



**MEMORANDUM OF UNDERSTANDING  
ON THE CONSERVATION OF  
MIGRATORY SHARKS**

CMS/Sharks/AC4/Report  
14 February 2025  
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4<sup>th</sup> Meeting of the Advisory Committee (AC4)  
Puerto Princesa, Philippines, 25 – 29 November 2024

**REPORT OF THE MEETING**

*(Prepared by the Chair of the Advisory Committee and the Secretariat)*



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## REPORT OF THE MEETING

*(Prepared by the Chair of the Advisory Committee and the Secretariat)*

### Agenda item 1: Opening of the Meeting

1. Welcoming remarks were provided by Moonyeen Alava (Advisory Committee (AC) member from the Philippines, representing the Asia region), Melanie Virtue (Head of the CMS Aquatic Species Team) and James Ellis (AC Chair).
2. Roberto Abrera (Regional Director, Bureau of Fisheries and Aquatic Resources - MIMAROPA) provided a warm welcome speech to formally open the meeting.
3. James Ellis (AC Chair) presided over the meeting with the constant support of the AC Vice Chair, John Carlson. The Chair explained that, during the joint meeting of the AC and the Conservation Working Group (CWG), discussions and contributions were welcome from both groups on all agenda items.
4. All participants of the Meeting then gave a brief introduction to themselves. The Secretariat noted that AC member Lesley Gidding-Reeve was unable to attend AC4 and gave her apologies.
5. AC4 reiterated that the Sharks MOU addresses sharks, rays, and chimaeras. For the purposes of this report, these are referred to collectively as “sharks”. The term rhino rays is used in this report as relating to the order Rhinopristiformes, thus encompassing guitarfishes (Family Rhinobatidae), wedgefishes (Rhinidae), giant guitarfishes (Glaucostegidae), sawfishes (Pristidae), and banjo rays (Trygonorrhinidae). No species in the latter family are listed under CMS or the Sharks MOU.

### Agenda item 2: Agenda

6. The agenda was presented, with some minor amendments proposed by the Chair and Secretariat. These changes were to provide more time for discussing agenda item 4 (Amendments to Annex 1 of the Sharks MOU), and some restructuring of the agenda to allow for focused time discussing agenda item 5 (Fisheries Management and Conservation Issues) in the late afternoons, to take advantage of the presence of an online CWG member. These changes to the agenda were agreed.

### Agenda item 3: Report of the Chair, Vice Chair and the Secretariat

7. Andrea Pauly (CMS Secretariat) gave a brief presentation providing an overview of recent activities since the 3<sup>rd</sup> Meeting of the AC (AC3).
8. Since the 4<sup>th</sup> Meeting of the Signatories to the Sharks MOU (MOS4), the AC has maintained a consistent schedule of online meetings to ensure continuous progress and coordination. In 2023, the AC held four calls, followed by three calls in 2024, a Programme of Work for 2023–2025 for the AC was approved, an analysis of proposals for inclusion of four species in CMS Appendices was prepared and submitted to the 6<sup>th</sup> Meeting of the Sessional Committee of CMS (ScC-SC6), including **sand tiger shark** *Carcharias taurus*, **blackchin guitarfish** *Glaucostegus cemiculus*, **bull ray**

*Aetomylaeus bovinus*, and **Lusitanian cownose ray** *Rhinoptera marginata*. The AC also provided valuable scientific guidance on several relevant agenda items discussed at CMS COP14.

9. The AC has also developed the Terms of Reference (ToR) for a study on fisheries-induced mortality, which will be conducted under the auspices of CMS. This study aims to address the significant issue of fisheries, which poses a major threat to many shark and ray species.
10. To enhance collaboration and information sharing, the AC has prepared an outreach document on the Sharks MOU for the International Commission for the Conservation of Atlantic Tunas (ICCAT) Standing Committee on Research and Statistics (SCRS). This document aimed to inform and engage ICCAT SCRS members about the objectives and activities of the Sharks MOU, fostering greater cooperation in shark conservation efforts. This document was also addressed under Agenda item 7.
11. Highlights of recent shark-related work at COP14 included:

— Amendment of CMS Appendices: All four proposals for listing sharks and rays on the CMS Appendices were adopted by consensus. Sand tiger shark: Listed globally in Appendix I and II after amendments by Brazil. No regional populations were excluded. Global populations of blackchin guitarfish *Glaucostegus cemiculus*, bull ray *Aetomylaeus bovinus*, and Lusitanian cownose ray *Rhinoptera marginata* were listed in Appendix II, whilst their Mediterranean Sea populations were included in Appendix I.

Next steps: Proposals will be forwarded to MOS5 for consideration of inclusion in Annex 1 of the Sharks MOU.

