Review of management arrangements that support the Conservation Dependent listing of Scalloped Hammerhead shark (*Sphyrna lewini*) under the EPBC Act

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Disclaimer:

In preparing this report the author has made all reasonable efforts to ensure the information it contains is based on evidence. The views expressed in this report are those of the author based on that evidence. The author does not guarantee that there is not further evidence relevant to the matters covered by this report and therefore urges those with an interest in these matters to conduct their own due diligence and to draw their own conclusions.

Key Findings

1. There are strong grounds for the conservation dependent (CD) listing of Scalloped Hammerhead shark (the species) to be reconsidered given Queensland (QLD) and the Northern Territory (NT) did not meet all of the Threatened Species Scientific Committee's (TSSC's) expected management measures when the species was listed as CD, and still have not done so more than one year later.
2. Both the NT and QLD have stated they have plans to meet the outstanding management measures but this is currently at least another year away.
3. The Australian sub-stock of the species has an estimated depletion range of 40 to 90 percent of its original biomass, with such a wide range leading to differing views on the need and urgency to take action to improve its status.
4. While QLD and the NT have put in place Total Allowable Commercial Catches (TACCs) to meet the Convention on International Trade in Endangered Species (CITES) Non Detriment Finding (NDF) regarding hammerhead sharks, and measures to slow the catch as it gets closer to the TACC, there are no agreed actions if the TACCs are reached or exceeded.
5. The absence of an on-going independent, comprehensive verification process for fisher log-book catch data in QLD means commercial fishing mortality estimates for the species are highly likely to be an under estimate, particularly in relation to quantities discarded.
6. While the NT employs both E-M and observers on its vessels it is unclear what level of confidence there can be in fisher logbook data on Scalloped Hammerhead shark given the design of both the programs.
7. Total mortality for the species is likely to be poorly estimated given the paucity or absence of data from non-commercial fishing sectors in all jurisdictions.
8. Matters raised in Findings 4 - 7 mean that it is possible that the 200 tonne CITES NDF national annual catch limit for the species could be exceeded.
9. The actions of Australia's international partners and neighbours will also influence hammerhead shark conservation decisions in Australia, particularly those of the US and Indonesia.

Key Recommendations (based on Key Findings)

Recommendations for immediate action relating to QLD and NT relevant fisheries

1. The TSSC must review the CD status of Scalloped Hammerhead shark (the species) and also consider an EN listing on the basis that:
   - neither the NT nor QLD had all the expected management measures in place at the time the Minister listed the species as CD,
   - neither the NT or QLD have all the expected management measures in place more than a year after the Minister listed the species as CD, and
   - it is unclear at present whether all the outstanding management measures will be effectively implemented by 2020.
2. All target fishing for the species must cease in all jurisdictions until:

- total mortality is better estimated and accounted for in management measures, and
- a harvest strategy (HS) and harvest control rules (HCRs) for the species are in place in both QLD and the NT, and there is support from WA for those measures.

3. A review of progress against the relevant fisheries Wildlife Trade Operations (WTOs) must be completed by the Department of the Environment and Energy (DoEE) by May 2020 given the relationship between the WTO conditions and the TSSC's expectations regarding management measures to support the species.
4. A level of observer coverage or its E-M equivalent must be in place that is designed to provide statistically significant data with which to verify fisher logbooks and data linking/matching ICT capability fully functional.
5. The species should be subject to a fishery independent quantitative stock assessment involving the collection of necessary data and the use of an appropriate technique, such as close kin genetics.

Recommendations for national actions to support Scalloped Hammerhead shark

6. Fins naturally attached (FNA) must be made a legal requirement in all Australian fisheries for all species in the hammerhead shark group.
7. The Federal Government should be approached to determine how Indonesia can be encouraged to take actions to help rebuild the Scalloped Hammerhead stock that is shared with Australia.
8. The Australian government reconsider its reservation on the CMS listing of both Scalloped and Great Hammerhead sharks to ensure the biomass of the species have the maximum opportunity to increase in size in each future year.

*NB **'relevant fisheries'** are the QLD East Coast Inshore Finfish fishery (ECIFFF), QLD Gulf of Carpentaria Inshore Finfish Fishery (GCIFFF) & the NT Offshore Net and Line Fishery (ONLF)*

Please note that this report also contains other matters that should be pursued but are regarded as less immediate or important than the matters above.

Introduction

Scalloped Hammerhead shark (the species) is a medium to large shark that is taken in a variety of commercial, artisanal and recreational fisheries globally. It was listed as Endangered (EN) by the IUCN in 2007 (noting this listing is recognised as needing updating) and in 2011 by NSW (**Attachment 1**). The US listed some stocks of the species as EN and other as Threatened (a conservation category which included the Australian sub-stock) in 2014 (**Attachment 2**). The species, when assessed by the Threatened Species Scientific Committee (TSSC – Cwlth), was eligible for EN listing based on levels of stock depletion, but was ultimately listed as conservation dependent (CD) by the Australian government in 2018. This decision was based on undertakings from Queensland and the Northern Territory governments to have a suite of management measures in place by the time the Minister listed the species. Australian range states and the NT have not listed the species in a conservation category.

This report primarily considers the undertakings of the two jurisdictions which led the TSSC to provide advice to the Minister to have the species listed as CD rather than EN.

The Background section of this report sets out the undertakings of QLD and the NT and the expectations of the TSSC as a result. It also summarises the recent CITES Non-Detriment Finding (NDF) for hammerhead sharks in Australia and the current Wildlife Trade Operations (WTOs) granted to the relevant fisheries. It also looks back at the decision to take out a reservation when the species was listed (along with others) under the Convention on Migratory Species (CMS). A number of scientific reports and related articles about the species have also been considered.

This report then analyses the extent to which the undertakings by QLD and the NT were implemented, and extends its considerations to related issues relevant to the sustainable harvesting and conservation of the species including decisions made by various bodies and individuals about the species.

Conclusions, findings and recommendations are then made that relate to the strength of the case to have the CD listing revisited and for the conservation status of the species to be reconsidered by the TSSC.

Background

There has been a recent literature review (to 2017) undertaken by the TSSC leading up to the Conservation Dependent (CD) listing of Scalloped Hammerhead shark (the species) in March 2018 by the Hon Melissa Price MP, Minister for the Environment (the Minister). That review is extensive and not fully revisited here, but it is drawn upon along with any new or other relevant information.

From its literature review, expert reports and its own deliberations the TSSC determined that the species is eligible for listing under Endangered (EN) and Conservation Dependent (CD) categories of the EPBC Act.

EN eligibility was based on Criterion 1 A2(a), (b) & (d) – population reduction based on direct observation, an index of abundance and actual or potential levels of exploitation. Population reduction for the stock was in the range 50-80 percent (Indonesian component 60-90%, Australian component 40-80%).

A key statement relevant to this report made by the TSSC in relation to the listing of the species as CD rather than EN is as follows - ***'The advice of the Committee contained herein is therefore based on the understanding that these measures (below) will be implemented, without alteration, and in force under law, prior to*** (my emphasis) ***the Minister for the Environment and Energy's listing decision under the EPBC Act being made.'***

The Minister accepted the advice of the TSSC and listed the species in the CD category effective from 15 March 2018. The measures referred to in the key statement above are assumed to be those specified in relation to EPBC 179(6)(b) which, if met, enable the species to be listed as CD.

