increased during the 1990s peaking at 240 tonnes in 1998-99. Reported landings declined between 2000 and 2004 when porbeagle shark was introduced into the QMS. An allowance of 22 t is provided for other sources of fishing-related mortality.
- 257 There is a recreational catch of porbeagle shark which is recognised as a game fish. Between 1994 and 2004, 114 porbeagle sharks were reported tagged and released by big game fishing clubs. The annual recreational allowance is 10 t.
- 258 There is no indication of the importance of porbeagle shark to customary Māori fisheries, however, shark in general is known to be important and within that category there must be a take of porbeagle shark. An allowance of two t is provided to account for customary take.

Spiny Dogfish (Squalus acanthias)

- 259 Reported catch of spiny dogfish by the inshore fleet has shown a steady increase and is now at a similar level to the catch from the deepwater fleet. Most of the spiny dogfish caught by the deepwater fleet are taken as a bycatch in the jack mackerel, barracouta, hoki, red cod, and arrow squid fisheries, in depths from 100 to 500 m. Some are packed whole but most are trunked and exported to markets in Asia and Europe.
- 260 Spiny dogfish are also taken as bycatch by inshore trawlers, set netters and longliners targeting flatfish, snapper, tarakihi and gurnard. Processing problems due to their spines, sandpaper-like skin, short shelf life, and their low economic value mean that many inshore fishers are not interested in processing and landing this species. Furthermore, because of their sheer abundance they can at times severely hamper fishing operations for other commercial species and they are regarded by many fishers as a major nuisance. Trawlers working off Otago during the summer months often reduce towing times and headline heights, and at times leave the area altogether to avoid having to spend hours pulling hundreds of meshed dogfish out of trawl nets. Set netters and longliners off the Otago coast, and in Tasman Bay and the south Taranaki Bight have also complained about spiny dogfish taking longline baits, attacking commercial fish caught in the nets or lines, and rolling up nets.
- 261 Although discard rates increased dramatically through the 1990s, this is believed to reflect a change in reporting practise rather than an increase in the proportion of catch discarded. Reported landings from the fishing years 1998-99 to 2002-03 have averaged 9006 t, however, as spiny dogfish were not managed within the QMS until the 2004-05 fishing year, they could be legally discarded at sea (provided that total catch was reported). Since introduction of spiny dogfish into the QMS catches have ranged from 7500 to 9200 t of which between 55 and 70% are reportedly discarded at sea.
- 262 Spiny dogfish are caught by recreational fishers throughout their geographical range in New Zealand. They are mainly taken as bycatch when targeting other more valued

species. In many parts of New Zealand spiny dogfish are regarded by recreational anglers as a pest, often clogging nets and taking baits from hooks. An estimate of recreational landings of approximately 6000 t was obtained from a survey in 1999-2000.

Protected species

- 263 Sharks that are not managed in the QMS can be subject to individual conservation actions. In response to global concerns over the conservation status of white pointer sharks (WPS), New Zealand prohibited the taking of the species within the New Zealand Territorial Sea and EEZ from 1 April 2007. The taking of white pointer shark by New Zealand vessels on the High Seas was also prohibited at this time. Commercial catch information for white pointer shark is summarised in Appendix 2.
- 264 Whale shark is currently being considered for protection under the Wildlife Act due to its listing on Appendix 2 of both CMS and CITES. Three other shark and ray species are also being considered for protection under the Wildlife Act as part of the review of the schedules of that Act. The species are the deepwater nurse shark and two species of manta ray.
- 265 A further group of shark species (basking shark, hammerhead shark, sharpnose sevengill shark and whale shark), have been listed on Schedule 4C to the Fisheries Act. These species will remain as non-QMS bycatch species until such time as a decision is made to add them to the QMS or alternatively to apply a more restrictive regime.

Non-QMS shark species

- 266 Fishers are required to report the catch of all non-QMS species when furnishing their monthly returns. As a result, the commercial reporting requirements provide information on total catch and effort of all sharks caught in New Zealand fisheries.
- 267 There are four shark species listed on Schedule 4C to the Act and another 60 or so non-QMS species which are taken in various quantities by commercial fishers. Commercial catch information for non-QMS species is summarised in Appendix 4. Less than 1% of the commercial shark catch was provided by species listed on Schedule 4C, with the remaining open access species accounting for approximately 12%.