- Bycatch: A report by Drynan and Baker (2023) [Technical Mitigation Techniques to Reduce Bycatch of Sharks: There is no Silver Bullet](#) was welcomed at COP14. It presents the first comprehensive global review of technical mitigation measures designed to reduce shark bycatch in commercial fishing gear. New COP Decisions on bycatch included a shift of focus from bycatch levels to overall fisheries-induced mortality.
- Vessel strikes: A Resolution and Decisions were adopted to mitigate risks for marine megafauna, with specific guidelines for whale shark *Rhincodon typus*.
- The Single Species Action Plan for Angelshark *Squatina squatina* in the Mediterranean Sea (SSAP Angelshark Med) which had been developed by the AC (in consultation with other relevant stakeholders) and previously endorsed by MOS4, was adopted. An International Working Group will develop implementation tools and hold a Range States meeting.
- Important Shark and Ray Areas (ISRAs): Resolution and Decisions were adopted to support implementation of Marine Spatial Planning (MSP) and designation of

Marine Protected Areas (MPAs), including a call for inclusion of ISRAs in National Biodiversity Strategies and Action Plans (NBSAPs).

- Oceanic whitetip shark *Carcharhinus longimanus*: Decisions to review domestic and regional measures for Appendix I listing implementation.
  - Concerted Actions (CAs): An extension of three years was approved for the rhino ray CA, and a new CA was adopted for blue shark *Prionace glauca*. The CAs for whale sharks, mobulids (Mobulidae), angelshark, and sawfish/guitarfish in Gabon expired without requests for extension.
  - Several AC and CWG members have been actively involved in progressing regional work on delineating Important Sharks and Ray Areas (ISRAs).
12. The Secretariat informed AC4 that the implementation of the Single Species Action Plan for Angelshark in the Mediterranean Sea (SSAP Angelshark Med) is progressing well. A meeting of Range States is planned for April 2025 (date updated by the Secretariat after Sharks AC4) with funding already secured. An International Working Group has been established, and Annex IV is under development. Additionally, a Partnership Agreement with the Angelshark Conservation Network is under discussion. Two projects have been funded and are underway: The Shark Trust is developing a toolbox for implementation, and the Angelshark Project (LIB) is providing advice for spatial management and identifying critical areas for angel sharks in the Mediterranean Sea.
13. Sally Snow gave a presentation on the work of the Large Marine Vertebrates Research Institute (LAMAVE), based in Puerto Princesa City in the Philippines (<https://www.lamave.org>). LAMAVE is a Filipino NGO that works on the conservation of marine megafauna, including some of the shark and ray species listed on Annex 1 of the Sharks MOU, including whale shark, and mobulid rays (and other species). LAMAVE have been involved in various work areas, including:
- Remote Underwater Videos
  - Baited Remote Underwater Video Systems (BRUVS)
  - Photo identification
  - Acoustic telemetry
  - Satellite telemetry
  - Tourism impact and compliance to local ordinance
  - Rapid bycatch assessment
  - Deepsea biodiversity assessment
  - Deepwater shark fisheries assessment
  - Illegal wildlife trade
  - Contributions to the ISRA process
14. John Carlson asked about whale shark, for which the Philippines is an important area for the population. Whale shark was being proposed for uplisting to Appendix I of CITES, and clarification as to potential fisheries-related impacts and other threats in the Philippines was of interest to the AC.

15. Sally Snow indicated that whale sharks were caught occasionally in fish corrals (stationary traps or weirs), with vessel strike, disturbance and habitat degradation potential other threats. No whale shark fins had been observed in market sampling of shark products in Philippines.

#### **Agenda item 4: Amendments to Annex 1 of the Sharks MOU**

16. AC4 undertook a further evaluation of the migratory and conservation status, as well as the benefit of international cooperation of the four species that were accepted for listing on the Appendices of CMS in 2024, especially in relation to any relevant scientific studies that had been published since the initial review by the AC. The updated analysis of the species listed on CMS in 2024 and their relevance to the Sharks MOU is included as **Annex 1** of this report. These species will be considered for listing in Annex 1 of the Sharks MOU at MOS5.
17. The meeting examined the list of current CITES-listed species to identify those that may be migratory, and so potentially benefit from consideration for inclusion in the CMS Appendices. For each species two attributes were scored based on the knowledge of the participants on a three-level qualitative scale: quality/quantity of the data informing on the migratory status (high/medium/low) and the likelihood of them meeting the CMS definition of migratory (unlikely/maybe/yes). This “Assessment of shark and ray species listed in CITES appendices against CMS criteria for inclusion in CMS Appendices” is provided in **Annex 2** of this report.
18. **Annex 3** provides an excerpt from [CMS/Sharks/Outcome 3.2](#) Modifying the species list (Annex 1) of the MOU, outlining the criteria for the inclusion of species in Annex 1 of the Sharks MOU (adapted from CMS criteria for the inclusion of species in CMS Appendix II).
19. AC4 considered the [2024 Report The State of the World's Migratory Species \(UNEP-WCMC, 2024\)](#) and took the opportunity to provide some feedback regarding this report and its future application to the progress and implementation of the Sharks MOU and CMS.
20. AC4 acknowledged the work on compiling a comprehensive and thorough account of the status of migratory species, the pressures and threats they face, and the account of management options and potential solutions. Given the scope and scale of this assessment, the work of the authors should be recognised for their collation, conceptualisation, and communication of such a large amount of information for a diverse range of species in an easy to read and concise manner. AC4 supported some of the broader findings, such as fishes being likely to be amongst the most highly threatened migratory species but are also amongst the most challenging species for managers, and that many species are also very poorly understood. AC4 also noted that the most significant threats for many species are fishing and habitat loss/degradation, but that there are also a range of other threats facing many of these species (e.g. contaminants, and climate change).
21. AC4 recognised that a range of chondrichthyan species may be considered for potential future CMS listings. Regarding this, AC4 raised concerns relating to Annex B of UNEP-WCMC (2024) and considered that it was not appropriate for this list to be used for policy

