Ministry for Primary Industries
Manatū Ahu Matua

Strategy to eliminate shark finning in New Zealand

Inshore Fisheries

MPI Information Paper No: 2014/10

ISBN No: 978-0-478-43219-0 (online)
ISSN No: 2253-394X (online)

May 2014

New Zealand Government

Growing and Protecting New Zealand

Disclaimer

While every effort has been made to ensure the information in this publication is accurate, the Ministry for Primary Industries does not accept any responsibility or liability for error of fact, omission, interpretation or opinion that may be present, nor for the consequences of any decisions based on this information.

Requests for further copies should be directed to:

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

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

This publication is also available on the Ministry for Primary Industries website at http://www.mpi.govt.nz/news-resources/publications.aspx

Contents

Page

1 Introduction

1. This document represents the strategy to eliminate shark finning in New Zealand's inshore fisheries. The strategy characterises New Zealand's inshore fishing fleet and fisheries, with a focus on factors that may contribute to or provide incentives for the practice of shark finning under current management and conditions. The strategy outlines the regulatory framework proposed for the elimination of finning in New Zealand, the main challenges for implementation in inshore fisheries, and the chosen approach for overcoming these challenges (i.e. the monitoring, education, liaison and research associated with eliminating shark finning in inshore fisheries).

2. The context for this strategy is the National Plan of Action for the Conservation and Management of Sharks 2013 (NPOA-Sharks), which is provides goals and objectives for the management of New Zealand sharks for the next five years, in line with the International Plan of Action for Sharks.

3. Notably, objective 2.4 of the NPOA-Sharks is to "Eliminate shark finning in New Zealand fisheries by 1 October 2015, with one exception."

4. The NPOA-Sharks defines finning as 'the removal of the fins from a shark (Class Chondricthyes – excluding Batoidea (rays and skates)) and the disposal of the remainder of the shark at sea. As such, removal of the fins from a shark where the trunk is also retained for processing is not defined as 'shark finning'.

1.1 MANAGEMENT FRAMEWORK

5. Shark finning will be banned through a regulation stating that fishers are not permitted to retain just the fins of any shark they catch (i.e. fishers will not be able to land fins as a primary state). Compliance with this ban will be verified in one of two ways:

    - by requiring sharks to be landed with **fins naturally attached** (with some minimal processing to allow sharks to be bled and gutted, and to allow fins to be folded against the trunk of the shark); or
    - through a **ratio approach** (i.e. landed shark fins to weigh no more than a specified percentage of the greenweight determined from the landed primary product).

1.1.1 Fins Naturally Attached (FNA) approach

6. The FNA approach requires that any fins a fisher wishes to land be naturally attached to the trunk of the shark. FNA has emerged as a preferred approach internationally for eliminating shark finning. Various reasons are given for this including ease of monitoring and enforcement, potential to improve species identification and catch reporting, reduction in overall catches, and the ability to ensure a 1:1 ratio between fins and trunks.

7. Some of the advantages cited for FNA may be less relevant in the context of New Zealand's quota management system (QMS) and catch limits. For example, the requirement to land the whole shark may limit the number of sharks that can be taken in each trip (due to space restrictions), and allows for the collection of information on the sharks being landed (where they are not discarded). Directed fisheries for shark fins are not present in New Zealand, and the primary limit on shark catches is catch limits under the QMS.

8. The FNA approach does have operational ramifications for fishers. Shark blood contains urea, which is converted to ammonia after the animal dies. Ammonia can impart an off taste in shark meat, and is reported to taint other fish stored in close proximity. There are also practical concerns which require consideration when implementing an FNA regulation, including the safety of fishers when moving a whole shark into or out of the hold. These issues can, in part, be mitigated by allowing cuts to be made to fold the fins flat against the trunk for storage, and for the shark to be gutted and/or bled to prevent or slow the ammoniation of the meat in storage.

9. The FNA approach can potentially also restrict utilisation of some species where markets may be developed for additional processed states of the shark. However, fishers would not be precluded from undertaking further processing of any sharks required to be landed with FNA; if they wished to retain the fins from such species the processing would have to take place after landing. If not retaining the fins, the shark could be landed in any processed state desired. If over time new markets developed for species required to be landed with FNA, this would likely be seen in landing data with an increase of landings in other primary states, enabling assessment of whether provision of a fin ratio option was appropriate.

1.1.2 Ratio approach

10. The ratio approach requires that landed shark fins weigh no more than a specified percentage of the greenweight of the shark (determined from the landed primary product). This allows existing operational practice to continue where fish is processed at sea to the most saleable landed states such as dressed trunks. In fisheries where at-sea processing commonly occurs, fins are frequently retained and landed as a secondary landed state alongside the primary state.

11. Enabling at-sea processing to continue is considered to be more efficient than landing the fish whole and processing on land, and enables fishers to continue to maximise value from retained shark products. This is in line with the NPOA-Sharks goal of encouraging the full use of dead sharks, minimising unutilised incidental catches of sharks, and eliminating shark finning in New Zealand fisheries.

12. Under this approach, it is important that ratios are set appropriately. If ratios are set too high, a loophole may be created which allows fishers to harvest more fins than correspond to the carcasses on board. Ratio-based regulations may also provide an opportunity for high-grading, the practice of mixing carcasses and fins from different animals (i.e. different sized sharks) to maximise profit. Under current circumstances, both opportunities and incentives for this type of high-grading are believed to be limited. While in the past, shark fins have received a high price at market, there has been a recent and dramatic decline in shark fin exports, and licensed fish receivers are reportedly reluctant to accept fins at present. In addition, frequently sharks of only a limited number of species are landed on any one trip, meaning limited opportunities to high-grade by retaining fins of one shark species and trunks of another.

13. The Ministry for Primary Industries (MPI) currently uses comprehensive discrepancy analysis to monitor catches in New Zealand fisheries. This existing approach can be readily applied to sharks to verify compliance with ratios (with some changes to the way in which fins as a secondary state are managed, as outlined further below).

14. It is likely that the ratio of fin to body weight will vary between species, between fishers (depending on the cuts made) and also depending on what the primary landed state is.

Internationally a figure of 5% is often used, although this is variously used as the ratio of fin weight to processed carcass weight, rather than fins to greenweight.

