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**A Proposal for a Process for Designating
WCPFC Key Shark Species for Data Provision and Assessment**

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Abstract

This paper responds to SC6's request for SPC to develop a process for the nomination of key shark species and to identify a subset of these for assessment. It provides a framework for evaluating proposals for new key shark species by describing the range of issues to be considered including i) potential impact by fisheries; ii) designations by other conservation and management systems; iii) the degree of ecological concern; and iv) adequacy of available data and the potential to collect more. A proposed process flowchart and worksheet are provided to assist in evaluating whether the species should be designated as a WCPFC key shark species for data provision, for assessment, or both.

1. Background and Objectives

Article 1 of the Western and Central Pacific Fisheries Commission's (WCPFC) Convention requires it to manage highly migratory fish stocks listed in Annex 1 of the United Nations Convention on the Law of the Sea (United Nations 1982) as well as such other species of fish as the Commission may determine (WCPFC 2000). The Food and Agriculture Organization of the United Nations' (FAO) International Plan of Action - Sharks, which includes non-shark species of chondrichthyan fishes such as skates, rays and chimaeras, also calls on concerned States to collaborate in the conservation and management of transboundary, straddling, highly migratory and high seas stocks (FAO 1999).

The WCPFC first articulated which of the over one thousand chondrichthyan fishes were priorities for conservation and management in 2008 when it adopted CMM 2008-06. This conservation and management measure (CMM) listed blue, oceanic whitetip, mako (two species) and thresher (three species) sharks as key shark species. Silky sharks were added to the list when this CMM was amended in 2009 (CMM 2009-04). At WCPFC7, the Commission increased the number of key shark species from eight to 13 with the addition of porbeagle and four species of hammerhead sharks (CMM 2010-07), but maintained the focus of the Shark Research Plan on the original eight species until further funding is made available (WCPFC 2010a). The designation of these key shark species was based on ad hoc consideration of a number of factors including: i) high risk from fishing activities based on the WCPFC's Ecological Risk Assessment project; ii) ease of identification; and iii) frequency of reporting in annual catch data provided by Commission members and cooperating non-members (CCMs) (Clarke and Harley 2010).

Recognizing the issues arising from further expansion of the key shark species list, SC6 called for SPC to develop a process for the nomination of key shark species and to identify a subset of these for assessment (WCPFC 2010b). This paper has been prepared in response to the SC6 request. It provides a framework for evaluating proposals for new key shark species by describing the range of issues to be considered. It does not, however, prescribe which species should gain "key" status based on formulae and criteria. It is considered that the process proposed here should be initially applied in a qualitative manner and the designation decision be taken on the basis of SC discussion. If, in the future, the SC wishes to develop quantitative criteria to augment the process, this can be done on the basis of experience gained through qualitative application of the framework.

The process outlined here is designed to simultaneously consider whether nominated key shark species are designated for the purposes of data provision and/or assessment. When key shark species are designated for data provision they are included in the Scientific Data to be Provided to the Commission (WCPFC 2011), in terms of estimates of annual catches as well as catch and effort data based on logsheets¹. When key shark species are designated for assessment, they are included in the WCPFC's Shark Research Plan (Clarke and Harley 2010). While it is understood that all key shark species are of sufficient concern to warrant assessment, it is also acknowledged that data quantity/quality constraints and budget limitations might restrict assessments to a smaller group of species. In the case of the recent porbeagle and hammerhead key shark species designations, there exist both data and budgetary constraints to assessment. The current list of species for assessment is limited to blue, mako, oceanic whitetip, silky and thresher sharks (eight species; WCPFC 2010a).

¹ Note that WCPFC regional observer programmes are already designed to record all sharks to species regardless of whether they are key shark species.

2. Factors for Consideration

The following five factors should be considered when evaluating nominated species for designation as WCPFC key shark species. A proposal for applying these factors in a decision-making process is presented in the following section.

2.1 Is the species found within the WCPF Convention Area?

Objective: Proposed key shark species should be chondrichthyan (shark, skate, ray or chimaera) taxa whose documented range includes habitats within the WCPF Convention Area.

- Evidence for the occurrence of proposed species within the Convention Area should be referenced in the form of peer-reviewed papers, taxonomic guides or other scientific reference materials.
- If the proposal is for a group of species, for example, a genus (e.g. *Alopias* spp.) or two or more species which are difficult to distinguish (e.g. Galapagos and dusky sharks) a rationale should be given.

