



Australian Government

Department of the Environment and Heritage

Assessment of the
Western Australian Tropical Shark Fisheries

February 2006

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Disclaimer

This document is an assessment carried out by the Department of the Environment and Heritage of a commercial fishery against the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries*. It forms part of the advice provided to the Minister for the Environment and Heritage on the fishery in relation to decisions under Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999*. The views expressed do not necessarily reflect those of the Minister for the Environment and Heritage or the Australian Government.

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Assessment of the ecological sustainability of management arrangements for the Western Australian Tropical Shark Fisheries

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EXECUTIVE SUMMARY

Background

The Department of Fisheries Western Australia (DFWA) has submitted a document for assessment under Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The draft document *Application to the Australian Government Department of the Environment and Heritage on the Western Australian Tropical Shark Fisheries (covering the Western Australia North Coast Shark Fishery and the Joint Authority Northern Shark Fishery)* (the submission) was received by the Department of the Environment and Heritage (DEH) on 30 November 2005. The submission was released for a forty-day public comment period that expired on 16 January 2006. Five public comments were received. DFWA provided a response to the issues raised. No changes were made to the submission as a result of public comment. A final submission for assessment was received in February 2006.

The submission reports on the Joint Authority Northern Shark Fishery (JANSF) and the North Coast Shark Fishery (NCSF), (together known as the Western Australian Tropical Shark Fisheries (WATrSF)) against the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries* (the Guidelines). The DEH assessment considers the submission, associated documents, public comments and DFWA's response to the comments.

Table 1: Summary of the WATrSF

Area	<u>JANSF</u> : 123°45'E to the WA/NT border (dropline) and 114°06'E to 123°45'E (longline). <u>NCSF</u> : 114°06'E to 129°E (WA/NT) border.
Fishery status	Overfished: Sandbar sharks (<i>Carcharhinus plumbeus</i>) key indicator sp. In 2002 defined as underexploited. 2005 stock assessment "urgent need for reduction in fishing mortality to arrest decline" and "more susceptible to fishing than dusky shark". Stock assessment for sandbar shark links both temperate and tropical stocks and concludes that significant reductions need to occur in both fisheries or more intense in one to allow the other to operate at sustainable (but lower than current) rates of fishing. Unknown: Other sharks, rays and scalefish.
Target Species	Sandbar shark (<i>Carcharhinus plumbeus</i>) Blacktip spp (<i>C. tilstoni</i> , <i>C. limbatus</i> , <i>C. brevipinna</i> and <i>C. sorrah</i>).
Byproduct Species	Hammerhead spp (<i>Fam. Sphyrnidae</i>) Tiger (<i>Galeocerdo cuvier</i>) Pig eye (<i>C. amboinensis</i>) Lemon sharks (<i>Negaprion acutidens</i>) Other sharks (unknown spp) and rays (Rajiforms).
Gear	Longlines: Demersal and pelagic. Power hauled. Historically preferred gear type. Length between 3.5 and 5 km of 12 mm polypropylene mainline. Dropline: Used in a form that it is not distinguishable from

	<p>longlining. Pelagic monofilament gillnets: Use encouraged.</p>																																																			
Season	Year round.																																																			
Commercial harvest 2002/03	<p>Shark harvest: combined take of 591 tonnes comprised of:</p> <table border="1"> <thead> <tr> <th>Species</th> <th>Tonnage</th> <th>2003/04 catch compared to 2000 to 03 trend</th> </tr> </thead> <tbody> <tr> <td>Sandbar shark</td> <td>209 t</td> <td>↑ 261%</td> </tr> <tr> <td>Blacktip spp</td> <td>40 t</td> <td>↓ 29% of average take</td> </tr> <tr> <td>Lemon shark</td> <td>24 t</td> <td>↓ 72% of average take</td> </tr> <tr> <td>Hammerhead shark</td> <td>33 t</td> <td>↓ 89%</td> </tr> <tr> <td>Tiger shark</td> <td>51 t</td> <td>↑ 134%</td> </tr> <tr> <td>Shovelnose rays</td> <td>8 t</td> <td>↑ 134%</td> </tr> <tr> <td>Bronze whaler</td> <td>17 t</td> <td>↑ 232%</td> </tr> <tr> <td>Pigeeye</td> <td>24 t</td> <td>↓ 84%</td> </tr> <tr> <td>Grey reef</td> <td>9 t</td> <td>↑ 136%</td> </tr> <tr> <td>Spot-tail</td> <td>0 t</td> <td>↓ 3 t caught in 02/03</td> </tr> <tr> <td>Bull</td> <td>19 t</td> <td>↑ 0 t caught previously</td> </tr> <tr> <td>Other sharks/rays</td> <td>156 t</td> <td>↑ 520%</td> </tr> </tbody> </table> <p>Total shark catch per year and % increase</p> <table border="1"> <thead> <tr> <th>2000/01</th> <th>2001/02</th> <th>2002/03</th> <th>2003/04</th> </tr> </thead> <tbody> <tr> <td>272</td> <td>456</td> <td>490</td> <td>591</td> </tr> <tr> <td></td> <td>168 %</td> <td>180 %</td> <td>217 %</td> </tr> </tbody> </table> <p>Scalefish harvest: Reported for 2002/03 as 8.2 t of which 7 t was Grey mackerel.</p>	Species	Tonnage	2003/04 catch compared to 2000 to 03 trend	Sandbar shark	209 t	↑ 261%	Blacktip spp	40 t	↓ 29% of average take	Lemon shark	24 t	↓ 72% of average take	Hammerhead shark	33 t	↓ 89%	Tiger shark	51 t	↑ 134%	Shovelnose rays	8 t	↑ 134%	Bronze whaler	17 t	↑ 232%	Pigeeye	24 t	↓ 84%	Grey reef	9 t	↑ 136%	Spot-tail	0 t	↓ 3 t caught in 02/03	Bull	19 t	↑ 0 t caught previously	Other sharks/rays	156 t	↑ 520%	2000/01	2001/02	2002/03	2003/04	272	456	490	591		168 %	180 %	217 %
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Value of commercial harvest 2002/03	\$1.4 M for all tropical shark fisheries (fin and meat).																																																			
Recreational harvest	Unknown.																																																			
Commercial licences issued	<p>14 authorities:</p> <ul style="list-style-type: none"> ○ JANF 6 “recognised operators” ○ NCSF “8 wire trace licenses”. <p>11 were active, but not full time in 2002/03. Considerable risk from latent effort.</p>																																																			
Management arrangements	<p><u>Management arrangements to date:</u> No management plans in place for either fishery.</p> <p>Both JANSF and NCSF, input controlled by:</p> <ul style="list-style-type: none"> • Limited entry; • Operating under an exemption to Notice 602 of 1993 that prevents the use of fishing gear that normally would be used to target sharks (e.g. longlines and droplines containing metal in the snood and restricting the use of gillnets to a few licensees). Fishers operate under an authority of conditions on a fishing boat license allowing them to use gear required for sharks; • Fixed number of net and longline fishing days; • Gear configuration measures for longline and gillnet; • Prohibition on automated longline and baiting gear; • Fin to meat ratios (except in Broome zone); • Compulsory Vessel Monitoring System (VMS); 																																																			

	<ul style="list-style-type: none"> • (to be done) Implementation of 10% observer coverage in the fishery with initial focus on the proposed Broome zone; • (to be done) Establishment of a periodic review mechanism and setting performance indicators; • Area closure in the NCSF (suggested by DFWA to effect a 90% reduction in sandbar shark mortality); • Compulsory logbooks; and • Tighter controls on provision of catch & effort data. <p>For JANSF (either in place or by June 06):</p> <ul style="list-style-type: none"> • Gillnetting not permitted within 12 n.m of coast; • Limits to 200 longline fishing days and 400 pelagic net fishing days; • Gear lengths and dimensions; • Single jurisdiction fishing trips; • Prohibition on automatic longline and baiting gear; • Zoning of the remaining open area in to Broome zone and Cape Leveque zone to provide protection on more abundant Broome sandbar sharks; • Maximum of 100 longline days and 200 net fishing days; • Limitation in the Broome zone to 100 fishing days restricted to October to January; • Maintaining existing anti-finning regulations in the Broome zone; • Closure of King Sound, (and other areas) within the Kimberley Gillnet and Barramundi fishery to shark net and line fishing; • Requirement to land Broome zone catch in Broome; and • Additional licence conditions may apply in relation to areas fished. Also, demersal gillnets or demersal longlines used in the Fishery must be removed from the water at least once a day.
Export	<p>Shark fins to Asian markets. Flesh export being developed, currently sold for low grade use (fertiliser).</p>
Bycatch	<p>Considered low impact to a particular species due to a large number of species considered as target or secondary species. Includes numerous types of skates and rays.</p>
Interaction with Threatened Species	<p>Considered medium to high risk due to lack of accurate reporting or validation measures. <u>Sawfish</u> are reported as an “occasional catch”. <u>Turtle</u> interactions are reported as unlikely due to the low number of operators and different areas of activity to those generally frequented by turtles. <u>Dolphin</u> interactions with longline gear have not been reported.</p> <ul style="list-style-type: none"> • Gillnetting is being encouraged as a method and there is recognition that this may increase

	<p>interactions with dolphins. However pelagic gillnetting is to be phased out in the JANSF reducing the risk of interaction.</p> <p><u>Whale sharks</u> considered unlikely to be caught in longlines and gillnets.</p>
Other fisheries taking shark	<p>In 2002/03 combined take by “external” fisheries was 194 t up 14% from previous year. Sharks are also taken in the:</p> <ul style="list-style-type: none"> • Marine Aquarium Fish Managed Fishery; • Kimberley Gillnet & Barramundi Managed Fishery; • Rock Lobster Fisheries (wobbegong sharks 1 per day); • Pilbara Fish Trawl Interim Managed Fishery; • 80 Mile Beach Gillnetters; and • Mackerel (Interim) Managed Fishery.

The JANSF and NCSF are jointly known as the tropical shark fisheries. The management boundaries are first based on jurisdiction and the by gear type. Under Western Australian (WA) management dropline fishing from 114⁰⁶'E to 129°E [WA/Northern Territory (NT)] border and longline fishing from 114⁰⁶'E to 123⁰⁴⁵' E as the NCSF. Under Joint Authority and state legislation longline and gillnet fishing for sharks from 123⁰⁴⁵'E to the WA/NT border is managed as a Joint Authority between Western Australia and the Commonwealth as the JANSF.

The WATrSF targets a range of shark species including sandbar, blacktip spp, hammerhead spp tiger, pig eye, lemon sharks and a range of other sharks (unknown spp) and rays (mostly Rajiforms).

Due to the large number of shark and teleost species harvested in the fishery, it is not possible to include detailed biological details on each species harvested. The submission includes a range of information on the key target species as well as reference to detailed scientific reports on shark species. A number of details however are important to note. Shark species generally are slow growing, long lived and have a low fecundity so require strict management controls, lacking to date in this fishery, to ensure sustainability of harvest. A recent stock assessment for sandbar sharks identified them as being depleted with an urgent need for a reduction in fishing mortality if the decline is to be arrested (McAuley and Gaughan, 2005).

For 2003/04, the combined take of 591 t was comprised mostly of sandbar shark (209 t), blacktip spp (40 t), lemon shark (24 t), hammerhead shark (33 t), tiger shark (51 t), shovelnose rays (8 t), bronze whaler (17 t), pigeye (24 t), grey reef (9 t), bull (19 t), and “other sharks/rays” (156 t). This represents over 200% increase from 2000/01 shark catch of 272 t. The value of the fisheries for 2003/04 was reported at \$1.4 million which was the combined value of meat and fins.

Domestic and shark fisheries have operated in WA since the 1970's. A Taiwanese fishery operated to within 12 nm of the coast between 1974 and 1986. After 1978 the areas of operation were restricted until by 1983 these were limited to waters north of 18°S. The gear limits imposed in 1986 effectively made the fishery uneconomical to foreign fishing fleets. From that period onwards small catches of sharks were reported. In 1993 the first management initiative in the form of a prohibition on the use of metal in the snood and the restriction of gillnets to a limited number of licence holders effectively established a limited entry shark fishery. An Offshore Constitutional Settlement (OCS) was brought into force in 1995 under which the use of longlines and gillnets off the Kimberley coast was designated a Joint Authority with day to day management responsibility vested in the state. The fisheries originally focussed on the local market however, an increased demand for fins has led to an increase in the export of fins to Asian markets.