15. The approach proposed for New Zealand is to base ratios on fin weight to shark carcass weight, converted by conversion factor to greenweight. For example, this would require a ratio of 3.3% of fin weight to shark greenweight be achieved (based on the standard generic conversion factor for wet fins of 30), but there would be scope to develop species-specific ratios as required over time. It is not proposed to place restrictions on the primary state in which sharks can be landed at present (aside from removing the option of fins as a primary state).

16. Other factors to consider when determining a ratio for a species is whether it is based on dry or wet fin weight, and whether just primary fins (the first dorsal fin, both pectorals and the lower lobe of the caudal fin) or also secondary fins (e.g. second dorsal fin, anal fin, pelvic fins, upper caudal lobe) are landed. This should be based on existing fishery practices (i.e. the types and state of fins currently landed). The fins to be counted, and wet/dry state used when calculating the fin: greenweight ratio will be specified as part of the regulations.

1.1.3 Choice of approach

17. The central advantage of the fins naturally attached approach is ease of monitoring compliance with the 1:1 ratio of fins to shark bodies. The main benefit of the fin ratio approach is that it more readily enables utilisation of the shark, because it allows more processing at sea to occur. The relative weighting of these monitoring and utilisation considerations will vary depending on the species and the fisheries. It is proposed that any shark species for which fishers wish to retain the fins could be landed in an FNA state; for identified species, fishers would also have the option to land fins in a ratio to the greenweight of sharks retained.

18. It is generally agreed that a ratio approach could be appropriate for sharks with existing high levels of utilisation. Environment groups have indicated they can appreciate the differences between fisheries with high levels of existing processing (where fins are retained as a secondary product), and those where fin-only landings are currently common. However, the FNA approach remains the preference for environment groups, for reasons including ease of monitoring and enforcement, potential to improve species identification and catch reporting, and the ability to ensure a 1:1 ratio between fins and trunks.

19. Discussions with industry have emphasised the operational difficulties the FNA approach entails. In general, industry has argued that they are being asked to improve utilisation of dead sharks (in line with the NPOA-Sharks goal), and that this would not be possible if an FNA rule were applied. A likely impact of applying an FNA rule on shark species for which the value of the flesh is low is that the sharks will not be retained at all – potentially leading to some challenges with monitoring overall catches, as well as creation of misreporting offences under current regulatory settings.

20. However, the framework to be adopted will need to apply not just to the commonly-caught shark species that are typically managed under the QMS, but to all catches of sharks – i.e. to as many as 40 or 50 species of shark and chimaera that may be encountered in commercial fisheries from time to time. Fin ratios will not be provided for non-QMS species at present.

21. When considering the generally low and intermittent catches of non-QMS species, MPI considers the relative weighting of utilisation and monitoring considerations shifts somewhat. Some

processing at sea does occur, including for northern spiny dogfish, seal shark, thresher shark, broadnose sevengill shark, bronze whaler, and hammerhead shark (with processed catches ranging from 75 to 100 tonnes for northern spiny dogfish and seal shark respectively, to less than 20 tonnes for most of the remaining species in the 2012-13 fishing year). In general however, non-QMS species tend to be caught in lower quantities, and many are predominantly discarded, suggesting a relatively low market value at present.

22. Monitoring of fisheries occurs in a number of ways, including through the use of at-sea observers (and, to an extent, at-sea patrols); through checks of permit holders, fish receivers, and others in the supply chain; and through analysis of submitted data, for example discrepancy analysis. Many of these routine forms of monitoring are focussed on ensuring the integrity of the QMS, because of the need to ensure catches remain within the overall Total Allowable Commercial Catch (TACC), and that individuals and companies are meeting their obligations under the Act. This means that QMS and non-QMS species are subject to different baseline monitoring levels.

23. Given that catches of non-QMS species tend to be low, fishers may only be dealing with one or two specimens on any given trip. If a fisher wished to retain the fins of the shark, he could land the fish with fins attached. Alternatively, if wishing to use the rest of the shark, the fish could be processed at sea and the fins not retained. This would entail some foregone utilisation compared to current practices, and MPI acknowledges the industry preference to be as consistent as possible with the application of rules (including to non-QMS species). It should also be noted that the ability to monitor QMS and non-QMS fisheries is broadly equivalent, and the tools would be available to monitor a fin ratio approach for some species if additional resources were to be applied to monitoring. This means the option for a fin ratio approach could be provided for some non-QMS species over time if appropriate.

1.1.4 Associated regulatory changes

Commercial Fishing Regulations

24. It is proposed to implement the finning ban through an amendment to the Fisheries (Commercial Fishing) Regulations 2001 (the Commercial Fishing Regulations), to include a general regulation prohibiting shark finning as defined in the NPOA-Sharks (i.e. prohibiting the retention of just the fins of a shark (Class Chondricthyes, excluding Batoidea)). This amendment will be made under Section 297 of the Fisheries Act 1996 (the Act).

25. As noted, compliance with the finning ban would be verified by either requiring sharks to be landed with fins naturally attached if the fins are to be retained, or by requiring retained fins to weigh no more than a specified percentage of the greenweight equivalent of the processed shark carcass.

26. Up to 70 shark species (potentially including 40-50 ‘true sharks’ and chimaeras to which the finning provisions will apply) may be caught in commercial fisheries from time to time (the number of commonly-caught species is much less than this). On this basis, an inclusive approach is proposed (i.e., FNA would apply to all species not otherwise specified). Provision should also be made for certain species to be added to or removed from the list of species for which the ratio approach is available, preferably by Gazette notice.

Schedule 6 of the Fisheries Act 1996

27. In overseas administrations that have implemented shark finning bans, fishers are typically allowed to discard the whole shark if there is no financial incentive to retain it (e.g. where the costs of landing the shark whole with fins attached outweigh the benefit of doing so). In New Zealand, fishers are required to land every QMS shark species that they catch (at least in part) (unless Schedule 6 provisions apply or an MPI observer authorises the discard).

28. Schedule 6 lists QMS species and stocks which may be returned to the sea or other waters in accordance with the stated requirements. Several species of sharks are currently listed on Schedule 6, including blue shark, mako shark, porbeagle shark, rig, school shark, and spiny dogfish. For all of these species other than spiny dogfish, the stated conditions require that the animal be likely to survive on return to the sea and that the return takes place as soon as practicable after the animal is taken. Animals returned to the sea alive are not counted against a fisher's Annual Catch Entitlement (ACE) or the TACC for that species. Spiny dogfish may be returned to the sea either alive or dead, however all returns are counted against a fisher's ACE and the TACC.