It should also be noted that the TSSC recommended the following be put into practice by the Department of Environment and Energy (the Department) in relation to this listing:

- Check catch validation
- Check landing of hammerhead sharks with fins naturally attached
- Advise the Committee of the QLD June 2019 review of hammerhead stock status
- Monitor catch levels of winghead sharks compared to scalloped & great hammerhead
- A full review of the CITIES non-detriment finding following the QLD review
- TACCs to be reviewed in line with the revised non-detriment finding
- Notify the Committee if the Northern Shark Fishery is to be reopened in WA
- An annual report on the performance of the suite of management arrangements relating to 179(6)(b)(ii)
- Review this listing within 5 years.

A summary table of the performance of Queensland and the Northern Territory against the fisheries management measures expected by the TSSC, along with a progress table against the TSSC's recommendations to the Department, is at Attachment 3.

Also considered in this report is the CITES NDF in relation to the CITES listing of hammerhead sharks in 2014. This preceded the considerations of the TSSC but the NDF, in relation to several hammerhead species (including Scalloped Hammerhead) and recommendations for management from the Australian CITES Scientific Authority, are relevant to this report and are at **Attachment 4.**

In addition, Australia's decision to take out a reservation regarding the listing of the species under the CMS in 2014 is also considered as it is at this point the Australian government took a position that it most often does not and raised some public concern (**Attachment 5**). This decision then influences what then occurs in relation to Australia's response to the CITES listing of hammerhead sharks and the subsequent domestic listing of Scalloped

Hammerhead as CD given the implications for governments and commercial and recreational fishers.

Method of Analysis

This is necessarily a qualitative analysis since it focusses on undertakings made by both QLD and NT to put fisheries management measures in place in relation to advice to the Minister by the TSSC to list Scalloped Hammerhead shark (the species) as CD. It relies primarily on published information and personal comments from staff of the relevant jurisdictions who were contacted by the author.

The methodology takes account of the various elements of s179(6)b of the EPBC Act in relation to the expectations the TSSC had of QLD and NT to implement fishery management measures that were the basis of CD rather than EN listing advice to the Minister.

Also considered is any new information (scientific or otherwise) that may change the conclusions the TSSC made at the time it provided advice to the Minister including:

- New stock population reports
- Catches in the QLD Shark Control program
- Changes in catch information on winghead sharks
- Assumptions about the accuracy of discard reporting & rates.

Other relevant information obtained as a result of investigating the CD listing was also considered.

The outcomes of the considerations above form the basis to answer the following question in the Discussion section of this report:

Do current management measures support the CD listing for the species as intended by the TSSC or does the listing need to be revisited with both CD or EN as possible outcomes?

Results

An analysis of progress by QLD and the NT against the TSSC's expectations to have fisheries management measures in place for Scalloped Hammerhead sharks follows. Please note that the TSSC's expectations are in **bold** below with an indication of whether the management measure is **IN PLACE, MAY BE/PARTLY IN PLACE** or **NOT IN PLACE**. The text then comments on progress and any related matters. As noted earlier **Attachment 3** provides a summary of the results.

QUEENSLAND

An annual 150t TACC for all hammerhead sharks (with regional sub-limits)

IN PLACE

When 75% of the TACC is reached then trip limits (10 net & 4 line) are introduced

IN PLACE

All hammerheads landed whole (head & fins attached)

NOT IN PLACE

Hammerhead sharks have been targeted in the East Coast Inshore Fin Fish Fishery (ECIFFF) and Gulf of Carpentaria Inshore Fin Fish Fishery (GCIFFF) for many years but are currently byproduct species due to low market demand. Nonetheless they remain the subject of specific management measures. QLD has a 150 tonne annual commercial catch limit for all hammerhead shark species combined that has taken account of the CITES NDF report. Within its 150 tonnes QLD has in place east coast regional catch limits of 78 tonnes in northern QLD and 22 tonnes in southern QLD. The remaining 50 tonnes is the catch limit for the GCIFFF. Within the overall 150 tonne TACC for hammerhead shark a maximum 100 tonnes can be Scalloped Hammerhead (the species).

Hammerhead sharks can be processed at sea (fins not attached) until 75 per cent of the TACC is reached. Once this amount has been registered caught, fishers are required to land sharks with fins (but not the head) attached to aid species identification. While useful, these measures do not prevent misreporting of catches (either through accidental or deliberate misidentification or underreporting).

Vessel trip limits also apply after the 75% trigger has been reached with 10 for the net sector and 4 for the line sector. It is unclear what the management response would be if the Scalloped Hammerhead TACC is met or exceeded.

Most other Australian fisheries require hammerhead (and other) sharks to be landed with fins naturally attached at all times to reduce the misreporting risk. While QLD does not currently have this arrangement in place it previously advised at the annual Shark Plan meeting in October 2018 that it was going to consult on this measure. Six months later it appears to have made little progress with the consultation which is yet to commence.

Further measures, including fishery independent monitoring, are being developed to improve reporting of hammerhead shark catches to species level. QLD currently has electronic monitoring (E-M) trials underway in several of its fisheries alongside a temporary at-sea data collection program specifically aimed at sharks.

Reporting discards of hammerhead sharks on fisher logbooks came into effect in QLD in 2018 and will provide future stock assessments with data on this source of mortality. While discard reporting is a useful step forward the quality of this data will likely remain poor until E-M is fully deployed and data matching systems are in place.

A stock assessment for whaler and hammerhead sharks was undertaken in 2015 but constrained by problems with logbook data quality and the availability of information on discards. Catch limits were modelled on limited on-board scientific observer data collected between 2006 and 2012, prior to cessation of the observer program. The 2015 report states that future stock assessments would benefit from improved catch composition data and afford greater confidence in sustainable harvest limits (Leigh, 2015). This view is re-enforced by a self-published paper by Cortes (2016).

A harvest strategy (HS) is being developed for the ECIFFF and GCIFFF. The HS is expected to contain strategic objectives and performance criteria to measure the effectiveness of management arrangements. This is scheduled to be finalised by December 2019 and implemented for the 2020 fishing season (starting on 1 January 2020). The HS currently being developed for the fisheries is expected to account for all sources of mortality (commercial, recreational including charter and indigenous). The priority given to Scalloped Hammerhead shark in this process is not clear.

Data validation (through prior reporting & at unloading)

IN PLACE

The one hour reporting prior to landing requirement when a fisher has shark on board is enabling Fisheries Officers to undertake random inspections more readily. However, it is having the unintended consequence of some fishers discarding sharks when they only have a few on board due to the increased cost and inconvenience of waiting for permission to land. QDAF is aware of this and working to find a solution (QDAF, pers comm).

Independent data collection and validation program from 1 January 2020, catch disposal for collection and validation of accurate retained catch data, forensic auditing and cross checking of data (eg logbooks and VMS) are all likely to improve QDAF's future enforcement capability and benefit shark management. These initiatives require considerable investment in ICT systems and personnel capabilities which may take beyond 2019 to fully implement.

Also, Catch Disposal Records (for quota reporting) are in place and require the recording of shark species landed which enables cross checking with logbooks.

