Pacific Non-Detriment Finding Template for the Scalloped Hammerhead, *Sphyrna lewini*

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Report to CITES

Non-detriment finding (NDF) for Scalloped Hammerhead
Sphyrna lewini

The Scalloped Hammerhead is listed on CITES Appendix II and trade in this species requires that the CITES Management Authority of the exporting country (or a designated competent authority in countries that are not Parties to CITES) must verify that the species was legally obtained. The CITES Scientific Authority of the exporting country must advise that export will not be detrimental to the survival of the species (a non-detriment finding).

The following Worksheets follow a six step process for the NDF that is illustrated in this Flow Chart from the Shark NDF Guidance[1]. The Worksheets are supported at each step by information in the Shark NDF Guidance.

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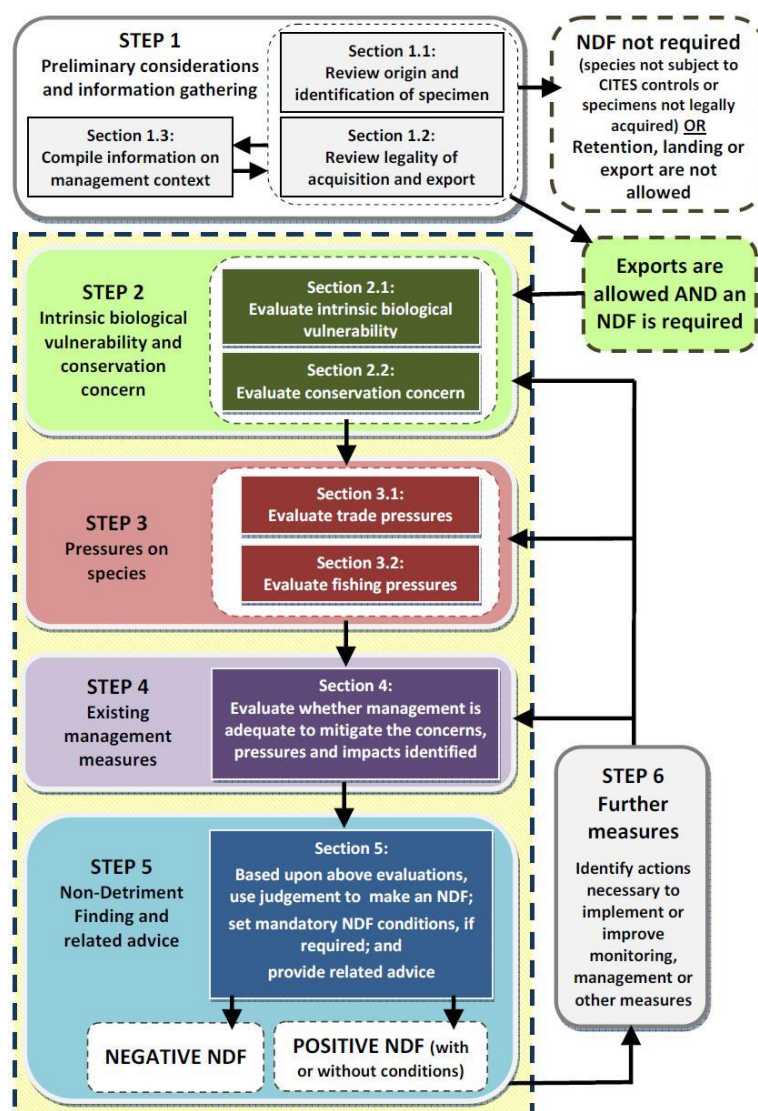
[1] Mundy-Taylor, V., Crook, V., Foster, S., Fowler, S., Sant, G., and Rice, J. 2014. CITES Non-detriment findings guidance for shark species. 2nd, revised version. A framework to assist Authorities in making Non-detriment Findings (NDFs) for species listed in CITES Appendix II. Report prepared for the Germany Federal Agency for Nature Conservation (Bundesamt fur Naturschutz, BfN). Available at https://cites.org/eng/prog/shark/Information_resources_from_Parties_and_other_stakeholders.

Worksheet for Step 1			
Question 1.1 (a) **Is the specimen subject to CITES controls?** **(How did you identify the species?)**			
See pages 64–65 of **Annex 1** for additional Guidance Notes on completing this Worksheet.			
Species Name	**Product Form**	**CITES Appendix**	**Source of Identification**
Sphyrna lewini	Country adds this	II	Country adds this
NEXT STEPS			
In view of the above, is the specimen subject to CITES controls? Consult 'Decision and Next Steps' guidance in **Annex 1**	**YES**	GO TO **Question 1.1 (b)**	
	NOT CERTAIN	Describe concerns in more detail below, and GO TO **Question 1.1 (b)**	
	NO	**NDF is not required**	
Concerns and uncertainties:			

Worksheet for Step 1 (continued)		
Question 1.1 (b) **From which stock will the specimen be taken/was the specimen taken?** **(Can origin and stock be confidently identified)**		
See pages 66–67 of **Annex 1** for additional Guidance Notes on completing this Worksheet.		
	Description/comments	**Sources of information**
Ocean basin	Pacific (requires verification from each country)	
Stock location/ distribution/ boundaries (attach a map)	There appear to be two distinct stocks: Atlantic and Indo-Pacific. Map of conceptual population model of Scalloped Hammerhead in the Indo-Pacific is included in the Published Information (Section 2.1).	Simpfendorfer 2014
Is this a shared stock (i.e. occurring in more than one EEZ[2] and/or the high seas)?	Yes	
If the stock occurs in more than one EEZ, which other Parties share this stock?	Fiji, Palau, Papua New Guinea, Indonesia, Solomon Islands, Vanuatu, Australia. CITES Non-Party but Competent Authorities: Federated States of Micronesia, Kiribati, Marshall Islands, Tonga. CITES external Territories: New Caledonia.	Brouwer and Harley 2015, Published Information (Section 2.3)
If high seas stock, which other Parties shark this stock?	Country adds this	
Which, if any, RFB[3](s) cover(s) the range of this stock?	WCPFC	
Are all Parties listed above (which fish or share the stock concerned) members of the relevant RFBs?	Yes- All CITES Parties and Competent Authorities are members of WCPFC. New Caledonia is a WCPFC Participating Territory.	http://www.wcpfc.int
Are there geographical management gaps?	The High Seas	
How reliable is the information on origin?	Country adds this	
NEXT STEPS		
Is information on origin sufficiently detailed for Question 1.2 to be answered?		**YES**
Consult "Decision and Next Steps" guidance in **Annex 1.** **(Apply this answer at end of Question 1.2)**		**NO**