29. Live releases under Schedule 6 are an important way of meeting the NPOA-Sharks goal of minimising unutilised incidental catches (coupled with work to avoid catches altogether where possible and to maximise survival of released sharks).

30. However, the proportion of sharks caught alive varies between species, and from fishery to fishery. In some cases, markets can be found for the shark meat but for many species only a limited market is currently available (e.g. spiny dogfish, blue shark, carpet shark) and/or markets are specific to certain types of landed product (e.g. fresh rather than frozen product in the case of porbeagle and mako sharks). There are also specific circumstances in which individual specimens of otherwise saleable species may not be able to be sold. In particular, large sharks of many species are not accepted because of concerns about mercury levels in the meat. This has been raised as a particular concern for mako shark.

31. Where markets are not available, requiring the landing of the shark is not decreasing waste or increasing utilisation, as the product landed will likely be sent to a rendering plant or simply disposed of on land, at an additional cost to the fisher. MPI considers that this cost creates a substantial incentive to misreport shark catches, which may reduce the ability to determine the actual levels of shark mortality. To reduce this risk, it is proposed that the provisions of Schedule 6 be reviewed and amended for some species (blue, mako and porbeagle sharks) to allow for the return of sharks to the water either alive or dead.

32. In some fisheries, additional incentives are considered necessary to encourage live releases of sharks that are caught alive. In this case, live releases may not count against ACE (while dead returns to the sea would).

33. Any changes to allow for the return to the sea of dead sharks would need to be linked to industry commitments to minimise the use of these provisions and particularly, to apply them only to sharks that were dead on arrival at the vessel. To that end, observer data could be used to quantify existing status of sharks at the boat (i.e. alive, moribund, dead), and to compare with fisher-reported data (i.e. use of Schedule 6 release codes). Use of these codes should be closely monitored, and dead returns should not exceed expected levels. Overall reporting of shark catches should also be closely monitored, along with discrepancy analysis of observer and fisher reporting of catch rates and retained and discarded catches.

Changes to reporting requirements

34. To enable monitoring of landings of fins versus primary processed states, some changes would be required to the way in which landings of the secondary processed state (i.e. fins) currently occur. In particular, these landings would need to be weighed on a species-specific basis, and would need to be landed in separate batches on a species by species basis. These changes will require amendment of the Fisheries (Reporting) Regulations 2000 (the reporting regulations).

Conversion factors

35. Once the finning ban is in place, the primary landed states of Fins (FIN), Wet fins (FIW), and Dried fins (FID) and the associated conversion factors would be removed from the reporting regulations. The ability to land fins as an additional landed state would remain. New conversion factors for landings that are made with fins naturally attached will also be required (this will not be a greenweight landing since some limited processing e.g. bleeding of the shark and removal of the head will still occur).

2 Inshore fisheries

36. New Zealand's inshore commercial fisheries employ a wide range of fishing methods to target a variety of species throughout inshore waters. Some shark species are targeted by inshore fisheries, mostly by set net; sharks are also taken as bycatch in inshore trawl, Danish seine, and bottom longline fisheries.

37. The most important inshore shark species taken are school shark, dark ghost shark, elephantfish, and rig or spotted dogfish. Landings of these species make up approximately 30% of all sharks caught in all New Zealand fisheries and the inshore fisheries took more than 96% of the total catch of these species. These species are highly valued and are processed for domestic and international markets. Combined they contribute more than 60% of the exported value of all sharks. The most valuable shark fishery is for school shark. School shark are both targeted (55% in 2010-11) and taken as bycatch in fisheries targeting other species.

38. Catches of these sharks are managed under the QMS, and catch limits are reviewed and adjusted according to the best available information to ensure sustainable harvesting. Inshore mixed species fisheries are characterised by complex interactions, and various management tools are used to support sustainable management and enable fishers to optimise value from their catches. This includes inclusion of school shark and rig (but not elephantfish and dark ghost shark) on Schedule 6, allowing commercial fishers to return these species to the sea if likely to survive.

39. There is also a substantial catch of spiny dogfish as a bycatch of some inshore trawl fisheries. This is mostly an unwanted bycatch, and the management system allows for this species to be returned to the sea either alive or dead, as long as the catch quantities are reported so that fisheries can be monitored and counted against ACE. In 2011-12, spiny dogfish alone made up about 28% of all sharks caught in all New Zealand fisheries, and the inshore fisheries took approximately 40% of that catch. Some of the catch is returned alive under the Schedule 6 provisions. Monitoring shows the amount of spiny dogfish discarded is declining slowly.

40. The bycatch of other shark species, including those not managed under the QMS, is retained according to market availability or returned to the sea. Carpet shark, seal shark, and northern spiny dogfish are the main non-QMS species caught. Smaller amounts of shovelnose dogfish, mako, seven gilled shark, porbeagle, hammerhead shark and bronze whaler are also caught.

2.1 SHARKS IN INSHORE FISHERIES

41. Fifteen species of sharks typically have annual catches greater than 10 tonnes reported from a range of different inshore fisheries. The approach taken to identify and quantify these fisheries has been to separate from total landings those shark landings that may be attributed to the surface longline fleet of vessels (that take the bulk of the HMS species of sharks) and those shark landings that may be attributed to the deepwater fleet (that take the bulk of the deepwater species of shark).

Table 1: Description and catches of New Zealand inshore shark species
QMS = quota management system; TAC = Total Allowable Catch

Common name	Species code	Domestic management	Total catches (tonnes) (2012-13)	Catches in Inshore fisheries (tonnes) (2012-13)
School shark	SCH	QMS-TAC set under section 13 of the Fisheries Act	3,168.74	2,922.08
Spiny dogfish	SPD	QMS-TAC set under s13 of the Act	5,076.03	1,860.36
Elephantfish	ELE	QMS-TAC set under s13 of the Act	1,429.23	1,406.23
Rig (spotted dogfish)	SPO	QMS-TAC set under s13 of the Act	1,302.13	1,293.83
Dark ghost shark	GSH	QMS-TAC set under s13 of the Act	1,719.89	1,106.38
Carpet shark	CAR	Open Access Proposed for QMS introduction 2014	344.14	302.55
Seal shark	BSH	Open Access Proposed for QMS introduction 2014	322.80	100.25
Northern spiny dogfish	NSD	Open Access	93.22	60.92
Shovelnose dogfish	SND	Open Access	183.94	24.38
Pale ghost shark	GSP	QMS-TAC set under s13 of the Act	700.74	18.08
Sevengill shark	SEV	Open Access	19.77	17.79
Thresher shark	THR	Open Access	37.88	10.52
Hammerhead shark	HHS	Open Access	9.79	9.64
Bronze whaler shark	BWH	Open Access	37.88	9.63

42. As shown in table 1, some inshore sharks are also commonly caught in deepwater trawl fisheries and, to some extent, in surface longline fisheries for highly migratory species (HMS). Certain sharks that are defined on schedule 4B as HMS such as bronze whaler shark and smooth hammerhead shark are seldom caught in surface longline fisheries, but may be caught in a range of inshore fisheries.

43. Table 2 shows a breakdown of processing information for sharks caught in inshore fisheries in 2012-13, as well as whether or not they are retained (in the case of non-QMS species). This information for the previous 4 years may be found in Appendix I. Because of the range of fisheries involved in inshore fisheries, catch attributed to inshore is the remaining catch after specific deepwater and surface longline fleet catches were identified. In some instances, a vessel may fish in more than one fishery (for example in inshore and surface longline fisheries), meaning some inshore catch may be attributed to surface longline fisheries but this is unlikely to affect the overall proportions substantially.

44. The table shows the total landings included in the analysis, along with various destinations for the catch i.e. information on fish 'lost' at sea (reported under the 'A' code); spiny dogfish returned to the sea under Schedule 6 provisions (either alive or dead); non-QMS species returned to the sea (reported under the 'D' code); and, where applicable, fish eaten on board the vessel (reported under the 'E' code), as well as fish landed. In the latter case, processing information is also provided. 'Greenweight' in this case refers to fish that are landed whole. The column entitled 'Sch. 6 live releases' indicates the quantity (in tonnes) of sharks released alive under the

provisions of Schedule 6. These live releases are not included in the subsequent landings and processing information.

Table 2: Landing and processing information for sharks caught in inshore fisheries in the 2012-13 fishing year. Shading indicates QMS species. See explanatory note above for details on how the data has been compiled.

				Proportion of catch									
Species	Code	Sch. 6 live releases (tonnes)	Total inshore landings 2012-13 (tonnes)	Lost/ Abandoned	Returned under Sch. 6 (SPD only)	Discarded	Eaten	Greenweight	Dressed	Gutted	Headed and gutted	Fins/ Wet fins	Livers
School shark	SCH	1.81	2,922.08	0		0	0	0	0.90	0	0.09	0	0
Spiny dogfish	SPD		1,860.36	0	0.54	0	0	0.12	0.02	0	0	0.31	0
Elephantfish	ELE		1,406.23	0		0	0	0	0.10	0.89	0	0	0
Rig	SPO	9.36	1,293.83	0		0	0	0.02	0.87	0	0.10	0.01	0
Dark ghost shark	GSH		1,106.38	0		0	0	0.03	0.93	0.04	0	0	0
Carpet shark	CAR		302.55	0		0.82	0	0	0	0	0	0.18	0
Seal shark	BSH		100.25	0.01		0.10	0	0	0.63	0	0.06	0	0.20
Northern spiny dogfish	NSD		60.92	0		0.15	0	0.01	0.69	0	0.04	0.11	0
Other sharks and dogfish	OSD		38.68	0		0.95	0	0	0.05	0	0	0	0
Shovelnose dogfish	SND		24.38	0		0.27	0	0.02	0.70	0	0.01	0	0
Pale ghost shark	GSP		18.08	0		0	0	0.06	0.34	0	0.60	0	0
Broadnose sevengill shark	SEV		17.79	0		0.41	0	0	0.54	0	0.04	0	0
Thresher shark	THR		10.52	0		0.13	0	0.02	0.75	0	0.09	0.02	0
Hammerhead shark	HHS		9.64	0		0.02	0	0.03	0.79	0	0.15	0	0
Bronze whaler	BWH		9.63	0		0.01	0	0.07	0.76	0	0.14	0.01	0
Mako shark	MAK	0.21	9.08	0.02		0	0	0.06	0.86	0	0.03	0.03	0
Blue shark	BWS	0.14	7.83	0		0	0	0.11	0.73	0	0.07	0.08	0
Slender smooth-hound	SSH		7.42	0		0.02	0	0.25	0.03	0	0.71	0	0
Porbeagle shark	POS	0.03	3.99	0.04		0	0	0.01	0.84	0	0.01	0.11	0
Longnosed chimaera	LCH		3.53	0		0	0	0.94	0.06	0	0	0	0
Purple chimaera	CHP		0.23	0		0	0	1.00	0	0	0	0	0
Prickly shark	ECO		0.04	0		0	0	0.05	0	0.95	0	0	0
Purple chimaera	CHG		0.03	0		0	0	1.00	0	0	0	0	0
Sharpnose sevengill shark	HEP		0.01	0		0	0	0	1.00	0	0	0	0
Sixgill shark	HEX		0.01	0		0	0	0	0	0	0	1.00	0
Widenose chimaera	RCH		0	0		0	0	1.00	0	0	0	0	0

* Wet fin state applies only to POS, MAK, BWS

45. A high proportion of inshore shark species are processed primarily for their meat. Most catches of inshore species of shark are processed on board fishing vessels to maximise the value from the fishery. A variety of processed states are used and the degree to which processing occurs is sometimes subject to food safety rules. There is a lucrative export market ($25 million) for shark meat that the strategy to eliminate shark finning from inshore sharks should attempt to maintain.

46. Broadly, sharks caught in inshore fisheries can be grouped as follows:

Fully utilised / fins retained as secondary state

47. QMS species which are fully utilised for their meat and where fins are also typically retained include school shark, rig, elephantfish, and dark ghost shark. The proportion of the catches processed and utilised for meat is close to 100% amongst these species.

48. Other QMS species that are caught in lower volumes but are typically processed at sea by inshore vessels include pale ghost shark, blue shark, mako shark, and porbeagle (with combined dressed or headed and gutted landings of 94%, 80%, 89%, 85% and respectively). These species are more associated with deepwater or HMS fisheries, where they are landed in much greater quantities.

49. A number of non-QMS species of shark are also mostly processed at sea by the inshore fleet. Fins are often retained from these species as a secondary product (if at all) along with the primary state (typically dressed). Non-QMS species include seal shark (89% processed landings, with landings in dressed state or as livers most common), northern spiny dogfish (73%), shovelnose dogfish (71%), broadnose sevengilled shark (71%), thresher shark (84%), hammerhead shark (94%), bronze whaler (90%), and slender smooth-hound (74%) (catches of some of these are very low in inshore fisheries i.e. <10t). Relatively high proportions of some of these species are also discarded rather than retained (e.g. up to 41% of broadnose sevengill sharks are discarded).

Species with fins as primary landed state

50. For some inshore species of shark that have low value meat, the sharks are commonly discarded or, if they are retained, landed with fins as the primary state. The most common of these species is carpet shark.

Not retained or landed whole

51. Spiny dogfish landed green have been known to be processed on land for the European export market. Spiny dogfish is processed by band sawing the head and detaching the guts with the head after being landed in a frozen or semi frozen state.

2.2 FACTORS THAT CURRENTLY CONTRIBUTE TO SHARK FINNING IN INSHORE FISHERIES

52. Noting that sharks in inshore fisheries are predominantly processed for their meat, there are some factors that may nonetheless contribute to finning occurring at present, including:

- Market considerations
    - The value of the shark meat may be low (this varies from species to species, as is shown in the different processed states by species).
- Storage and processing

    - The inshore fleet is dominated by small vessels that catch fresh product and place it on ice, so hold space is limited;
    - Shark meat can ammoniate rapidly and fishers may not be set up to process and store it appropriately to avoid contamination of both the shark flesh and of target fishery catches;
- Quota Management System
    - Fishers are required under the Fisheries Act to retain all quota species they catch, with the exception of those listed on the 6th Schedule, which may generally be released if alive and likely to survive. If QMS sharks are dead when caught fishers are required to retain at least part of the shark for catch accounting purposes, in some cases leading to retention of just the fins.
- Offsetting the costs of fishing for other species
    - Catching unwanted sharks (e.g. carpet sharks) may incur a cost on fishers (e.g. lost gear, and reduced target catches) which may create an incentive for fishers to kill any carpet shark before discarding to ensure they are not recaptured. Fins of unwanted sharks are often retained to offset these costs.

53. This document outlines a strategy for addressing the incentives that may currently lead to shark finning, along with a regulatory and monitoring framework to back this up. As well as discussing inshore species, consideration is given to the following groups of species:

    - Non-QMS species caught in inshore fisheries;
    - Deepwater species caught in inshore fisheries; and
    - HMS species caught in inshore fisheries.

3 Implementation of the shark finning ban

3.1 APPLICATION OF REGULATORY FRAMEWORK

3.1.1 Inshore sharks

54. There are currently high levels of utilisation in inshore fisheries. Management will focus on allowing this use to continue and fishers to maximise the benefit of their catches while ensuring that shark finning is not taking place in inshore fisheries.

55. The most important QMS shark species taken in inshore fisheries are school shark, dark ghost shark, elephantfish, and rig or spotted dogfish. These species have relatively high volumes of catches that are fully processed at sea. It is proposed that a fin ratio be provided for all inshore QMS species.

56. If dressed trunks and fins are stored separately on-board the vessel, it is important to ensure traceability i.e. that any fins landed did have corresponding parts of the same species. It is proposed that batching of fins be required to ensure that the number of fins and carcasses can be reconciled, which will be implemented as a requirement under new regulations (i.e. that fins will be stored separately by species, rather than in mixed bins).

57. Conversion factors for primary landed states will also need to be monitored and reviewed for accuracy to ensure ratios are appropriately set.

58. Efforts should still be made to minimise any incidental catches of these species where they are unwanted, and to maximise live releases (and survival of released fish) where possible. School shark and rig are presently included on Schedule 6 of the Act with the stated condition that the animal be likely to survive on its return to the sea and that the return takes place as soon as practicable after the animal is taken. Animals returned to the sea alive are not counted against a fisher's ACE or the TACC for that species. It is not proposed to add any other inshore species to Schedule 6 of the Act at this time[1].

59. Survival rates of sharks released alive under Schedule 6 provisions differ by fishing method and fisheries. It has been demonstrated that survival rates are generally low for sharks released in setnet fisheries. A voluntary code of practice has been developed and applied in some fisheries that addresses this and aims to maximise the survival of released sharks.

3.1.2 Non-QMS species

60. Inshore fisheries catch a wide range of non-QMS species, including some for which relatively high levels of catches and processing at sea occur.

61. As a starting position it is proposed that all non-QMS species be managed through an FNA approach, because of the more limited monitoring of these species. This does not preclude the ability to land any other parts of the shark as a primary processed state. It only requires that where a fisher wants to land the fins, they must be naturally attached to the body of the shark.

[1] Carpet and seal shark are proposed for introduction into the QMS on 1 October 2014. If the Minister agrees that these species are included into the QMS he will also consider a proposal for inclusion both these species on Schedule 6 of the Act.

62. MPI acknowledges industry's preferred approach would be to adopt a ratio approach from the onset for non-QMS species that are highly utilised consistent with the proposed approach for the QMS species. The level of utilisation does vary between the species. Markets do exist for some non-QMS species and potentially could be developed further for some of these species so that a greater proportion of shark is utilised for meat.

63. It should also be noted that the ability to monitor QMS and non-QMS fisheries is broadly equivalent, and the tools would be available to monitor a fin ratio approach for some species if additional resources were to be applied to monitoring. This means that a fin-ratio could be provided for appropriate non-QMS species over time.

3.1.3 Deepwater sharks

64. Deepwater sharks also caught from inshore fisheries include spiny dogfish and pale ghost shark. The deepwater strategy proposes a fin ratio be provided for both spiny dogfish and pale ghost shark.

65. Spiny dogfish is caught in high quantities in inshore fisheries (e.g. around 1,860 tonnes in 2012-13). Around half of this catch is discarded in accordance with Schedule 6 provisions for spiny dogfish (i.e. either dead or alive). At present, 31% of the catch is finned and the remaining 14% is landed in a green or dressed state. Once the ability to land only the fins of the shark is removed, it is considered likely that more of the catch will be discarded. The ability to return spiny dogfish to the sea and the high volume of catch that is landed as fins-only results in no ratio being provided for spiny dogfish, instead requiring any fins to be landed naturally attached to the body.

66. Pale ghost shark are landed in inshore fisheries, all fully utilised (95% either dressed or headed and gutted, the remainder landed whole). The ratio approach proposed in the deepwater strategy supports the continued use of pale ghost shark.

3.1.4 HMS sharks

67. The HMS sharks blue, mako and porbeagle are reportedly landed as bycatch in inshore fisheries from time to time. High levels of processing reportedly occur for these species in inshore fisheries (in comparison to processing levels in surface longline fisheries). The HMS strategy proposes a trial ratio approach for mako and porbeagle to enable existing processing and potentially to encourage additional utilisation. This approach would suit inshore fisheries well, since existing levels of utilisation are already high. The HMS strategy proposes no ratio be provided for blue shark because of the large proportion of fin-only landings and limited fully utilised landings.

68. The HMS strategy, taking into account market limitations, also proposed that Schedule 6 provisions for blue, mako and porbeagle sharks be reviewed. It is proposed that these three species be allowed to be returned to the sea dead, but still reported and counted against a fisher's ACE and the TACC for each species.

3.2 IMPLEMENTATION

3.2.1 Timing

69. Both the FNA approach and the fin ratio approach are associated with some operational and monitoring complexities (the former more on the part of fishers, and the latter more on the part of MPI, in assuring the ratio put in place is appropriate). When the NPOA-Sharks was adopted, it was thought that additional time might be required to develop a shark finning ban that would be practical and would not have unintended consequences. Blue sharks were specifically identified as a fishery in which implementation could be complex, meaning that more time was provided for this species. However, industry has now committed to swiftly implement measures to cease shark finning. It is now proposed instead to put rules in place across the board by 1 October 2014, and then use the remaining two years identified in the NPOA-Sharks to fine-tune the system, including moving sharks from one approach to the other if either significant compliance or operational difficulties are identified.

3.2.2 Education/liaison

70. MPI will continue to work with inshore fishers in the implementation of the NPOA-Sharks, including the finning ban. Priorities for education and work with the inshore industry will focus on implementing new reporting requirements, and ensuring that best practice is always used for the handling and release of live sharks. An information sheet will be produced prior to 1 October 2014 to clarify all changes to the regulatory regime, including new reporting requirements and codes to be used.

3.2.3 Monitoring and research

71. New Zealand's fisheries management system has comprehensive monitoring systems in place that include rigorous reporting requirements for fishers; at-sea observers; inspections at-sea, in port, and of fish receiving businesses; as well as retrospective analyses of data collected.

Work prior to 1 October 2014

72. Preparatory work will include tasking observers to focus on collection of data on shark catches, including life status at the vessel; handling; releases; and processing of retained sharks. In particular, information should be collected on fin and processed catch weights, and efforts should be made to determine an appropriate conversion factor for any landings in an FNA state (this would not be a greenweight landing because limited processing could still occur with fins remaining attached).

Work after 1 October 2014

73. Once the finning ban is in place, existing systems can be used to monitor compliance with the new regulations. However, an additional focus on monitoring of shark catches will be required, as follows:

- Landed states of shark catches, in particular fin: greenweight ratios. This information would be monitored both to assess accuracy of the ratio established, and to determine any instances of non-compliance, meaning both trends across the fishery and from individual fishers would be important (i.e. are ratios consistent between fishers or do they vary, and if so what reasons can be established for the variance).

- Trends in retained and released catches and life status of release (including discrepancy analysis between observed and non-observed vessels, and comparison of release rates and life status before and after the finning ban was established).

74. New monitoring methods are currently being trialled in inshore fisheries, including the use of cameras on board fishing vessels. These new methods could be used to monitor compliance with new regulations, and with amended Schedule 6 provisions.

75. Compliance activities will be consistent with the current approach taken in New Zealand fisheries using the 'VADE' model (Voluntary, Assisted, Directed Enforcement). The initial focus would be on working with fishers to achieve voluntary and assisted compliance, but enforcement action would be taken where continued or gross non-compliance is identified. Enforcement of compliance with the fin:greenweight ratio will be similar to that used for conversion factors in general, where there is expected to be some variation around the specified number. Statistical analyses will be used to identify potential systematic non-compliance.

3.2.4 Penalties

76. The standard penalty regime included in the Fisheries Act 1996 would apply to all regulations associated with the shark finning ban. Under this regime, the penalty for non-compliance with the over-arching regulation or any consequential regulations may include a community sentence or a fine up to $100,000. Gross non-compliance will also potentially be subject to penalties provided for in section 252 of the Act, which provides for fines up to $250,000 and/or imprisonment for a term up to 5 years

Appendix I: Catch tables

Table 2: Landing and processing information for sharks caught in inshore fisheries in the 2011-12 fishing year. Shading indicates QMS species. See explanatory note on page 8 for details on how the data has been compiled.

				Proportion of catch									
Species	Code	Sch. 6 live releases (tonnes)	Total inshore landings 2011-12 (tonnes)	Lost/ Abandoned	Returned under Sch. 6 (SPD only)	Discarded	Greenweight	Dressed	Gutted	Headed and gutted	Fillet	Fins/ Wet fins	Livers
School shark	SCH		2,891.04	0		0	0.01	0.91	0	0.08	0	0	0
Spiny dogfish	SPD		2,182.33	0	0.48	0	0.19	0.02	0	0	0	0.31	0
Dark ghost shark	GSH		1,339.94	0		0	0.02	0.92	0.03	0.03	0	0	0
Elephantfish	ELE		1,338.19	0		0	0	0.10	0.89	0.01	0	0	0
Rig	SPO	2.37	1,167.64	0		0	0.02	0.89	0	0.08	0	0.01	0
Carpet shark	CAR		263.68	0		0.71	0.01	0.01	0	0	0	0.27	0
Seal shark	BSH		100.09	0		0.19	0.01	0.56	0	0.01	0	0	0.24
Northern spiny dogfish	NSD		56.88	0		0.06	0	0.74	0	0.16	0	0.03	0
Other sharks and dogfish	OSD		38.79	0		0.96	0.01	0.03	0	0	0	0	0
Shovelnose dogfish	SND		21.41	0		0.13	0.03	0.71	0	0	0	0	0.14
Thresher shark	THR		18.66	0		0.06	0.16	0.73	0	0.04	0	0.01	0
Purple chimaera	CHG		17.85	0		1.00	0	0	0	0	0	0	0
Broadnose sevengill shark	SEV		17.14	0		0.39	0.01	0.57	0.01	0.02	0	0.01	0
Blue shark	BWS	0.42	11.93	0		0	0.09	0.81	0	0.01	0	0.08	0.01
Hammerhead shark	HHS		11.85	0		0.01	0.02	0.72	0	0.25	0	0	0
Bronze whaler	BWH		9.53	0		0.03	0.09	0.69	0	0.10	0	0.08	0
Mako shark	MAK	0.39	9.13	0		0	0.02	0.70	0	0.02	0	0.26	0
Pale ghost shark	GSP		7.70	0		0	0.04	0.47	0	0.49	0	0	0
Porbeagle shark	POS	0.17	6.46	0		0	0.09	0.88	0	0.01	0	0.02	0
Slender smooth-hound	SSH		2.73	0		0	0	0.05	0	0.95	0	0	0
Longnose chimaera	LCH		1.85	0		0.02	0.45	0.53	0	0	0	0	0
Sherwood's dogfish	SHE		0.25	0		0	1.00	0	0	0	0	0	0
Roughskin dogfish	SCM		0.24	0		0	0	0	0	1.00	0	0	0
Leafscale gulper shark	CSQ		0.15	0		0.91	0.09	0	0	0	0	0	0
Sixgill shark	HEX		0.11	0		0	0	0	0	0	0	1.00	0
Portuguese dogfish	CYL		0.06	0		0	1.00	0	0	0	0	0	0
Chimaera, purple	CHP		0.03	0		0	1.00	0	0	0	0	0	0

Species	Code	Sch. 6 live releases (tonnes)	Total inshore landings 2011-12 (tonnes)	Proportion of catch								
				Lost/ Abandoned	Returned under Sch. 6 (SPD only)	Discarded	Greenweight	Dressed	Gutted	Headed and gutted	Fillet	Fins/ Wet fins	Livers
Prickly shark	ECO		0.02	0		0	0	0	0	1.00	0	0	0
Lucifer's dogfish	ETL		0.02	0		0	1.00	0	0	0	0	0	0
Baxter's lantern dogfish	ETB		0	0		0	1.00	0	0	0	0	0	0

Table 3: Landing and processing information for sharks caught in inshore fisheries in the 2010-11 fishing year. Shading indicates QMS species. **See explanatory note on page 8 for details on how the data has been compiled.**

Species	Code	Sch. 6 live releases (tonnes)	Total inshore landings 2010-11 (tonnes)	Proportion of catch								
				Lost/ Abandoned	Returned under Sch. 6 (SPD only)	Discarded	Greenweight	Dressed	Gutted	Headed and gutted	Fins/ Wet fins	Livers
School shark	SCH		3,177.12	0		0	0.01	0.92	0	0.07	0	0
Spiny dogfish	SPD		2,419.07	0	0.47	0	0.27	0.02	0	0	0.24	0
Dark ghost shark	GSH		1,617.36	0		0	0.02	0.91	0.02	0.04	0	0
Elephantfish	ELE		1,385.19	0		0	0.01	0.08	0.90	0.01	0	0
Rig	SPO		1,152.65	0		0	0.02	0.91	0	0.06	0	0
Carpet shark	CAR		260.60	0		0.77	0.01	0	0	0	0.22	0
Seal shark	BSH		152.40	0		0.14	0.02	0.36	0	0.01	0	0.47
Northern spiny dogfish	NSD		68.11	0.01		0.26	0.01	0.59	0	0.08	0.05	0
Shovelnose dogfish	SND		47.03	0		0.12	0.05	0.24	0	0	0	0.60
Slender smooth-hound	SSH		18.22	0		0	0	0.37	0	0.63	0	0
Thresher shark	THR		16.98	0		0.02	0.23	0.63	0	0.11	0.01	0
Broadnose sevengill shark	SEV		15.69	0		0.22	0.01	0.70	0	0.03	0.03	0
Hammerhead shark	HHS		12.94	0		0	0.01	0.68	0	0.30	0	0
Other sharks and dogfish	OSD		11.70	0		0.69	0.02	0.29	0	0	0	0
Mako shark	MAK	0.55	11.00	0.03		0	0.05	0.54	0.01	0.07	0.31	0
Bronze whaler	BWH		10.50	0		0.02	0.04	0.74	0	0.07	0.12	0
Blue shark	BWS	0.41	8.07	0		0	0	0.82	0	0.03	0.14	0
Pale ghost shark	GSP		6.93	0		0	0.04	0.36	0	0.60	0	0

				Proportion of catch								
Species	Code	Sch. 6 live releases (tonnes)	Total inshore landings 2010-11 (tonnes)	Lost/ Abandoned	Returned under Sch. 6 (SPD only)	Discarded	Greenweight	Dressed	Gutted	Headed and gutted	Fins/ Wet fins	Livers
Porbeagle shark	POS	0.11	6.36	0		0	0.02	0.89	0	0.06	0.03	0
Longnose chimaera	LCH		1.11	0		0	0.86	0.13	0	0	0	0
Sherwood's dogfish	SHE		0.12	0		0	1.00	0	0	0	0	0
Deepwater dogfish	DWD		0.11	0		1.00	0	0	0	0	0	0
Basking shark	BSK		0.09	0		0	0	1.00	0	0	0	0
Sixgill shark	HEX		0.09	0		0.23	0	0	0	0	0.77	0
Pacific sleeper shark	SOP		0.03	0		0	0	1.00	0	0	0	0
Purple chimaera	CHP		0.03	0		0	1.00	0	0	0	0	0
Cat shark	APR		0	0		0	1.00	0	0	0	0	0
Baxter's lantern dogfish	ETB		0	0		1.00	0	0	0	0	0	0
Lucifer's dogfish	ETL		0	0		1.00	0	0	0	0	0	0

Table 4: Landing and processing information for sharks caught in inshore fisheries in the 2009-10 fishing year. Shading indicates QMS species. **See explanatory note on page 8 for details on how the data has been compiled.**

				Proportion of catch									
Species	Code	Sch. 6 live releases (tonnes)	Total inshore landings 2009-10 (tonnes)	Lost/ Abandoned	Returned under Sch. 6 (SPD only)	Discarded	Greenweight	Dressed	Gutted	Headed and gutted	Fillet	Fins/ Wet fins	Livers
School shark	SCH		2,829.93	0		0	0.01	0.93	0	0.06	0	0	0
Spiny dogfish	SPD		2,619.39	0	0.35	0	0.48	0.01	0	0	0	0.15	0
Dark ghost shark	GSH		1,465.59	0		0	0.04	0.89	0.02	0.05	0	0	0
Elephantfish	ELE		1,362.24	0		0	0.01	0.08	0.91	0	0	0	0
Rig	SPO		1,135.03	0		0	0.03	0.90	0	0.07	0	0	0
Carpet shark	CAR		236.29	0		0.85	0	0	0	0	0	0.14	0
Seal shark	BSH		117.37	0		0.09	0	0.45	0	0.01	0	0	0.45
Northern spiny dogfish	NSD		53.46	0		0.34	0.02	0.57	0	0.06	0	0	0
Shovelnose dogfish	SND		37.61	0		0.15	0.02	0.16	0	0	0	0	0.67
Other sharks and dogfish	OSD		24.84	0		0.65	0	0.20	0	0.01	0	0.14	0