Inspections at sea and in port

MAY BE IN PLACE

QDAF has a compliance program which is capable of investigating and responding to any alleged misreporting. QDAF uses a fishery Compliance Risk Assessment framework to develop state and regional operational plans to deliver its compliance program. An overview of this program is available on the QDAF website and includes references to at sea and in-port capabilities. However, it is unclear the extent to which this program is focussing on Scalloped Hammerhead shark.

Reporting catch by phone to enable real-time catch-monitoring

IN PLACE

For shark species, including hammerhead sharks, fishers must report their catch through QDAF's automated interactive voice response (AIVR) system prior to landing. There are variations in reporting requirements between fisheries and licence types for regulatory and practical reasons.

Cross validation of data (fisher logbooks, VMS data & buyer sourcing)

NOT IN PLACE

Data is collected primarily from commercial fishing logbooks which provide for reporting of target species and certain shark and ray species. QDAF has also published a number of identification guides for fishers but the degree to which they are improving identification and reporting at a species level cannot be verified.

Since the cessation of the observer programs seven or more years ago there has been no fishery-independent data collected to validate fisher logbooks. However, from January 2019 VMS has been introduced to the ECIFFF and GCIFFF which will provide a significant independent data stream to QDAF by enabling it to both track boats and in many cases determine whether they are fishing or not. Catch validation remains a work in progress with a comprehensive observer and/or E-M program scheduled to be in place by 2020.

Regarding the use of observers, QDAF has advised that due to their small size most ECIFFF boats can refuse an observer due to crewing requirements under Australian Maritime Safety Authority legislation. Larger boats can also refuse to carry an observer on occupational health and safety grounds. This makes the use of observers problematic in many parts of the fishery leaving few on-going monitoring solutions other than VMS & E-M.

QDAF is investigating the use of E-M as a means of providing fisher independent data as part of its Sustainable Fisheries Strategy. Electronic monitoring has been shown to significantly improve the quality and reliability of fisher-dependent data in other Australian fisheries and elsewhere in the world. QDAF has advised that E-M will be implemented as follows:

Stage 1: Implementation of vessel monitoring systems (1 Jan 2019) with the remaining actions to be progressed during 2019 and *include data dictionary; forensic auditing and cross checking of data; education and capacity building; logbook design and development and rollout of electronic reporting solutions; catch disposal for collection and validation of accurate retained catch data*; and

Stage 2: An independent data collection and validation program (such as electronic monitoring) from 1 January 2020.

As noted earlier the ICT and personnel challenges contained in Stages 1 and 2 should not be underestimated and the timeline for implementation appears ambitious.

While there are no recent independent stock surveys for hammerhead sharks in QLD, QDAF has recently commenced a shark monitoring program in the ECIFFF that elicits information from the fishers about their practices and what motivates them. This information is intended to be used to help inform future fisheries management arrangements that account for those motivations (QDAF, Pers comm).

Species specific catch and discard information in logbooks

IN PLACE

A new logbook was recently introduced that enables the recording of individual shark species, including scalloped hammerhead, and incorporates the recording of discarded catch. QLD data shows the reported landed catch of 27 t for all hammerhead sharks in 2018. Discarded hammerhead shark for all of QLD was 17 tonnes in 2018, noting some logbooks are still being received and entered. Discard amounts from early 2019 data shows an increase from the same period compared to 2018. This may be due to poor market demand or other factors.

While the new logbook is a useful step forward the issue of misreporting of catches remains until an independent verification process is in place. It would also be advisable for tighter timelines to be in place for logbook returns so that more up-to-date data can reported.

N4 sector to have VMS

IN PLACE

VMS became mandatory for all commercial fishing boats in the ECIFFF and GCIFFF from 1 January 2019. This includes N1, N2 and N4 vessels. The portion of vessels polling without fault would be a useful performance measure for the VMS program. A suggested benchmark is 95% in year one moving to 98% in subsequent years.

Other relevant matters

Research

QDAF commenced a three-year research project in July 2017, to validate catch composition of shark species in net fisheries along the east coast as well as the Gulf of Carpentaria. This project aims to determine species catch composition of harvest by sampling at ports, processors or on-board/on-water. It also aims to develop a profile of discards, by including data gathered from random on-board observations.

The TSSC, in its assessment of Scalloped Hammerhead shark for listing as a threatened species, also noted that the Queensland government is undertaking a review of the hammerhead shark stock assessments in 2019. This is likely to be as part of the Sustainability of Australian Fish Stocks (SAFS) reporting (QDAF, Pers comm).

Data Limitations

The Queensland government collects information on protected species interactions and publishes some of this information on the data.qld.gov.au website. The available records detail species, fishing methods and whether the animal was released alive, dead or injured. The published records do not distinguish where interactions occurred which means interactions at a fishery level or finer spatial scale are unknown. The published records also do not include records taken from five boats or less (for confidentiality reasons). Distinguishing interactions that occur in the ECIFFF line sector from line fishing sectors in other Queensland managed fisheries is also difficult.

Performance Review

There is currently no process in place for reviewing fishery management performance. A performance measurement system was in place historically for the ECIFFF and GCIFFF but is no longer in effect. With the development of a HS, HCRs, ERAs and related regulations a fisheries performance review at least every five years should be undertaken.

Ecological Risk Assessments (ERAs)

QDAF has committed to undertake and publish ERAs for all fisheries including ECIFFF and GCIFFF according the following timeframe:

A Level 1 ERA for the ECIFFF by July 2019

A level 2 ERA for species of conservation concern (including protected species and identified shark species) by December 2019

A level 2 ERA for target and byproduct species during 2019–20, and

A level 2 ERA for bycatch species in 2020–21.

National Fisheries Arrangements

Fishery management arrangements in QLD do not explicitly require fishers to comply with relevant threat abatement plans, recovery plans, the National Policy on Fisheries Bycatch, and bycatch action strategies developed under the policy. QDAF regards these as useful guidance documents in formulating its regulatory arrangements, rather than being prescriptive in terms of what the regulations should contain (QDAF Pers comm).

Line fishing sector of the ECIFFF

Bycatch rates have historically regarded as low in the line sector with most unwanted bycatch assumed to be released unharmed. However, recent data is sparse and previous assumptions about the quantity and fate of bycatch should be updated as part of the fishery research program. More recent research suggests that released hammerhead shark may have high levels of mortality (Dapp et al, 2016 and **Attachment 6**).

Current Bycatch Mitigation

Bycatch mitigation measures currently in place in the ECIFFF and GCIFFF net sector include restrictions on net type, length and mesh size for mesh nets, net attendance rules and the use of turtle excluder devices in tunnel nets. No specific bycatch mitigation is apparent for the line sector. It is unlikely that the current bycatch mitigation measures in the net sector would lead to any significant reduction in hammerhead shark catch and mortality rates.

CITES Listing

Great Hammerhead (*Sphyrna mokarran*), Scalloped Hammerhead (*S. lewini*) and Smooth Hammerhead (*S. zygaena*) sharks are listed under CITES Appendix II, and these species were targeted, and are now byproduct, in the GCIFFF and ECIFFF.