Evaluation: Only those proposed key shark species which occur in the Convention Area are eligible for further consideration.

2.2 Is the species impacted by fishing activities in the WCPF Convention Area?

Objective: Proposed key shark species which are caught, or otherwise impacted, by fisheries in the WCPF Convention Area should be given priority for designation.

- Proposals should provide any empirical evidence of interaction between the proposed species and fisheries in the WCPF Convention Area. This may take the form of observer records or other scientific observations such as fishery research cruises.
- In the absence of empirical evidence, species-specific susceptibility scores from the WCPFC Ecological Risk Assessment project may be used to evaluate the species' vulnerability to fishing activities.
- The geographic range of impact, including high seas areas and areas under national jurisdiction, should be taken into account when evaluating the species' vulnerability to fishing activities.
- If available, an estimate of the total catch of the proposed species, e.g. based on observer data as in SPC (2008), can be used to evaluate potential fishery impacts.
- Evidence of targeting (primary or secondary) of the proposed species should be considered and may be used to prioritize species for designation.

Evaluation: Proposed key shark species which are impacted by fisheries in the WCPF Convention Area should be prioritized for designation. When considering impacts, the number of fisheries and the geographic range over which impacts occur, the existence of fisheries targeting the species, and the amount of catch can be used to rank and prioritize proposals.

2.3 Are WCPFC compatible measures warranted due to the species' designation for conservation and management under other systems?

Objective: The conservation and management status of the species as defined under international conventions, national legislation/regulation, and recognized international ranking systems should be considered.

- Proposals should identify whether the species is listed under other international conservation and/or management instruments such as the Convention on International Trade in Endangered Species (CITES), the Convention on Migratory Species (CMS), the International Union for the Conservation of Nature (IUCN) Redlist of Threatened Species, other regional fisheries management organizations, or other similar international systems.
- If the species is protected under national legislation or regulation by any WCPFC CCM, this should also be described.
- The conservation and management benefit of introducing compatible measures by the WCPFC should be explained.

Evaluation: Proposed key shark species which have been designated as priorities for conservation and management by other international or national bodies, and for which compatible measures by WCPFC are warranted, should be given priority for designation.

2.4 Is there evidence of particular ecological concern for the species?

Objective: In addition to potential fishery impacts and international conservation status, the ecological basis for concern, e.g. a particularly vulnerable life history or documented population declines, should be considered.

- If the species is considered to have particularly vulnerable life history characteristics this should be documented through reference to productivity scores from the WCPFC Ecological Risk Assessment project, demographic analyses, or other relevant studies.
- Other fishery-related information in the form of range reductions, declines in indices of abundance, high catches of vulnerable life stages such as pregnant females or juveniles, or other indicators should also be cited if applicable.

Evaluation: Those species which can be demonstrated to be ecologically vulnerable, either on the basis of theoretical studies of life history traits or observed population impacts, should be given priority for designation.

2.5 Are current data adequate to support detailed assessment of stock status and if not, is collection of such data practical?

Objective: The availability of existing data and the feasibility of obtaining more data should be considered when designating a key shark species for data provision and/or for assessment.

- The proposal should indicate whether existing observer, port sampling and logsheet systems record the proposed species and, if recorded, the accuracy of such records (e.g. recorded to genus only, the potential for confusion with similar species).
- The timeframe over which logsheet and/or observer catch records have been kept and an estimate of the number of occurrences of the species in the available databases should be described.
- The proposal should distinguish between data held by CCMs, and data provided to the WCPFC and available for analysis, as appropriate.
- If misidentification is a data quality concern, the proposal should suggest ways that this can be overcome, e.g. through provision of identification keys to fishermen, better training of observers, data analysis to partition undifferentiated catches, etc.
- The proposal should specify whether intended designations for data provision would apply to the entire WCPF Convention Area and all the fisheries conducted in it, or to a subset of this area and/or its fisheries. This is particularly important to avoid unnecessary paperwork when certain CCMs and/or fisheries are not expected to encounter the proposed species.

Evaluation: Lack of existing, accurate records may downgrade the priority of designation for assessment until such time as adequate information is available. However, lack of existing, accurate records in combination with other concerns will likely increase the priority of designation for data provision unless there are major data quality obstacles (e.g. potential misidentification). As most observer and port sampling programmes are already designed to, where possible, report all sharks to species, the main additional data to be gained by designation of key shark species will be through logsheet data systems (e.g. inclusion in the Scientific Data to be Provided to the Commission by CCMs). Therefore, the balance between improved data quantity/quality and increased cost for CCMs should be explicitly considered.