				Proportion of catch									
Species	Code	Sch. 6 live releases (tonnes)	Total inshore landings 2009-10 (tonnes)	Lost/ Abandoned	Returned under Sch. 6 (SPD only)	Discarded	Greenweight	Dressed	Gutted	Headed and gutted	Fillet	Fins/ Wet fins	Livers
Broadnose sevengill shark	SEV		15.56	0		0.23	0.01	0.73	0	0.01	0	0.02	0
Blue shark	BWS	0.08	12.69	0		0	0.06	0.33	0.01	0.01	0	0.59	0
Thresher shark	THR		12.56	0		0.02	0.02	0.91	0	0.05	0	0	0
Bronze whalers	BWH		11.64	0.02		0	0.07	0.77	0	0.08	0	0.05	0
Mako shark	MAK	0.25	11.32	0.02		0	0.03	0.43	0	0.02	0	0.49	0
Porbeagle shark	POS	0.31	7.39	0		0	0.02	0.55	0	0	0	0.43	0
Hammerhead shark	HHS		5.77	0		0	0.05	0.81	0	0.13	0	0	0
Pale ghost shark	GSP		2.92	0		0	0.07	0.65	0	0.28	0	0	0
Basking shark	BSK		2.31	0		0	0	0.76	0	0	0	0	0
Baxter's lantern dogfish	ETB		1.89	0		1.00	0	0	0	0	0	0	0
Longnose chimaera	LCH		0.75	0		0	0.91	0.09	0	0	0	0	0
Longnose velvet dogfish	CYP		0.23	0		1.00	0	0	0	0	0	0	0
Plunket's shark	PLS		0.19	0		1.00	0	0	0	0	0	0	0
Purple chimaera	CHP		0.14	0		0	1.00	0	0	0	0	0	0
Deepwater dogfish	DWD		0.07	0		1.00	0	0	0	0	0	0	0
Slender smooth-hound	SSH		0.05	0		0	0	1.00	0	0	0	0	0
Sixgill shark	HEX		0.02	0		0	0	0	0	0	0	1.00	0
Cat shark	APR		0	0		1.00	0	0	0	0	0	0	0
Prickly shark	ECO		0	0		0	1.00	0	0	0	0	0	0

Table 5: Landing and processing information for sharks caught in inshore fin the 2008-09 fishing year. Shading indicates QMS species. **See explanatory note on page 8 for details on how the data has been compiled.**

				Proportion of catch									
Species	Code	Sch. 6 live releases (tonnes)	Total inshore landings 2008-09 (tonnes)	Lost/ Abandoned	Returned under Sch. 6 (SPD only)	Discarded	Greenweight	Dressed	Gutted	Headed and gutted	Fillet	Fins/ Wet fins	Livers

School shark	SCH		3,122.37	0		0	0.01	0.92	0	0.07	0	0	0
Spiny dogfish	SPD		2,552.27	0	0.39	0	0.43	0.01	0	0	0	0.17	0
Dark ghost shark	GSH		1,388.97	0		0	0.04	0.86	0.01	0.08	0	0	0
Elephantfish	ELE		1,367.72	0		0	0.01	0.11	0.88	0.01	0	0	0
Rig	SPO		1,176.32	0		0	0.03	0.90	0	0.07	0	0	0
Carpet shark	CAR		257.43	0		0.83	0.01	0	0	0	0	0.16	0
Seal shark	BSH		115.23	0		0.09	0.01	0.57	0	0.05	0	0	0.28
Northern spiny dogfish	NSD		64.29	0		0.33	0.01	0.62	0	0.03	0	0	0
Other sharks and dogfish	OSD		44.14	0		0.64	0.01	0.14	0	0	0	0.21	0
Shovelnose dogfish	SND		36.53	0		0.18	0.03	0.77	0	0.01	0	0.01	0
Thresher shark	THR		23.57	0		0.01	0.02	0.94	0	0.03	0	0	0
Broadnose sevengill shark	SEV		17.58	0		0.32	0	0.58	0	0.01	0	0.09	0
Hammerhead shark	HHS		13.10	0		0.04	0.20	0.64	0.01	0.12	0	0	0
Blue shark	BWS	0.36	11.05	0		0	0.14	0.53	0.01	0.01	0	0.31	0
Bronze whaler	BWH		10.57	0		0.03	0.05	0.80	0.01	0.08	0	0.03	0
Mako shark	MAK	0.12	9.49	0		0.01	0.02	0.74	0.01	0.04	0	0.17	0
Pale ghost shark	GSP		4.15	0.09		0	0.08	0.79	0	0.04	0	0	0
Porbeagle shark	POS	0.14	4.06	0		0.01	0	0.50	0	0.07	0	0.42	0
Longnose chimaera	LCH		1.89	0		0.02	0.97	0.02	0	0	0	0	0
Basking shark	BSK		1.44	0		0.94	0.02	0	0	0.04	0	0	0
Cat shark	CSH		0.94	0		0	0	1.00	0	0	0	0	0
Slender smooth-hound	SSH		0.29	0		0	0	1.00	0	0	0	0	0
Widenose chimaera	RCH		0.21	0		0	1.00	0	0	0	0	0	0
Purple chimaera	CHP		0.13	0		0	1.00	0	0	0	0	0	0
Sixgill sharp	HEX		0.06	0		0	0	0	0	0	0	1.00	0
Purple chimaera	CHG		0.06	0		0	0	1.00	0	0	0	0	0
Smooth skin dogfish	CYO		0.03	0		0	0.59	0.41	0	0	0	0	0
Prickly dogfish	PDG		0.02	0		0	0	1.00	0	0	0	0	0
Lucifer's dogfish	ETL		0.02	0		1.00	0	0	0	0	0	0	0
Deepwater dogfish	DWD		0.01	0		0	0	1.00	0	0	0	0	0
Blackbelly lantern shark	EMO		0	0		0	1.00	0	0	0	0	0	0