In 2014, Australia's CITES Scientific Authority determined that Australia's national take of hammerhead sharks would not be detrimental to the survival of the species if catch was restricted to levels at the lower end of the historically recorded range from the commercial fisheries. QLD's position was that the existing ECIFFF catches would not be detrimental to the survival of the hammerhead species during the term of the proposed approval of the previous WTO. This position was based on the management arrangements in place to monitor and control the level of harvest of CITES species in the ECIFFF, and the conditions imposed. The TSSC subsequently took a different view.

Further, QLD determined that the CITES listed species harvested from the fishery are not considered to be overfished in Queensland and management arrangements including catch limits are designed to ensure their ecologically sustainable harvest. However, this has since been superseded by the National Shark Report Card which describes both Great and Scalloped Hammerhead as depleted and overfished (Simpfendorfer et al, 2019).

Despite its stated position above QLD has complied with the CITES NDF and is progressively implementing the TSSC expectations regarding management measures for Scalloped Hammerhead shark.

Wildlife Trade – Part 13A

ECIFFF and GCIFFF WTO Condition 6, which directly refers to hammerhead sharks, is in place for each fishery until December 2021 and March 2022 respectively, and a brief commentary on progress to date follows

Condition 6: The Queensland Department of Agriculture and Fisheries to:

a. Continue to support fishers to accurately identify and record sharks at the species level. This should include some assessment and monitoring of reporting performance to identify and target ongoing improvements where necessary.

Education through identification guides is in place and was recently re-launched, but there is doubt that identification to species level by fishers is accurate. There has been no assessment or monitoring of reporting performance to date noting new regulations have been in place just over a year.

b. Ensure all commercial catches of shark species of conservation concern can be readily and reliably determined, at a taxonomic level sufficient to monitor and manage risks at the species level. This may require a prohibition on removal of fins, fillets or other morphological features that assist in identifying species prior to landing.

Shark fins can be removed prior to landing in most cases, including Scalloped Hammerhead shark, up until 75% of the TACC is taken following which they must be attached. The likelihood of underreporting and misreporting the species in such circumstances remains high.

c. By February 2020, report results of the Queensland Government's scheduled June 2019 review of hammerhead stock status to the Department, in a form suitable for the TSSC's review of Conservation Dependent species.

The review has been commenced and due to be completed by the due date via the SAFS process managed by the Fisheries Research and Development Corporation.

d. Review and provide catch data for Scalloped Hammerhead (*Sphyrna lewini*), Great Hammerhead (*Sphyrna mokarran*) and Winghead Sharks (*Eusphyra blochii*) to the Department of Environment and Energy for the TSSC's consideration. The data should be in a form that facilitates a comparison of catch levels between the three species, and provide advice on the level of confidence in the various data collected by Queensland Department of Agriculture and Fisheries.

As noted above there remains significant issues with species identification by fishing operators through misidentifying the species and/or under report catches (especially discards). Given fishery independent data collection has just commenced via VMS, and is proposed to commence in 2020 with E-M, it will likely be some years before there is a full capability to verify logbook data quality.

e. Provide annual reports to the Department of Environment and Energy (as per Condition 3) on the performance of management arrangements, including actions undertaken as part of these conditions, and which comprise the 'plan of management' for the purposes of subparagraph 179(6)(b)(ii) of the EPBC Act for Scalloped Hammerhead Sharks.

QLD is seeking to meet the TSSC in the coming months to update it on progress against the requirements that led to the CD listing of the species. See ***Attachment 3*** *for QLD's progress against these requirements.*

Regarding the previous (now expired) WTO it is unclear whether QLD provided DoEE with all the required annual reports. Whether or not they have all been provided, there appears to be a lack of clarity regarding whether they are made public or not. Clarifying this with DoEE would be useful.

Recreational Fisheries

QLD will be consulting on a proposed non-retention of hammerhead sharks by recreational fishers in mid 2019. It is unclear what other recreational fishing rules may be considered for change with the use of circle hooks, line cutters, de-hookers and ban on heavy traces all worthy of consideration to improve the survival of all shark species, including Scalloped Hammerhead shark.

NORTHERN TERRITORY

New regulations for the Offshore Net and Line Fishery (ONLF) commenced in December 2018 and the associated Management Framework, including the Harvest Strategy, are also in place. These respond to many of the TSSC's expectations regarding management measures for Scalloped Hammerhead shark.

Annual TACC of 50t for Scalloped Hammerhead

IN PLACE

Once catch reaches 37.5t then harvest control rules implemented

IN PLACE

HCRs could include increased observer coverage, area closures, fishery closure, trip limits, gear restrictions and temporal closures

IN PLACE

Scalloped Hammerhead shark is considered a secondary commercial species in NT fisheries. The 50 tonne TACC has been in place since late 2018 and appears unlikely to be fully caught, probably for the same market reasons the QLD fishery is facing and because it was introduced part way through a fishing year.

NT's response to the recent listing of hammerheads on CITES Appendix II was to develop what it regarded as precautionary management measures for both great and scalloped hammerhead sharks. The measures are aimed at ensuring the catch of hammerheads is maintained at levels consistent with the NDF and for the NT that means no more than 50 tonnes of scalloped hammerhead per annum as a TACC.

Relevant statutory provisions, including possible management responses, are contained in the NT Offshore Net and Line Fishery (ONLF) Management Plan 2018 (**Attachment 7**) and include:

- maintaining the catch of secondary species (including Scalloped Hammerhead) at sustainable levels;
- using logbook information, observer data and catch disposal records (CDRs) to determine annual catch;

- setting the annual commercial retained harvest for the species at no more than 50 tonnes;
- once the recorded catch reaches 75% of the TACC (37.5 tonnes) the species must be landed fins and head on, and 5 per species trip limit is implemented
- once the 50 tonne TACC is recorded taken then a range of management actions may be used to limit further catch.

Actions that may be taken include reviewing the appropriateness of the TACC, introducing a trip limit (five proposed), fins attached to body, cease targeting of sharks and cease all fishing. Other actions could include gear modifications, move-on provisions or closures. While one or more of these measures might be useful none are pre-agreed HCRs so there may be considerable delay before any implementation during which time the TACC could be exceeded.

Apart from the 37t trigger point and associated rules there are no plans to develop further species specific Scalloped Hammerhead performance indicators or decision rules. However, in line with the Northern Territory Fisheries Harvest Strategy Policy, harvest strategies can be periodically reviewed through advisory group processes. It should also be noted that new hammerhead shark assessments have been accorded a high research priority by the NT (NTF, Pers comm).

Data validation techniques including-

VMS on all vessels

IN PLACE

Electronic logbooks

NOT IN PLACE

VMS is now in place on all ONLF vessels. Outputs from the VMS will be used to confirm the location of fishing operations and used in determining impact on habitat type and total overlap of fishing activities with species distribution during the Sustainability Assessment of Fisheries Effects (SAFE) assessment. SAFE is a semi-quantitative ERA process from which fishing mortality can be derived.

E-logs are currently being trialled in the ONLF and, if successful, implementation will follow in 2020.

Product unloaded in Darwin & Gove only

PARTLY IN PLACE

Scalloped Hammerhead (and other species) from the ONLF can only be landed in Gove and Darwin unless an exemption is granted by the Director of Fisheries. Arrangements for exemptions are currently being considered and will probably apply to smaller and more remote fishing operations.