3. Process

The five factors outlined above were used to construct a format for supplying information about nominated key shark species to the SC (Annex 1). This format can be used by the proponent to summarize the rationale for the proposal. It can also be used as a worksheet by the SC when discussing and evaluating proposals for key shark species designations.

A process for considering new proposals for key shark species is shown in Figure 1. Each proposal would first need to demonstrate that the proposed species occurs in the Convention Area. The proposed species would then be evaluated in terms of its i) potential impact by fisheries; ii) designations by other conservation and management systems; iii) the degree of ecological concern; and iv) adequacy of

available data and the potential to collect more; to determine the priority for designation. There are five potential outcomes from the process of evaluating a nomination:

- The species is not found in the Convention Area and is not suitable for designation;
- The species is found in the Convention Area but is not of sufficient priority to designate as a key shark species either for data provision or for assessment;
- The species is found in the Convention Area and is of sufficient priority to designate as a key shark species for data provision, but there are insufficient data for assessment at present;
- The species is of sufficient priority to designate as key shark species for assessment, but additional logsheet data collection is not practical and thus it will be assessed on the basis of existing information (e.g. observer data and/or existing (partial) logsheets);
- The species is of sufficient priority to designate as a key shark species for both data provision and assessment.

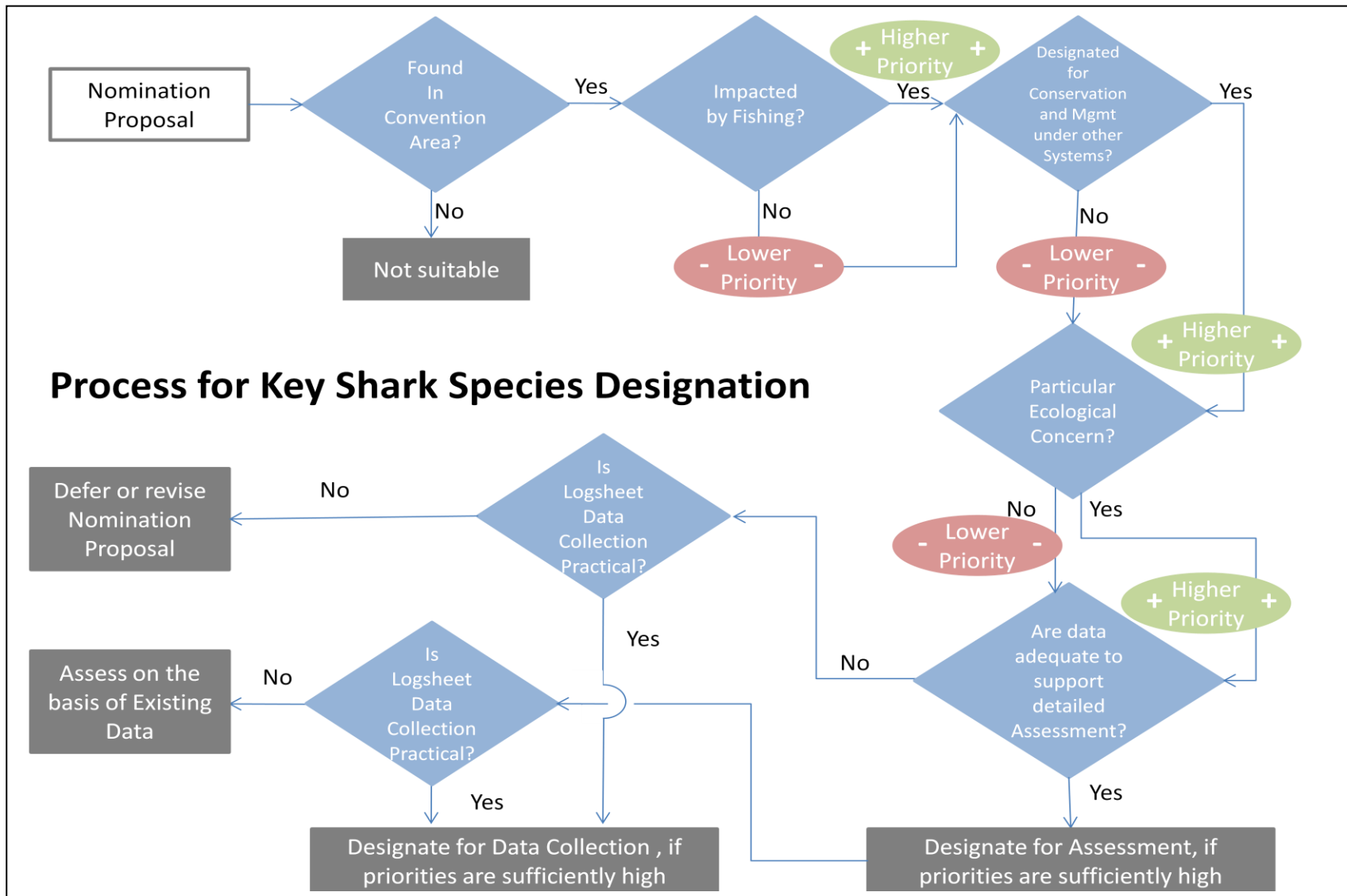


Figure 1. Flowchart illustrating a qualitative process based on factors (blue diamonds) to be considered in designation of key shark species for the WCPFC, and how these considerations lead to one of five outcomes (gray rectangles).

4. Proposed Implementation and Issues for Consideration

This process for evaluation of key shark species nominations can be implemented immediately upon approval by the SC. It can then be applied to all new nominations coming before the SC.

The process outlined here is qualitative but it may be made quantitative with the definition and application of specific criteria under each factor. The SC may wish to consider whether the process would benefit from quantitative criteria once some experience is gained with the qualitative process.