A major review of the management of WA shark fisheries was instigated in 2003 in response to dramatic increases in demersal longline fishing and strong evidence of a significant decline in dusky shark stocks. A stock assessment of Sandbar sharks in 2004 revealed that this species too was in significant danger of overfishing.

Recently DFWA has closed the WANCSF (to be followed by a similar measure in JANSF) to shark fishing by a prohibition on the use of gear to target shark. Only authorised WANCSF and JANSF operators will be permitted to continue fishing under exemptions until proposed management arrangements have been implemented.

The principal fishing method in the WANCSF has been demersal longlining. Droplining has also been an approved method but the configuration of these two types of gear are so similar that they are for all purposes considered as longlining. Operators usually set once a night but up to two sets per day are not uncommon. Hydraulic powered drums are used with longlines consisting of 12 mm polypropylene from 2 to 5 nm long. Baited hooks are attached at 10 m intervals to the mainline. DFWA states that measures have been put in place to reduce the effectiveness of longlining gear in targeting larger sharks and is encouraging the use of gillnets.

Detailed information on gear structure is available in the submission. Table 1 above provides a detailed description of current management as well as proposed changes to management arrangements for implementation in January and June 2006.

Direct information on bycatch in the fishery is limited, however the WA Status of the Fisheries Report 2003-2004 states that “There is some discarded bycatch of unsaleable species of sharks, rays and scalefish.” The report further states that the Ecological Risk Assessment (ERA) carried out for the fishery, suggested that all impacts on bycatch species are considered to be low.

Interactions with protected species under the Commonwealth EPBC Act have been assessed through the WA ERA process and classified as generally of low risk. The DFWA submission states that as the shark fisheries generally operate offshore, they pose a negligible risk to spartooth shark (*Glyphis sp. A*) and the freshwater sawfish (*Pristis microdon*) which primarily inhabit nearshore or estuarine environments. White sharks (*Carcharodon carcharias*) and the grey nurse shark (*Carcharias Taurus*) rarely occur in the area of operation of the tropical shark fisheries. Whale sharks (*Rhincodon typus*), turtles and cetaceans are considered to be unlikely to interact with longlines. Proposed management changes will encourage greater use of gillnets which may increase the risk of interactions with dolphins and other protected species. These interactions are assessed in more detail under Principle Two of this report.

There is limited information on the nature and quantity of recreational and indigenous take of sharks in this fishery. Limited management measures are in place to control this harvest, however there is very limited compliance and enforcement activities to enforce such measures.

The fishery is managed under the Western Australian *Fish Resources Management Regulations 1995* (FRMR) in force under the Western Australian *Fish Resources Management Act 1994*. The WA tropical shark fisheries are currently being managed under interim regimes while the implementation of new management arrangements for each fishery are implemented.

New management arrangements, inclusive of new effort restrictions, are due to be implemented by June 2006. Management arrangements are discussed in more detail in Part II of this report.

Overall assessment

The material submitted by DFWA demonstrates that the management arrangements for the JANSF and the WANCSF meet the requirements of the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries*. However a number of risks to ecological sustainability have been identified which need to be addressed including:

- Steep increase in effort;
- Overfished and fully exploited status of the target shark species with no recovery strategies in place;
- The absence of catch limits for key target species, such as total allowable commercial catch;
- Inadequate information on critical elements of the target, byproduct and bycatch species biology;
- Lack of performance measures, objectives or trigger limits (that lead to a management response);
- High risk of interactions with protected species; and
- Lack of enforcement of the minimal management measures in place, including a possible nil enforcement of protected species reporting requirements under the EPBC Act.

Conditions to address these issues have been developed to ensure that the risk of impact is minimised in the short to medium term. Through the implementation of the conditions and the continuation of a responsible attitude to the management of the fishery, management arrangements are likely to be sufficiently precautionary and capable of controlling, monitoring and enforcing the level of take from the fishery while ensuring the stocks are fished sustainably.

The WANCSF and JANSF have been in a developmental stage and have made considerable progress in developing sound management arrangements. The management regimes aims to ensure that fishing is conducted in a manner that does not lead to overfishing and for fishing operations to be managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem. The assessment that the target stock of sandbar sharks is overfished is being addressed through a recovery strategy. DEH considers that there is a high degree of probability the stocks will recover. On balance, the fisheries are being managed in an ecologically sustainable manner and are working to address existing problems and minimise environmental risks.

The operation of the fishery, for reasons discussed throughout the assessment report, although consistent with Part 13A of the EPBC Act requires the implementation of additional measures to ensure it is being managed in an ecologically sustainable manner and environmental risks minimised or managed in a way which would give confidence in the sustainable management of stocks.

DEH considers that the fishery will not be detrimental to the survival and conservation status of the taxon to which it relates in the short term. DEH therefore recommends that this fishery be declared an approved Wildlife Trade operation (WTO) for a period of 12 months with the action specified in the conditions to be undertaken by DFWA to contain the environmental risks in the medium to long term. DEH considers that the fishery, as managed in accordance with the management regime is not likely to cause serious or irreversible ecological damage over the period of the export decision. Specifically the WTO declaration would allow the export of product from the fishery for a period of 12 months. The WTO declaration will require quarterly reporting on the progress of implementing

the conditions outlined in this report and other managerial commitments. The implementation of the conditions will be monitored and reviewed as part of the next DEH review of the fishery in 12 months.

As the official fishery area encompasses Commonwealth as well as State waters, consideration under Part 13 of the EPBC Act is required regarding the impact of the fishery on listed threatened species, listed migratory species, cetaceans and listed marine species.

Protected species occurring in the fishery area include marine turtles, cetaceans, spartooth shark and sawfish. While interactions with these species are considered infrequent or unlikely they are considered a low risk. However, adequate protection for these species is needed including DFWA requiring fishers to accurately report interactions. There are no listed threatened ecological communities in the fishery area.

DEH recommends that the management regimes for the JANSF and the WANCSF be declared accredited management regimes under Sections 208A, 222A, 245 and 265 of the EPBC Act. In making this judgement, DEH considers that the fishery to which the regime relates does not, or is not likely to, adversely affect the survival in nature of listed threatened species or population of that species, or the conservation status of a listed migratory species, cetacean species or listed marine species or a population of any of those species. DEH also considers that the management regimes require that all reasonable steps are taken to avoid the killing or injuring of protected species, and the level of interaction under current fishing operations is high. On this basis, DEH considers that an action taken by an individual fisher, acting in accordance with the management regime will not have a significant impact on a listed threatened species or listed migratory species protected by the EPBC Act.