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[2] Exclusive Economic Zone
[3] Regional Fisheries Body

Worksheet for Step 1 (continued)		
Question 1.2 **Was (will) the specimen (be) legally obtained and is export allowed?**		
See pages 67–68 of **Annex 1** for additional Guidance Notes on completing this Worksheet.		
Is the species:	**Description/comments**	**Sources of information**
Protected under wildlife legislation, a regional biodiversity Agreement, or (for a CMS[4] Party) listed in CMS Appendix 1?	CITES Appendix II, CMS Appendix II	CITES website (https://cites.org/eng/prog/shark) CMS website (http://www.cms.int/en/page/appendix-i-ii-cms)
Sourced from illegal fishing activities (e.g. in contravention of finning regulations, or where a TAC[5] is zero or exceeded)?	Country adds this	
Taken from a no-take marine protected area or during a closed season?	Country adds this	
Taken in contravention of RFB recommendations, if any?	Country adds this	
Listed as a species whose export is prohibited?	Country adds this	
Of concern for any other reason?	Country adds this	
NEXT STEPS		
In view of the above and the final section of the Worksheet for Question 1.1(b), was the specimen legally acquired and can exports be permitted? Consult "Decision and Next Steps" guidance in **Annex 1.**	YES	**GO TO Question 1.3**
	SOME DOUBT	Describe concerns in more detail below, and **GO TO Question 1.3**
	NO	Export cannot be permitted, **NDF is not required**
Concerns and uncertainties:		

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[4] Convention on Migratory Species
[5] Total Allowable Catch

Worksheet for Step 1 (continued)

Question 1.3
What does the available management information tell us?

See pages 69 and Table A of **Annex 1** for additional Guidance Notes on completing this Worksheet.

Part 1. Global-level information

	Description/comments	Sources of information
Reported global catch	222 tonnes (average global annual catch 2010-2014). This is considered a significant underestimate.	FAO 2016
Species distribution	Tropical and warm temperate oceans worldwide. Need more accurate information on occurrence of species within each of the Pacific countries	Last and Stevens 2009
Known stocks/populations	Global stock structure is different between males and females. For females there are at least four genetically distinct subpopulations: Northwest Atlantic, Southwest Atlantic, Eastern Atlantic, and Indo-West Pacific. For males there appear to be no genetically distinct populations across and between ocean basins.	Duncan et al. 2006, Baum et al. 2007, Daley-Engel et al. 2012, NOAA 2013, Heupel et al. 2015
Main catching countries	Mauritania, Brazil and Ecuador. Hammerhead Shark (general): Indonesia, Senegal, Congo, Mexico, Ghana and Benin.	Mundy-Taylor and Crook 2013, FAO 2016
Main gear types by which the species is taken	Trawls, purse seines, gillnets, fixed bottom longlines, pelagic longlines and inshore artisanal fisheries.	Baum et al. 2007
Global conservation status	IUCN Status: Globally: Endangered (2007) Eastern Central and Southeast Pacific: Endangered (2007) Eastern Central Atlantic: Vulnerable (2007) Northwest and Western Central Atlantic: Endangered (2007) Southwest Atlantic: Vulnerable (2007) Western Indian Ocean: Endangered (2007)	Baum et al. 2007
Multilateral Environmental Agreements	CITES Appendix II, reservation by Japan (WCPFC CITES Party) CMS Appendix II, reservation by Australia Sharks MoU Annex 1	CITES https://cites.org/eng/prog/shark/index.php CMS http://www.cms.int/en/species Sharks MoU http://www.cms.int/sharks/en/mos2

Part 2. Stock/context-specific information

	Description/comments	Sources of information
Stock assessments	No stock assessments for the Indo-West Pacific Stock have been done. Due to the lack of data, a stock assessment is currently not feasible.	Lack et al. 2014, Rice et al. 2015
Main management bodies	WCPFC for the Indo-West Pacific stock in the Western and Central Pacific Ocean	Lack et al. 2014