In order to both test the process and to confirm the previous ad hoc designations, the SC may wish to apply the process to the existing list of key shark species. This could provide useful standards of comparison between existing and future proposed key shark species. It could also clarify the need for assessment of the five new key shark species (porbeagles and hammerheads).

Finally, as thus far envisaged, there are no provisions for removing species from the list of WCPFC key shark species. In parallel with adopting a process for designating new key shark species, the SC may wish to consider whether it should adopt procedures for periodic review of the list and for removing species if their population status or conservation priority changes.

5. References

Clarke, S.C. and S.J. Harley. 2010. A Proposal for a Research Plan to Determine the Status of the Key Shark Species. WCPFC-SC6-2010/EB-WP-01. Accessed online at www.wcpfc.int/.../WCPFC-SC6-2010_EB-WP-01_Research_Plan_to_determine_status_of_Key_Shark_Species.pdf

FAO (Food and Agriculture Organization). 1999. International Plan of Action for the conservation and management of sharks. FAO: Rome. 26 p. Accessed online at <ftp://ftp.fao.org/docrep/fao/006/x3170e/X3170E00.pdf>

SPC (Secretariat of the Pacific Community). 2008. Estimates of Annual Catches in the WCPFC Statistical Area (WCPFC-SC4-2008/ST-IP-1). Accessed online at <http://www.wcpfc.int/sc4/pdf/SC4-STIP1%20Annual%20Catch%20Estimates.pdf>

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United Nations 1982. United Nations Convention on the Law of the Sea (UNCLOS). Annex I. Highly Migratory Species. Accessed online at http://www.un.org/Depts/los/convention_agreements/texts/unclos/annex1.htm

ANNEX 1. Proposed format for nomination of a key shark species

PROPOSAL FOR DESIGNATION OF WCPFC KEY SHARK SPECIES		
<i>Nomination for (check all that apply):</i>		
<input type="checkbox"/> Key Species - Data Provision	<input type="checkbox"/> Key Species –Assessment	
<i>Species/Taxa Nominated</i>		
Scientific Name(s):	Common Name(s):	
If more than one species is included in this nomination explain why:		
<i>In WCPF Convention Area? (see Section 2.1)</i>		
<input type="checkbox"/> Yes	<input type="checkbox"/> No	Explain:
<i>Impacted by Fishing? (see Section 2.2)</i>		
<input type="checkbox"/> Yes	<input type="checkbox"/> No	Explain:
<i>Designated for Conservation and Management under other Systems? (see Section 2.3)</i>		
<input type="checkbox"/> Yes	<input type="checkbox"/> No	Explain:
<i>Particular Ecological Concern? (see Section 2.4)</i>		
<input type="checkbox"/> Yes	<input type="checkbox"/> No	Explain:
<i>Adequate Data to Support Detailed Assessment? (see Section 2.5)</i>		
<input type="checkbox"/> Yes	<input type="checkbox"/> No If no, is additional logsheet data collection practical? <input type="checkbox"/> Yes <input type="checkbox"/> No	Explain: Explain: