CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

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Veracruz (Mexico), 28 April – 3 May 2014

Interpretation and Implementation of the Convention

Species trade and conservation

Conservation and management of sharks

REPORT ON THE DEVELOPMENT OF A RAPID MANAGEMENT-RISK ASSESSMENT METHOD FOR FISH SPECIES THROUGH ITS APPLICATION TO SHARKS

1. This document has been submitted by the United Kingdom of Great Britain and Northern Ireland in relation to agenda item 22.[1]

2. The document provides in Annex 1 a summary of a draft report (see document AC27 Inf. 1) which was commissioned from TRAFFIC by the UK Government Department for Environment, Food, and Rural Affairs(DEFRA).

3. A final version of the report entitled '*Fish and Multilateral Environmental Agreements – Further developing a framework for fisheries species, and application of the framework to fished shark species'* will be published on the Defra website in due course (http://randd.defra.gov.uk/).

4. The M-Risk (management and compliance risk) assessment framework aims to identify the species or stocks of potential concern, and establish the level of concern relative to other species. This should facilitate the prioritisation of those species or stocks for which closer scrutiny of management arrangements is warranted. The M-Risk assessment also has the capacity to identify those stocks where improvements in specific aspects of management are deficient. This can facilitate efforts to improve management which may include a listing on an Multilateral Environmental Agreement (MEA) or, in fact, preclude the need for such a listing.

5. This report follows up work reported in document AC26 Inf. 9 which focused on assessing the intrinsic vulnerability of sharks to harvest.

Recommendations

6. The Animals Committee is invited to discuss this report in the context of the first DIRECTS in Resolution Conf. 12.6 (Rev. CoP16), namely '*to examine new information provided by range States on trade and other available relevant data and information, and report their analyses at meetings of the Conference of the Parties*'. The Committee is invited to endorse, in principle, the approach of using risk assessment frameworks such as the one reported here, derived from fisheries science, to identify those species and/or stocks most in need of management interventions. Such interventions might include actions by an MEA such as CITES.

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[1] *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat or the United Nations Environment Programme concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

7. The Committee is also invited to advise in ways in which such risk management frameworks might be improved, especially with respect to whether the attributes used for the assessment (as indicators of responsible management), and the weightings given to each, are the most appropriate. The Committee may wish to consider how risk-assessment frameworks might contribute to guidance on making non-detriment findings for commercially exploited aquatic organisms (see document AC27 Doc. 22.2).

Report Summary

Development of a Rapid Management-Risk Assessment Method for Fish Species through its Application to Sharks

Lack, M., Sant, G., Burgener, M., Okes, N.

1. Background

1.1. Over-exploitation of fish species has been identified as the dominant direct driver of biodiversity loss in the marine environment (Polidoro *et al.,* 2009). In 2008, 32% of fish stocks were considered to be over-exploited, depleted or recovering, an increase from around 10% in the 1970s (FAO, 2010). The failure of fisheries management alone to protect fish stocks has led to increasing calls for the application of multilateral environmental agreements (MEAs), such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on the Conservation of Migratory Species of Wild Animals (CMS), to marine species.

1.2 It was in this context that in 2010, the Joint Nature Conservation Committee (JNCC) [2] commissioned TRAFFIC to develop a risk assessment process. This work aimed to identify commercially exploited aquatic organisms in trade which were at highest risk of over-exploitation and to consider whether those species would benefit from measures under MEAs. The risk assessment process was intended to highlight species for which the application specifically of CITES or CMS might make a tangible difference to conservation and sustainable use. It was not intended to provide a definitive statement on the need for the listing of such species..

1.3 The risk assessment process developed by TRAFFIC (Sant *et al*., 2012) assessed risk according to vulnerability, value and violability, based on previous work by the Food and Agriculture Organization (FAO) of the United Nations (FAO, 2000). The risk assessment process was subsequently peer reviewed at a workshop in 2011[3] which recommended that a two-step approach be adopted to further develop the process:

a) intrinsic vulnerability (based on biological and life-history characteristics) be reviewed for one taxonomic group; and

b) 'exposure' and management risk for that group be reviewed (Fleming *et al*., 2012).

1.4 Step one was completed by reviewing intrinsic vulnerability in 61 species of sharks (Oldfield *et al*., 2012). That study assessed 46 of those species as at medium to high intrinsic risk. In 2013, TRAFFIC was engaged by the UK Government Department for Environment, Food and Rural Affairs (Defra) to undertake Step two, assessment of exposure and management risk, for the 46 medium to high intrinsic risk shark species. The outcomes of that assessment are summarised in this annex.