decisions relating to which sharks and rays could be candidate species for listing on CMS and/or the Sharks MOU. Indeed, there were multiple examples of species that would not, or be unlikely to, meet the CMS criteria for migratory and/or of unfavourable conservation status. **Annex 4** of this document highlights examples of certain questionable species listed in Annex B of UNEP-WCMC (2024). However, these are merely illustrative and do not represent a comprehensive review.

22. AC4 noted that the 2014 report “*The conservation status of migratory sharks*” (Fowler, 2014) would be more appropriate for informing the development of proposals, when considering the migratory behaviour of species, pending a more thorough and updated revision of this list.
23. A revision to this list could also usefully include development of more transparent process and standardised approach to identifying species which would or may meet the criteria for being migratory.
24. AC4 drafted terms of reference for a study to develop and apply criteria for gauging the migratory status of sharks and compiling a list of which species are more likely to meet the criteria for being migratory (sensu CMS). This draft text, provided in **Annex 5** of this report, will be refined, and CMS should be encouraged to seek funding.

**Action Point 4.1:** A revision of Fowler (2014) is required urgently to inform the development of future CMS and Sharks MOU listing proposals. The Secretariat is requested to facilitate this work based on the TOR included in Annex 5 of this report, subject to the availability of funding.

25. AC4 noted that, given changes in the taxonomy of the genus *Squalus*, the North Pacific spiny dogfish *Squalus suckleyi* had been resurrected as a valid species. This species occurs in the North Pacific, including the waters of North and South Korea, Japan, Russia, Canada, USA and, possibly, the northern parts of Mexico. Of these, only the USA is a Signatory to the Sharks MOU.
26. Whilst the original proposal for listing the northern hemisphere populations of spiny dogfish included information pertaining to North Pacific spiny dogfish, the latter species is currently assessed as Least Concern on the IUCN Red List of Threatened Species (Bigman et al., 2016).
27. Given the changes to the taxonomy of the genus, and that the original proposal used information from the North Pacific in the original proposal, the AC recognised the need to consider adopting the resurrected species on Annex 1 of the Sharks MOU.

**Action Point 4.2:** Given that North Pacific spiny dogfish is considered as Least Concern by the IUCN Red List of Threatened Species, it does not currently meet the criteria for being of 'unfavourable conservation status'. Thus, even though CMS has included the species in Appendix II following the species split of *S. acanthias* into *S. acanthias* and *S. suckleyi*, the AC does not advise that *S. suckleyi* to be considered for inclusion in Annex 1. The Secretariat is requested to inform the Signatories accordingly.

## Agenda Item 5: Fisheries management and conservation issues

### 5.1 Important Sharks and Rays Areas (ISRAs)

28. Rima Jabado gave an update on the status and progress of the Important Shark and Ray Areas (ISRA) project. The overall concept of the project was developed by the IUCN-SSC Shark Specialist Group (SSG). The ISRA process could also be viewed in context of Target 3 of the Kunming Montreal Global Biodiversity Framework (KMGBF) also known as the 30 x 30 initiative, and the Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ Agreement).
29. Many existing Marine Protected Areas (MPAs) may be ineffective for the conservation of sharks, rays, and chimaeras, and so an approach to identifying critical habitats and informing area-based management for these species is required.
30. ISRAs are an expert-driven approach to ensure that discrete portions of habitats, critical to shark, ray, and chimaera species are delineated and that have the potential to be managed for conservation. Identification and delineation of ISRAs follows four non-hierarchical criteria (vulnerability, range restriction, life history, special attributes). The ISRA process is approaching the delineation process across 13 defined regions, with ISRAs being delineated in each area. At the time of AC4, six of these regions have been examined.
31. After two years of project work, over 1,000 people have contributed data to inform ISRAs, and over 600 areas have been delineated correspondingly. Currently, roughly half of the world/regions have been assessed – full global coverage is expected by early 2027.
32. An [eAtlas](#) of the ISRAs delineated so far is available online, together with shape files for the areas and fact sheets with summary information on each ISRA, including the species considered and criteria met. The fact sheets undergo a review process through an independent review panel. Regional compendia are available, highlighting ISRAs in each country. The eAtlas is also searchable by species, and spatial data requests are possible.
33. ISRAs are not MPAs, but they provide information that can be used by relevant bodies in marine spatial planning and conservation. ISRAs could also be useful for work in relation to Key Biodiversity Areas (KBAs) and the Convention on Biological Diversity (CBD). For example, ISRAs have informed the KBA updating process for the Philippines which in turn will feed into the Philippine's National Biodiversity Strategies and Action Plans (NBSAP).

