Ministry for Primary Industries
Manatū Ahu Matua

Strategy to eliminate shark finning in New Zealand

Highly Migratory Species fisheries

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1 Introduction

1. This document represents the strategy to eliminate shark finning in New Zealand's fisheries for highly migratory species (HMS). The strategy characterises New Zealand's HMS 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 HMS fisheries, and the chosen approach for overcoming these challenges (i.e. the monitoring, education, liaison and research associated with eliminating shark finning in New Zealand HMS fisheries).

2. The context for this strategy is the National Plan of Action for the Conservation and Management of Sharks 2013 (NPOA-Sharks), which 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). The ban will be implemented 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 limits 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 has 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 sharks to be landed with FNA; if they wished to retain the fins, the processing would have to take place after landing. If the fins are not retained, the shark can be landed in any processed state desired. If over time new markets developed for species required to be landed FNA, this would likely be seen in landing data with an increase of landings in other primary states, enabling assessment of whether providing 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 in fisheries 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 requiring the fish to be landed whole and processed 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 and trunks of another.

13. The Ministry for Primary Industries (MPI) currently uses comprehensive discrepancy analysis to monitor catches and landings 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 that will be considered when determining the ratio for a species is whether this 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 clearly 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 the ratio approach is 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 and potential to improve species identification and catch reporting.

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 this would not be possible if an FNA rule were applied. It has been noted that a possible impact of applying an FNA rule on shark species for which the value of the meat 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 2001

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 30-40 '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 will be made for any 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, but must be fully reported. 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. 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 accurately determine actual levels of shark mortality. To reduce this risk, it is proposed that the provisions of Schedule 6 are reviewed and amended for some species (blue, mako and porbeagle) 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 to counter disincentives like the costs of lost hooks and/or snoods. Setting the provisions of Schedule 6 so that live releases will not count against ACE (while dead returns to the sea would) is considered to address this.

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 use of Schedule 6 release codes. Use of these codes would 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.

Fisheries Reporting Regulations 2001

34. To enable monitoring of landings of fins versus primary processed states, 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 reporting regulations.

Conversion factors

35. To implement the finning ban, the primary landed states of Fins (FIN), Wet fins (FIW), and Dried fins (FID) and the associated conversion factors will be removed from the Fisheries (Reporting) Regulations 2000 (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 will still occur).

2 HMS fisheries

36. New Zealand HMS fisheries target large tuna (principally bigeye and southern bluefin tuna) and swordfish by longline; skipjack by purse seine; and albacore by trolling. The tuna longline fishery has the most significant bycatch of highly migratory sharks (blue shark, mako shark, and porbeagle shark). This fishery also has a high proportion of landings with fins as the primary landed state (e.g. 87% for blue shark, 52% for mako and 39% for porbeagle caught in surface longline fisheries in the 2012-13 fishing year; refer Table 2 for details). A significant proportion of highly migratory sharks taken in tuna longline fisheries arrive at the vessel alive, particularly blue sharks (around 90%; figures for mako and porbeagle are around 75% and 60% respectively).[1]

37. Sharks and spine-tailed devil rays are an occasional bycatch of purse seine fisheries for skipjack and a rare bycatch of albacore trolling. No particular issues have been identified in these fisheries that would require a different approach to that outlined for HMS sharks generally.

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

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

2.1 SHARKS IN HMS FISHERIES

40. HMS species, including sharks, are listed in Schedule 4B of the Fisheries Act 1996. These species are listed in Table 1, along with a summary of their existing management and catch volumes (where available – noting some of these species are seldom encountered).

[1] Source: S.C. Clarke, M.P. Francis, L.H. Griggs (2013) Review of shark meat markets, discard mortality and pelagic shark data availability, and a proposal for a shark indicator analysis. New Zealand Fisheries Assessment Report 2013/65.