Generic codes

- 268 There are a number of generic codes for shark species to allow fishers to record catch of species that they cannot distinguish. Commercial catch information recorded against these generic codes for the last 5 fishing years is summarised in Appendix 6.
- 269 Approximately 4-5 % of the total commercial shark catch was recorded against generic codes.

APPENDIX 2

Reported commercial catch of white pointer shark for fishing years 2001-02 to 2005-06

Common name	Species code	2001-02		2002-03		2003-04		2004-05		2005-06	
		Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch
White pointer shark ³⁶	WPS	1967	0.00%	48	0.00%	3840	0.00%	845	0.00%	2485	0.00%
Catch of species proposed for protection as a percentage of total annual shark catch			0.01%		0.00%		0.02%		0.00%		0.01%

³⁶ White pointer sharks will be protected from 1 April 2007. Note that there are particular problems with WPS data including misreporting fin weights as greenweight and non-reporting (see International trade in white shark products from New Zealand in Shark News 16 Newsletter of the IUCN shark specialist group October 2004). Data for 2001-02 is from that report.

APPENDIX 3

Reported commercial catch of QMS shark species for fishing years 2001-02 to 2005-06

QMS shark species managed under section 13

Common name	Species code	2001-02		2002-03		2003-04		2004-05		2005-06	
		Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch
Elephant fish	ELE	1065007	3.57%	1124476	3.88%	1126515	4.48%	1180444	5.18%	1259421	5.71%
Ghost shark	GSH	2085986	6.99%	2557218	8.82%	1966498	7.81%	2112661	9.27%	1718187	7.79%
Pale ghost shark	GSP	1702501	5.71%	1943660	6.71%	1574615	6.26%	942670	4.14%	689683	3.13%
Rough skate	RSK	679031	2.28%	1147146	3.96%	1871595	7.44%	2135136	9.37%	1743107	7.90%
School shark	SCH	2977357	9.98%	3212083	11.08%	3108879	12.35%	3418128	15.00%	3040125	13.78%
Spiny dogfish	SPD	13104787	43.93%	10703541	36.93%	9165430	36.42%	7498517	32.90%	8209206	37.22%
Rig	SPO	1492892	5.00%	1525681	5.26%	1472570	5.85%	1410156	6.19%	1309830	5.94%
Smooth skate	SSK	1107395	3.71%	914690	3.16%	683403	2.72%	643690	2.82%	705218	3.20%
Catch of species managed under s 13 as a percentage of total annual shark catch			81.18%		79.79%		83.32%		84.86%		84.67%

QMS shark species managed under section 14

Common name	Species code	2001-02		2002-03		2003-04		2004-05		2005-06	
		Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch
Blue shark	BWS	1045022	3.50%	908240	3.13%	752203	2.99%	757125	3.32%	669302	3.03%
Mako shark	MAK	240056	0.80%	232460	0.80%	113149	0.45%	167396	0.73%	87602	0.40%
Porbeagle shark	POS	160175	0.54%	152121	0.52%	83728	0.33%	61936	0.27%	53999	0.24%
Catch of QMS species managed under s 14 as a percentage of total annual shark catch			4.85%		4.46%		3.77%		4.33%		3.68%

APPENDIX 4

Reported commercial catch of non-QMS shark species for fishing years 2001-02 to 2005-06

Shark species listed on Schedule 4C

Common name	Species code	2001-02		2002-03		2003-04		2004-05		2005-06	
		Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch
Basking shark	BSK	78649	0.26%	181256	0.63%	195913	0.78%	93593	0.41%	25570	0.12%
Hammerhead shark	HHS	8425	0.03%	12317	0.04%	11174	0.04%	7136	0.03%	1430	0.01%
Sharpnose sevengill shark	HEP	245	0.00%	118	0.00%	293	0.00%	75.5	0.00%	8361	0.04%
Whale shark		0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Catch of 4C species as a percentage of total annual shark catch			0.29%		0.67%		0.82%		0.44%		0.16%