The implementation of conditions and other commitments made by DFWA in the submission will be monitored and reviewed as part of the next DEH review of the fishery in 12 months time.

Conditions

- 1:** Department of Fisheries, Western Australia, to advise DEH of any material change to the JANSF or the WANCSF's legislated management plan and/or arrangements that could affect the criteria on which EPBC decisions are based, within three months of that change being made.
- 2:** Within 12 months, DFWA to develop fishery specific objectives linked to performance indicators and performance measures for target species, key byproduct, discards and protected species interactions. Within 3 months of becoming aware that a performance measure has not been met, DFWA will develop appropriate management responses for timely implementation.
- 3:** Within 4 months, DFWA to implement all proposed management changes, as outlined in the *Application to the Australian Government Department of the Environment and Heritage on the Western Australian Tropical Shark Fisheries*. Additionally, DFWA to review the effort caps in place for the fishery and if necessary implement reduced effort limits commensurate with the precautionary principle within 6 months.
- 4:** Within 12 months, DFWA to conduct a compliance risk assessment for the WATrSF paying particular attention to illegal harvest, non compliance with fin to meat ratios and non compliance with new management arrangements and any other identified risks. DFWA to also develop a compliance strategy for the fishery to address these risks.

- 5: Within 10 months, DFWA to develop and implement a strategic research plan addressing key priorities in the fisheries including (but not limited to) key target stock biology and ecology, stock assessments for key target stocks, monitoring of byproduct, bycatch and ecosystem impacts and levels of protected species interactions and measures to reduce interactions.
- 6: Within 9 months, DFWA to develop and implement ongoing monitoring of byproduct and bycatch in the fishery, sufficient to identify changes in the composition and quantity of catch. The nature of the monitoring program will be informed by the analysis around observer coverage needs.
- 7: Within 8 months DFWA to develop and implement recovery strategies for all overfished target stocks to actively promote the recovery of shark stocks to ecologically viable stock levels.
- 8: DFWA, within 3 months, to provide a mechanism, which allows fishers to record interactions with protected and/or listed species. DFWA will implement an education program within 3 months to ensure that industry:
 - has the capacity to make these reports at an appropriate level of accuracy; and
 - is aware of the EPBC Act requirement to report any interaction with a listed and/or protected species to DEH within 7 days of the interaction occurring.
- 9: Within 6 months, DFWA to analyse existing information and observer data and develop a predictive model to identify the levels of coverage required to determine, for management purposes, the nature and level of protected species interactions within the fishery. Within 12 months, DFWA will, in consultation with DEH, implement a program consistent with the levels of coverage identified.

Recommendations

- 1: Within 8 months, DFWA to develop and implement a process to improve estimates of recreational, indigenous and illegal harvest and factor these estimates into stock assessment processes and future management arrangements.
- 2: Where interactions with protected species are identified as occurring, DFWA will initiate a management response within 3 months to mitigate the risk of further interactions.

PART I - MANAGEMENT ARRANGEMENTS

The JANSF and the WANCSF are managed by DFWA.

The management regime is described in the following documents, all of which are, or will be publicly available:

- *Fish Resources Management Regulations 1995;*
- *Fish Resources Management Act 1994;*
- *Fishery Management Plan 1997;*
- *Offshore Constitutional Settlement 1995;*
- *North Coast Shark Fishing (Professional) Notice 1993; and*
- Relevant Fishery Status Reports, Gazetted notices and licence conditions.

A number of other documents, including research reports, scientific literature and discussion papers are integral to the management of the fishery.

DEH considers it important that management arrangements remain flexible to ensure timely and appropriate managerial decisions. Because of the importance of the management plan and documents referred to above to DEH's assessment of the fishery, an amendment could change the outcomes of the assessment and decisions stemming from it. Decisions resulting from this assessment relate to the arrangements in force at the time of the decision. In order to ensure that these decisions remain valid, DEH needs to be advised of any changes that are made to the management regime and make an assessment that the new arrangements are equivalent or better, in terms of ecological sustainability, than those in place at the time of the original decision.

Condition 1: *Department of Fisheries, Western Australia, to advise DEH of any material change to the JANSF or the WANCSF's legislated management plan and/or arrangements that could affect the criteria on which EPBC decisions are based, within three months of that change being made.*

As the submission provided to DEH is "interim" no information on consultative mechanisms was provided. DEH is aware that consultation was undertaken with a variety of stakeholders in the development of a new range of management changes aimed at improving the sustainability of the fishery. The northern shark fishers have formed the Northern Shark Industry Association (NSIA) with the intent of providing advice in the future development of a formal management plan. DEH considers that the level of consultation regarding these issues has been adequate and is confident that DFWA will continue to ensure interested parties are consulted appropriately. DEH will revisit this issue in more detail when the temporary WTO decision is revisited in 12 months time.

The fisheries are managed according to the policy regime described in the interim management plans in force under the FRMA. The interim plans contain very limited controls relating to the harvest of target species. DEH is concerned at the lack of fishery specific objectives or performance indicators to ensure that the performance of the fishery can be measured and management action taken as required. DEH considers that the development of fishery specific objectives, linked to performance indicators and performance measures for target stock, key byproduct species, discards and impacts on the ecosystem is a priority for the WATrSF and should be developed as a priority. Once developed, the WATrSF should be regularly monitored in relation to the objectives, indicators and performance measures. A clear process for responding to a breach in a performance measure is also required to ensure that prompt management action is taken to address any threats to sustainability.

Condition 2: *Within 12 months, DFWA to develop fishery specific objectives linked to performance indicators and performance measures for target species, key byproduct, discards and protected*

species interactions. Within 3 months of becoming aware that a performance measure has not been met, DFWA will develop appropriate management responses for timely implementation.

The fisheries are managed according to fishery notices and conditions in force under the FRMA. An assessment of these measures is included in Part II of this report.

Current management of this fishery is based on a mixture of input controls including:

- Gear limitations (demersal gillnets or demersal longlines);
- Spatial management measures;
- Limitations on mesh size and depth; and
- Limitations on the number of hooks or metres of net used in any one month.