1.5 The key recommendations made for exposure and management risk assessment by Fleming *et al*. (2012) were that:

a) 'a revised approach to the "management risk" component of the risk assessment process be adopted by scoring 'exposure' by looking at the scale of the fishery as well as at the value (and other related factors) and combine that score in a meaningful (weighted) way with a score for the M-Risk (management and compliance risk)';

b) the following six factors were suitable for the assessment of M-Risk:

- Is there a stock assessment?

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[2] *JNCC is the public body that advises the UK Government and devolved administrations on UK-wide and international nature conservation.*

[3] *The workshop was attended by representatives from the CMS, Marine Stewardship Council (MSC), the US National Oceanic and Atmospheric Administration (NOAA), the Centre for Environment, Fisheries and Aquaculture Science (CEFAS), the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO), TRAFFIC and JNCC.*

- Are there appropriate management controls to constrain catch levels?

- Are scientific recommendations on catches adopted and implemented?

- Are there compliance measures to address illegal, unreported and unregulated (IUU) fishing?

- Are harvest rates reduced appropriately at low stock sizes?

- Are landings monitored?

c) it is necessary to look at the appropriateness of any management and not just equate high levels of regulation with good management; and

d) the approach should identify the problems with existing management and compliance arrangements and logically draw attention to what management and compliance solutions may be used to reduce risk for a species through risk management.

1.6 The risk assessment framework developed by Sant *et al.* (2012) was therefore revised, taking into account the above recommendations. The revised assessment method was then trialled by developing draft risk assessments for five shark species[4].

1.7 An Expert Workshop[5] was subsequently held in Wollongong, Australia, in August 2013 to consider the draft exposure framework and the five draft risk assessments. The Workshop considered a number of elements related to the exposure risk framework, in particular the distinction between 'exposure' and M-Risk, the difficulties involved in assessing exposure, and how it might best be assessed. Revisions were made to the draft risk assessment framework and then applied to the five draft risk assessments and the remaining 41 shark species.

2. Exposure risk

2.1 Exposure risk is largely about susceptibility of the species to various types of fishing gear, the proportion of the distribution of the species that is fished by those gears and the level of effort by that gear. However, detailed information on the nature of gears used to catch individual species or stocks, the relative susceptibility of the species to those gears and the relative effort by each of those gear types is not commonly available.

2.2 The 2013 Expert Workshop considered the inclusion of fishing effort data by gear type which was considered preferable to catch data as an indicator of the level of 'exposure' of a species to fishing impacts. The availability of such data at the global level was investigated, revealing two recent studies which attempted to collate and analyse global fishing effort data (Anticamara *et al.* (2011), Watson *et al*. (2012)). However, it was concluded that meaningful interrogation of the available data was not feasible for this project.

2.3 Other factors such as the scale of the fishery (both in terms of the quantity of the catch and the nature of the fishing operations i.e. subsistence, artisanal, small-scale commercial or industrial) and the value of fish products were also considered in determining exposure risk.

2.4 However, it was concluded that these additional factors could not be included as indicators of exposure risk due to issues such as data availability, and poor/varied relationships to exposure risk. These issues are explored in further detail in section 5 of the final report.

Conclusions on exposure risk

2.5 The 2013 Expert Workshop concluded that it was beyond the scope of the project to address exposure in a meaningful way. It was decided that this would be better done as a more in-depth, second stage analysis of particular species or stocks highlighted by the M-Risk assessment process

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[4] *Porbeagle Shark (*Lamna nasus), *Scalloped Hammerhead Shark (*Sphyrna lewini), *Oceanic Whitetip Shark* (Carcharhinus longimanus), *Spiny Dogfish* (Squalus acanthias), *Kitefin Shark* (Dalatias licha).

[5] *The Workshop was attended by Dr Vin Fleming (JNCC), Dr Tony Smith (CSIRO), Glenn Sant and Markus Burgener (TRAFFIC), Karen Winfield (Australian Department of the Environment) and Mary Lack (Shellack Pty Ltd).*

as of particular concern. The risk assessment framework therefore focuses on M-Risk but does include a weighting to reflect the higher risk of species in international trade and species of high value as a proxy for some elements of exposure risk. Thus, while the assessment method developed is entitled M-Risk, it includes a component of exposure risk..

3. Management risk (M-Risk)

3.1 The M-Risk assessment framework is intended to identify the species or stocks of potential concern and the level of this concern relative to other species. This allows for the prioritisation of those species or stocks for which closer scrutiny of management arrangements is warranted. M-Risk assessment also has the capacity to identify those stocks where improvements in specific aspects of management are deficient. This can facilitate efforts to improve management which may include a listing on an MEA or, in fact, preclude the need for such a listing.

3.2 The M-Risk Assessment Framework is split into two parts: Management Context (Part A); and M-Risk Assessment (Part B). Guidance and Explanatory Notes are provided in Annex 2 of the final report.