Cooperative management arrangements	Scalloped Hammerhead is a Highly migratory species and the relevant RFMOS are: WCPFC, IATTC, ICCAT, IOTC and NAFO. Within the Pacific Ocean, SPC and FFA are also involved in data management and monitoring and surveillance. An advisory body (Council of Regional Organisations in the Pacific) facilitates cooperation between RFMOs. The ABNJ project is also aiming to improve cooperation between tuna RFMOs.	UNCLOS Annex 1 www.un.org/unlcos/annex1; http://www.commonoceans.org/home/en/ Lack et al. 2014, Clarke and Nichols 2015
Non-membership of RFBs	The main catching country of Hammerhead (general) is Indonesia which is a member of WCPFC. There is no specific information on main catching country of Scalloped Hammerheads.	FAO 2016
Nature of harvest	Taken as target, byproduct and bycatch. Fishing effort is not evenly spread across Indo-West Pacific stock; Indonesia takes all the Oceania area reported Hammerhead (general) FAO catch. Catch by other Oceania/Pacific countries is poorly known (see Part 3).	Baum et al. 2007, FOA 2016
Fishery types	Country adds this.	See published information for summary of fisheries, target species, main gear types, and scale of fisheries.
Management units	In the Pacific region, the main body responsible is WCPFC. Gaps in regional management are in the Areas Beyond National Jurisdiction (ABNJs). National level: Country adds this	http://www.wcpfc.int
Products in trade	Fins are the main product. In some cases, meat, skin, liver oil and jaws are also traded. Each country needs to verify their products in trade.	CITES 2013a, Lack and Meere 2009.
Part 3. Data and data sharing		
Reported national catch(es)	Country adds this	See Published Information (Section 2.3)
Are catch and/or trade data available from other States fishing this stock?	Yes, the tuna bycatch observer and logsheet data are managed by SPC with coastal data also managed by SPC. Access to the data requires permission from each member country for both the pelagic and coastal catch data. Trade data reported by some Pacific countries to FAO.	See Published Information (Section 2.3)
Reported catches by other States	Yes, there are reported catches by many other Flag States. Average annual catch in tonnes of all hammerheads in the WCPFC for the previous five years: Australia: 5.3, Fiji: 29.3, Korea: 12.7, Marshall Islands: 1, New Zealand: 8, Papua New Guinea 3.8, Chinese Taipei: 363.	WPFC Data Catalogue http://www.wcpfc.int/wcpfc-data-catalogue-0 See Published Information (Section 2.3)
Catch trends and values	The limited catch data precludes any analyses of catch trends with confidence. A standardised Catch per unit effort analyses	See Published Information (Section 2.3) Rice et al. 2015.

	of the hammerhead shark complex indicated a large increase in CPUE from 1997-2001 in the WCPO and no consistent rise or fall in the following years.	
Have RFBs and/or other States fishing this stock been consulted during or contributed data during this process?	Yes, SPC was contacted and provided some observer data, WCPFC have hammerhead catches from the longline fishery online and a workshop was held where countries were requested to provide data.	See Published Information (Section 2.3)

Sources of information

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NOAA. 2013. https://www.federalregister.gov/a/2013-07781. Downloaded on 15 December 2015.

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NEXT STEPS

The information collated in the above worksheets can now be passed to the Scientific Authority, so that the NDF process can begin with Step 2

Worksheet for Step 2

Question 2.1
What is the level of intrinsic biological vulnerability of the species?

- See pages 73–75 of **Annex 1** for additional Guidance Notes on completing this Worksheet.
- In the Worksheet below, circle **the level of vulnerability** associated with each **Intrinsic Biological Factor**. Default indicator/metric figures for listed shark and ray species are provided in **Annex 4** (pages 111-131). These may be inserted here, but they are derived from international standardised data and may not reflect local stock characteristics. Wherever possible, verified local data on stocks should be utilised.

Intrinsic biological factors *(see page 73 of the Guidance Notes)*	Level of vulnerability *(circle or highlight as appropriate)*	Indicator/metric *(see page 73 of the Guidance Notes)*
a) Median age at maturity	Low	3.8 years (male), 4.1 years (female) (2 band pairs per year) Chen et al. 1990; Taiwan)
	Medium	8.9 years (male), 13.2 years (female) (1 band pair per year) Drew et al. 2015; Indonesia) 5.7 years (male), (no female estimate) (1 band pair per year) (Harry et al. 2011; tropical east coast Australia)
	High	
	Unknown	
b) Median size at maturity	Low	
	Medium	1471 mm L_{ST} (male) (Harry et al. 2011; tropical east coast Australia) 1500 mm L_{ST} (male) (Stephens and Lyle 1989; northern Australia) 1756 mm L_{ST} (male) (White et al. 2008; Indonesia)
	High	2285 mm L_{ST} (female) (White et al. 2008; Indonesia)
	Unknown	
c) Maximum age/longevity in an unfished population	Low	
	Medium	10.6-11 years (male) and 14.0-18.6 years (female) (based on 2 band pairs per year) (Chen et al. 1990, Anislado-Telentino and Robinson-Mendoza 2001, Anislado-Telentino et al. 2008). 21 years (male) (1 band pair per year) (Harry *et al.* 2011)
	High	35 years (female) (1 band pair per year) (Drew et al. 2015)

	Unknown	
d) Maximum size	Low	
	Medium	
	High	3010 mm TL (male), 3460 mm TL (female) (Stephens and Lyle 1989) (observed)
	Unknown	
e) Natural Mortality rate (M)	Low	
	Medium	
	High	0.123 year-1 (Harry et al. 2011); 0.107 $year^{-1}$ (Chen and Yuan 2006).
	Unknown	
f) Maximum annual pup production (per mature female)	Low	12-41 (mean 25-26) (Chen et al. 1988, White *et al.* 2008) (annual cycle)
	Medium	6-21 (mean 12.5-13) biennial cycle (Liu and Chen 1999)
	High	
	Unknown	
g) Intrinsic rate of population increase (r)	Low	
	Medium	0.205 $year^{-1}$ (2 band pairs per year) (Liu and Chen 1999)
	High	0.086 $year^{-1}$ (1 band pair per year) (Chen and Yuan 2006)
	Unknown	
h) Geographic distribution of stock	Low	Global male population (Daly-Engel et al. 2012)
	Medium	Indo-West Pacific female population (Duncan et al. 2006; Baum et al. 2007, NOAA 2013)
	High	
	Unknown	
i) Current stock size relative to historic abundance	Low	
	Medium	
	High	Reported large declines in hammerhead complex abundance of 60-99% over recent decades in Atlantic and Indo-Pacific (CITES 2013a)
	Unknown	
j) Behavioural factors	Low	

	Medium	
	High	Inshore pupping and high natural predation on juveniles (Baum et al. 2007), aggregating behaviour, and very high at-vessel fishing mortality rates (Morgan and Burgess 2007)
	Unknown	
h) Trophic level	Low	
	Medium	
	High	4.1 (Froese and Pauly 2015)
	Unknown	

SUMMARY for Question 2.1
Intrinsic biological vulnerability of species

Provide an assessment of the overall intrinsic biological vulnerability of the species (tick appropriate box below). Explain how these conclusions were reached and the main information sources used.