Sharks landed with fins naturally attached (with exemptions)

IN PLACE

The Fins Naturally Attached (FNA) regulation applies to all shark and ray species landed in the ONLF regardless of harvest levels. Operators may seek an exemption to process sharks at sea, however exemptions are conditional on e-monitoring (video) coverage (NTF Pers comm).

Heads remain attached to body unless E-M operational

NOT IN PLACE

Once the 37.5 tonne catch trigger level for Scalloped Hammerhead all subsequent landings from the ONLF must have the head and fins naturally attached.

Species specific recording in CDRs

IN PLACE

Catch disposal records (CDRs) require the recording of the number and weights of Scalloped Hammerhead sharks (NTF Pers comm).

Random port inspections

IN PLACE

VMS enables fisheries officers to inspect catches both at sea or in port. This now includes a port departure notice to enable pre-trip inspections to take place as well.

Increased monitoring to at least 20% where high risk of interactions exist

IN PLACE

Observer coverage is linked to the harvest of the fishery. One observer trip is conducted for each 20% of combined TAC taken, or ~300t combined catch. Note that this is not the same as 20% observer coverage of fishing trips, shots or the catch where the number of observer trips would be higher.

Observer and logbook reporting and on-board cameras (electronic monitoring) will be utilised to monitor interaction levels with all conservation listed species in the fishery.

Information from this observer coverage will be used to assess the type and amount of bycatch and conservation listed species that are interacted with during fishing operations. There will be information collected on size and age of target species, bycatch quantity and composition and conservation listed species interactions and habitat distribution when research officers are present on observer trips.

ONLF Management Plan

Historically, advice from the TSSC noted there is recognition that much has been done (and is planned) to sustainably manage sharks in the NT ONLF, but that the current rules in place were not sufficient to support a CD listing. The Committee also noted that a number of additional measures would be required before September 2017 to support the consideration of a CD listing (catch limits, verification of catch and discards, monitoring etc).

The Offshore Net & Line Fishery (ONLF) now operates under a statutory fisheries management plan (2018). This plan incorporates many of the requirements of the CITES Scientific Authority's NDF and the TSSC's management measures in relation to Scalloped Hammerhead shark.

Following the implementation of the management plan the ONLF was granted a three year WTO in April 2019 which expires in March 2022.

Other New Information

There is a new publication (Roff et al, 2018) which uses the Queensland Shark Control Program (QSCP) data to estimate the depletion of the species over 5 decades and concludes a 92% depletion. However, it is unclear how the catch rate data was standardised to ensure a reasonable comparison over time given changing parameters such as fishing gear, skippers, crew and vessels.

The first national report card on the status of shark and ray species in Australia was released in March 2019 (Simpfendorfer et al). Scalloped Hammerhead shark was assessed as a depleted stock and overfished.

Winghead sharks were noted as of interest to the TSSC. Their catch in QLD of around 35 tonnes in 2018 is not comparable historically since this group was not separately reported before 2018, and identification remains imperfect. NT catches of Winghead sharks, including discards, have been reported for many years. In 2018 the total catch was 4.2 tonnes, with about 50% discarded, and five year average total catch of around 6.3 tonnes.

WA is yet to put in place a fins naturally attached (FNA) requirement for its relevant fisheries and it would be useful for it to do so prior to any reactivation of its Northern Shark Fishery.

Discussion

This discussion focusses on answering the question:

Do current management measures support the CD listing as intended by the TSSC or does the listing need to be revisited with both CD or EN as possible outcomes?

The short answer is that:

the TSSC must review the CD status of Scalloped Hammerhead shark and also consider an EN listing on the basis that:

- **neither the NT nor QLD had all the expected management measures in place at the time the Minister listed the species as CD,**
- **neither the NT or QLD have all the expected management measures in place more than a year after the Minister listed the species as CD, and**
- **it is unclear at present whether all the outstanding management measures will be effectively implemented by 2020.**

This answer draws on the Results section above with key elements expanded on in the Discussion below.

Queensland

QDAF has stated previously that Scalloped Hammerhead shark is a target species (although currently a byproduct due to a poor market), therefore consideration should be given to what this means in terms of specific management measures, particularly to develop a harvest strategy and harvest control rules.

While a formal harvest strategy (HS) is yet to be developed for the species the estimated level of depletion suggests that the stock is almost certainly below commonly used target reference points for sharks (40 to 60% of initial biomass (Bo)) It may also be below commonly used limit reference points for all marine fishes (10 to 30% of Bo) when stock rebuilding becomes urgent. Notwithstanding the absence of a formal HS, the CITES NDF for the species recommended a national limit of 200 tonnes per annum based on reported annual commercial catches. The 200 t pa reflects the lower end of the recent range of annual commercial catches. This has then been divided into 100 tonnes for QLD, 50 tonnes for the NT and 50 tonnes for other fishing mortality (other jurisdictions, discarding, incorrect species identification, non-reported catch and catch by other fishing sectors being poorly reported). This approach appears consistent with concerns about misreporting in Koopman & Knuckey (2014).

QLD and the NT cite a range of possible management actions should the TACC for the species be approached or exceeded. While several are pre-agreed, many are not and the process of selecting and applying a preferred suite of additional measures is not stated. This causes uncertainty for the fishing industry and other stakeholders, and could lead to significant overcatching of the species while consultation and decision making take place. It

is far preferable to have all actions pre-agreed (as is the purpose of HCRs) so that interested parties understand before the TACC is reached what the management actions will be if it is.

While Roff et al 2018 have determined a 92% reduction in the CPUE for hammerheads from 1962 to 2017 based on QSCP data, this is not conclusive. The review of the literature and other data to 2017 by the TSSC suggests a lesser depletion range of 40 to 80% for the Australian sub-stock. However, it does raise the prospect that the earlier depletion range may be too narrow and should be extended to around 90%. It should be noted that if depletion were confirmed to be around 90% several other Australian shark species with a similar level of depletion have been recommended by the TSSC for listing as CD and previous Ministers have accepted this advice. However, the difference in the case of Scalloped Hammerhead shark is that expected management measures were not in place at the time the CD listing advice was accepted by the Minister, even though the TSSC understood that they would be so.

As an example from another jurisdiction, gulper sharks comprise several species with estimates of depletion ranging from 75% to 90%. Most of the depletion occurred from the late 1980s to early 2000s with shark livers the valued product. There is no stock assessment for these species. Management actions are focussed on on-going spatial fishery closures to preserve and rebuild remaining populations over a long period of time (many decades). There are also catch and release rules in place when any gulper shark is caught and closed areas differentiate between the two main fishing methods (otter trawl and demersal longline). Spatial management is preferred as gulper sharks are generally resident in local areas, especially in the Commonwealth SE Fishery which has VMS on all boats, e-logs (including daily reporting of interactions with gulper sharks) and longline boats with electronic monitoring and/or high levels of observer coverage. These tools also enable almost immediate boat level responses to interactions with gulper sharks when they occur.