In the review of the management arrangements of the fishery, a number of strategies were developed to improve controls on the fishery. These controls were outlined above in Table 1. Further detail of these measures along with an assessment of the effectiveness of these measures is included in Part II of this report.

The fisheries are currently undergoing review to establish new management arrangements in 2006. Stock assessments have recently been conducted on target species in the fishery and the status of the fisheries are reported on in the annual Fishery Status Report. These reviews are discussed more fully in Part II of this report.

Condition 3: *Within 4 months, DFWA to implement all proposed management changes, as outlined in the Application to the Australian Government Department of the Environment and Heritage on the Western Australian Tropical Shark Fisheries. Additionally, DFWA to review the effort caps in place for the fishery and if necessary implement reduced effort limits commensurate with the precautionary principle within 6 months.*

Compliance and enforcement tools have been implemented in the fisheries to date on an ad-hock basis defined by operational constraints and risk management. Compliance risks in the fishery, including but not limited to, illegal harvest, black marketing of catch, non compliance with fin-to-trunk ratios and possible non compliance with new management arrangements. DEH commends the introduction of VMS, however considers that further work is needed to ensure compliance with new management controls and to control and validate the level of interactions with protected species. DEH therefore requires that a compliance risk assessment be undertaken for the WATSF, with a compliance strategy developed to address identified risks.

Condition 4: *Within 12 months, DFWA to conduct a compliance risk assessment for the WATrSF paying particular attention to illegal harvest, non compliance with fin to meat ratios and non compliance with new management arrangements and any other identified risks. DFWA to also develop a compliance strategy for the fishery to address these risks.*

Fishery dependent data relating to the target species is collected on a regular basis in the fishery. Some fishery independent information is also collected. Discussion of the information collection system can be found in Part II of this report.

An analysis of the fisheries' capacity for assessing, monitoring and avoiding, remedying or mitigating any adverse impacts on the wider marine ecosystem in which the target species lives and the fishery operates is contained under Principle Two of this report.

Northern Australia shark stocks have a wide geographical distribution and DEH commends DFWA's ongoing participation in cross jurisdictional fishery management forums such as the

Northern Fisheries Managers Workshops, any joint stock assessment and research. This is discussed in more detail under Principle 1.

DEH considers that the current management arrangements comply with all relevant threat abatement plans, recovery plans, the National Policy on Fisheries Bycatch, and bycatch action strategies developed under that policy. DEH suggests that the National Plan of Action (Sharks) (NPOAS) should be the minimum standard in establishing objectives and operational guidelines for the WATrSF. DEH expects that DFWA will also ensure compliance with any future plans or policies as they are developed.

No regional or international management regimes, to which Australia is a party, are of direct relevance to the fishery. The prime international regime affecting the fishery is the United Nations Convention on the Law of the Sea (UNCLOS). The management regime essentially complies with this. Other international regimes are applicable to fisheries management but do not explicitly involve this fishery, for example the 1992 Convention on Biological Diversity and in particular the 1995 Jakarta Mandate requiring that, in relation to the sustainable use of marine and coastal biological diversity, the precautionary principle should apply in efforts to address threats to biodiversity. While these agreements are not specifically addressed in the Submission, the fishery's compliance with their requirements can be assessed by examination of Part Two of this report. The application of the International Convention for the Prevention of Pollution from Ships (MARPOL) to vessels operating in the fishery is explicitly discussed under Principle 2, Objective 3.

Conclusion

DEH considers that the JANSF and WANCSF management regimes are documented, publicly available and transparent, and developed through a consultative process. The management arrangements are not currently adaptable and underpinned by appropriate objectives and performance criteria by which the effectiveness of the management arrangements can be measured, enforced and reviewed. These issues have been addressed through Conditions 2 and 4.

The management arrangements are capable of controlling the harvest through a combination of input controls appropriate to the size of the fishery. Condition 3 will assist in consolidating proposed management arrangements. Periodic review of the fishery is provided for, as are the means of enforcing critical aspects of the management arrangements.

DEH considers that there is scope to further refine the management arrangements and has provided a number of conditions for improvements in the longer term.

PART II – GUIDELINES FOR THE ECOLOGICALLY SUSTAINABLE MANAGEMENT OF FISHERIES

Stock Status and Recovery

Principle 1: *‘A fishery must be conducted in a manner that does not lead to over-fishing, or for those stocks that are over-fished, the fishery must be conducted such that there is a high degree of probability the stock(s) will recover’*

Maintain ecologically viable stocks

Objective 1: *‘The fishery shall be conducted at catch levels that maintain ecologically viable stock levels at an agreed point or range, with acceptable levels of probability’*

Information requirements

Fishery dependent data are obtained through compulsory daily logbooks. DFWA note that data is collected on a latitude/longitude basis. Data entry occurs within seven days of receipt of the log-sheet.

The logbooks contain information on daily and shot-by-shot target catch, hours fished and areas of operation. Fishers are obliged to record finfish by-product data on a separate logbook, which is under review. To date, logbooks have not included a compulsory field on discards (discarding is discussed in greater detail under Principle Two of this report). DEH believes that data reliability for target species is reasonable and that compliance and enforcement activities have the capacity to ensure the ongoing reliability of data in the fishery.

Information in the submission regarding fishery-independent data collection is limited but is referred to as an indicator that logbook data may be under-reported. Validation of fishery dependent information is alluded to but no description of process given.

DFWA collects data from a wide range of sources (logbooks, processor records dockets, voluntary catch sampling and observer data) in an effort to counteract the lack of fishery-independent data. DEH considers this a useful approach given the economic and resource constraints under which the fishery operates. DEH is concerned however that the data validation mechanisms available in the fishery largely relate to landed target species and there is little validation of data relating to non-target species.

DFWA has conducted extensive empirical research into the fisheries’ target and some secondary shark species. DFWA has sound data on all aspects of their reproductive biology (including frequency), other key demographic characteristics, as well as their distribution and abundance outside of the fisheries area and the timing and duration of their migratory patterns. The characteristics of other species are either known generally from other studies or can be inferred.

While DFWA recognises future research requirements for these fisheries, such research is dependent on the relative priority of limited research dollars. DFWA has committed considerable resources to research and has obtained significant external research funds. The comprehensive suite of information on these fisheries reflects the fact DFWA has had a serious commitment to research into the shark fisheries.