34. The CMS and the Sharks MOU have encouraged Parties to support implementation of ISRAs ([CMS Resolution 14.7](#) Important Shark and Ray Areas (ISRAs), [CMS Decision 14.61](#), [CMS/Sharks/MOS4/Decisions/Rev.1](#) Decisions of the Meeting (MOS4)) and to specify objectives within NBSAP relating to using ISRAs in spatial planning.
35. AC4 acknowledged that the ISRA process is a great contribution to the Sharks MOU conservation plan. It was considered worthwhile to produce a map and supporting documents of critical habitats/ISRAs identified for those sharks and rays listed on CMS and Sharks MOU.

**Action Point 5.1:** AC4 agreed to produce maps and supporting documents of critical habitats/ISRAs for sharks and rays listed on CMS and Sharks MOU for submission to CMS COP15 and MOS5. As such, this document would need to be produced by August 2025.

36. It was also stressed that the ISRA process is a vital contribution to the Sharks MOU Conservation Plan, Objective C (Ensuring to the extent practicable the protection of critical habitats and migratory corridors and critical life stages of sharks), specifically Activity 9.1.

## 5.2 Regional prioritization of conservation actions for Annex 1-listed species

37. AC4 postponed its discussion on approaches to the regional prioritization of conservation action for Annex 1-listed species. This agenda item will be addressed intersessionally. AC4 noted that the development of relevant conservation strategies and concerted actions may facilitate regional prioritization of work.

**Action Point 5.2:** AC4 agreed to revisit the “Regional prioritization of conservation actions for Annex 1-listed species” intersessionally.

## 5.3 Assessment of landings data

38. Maria-Pozo Montoro (CWG) gave a presentation on the analyses of FAO landings data that had been undertaken previously (see [CMS/Sharks/AC4/Inf.8](#)) and had been presented at MOS4. The appraisal of reported landings data aligns with the work required under Objective B, Action 3 of the Sharks MOU Conservation Plan.
39. This analysis included insights on the landings data reported to FAO for the period 2015-2019 regarding CMS Appendix I-listed species (no-take) and Sharks MOU Annex 1-listed species.
40. The analysis showed that Sharks MOU Annex 1-listed species would account for at least 7% of global reported shark and ray landings, excluding landings reported at higher taxonomic levels (e.g. Elasmobranchii or Rhinobatidae) for which it is uncertain to allocate the contribution of listed species to reported quantities (57% of shark and ray landings globally).
41. Despite over half of shark and ray landings in the world were being reported at higher taxonomic levels (i.e. non-species-specific reporting), the analysis showed that Signatories reported a lower proportion of the non-species-specific landings (20%) compared to non-Signatories (80%).

42. Additionally, some records were flagged as potential input errors (e.g. incorrect three-letter codes) after careful examination of temporal data.
43. AC4 recognised the need to have improved species-specific landings data but also noted that inaccurate categorization of species-level data was deleterious to understanding shark catches. Signatories and Range States reporting at higher taxonomic levels should initiate programmes to support appropriate catch sampling (e.g. market or port sampling, at-sea observer coverage) to support quantification of the species composition of the landings.

**Action Point 5.3.1:** Signatories are reminded of the need for improved species-specific in catch (landings and discards) data. Accurate species-level data are needed to better understand trends in shark catches. Adequate sampling schemes should be developed and implemented if annual landings data for sharks are reported at higher taxonomic levels.

44. AC4 also recognised that there could be important data gaps in reported landings data and, given that such official statistics are important for a variety of reasons, periodic appraisal of reported landings data (FAO data, RFB/RFMO data, national data) could usefully be undertaken by Signatories and relevant bodies.

**Action Point 5.3.2:** AC4 agreed to conduct periodic appraisals of reported landings data (FAO data, RFB/RFMO data, relevant national data) to identify and address data gaps and data quality issues and support a more accurate interpretation of official landings statistics, subject to the availability of capacity and resources.

45. Andrea Pauly reminded AC4 that the European Union (EU) had asked for a compendium of relevant fisheries measures, and that the Secretariat had been corresponding with relevant data owners to address how information on different websites could be linked on a compendium that can be maintained in an effective and updated manner. This work is ongoing.
46. Rima Jabado reminded AC4 that many new three-letter codes were now available (updated in 2022), including for rhino rays, and some reported landings data may have been updated since this analysis.
47. AC4 considered that it would be useful, under the Sharks MOU, for Signatories to engage with relevant non-Signatories to encourage improvements in future data collection (for reporting species-specific landings) and/or, where data could not be allocated to a meaningful taxonomic unit, to promote capacity-building programmes to estimate species composition of catches (landings, discards etc.).