Open access shark species

Common name	Species code	2001-02		2002-03		2003-04		2004-05		2005-06	
		Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch
Cat shark	APR	144	0.00%	216	0.00%	54	0.00%	10	0.00%	7	0.00%
Eaton's skate	BEA	946	0.00%	140	0.00%	103	0.00%	192	0.00%	53	0.00%
Electric ray	BER	8	0.00%	2463	0.01%	256	0.00%	2194	0.01%	0	0.00%
Bigeye thresher	BET	0	0.00%	0	0.00%	241	0.00%	0	0.00%	257	0.00%
Short-tailed black ray	BRA	4872	0.02%	15805	0.05%	22029	0.09%	16961	0.07%	10953	0.05%
Bramble shark	BRS	0	0.00%	15	0.00%	0	0.00%	0	0.00%	0	0.00%
Seal shark	BSH	838516	2.81%	804502	2.78%	729073	2.90%	716805	3.14%	633875	2.87%

Deepsea skates	BTH	0	0.00%	0	0.00%	0	0.00%	2	0.00%	62	0.00%
Notoraja spinifera	BTS	0	0.00%	0	0.00%	1	0.00%	0	0.00%	0	0.00%
Bronze whaler shark	BWH	34979	0.12%	27528	0.09%	28863	0.11%	16422	0.07%	14540	0.07%
Carpet shark	CAR	35622	0.12%	73589	0.25%	102646	0.41%	127268	0.56%	177954	0.81%
Deepsea sharks	CEN	85	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Purple chimaera	CHG	24282	0.08%	8833	0.03%	2104	0.01%	2592	0.01%	1374	0.01%
Chimaera spp.	CHI	111	0.00%	846	0.00%	470	0.00%	248	0.00%	302	0.00%
Chimaera, purple	CHP	1213	0.00%	185	0.00%	441	0.00%	161	0.00%	898	0.00%
Cat shark	CSH	588	0.00%	8098	0.03%	3722	0.01%	276	0.00%	42	0.00%
Leafscale gulper shark	CSQ	1208	0.00%	1624	0.01%	2715	0.01%	157	0.00%	2894	0.01%
Portuguese dogfish	CYL	0	0.00%	2352	0.01%	651	0.00%	394	0.00%	858	0.00%
Smooth skin dogfish	CYO	2390	0.01%	2247	0.01%	3542	0.01%	1139	0.00%	2889	0.01%
Longnose velvet dogfish	CYP	2451	0.01%	5118	0.02%	939	0.00%	131	0.00%	280	0.00%
Pelagic stingray	DAS	0	0.00%	395	0.00%	105	0.00%	0	0.00%	95	0.00%
Dawson's cat shark	DCS	0	0.00%	23	0.00%	23.15	0.00%	0	0.00%	0	0.00%
Deepwater spiny skate	DSK	711	0.00%	452	0.00%	5962	0.02%	6473	0.03%	2912	0.01%
Deepwater dogfish (Unspecified)	DWD	272023	0.91%	252604	0.87%	267785	1.06%	246380	1.08%	204236	0.93%
Prickly shark	ECO	18	0.00%	91	0.00%	7	0.00%	5	0.00%	967	0.00%
Eagle ray	EGR	12203	0.04%	19782	0.07%	44577	0.18%	48355	0.21%	47325	0.21%
Electric ray	ERA	3841	0.01%	20518	0.07%	32337	0.13%	22720	0.10%	26921	0.12%
Baxter's lantern dogfish	ETB	11175	0.04%	19407	0.07%	24564	0.10%	12796	0.06%	21803	0.10%
Lucifer dogfish	ETL	16458	0.06%	7138	0.02%	9655	0.04%	3247	0.01%	3159	0.01%
Etmopterus spp.	ETM	0	0.00%	0	0.00%	395	0.00%	177	0.00%	1309	0.01%
Etmopterus pusillus	ETP	0	0.00%	0	0.00%	150	0.00%	0	0.00%	0	0.00%
Frill shark	FRS	0	0.00%	8	0.00%	14	0.00%	0	0.00%	0	0.00%
Sixgill shark	HEX	51	0.00%	860	0.00%	52	0.00%	115	0.00%	452	0.00%
Giant black ghost shark	HGB	0	0.00%	910	0.00%	0	0.00%	0	0.00%	0	0.00%

Black ghost shark	HYB	0	0.00%	30	0.00%	0	0.00%	1164	0.01%	0	0.00%
Pointynose blue ghost shark	HYP	0	0.00%	0	0.00%	1473	0.01%	286	0.00%	0	0.00%
Long-nosed chimaera	LCH	104667	0.35%	195169	0.67%	197113	0.78%	166666	0.73%	133198	0.60%
Long-tailed skate	LSK	69	0.00%	864	0.00%	773	0.00%	436	0.00%	4458	0.02%
Manta ray	MJA	122	0.00%	0	0.00%	0	0.00%	1033	0.00%	40	0.00%
Northern spiny dogfish	NSD	88539	0.30%	101748	0.35%	86146	0.34%	45462	0.20%	113923	0.52%
Sand shark	ODO	5966	0.02%	400	0.00%	155	0.00%	262	0.00%	1301	0.01%
Other sharks & dogfish	OSD	910101	3.05%	1111653	3.84%	1013930	4.03%	541071	2.37%	702171	3.18%
Skate, Other	OSK	0	0.00%	0	0.00%	110	0.00%	148	0.00%	2719	0.01%
Prickly dogfish	PDG	1541	0.01%	3208	0.01%	5190	0.02%	2158	0.01%	1936	0.01%
Plunket's shark	PLS	0	0.00%	105	0.00%	116	0.00%	0	0.00%	164	0.00%
Longnosed deepsea skate	PSK	70	0.00%	81	0.00%	987	0.00%	22	0.00%	841	0.00%
Rays	RAY	15887	0.05%	31799	0.11%	1868	0.01%	3510	0.02%	1022	0.00%
Widenosed chimaera	RCH	265	0.00%	175	0.00%	365	0.00%	804	0.00%	744	0.00%
Roughskin dogfish	SCM	1667	0.01%	1845	0.01%	2290	0.01%	427	0.00%	1013	0.00%
Broadnose sevengill shark	SEV	3098	0.01%	5216	0.02%	3194	0.01%	3846	0.02%	3977	0.02%
Sherwood's dogfish	SHE	5834	0.02%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Shark (Unspecified)	SHA	0	0.00%	3559	0.01%	0	0.00%	0	0.00%	0	0.00%
Skates	SKA	1136597	3.81%	1261457	4.35%	16791	0.07%	0	0.00%	0	0.00%
Shovelnose dogfish	SND	399364	1.34%	260396	0.90%	332013	1.32%	292838	1.28%	333039	1.51%
Rough shovelnose dogfish	SNR	245	0.00%	0	0.00%	416	0.00%	640	0.00%	0	0.00%
Little sleeper shark	SOM	0	0.00%	0	0.00%	33	0.00%	0	0.00%	0	0.00%
Pacific sleeper shark	SOP	3012	0.01%	0	0.00%	0	0.00%	0	0.00%	1500	0.01%
Amblyraja georgiana	SRR	28305	0.09%	586	0.00%	3630	0.01%	1546	0.01%	947	0.00%
Slender smooth-hound	SSH	14646	0.05%	5552	0.02%	8757	0.03%	9190	0.04%	10846	0.05%

Stingray (Unspecified)	STR	26666	0.09%	19028	0.07%	2382	0.01%	5194	0.02%	11883	0.05%
Thresher shark	THR	69129	0.23%	89979	0.31%	64742	0.26%	44972	0.20%	35118	0.16%
Tiger shark	TIS	180	0.00%	416	0.00%	0	0.00%	2.4	0.00%	0	0.00%
Whiptail ray	WRA	900	0.00%	2486	0.01%	13054	0.05%	16520	0.07%	14982	0.07%
Velvet dogfish	ZAS	0	0.00%	0	0.00%	0	0.00%	0	0.00%	69	0.00%
Catch of open access species as a percentage of total annual shark catch			13.68%		15.08%		12.07%		10.37%		11.48%

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APPENDIX 5

Table 1 Annual reported shark catch from New Zealand EEZ by landed state (2003-05)

	Discarded at sea (category 1)	Meat landed in filleted state or better (category 2)	Landed as fins only (category 3)
Percentage of reported catch	21-27	68-73	6-11 ³⁷
Greenweight tonnes	4700 – 7500	16200 - 18800	1300 - 1600

Table 2 Percentage of shark species caught during 2004-05 reported as either discarded at sea or landed. Data based on CLR data apart from species marked with an asterisk that are estimates from observer data

Species code	SPD	SCH	RSK	GSH	SPO	ELE	GSP	BWS*	BSH	SSK	OSD	MAK*	CAR	BSK	POS*	EGR	THR	BWH	HHS	SEV
Percentage discarded	55%	0%	0%	1%	0%	0%	0%	28%	5%	1%	64%	25%	63%	37%	20%	49%	31%	4%	17%	31%
Percentage landed	45%	100%	100%	99%	100%	100%	100%	72%	95%	99%	36%	75%	37%	63%	80%	51%	69%	96%	83%	69%

Table 3 Percentage of shark species landed during 2004-05 reported as either whole sharks or carcasses with fins attached (category 1); sharks landed with fins removed from the carcass but with the carcass and fins both being landed separately (category 2); and landings of the fins only with the rest of the shark having been discarded (category 3). Data from CLR

Species code	SPD	SCH	RSK	GSH	SPO	ELE	GSP	BWS	BSH	SSK	OSD	MAK	CAR	BSK	POS	EGR	THR	BWH	HHS	SEV
Category 1	76%	9%	10%	16%	20%	92%	1%	1%	30%	19%	6%	32%	6%	0%	2%	27%	9%	41%	30%	9%
Category 2	15%	90%	90%	84%	79%	8%	99%	9%	70%	81%	81%	27%	0%	8%	14%	72%	81%	33%	70%	89%
Category 3	9%	1%	0%	0%	1%	0%	0%	90%	0%	0%	13%	41%	94%	92%	84%	2%	10%	26%	0%	2%

³⁷ Pelagic sharks TACCs are presently under caught. The percentage of the total shark catch that is finned could potentially rise to 11% if pelagic sharks were landed to the level of their respective TACCs and finned at current ratios.

Table 4 Percentage of pelagic shark landings that are finned at sea (category 3) for the three most recent fishing years.

	BWS	MAK	POS
2002-03	87%	50%	60%
2003-04	89%	56%	94%
2004-05	90%	41%	84%

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Table 5 **Reported landings of shark species by landed state. Data from CLR for 2004-05, codes for landed states are provided in Table 6**

2004-05	SPD	SCH	RSK	GSH	SPO	ELE	GSP	BWS	BSH	SSK	OSD	MAK	CAR	BSK	POS	EGR	THR	BWH	HHS	SEV	
DISC	4,093,114	2,572	3,662	13,452	3,196	86	1,452	9,177	34,800	4,461	356,537	2,746	81,286	34,800	5,680	27,207	14,117	635	1,407	1,174	
Category 1																					
GRE	2,517,238	27,043	202,185	75,113	71,681	7,955	3,160	2,661	180,054	119,036	5,332	52,484	2,713	0	451	7,314	1,398	973	909	9	
GUT	78,553	760	704	5,488	1,754	1,055,317	232		149	96	1	35				168	25				
HGU	12,978	281,243	8,711	250,779	220,451	20,132	2,668	291	22,591	3,087	6,233	1,348			481			1,190	4,349	1,028	225
HGT		12,386		1,543	3,814	47		1,339			21	293						224	1,572	102	
Category 2																					
DRE	170,325	3,052,998	77,752	1,704,982	1,195,584	100,053	874,808	72,519	259,041	2,358	42,192	43,917		4,957	7,488	1,454	25,502	5,423	4,822	2,373	
HGF		8,152			1,498			636			3	1,067					20		34		
DVC	155	5,467	2,128	3,302	3,141	99				138											
FIL	1,638	25,378	1,811,290	6,528	130	40		1,226	332	496,622		177			60	18,601					
SKF		16,779		2,114	38																
MEA	324,917	1,301	18,906	49,352		109	60,000	18	128,454	15,395	56,562	216			517	264					
LIV		96					350		89,170		61,722										
TSK		43	8,955							2,206											
UTF			170																		
USK					10																
FLP	0	0			0																
LUG					0																
ROE															0						
HDS	0	0		0	0																
SHF	0	146		0	0	15		57	0		0	5			0		0	0	0	0	
LIB									0		0										
WSB	87											0			0						
DSB																					
Category 3																					
FIN	308,281	26,777	2,725	592	20,069			403,221	2,397	607	25,945	52,927	45,111	53,837	22,882	428	3,148	4,258		65	
FIW								302,702				17,670			25,305			87			
FID																					