Assessment of byproduct, bycatch, ecosystem impacts and levels of protected species interactions has primarily been based on very extensive empirical data collected over the course of three large-scale Fisheries Research and Development Corporation (FRDC) -funded projects. As explained the original EPBC applications (2003), in supporting documentation for the current applications and in

DFWA's responses to public submissions, bycatch, byproduct, protected species and ecosystem risks can only be lower than LOW to NEGLIGIBLE risk once effort is reverted to target levels. While DFWA will continue to monitor these issues to the extent of available funding, research will necessarily be prioritised to address HIGH to MEDIUM risk issues, such as updating dusky and sandbar exploitation rates, assessing their vulnerability to capture outside the target fisheries and evaluating the effects of new management arrangements (e.g. seasonal and spatial closures).

Overall, given the range of fishery dependent and independent data gathered by DFWA and the mechanisms for regularly reviewing the data requirements, DEH considers that there is a reliable information collection system in place appropriate to the scale of the fishery. Continuation of existing data collections and research programs, combined with some extension should be based on a strategic plan to ensure that critical aspects are continued to be researched a condition has been developed to address this issue.

Condition 5: *Within 10 months, DFWA to develop and implement a strategic research plan addressing key priorities in the fisheries including (but not limited to) key target stock biology and ecology, stock assessments for key target stocks, monitoring of byproduct, bycatch and ecosystem impacts and levels of protected species interactions and measures to reduce interactions.*

Assessment

The 2005 stock assessment (McAuley and Gaughan, 2005) for the Sandbar shark was conducted using demographic analysis. This model is generally applied for long lived shark species such as *C. plumbeus*. The model generates estimates of the potential capacity for a stock increase/decrease using biological information and fishing mortality rates derived from capture rates of tagged sharks. Biological and tagging data were used from a recently completed FRDC funded project (2000/134 McAuley, et al., 2005). The results indicated that under zero fishing mortality the *C. plumbeus* stocks have a rate of growth of 2.5% per annum which is at a much lower rate than previously thought and lower than the closely related and co-occurring dusky shark (*C. obscurus*). The stock assessment expresses concern over the current exploitation regime that takes all age classes and recommends an urgent reduction in *C. plumbeus* fishing mortality in both the WATrSF and the WATSF to arrest the current population decline. DFWA has committed to implementing a series of new management arrangements seeking to address the decline of target shark stocks. **Condition 3** addresses this issue. DFWA state that the range of management changes outlined in Table One of this report will address all of these issues, however DEH is concerned that these management changes may not be sufficient to ensure the recovery of all overfished stocks. This is further discussed under Objective 2. The recovery of stocks is discussed in detail under Principle One, Objective 2 of this report.

Under the proposed new management arrangements the status of the fishery is assessed on a periodic basis, using fishery dependent and independent information. These assessments are to be published by DFWA and thus publicly available. Catch and effort are assessed and are the basis to determine if decline has occurred and if triggers are reached.

The primary management tool for the fisheries are input controls. DFWA has committed to reviewing these on a regular basis.

A range of both international and national studies provides a fairly comprehensive picture of the distribution and spatial structure of the key target species in the fishery. Both dusky and sandbar sharks are widespread, being found in most tropical and temperate oceans in the world. Studies undertaken in WA have also given some limited indication of stock movement and has been used to

identify pupping areas for closure. Despite substantial research conducted in WA and internationally, relatively little is known about growth rates, migration, ecosystem and habitats.

Dedicated shark and finfish fisheries are also operating in other jurisdictions including the Commonwealth and NT. Ideally, management arrangements affecting single stock should be under single jurisdiction, or at least complementary across jurisdictions. DEH believes it would be beneficial for DFWA to continue to be involved in cross jurisdictional actions to address shared stock concerns. Furthermore, removals of key species in other jurisdictions should be factored into stock assessment and management controls in the WATSF.

Potential removals from the shark and finfish population include direct harvest by the WATSF, recreational and Indigenous harvest, and harvest and discarding of the species in other fisheries.

A number of surveys have been undertaken on the extent and harvest of recreational fishing in the area of the fisheries, however they are not regularly conducted or specific to the WATSF, nor are they considered particularly robust due to the age of the data. Due to the overfished status of a number of the target stocks, it is important that robust information on the large recreational sector is obtained for the purposes of managing the overall level of take within sustainable levels. Indigenous harvest is also unquantified at this time and should be considered in the total removals from the stock. Illegal harvest from the fishery is also a significant issue and take should be incorporated in stock assessment processes and management arrangements. Given the range of conditions in place for the fishery and lower priority of this issue in comparison to others, DEH considers that this issue should be placed as a recommendation rather than a condition.

Recommendation 1: *Within 8 months, DFWA to develop and implement a process to improve estimates of recreational, indigenous and illegal harvest and factor these estimates into stock assessment processes and future management arrangements.*

Management response

The current management regime and proposed new management arrangements aim to maintain ecologically viable stock levels through a range of input and output controls. These measures are outlined in Table 1 and Part I of this report.

DEH considers that the combination of the input controls should ensure adequate protection of the target stocks, but notes that this is contingent upon the effort level being set at a sustainable level. In addition, DEH is concerned that the unknown mortality of shark stocks due to illegal, unregulated and unreported (IUU) fishing and the recreational take, may have the potential to seriously undermine the effectiveness of DFWA's management strategies.

DEH considers that the combination of these controls, combined with the implementation of all conditions made in this report should ensure adequate protection of the target stock. DEH is concerned about effort caps in place for the key target species, however this is discussed in more detail under Objective 2.

No performance indicators have been put in place for the WATrSF. **Condition 2** addresses this issue. The submission commits to the establishment of a periodic review mechanism and setting of appropriate performance indicators and trigger points to assess stock status and determine future management responses.

Secondary species (byproduct) taken in the fishery include Hammerhead spp (*Fam. Sphyrnidae*) Tiger (*Galeocerdo cuvier*), Pig eye (*C. amboinensis*), Lemon sharks (*Negaprion acutidens*), Other sharks (unknown spp) and rays (Rajiforms).

Fishers are required to record in compulsory logbooks byproduct species taken. No management objectives, performance indicators or management measures are in place to trigger management action if take increases substantially. This issue will be dealt with through the implementation of **Condition 2**.