High	Medium	Low	Unknown

Explanation of conclusion and sources of information used:

Most of the intrinsic biological factors are ranked as a high vulnerability with females generally more vulnerable than males. The exceptions are pup production which is low to medium vulnerability and male geographic distribution which is also a low vulnerability but medium vulnerability for females. There is a circumglobal distribution but genetic structuring is evident between ocean basins. The Indo-West pacific population is considered as warranted for Endangered listing (NOAA US listing process).

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NEXT STEPS

- Go to **Section 2.2**

Worksheet for Step 2 (continued)

Question 2.2
What is the severity and geographic extent of the conservation concern?

- See pages 76–80 of **Annex 1** for additional Guidance Notes on completing this Worksheet**.**
- Based on existing stock assessments or conservation status assessments, evaluate the severity and geographic extent/scope of conservation concern, including reasons for the conclusions drawn and information on sources used.
- In the Worksheet below, circle the **level of severity/scope of concern** associated with each **Factor** using the descriptions in the indicator column in **Table B** in the Guidance Notes (**Annex 1**). In the column entitled Indicator in the Worksheet below, note briefly the reason for this assessment of level of severity/scope of concern. Further explanation (including information on sources used) can be provided in the boxes entitled '*Comments*'.

Conservation concern factors *(see page 78 of the Guidance Notes)*	Level of severity/scope of concern *(circle as appropriate)*	Indicator/metric *(see page 78 of the Guidance Notes)*
Conservation or stock assessment status	Low	
	Medium	
	High	IUCN – Global Endangered and Eastern Central and Southeast Pacific stock Endangered (Baum et al. 2007) NAFO only stock assessment-stock is overfished and overfishing occurring (Lack et al. 2014)
	Unknown	
	Comments:	
Population trend	Low	
	Medium	
	High	Population trend decreasing and global stock of hammerhead complex is estimated at 15-20% of historic baseline (CITES 2013a)
	Unknown	
	Comments:	
Geographic extent/scope of conservation concern	Low	
	Medium	

	High	Identified threats affect the entire global population of the species and the Indo-West Pacific Population (Baum et al. 2007)
	Unknown	
	Comments:	

SUMMARY for Question 2.2
Severity and geographic extent of the conservation concern
Provide an assessment of the overall severity and geographic extent of the conservation concern for this species or stock (tick appropriate box below). Explain how these conclusions were reached and the main information sources used.

High	*Medium*	*Low*	*Unknown*

Explanation of conclusion and sources of information used:

The Scalloped Hammerhead is Endangered, populations of the hammerhead complex have decreased dramatically from baseline levels and the threats are high to both the global and Indo-West Pacific population.

Baum, J., Clarke, S., Domingo, A., Durocq, M., Lamonaca, A.F., Gaboir, N., Graham, R., Jorgensen, S., Kotas, J.E., Medina, E., Martinez-Ortiz, J., Monzini, J., Morales, M.R., Navarro, S.S., Perez-Jimenez, J.C., Ruiz, C., Smith, W.D., Valenti, S.V., and Vooren, C.M. 2007. www.iucnredlist.org. Downloaded on 15 December 2015.

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NEXT STEPS

- Go to **Step 3**

Worksheet for Step 3

Question 3.1
What is the severity of trade pressure on the stock of species concerned?

- See pages 81–84 of **Annex 1** for additional Guidance Notes on completing this Worksheet.
- In the Worksheet below, circle the **level of severity** associated with each trade pressure **Factor** using the descriptions in the Indicator column in **Table C** in the Guidance Notes (**Annex 1**). In the column entitled **Indicator/metric** in the Worksheet below, note briefly the reason for this assessment of level of trade pressure severity. Consider **all products in both domestic and international trade.**
- For each Factor, circle the **level of confidence** associated with each assessment of trade pressure severity. This involves an assessment of the **quality of the information** used to evaluate the severity of trade pressure on the stock of the species concerned.
- In the box entitled '*Reasoning*', provide reasons to justify the evaluation of severity of trade pressure and assessment of confidence level (i.e. quality of information used). Here, comments/information should also be provided on:
  - the sources of information used to evaluate severity of trade pressure;
  - whether a precautionary approach was taken to the evaluation of trade pressure severity (e.g. due to a lack of robust trade information to inform the evaluation);
  - whether the evaluation of trade pressure was adjusted (i.e. severity increased to a higher level) to take into account high intrinsic biological vulnerability/conservation concern assessed in **Step 2**;
  - whether information is particularly lacking and, if so, how this data availability may be improved (see also **Section 6.1** of the Guidance Notes in **Annex 1** for further advice).

Factor *(see page 84 of the Guidance Notes)*	Level of severity of trade pressure **Country needs to fill this in** *(highlight or circle as appropriate)*	Indicator/metric *(see page 84 of the Guidance Notes)*
a) Magnitude of legal trade	Low	
	Medium	
	High	
	Unknown	
	Level of confidence *(circle as appropriate): (see page 83 of Guidance Notes)*	
	Low Medium High	

Reasoning (e.g. has this assessment involved the exercise of precaution, and/or has severity of trade pressure been increased in light of the assessment in Step 2?)

b) Magnitude of illegal trade	Low	
	Medium	
	High	
	Unknown	
	Level of confidence *(circle as appropriate): (see page 83 of Guidance Notes)*	

	Low	Medium	High

Reasoning (e.g. has this assessment involved the exercise of precaution, and/or has severity of trade pressure been increased in light of the assessment in Step 2?)