Another example is school shark which comprise a single management unit in Australia within which several regional and overlapping sub-populations are thought to exist. The Australian stock also has some minor exchange with the NZ stock. The depletion estimate for the Australian stock is about 90%. This stock has also recently been the subject of a close-kin genetic analysis which has confirmed the amount of depletion and that slow rebuilding may have begun. Management actions are focussed on preventing targeted fishing and linking the 'bycatch TACC' to a ratio against the primary target species in the fishery, gummy shark. Catch and release rules also apply. Similar to the relevant QLD and NT fisheries, this is predominantly a gillnet fishery with a demersal longline fishery component. However, all boats in the fishery have VMS and E-M or observer coverage, and are moving to e-logs. Again, these technologies enable boat level responses to high levels of school shark bycatch.

In comparison to the above two fisheries Scalloped Hammerhead shark catch in QLD is significantly higher risk, particularly given poor data quality, limited fishery monitoring and no catch data verification.

While further scientific analysis planned by QLD (currently due to be completed in July 2019) may reduce the current depletion range, generally poor species-specific data, several unique

datasets and the unverified nature of much of the data means that it is likely that a considerable range of possible depletion estimates for Scalloped Hammerhead will remain. Consideration of fishery independent techniques, such as close kin genetics, is probably the most feasible way to gain a more accurate understanding of stock size and depletion, and then track it through time. If this was accepted and regarded feasible a project started today would take until at least 2021-22 to produce results, so other immediate management actions must be taken, such as no targeted commercial fishing, closures and move-on rules.

While the new scientific information re-enforces many of the uncertainties about the science of Scalloped Hammerhead shark it makes little progress in resolving them. One major reason for that is that without an observer program or E-M, and with VMS just commenced, the fishery dependent data (logbooks) must be treated with great caution as it is highly likely to misrepresent the level of catch of the species and their life status, if discarded. When the fishery independent data collection program is implemented it must be specifically designed to address the objective(s) being sought (eg estimating the total mortality of Scalloped Hammerhead in ECIFFF using a power analysis or similar tool. This will then drive the most cost-effective design for an independent data collection program. QLD has stated that it is seeking to have such a program place by 2020 as required by the fishery WTO. The recent DoEE assessment of the relevant fisheries against the EPBC Act Guidelines shows prior to the WTOs being granted showed that only 3 of 37 requirements were fully met and either 9 or 12 (depending on the fishery) of 37 not met at all. This suggests that the GCIFFF and ECIFFF have some way to go before they are compliant with the Guidelines.

In 2017 much of the information described above and the associated management risks would have been known to the TSSC. For reasons which are not clear the TSSC entrusted QLD with having the necessary arrangements in place under law by the time Minister Price made her decision on listing the species as CD. This level of trust is somewhat at variance with previous CD listings where the management agency had to demonstrate it had the necessary arrangements in place beforehand, or at least had decision maker approval to enact them almost immediately afterward, e.g. Orange roughy, School shark and Gulper sharks. The degree to which QLD had not met the TSSC's expectations is reflected in the current WTO conditions for the ECIFFF and GCIFFF. They set out the significant work remaining for QLD to meet the TSSC's expectations as to what should have been in place by March 2018.

Northern Territory

In general, the NT either has in place or is in the process of putting in place many of the management measures expected by the TSSC through the recently prescribed ONLF Management Plan 2018. Many of the measures are also reflected in the fishery's current WTO. However, the issue of needing an accurate estimate of the total mortality of the species in all NT fisheries sectors (commercial, charter and recreational) means the risk of the 50 tonne TACC for Scalloped Hammerhead shark being exceeded in at least some years remains.

A number of the matters raised in the QLD part of the Discussion are also relevant to the NT including stock connectivity to Indonesia, the need for a quantitative stock assessment for the species that is preferably independent of the fishery logbook data and completing the implementation of a fishery independent monitoring program.

Western Australia

Reactivation of the Northern Shark Fishery (NSF) remains a possibility given approaches by industry representatives to the WA government. If the fishery does reopen, the fisheries management measures expected by the TSSC of the relevant QLD and NT fisheries would be equally applicable to the WA NSF.

Stock Structure

The matter of stock structure for the species both within Australia and between Australia and Indonesia is worthy of specific comment. Welch et al (**Attachment 8**) have found that there is stock structuring between QLD and NSW, and between Australia and Indonesia (which likely comprise the same stock). The link with Indonesia is more problematic since that portion of the stock is qualitatively assessed to be more depleted than the Australian portion. Further research is currently underway through the National Environmental Science Program to better understand hammerhead shark stock structure in the Australian region.

Any action by Australia to rebuild the species will best be achieved by working with Indonesia towards the same sustainability goals. Welch et al also note that there is some stock structuring within the QLD east coast area. As noted earlier, there are similar observations for the School shark stock off southern Australia which became a relevant factor in the application of close kin genetics to that species, that is, it made it more complex and time consuming. The experience of applying close kin genetics to School shark should be drawn upon if this technique is to be used for Scalloped Hammerhead shark.

Conclusions

In considering all the relevant matters the case to revisit the CD listing of Scalloped Hammerhead shark is strong. More than a year after the listing, when the NT and QLD were to have a range of agreed management measures in place for the species, neither jurisdiction has fully implemented these. The TSSC's expectations that led it to a CD listing advice to the Minister have not been met. Further, the latest science continues to suggest the Australian sub-stock has been depleted and perhaps more severely than previously thought.

The TSSC's expectations of QLD and the NT in relation to implementing a broad range of Scalloped Hammerhead shark management measures by March 2018 had a high risk of failure and this would have been apparent to the committee. Why it took the course of seeking an outcome from QLD and the NT that was not achievable in the timeframe available is unclear. It is more usual for the fisheries agency to demonstrate to the TSSC that it has expected management measures substantially in place before the advice of the TSSC is finalised and a listing decision made by the Minister.

In any event QLD and NT did not meet the expectations of the TSSC to have all the relevant management measures in place before the Minister's decision to list the species as CD.

Furthermore, the recent ECIFFF & GCIFFF WTO analysis by DoEE against the EPBC Act Guidelines showed that most requirements of the Guidelines were not being met with some not likely to be so until 2021. The current WTOs for the two fisheries extend to December 2021 and March 2022 respectively giving QLD further time to address the conditions which overlap with the TSSC expectations. Similarly, the NT ONLF was recently granted a WTO that expires in March 2022, although it has fewer conditions to address.

It is important to note that while the WTO timelines appear sufficient to address the conditions the establishment of VMS, logbook and E-M systems that can cross match and link data and provide timely reporting is a significant task. Working out the roles and responsibilities of the industry, service providers and the government is also both challenging and time consuming. While it might not seem like it at the time the easier part of establishing an independent verification process for fisher logbooks is getting VMS and E-M equipment on fishing boats.

The CITES Non-Detriment Finding for Scalloped Hammerhead sharks appears based on reported commercial catch data which is likely to represent a significant under-estimation of total mortality for the species in Australia. The 200 tonne national catch limit, which is at the lower end of the historic recorded annual commercial catch, is an attempt to set a conservative harvest level while better estimates of total mortality and sustainable harvest levels are determined. To date little progress appears to have been made on these matters and in the meantime the commercial catch has declined substantially apparently due to poor market conditions.

The wide range of depletion estimates for the species (~ 40 to 90%) makes decision making about appropriate management actions difficult and resolving this, preferably using a fishery independent assessment technique, is both urgent and important.