Codes for landed states in table 5

Landed state code	Sole or principal landed state
GRE	Green (or whole)
GUT	Gutted
HGU	Headed and gutted
HGF	Headed, gutted, and finned
DFT	De-fat fillets
DRE	Dressed
FIL	Fillets: skin-on
SKF	Fillets: skin-off
USK	Fillets: skin-off untrimmed
UTF	Fillets: skin-on untrimmed
SUR	Surimi
TSK	Fillets: skin-off trimmed
TRF	Fillets: skin-on trimmed
DSC	Dressed-straight cut (stargazer)
DVC	Dressed-V cut (stargazer)
MEA	Fish meal
FIN	Fins
LIV	Livers
MKF	Minced, skin-off fillets
MGU	Minced, headed and gutted
HGT	Headed, gutted, and tailed
GGO	Gilled and gutted tail on
GGT	Gilled and gutted tail off
FID	Dried fins
FIW	Wet fins

Landed state code	Additional landed state
ROE	Roe
HDS	Heads
FIT	Fish tails
SHF	Shark fins
MBS	Minced by-product, skin-off fillets
MBH	Minced by-product, headed & gutted
MEB	Fish meal by-product
FLP	Flaps
LIB	Livers by-product
CHK	Cheeks
LUG	Lugs or collars
OIL	Oil
GBP	Gut by-product
WSB	Wet shark fins by-product
DSB	Dried shark fins by-product

APPENDIX 6.

Reported commercial catch of Shark species recorded under generic codes for fishing years 2001-02 to 2005-06

Common name	Species code	2001-02		2002-03		2003-04		2004-05		2005-06	
		Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch	Catch (greenweight kg)	Percentage of annual shark catch
Chimaera spp.	CHI	111	0.00%	846	0.00%	470	0.00%	248	0.00%	302	0.00%
Deepwater dogfish (Unspecified)	DWD	272023	0.91%	252604	0.87%	267785	1.06%	246380	1.08%	204236	0.93%
Other sharks & dogfish	OSD	910101	3.05%	1111653	3.84%	1013930	4.03%	541071	2.37%	702171	3.18%
Skate, Other	OSK	0	0.00%	0	0.00%	110	0.00%	148	0.00%	2719	0.01%
Rays	RAY	15887	0.05%	31799	0.11%	1868	0.01%	3510	0.02%	1022	0.00%
Stingray (Unspecified)	STR	26666	0.09%	19028	0.07%	2382	0.01%	5194	0.02%	11882	0.05%
Catch recorded under generic codes as a percentage of total annual shark catch			4.11%		4.88%		5.11%		3.49%		4.18%

Notes on data used to derive the tables shown in the appendices.

The following notes relate to the data;

- Data comes from the landing section of the commercial fishing returns.
- Data was restricted to landings of species class **F** - Fish, species sub classes **S** (sharks and dogfish), **R** (rays and skates) and **C** (chimaeras).
- Any weights recorded as retained, held in holding pots in the sea or on land, transhipped to a New Zealand registered vessel, were excluded to avoid double counting.
- The fishing year is the standard fin-fishing year which runs from October to September.
- The total greenweight will include any ET (extra territorial) landings reported to the Ministry on the returns.
- The Ministry has prepared these tables on the basis of information provided to it in returns provided by fishers. The Ministry does not accept responsibility for the completeness or accuracy of the information used