NEXT STEPS

- Add notes in the Worksheet for **Section 6.1** on improvements in trade data availability/monitoring required to evaluate trade pressure under **Section 3.1**.
- GO TO **Section 3.2** to evaluate fishing pressures.

Worksheet for Step 3
Question 3.2
What is the severity of fishing pressure on the stock of species concerned?

- See pages 85–90 of **Annex 1** for additional Guidance Notes on completing this Worksheet**.**
- In the Worksheet below, circle the **level of severity** associated with each fishing pressure **Factor** using the descriptions in the Indicator column in **Table D** in the Guidance Notes (**Annex 1**). In the column entitled **Indicator/metric** in the Worksheet below, note briefly the reason for this assessment of level of fishing pressure severity. Consider **all fishing methods and gears that** interact with the shark stock concerned.
- For each Factor, circle the **level of confidence** associated with each assessment of fishing pressure severity. This involves an assessment of the **quality of the information** used to evaluate the severity of fishing pressure on the stock of the species concerned.
- In the box entitled '*Reasoning*', provide reasons to justify the evaluation of severity of fishing pressure and assessment of confidence level (i.e. quality of information used). Here, comments/information should also be provided on:
  - o the sources of information used to evaluate severity of fishing pressure;
  - o whether a precautionary approach was taken to the evaluation of fishing pressure severity (e.g. due to a lack of robust information to inform the evaluation);
  - o whether the evaluation of fishing pressure was adjusted (i.e. severity increased to a higher level) to take into account high intrinsic biological vulnerability/conservation concern assessed in **Step 2**;
  - o whether information is particularly lacking and, if so, how this data availability may be improved (see also **Section 6.1** of the Guidance Notes in **Annex 1** for further advice).

Factor *(see page 89 of the Guidance Notes)*	Level of severity of fishing pressure <mark>Country needs to fill this in</mark> *(highlight or circle as appropriate)*	Indicator/metric *(see page 89 of the Guidance Notes)*
a) Fishing mortality (retained catch)	Low	
	Medium	

	High	
	Unknown	
	Level of confidence *(circle as appropriate): (see page 88 of Guidance Notes)*	
	Low Medium High	

Reasoning (e.g. has this assessment involved the exercise of precaution, and/or has severity of fishing pressure been increased in light of the assessment in Step 2?)

b) Discard mortality	Low	
	Medium	
	High	
	Unknown	
	Level of confidence *(circle as appropriate): (see page 88 of Guidance Notes)*	
	Low Medium High	

Reasoning (e.g. has this assessment involved the exercise of precaution, and/or has severity of fishing pressure been increased in light of the assessment in Step 2?)

c) Size/age/sex selectivity	Low	
	Medium	
	High	
	Unknown	
	Level of confidence *(circle as appropriate): (see page 88 of Guidance Notes)*	
	Low Medium High	

Reasoning (e.g. has this assessment involved the exercise of precaution, and/or has severity of fishing pressure been increased in light of the assessment in Step 2?)

d) Magnitude of illegal, unreported and unregulated (IUU) fishing	Low	
	Medium	
	High	
	Unknown	

Level of confidence *(circle as appropriate): (see page 88 of Guidance Notes)*		
Low	Medium	High

Reasoning (e.g. has this assessment involved the exercise of precaution, and/or has severity of fishing pressure been increased in light of the assessment in Step 2?)

NEXT STEPS

- Add notes in the Worksheet for **Section 6.1** on improvements in fisheries data availability/monitoring required to evaluate fishing pressure under **Section 3.2**.
- GO TO **Section 4** to evaluate the extent to which existing management measures are effective in mitigating the risks/pressures/concerns identified in **Steps 2 and 3**.

Worksheet for Step 4

Preliminary stage
Compile information on existing management measures

In the table below, provide a list of existing generic and species-specific management measures in place for the stock or population of the species concerned. Consider measures implemented at the **(sub-) national, regional and international level** (i.e. including any measures implemented by relevant RFBs). Include a brief description of each measure, the sources of information used and any other comments if appropriate.

A table of commonly used generic and species-specific fisheries management measures is provided in **Annex 5** (page 132). It is **advisable to consult Annex 5 prior to completing the Worksheets in this section, in conjunction with context-specific fisheries management advice.**

Existing management measures *(see Annex 5 for examples)*	Is the measure generic or species-specific?	Descriptions/comments/sources of information
(SUB-)NATIONAL Country needs to fill this in		
REGIONAL/INTERNATIONAL		
WCPFC CMM2010-07	Generic to sharks (implemented January 2008)	Requires full utilisation of sharks, or live release of unused sharks, and maintenance of a 5% fin to carcass weight ratio (http://www.wcpfc.int/sharks)
WCPFC CMM2011-04	Specific to Oceanic whitetip sharks (OCS) (implemented January 2013)	Prohibits retention, transhipping, storing or landing of OCS and calls for release with as little harm as possible (http://www.wcpfc.int/sharks)
WCPFC CMM2012-04	Specific to Whale sharks (implemented January 2014)	Prohibits purse seine setting on a whale shark if it is sighted prior to the set and calls for safe release of the whale shark if it is inadvertently encircled in the net (http://www.wcpfc.int/sharks)
WCPFC CMM2013-05	Generic to sharks (issued December 2013)	Requires daily catch and effort reporting, including sharks, when vessels operate in the high seas
WCPFC CMM2013-08	Specific to Silky sharks (implemented July 2014)	Prohibits retention, transhipping, storing or landing of Silky sharks and calls for release with as little harm as

		possible (http://www.wcpfc.int/sharks)
WCPFC CMM2014-05	Generic to sharks (implemented July 2015)	Reduce use of wire traces and shark lines in tuna and billfish longline fisheries and dedicated shark fisheries require management plans (https://www.wcpfc.int/conservation-and-management-measures)
WCPFC CMM2015-07	Generic to all CMMs and hence also generic to sharks (effective only for 2016 and 2017, pending review)	WCPFC Compliance Monitoring Scheme (CMS) to ensure implementation and compliance with CMMs (https://www.wcpfc.int/conservation-and-management-measures)
NEXT STEPS • GO TO **Question 4.1(a).**		

Worksheet for Step 4 (continued)

Question 4.1(a)
Are existing management measures appropriately designed and implemented to mitigate the pressures affecting the stock/population of the species concerned?