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

HMS Sharks	Family	Domestic management	Total catches (tonnes) (2012-13)	Catches in HMS fisheries (tonnes) (2012-13)
Blue shark (*Prionace glauca*)	Carcharhinidae	QMS-TAC of 2,080t set under section 14 of the Fisheries Act	716	698.5
Porbeagle shark (*Lamna nasus*)	Lamnidae	QMS-TAC of 129t set under s14 of the Act	83.3	38.1
Shortfin mako (*Isurus oxyrinchus*)	Lamnidae	QMS-TAC of 276t set under s14 of the Act	80.6	60.1
Bronze whaler (*Carcharhinus brachyurus*)	Carcharhinidae	Open Access	10.3	0.9
Smooth hammerhead (*Sphyrna zygaena*)	Sphyrnidae	Schedule 4C – subject to fishing permit moratorium	9.7	.08
Bigeye thresher (*Alopias superciliosus*)	Alopiidae	Open Access	0	0
Tiger shark (*Galeocerdo cuvier*)	Carcharhinidae	Open Access	0	0
Galapagos shark* (*Carcharhinus galapagensis*)	Carcharhinidae	Open Access	0	0
Longfin mako* (*Isurus paucus*)	Lamnidae	Open Access	0	0
Oceanic white tip* (*Carcharhinus longimanus*)	Carcharhinidae	Protected/non-retention	0	0
Silky shark* (*Carcharhinus falciformis*)	Carcharhinidae	In process for protection/non-retention	0	0

* No fisher-reported catches of this species (i.e. species code not available for fisher reporting); some limited observer catch records may exist

41. As shown in table 1, some highly migratory sharks such as blue shark and mako shark are most commonly caught in HMS fisheries; others are also commonly caught in other fisheries such as, in the case of porbeagle sharks, deepwater and middle-depth trawl fisheries. Other highly migratory sharks including bronze whaler and smooth hammerhead are seldom caught in surface longline fisheries, but may be caught in a range of other inshore fisheries.

42. Non-HMS sharks are also caught in surface longline fisheries. Shark species most often captured in HMS fisheries include blue shark, school shark, rig, mako shark, porbeagle shark, spiny dogfish and northern spiny dogfish. Table 2 shows how these species are typically processed, as well as whether or not they are retained (in the case of non-QMS species).

43. Table 2 shows a breakdown of processing information for sharks caught in surface longline fisheries in 2012-13 (see appendix 1 for the same information for the preceding four years). 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 surface longline fisheries (SLL) 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 SLL landings 2012-13 (tonnes)	Observer-authorised discards/lost/ abandoned	Released under Sch. 6 (SPD only)	Discarded	Greenweight	Dressed	Gutted	Headed and gutted	Fillet	Fins/ wet fins	Livers
Blue shark	BWS	21.79	698.92	0.04		0	0	0.08	0	0	0	0.87	0
School shark	SCH		72.13	0		0	0.01	0.99	0	0	0	0	0
Mako shark	MAK	1.46	59.57	0		0	0.01	0.40	0	0	0.07	0.52	0
Porbeagle shark	POS	3.1	37.90	0.03		0	0	0.57	0	0	0	0.39	0
Elephantfish	ELE		17.70	0		0	0	0	1.00	0	0	0	0
Shovelnose dogfish	SND		17.54	0		0.03	0	0	0	0	0	0.01	0.96
Seal shark	BSH		15.79	0		0.01	0	0.07	0	0	0	0	0.92
Northern spiny dogfish	NSD		11.38	0		0.26	0	0.03	0	0	0	0.72	0
Thresher shark	THR		9.31	0		0.19	0	0.62	0	0	0.19	0	0
Spiny dogfish	SPD		7.02	0	0.69	0	0	0.03	0	0	0	0.28	0
Rig	SPO	0.33	3.47	0		0	0.01	0.94	0	0.04	0	0	0
Carpet shark	CAR		2.30	0		1.00	0	0	0	0	0	0	0
Smooth skin dogfish	CYO		1.56	0		1.00	0	0	0	0	0	0	0
Other sharks and dogfish	OSD		1.02	0		0.97	0	0.03	0	0	0	0	0
Bronze whaler shark	BWH		0.82	0		0.43	0	0.04	0	0	0	0.53	0
Dark ghost shark	GSH		0.19	0		0	0.17	0.83	0	0	0	0	0
Big-eye thresher shark	BET		0.08	0		1.00	0	0	0	0	0	0	0
Pale ghost shark	GSP		0.05	0		0	0	1.00	0	0	0	0	0
Broadnose sevengill shark	SEV		0.04	0		0	0	1.00	0	0	0	0	0
Cat shark	CSH		0.01	0		1.00	0	0	0	0	0	0	0

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

44. Broadly, sharks caught in HMS fisheries can be grouped as follows:

2.1.1 Fins as secondary state (or fins not retained)

45. QMS species where the sharks are generally processed at sea (and fins are landed as a secondary state if they are retained) include school shark, rig, elephantfish, and dark and pale ghost shark (all in relatively small quantities). Significant quantities of mako and porbeagle are also processed at sea and landed in a dressed state (40 and 57% respectively in 2012-13).