**Action Point 5.3.3:** Signatories are encouraged to engage with relevant non-Signatories to promote improvements in data collection, including the reporting of species-specific landings and, where data could not be allocated to a meaningful taxonomic unit, to develop joint capacity-building programmes to estimate species composition of catches (landings, discards etc.).

48. There was notable interest in the landings data from the Indo West Pacific area, for which there is a limited number of Signatories, so engaging with Range States in this area was of particular importance for several Annex 1-listed species, notably rhino rays.

**Action Point 5.3.4:** Signatories, AC and Secretariat are encouraged to engage with Range States in the Indo West Pacific area, where there is a limited number of Signatories, to improve data collection and address knowledge gaps for Annex 1-listed species, notably rhino rays.

49. Andrew Chin (CWG) highlighted that a regional 'Asian Shark and Ray Alliance' was being established, which would be akin to the American Elasmobranch Society (AES), and European Elasmobranch Association (EEA). The increased interest in sharks and rays in this region would hopefully help address many of the knowledge and data gaps.
50. In terms of engaging more with non-Signatories, it was queried as to what were the advantages of non-Signatories becoming Signatories to Sharks MOU, and how the advantages could be promoted. It was also queried as to whether there could be options to invite (and fund) a relevant person from a non-Signatory to attend a MOS, focusing on those non-Signatories with known interactions with Annex 1-listed species (as highlighted in detail in [CMS/Sharks/AC4/Inf.8](#) and further updates of the analysis) and relatively close to the location of the Meeting of the Signatories (MOS). A targeted approach to inviting non-Signatory Range States to the MOS may enable Signatories to the Sharks MOU to address Paragraph 13 (o) of the MOU (To "*encourage other States to sign this Memorandum of Understanding*").

**Action Point 5.3.5:** The Secretariat is requested to continue promoting the advantages of non-Signatories becoming Signatories to the Sharks MOU and consider inviting relevant persons from non-Signatory Range States to attend Meetings of Signatories (MOS). The Secretariat is further requested to investigate funding options to support participation of non-Signatory Range States.

51. It was also noted that there is the Asian Society of Ichthyologists and the Indo-Pacific Fish Conference (IPFC), and that the World Fisheries Conference would also periodically meet in relevant Range States. Targeted attendance at such meetings to raise awareness of the Sharks MOU should be encouraged.
52. Andrew Chin informed AC4 that the joint meeting of the Asian Society of Ichthyologists and the 12th Indo-Pacific Fish Conference will be held in Taiwan from 9-13 June 2025, and there will be a special session on shark and ray fisheries management and conservation. It is anticipated that many delegates from the Indo West Pacific will attend, and this would be an opportunity to raise awareness of CMS with these delegates.

**Action Point 5.3.6:** The Secretariat is requested to consider targeted participation at relevant conferences, such as the Asian Society of Ichthyologists, Indo-Pacific Fish Conference, and World Fisheries Conference, to raise awareness of the Sharks MOU.

53. James Ellis gave a presentation on the updated reported landings of Appendix 1-listed species, as reported to FAO (2000–2022). This work was a continuation of the work described in paragraphs 38 and 42. The supporting information for this study is included as Annex 6 "*Sharks listed on Appendix I of CMS and their international landings as reported to FAO*".
54. In those instances where FAO landings data indicated that a Signatory had been reporting landings of Appendix 1-listed species, there could be opportunities for the AC/Secretariat to write to the relevant Focal Point to seek clarification regarding these data and whether the species is nationally prohibited. AC4 also recognised that any

landings of prohibited species ought to be reported accurately, and not omitted from international fishery statistics, nor to be reported at higher taxonomic levels.

**Action Point 5.3.7:** The Secretariat and the AC Chair are requested to write to relevant Focal Points to seek clarification regarding reported landings of Appendix I-listed species and support accuracy in the reporting of prohibited species.

55. Colin Simpfendorfer highlighted the recent TRAFFIC report [Missing Sharks: A Country Review Of Catch, Trade And Management Recommendations For CITES-Listed Shark Species](#) (Sant et al. 2022), which examined trade data for CITES-listed species, and AC4 agreed that analyses to compare landings and trade data could usefully be undertaken.

**Action Point 5.3.8:** The AC agreed to undertake an analysis to compare landings and trade data for Sharks MOU listed species, as highlighted in the recent TRAFFIC report on CITES-listed shark species, subject to the availability of resources, including funding.

56. AC4 noted that some data that had been identified as questionable during the analysis of landings data presented in [CMS/Sharks/AC4/Inf.8](#) (e.g. a large quantity of angelshark landings) had been updated in the data used for the more recent analysis provided in Annex 6 of this report. This indicated that the erroneous data had been corrected. AC4 welcomed this updating of international statistics and serves as an example of the need for regular quality checks and correcting of official statistics (where necessary) by fishing nations.

**Action Point 5.3.9:** Signatories are encouraged to ensure regular quality checks and correction of official statistics where needed to maintain accurate international fishery statistics.

## Agenda Item 6: Conservation strategies and concerted actions

### Oceanic<sup>1</sup> sharks and rays

57. John Carlson gave a verbal update on the development of conservation strategy and regional action plans for ‘pelagic’ sharks and rays by the IUCN SSC SSG. There had been earlier interest in data mining for the Indian Ocean Tuna Commission (IOTC) area, to develop time-series data, with the EU keen to support this work. This was then developed as a project for stage 1 (data mining) and stage 2 (development of reference points), and involved discussions between DGMARE, AC members and the Secretariat. Progress on this was impacted by the COVID pandemic. Subsequently, there was an identified need to expand the scope of the work outside of the Indian Ocean, given the large decline of oceanic shark species globally. There were also discussions on what constituted a ‘pelagic species’ in the context of this work and that it would be better termed as ‘oceanic sharks’.
58. Rima Jabado expounded on the planned work, indicating the action plans should focus on threat-based approaches (e.g. fisheries interactions and tourism), rather than a species-based approach (i.e. they should focus on relevant regions). This would require

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<sup>1</sup> “Oceanic” sharks and rays are sometimes referred to as “pelagic” sharks and rays. The term ‘oceanic’ refers to those species that are found primarily in (offshore) oceanic waters, whilst the term ‘pelagic’ refers to a species that lives in the water column.

appropriate funding to support stakeholder engagement, including with RFMO contributors.

**Action Point 6.1:** The IUCN SSC SSG is encouraged to expand the scope of conservation work beyond the Indian Ocean to address the global decline of oceanic shark species, to focus action plans on threat-based approaches and secure funding to support stakeholder engagement.

59. Andrea Pauly confirmed the earlier work was aimed at data mining for the IOTC Convention Area, collating national data that were unavailable at an IOTC-level, but that the planned resource was insufficient for data mining and conservation planning. The Secretariat had been unable to make progress on this issue as the modifications to the scope of the work meant that the EU would have needed the work to be undertaken under a different contract.
60. Rima Jabado added that other potential collaborators have supported shark-related work, including one organisation which had someone trained in Conservation Planning (as per the IUCN SSC Conservation Planning Specialist Group), and thus their involvement in developing an action plan for oceanic sharks and rays could be a suitable option.
61. It was recognised that it might be more practical if the IUCN SSC and other relevant entities were to apply for funds, or to be included in a small consortium.

**Action Point 6.2:** The IUCN SSC SSG and other relevant entities are encouraged to apply for funds to support the development of regional conservation strategies and action plans for oceanic sharks and rays. Signatories and CMS Parties are encouraged to provide funding to the IUCN SSC SSG or other relevant parties directly. The Secretariat is requested to provide endorsement letters to support relevant fundraising activities.

62. Whilst action plans for oceanic species would be relatively broad, they would also need to be specific to particular fisheries and/or ocean basins and focusing on the key actions. The main fleets overlapping with oceanic shark and ray species are purse seine and longline fleets, but there were also recognised interactions with other fisheries (e.g. tuna traps, artisanal fleets, gillnet fleets). Action plans for specific fisheries would also enable fishery-related metrics to be developed.

### Whale shark

63. AC4 discussed the recent [CMS Concerted Action for whale shark](#), which had not been extended. AC4 considered that threats to whale shark should be addressed by their inclusion within the oceanic shark conservation plan (to address threats from fisheries, such as purse seine).
64. Another recognised threat impacting whale shark and other filter feeding species, including basking shark, mobulid rays is vessel strike. Elements for mitigating vessel strike on relevant Annex 1-listed species could usefully be developed. It may be possible to combine this with ongoing work relating to vessel strike and marine mammals.

**Action Point 6.3:** The IUCN SSC SSG is encouraged to include whale sharks within the oceanic shark conservation strategy and action plans to address threats from fisheries.

**Action Point 6.4:** The CMS is encouraged to expand its work for mitigating impacts from vessel strike to include relevant CMS and Sharks MOU Annex 1-listed species and consider combining it with ongoing work on marine mammals.

65. Other potential threats and/or sources of disturbance on whale sharks include tourism, microplastics, and climate change. AC4 considered that these were not of immediate importance at the current time and should be re-visited in the future. As such, AC4 felt that a single-species conservation strategy was not needed. National tourism guidelines for threatened marine species, such as whale shark, are available for the Philippines and other countries.

**Action Point 6.5:** Moonyeen Alava is requested to share the National tourism guidelines for the Philippines with the Secretariat to inform Signatories.

### Rhino rays (including sawfish)

66. Rima Jabado gave an update on rhino rays (including sawfish). A Signatory had provided partial funding for a workshop in Asia (e.g. Indonesia or Papua New Guinea). Bureaucratic constraints had limited progress, but work was still ongoing.

67. Moonyeen Alava asked whether there would be options for including work on sawfish and rhino rays within the Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security (CTI-CFF) (<https://www.coraltriangleinitiative.org/>), with this initiative including the governments of Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands and Timor Leste. Many of these are non-Signatories, and so engaging with the CTI-CFF could foster engagement more widely.