- See pages 91–92 of **Annex 1** for additional Guidance Notes on completing this Worksheet**.**
- Firstly assess whether **appropriately designed** management measures are in place to mitigate the pressures affecting the stock/population of the species concerned:
  - From the '**Preliminary stage**' Worksheet above, transfer information on existing management measures into the Worksheet below, alongside the relevant fishing and trade pressure Factor(s) the measures(s) can help to mitigate (as evaluated in **Step 3**).
  - Use the information in the table of commonly used generic and species-specific fisheries management measures in **Annex 5** to determine which pressures the existing management measures in place can help to address/mitigate.
- Next, assess whether the existing management measures in place are being **implemented**:
  - In the column entitled "Relevant Monitoring, Control and Surveillance (MCS) measure(s)", include information on existing MCS measures that are relevant to the implementation of the existing management measures identified. **Annex 5** provides information on MCS measures that can help to secure compliance with commonly used fisheries management measures.
  - Second, based on the explanations provided in the column in the Worksheet below entitled "Overall assessment of compliance regime", make a judgement as to whether the existing management measure(s) identified is/are being implemented (i.e. adequately enforced/complied with).
  -
NOTE: in some circumstances where the fishing/trade pressure severity was assessed as "Low" for any of the Factors in **Step 3**, mitigation may not be required (see also the Guidance Notes for Question 4(a) in **Annex 1**). In such cases, "Not applicable" can be noted under the "Existing management measure(s)" and "Relevant MCS measure(s)" columns in the Worksheet (for that trade/fishing pressure Factor).
  - Provide reasons to justify the assessments made in this Worksheet in the box entitled "Reasoning/comments", including any sources used.
  - Where certain management measures are being implemented but others are not, this information can also be included under "Reasoning/comments". Also note down any considerations, issues or shortcomings relating to any of the management measures identified that will need to be kept in mind when completing the Worksheet for **Question 4.1(b)** below

Factor	Existing management measure(s)	Relevant monitoring, control and surveillance (MSC) measure(s)	Overall assessment of compliance regime *(tick as appropriate)*	
TRADE PRESSSURE Country needs to fill this in				
			Unknown (no information on compliance)	

a) Magnitude of legal trade			Poor (limited relevant compliance measures in place)	
			Moderate (some relevant compliance measures in place)	
			Good (comprehensive relevant compliance measures in place)	
	Reasoning/comments (e.g. Are management measures being implemented to varying degrees? Which compliance measures are lacking?)			
b) Magnitude of illegal trade			Unknown (no information on compliance)	
			Poor (limited relevant compliance measures in place)	
			Moderate (some relevant compliance measures in place)	
			Good (comprehensive relevant compliance measures in place)	
	Reasoning/comments (e.g. Are management measures being implemented to varying degrees? Which compliance measures are lacking?)			
FISHING PRESSSURE <mark>Country needs to fill this in</mark>				
a) Fishing mortality (retained catch)			Unknown (no information on compliance)	
			Poor (limited relevant compliance measures in place)	
			Moderate (some relevant compliance measures in place)	
			Good (comprehensive relevant compliance measures in place)	

	Reasoning/comments (e.g. Are management measures being implemented to varying degrees? Which compliance measures are lacking?)			
b) Discard mortality			Unknown (no information on compliance)	
			Poor (limited relevant compliance measures in place)	
			Moderate (some relevant compliance measures in place)	
			Good (comprehensive relevant compliance measures in place)	
	Reasoning/comments (e.g. Are management measures being implemented to varying degrees? Which compliance measures are lacking?)			
c) Size/age/sex selectivity			Unknown (no information on compliance)	
			Poor (limited relevant compliance measures in place)	
			Moderate (some relevant compliance measures in place)	
			Good (comprehensive relevant compliance measures in place)	
	Reasoning/comments (e.g. Are management measures being implemented to varying degrees? Which compliance measures are lacking?)			

			Unknown (no information on compliance)	
			Poor (limited relevant compliance measures in place)	
			Moderate (some relevant compliance measures in place)	
d) Magnitude of IUU fishing			Good (comprehensive relevant compliance measures in place)	
	Reasoning/comments (e.g. Are management measures being implemented to varying degrees? Which compliance measures are lacking?)			
NEXT STEPS				
• **Go to Question 4.1(b)**				

Worksheet for Step 4 (continued)

Question 4.1(b)
Are existing management measures effective (or likely to be effective) in mitigating the pressures affecting the stock/population of the species concerned?

- See pages 93–94 of **Annex 1** for additional Guidance Notes on completing this Worksheet.
- From the **Worksheet for Question 4.1(a)** above, transfer information on existing management measures currently in place into the column in the table below entitled "Existing management measure(s)", alongside the relevant fishing/trade pressure Factor.

NOTE as above for **Question 4.1(a)**: in some circumstances where the fishing/trade pressure severity was assessed as "Low" for any of the Factors in **Step 3**, mitigation may not be required (see also the Guidance Notes for **Question 4(b)** in **Annex 1**). In such cases, "Not applicable" can be noted under the "Existing management measure(s)" and "Relevant MCS measure(s)" columns in the Worksheet (for that trade/fishing pressure Factor).

- In the relevant columns in the table below, for each management measure indicate with a tick in the appropriate box whether:
    1. Data are collected and analysed to inform management decisions?
    2. Management is consistent with expert advice?