There is a similarly important need to verify fisher logbook data and improve species identification. It is highly likely this data will remain the primary source of information on Scalloped Hammerhead fishing mortality for at least the next few years while an independent means of assessment is identified, commissioned and the results obtained.

A final consideration is the effect of any actions in Australia to rebuild the species biomass to a higher level and that best being undertaken with concurrent actions in Indonesia which shares the same Scalloped Hammerhead shark stock. This would largely be a matter for the Federal Government to lead and a first step is to gain an understanding of Indonesia's willingness to act. With or without a cooperative approach from Indonesia, Australia must take all reasonable steps to rebuild the Scalloped Hammerhead stock in its own jurisdiction.

Attachment 1 NSW Scalloped Hammerhead Fact Sheet & FSC Decision

file:///C:/Users/seaqu/OneDrive%20-%20FutureCatch/NSW%20Fact%20Sheet%20-%20Scalloped%20Hammerhead.pdf

http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/432792/Scalloped-hammerhead.pdf

Attachment 2 US listing of Scalloped Hammerhead as Endangered & Threatened

https://www.scientificamerican.com/article/scalloped-hammerheads-become-first-shark-species-on-the-u-s-endangered-species-list/

https://www.cio.noaa.gov/services_programs/prplans/pdfs/ID208_Work_Product_Scalloped_Hammerhead_Report.pdf

Attachment 3 TSSC Conservation Dependent Listing Performance Tables

These tables summarise performance of QLD and the NT against the expectations of the TSSC in listing Scalloped Hammerhead Shark as CD rather than EN. They are colour coded to indicate whether measure is IN PLACE, MAY BE/PARTLY IN PLACE or NOT IN PLACE. Note that in some instances a reporting date has not yet been reached and the text is in black.

TABLE 1 Queensland Performance against TSSC Expectations

Queensland	**Measure**	**Performance against Measure**
The species is a species of fish s.179(6)b(i)	Scalloped Hammerhead Shark is a species of fish	IN PLACE
The fish species is the focus of a plan of management that provides for the management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long-term survival in nature are maximised s.179(6)b(ii)	An annual TACC (with regional sub-limits)	150 tonne annual TACC in place for hammerhead sharks with regional sub-limits: - 22 tonnes SE QLD - 78 tonnes NE QLD - 50 tonnes GoC No more than 100 tonnes per annum can be scalloped hammerhead
	When 75% of the TACC is reached then trip limits (10 net & 4 line) are introduced	IN PLACE
	All hammerheads landed whole (head & fins attached)	NOT IN PLACE. No requirement to have fins or head attached up to 75% of TACC above which fins only need to be attached
	Data validation (through prior reporting & at unloading)	IN PLACE One hour prior reporting of landing enables unload inspections

	Inspections at sea and in port	MAY BE IN PLACE While there is a compliance program to enable this, it is unclear how much focus is being placed on scalloped hammerhead shark
	Reporting catch by phone to enable real-time catch-monitoring	IN PLACE For all shark species fishers must report their catch through an automated interactive voice response (AIVR) system prior to landing.
	Cross validation of data (fisher logbooks, VMS data & buyer sourcing)	NOT IN PLACE VMS commenced 1 January 2019 and no evidence yet of cross validation with logbooks or buy data
	Species specific catch and discard information in logbooks	IN PLACE New logbook enables recording of sharks to species level and discards
	N4 sector to have VMS	IN PLACE All vessels in the GOC and ECIFFF (including the N4 sector) have VMS from 1 January 2019
The plan of management is in force under a law of the Commonwealth or State or Territory s179(6)b(iii)	An annual 150 t TACC for all hammerhead sharks (with regional sub-limits	IN PLACE (see above)
	When 75% of the TACC is reached then regional control rules are triggered	IN PLACE (see above)

Cessation of the plan of management would adversely affect the conservation status of the species s179(6)b(iv)	Maintain all the above measures	MAJORITY IN PLACE

TABLE 2 Northern Territory Performance against TSSC Expectations

Northern Territory	**Measure**	**Performance against Measure**
The species is a species of fish s.179(6)b(i)	Scalloped Hammerhead Shark is a species of fish	IN PLACE
The fish species is the focus of a plan of management that provides for the management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long-term survival in nature are maximised s.179(6)b(ii)	Annual TACC of 50t for Scalloped Hammerhead	IN PLACE
	Once catch reaches 37.5t then harvest control rules implemented	IN PLACE
	HCRs could include increased observer coverage, area closures, fishery closure, trip limits, gear restrictions and temporal closures	IN PLACE
	Data validation techniques including- VMS on all vessels	IN PLACE
	Electronic logbooks	NOT IN PLACE But trials underway
	Product unloaded in Darwin & Gove only	PARTLY IN PLACE Noting Director of Fisheries exemptions to be finalised
	Sharks landed with fins naturally attached (with exemptions)	IN PLACE Noting exemptions only for boats with E-M

	Heads remain attached to body unless E-M operational	NOT IN PLACE No requirement for head to be attached to body unless 75% TACC trigger breached
	Species specific recording in CDRs	IN PLACE
	Random port inspections	IN PLACE Supported by VMS and port departure notice
	Increased monitoring to at least 20% where high risk of interactions exist	IN PLACE Noting the 20% referred to may not be understood well
The plan of management is in force under a law of the Commonwealth or State or Territory s179(6)b(iii)	Annual TACC of 50t for Scalloped Hammerhead under the NTONLF management plan .	IN PLACE Via the ONLF Management Plan 2018
	When 40t is reached then control rules are triggered including increased observer coverage	IN PLACE Noting that a 37 tonne trigger is being used
	Implementing data validation techniques under the MP	PARTLY IN PLACE It is unclear whether NT has data matching capability yet
Cessation of the plan of management would adversely affect the conservation status of the species s179(6)b(iv)	Maintain all of the above measures	PARTLY IN PLACE

TABLE 3 QLD & NT Performance against TSSC Recommendations to DoEE

Department of Environment & Energy	Recommendation	Progress
	Check catch validation	NT PARTLY IN PLACE QLD PARTLY IN PLACE
	Check landing of hammerhead sharks with fins naturally attached	NT IN PLACE QLD NOT IN PLACE
	Advise the Committee of the QLD June 2019 review of hammerhead stock status	NOT DUE YET - Note using SAFS as the reporting tool
	Monitor catch levels of winghead sharks compared to scalloped & great hammerhead	NT & QLD - Species level ID is new in logbooks NT has observers & E/M deployed for verification QLD is yet to deploy observers or E-M
	A full review of the CITIES non-detriment finding following the QLD review	NOT DUE YET - Current catches in NT & QLD well below NDF levels
	TACCs to be reviewed in line with the revised non-detriment finding	NOT DUE YET - Fishery independent quantitative assessment required
	Notify the Committee is the NCSF is to be reopened with WA	While interest has been shown in the fishery there is no immediate plan to reopen it
	An annual report on the performance of the suite of management arrangements relating to 179(6)(b)(ii)	MAJORITY IN PLACE - See above Tables 1 & 2
	Review this listing within 5 years	Given QLD and NT have not met the TSSC's expectations an immediate review is necessary

The text below sets out the actual requirements for CD listing and relevant comments from the TSSC on which Tables 1 & 2 are based.