**Action Point 6.6:** The AC has agreed to explore options for including work on rhino rays within the Coral Triangle Initiative to foster wider engagement.

68. The Southeast Asian Fisheries Development Center (SEAFDEC) was also considered as a potential forum for a workshop, as this could also help enhance liaison with relevant non-Signatories. Indeed, most of the members of SEAFDEC are non-Parties to the CMS and are not Signatories to the Sharks MOU (Brunei Darussalam, Cambodia, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Myanmar, Singapore, Thailand, Viet Nam), with just a single SEAFDEC member also being a Party to CMS and Sharks MOU Signatory (Philippines). The Government of the Philippines is encouraged to support the Secretariat with reaching out to non-Signatory Range States through their involvement with CTI-CFF and SEAFDEC.

**Action Point 6.7:** The Secretariat is requested to a) reach out to SEAFDEC to explore options for holding a joint rhino ray workshop, and b) to encourage the Government of the Philippines to support outreach to non-Signatory Range States through CTI-CFF and SEAFDEC.

69. AC4 determined that additional funds are required to develop the conservation strategy for rhino rays in the Indo-West Pacific.

**Action Point 6.8:** The IUCN SSC SSG and the Secretariat are encouraged the secure additional funds to develop the conservation strategy for rhino rays in the Indo-West Pacific.

### General comments on conservation plans

70. Colin Simpfendorfer reminded the AC that conservation plans for some other taxa were also available from outside the MOU framework (e.g. the Sawfish conservation strategy, Mobulid conservation strategy) as well as those developed through the MOU (e.g. SSAP Angelshark Med), and these are also important source documents providing guidance on these taxa.
71. It was also highlighted that any regional action plans and conservation plans, although developed primarily for CMS Parties and Sharks MOU Signatories, are available for use by non-Parties.
72. AC4 noted that National Plans of Action (NPOAs) are often outdated, and some have not been reviewed and updated since initial drafting. Concern was expressed that for some nations, these NPOAs were simply a 'paper exercise' and not being used to help progress sustainable fisheries. It was recognised that, when undertaken properly, they can be very useful documents to identify appropriate actions and assess achievable targets.
73. AC4 noted that Paragraph 23 of FAO (1999) indicates that "States which implement the Shark-plan should regularly, at least every four years, assess its implementation for the purpose of identifying cost-effective strategies for increasing its effectiveness".

**Action Point 6.9:** Signatories are encouraged to review and, where relevant, update their National Plans of Action (NPOAs) to ensure they are used effectively to progress sustainable fisheries. Signatories are reminded that FAO (1999) suggests that NPOAs should be reviewed at least every four years.

74. AC4 recognised that developing appropriate conservation strategies and action plans for oceanic sharks and rays (in all ocean basins), and rhino rays (Indo-West Pacific) should be a key priority. It was also noted that completing the latter would then help inform comparable initiatives for western Africa and Mediterranean Sea, and for South America.

**Action Point 6.10:** Signatories are encouraged to prioritize and support the development of conservation strategies and regional action plans for a) oceanic sharks and rays, and b) rhino rays, and to use these to inform initiatives in other regions.

### Agenda Item 7: Strategic focus of the Advisory Committee

#### 7.1 Recent work of the AC in RFMO and RFB meetings related to Annex 1-listed species

75. James Ellis gave a short presentation on 'Migratory sharks and rays in the Atlantic: Chronology of the work of ICCAT, CMS and the Sharks MOU, potential synergies and emerging issues', which was based on a document submitted to ICCAT (Ellis and Pauly, 2024). This document was available as [CMS/Sharks/AC4/Inf.15](#).

76. James Ellis then gave a short presentation on ‘Mobulid rays in the ICCAT Convention Area: A review of current knowledge’, which was based on a document submitted to ICCAT (Ellis et al., 2024). This document was the result of international collaboration. This document was available as [CMS/Sharks/AC4/Inf.16](#).
77. AC4 discussed options for comparable work with other RFMOs, such as IOTC and IATTC.

**Action Point 7.1:** The AC and the Secretariat are encouraged to investigate opportunities for activities, comparable to the submission of information documents to the ICCAT SCRS, to reach out to other relevant RFBs.

