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THE ANALYSIS OF PROPOSALS FOR INCLUSION OF SHARK AND RAY SPECIES IN THE APPENDICES OF THE CONVENTION ON THE CONSERVATION OF MIGRATORY SPECIES OF WILD ANIMALS (CMS) AT THE 15th MEETING OF THE CONFERENCE OF THE PARTIES TO CMS

(Prepared by the Advisory Committee of the Memorandum of Understanding on the Conservation of Migratory Sharks – Sharks MOU)

Summary:

This document includes a review of proposals for the inclusion of shark and ray species in the Appendices of the Convention. Prepared by the Advisory Committee of the Memorandum of Understanding on the Conservation of Migratory Sharks – Sharks MOU to inform Signatories prior to COP15.

ANALYSIS OF PROPOSALS FOR INCLUSION OF SHARK AND RAY SPECIES IN THE APPENDICES OF THE CONVENTION ON THE CONSERVATION OF MIGRATORY SPECIES OF WILD ANIMALS (CMS) AT THE 15th MEETING OF THE CONFERENCE OF THE PARTIES TO CMS

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Summary

1. The Advisory Committee (AC) of the Sharks MOU reviewed the following proposed CMS listings relating to elasmobranch fish, in relation to migratory behaviour for all species not yet listed in any Appendix and population status for all species proposed:

Document number	*Species*	Proponent
30.2.12	*Alopias pelagicus*	Panama
	Alopias superciliosus	
	Alopias vulpinus	
30.2.13	*Mustelus schmitti*	Brazil
30.2.14	*Sphyrna lewini1*	Ecuador
30.2.15	*Sphyrna mokarran1*	Ecuador
30.2.16	*Squatina guggenheim*	Brazil

2. The AC concluded that angular angelshark (*Squatina guggenheim):*

- Meets the CMS criterion of being in an 'unfavourable conservation status';
- Does not meet the CMS criterion for being 'migratory';
- **Therefore, does not meet the criteria to be listed in Appendix II of CMS.**

3. The AC concluded that Patagonian narrownose smoothhound (*Mustelus schmitti):*

- Meets the CMS criterion of being in an 'unfavourable conservation status';
- Meets the CMS criterion for being 'migratory';
- **Therefore, meets the criteria to be listed in Appendix II of CMS**.
- Whilst meeting the criteria, the AC also noted that the status of this species is improving and the main part of the stock is subject to regular stock assessment and management advice.

4. In relation to thresher sharks, the AC concluded that the global population of pelagic thresher **meets** the criteria to be listed in Appendix I of CMS, and that the global populations of bigeye thresher and common thresher **do not meet** the criteria for listing in Appendix I.

5. The other proposals were to include great hammerhead *Sphyrna mokarran,* and scalloped hammerhead *Sphyrna lewnini* in Appendix I of CMS (these species are currently listed in Appendix II). These proposals were based largely on the most recent IUCN Red List Assessments. The AC agreed these species meet the Criterion for being 'migratory' but did not come to a consensus on whether the global populations of these species met the criteria for being 'endangered' (i.e. being "*in danger of extinction throughout all or a significant portion of its range*) in relation to the proposed listings in Appendix I, with two perspectives.

6. The **first perspective** was that the most recent IUCN Red List Assessments provided sufficient evidence to guide advice in relation to proposed Appendix I listings. Both great hammerhead and scalloped hammerhead are assessed as Critically Endangered and, in the absence of other relevant data, would meet the criteria for listing in Appendix I.

7. The **second perspective** was that the IUCN Red List Assessments provided insufficient data to determine whether some of these species were "in danger of extinction throughout all or a significant portion of [their] range". The basis of this perspective was that the assessments were informed in part by a model (Just Another Red List Assessment, JARA) that is driven largely by the data points at the start and end of the time-series, and so can estimate a decline even if the most recent population trend is increasing. In general terms, the projections from JARA assessments may not represent the most recent part of the time-series (e.g. would not consider any management actions introduced during the time-series that may have benefitted the stock), and some can be based on data that are highly variable. Furthermore, some assessments were only available for parts of the species range, which could include areas with robust management or areas at the fringes of the geographical range - in both instances, any observed changes may or may not be representative of other stocks or of the global population. Hence, whilst IUCN RLA provides standardised approaches to threat status, individual RLA should be examined on a case-by-case basis. The datasets for RLA for many of these species were limited. In such cases there will always be questions over the degree of uncertainty as to how representative individual trends are for global populations.

8. The AC agreed it would be beneficial to encourage Regional Fisheries Bodies (RFBs), such as the main Regional Fisheries Management Organisations (RFMOs) and other relevant bodies, to prioritise assessments for these species so that there is a more robust understanding of the current statuses and population trends of thresher sharks and hammerhead sharks as soon as practicable.

9. In the absence of fishery-independent data for many of these species, data for population trends are usually based on fishery-dependent data. Hence, appropriate observer effort may be needed to better monitor catches (and fate of discards) if such data are to be used for monitoring the populations.

10. The AC recognised that all these species were data-limited in many parts of their geographical ranges, were subject to fishing pressure in high seas and shelf seas by both commercial and artisanal fisheries, and had biological characteristics that conferred a high vulnerability to overexploitation. The lack of data for large parts of the species ranges remains a cause of concern.

Proposal for the inclusion of the angular angelshark (*Squatina guggenheim*) on Appendix II of the Convention

Background

11. Angular angelshark (*Squatina guggenheim*) is a demersal shark that is distributed from southern Brazil to Patagonia in Argentina. The species distribution straddles three range states (Brazil, Uruguay and Argentina).

12. The IUCN Red List of Threatened Species has assessed angular angelshark as Endangered (Oddone et al., 2019).

13. The Government of Brazil submitted a proposal to list angular angelshark in Appendix II of CMS.

Migratory nature

14. Angel sharks (*Squatina* spp.) generally undertake limited migrations, with available evidence indicating that these are usually seasonal, inshore-offshore migrations (Ellis et al., 2021).

15. Whilst dedicated tagging studies for angular angelshark are lacking, inferences on their migratory behaviour can be derived from published studies regarding seasonal changes in captures, and from genetic studies.

16. Based on survey data, several studies indicate that angular angelshark make seasonal inshore-offshore migrations (Colonello et al., 2007; Awruch et al., 2008), although seasonal latitudinal migrations may also be undertaken. Given the expected depth range of the species is largely <80–100 m (Klippel et al., 2016; Oddone et al., 2019), then the seasonal inshore-offshore migrations are not expected to involve significant (if any) migrations across the border of the EEZ and high seas.

17. Recent genetic studies of angular angelshark using samples across much of the latitudinal range led Bunholi et al. (2022) to report that "*high genetic population structure can be observed even between closely sampling regions"* and that "*all analyses herein showed high latitudinal genetic population structure among S. guggenheim populations in the Southwest Atlantic Ocean*". The conclusion of that study was that there was clear genetic structure and that the "*heterogeneity may be addressed to its biological characteristics, such as limited dispersal, preference for shallow waters and to reproductive behaviors (Ellis et al., 2020). Moreover, given the uniqueness of Southwest Atlantic Ocean, we suggest that environmental features also have an important influence in modulating* S. guggenheim *dispersal, especially salinity and thermal variations*".

18. The proposal also noted that the Brazilian population had declined and "*shows no indication of recovery*", which appears contradictory to any perception of there being regular migrations, especially given the quantities being reported in landings data from nations to the south. That former areas of occurrence are not re-colonised is more in keeping with a species not being sufficiently migratory, with the proviso being that habitat suitability is unchanged.

19. There is a transboundary area with a concentration of angular angelshark in the Rio de La Plata area. Whilst this population straddles two jurisdictions (Uruguay and Argentina), there is no evidence of 'cyclical and predictable' migrations across the jurisdictional boundary. Furthermore, management measures are already in place for this population in the Argentinean-Uruguayan Common Fishing Zone (AUCFZ).

20. The CMS definition of migratory is that "*a significant proportion of whose members* cyclically *and predictably cross one or more national jurisdictional boundaries*". Based on the best available scientific evidence, **the AC concluded that angular angelshark <u>does not</u> meet the CMS definition of migratory**.