- Based on the responses to these questions, make a judgement as to whether the management measures(s) identified is/are effective/likely to be effective. Provide reasons to justify this assessment. For example, is effectiveness being compromised by poor design of the management measures or by their inadequate implementation (see responses in the Worksheet for **Question 4.1(a)** above)? Include information on any sources used in the box entitled "Reasoning/comments".

- Note that for each fishing/trade pressure identified, there may be more than one management measure currently in place aimed at mitigating the pressure. When assessing whether the management of a particular fishing/trade pressure is effective/likely to be effective, the aim should be to consider the combined effect of all relevant measures in mitigating the pressure identified.

Factor	Existing management measure(s)	Are relevant data collected and analysed to inform management decisions? (e.g. landings, effort, fisheries independent data) *Tick as appropriate*	Is management consistent with expert advice? *(tick as appropriate)*	
TRADE PRESSSURE <mark>Country needs to fill this in</mark>				
a) Magnitude of legal trade		No data OR data are of poor quality OR data are not	No expert advice on management identified	

		analysed (adequately) to inform management		
		Limited relevant data are collected AND analysed to inform management	Not consistent	
		Some relevant data are collected AND analysed to inform management	Expert advice partially implemented	
		Comprehensive data collected AND analysed to inform management	Consistent	

Management measure(s) effective/likely to be effective? (circle as appropriate)
Yes   Partially   No   Insufficient information

Reasoning/comments (e.g. Is effectiveness compromised by poor design and/or implementation, or is a greater diversity or amount of management required? What data are required to better inform and evaluate management decisions? How is management inconsistent with expert advice?)

TRADE PRESSSURE <mark>Country needs to fill this in</mark>

b) Magnitude of illegal trade		No data OR data are of poor quality OR data are not analysed (adequately) to inform management	No expert advice on management identified	
		Limited relevant data are collected AND analysed to inform management	Not consistent	
		Some relevant data are collected AND analysed to inform management	Expert advice partially implemented	

		Comprehensive data collected AND analysed to inform management		Consistent	

Management measure(s) effective/likely to be effective? (circle as appropriate)	
Yes Partially No Insufficient information	

Reasoning/comments (e.g. Is effectiveness compromised by poor design and/or implementation, or is a greater diversity or amount of management required? What data are required to better inform and evaluate management decisions? How is management inconsistent with expert advice?)

FISHING PRESSSURE <mark>Country needs to fill this in</mark>

		No data OR data are of poor quality OR data are not analysed (adequately) to inform management		No expert advice on management identified	
		Limited relevant data are collected AND analysed to inform management		Not consistent	
a) Fishing mortality (retained catch)		Some relevant data are collected AND analysed to inform management		Expert advice partially implemented	
		Comprehensive data collected AND analysed to inform management		Consistent	

Management measure(s) effective/likely to be effective? (circle as appropriate)	
Yes Partially No Insufficient information	

	Reasoning/comments (e.g. Is effectiveness compromised by poor design and/or implementation, or is a greater diversity or amount of management required? What data are required to better inform and evaluate management decisions? How is management inconsistent with expert advice?)				
FISHING PRESSSURE <mark>Country needs to fill this in</mark>					
b) Discard mortality		No data OR data are of poor quality OR data are not analysed (adequately) to inform management		No expert advice on management identified	
		Limited relevant data are collected AND analysed to inform management		Not consistent	
		Some relevant data are collected AND analysed to inform management		Expert advice partially implemented	
		Comprehensive data collected AND analysed to inform management		Consistent	
	Management measure(s) effective/likely to be effective? (circle as appropriate)				
	Yes	Partially		No	Insufficient information
	Reasoning/comments (e.g. Is effectiveness compromised by poor design and/or implementation, or is a greater diversity or amount of management required? What data are required to better inform and evaluate management decisions? How is management inconsistent with expert advice?)				

FISHING PRESSSURE

c) Size/age/sex selectivity		No data OR data are of poor quality OR data are not analysed (adequately) to inform management		No expert advice on management identified	
		Limited relevant data are collected AND analysed to inform management		Not consistent	
		Some relevant data are collected AND analysed to inform management		Expert advice partially implemented	
		Comprehensive data collected AND analysed to inform management		Consistent	

Management measure(s) effective/likely to be effective? (circle as appropriate)

          Yes   Partially   No   Insufficient information

Reasoning/comments (e.g. Is effectiveness compromised by poor design and/or implementation, or is a greater diversity or amount of management required? What data are required to better inform and evaluate management decisions? How is management inconsistent with expert advice?)

d) Magnitude of IUU fishing		No data OR data are of poor quality OR data are not analysed (adequately) to inform management		No expert advice on management identified	
		Limited relevant data are collected AND analysed to inform management		Not consistent	

		Some relevant data are collected AND analysed to inform management		Expert advice partially implemented	
		Comprehensive data collected AND analysed to inform management		Consistent	
	Management measure(s) effective/likely to be effective? (circle as appropriate)				
	Yes	Partially	No	Insufficient information	
	Reasoning/comments (e.g. Is effectiveness compromised by poor design and/or implementation, or is a greater diversity or amount of management required? What data are required to better inform and evaluate management decisions? How is management inconsistent with expert advice?)				

NEXT STEPS

- Add notes in the Worksheet for **Section 6.1** on improvements in data availability/monitoring required to evaluate the effectiveness/likely effectiveness of management under **Question 4.1(b)**.
- Add notes in the Worksheet for **Section 6.2** on improvements in management (including compliance systems) required to more fully mitigate the pressures impacting the stock/population of the shark species concerned.
- Go to **Step 5**

Worksheet for Step 5

Question 5.1
Based on the outcomes of the previous steps, is it possible to make a positive NDF (with or without associated conditions) or is a negative NDF required?