46. Non-QMS species that are processed at sea include thresher shark and broadnose sevengill shark. Fins may be retained from these species as a secondary product along with the primary state (typically dressed). Shovelnose dogfish and seal shark are two species for which the liver is the most common primary landed state.

2.1.2 Species with fins as primary landed state

47. QMS sharks in which fins are currently a common or predominant primary landed state include blue shark, mako, porbeagle, and spiny dogfish.

48. A range of non-QMS species are also caught in surface longline fisheries, often in small quantities (i.e. typically less than 20 tonnes). Some of these species are commonly or predominantly landed as fin-only landings at present (if retained), including northern spiny dogfish, carpet shark, and bronze whaler.

2.1.3 Survival of HMS sharks

49. Sharks caught in HMS fisheries form an unintended bycatch of fishing for target highly migratory species including tuna and swordfish. Sharks that are caught on surface longlines are often still alive when they are brought to the boat, although the proportions that are alive may vary not just by species, but also by size and sex of the individual. The gear that is used and the way in which it is set (e.g. how long hooks remain in the water) will also influence survivorship.

50. A shark's survival also depends on handling it receives at the vessel, including obviously whether it is retained by the vessel (at present for its meat and/or its fins), or how it is treated before release if it is not retained. A recent review of handling techniques internationally showed a range from relatively benign (cutting the leader) to relatively harsh methods (e.g. cutting the hook from the shark's mouth or pulling the hook out by force).

51. Analysis of the fate of sharks in surface longline fisheries based on observer data records between 1992 and 2012 shows haulback mortality by species, ranging from 10% for blue shark to 38% for porbeagle shark) (see figure 1 below) (i.e. around 90% of blue sharks are still alive when they get to the vessel). Blue, porbeagle and school shark had different probabilities of mortality due to haulback and handling but nearly the same overall mortality rate (about 80%). The overall mortality rate for mako sharks is slightly lower (about 70%).