Conservation status

21. The IUCN Red List of Threatened Species has assessed angular angelshark as Endangered (Oddone et al., 2019). Most of the data evidencing the decline were from reported landings and commercial data, although such data may not necessarily be informative of stock trends.

22. The AC is not aware of any recent, robust estimates of population size for the global population of angular angelshark. There has been a marked decline in Brazilian landings, which is at the northern part of the species range. Further south, fisheries have not been able to meet the available Total Allowable Catches in the AUCFZ (which have been reduced over time), though several factors may affect fleet behaviour and uptake.

23. Given the inferred reduction in the distribution and relative abundance of angular angelshark in Brazilian waters, as identified in the proposal and the most recent IUCN Red List Assessment, **the AC concluded that this species meets the criteria for being considered in an 'unfavourable conservation status'.**

Conclusion

24. The AC considers that angular angelshark meets the criteria for being in an 'unfavourable conservation status' but does not meet the CMS definition of migratory. **The AC therefore concludes the angular angelshark does not meet the criteria for listing in Appendix II of CMS**.

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Proposal for the inclusion of the Patagonian narrownose smoothhound (*Mustelus schmitti*) on Appendix II of the Convention

Background

25. Patagonian narrownose smoothhound (*Mustelus schmitti*) is a demersal shark that is distributed from southern Brazil to Patagonia in Argentina, thus the species distribution straddles three range states (Brazil, Uruguay and Argentina).

26. The IUCN Red List of Threatened Species has assessed Patagonian narrownose smoothhound as Critically Endangered (Pollom et al., 2020).

27. The Government of Brazil submitted a proposal to list Patagonian narrownose smoothhound in Appendix II of CMS.

Migratory nature

28. Several studies have highlighted that the highest catches of Patagonian narrownose smoothhound in Uruguayan and Argentinean waters occur during the summer and autumn, and the species then returns to Brazilian waters for the winter (Oddone et al., 2005, 2007).

29. Consequently, there are seasonal, latitudinal migration that would result in Patagonian narrownose smoothhound cyclically and predictably crossing national jurisdictional boundaries. **The AC concluded that Patagonian narrownose smoothhound meets the CMS definition of migratory**.

Conservation status

30. The IUCN Red List of Threatened Species has assessed Patagonian narrownose smoothhound as Critically Endangered (Pollom et al., 2020). The underlying data for this assessment included catch-per-unit-effort (CPUE) data from research trawl surveys (southern Brazil) and a decline in reported landings (Uruguay). The AC notes that temporal trends in landings may not be indicative of population trends, as fleet behaviour and management measures may also influence reported landings.

31. An Expert Group convened by FAO reviewed population trends of *Mustelus schmitti,* albeit in relation to CITES listing criteria (FAO, 2025). This Expert Group reported the following:

> *Stock assessments of* M. schmitti *have been conducted annually since 2011 by the Joint Technical Commission of the Maritime Front (CTMFM) of Uruguay and Argentina. The most recent stock assessment covering the entire area of distribution in Argentina, Uruguay and adjacent waters (CTMFM, 2025), including data up to 2024, indicates that the stock declined sharply during the 1990s until 2013, reaching a minimum level close to 15 percent of unfished biomass. Trends in estimated biomass stabilized since then following major reductions in catches and have shown a small increase.*
>
> *Projections indicate that, if catch levels remain constant at around 4 000 tonnes – as observed in 2024 – the biomass is expected to exceed 0.25* B_0 *within 7 years. Furthermore, maintaining annual catches near 3 000 tonnes would allow the population to achieve* B_{MSY} *within 15 years. According to this regional analysis, the stock of* M. schmitti *is estimated to have declined below 20 percent* B_0*, which meets the historical extent of decline criterion for a medium productivity species. However, the stock decline is not ongoing and future projections indicate*

that the recovery plan will achieve a 25 percent B_0 threshold in less than 10 years (CTMFM, 2025).

32. Whilst the findings of that review indicate that the stock status of Patagonian narrownose smoothhound is possibly improving, the species is still depleted and thus **the AC concluded that this species meets the criteria for being considered in an ‘unfavourable conservation status’.**

Conclusion

33. The AC considers that Patagonian narrownose smoothhound meets the criteria for being in an ‘unfavourable conservation status’, and for being migratory. **The AC therefore concludes the Patagonian narrownose smoothhound meets the criteria for listing in Appendix II of CMS**.

Other considerations

34. The AC also notes that the stock is assessed regularly (annually) by the Joint Technical Commission of the Maritime Front. Hence, there is already ongoing cooperation covering an important part of the stock area, and stock status has been improving.

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Proposal for the inclusion of the pelagic thresher (*Alopias pelagicus*), the bigeye thresher (*Alopias superciliosus*), and the common thresher (*Alopias vulpinus*) on Appendix I of the Convention

Background

35. Thresher sharks are large pelagic sharks occurring in oceanic waters and shelf seas. Pelagic thresher (*Alopias pelagicus*) is widely distributed in the tropical and subtropical waters of the Indo-Pacific. Bigeye thresher (*Alopias superciliosus*) occurs in the tropical to warm temperate waters of the Atlantic, Indian and Pacific Oceans. Common thresher (*Alopias vulpinus*) is predominantly found in shelf seas in the temperate to tropical waters of the Atlantic and Pacific Oceans. Consequently, these species may occur in the waters of numerous Range States as well as the high seas.

36. The IUCN Red List of Threatened Species has assessed pelagic thresher as Endangered (Rigby et al., 2019a), and both bigeye thresher (Rigby et al., 2019b) and common thresher (Rigby et al., 2022) as Vulnerable.

37. All three species were included in Appendix II of CMS in 2014. The Government of Panama has now submitted a proposal to include all species in Appendix I of CMS.

38. Given that these species have long been recognised as migratory species, that all are included on CMS, and that the AC were not aware of any recent studies that would refute their migratory nature, the evaluation of the proposal focuses on whether the species meet the criteria of being 'endangered'.

39. The convention text states that "*A migratory species may be listed in Appendix I* provided *that reliable evidence, including the best scientific evidence available, indicates that the species is endangered"*, whilst "*Appendix II shall list migratory species which have an unfavourable conservation status and which require international agreements for their conservation and management, as well as those which have a conservation status which would significantly benefit from the international cooperation that could be achieved by an international agreement*". Endangered is defined under the CMS as being "*in danger of extinction throughout all or a significant portion of its range*".

Existing management measures for thresher sharks

40. There are numerous international fisheries management measures that relate to thresher sharks, including in the Mediterranean Sea (GFCM area), ICCAT Convention Area, and IOTC Convention area, as shown in Annex, Table 1.

Conservation status of pelagic thresher

41. The proposal was based largely on data contained in the latest IUCN assessment (Rigby et al., 2019a), including data for the Indian and Pacific Oceans, for which trends from the available time-series were extrapolated to cover three generation lengths (3 GL = 55.5 years).This assessment concluded that the global population of pelagic thresher met the IUCN criteria for being listed as Critically Endangered.

42. Standardised CPUE for the western Central Pacific showed a gradual decline over the time-series (1996–2014; Figure 1), with a notable drop in the final year of the time-series (it is unclear as to whether this is an anomalous data point or a genuine decrease). These data refer to *Alopias* spp. but are likely to be dominated by pelagic thresher and bigeye thresher. Extrapolating the observed decrease from the 19-year time-series to three GL resulted in an estimated decline that equated with an Endangered status under the IUCN criteria.