Management Context (Part A)

3.3 The information collated in the Management Context (Part A) section of the M-Risk Assessment Framework:

a) underpins decisions on the number and nature of the management units and management bodies to be assessed under Part B of the Framework;

b) assists in interpreting and scoring the available information on management; and

c) identifies whether products from the species are traded internationally and, if so, whether they are considered to be high value (in order to determine the risk weighting for trade / value applied to the M-Risk score).

3.4 This requires an assessment of stocks or management units, management bodies, and a classification of species (i.e. whether they are migratory or occur only within single countries EEZs).

3.5 It is the management applied by relevant management bodies to the management unit that is the subject of the assessment. Management bodies take a variety of forms. For highly migratory species or discrete high seas stocks, the relevant management body may be the relevant Regional Fisheries Management Organisation (RFMO). Alternatively, or in addition, the relevant management body might be a State or entity in which the species occurs and is fished, or a particular jurisdiction within that State or entity. For non-migratory species, the species may be taken in a range of different fisheries within a jurisdiction. As a result, there are potentially many management bodies involved in management of a species or even a stock.

3.6 The M-Risk assessment has been conducted only at a stock / management unit level. It is believed that, from a management perspective, this provides a meaningful basis to identify where significant improvements in management are required. It should be noted, however, that while it may be possible to say that product from one stock / management unit may be at lower risk than product from another, it will be difficult to discriminate between the two products in the trade chain in the absence of good traceability / chain of custody arrangements. Thus, where it is considered necessary to place a stock under the protection of an MEA, in practice, the whole species may need to be listed.

3.7 A single species can be subject to the management of a range of management bodies and sharks are a good example of this, often taken across a number of fisheries in national waters and on the high seas. For this reason only the main management bodies involved in management of the species have been included in the assessments in order to make the M-Risk assessment both manageable and meaningful.

3.8 At a national level, assessment has been constrained to the main catching countries i.e. those responsible for 85% of the reported catch as identified in the FAO Capture Production database (FAO, 2013). This again helps ensure the scope of the assessment is kept within reasonable and meaningful limits. For other species the catch profile may be different. It is acknowledged that this approach has

its limitations as some countries do not report catch or species specific data to the FAO. However, the FAO database is the most comprehensive available.

3.9 Regional measures are relevant for highly migratory and deep sea stocks found on the high seas. Relevant RFMOs are identified based on the FAO areas in which the sharks are taken together with the fishing methods managed by the RFMO and the nature of the species (highly migratory/other, deep sea) where relevant. Where an RFMO has a mandate to manage the species under assessment, either as bycatch or target catch, the management and compliance measures required by the RFMO have been assessed. However, where it is known that one or more of the main catching countries has stronger species-specific domestic management measures in place than the RFMO, those countries are assessed separately and in addition to the RFMO, in the M-Risk assessment framework.

M-Risk Assessment (Part B)

3.10 The M-Risk Assessment (Part B) is based on three elements:

- stock status;
- adaptive, species-specific management; and
- generic management.

3.11 The indicators used to assess each of these elements are:

a) Stock Status

- What is the status of each stock OR the status of the species in each management unit if stocks are not well-defined?

b) Adaptive Management System

- Is information collected to inform the status of the stock?
- Have the available data been analysed to inform management decisions?
- How does the management unit manage the stock?
- Are the measures consistent with the species-specific advice for the stock?
- How comprehensive is the compliance regime in place to support these species-specific measures?
- What is the level of compliance with the reporting requirements for the stock?
- Is IUU fishing recognized as a problem for the stock (if it is a target) or for the fishery in which the stock is taken (if it is a bycatch)?

c) Generic Fisheries Management

- Are the generic fisheries management measures in place likely to reduce the impact on the species / stock being assessed?
- How comprehensive is the compliance regime in place to support the generic management measures that are relevant to the species/stock being assessed?

3.12 In scoring M-Risk these three elements are weighted by 2, 4 and 1 respectively. That is, adaptive, species-specific management is given the greatest emphasis in calculation of M-Risk.

4. M-Risk assessment results

4.1 Summaries of the scores for each species and stock assessed can be found in the final report. The full details of the assessments are also available in a separate Excel file which will be available for download from the Defra website once the report has been finalised[6].

4.2 One-hundred and seventy three management units or stocks were assessed for the 46 species. Of those, 147 (85%) were assessed as having high M-Risk and 26 as medium M-Risk. No shark management unit or stock was assessed to be at low M-Risk.

4.3 Of the 53 management units / stocks of MEA listed shark species assessed here, 48 were assessed as high risk. This supports the view of the parties to these conventions that additional management intervention is required for these species and provides some confidence that the assessment method is delivering meaningful outcomes.