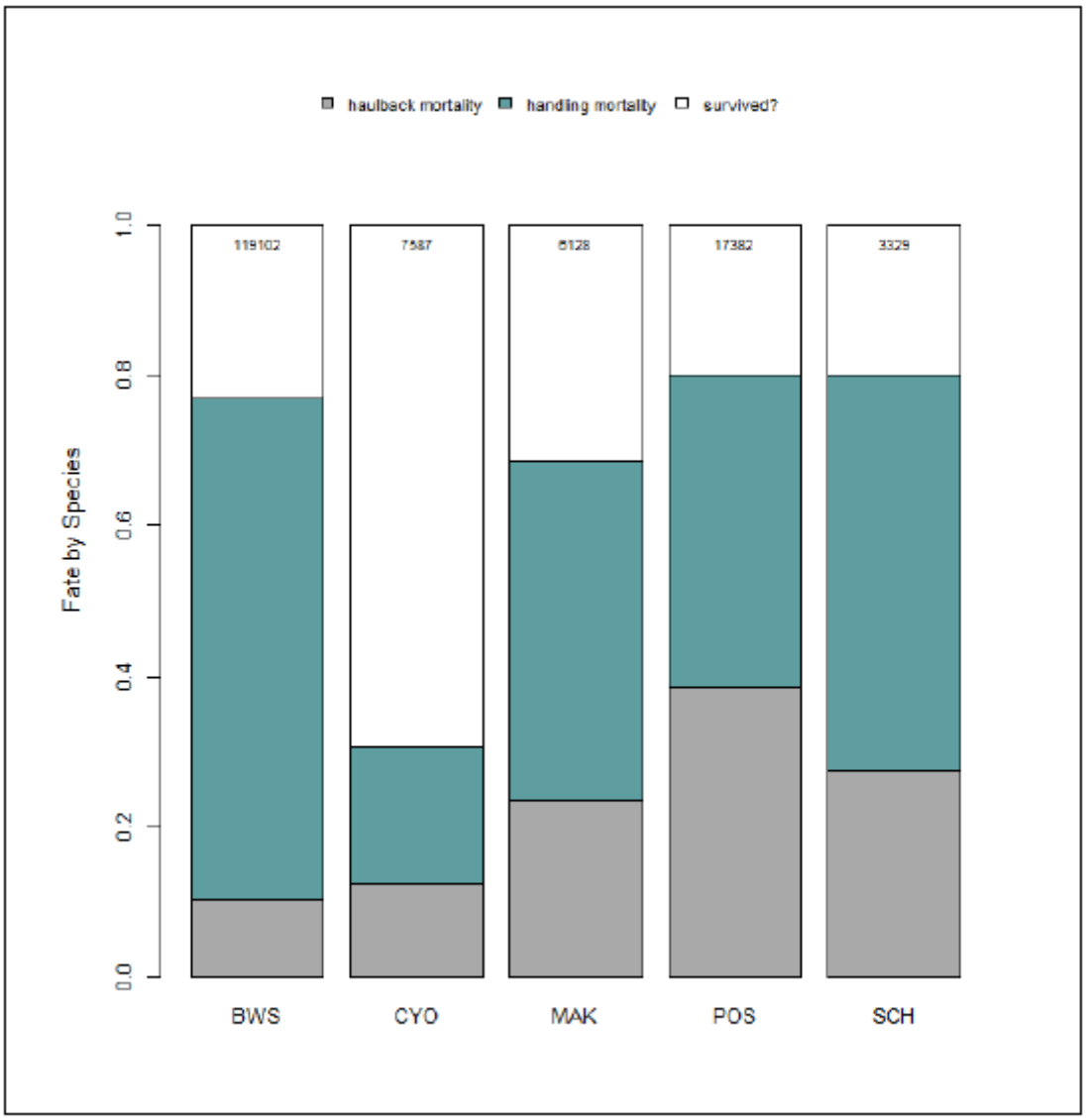

Figure 1: Proportion of observed sharks of each species dying during haulback or handling, or potentially surviving, in the SLL fishery, 1992–2012. The sample size in number of sharks is shown at the top of each column. BWS= blue shark; CYO= Owston's dogfish (also known as smooth skin dogfish); MAK = mako shark; POS= porbeagle shark; SCH= school shark.
Source: S.C. Clarke, M.P. Francis, L.H. Griggs (2013) Review of shark meat markets, discard mortality and pelagic shark data availability, and a proposal for a shark indicator analysis. New Zealand Fisheries Assessment Report 2013/65.

2.2 FACTORS CONTRIBUTING TO FINNING IN HMS FISHERIES

52. A number of factors can contribute to the situation of just the fins being retained 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, but some species such as blue shark are consistently reported to have low value both in New Zealand and internationally).
    - Storage and processing

    - The surface longline fleet is dominated by small vessels that catch fresh product and place it on ice, so hold space is limited;
    - Shark flesh can ammoniate rapidly and fishers may not be set up to process and store it appropriately to avoid contamination of both the shark meat and of target fishery catches (e.g. valuable tuna catches);
- Costs associated with catching sharks
    - Catching sharks incurs a cost on fishers (lost gear and time, reduced target catches – every hook that catches a shark is not catching a target species i.e. tuna or swordfish), and retaining shark fins can be seen as a means of recouping some of these losses;
- 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. Many HMS sharks are alive when brought to the vessel but some are dead when caught; in this case, fishers are required to retain at least part of the shark for catch accounting purposes. For the reasons outlined above, it may not be desirable to retain the meat of the shark so just the fins may be retained.

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. The focus is on the three primary HMS sharks (blue, porbeagle, and mako), for which finning currently occurs. Of these, markets do occur for the meat of mako and porbeagle, while this is not considered to be the case for blue sharks. For this reason, the approach will be different for these species.

54. Consideration is also given to the following groups of species:
    - Non-QMS species caught in HMS fisheries;
    - Deepwater species caught in HMS fisheries; and
    - Inshore species caught in HMS fisheries.