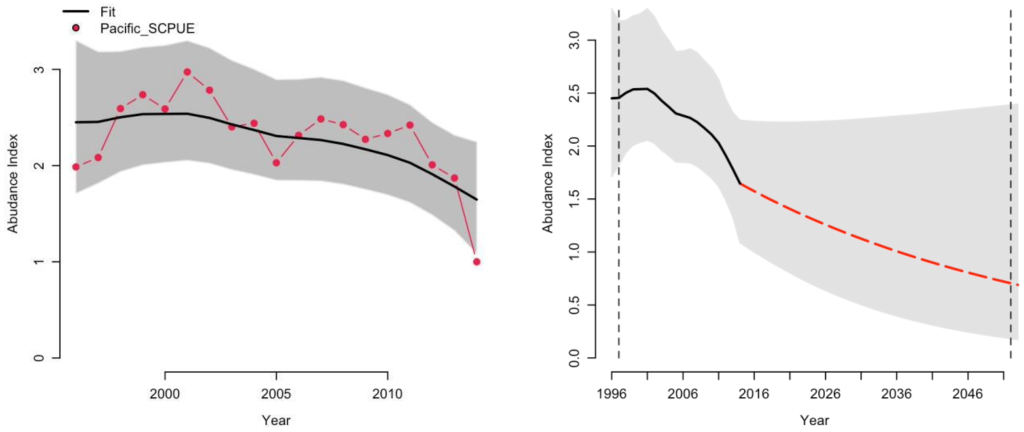

Figure 1: JARA results for pelagic thresher in the western Central Pacific showing time-series data (1996–2014; left), and predicted population trajectory (red dashed line) to encompass 3 GL (right). Source: Rigby et al. (2019a).

43. Indian Ocean: The index used for the Indian Ocean was variable (with high inter-annual variation), and data were intermittent across the time-series (Figure 2). Extrapolating the decreasing trend from this time-series, that spanned 21-years, to three GL resulted in an estimated decline equating with a Critically Endangered status under the IUCN criteria. This analysis was based on unpublished data, and the last year of the time-series was 1987.

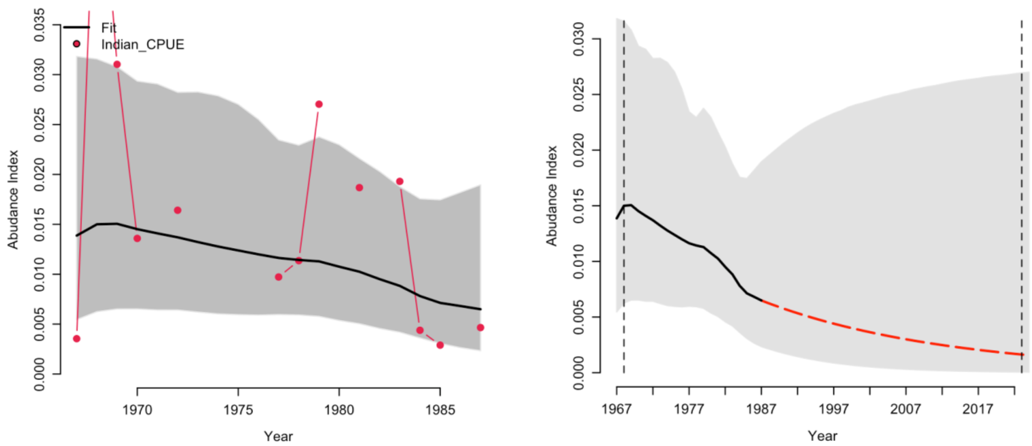

Figure 2: JARA results for pelagic thresher in the Indian Ocean showing time-series data (1967–1987; left), and predicted population trajectory (red dashed line) to encompass 3 GL (right). Source: Rigby et al. (2019a).

44. From the same region, a demographic analysis of pelagic thresher off Taiwan, Northwest Pacific reported a projected stock reduction of 34.3% over 20 years (2007–2027), and that the stock is overexploited (Tsai *et al.* 2010). This conclusion was consistent with a spawning-per-recruit analyses of the pelagic thresher off Taiwan that also found it to be overexploited (Liu *et al.* 2006).

45. The AC also noted the paper by Cardnosa et al. (2014), which indicated genetic differences in populations of pelagic thresher in the eastern and western Pacific.

Conservation status of bigeye thresher

46. The proposal was based largely on data contained in the latest IUCN assessment (Rigby et al., 2019b), including data for the North-west Atlantic, Pacific Ocean and Indian Ocean, with the trend from the time-series extrapolated to cover three generation lengths (3 GL = 55.5 years). This assessment concluded that the global population of bigeye thresher met the IUCN criteria for being listed as Vulnerable

47. North Atlantic: The relative abundance of bigeye thresher in the North-west Atlantic was estimated to have declined (Figure 3) but possibly beginning to stabilise. Extending the observed decrease from the 22-year time-series to three GL resulted in an estimated decline equating with a Critically Endangered status using the IUCN criteria. However, this projection (i) was based on the decline observed over the overall time-series, and not the trend from the most recent years; and (ii) may have been influenced strongly by a single high data point in the first year and (iii) did not consider the introduction of management measures that would potentially alter the population trajectory. The AC also noted that this index was for the North-west Atlantic, an area where there is more fisheries regulation (including enforcement), and so trends may not have been indicative of the wider Atlantic.

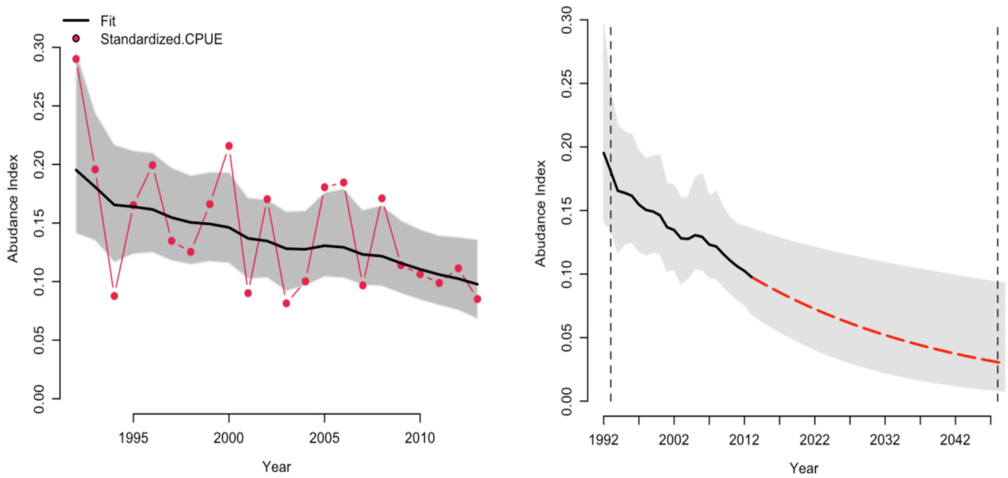

Figure 3: JARA results for bigeye thresher in the North-west Atlantic Ocean showing time-series data (1992–2013; left), and predicted population trajectory (red dashed line) to encompass 3 GL (right). Source: Rigby et al. (2019b).

48. The AC noted the work of an earlier FAO Expert Panel which considered data for thresher sharks (FAO, 2016). In relation to the North-east Atlantic, this Expert Panel stated "*A recent status review of bigeye thresher shark conducted by the US National Marine Fisheries Service (Young et al., 2016) using an update of the observer data used by Cortés et al. (2007) and Baum and Blanchard (2010) found the trend in bigeye thresher abundance to be relatively flat from 1992–2014".*

49. The relative abundance of bigeye thresher in the Indian Ocean was also reported to have declined over the longer time-series, but these may have been from different sources, given the sporadic points from the late 1960s to early 1970s, and then more consistent annual data from 1979–1986, for which the trend was largely stable (Figure 4). Extrapolating the perceived decrease from a 21-year time-series to three generation lengths (55.5 years) resulted in an estimated decline equating with a Critically Endangered status. It was noted that this estimation was based on extrapolating the decline from the overall time-series (and noting the disparate data), and not the more recent trend. This analysis was based on unpublished data, and the last year of the time-series was 1986.