- See pages 95–97 of **Annex 1** for additional Guidance Notes on completing this Worksheet**.**
- Transfer all results from **Steps 2–4** to the Table below by circling the appropriate descriptors.

  - From the **Worksheets for Questions 2.1 and 2.2** above, transfer the **level of vulnerability** and **level of severity/scope of conservation concern** into the Worksheet below.

  - From the **Worksheets for Questions 3.1 and 3.2** above, transfer the **level of severity** for each trade and fishing pressure Factor into the second column in the Worksheet below and the **level of confidence** associated with each evaluation of severity into the third column in the Worksheet below.

  - Based on the information contained in the **Worksheets for Questions 4.1(a) and 4.1(b),** state in the Worksheet below whether the **existing management measures are effective/likely to be effective** at mitigating each of the pressures identified (taking into account whether they are **appropriately designed** and **being implemented**), or whether there is insufficient information to make such an assessment.

- Based on the information generated and evaluations made in the previous **Steps**, the Scientific Authority now has to decide whether to make a positive NDF for the export (with or without mandatory conditions), or a negative NDF. A decision tree to assist in this decision-making process is provided in the Guidance Notes in **Annex 1**.

- The final decision regarding the NDF should be indicated in the relevant box at the end of this Worksheet. Under "Reasoning/comments" include justification for the decision made and describe any **mandatory conditions** (for a positive NDF) and/or **recommendations as to further measures** (e.g. improvements in monitoring and/or management required – relevant for both positive and negative NDFs).

Step 2: Intrinsic biological vulnerability and conservation concern Country needs to fill this in				
Intrinsic biological vulnerability (Question 2.1)	High	Medium	Low	Unknown
Conservation concern (Question 2.2)	High	Medium	Low	Unknown

Step 3: Pressures on species Country needs to fill this in			Step 4: Existing management measures Country needs to fill this in
Pressure	**Level of severity (Questions 3.1 and 3.2)**	**Level of confidence (Questions 3.1 and 3.2)**	**Are the management measures effective* at addressing the concerns/pressures/impacts identified? (Question 4.1b)** *Taking into account the evaluation of management appropriateness and implementation under Question 4.1a*
Trade pressures Country needs to fill this in			

a) Magnitude of legal trade	High Medium Low Unknown	High Medium Low	Yes Partially No Insufficient Information **Not applicable
a) Magnitude of illegal trade	High Medium Low Unknown	High Medium Low	Yes Partially No Insufficient Information **Not applicable

** Only to be used where the trade pressure severity was assessed as "Low" for any of the Factors in **Step 3** and a judgement is made that the impacts on the shark stock/population concerned are so low that mitigation is not required.

Fishing pressures <mark>Country needs to fill this in</mark>

a) Fishing mortality (retained catch)	High Medium Low Unknown	High Medium Low	Yes Partially No Insufficient Information **Not applicable
b) Discard mortality	High Medium Low Unknown	High Medium Low	Yes Partially No Insufficient Information **Not applicable
c) Size/age/sex selectivity of fishing	High Medium Low Unknown	High Medium Low	Yes Partially No Insufficient Information **Not applicable
d) Magnitude of IUU fishing	High Medium Low Unknown	High Medium Low	Yes Partially No Insufficient Information **Not applicable

** Only to be used where the fishing pressure severity was assessed as "Low" for any of the Factors in **Step 3** and a judgement is made that the impacts on the shark stock/population concerned are so low that mitigation is not required.

A) Can a positive NDF be made?	**YES** – *go to B*	**NO** – *go to **Step 6** and list recommendations for measures to improve monitoring/management under Reasoning/comments below*
B) Are there any mandatory conditions to the positive NDF?	**YES** - *list under Reasoning/comments below and go to C*	**NO** – *go to C*

C) Are there any other further recommendations? *(e.g. for improvements to monitoring/management)*	YES - *go to Step 6 and list recommendations for measures to improve monitoring/management under Reasoning/comments below*	NO
Reasoning/comments (include justification for decision made and information on mandatory conditions and/or further recommendations)		

NEXT STEPS

- OPTION 1: If improvements in monitoring or management are required (whether in the case of a **positive or negative NDF**) go to **Step 6**
- OPTION 2: If no improvements in monitoring or management are required, make a **positive NDF** and stipulate any **mandatory conditions**, if appropriate, to the Management Authority and any other relevant bodies.

Worksheet for Step 6
Further measures
Section 6.1
Improvement in monitoring or information required

In the space below, authorities are encouraged to list the improvements in monitoring or information that are required to address cases where:

(i) The severity of trade/fishing pressures has been assessed as <u>unknown</u>.
(ii) The level of confidence in the evaluation of trade/fishing pressures is <u>low</u>.
(iii) There is <u>insufficient information</u> on the effectiveness of management.
(iv)

Recommendations should be made in **consultation with the national fisheries management agency** and should be as **specific as possible** to address any gaps/shortcomings identified with **clearly defined objectives**. Time-frames for implementation should be specified where possible, including with regard to the review of progress on implementation.

See pages 98-99 of **Annex 1** for additional Guidance Notes on completing this Worksheet.

<mark>Country needs to fill this in</mark>

Section 6.2
Improvement in management is required

In the space below, authorities are encouraged to list the improvements in management that are required to address cases where management has been assessed as <u>partially effective or ineffective</u> at addressing any of the concerns/pressures/impacts identified, particularly where a fishing or trade pressure is assessed as <u>medium or high</u> (confidence levels: <u>low, medium or high</u>).

As noted above for **Section 6.1**, recommendations should be made in **consultation with the national fisheries management agency** and should be as **specific as possible** to address any gaps/shortcomings identified with **clearly defined objectives**. Time-frames for implementation should be specified where possible, including with regard to the review of progress on implementation.

See page 100 of **Annex 1** for additional Guidance Notes on completing this Worksheet.

Country needs to fill this in