3 Implementation of the shark finning ban

3.1 APPLICATION OF REGULATORY FRAMEWORK

3.1.1 Highly migratory sharks

55. In keeping with the utilisation and waste reduction goal of the NPOA-Sharks, management of HMS sharks needs to address existing incentives and challenges by focussing on:

    1. **Prevention** i.e. measures to avoid catching sharks;
    2. **Mitigation** i.e. measures to encourage additional live releases and to maximise survival of released sharks;
    3. **Solutions** for what to do with any dead sharks/sharks fishers wish to retain (notwithstanding the prevention and mitigation initiatives). Key under this management stream is to allow for at-sea processing where appropriate for particular species, and to ensure options are available in situations where there is no market for the dead shark.

56. Different elements will be of greater relevance for particular species, as discussed in more detail below.

Blue sharks

57. Blue sharks have historically had high proportions of fin-only landings (86% in 2012-13), with little other utilisation (9-16% of landings over the past 3 years landed in other processed states such as dressed). Industry has indicated limited markets are available for blue shark meat, and this is reflected in the limited at-sea processing at present.

58. Recent research identified the key barriers to finding markets for the meat of blue sharks, including that:

    - Small, inshore vessels use refrigerated seawater to preserve catch and this system cannot produce a high quality shark meat product because it does not adequately prevent the degradation of urea in shark tissue to ammonia. It was reported that prospective buyers of shark meat refused the product after seeing the quality of the shark meat produced.
    - Shark meat requires bleeding in order avoid high concentrations of ammonia and this could be made difficult by regulations which require fins to remain attached. The storage of sharks alongside other catch in confined spaces on small vessels could lead to ammonia contamination of the other catch.[2]

59. Because of the limited at-sea processing of blue sharks, and limited scope seen to increase dressed landings in the future, it is not proposed to make a ratio option available for blue sharks at this time. The use of a ratio would potentially provide some opportunities for high-grading (i.e. landing additional fins compared to the quantity of sharks retained), although both opportunities and incentives to do so are considered fairly

[2] Source: S.C. Clarke, M.P. Francis, L.H. Griggs (2013) Review of shark meat markets, discard mortality and pelagic shark data availability, and a proposal for a shark indicator analysis. New Zealand Fisheries Assessment Report 2013/65.

low. 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.

60. Having to land sharks with FNA would impose a greater cost on fishers, in terms of reductions in quality of the product because it is difficult to fully bleed the shark without removing the fins (particularly the tail), and because of the additional hold space required to accommodate whole sharks. The configuration of the small tuna vessels involved in this fishery would likely make retention of any blue sharks unfeasible if they had to be landed whole. Therefore, a likely impact of requiring blue shark to be landed FNA is that fishers would prefer not to land the catch at all.

61. This option may encourage additional live releases of sharks where they are caught alive, and measures are proposed to encourage this, including through industry initiatives to support live releases. In cases where the sharks are already dead (i.e. most of trawl fishery catches and around 10% of surface longline catches), fishers will likely require additional options for dealing with unwanted shark catches.

62. It is proposed that strictly limited provision be made for blue sharks that are already dead upon capture to be released back into the sea dead (i.e. changes to existing 6th Schedule provisions). Incentives may also be required for fishers to release sharks alive (such as only requiring ACE to cover dead releases or retained fish). An industry code of practice should be developed covering best practice release methods, as well as industry commitments on use of the Schedule 6 provisions.

63. Small quantities of blue sharks are also caught in deepwater fisheries, where they are typically dead upon capture. Environmental certification requirements in these fisheries mean fishers should not currently retain the fins, although some fin-only landings are still reported. One reason that is given is that fishers are retaining the fins to satisfy QMS reporting requirements (i.e. fishers are not allowed to discard whole, dead fish). Changes to Schedule 6 to allow dead releases would allow blue sharks caught in deepwater fisheries to be discarded, but would still ensure collection of data on overall mortality levels.

Mako and porbeagle sharks

64. While fin-only landings of mako and porbeagle sharks are currently common, between 40 and 57% of mako and porbeagle landings respectively in surface longline fisheries are landed in the dressed state. The focus for these species is proposed to be on a trail approach of allowing this utilisation to continue (through use of the fin ratio approach), and improving utilisation for the remainder of catches. Industry have indicated they believe it should be feasible to improve utilisation rates for these species, although noting that the market is focussed on fresh product and has some limitations. In particular, large sharks of many species including mako and porbeagle are not accepted because of concerns about mercury levels in the meat (fishers also note the quality of the meat is lower for larger sharks).

65. Haulback mortality tends to be higher for mako and, in particular, for porbeagle in comparison to blue sharks. Efforts should still be made to avoid captures where possible if fishers do not wish to retain and process the catch, and to maximise live releases (and survival of released fish).

66. Mako and porbeagle sharks are also caught in deepwater fisheries, and are commonly dead on capture. As for blue sharks, environmental certification requirements in these fisheries mean fishers should not currently retain the fins. Changes to Schedule 6 to allow dead releases would allow mako and porbeagle sharks caught in deepwater fisheries to be discarded, but would still ensure collection of data on overall mortality levels.

3.1.2 Non-QMS species

67. Non-QMS species are caught in small quantities in HMS fisheries, as well as in inshore and/or deepwater fisheries (depending on the species). Non-QMS species caught in surface longline fisheries include carpet shark, shovelnose dogfish, seal shark, northern spiny dogfish, thresher shark, bronze whaler, broadnose sevengill shark, and hammerhead shark (table 2 and appendix 1). Existing utilisation varies by species, with some being landed primarily as fins, while others are processed at sea. Catches of non-QMS species are also frequently discarded.

68. Some of the non-QMS species commonly finned in HMS fisheries are processed at sea in other fisheries, indicating practices may vary depending on established norms in the fishery sector, and that at least some markets are available for the meat of some of these species.

69. As a starting position it is proposed that non-QMS species be managed through an FNA approach, because of the more limited landings and 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.

3.1.3 Deepwater sharks

70. Deepwater sharks also caught from time to time in HMS fisheries include spiny dogfish and pale ghost shark. The deepwater strategy proposes a ratio approach for pale ghost shark, and FNA for spiny dogfish. Spiny dogfish is caught in low quantities in surface longline fisheries (e.g. around 7 tonnes in 2012-13). Much of the catch is discarded in accordance with Schedule 6 provisions for spiny dogfish (i.e. either dead or alive). At present, 28% of the spiny dogfish catch in HMS fisheries is landed with only the fins and the remaining 3% is landed in a dressed state. Once the ability to make fin-only landings is removed, it is considered likely that more of the catch will be discarded.

71. Less than a tonne of pale ghost shark was landed in surface longline fisheries in 2012-13, and the catch was landed in a dressed state.

3.1.4 Inshore sharks

72. Some of the main inshore QMS shark species including school shark, rig, and to a lesser degree elephantfish are also caught in surface longline fisheries. These species are generally processed at sea and landed in a dressed state (i.e. trunks with the fins removed but likely retained separately). The inshore strategy proposes that these species be managed with a fin ratio approach. The main change for surface longline fishers will be the requirement to batch fins from these species so they can be more clearly identified by species. No specific management issues have been identified that relate to captures of these species in surface longline fisheries.

3.2 IMPLEMENTATION

3.2.1 Timing

73. 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

74. MPI will continue to work with surface longline fishers in the implementation of the NPOA-Sharks, including the finning ban. Priorities for education and work with the HMS industry will focus on minimising catches of unwanted sharks, and ensuring that best practice is always used for the handling and release of live sharks. Best practice measures should be identified and documented in a code of practice. 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

75. 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

76. 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

77. 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).

78. 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

79. 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 1: Catch tables

Table 2: Landing and processing information for sharks caught in surface longline fisheries (SLL) 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 SLL landings 2011-12 (tonnes)**	**Observer-authorised discards/lost/ abandoned**	**Returned under Sch. 6 (SPD only)**	**Discarded**	**Greenweight**	**Dressed**	**Gutted**	**Headed and gutted**	**Fillet**	**Fins/ wet fins**	**Livers**
Blue shark	BWS	22.67	981.60	0		0	0.01	0.16	0	0	0	0.84	0
School shark	SCH		188.15	0		0	0.02	0.98	0	0.01	0	0	0
Rig	SPO		108.34	0		0	0	0.96	0	0.04	0	0	0
Mako shark	MAK	0.23	77.60	0		0	0	0.31	0	0	0.03	0.66	0
Spiny dogfish	SPD		33.64	0	0.03	0	0	0	0	0	0	0.97	0
Northern spiny dogfish	NSD		31.81	0		0.14	0	0.03	0	0	0	0.83	0
Porbeagle shark	POS	0.7	29.06	0		0	0	0.56	0	0	0	0.44	0
Shovelnose dogfish	SND		24.84	0		0.15	0	0.01	0	0.02	0	0	0.83
Carpet shark	CAR		24.31	0		0.07	0	0	0	0	0	0.93	0
Seal shark	BSH		23.57	0		0.03	0	0	0	0	0	0	0.97
Elephantfish	ELE		15.87	0		0	0.07	0.04	0.88	0.02	0	0	0
Thresher shark	THR		5.82	0		0	0	0.74	0	0	0.04	0.22	0
Bronze whaler	BWH		4.13	0		0	0	0.14	0	0	0	0.86	0
Smooth skin dogfish	CYO		2.06	0		1.00	0	0	0	0	0	0	0
Other sharks and dogfish	OSD		1.59	0		0.98	0	0.02	0	0	0	0	0
Broadnose sevengill shark	SEV		0.90	0		0	0	0.84	0	0	0	0.16	0
Dark ghost shark	GSH		0.79	0		0	0.01	0.99	0	0	0	0	0
Tiger shark	TIS		0.29	0		0	0	0	0	0	0	1.00	0
Hammerhead shark	HHS		0.09	0		0	0.11	0	0	0	0	0.89	0

Table 3: Landing and processing information for sharks caught in surface longline fisheries (SLL) 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.**

						Proportion of catch						
	Code	Sch. 6 live releases (tonnes)	Total SLL landings 2010-11 (tonnes)	Observer-authorised discards/lost/abandoned	Released under Sch. 6 (SPD only)	Discarded	Greenweight	Dressed	Gutted	Headed and gutted	Fillet	Fins/ wet fins
Blue shark	BWS	1.92	746.30	0.02		0	0.01	0.10	0	0	0	0.88
School shark	SCH		197.14	0		0	0.01	0.99	0	0	0	0
Rig	SPO		107.35	0		0	0	0.99	0	0.01	0	0
Mako shark	MAK		68.97	0		0	0	0.31	0	0.01	0.02	0.66
Porbeagle shark	POS	0.52	35.90	0		0	0	0.11	0	0	0	0.88
Spiny dogfish	SPD		26.95	0.05	0.02	0	0	0	0	0	0	0.93
Northern spiny dogfish	NSD		24.42	0		0.52	0	0.01	0	0	0	0.47
Carpet shark	CAR		16.91	0		0	0	0	0	0	0	1.00
Elephantfish	ELE		12.35	0		0	0	0.03	0.97	0	0	0
Seal shark	BSH		12.23	0		1.00	0	0	0	0	0	0
Shovelnose dogfish	SND		7.19	0		1.00	0	0	0	0	0	0
Other sharks and dogfish	OSD		4.65	0		0.71	0.09	0.20	0	0	0	0
Thresher shark	THR		4.52	0		0	0	0.72	0	0	0.27	0
Smooth skin dogfish	CYO		1.13	0		1.00	0	0	0	0	0	0
Bronze whaler	BWH		0.95	0		0	0	0.15	0	0	0	0.85
Broadnose sevengill shark	SEV		0.52	0		0	0	1.00	0	0	0	0
Dark ghost shark	GSH		0.32	0		0	0.07	0.93	0	0	0	0
Hammerhead shark	HHS		0.24	0		0	0.02	0.98	0	0	0	0
Tiger shark	TIS		0.20	0		0	0	1.00	0	0	0	0
Slender smooth-hound	SSH		0.02	0		0	0	0.72	0	0.28	0	0

Table 4: Landing and processing information for sharks caught in surface longline fisheries (SLL) 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						
	Code	Sch. 6 live releases (tonnes)	Total SLL landings 2009-10 (tonnes)	Observer-authorised discards/lost/ abandoned	Released under Sch. 6 (SPD only)	Discarded	Greenweight	Dressed	Gutted	Headed and gutted	Fillet	Fins/ wet fins
Blue shark	BWS	10.55	667.61	0.01		0	0	0.10	0	0	0	0.89
School shark	SCH		326.41	0		0	0	1.00	0	0	0	0
Rig	SPO		136.52	0		0	0	0.99	0	0.01	0	0
Mako shark	MAK	0.62	49.67	0		0	0	0.29	0	0	0.02	0.69
Spiny dogfish	SPD		47.41	0	0.02	0	0.01	0	0	0	0	0.96
Porbeagle shark	POS	0.19	36.38	0.01		0	0	0.20	0	0	0	0.78
Carpet shark	CAR		25.16	0		0.13	0	0	0	0	0	0.87
Northern spiny dogfish	NSD		17.36	0		0.75	0	0.05	0	0	0	0.20
Elephantfish	ELE		13.55	0		0	0	0.01	0.99	0	0	0
Thresher shark	THR		6.77	0		0.19	0	0.43	0	0	0.28	0.11
Seal shark	BSH		6.43	0		0.80	0	0.20	0	0	0	0
Shovelnose dogfish	SND		3.67	0		0.99	0	0.01	0	0	0	0
Bronze whaler	BWH		1.84	0		0	0.04	0.27	0	0	0	0.68
Dark ghost shark	GSH		1.37	0		0	0.20	0.76	0	0.04	0	0
Smooth skin dogfish	CYO		1.07	0		1.00	0	0	0	0	0	0
Other sharks and dogfish	OSD		0.73	0		0.92	0	0.08	0	0	0	0
Broadnose sevengill shark	SEV		0.48	0		0	0	0.95	0	0	0	0
Longnose velvet dogfish	CYP		0.06	0		1.00	0	0	0	0	0	0

Table 5: Landing and processing information for sharks caught in surface longline fisheries (SLL) in 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								
	Code	Schedule 6 live releases (tonnes)	Total SLL landings 2008-09 (tonnes)	Observer-authorised discards/lost/abandoned	Released under Sch. 6 (SPD only)	Discarded	Greenweight	Dressed	Gutted	Headed and gutted	Fillet	Fins/ wet fins
Blue shark	BWS	16.7	765.53	0.02		0	0	0.04	0	0	0	0.93
School shark	SCH		224.72	0		0	0	1.00	0	0	0	0
Mako shark	MAK	0.04	60.29	0.04		0	0.01	0.26	0	0.01	0.08	0.61
Porbeagle shark	POS	0.16	30.20	0.01		0	0	0.09	0	0	0	0.90
Rig	SPO		23.89	0		0	0	0.99	0	0.01	0	0
Elephantfish	ELE		16.65	0		0	0	0	1.00	0	0	0
Spiny dogfish	SPD		15.18	0	0.97	0	0.01	0.02	0	0	0	0
Northern spiny dogfish	NSD		15.01	0		0.77	0	0.13	0	0.10	0	0
Thresher shark	THR		4.05	0.05		0.13	0	0.32	0	0	0.39	0.11
Other sharks and dogfish	OSD		3.89	0		0.17	0	0.83	0	0	0	0
Bronze whaler	BWH		2.71	0		0	0	0.63	0	0	0	0.37
Dark ghost shark	GSH		2.29	0		0	0	0.69	0.12	0.19	0	0
Smooth skin dogfish	CYO		1.59	0		1.00	0	0	0	0	0	0
Shovelnose dogfish	SND		1.45	0		0.77	0	0.23	0	0	0	0
Big-eye thresher shark	BET		0.28	0		0	0	0	0	0	1.00	0
Seal shark	BSH		0.20	0		0.59	0	0.41	0	0	0	0
Carpet shark	CAR		0.03	0		1.00	0	0	0	0	0	0
Broadnose sevengill shark	SEV		0.02	0		0	0	1.00	0	0	0	0
Pale ghost shark	GSP		0.01	0		0	0	1.00	0	0	0	0
Lucifer's dogfish	ETL		0.01	0		1.00	0	0	0	0	0	0
Sixgill shark	HEX		0.01	0		1.00	0	0	0	0	0	0