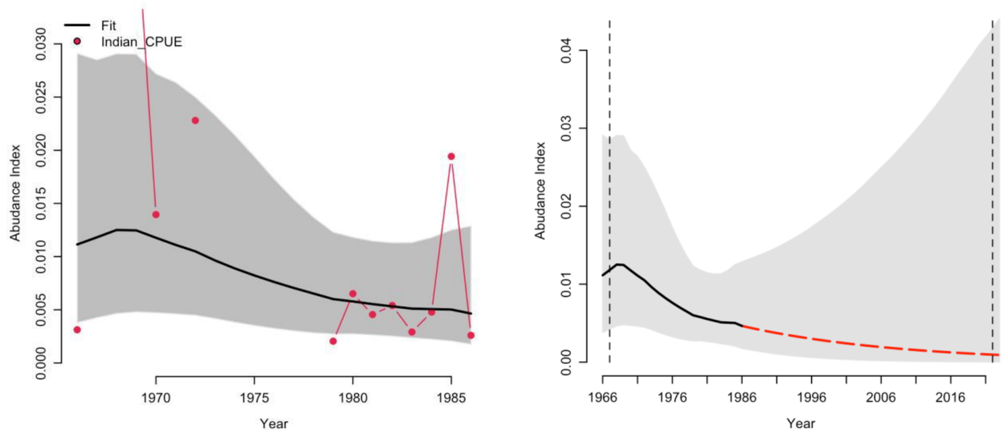

Figure 4: JARA results for bigeye thresher in the Indian Ocean showing time-series data (1966–1986; left), and predicted population trajectory (red dashed line) to encompass 3 GL (right). Source: Rigby et al. (2019a).

50. The AC noted that data for the Indian Ocean were very limited. FAO (2016) had previously stated that "*the Indian Ocean is the region with the largest deficiency of reliable catch and effort statistics*" for bigeye thresher.

51. Data from the Pacific Ocean (1995–2014) indicated an increasing catch rate (Figure 5), and the likely status equated with an assessment of Least Concern. Whilst the proposal caveated that these data "*may not be representative of the entire Pacific Ocean*", such a caveat could be stated for all data sources that cover only a proportion of what can be a very large stock range, including those with declining trends. Whilst the more recent trend was increasing, the higher value in the final year of the time-series could usefully be treated with a degree of caution.

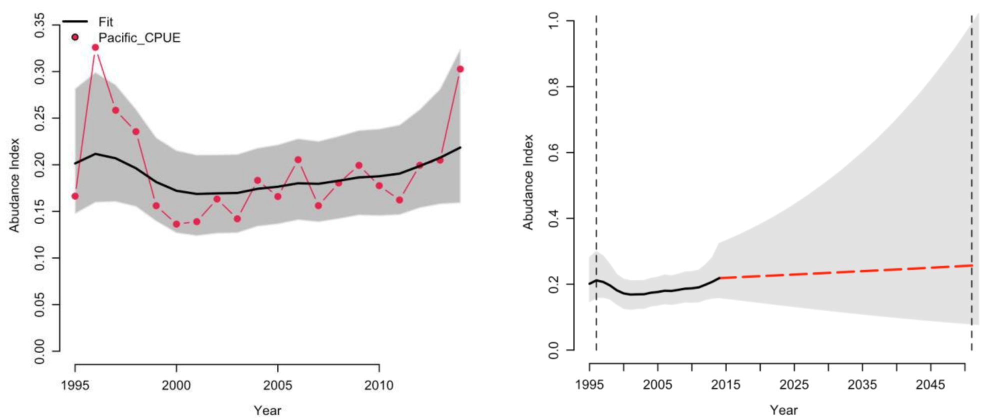

Figure 5: JARA results for bigeye thresher in the Pacific Ocean showing time-series data (1995–2014; left), and predicted population trajectory (red dashed line) to encompass 3 GL (right). Source: Rigby et al. (2019a).

Conservation status of common thresher:

52. The proposal was based largely on data contained in the latest IUCN assessment (Rigby et al., 2022), which comprised data from the North-west Atlantic and Pacific Ocean, including the extrapolation of trends from the available time-series to cover three generation lengths (3 GL = 76.5 years).This assessment concluded that the global population of common thresher met the IUCN criteria for being listed as Vulnerable.

53. North-west Atlantic: The relative abundance of common thresher in the North-west Atlantic had declined following the first two years of the time-series (Figure 6) but was stable for much of the available time-series (noting that there could be high inter-annual variation in the index). Extending the observed decline from the 22-year time-series to three GL resulted in an estimated decline equating with a Critically Endangered status under the IUCN approach. The AC noted that (i) this estimation was based on the decline observed over the overall time-series, and not the trends from the most recent years; (ii) the decline will have been influenced strongly by two high data points in the initial years; and (iii) did not consider the introduction of management measures over the time-series. The AC also noted that this index was for the North-west Atlantic, an area where there is more fisheries regulation (including enforcement), and so trends may not have been indicative of the wider Atlantic.

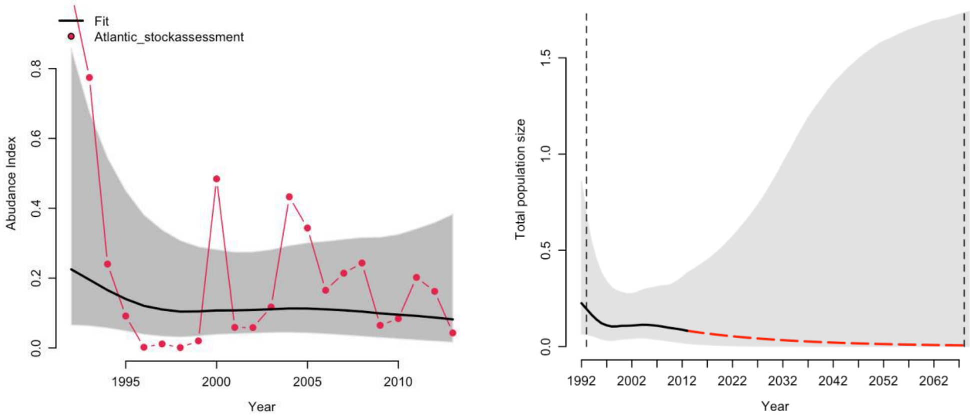

Figure 6: JARA results for common thresher in the North-west Atlantic Ocean showing time-series data (1992–2013; left), and predicted population trajectory (red dashed line) to encompass 3 GL (right). Source: Rigby et al. (2022).

54. Pacific Ocean: Data from the North-east Pacific Ocean (1981–2013) indicated an increasing catch rate over much of the time-series (Figure 7), with a slight decline in the more recent data. The likely status equated with an assessment of Least Concern when extrapolated over 3 GL. The AC noted that this index was for the North-east Pacific, specifically an area of greater fisheries regulation and enforcement, and so trends may not be indicative of the wider area.

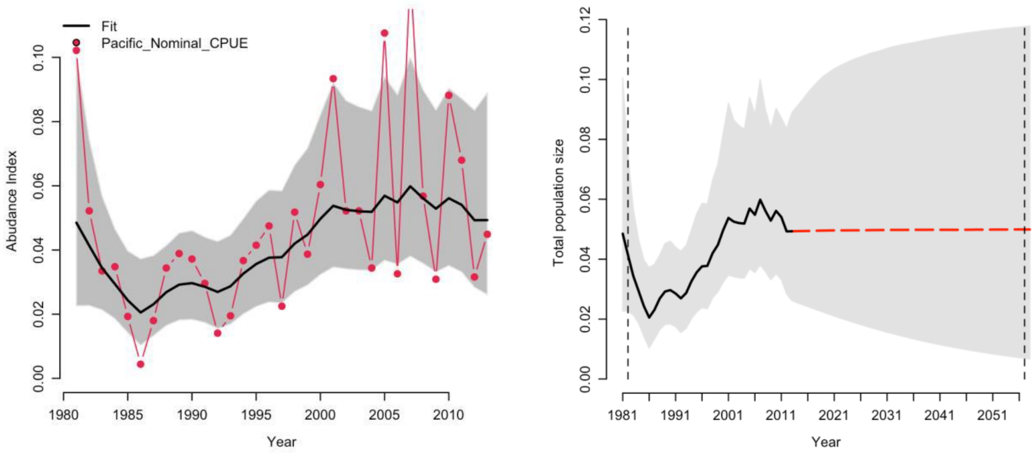

Figure 7: JARA results for common thresher in the North-east Pacific Ocean showing time-series data (1981–2013; left), and predicted population trajectory (red dashed line) to encompass 3 GL (right). Source: Rigby et al. (2022).

55. The proposal also used other information sources, stating that "*CPUE data for A.* vulpinus *show declines of 97% between 2002 and 2005 (Berrondo et al. 2006)*". The AC assumed this to relate to the paper by Berrondo et al. (2007), which provided initial summary data (2001–2005) for nominal (i.e. not standardised) catch rates. Whilst catch rates were higher in 2002 and minimal in 2005, the authors of this study stated that "A. vulpinus *is concentrated in higher latitudes, in areas near the continental bank*", and so the catch rates would have been highly susceptible to variation in the spatial distribution of fishing effort, which was not considered in the analysis. The AC questioned the appropriateness of inferring population-level trends from a nominal CPUE index derived from data collected largely outside the species distribution range and over a limited time-series.

Conclusions

56. In relation to pelagic thresher, the AC considered there was a clear decline in the western Central Pacific (thresher sharks combined), with recent scientific studies indicating a decline of 34.3% over 20 years (1 GL = 18.5 years; see paragraph 44). Given these declines, the AC considered that pelagic thresher met the criteria for listing in Appendix I.

57. In relation to bigeye thresher and common thresher, the AC considered that both these species are listed as Vulnerable on the IUCN Red List and therefore do not meet the guidance for listing in Appendix I.

Other considerations

58. The AC recognises that thresher sharks are low productivity species, and continue to be data-limited species for many areas. Whilst the current exact statuses and population trajectories of thresher shark populations are somewhat uncertain, there are indications of increasing catch rates of some species in some areas (which may reflect the existing management measures that are already in place for some regions and fisheries), but there was evidence of declining trends for other species and areas. There is also concern regarding the statues of these species in areas where large-scale artisanal fisheries operate, and for which data are often limited.

59. The AC noted that species identification can be problematic in some areas, and species-specific data lacking in some datasets, which hampers analyses of population trends of individual species.

60. Regional Fisheries Bodies (RFBs) and other relevant bodies could usefully undertake contemporary analyses of available data to better understand the current population statuses and trends of all species of thresher shark as soon as practicable.

61. The study by Ferretti et al. (2008) suggesting declines of 99.9% seem incompatible with the available time-series of landings information, and this study should be interpreted with due caution. Indeed, for the period 2000–2009 (prior to the ICCAT and GFCM Recommendation), reported landings of *Alopias vulpinus* were 12–26 t per annum (mean = 16.9 t; Figure 8). If the suggestion that the stock of a top predator had declined by 99.9% is correct, and that there were then relatively stable annual landings of ca. 17 t per annum (the inference being these landings are from the remaining 0.1% of the population), then the earlier biomass would seem somewhat implausible.

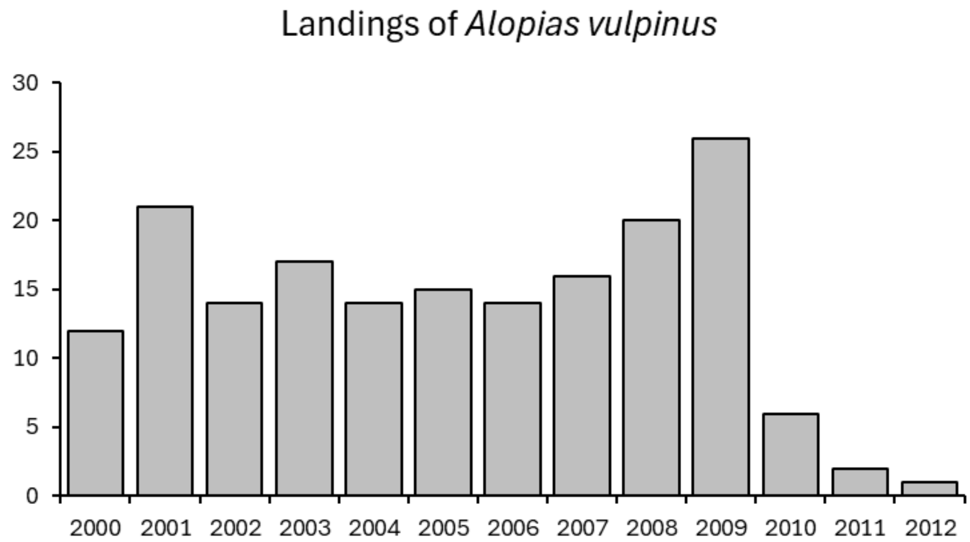

Figure 8. Reported landings of *Alopias vulpinus* from the Mediterranean Sea, Management restrictions entered into force at the end of this time-period. Source of data: FAO.

62. The study referred to a study indicating a decrease in median size of thresher sharks. In general terms, metrics such as 'median size' can be affected as much by an increased occurrence of proportionally more small-sized specimens in the sample (e.g. successful recruitment; bans on wire leaders leading to larger sharks not being caught) as the decreased occurrence in the proportion of larger fish (e.g. as a fishing-related impact). Hence, such data need careful analysis and interpretation, especially for large bodied species for which there can be various approaches to measuring (and reporting) 'length' measurements.

63. The proposal stated that "*Despite ICCAT prohibiting the retention of thresher sharks,* reported *catches of thresher sharks have continued to rise in the Atlantic*". The relevant ICCAT Recommendation prohibits "*retaining onboard, transshipping, landing, storing, selling, or offering for sale any part or whole carcass of bigeye thresher sharks (*Alopias superciliosus*) in any fishery …"* (with an exemption for a small-scale coastal fishery in Mexico), and there should be endeavours "*to ensure that vessels flying their flag do not undertake a directed fishery for species of thresher sharks of the genus* Alopias *spp.*". Consequently, *Alopias vulpinus* is still allowed to be landed (albeit in line with requirements relating to their CITES-listing). ICCAT Task I catch data indicates that reported landings of *Alopias superciliosus* are near-zero. The catches (landings and discards) of thresher sharks reported to ICCAT in 2021–2023 were dominated by reported landings of *Alopias* spp. by Ghana (166–373 t per annum).

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Proposals for the inclusion of (a) the great hammerhead shark (*Sphyrna mokarran*) and (b) scalloped hammerhead shark (*Sphyrna lewini*) on Appendix I of the Convention.

Background

64. Great hammerhead (*Sphyrna mokarran*) and scalloped hammerhead (*Sphyrna lewini*) are large sharks occurring in shelf seas and also extending into oceanic waters. Both occur in subtropical and tropical waters of the major ocean basins, sometimes extending into warm temperate waters. Thus, they occur in the waters of numerous Range States, as well as in the high seas.

65. The IUCN Red List of Threatened Species has assessed both great hammerhead (Rigby et al., 2019a) and scalloped hammerhead (Rigby et al., 2019b) as Critically Endangered.

66. Both species were included in Appendix II of CMS in 2014. The Government of Ecuador has now submitted proposals to include these species in Appendix I of CMS.

67. Given that these species have been recognised as migratory species, are included on CMS Appendix II, and that the AC were not aware of any recent studies that would refute their migratory nature, the evaluation of the proposal focuses on whether the species meet the criteria of being 'endangered' (i.e. "*in danger of extinction throughout all or a significant portion of its range*").

Existing management measures for hammerhead sharks

68. There are some international fisheries management measures that relate to hammerhead sharks already in place, including in the Mediterranean Sea (GFCM area) and ICCAT Convention Area (see Annex, Table 2).

Conservation status of great hammerhead

69. The proposal noted that there is no estimate of the global population size of great hammerhead, and that populations in the Atlantic Ocean and Indo-Pacific were separate. This was supported by the AC. The more robust species-specific data sets to inform on the relative abundance of great hammerhead are from the North-west Atlantic and the east coast of South Africa, as discussed below.

70. The proposal was based largely on data contained in the latest IUCN assessment (Rigby et al., 2019a), which comprised data from the North-west Atlantic and South-west Indian Ocean, including the extrapolation of trends from the available time-series to cover three generation lengths (3 GL = 71.1–74.4 years).This assessment concluded that the global population of great hammerhead met the IUCN criteria for being listed as Critically Endangered.

71. North-west Atlantic (including the Gulf of Mexico): Available data contained in Rigby et al. (2019a), and as also referred to in the proposal, shows that the catch rates of great hammerhead have been increasing in recent years (Figure 9). This was evident in stock assessment outputs (1981–2005), and from catch-per-unit-effort data (1994–2017) derived from observer programmes and longline surveys (Figure 10). Whilst the IUCN assessment predicted a decline in great hammerhead from the stock assessment data, this was based on a JARA assessment that extrapolated an inferred decline, and the projections from the CPUE data indicated an increase. The AC noted that data for 1981–1983 in the stock assessment data were higher than the remaining part of the time-series, but after a sharp decline (1984–1985), the abundance index subsequently showed a consistent increase for the remaining part of the time-series. Thus, the projections are not indicative of the more recent population trends, and did not consider the management measures introduced that may have benefitted the population of great hammerhead in the area.

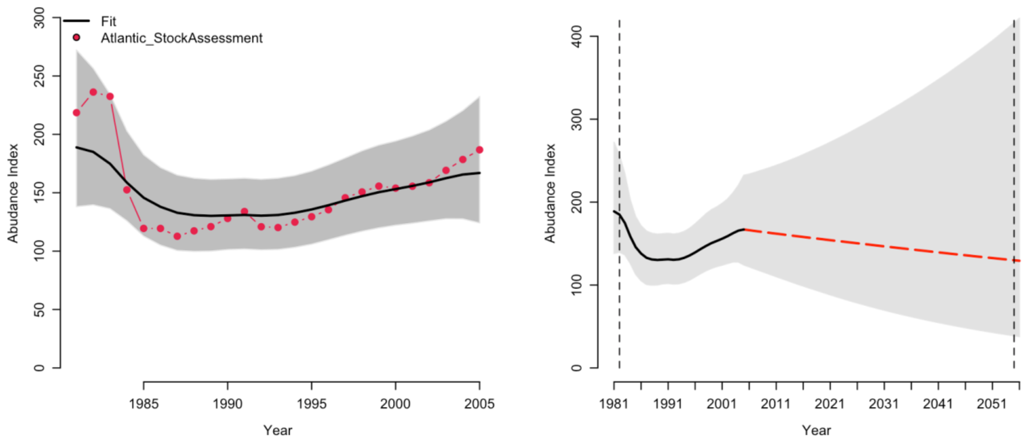

Figure 9: JARA results for great hammerhead in the North-west Atlantic Ocean showing time-series data (1981–2005; left), and predicted population trajectory (red dashed line) to encompass 3 GL (right).

72. The other data used were CPUE data and covered a more recent period (1994–2017; Figure 10), with these data showing an increasing trend. Whilst the available contemporary data (from two sources) showed an increasing trend in the relative abundance of great hammerhead in the North-west Atlantic, this is from an area with more fisheries management and enforcement, and the status of this species elsewhere in the Atlantic is uncertain.

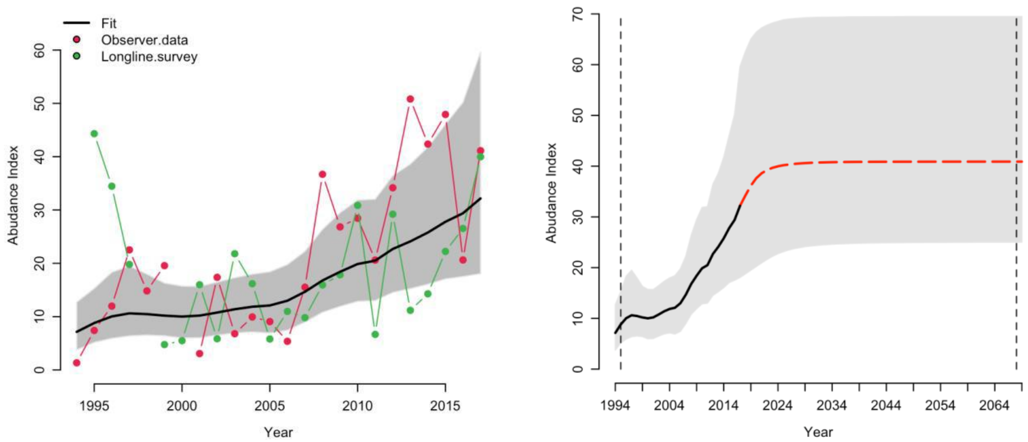

Figure 10: JARA results for great hammerhead in the North-west Atlantic Ocean showing time-series data (1994–2017; left), and predicted population trajectory (red dashed line) to encompass 3 GL (right).

73. Mediterranean Sea: The study by Ferretti et al. (2008) suggesting declines of 99.99% should be viewed in the context of this being towards the northern limit of the distributions of hammerhead sharks, and this study should be interpreted with due caution (see paragraph 61).

74. Indian Ocean: CPUE data from the protective netting programme on the coast of South Africa (western Indian Ocean; 1978–2003) showed a steep decline over the longer time-series (Dudley and Simpfendorfer 2006; Figure 11). The JARA analysis used by the IUCN extrapolated the observed decline (26 years) to the length of three generations (71.1 years), with this resulting in an estimated decline equivalent to 99.3%. The AC note that (i) the netting programme off South Africa has undergone changes in ‘effort’; (ii) there step-change in the abundance index occurring over the years 1986–1988 could

usefully be investigated, (iii) great hammerhead is primarily a tropical species and so the study area is at the southernmost limit of the distribution; and (iv) the catches of this species in the netting programme are low.

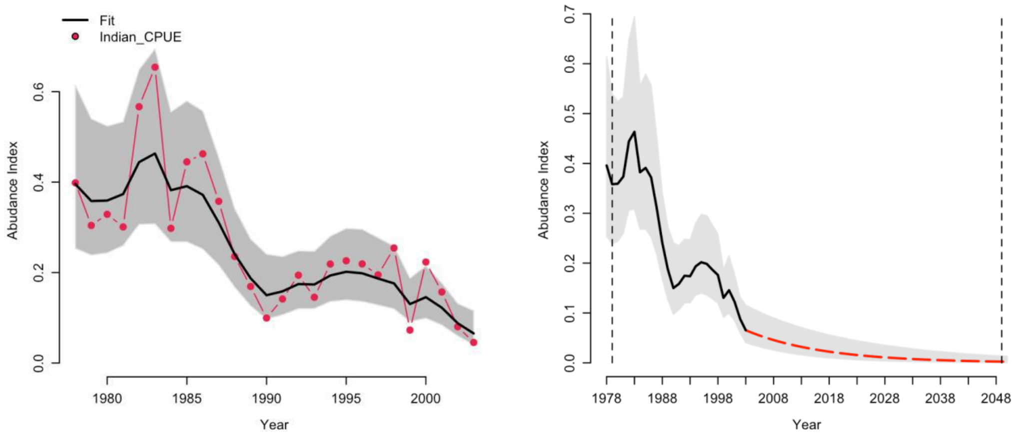

Figure 11: JARA results for great hammerhead in the South-west Indian Ocean showing time-series data (1978–2003; left), and predicted population trajectory (red dashed line) to encompass 3 GL (right).

75. Available data indicate that great hammerhead populations are increasing in parts of the North-western Atlantic. This is an area of more robust fisheries management and enforcement, and so the observed population trends may not be reflective of all areas within the global distribution of great hammerhead. Great hammerhead has declined off South Africa, but this is at the southern limit of its distribution. The AC considered that there has likely been a decrease in the populations of great hammerhead in some other areas, although the magnitudes of any such declines are uncertain.

<u>Conservation status of scalloped hammerhead</u>:

76. The proposal noted that there is no estimate of the global population size of scalloped hammerhead. The more robust species-specific data sets to inform on the relative abundance of scalloped hammerhead (Rigby et al., 2019b) are from the North-west Atlantic (two data sets), east coast of South Africa (see also Dudley and Simpfendorfer 2006), and from the South Pacific (see also Simpfendorfer et al. 2010).

77. The proposal was based largely on data contained in the latest IUCN assessment (Rigby et al., 2019a), which comprised data from the North-west Atlantic and South-west Indian Ocean, including the extrapolation of trends from the available time-series to cover three generation lengths (3 GL = 72.3 years).This assessment concluded that the global population of scalloped hammerhead met the IUCN criteria for being listed as Critically Endangered.

78. North-west Atlantic (including the Gulf of Mexico): Available data contained in Rigby et al. (2019b), and as also used in the basis of the proposal, showed that the assessed stock (1981–2005) declined steadily from 1981 to 1994 (Figure 12), and was then stable at a lower level between 1994 and 2005. The outputs from JARA, which were extrapolated beyond the time-series to estimate the decline over three generations (72.3 years; 99% decline) did not take into account recent stability, or the introduction of management.