4.4 Some shark stocks are assessed as high M-Risk despite the fact that they had very low average reported catch levels. While catch is not necessarily a good indicator of exposure, this may suggest that without an exposure risk component the M-Risk assessment may overstate the level of risk. To address this an assessment of exposure risk (based on fishing effort by gear type) as a middle step between intrinsic and M-Risk assessment should be considered. This would potentially filter out species / stocks that may not warrant M-Risk assessment.

4.5 The M-Risk assessment method includes weightings to reflect the impact of trade and value. The assessments show no impact of trade alone on M-Risk, however the inclusion of a high value of a species traded does result in a significant impact on M-Risk. Ninety percent of management units/stocks of species considered to produce high value products traded internationally were assessed as at high risk.

4.6 To test the influence of the weight for traded and high value species on the M-Risk rating, the stocks of the 23 species assessed as traded and high value were reassessed without any weighting. The results indicated that a further 30 stocks (i.e. a total of 42) would have been assessed as at medium, rather than high, M-Risk. This provides some confidence that the weights selected are meaningful.

5. Confidence

5.1 The level of confidence in the assessments conducted varies. For the majority (53%) of management units / stocks assessed, assessors had a mid-range level of confidence in the scores attributed. A high level of confidence was felt for 42% of the assessments. Assessors rated their confidence as “low” in relation to only 5% of assessments. This suggests that despite the rapid assessment method adopted, sufficient information was found in relation to 95% of the stocks to support a mid-range to high level of confidence in the results.

6. Combining intrinsic risk with M-Risk

6.1 Full details on how intrinsic risk and M-Risk are scored can be found in the final report however in summary, intrinsic risk is scored such that high risk equates to the highest score. M-Risk is scored such that good management (and therefore lower risk) equate to the highest scores. Furthermore intrinsic risk is scored on a species basis whereas M-Risk has been scored on a stock basis. These inconsistencies in the scoring systems do not present a problem in determining overall risk but they do prevent a graphical combination of intrinsic and M-Risk assessment. For this reason the final intrinsic risk and M-Risk assessment scores have been tabularised using a traffic light system similar to that adopted in Sant *et al*. (2012).

6.2 Where intrinsic and M-Risk scores differ, a judgement on their relative weighting is required to determine overall risk. However, it should be noted that the relative intrinsic risk of marine species is pre-determined and is not influenced by the extent of fishing mortality. Intrinsic risk has therefore been used as the mechanism for identifying the shark species to be subjected to M-Risk assessment. Given that the purpose of the M- Risk assessment is to identify those species where intervention through MEAs or other management mechanisms can reduce the risk posed by fishing mortality it is

[6] *http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=18800&FromSearch=Y&Publisher=1&SearchText=Fish & Multilateral Environmental &SortString=ProjectCode&SortOrder=Asc&Paging=10#Description*

considered appropriate that, where the intrinsic and M-Risk ratings diverge, the default overall risk rating is the M-Risk rating.

7. Conclusions and recommendations

7.1 The development of the M-Risk assessment method and its application to the shark taxa has significantly improved the assessment of the impact of management in mitigating the inherent risks faced by species subject to fishing mortality. The method developed is transparent and repeatable and can be applied to any fished species.

7.2 From a fisheries management perspective the M-Risk framework allows for easy identification of the key areas of management that need to be addressed in relation to a particular species or stock. Further, the approach adopted allows for the main stocks or management units from which catch is taken to be identified as a basis for prioritising stocks most in need of improved management. The risk assessment outcomes in relation to sharks appear to be consistent with the assessments of CITES and CMS on the management risk faced by listed shark species, suggesting that the framework is delivering meaningful outcomes.

7.3 There are a number of important qualifications that must be noted in the application of the M-Risk assessment framework. These include:

- it is essentially a rapid risk assessment method to guide more detailed investigation;

- it delivers a relative assessment of species/stocks rather than a definitive assessment of the risk for each species or stock;

- identification of the main management units and stocks that are subject to fishing is based on the best available, but flawed, data on global catch and on major catching countries;

- it is deliberately time constrained (on average one day/species assessment) and the application of more time and effort will likely deliver different M-Risk assessments outcomes on a stock basis; and

- the application of the framework by experts on specific stocks or management units is likely to result in refined and more confident M-Risk assessment outcomes.

7.4 There is scope to refine and improve confidence in the outcomes through further work. This could include:

- validation by applying the method to a number of non-shark species, for which there is a well-informed consensus on the level of M-Risk;

- sensitivity testing of the scoring bands that determine High, Medium and Low Risk. There would be merit in considering how sensitive the risk category results for M-Risk are to the scoring bands selected. This sensitivity analysis was not possible within the time constraints of the current project but it is considered to be a useful next step in refining the method;

- combining M-Risk and intrinsic risk quantitatively to overcome the limitations of a qualitative approach i.e. judgement on relative importance of M-Risk and intrinsic risk; and

- assessing exposure risk for which any meaningful analysis was beyond the scope of this project.