There is little information on the take of scalefish species. The submission states that the changes to longline use (due to management changes) may increase the capacity of demersal longlines to take scalefish and/or because of the reduction in the catch of large sharks, operators will seek to increase their catch of scalefish to compensate for the reduction in earnings from sharks. DFWA state that industry has been warned that this will be under close scrutiny, however no management strategies or monitoring programs have been developed to outline how this will be reviewed and no trigger limits have been set. DEH therefore requires that, within 9 months, DFWA develop and implement ongoing monitoring of bycatch and byproduct in the fishery sufficient to identify changes in the composition and quantity of catch.

Condition 6: *Within 9 months, DFWA to develop and implement ongoing monitoring of byproduct and bycatch in the fishery, sufficient to identify changes in the composition and quantity of catch. The nature of the monitoring program will be informed by the analysis around observer coverage needs.*

Conclusion

DEH considers that, contingent on the implementation of proposed new management arrangements, on balance the management regimes in the JANSF and WANCSF are appropriately precautionary and provide for the fishery to be conducted in a manner that may prevent over-fishing. DEH considers that the information collection system and stock assessment and management arrangements generally are sufficient to ensure that the fishery is conducted at catch levels that maintain ecologically viable stock levels with acceptable levels of probability.

DEH considers that there is scope to further refine some of the existing information collection, assessment and management responses and has provided a number of conditions for improvements in the longer term.

Promote recovery to ecologically viable stock levels

Objective 2: *‘Where the fished stock(s) are below a defined reference point, the fishery will be managed to promote recovery to ecologically viable stock levels within nominated timeframes’*

Recent assessment of the sandbar shark stock has revealed that the stock is in decline and that fishing mortality must be significantly decreased. In response, DFWA has instigated an indefinite closure (minimum 20 years) in the WANCSF through a Section 43 order covering the whole of the fishery with a Ministerial Exemption providing for continued fishing in the balance of the fishery. The submission states that this closure is considered likely to effect a 90% reduction in sandbar shark mortality. DFWA is seeking to implement a similar arrangement for management of the JANSF but, due to legislative complexity associated with the Joint Authority management arrangement, this is likely to take several months to implement. However it states that in the interim JANSF is operating under “agreed arrangements”.

The submission concedes that a number of the key target shark species are overfished and that the current level of harvest of sandbar sharks is unsustainable. The current management of this situation does not adequately meet with the Guidelines, nor does it comply with the NPOA - Sharks. While

the range of management changes to be in place by June 2006 will provide some protection for the species, no specific recovery strategies have been developed for overfished shark species in the fishery. DEH believes that it is crucial that prompt and effective action is taken to recover stocks to ecologically viable levels and that specific strategies should be developed for each overfished species to ensure recovery. DEH therefore requires that, within 8 months, DFWA will develop and implement recovery strategies for all overfished target stocks to actively promote the recovery of shark stocks to ecologically viable stock levels. These strategies should be developed in consultation with scientists and conservation groups. They should include management measures that reduce harvest of overfished stocks to precautionary levels in the absence of robust scientific evidence to allow recovery of the stocks, and complement the implementation of other DEH conditions.

In light of the recent stock assessment results, DEH believes it is crucial that prompt and effective action is taken to recover stocks to ecologically viable levels. DEH recognises that DFWA is addressing the issue and is working to promote the recovery of the stock.

Condition 7: *Within 8 months DFWA to develop and implement recovery strategies for all overfished target stocks to actively promote the recovery of shark stocks to ecologically viable stock levels.*

Conclusion

The recent assessment indicating that stocks are overfished is being addressed through spatial management and the implementation of a range of management arrangements. DEH considers that there is a high probability that the stocks will recover.

Ecosystem impacts

Principle 2: *'Fishing operations should be managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem'*

Bycatch protection

Objective 1: *'The fishery is conducted in a manner that does not threaten bycatch species'*

Information requirements

Fishers in the WATrSF are not required to report the level of discards. DFWA state that there are sufficient data on the spectrum of non retained species to recognise that it is a low risk area. DEH is concerned at the lack of information collected with regard to bycatch species.

Assessment

An ecological risk assessment was carried out for the WATrSF in 2002, which indicated a low to negligible risk for bycatch species. This decision was based on data from 1994 to 2001 when effort was substantially higher than target effort cap levels (in place by June 2006), therefore impacts are likely to be lower. These assumptions are likely to be held for the WATrSF.

Management response

No management measures are in place to monitor or reduce bycatch in the WATrSF. DFWA state that risks are low and that, as all "fish" species are permitted to be landed by fishers, bycatch is low. DEH is concerned however that there is no measure of the actual level of bycatch in the fishery and that monitoring of this issue has not occurred. No specific group of indicator species is monitored.

DEH considers that although the ERA carried out in 2002 indicated low to negligible risks (despite a lack of data on bycatch), monitoring should be carried out to establish the level of bycatch in the WATSF. DEH considers that the implementation of **Conditions 3 and 6** will address this issue.

Conclusion

DEH considers that there is a high likelihood the fishery is conducted in a manner that does not threaten bycatch species. Should this situation change, or a risk assessment process indicate otherwise, DEH expects that DFWA would undertake appropriate actions to ensure that bycatch species are not threatened by this fishery.

Conditions 3 and 6 have been developed to ensure that the risk of unacceptable impact on bycatch species is detected and minimised in the longer term.

Protected species and threatened ecological community protection

Objective 2: *'The fishery is conducted in a manner that avoids mortality of, or injuries to, endangered, threatened or protected species and avoids or minimises impacts on threatened ecological communities'*

Information requirements

Information on bycatch generally is collected from fisher logbooks, however the current logbooks do not contain fields for recording interactions with protected species. DFWA state that fishers are only required to report landed species, but as fishers are not permitted to land protected species, no report of interactions are made.

DEH seriously doubts that interactions have ceased and believes that the lack of reporting is likely due to DFWA reporting requirements, which only require landed catch to be recorded. As protected species are not allowed to be landed, no reports have been made, though no doubt some level of interaction has occurred.

Other than logbooks, no information is collected on protected species interactions. DFWA's submission states that the fisheries mostly operate offshore, and therefore pose a negligible risk to protected species such as the freshwater sawfish. Although the WATrSF operates in areas where turtles are commonly found, no turtle captures have been observed or reliably reported. It is considered that the lack of reported captures is because the amount of gear being used is low relative to the fisheries' operational area and as a result the likelihood of interactions is low.

An area of concern is the likelihood that proposed management arrangements for the WATrSF may encourage the use of gillnets with an increased risk of dolphin interactions. The submission states that there have been no reported dolphin captures or mortalities. This is primarily due to the predominant use of longline gear. DFWA has committed to an observer program which will serve to monitor the nature and level of fishers' interactions with dolphins and other protected species. DEH will monitor the situation.

Assessment

DEH considers it vital that logbooks are amended to allow the reporting of protected species interactions in the fishery. DFWA state that non reporting may also be occurring due to a lack of awareness of reporting requirements under the EPBC Act, or because of fears of prosecution. DEH therefore considers that in addition to logbook modifications, an education program must be

implemented as a priority to ensure that industry has the capacity to make reports at an appropriate level of accuracy and that industry is aware of reporting requirements under the EPBC Act.

Condition 8: *DFWA, within 3 months, to provide a mechanism, which allows fishers to record interactions with protected and/or listed species. DFWA will implement an education program within 3 months to ensure that industry:*

- *has the capacity to make these reports at an appropriate level of accuracy; and*
- *is aware of the EPBC Act requirement to report any interaction with a listed and/or protected species to DEH within 7 days of the interaction occurring.*

DEH expects that a comprehensive, independent observer program will be developed and implemented with a high level of coverage to determine the level of protected species interactions in the fishery. If interactions occur, DFWA will develop and implement measures within 3 months of the interaction occurring, to mitigate against further interactions.

Condition 9: *Within 6 months, DFWA to analyse existing information and observer data and develop a predictive model to identify the levels of coverage required to determine, for management purposes, the nature and level of protected species interactions within the fishery. Within 12 months, DFWA will, in consultation with DEH, implement a program consistent with the levels of coverage identified.*

Recommendation 2: *Where interactions with protected species are identified as occurring, DFWA will initiate a management response within 3 months to mitigate the risk of further interactions.*

There are no listed ecological communities in the fishery area.

Management response

Interactions with protected species are not currently well managed by DFWA. DEH considers that the implementation of **Conditions 2, 8 and 9** will improve this situation.

Conclusion

DEH notes that there is a strong potential of interactions with protected species in the WATrSF but considers that, through the implementation of **Conditions 2, 8 and 9** the WATrSF will be conducted in a manner that avoids mortality of, or injuries to, endangered, threatened or protected species and avoids or minimises impacts on threatened ecological communities. Should this situation change, or a risk assessment process indicate otherwise, DEH expects that appropriate actions will be undertaken to ensure the fishery avoids mortality or injury to these species and avoids or minimises impacts on threatened ecological communities.

Conditions have been developed to ensure that the risk of unacceptable impact on protected species is minimised in the longer term.

Minimising ecological impacts of fishing operations

Objective 3: *'The fishery is conducted, in a manner that minimises the impact of fishing operations on the ecosystem generally'*

Information requirements

No information is currently collected regarding ecosystem impacts arising from the WATrSF. DFWA advise that a research program has recently been undertaken, in collaboration with Murdoch University, to assess bioregional and trophic impacts of fishing (including shark fishing).

DEH understands that this project is being undertaken at a bio regional level rather than at a species specific or fishery specific level, given minimal resources available and the need to identify ecosystem impacts across a broad area.

DEH is concerned at the lack of information collection and research covering the fisheries impact on the ecosystem and environment generally. However, DEH understands that this lack of information is the case across a range of Australian and International fisheries and until appropriate research techniques and programs are developed and implemented this will continue to be the case. DEH strongly supports research in this area and commends DFWA for pursuing this project. DEH considers that it will be instrumental in providing further information on ecosystem impacts of the WATSF and informing future management decisions.

Assessment

The most likely ecosystem impact arising from the WATrSF would be trophic level impacts, resulting from the depletion of apex predators.

It is widely acknowledged that the depletion of apex predators may have wide ecological impacts, however DFWA state that this is difficult to measure and that there has been no indication of this occurring in the WATrSF.

The fishing gear generally is not regarded as posing a significant risk to the physical environment and the impact of vessel discharge on the ecosystem is considered to be low. WA legislation requires all vessels to be maintained to appropriate standards and not discharge any materials into the water. The number of vessels permitted in the fishery is regulated and no breaches have been reported.

Management response

No management measures have been implemented to specifically minimise the impact of the WATrSF on the wider ecosystem and their components. The new management measures, and conditions developed by DEH have been established to protect target, byproduct, discard and protected species, however a number of these conditions are likely to have an indirect impact in improving the management of ecosystem impacts. Specifically, the development in the reduction of effort in the fishery and size limits will ensure that the impacts on the trophic structure of the ecosystem is minimised by protected larger sharks and reducing the total amount of sharks harvested. The proposed research program outlined above will greatly assist in determining the level of impact that the WATrSF has on the ecosystem and will provide future guidance for management action.

DEH intends to revisit this issue in the WATrSF review in 12 months time.

Conclusion

DEH considers that the fishery is conducted in a sufficiently precautionary manner to minimise the impact of fishing operations on the ecosystem generally over the short term. These issues will be revisited in 12 months time.

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LIST OF ACRONYMS

DEH	Department of the Environment and Heritage
DFWA	Department of Fisheries Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1992</i>
ERA	Ecological Risk Assessment
FRMA	<i>Fish Resources Management Act 1994</i>
FRMR	<i>Fish Resources Management Regulations 1995</i>
IUU	Illegal, unregulated and unreported
JANSF	Joint Authority North Shark Fishery
JASDGLMF	Joint Authority Southern Demersal Gillnet and Longline Managed Fishery
MARPOL	International Convention for the Prevention of Pollution from Ships
NCSF	North Coast Shark Fishery
NPOA	National Plan of Action
NSIA	Northern Shark Industry Association
NT	Northern Territory
OCS	Offshore Constitutional Settlement
UNCLOS	United Nations Law of the Sea
VMS	Vessel Monitoring System
WA	Western Australia
WATSF	Western Australia Temperate Shark Fisheries
WATrSF	Western Australia Tropical Shark Fisheries
WCDGLMF	West Coast Demersal Gillnet and Longline Interim Managed Fishery
WTO	Wildlife Trade Operation