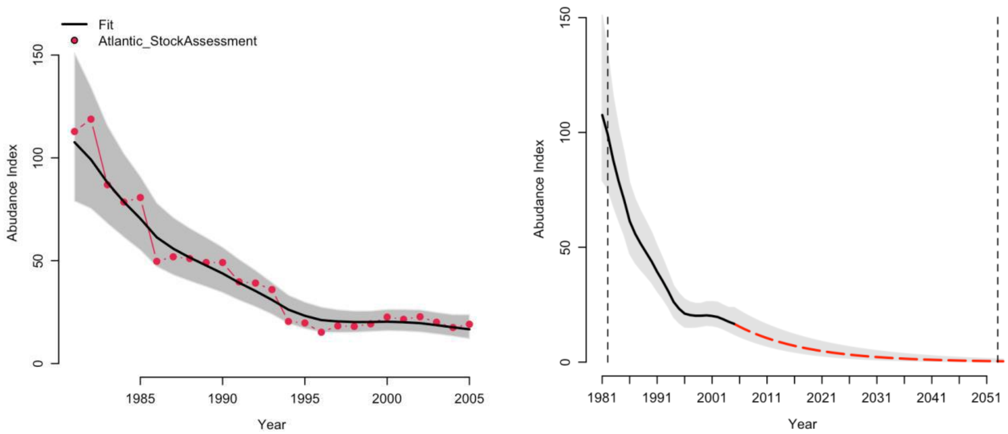

Figure 12: JARA results for scalloped hammerhead in the North-west Atlantic and Gulf of Mexico showing time-series data (1981–2005; left), and predicted population trajectory (red dashed line) to encompass 3 GL (right).

79. The other data sets for the North-east Atlantic were based on catch-per-unit-effort data (1994–2017) derived from observer programmes and longline surveys (Figure 13). Survey CPUE showed a gradually increasing trend. The observer data showed a greater degree of inter-annual variation, and there appeared to be a potential step-change between the periods 1994–2008 and 2009–2017. Overall, these datasets indicated an increasing trend in recent years, but that should be viewed in the context of the earlier decline. The proposal also highlighted other data sources indicative of stock recovery (Gore et al., 2024).

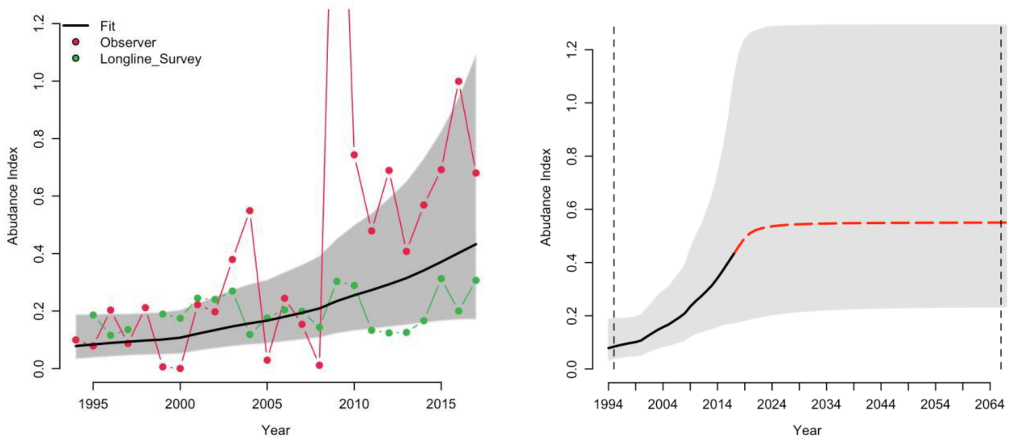

Figure 13: JARA results for scalloped hammerhead in the North-west Atlantic showing time-series data (1994–2017; left), and predicted population trajectory (red dashed line) to encompass 3 GL (right).

80. South Pacific: Two data sets were available for the South Pacific. The first was a standardised CPUE index (1964–2004; Figure 14) which showed a steady decline, with this stabilising at a much reduced level in the last decade of the dataset. The JARA outputs projected the overall decline to be 99.8% over three generations.

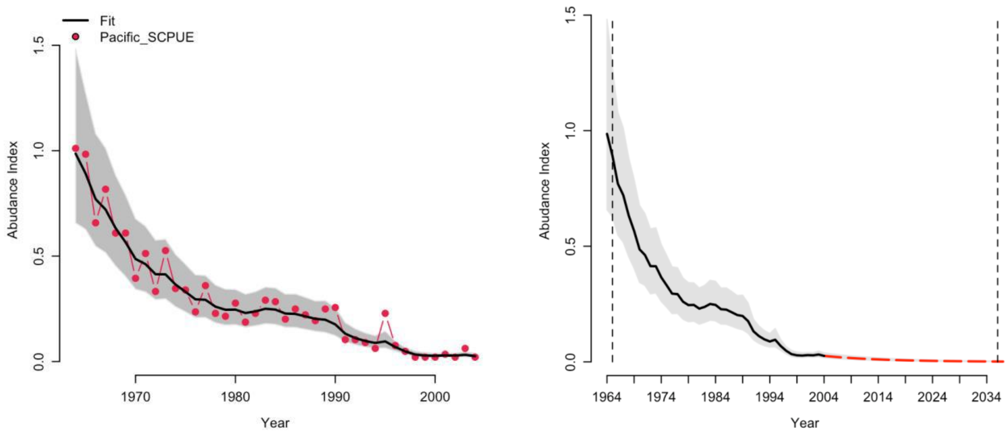

Figure 14: JARA results for scalloped hammerhead off Australia (Queensland, Cairns and Townsville) showing time-series data (1964–2004; left), and predicted population trajectory (red dashed line) to encompass 3 GL (right).

81. A second dataset (limited to the period 1996–2006; Figure 15) showed an increasing trend, but this was based on a much more limited dataset. Taken together, these results are indicative of a longer-term decline, but it is possible that the decline may have been arrested. Furthermore, the proposal stated that "*A recent assessment of the conservation status of the Australian population by the threatened species scientific committee was unable to estimate the number of mature individuals, but noted it is most plausible >10000 mature individuals (DCCEEW, 2024)*".

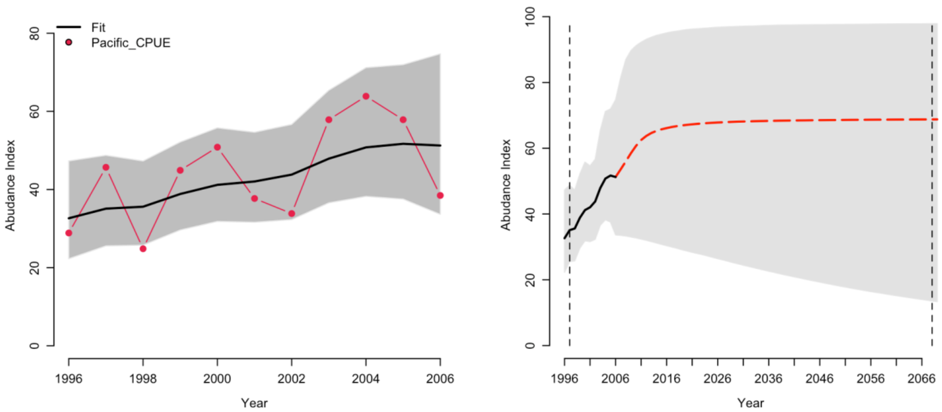

Figure 15: JARA results for scalloped hammerhead off Australia (Queensland) showing time-series data (1996–2006; left), and predicted population trajectory (red dashed line) to encompass 3 GL (right).

82. Indian Ocean: CPUE data from the protective netting programme on the coast of South Africa (South-western Indian Ocean; 1978–2003; Figure 16) showed a steep decline over the longer time-series (Dudley and Simpfendorfer 2006) but was somewhat more stable, at a lower level, from 1992–2003. The JARA analysis used in the IUCN assessment extrapolated the observed decline (26 years) to the length of three generations (72.3 years), with this resulting in an estimated decline equivalent to 93.4%. It should be noted that (i) the netting programme off South Africa has undergone changes in 'effort' over time; (ii) scalloped hammerhead is primarily a tropical species and so the area studied was towards the southernmost limit of the distribution; and (iii) forward projections to cover three generation lengths would have been based largely on the longer-term historic decline and not the recent period of more stability.