Conservation Dependent (CD) eligibility is based on satisfying all four subparagraphs of paragraph 179(6)(b). The TSSC's assessment against these is summarised below as it forms a key part of the analysis in this report.

179(6)(b)(i) *the species is a species of fish* is met.

179(6)(b)(ii) *the fish species is the focus of a plan of management that provides for the management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long-term survival in nature are maximised*.

The TSSC made the point that a national harvest level of (up to) 200 t per year is necessary.

The TSSC further clarified that the relevant Queensland and Northern Territory Fisheries (NT Offshore Net and Line Fishery & QLD East Coast & Gulf of Carpentaria Inshore Fin Fish Fisheries) are those being considered for assessment under 179(6)(b)

Queensland and NT governments committed to the TSSC to introducing a set of management arrangements under law. These were evaluated by the TSSC as equating to a plan of management for the purposes of assessment under 179(6)(b).

The set of management arrangements applicable to the species are:

Queensland

- An annual 150t TACC for all hammerhead sharks (with regional sub-limits)
  - .. when 75% of the TACC is reached then trip limits (10 net & 4 line) are introduced
  - .. all hammerheads landed whole (head & fins attached)
- Data validation (through prior reporting & at unloading)
- Inspections at sea and in port
- Reporting catch by phone to enable real-time catch-monitoring
- Cross validation of data (fisher logbooks, VMS data & buyer sourcing)
- Species specific catch and discard information in logbooks
- N4 sector to have VMS.

Northern Territory

- Annual TACC of 50t for Scalloped Hammerhead
  - .. once catch reaches 40t then harvest control rules implemented
  - .. HCRs could include increased observer coverage, area closures, fishery closure, trip limits, gear restrictions and temporal closures
- Data validation techniques including
  - .. VMS on all vessels
  - .. Electronic logbooks
- Product unloaded in Darwin & Gove only
- Sharks landed with fins naturally attached (with exemptions)

- Heads remain attached to body unless E-M operational
- Species specific recording in CDRs
- Random port inspections
- Increased monitoring to at least 20% where high risk of interactions exist.

179(6)(b)(iii) *the plan of management is in force under a law of the Commonwealth or State or Territory.*

The TSSC recognised that the following will be implemented under law:

QLD

- An annual 150t TACC for all hammerhead Sharks (with regional sub-limits)
- When 75% of the TACC is reached then regional control rules are triggered

NT

- Annual TACC of 50t for Scalloped Hammerhead under the NTONLF management plan
- When 40t is reached then control rules are triggered including increased observer coverage
- Implementing data validation techniques under the MP.

The TSSC noted that there may be other measures from (ii) that require the force of law to have effect.

179(b)(6)(iv) *cessation of the plan of management would adversely affect the conservation status of the species.*

The TSSC considered that the cessation of these management arrangements (measures under (ii)) would adversely affect the conservation status of scalloped hammerhead and noted that further declines are likely to be exacerbated if the total catch limit exceeded 200 tonnes per annum.

The TSSC concluded that CD is the best option because:

- Management actions for the species protection and recovery will be implemented immediately under law
- Management actions will remain in place while the species remains listed as CD
- Monitoring will be required to determine rates of recovery.

Attachment 4 Hammerhead sharks – CITES considerations

Scalloped, great and smooth hammerhead sharks are listed on Appendix II of CITES. The listing came into effect on 14 September 2014. CITES Parties deemed the scalloped hammerhead met the requirements for listing on Appendix II and included both great hammerhead and smooth hammerhead on Appendix II as "look-alike species", i.e. species whose specimens in trade look like those of species listed for conservation reasons.

To enable the export of CITES listed species, Australia must ensure that the export will not be detrimental to the survival of the species in the wild. A non-detriment finding assessment was undertaken by the Australian CITES Scientific Authority for the three CITES listed species of hammerhead in September 2014. The assessment found that while data are limited with regards to global stock sizes of these shark species, the findings and harvest levels in Australia's non-detriment finding have been determined using the best available scientific information, by analysing Australian harvest against global harvest and by assessing the risks associated with the management arrangements currently in place in Australian fisheries.

Australian national harvest levels set by the non-detriment finding for the hammerhead shark species are:

• Scalloped hammerhead (Sphyrna lewini) – 200 t per year.

• Great hammerhead (Sphyrna mokarran) – 100 t per year.

• Smooth hammerhead (Sphyrna zygaena) – 70 t per year.

The Australian CITES Scientific Authority also made a number of recommendations to state and Northern Territory fisheries management agencies, including:

• Species level reporting in log books;

• Further measures to reduce incidental capture and post release mortality as practically appropriate to specific fisheries and gear types;

• Landing of sharks with fins naturally attached;

• Mandatory discard reporting to species level;

• Maximum size limits;

• Trip limits;

• An improved understanding and management focus on illegal, unreported and unregulated harvest (IUU).

Further information on the 2014 Non-Detriment Finding assessment is available on the Department's webpage (https://www.environment.gov.au/biodiversity/wildlife-trade/publications/non-detrimentfinding-five-shark-species) along with a copy of the assessment, the scientific information that formed the basis of the assessment and advice on CITES Appendix II shark listings.

It should also be noted that CITES permits are required under the EPBC Act to internationally export or import any part or derivative (e.g. fillets, fins) for the three listed hammerhead shark species. CITES export permits are issued under section 303CG of the EPBC Act. In order for an exporter to be issued a permit they must provide evidence that the specimen(s) to be exported were sourced from a fishery which has been assessed as an approved wildlife trade operation (for the purposes of paragraph 303FN of the EPBC Act).

Attachment 5 CMS listing & Australian Reservation

https://www.cms.int/sharks/en/species/sphyrna-lewini

https://www.theguardian.com/environment/2015/apr/28/fishing-lobby-pushed-australia-to-opt-out-of-protection-of-five-shark-species

Attachment 6 Mortality concerns for released sharks

https://www.hakaimagazine.com/news/sharks-even-catch-and-release-can-kill/

Attachment 7 NT Offshore Net and Line Fishery Management

https://dpir.nt.gov.au/__data/assets/pdf_file/0017/620432/mgt-arranagements-offshore-net-line-fishery.pdf

Attachment 8 Welch et al 2011

http://frdc.com.au/Archived-Reports/FRDC%20Projects/2007-035-DLD.pdf

Extract of Management implications

For the purposes of fisheries management on the north-eastern Australian coastline R. acutus and S. lewini are comprised of multiple stocks separated by spatial scales of several hundreds of kilometres. As such the preferred management approach should be at a regional scale and based on the stock boundaries identified in this study. This also means that monitoring of these species within their respective fisheries, and their assessment, should also be conducted at a regional scale. It should also be noted in both species that the lack of difference detected between samples collected in the Townsville and Mackay regions

may be due to there being a single stock, however it may also be due to similar chemical signatures in those regions reflected in the vertebrae and possible due to similar environmental conditions experienced by the animals from those regions. A move towards regional scale management in coastal fisheries may be viewed as increased complexity of fisheries management, however it may also be viewed as a way forward given the likely increase in the future of resource allocation issues among sectors and the increasing interest among local communities in co-management approaches. Either way, there is increasing evidence for localised stock structure among different coastal species in north-eastern Australia. Further, future fisheries monitoring should at the very least incorporate this into future programs.

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