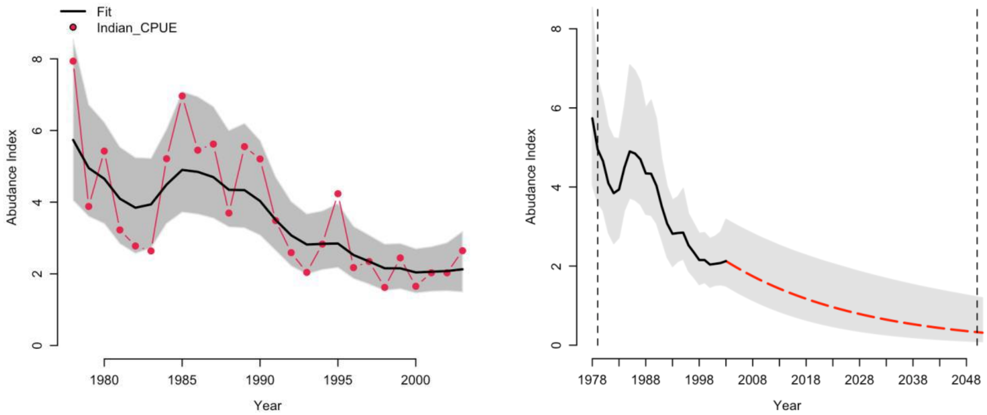

Figure 16: JARA results for scalloped hammerhead in the South-western Indian Ocean showing time-series data (1978–2003; left), and predicted population trajectory (red dashed line) to encompass 3 GL (right).

83. Other studies: The proposal identified a range of other studies that implied declines in scalloped hammerhead, including for South-west Atlantic (Barreto *et al*. 2016; Kotas et al., 2024), and the eastern Pacific (Peñaherrera et al. 2018; White et al. 2015). These studies were generally more limited in spatial and/or temporal extent. The basis for some of these studies are difficult to gauge. For example, Kotas et al. (2024) stated that "*The CPUE of experimental fisheries in Cananéia (SP) between the years 1962 and 1965 (Sadowski, 1967) was 70 individuals per km of net, while in Itanhaém, between the years 1997 and 2003, along with coastal gillnet fishing, it was 1.6 individuals per km of net, leading to a reduction of 97.7% (Motta, 2006)*". Sadowski (1967) also indicated very high seasonal variation in catch rates, and so there are potentially multiple factors (season, location, gear type and deployment) that may limit comparisons between such disparate studies.

84. The Australian scalloped hammerhead population was assessed against IUCN Red List criteria and found eligible for listing in the Endangered category (DCCEEW, 2024). This conclusion was based on an inferred population reduction of greater than 50% over the last 3 generations (estimated at 72 years). This inference was based on fishery-dependent CPUE data; a suite of candidate stock assessment models; standardised catch rates from relevant Shark Control Programs; and fishery-independent surveys. In Australian waters the commercial harvest of scalloped hammerhead is permitted under fisheries management arrangements that are designed to "*halt further decline and support the recovery of the species so its chances of long term survival in nature are maximised*" (management arrangements are summarised in DCCEEW, 2024).

Conclusions

85. In relation to the global population of great hammerhead, the AC had two perspectives (see paragraphs 6 and 7). The first perspective was that great hammerhead is listed as Critically Endangered on the IUCN Red List, and therefore meets the criteria for listing in Appendix I. The other perspective was that data were too limited to make a determination at a global scale, given the contrasting population trajectories from two areas and lack of data from elsewhere.

86. In relation to the global population of scalloped hammerhead, the AC had two perspectives (see paragraphs 6 and 7). The first perspective was that scalloped hammerhead is listed as Critically Endangered on the IUCN Red List and the Australian population has been assessed as meeting the criteria for listing as Endangered, and therefore scalloped hammerhead meets the criteria for listing in Appendix I. The other

perspective was that data were too limited to make a determination at a global scale and, whilst declines were evident in some areas, these declines had generally been arrested (with some populations showing increasing trends) and so it was unclear which populations would be at risk of extinction.

Other considerations:

87. The AC recognised that both these species of hammerhead are data-limited in many parts of their range, are subject to fishing pressure in high seas and shelf seas by both commercial and artisanal fisheries, have a body morphology that renders them susceptible to capture in set nets, and biological characteristics that conferred a high vulnerability to overexploitation. The lack of data for large parts of the species ranges was a cause of concern.

88. The AC noted that species identification can be problematic in some areas, and species-specific data lacking in some datasets, which hampers analyses of population trends of individual species.

89. Regional Fisheries Bodies (RFBs) and other relevant bodies could usefully undertake contemporary analyses of available data to better understand the current population statuses and trends of relevant species of hammerhead shark as soon as practicable.

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ANNEX

OVERVIEW OF INTERNATIONAL FISHERIES MANAGEMENT MEASURES

Table 1: International fisheries management measures relating to thresher sharks.

RFMO	Measure	Comment
GFCM	Recommendation GFCM/42/2018/2	Specimens of shark species listed in Annex II of the SPA/BD Protocol shall not be retained on board, transhipped, landed, transferred, stored, sold or displayed or offered for sale. This list includes common thresher. Note: This updated the earlier Recommendation GFCM/36/2012/3
IATTC	No specific measures for thresher sharks	Whilst other shark-related measures are in place, there are no current measures specifically to afford protection to thresher sharks.
ICCAT	Recommendation 2009–07 by ICCAT on the conservation of thresher sharks caught in association with fisheries in the ICCAT Convention Area	CPCs shall require vessels flying their flag to promptly release unharmed, to the extent practicable, bigeye thresher sharks when brought along side for taking on board the vessel. CPCs should strongly endeavour to ensure that vessels flying their flag do not undertake a directed fishery for species of thresher sharks of the genus *Alopias* spp.
IOTC	Resolution 2025/08 on the conservation of sharks caught in association with fisheries managed by IOTC	flag vessels do not retain on board, transship, land and store any part or whole carcass of thresher sharks (Alopiidae). This measure superceded the earlier Resolution 2012/09 On the Conservation of Thresher Sharks (Family Alopiidae) Caught in Association with Fisheries in the IOTC Area of Competence.
WCPFC	No specific measures for thresher sharks	Whilst other shark-related measures are in place, there are no current measures specifically to afford protection to thresher sharks. For example, CMM 2019–04 included a prohibition on finning, and longline vessels targeting tuna and billfish would have to either (i) not use or carry wire traces, or (ii) not use branch lines running directly off longline floats, or drop lines (known as shark lines)

Table 2: International fisheries management measures relating to hammerhead sharks.

RFMO	Measure	Comment
GFCM	Recommendation GFCM/42/2018/2	Specimens of shark species listed in Annex II of the SPA/BD Protocol shall not be retained on board, transhipped, landed, transferred, stored, sold or displayed or offered for sale. This list includes both great and scalloped hammerhead.
IATTC	No specific measures for thresher sharks	Whilst other shark-related measures are in place, there are no current measures specifically to afford protection to thresher sharks.
ICCAT	Recommendation 2010–08 by ICCAT on hammerhead sharks (family Sphyrnidae) caught in association with fisheries managed by ICCAT	CPCs “shall prohibit retaining onboard, transshipping, landing, storing, selling, or offering for sale any part or whole carcass of hammerhead sharks of the family Sphyrnidae (except for the *Sphyrna tiburo*), taken in the Convention area in association with ICCAT fisheries”.
IOTC	No specific measures relating to hammerhead sharks	Whilst other shark-related measures are in place, there are no current measures specifically to afford protection to any species of hammerhead shark.
WCPFC	No specific measures for thresher sharks	Whilst other shark-related measures are in place, there are no current measures specifically to afford protection to thresher sharks. For example, CMM 2019–04 included a prohibition on finning, and longline vessels targeting tuna and billfish would have to either (i) not use or carry wire traces, or (ii) not use branch lines running directly off longline floats, or drop lines (known as shark lines)