## 7.2. Supporting the Strategic Focus of the Sharks MOU

78. Terms of Reference have been established for the AC ([CMS/Sharks/Outcome 3.7](#)).
79. Within the framework of the ToRs, the AC considered that the following areas were of particular importance for their work:
- To identify gaps in relevant species information (e.g. catch data, life-history, movements and habitat use, population status and trends) for species of particular concern (focusing on CMS Appendix I species and those Appendix II species that are not addressed adequately by other organisations) and identify gaps in relevant management (e.g. where Appendix I-listed species still require protection).
  - Facilitate knowledge exchange relating to Annex 1-listed species.
  - Identify which Signatories could usefully cooperate to improve the status of species of particular concern.
  - Foster the development of conservation strategies and action plans for relevant species or species groups.
  - Provide advice on spatial planning relevant to species listed on the Sharks MOU.
  - Identify practical steps (e.g. data collection, collaborative studies and potential management options) for improving the knowledge of, and status of, species following listing on Annex 1, and inform relevant Signatories and CMS Parties.
  - Update relevant Signatories and the MOS of emerging issues relating to migratory sharks.
  - Foster approaches that bridge the gap between fisheries/environment departments.
  - Identify relevant tasks with which Cooperating Partners to the Sharks MOU can assist.
80. In terms of prioritizing future work, the AC noted the importance of conservation planning, as relevant conservation strategies and action plans should prioritise future work for the relevant species and areas.
81. Sawfish (Pristidae): The AC noted that a conservation strategy had already been developed (Harrison and Dulvy, 2014; Fordham et al., 2018), in which actions had been identified that could be undertaken by Signatories. This conservation strategy addresses all sawfish species.

82. Manta rays (Mobulidae): The AC noted that a conservation strategy had already been developed (Ender et al., 2018; Lawson et al., 2017), in which actions had been identified that could be undertaken by Signatories. This strategy therefore encompasses all mobulids listed on Annex 1 of the Sharks MOU.
83. Angel shark: A Single Species Action Plan for Angelshark *Squatina squatina* had been developed, with work on this ongoing. AC4 considered that future iterations of this SSAP could usefully extend the geographical scope to eastern Atlantic waters of North-west Africa and western Europe.
84. As discussed in paragraphs 57-62 and 66-69, the AC considered that both an 'Oceanic shark conservation strategy and action plan' and a 'Rhino ray conservation strategy and action plan' should be developed.
85. The scope of an 'Oceanic shark conservation strategy and action plan' may include the following Annex 1-listed species: *Rhincodon typus*, *Carcharodon carcharias*, *Isurus oxyrinchus*, *I. paucus*, *Lamna nasus*, *Cetorhinus maximus*, *Alopias superciliosus*, *A. vulpinus*, *A. pelagicus*, *Carcharhinus falciformis*, *C. longimanus*, *C. obscurus*, *Sphyrna mokarran*, *S. lewini*, *S. zygaena*, and the mobulids. The AC welcomed the fact that blue shark (*Prionace glauca*) was also included in this plan, even though the species is not listed on Annex I of the Sharks MOU.
86. AC4 reiterated that some of these species are not fully oceanic and so may interact with activities and threats in shelf seas. Hence there would need to be additional consideration of species such as *C. carcharias*, *L. nasus*, *C. maximus*, *A. vulpinus*, *C. obscurus*, and the three species of *Sphyrna*, as such species are known to have important life cycle events in shelf seas.
87. The 'Rhino ray conservation strategy and action plan' would include the following Annex 1-listed species: *Rhinobatos rhinobatos*, *Rhynchobatus australiae*, *Rhynchobatus djiddensis*, and *Rhynchobatus laevis*, and all species of sawfish. It would also include *Glaucostegus cemiculus* which will be considered for listing in Annex 1 at MOS5.
88. In terms of the remaining species listed in Annex 1 of the Sharks MOU, the AC noted the following:
- A proposed Single Species Action Plan was under development for *Galeorhinus galeus* in the North-east Atlantic and Mediterranean Sea, and regular assessments are conducted for the population in Australia-New Zealand waters. Consequently, there was still a need to consider those populations around South America and southern Africa.
  - In terms of *Squalus acanthias*<sup>2</sup> (northern hemisphere populations), the AC considered that the competent authorities were overseeing fisheries exploitation of this species in both the North-west and North-east Atlantic. Consequently, there was only a need to consider further those populations in the Mediterranean Sea and in the Black Sea.
89. There were also discussions of the niche of the CMS/Sharks MOU for listed species. Given that fisheries are typically the primary threat for those species listed in Annex 1 of

<sup>2</sup> In this context AC4 is not referring to *S. suckleyi*.

the Sharks MOU, the competent authorities are national fisheries departments and RFBs (including RFMOs). Areas where the Sharks MOU could potentially focus more could include:

- Promoting relevant work to understand the population status of species listed in Annex 1 of the Sharks MOU that are harvested (e.g. thresher sharks and hammerhead sharks are often not addressed).
- Identifying critical habitats and options for spatial planning and protection.
- Encouraging national focal points to bridge any potential gaps between fisheries and environmental departments (where relevant), and subsequently promoting relevant work related to fisheries threats to be conducted by the relevant competent authorities (e.g. RFBs).
- Fostering links with non-Party range states to encourage relevant range states to join the Sharks MOU and/or engage with relevant conservation strategies and action plans.
- Facilitating the development of conservation planning for relevant species and species-groups, including oceanic sharks and rays, and rhino rays (including sawfish), and promoting the implementation of existing conservation strategies and action plans.
- Given the cumulative effects of human impacts, ensure that Annex 1-listed species are considered within broader initiatives related to non-fisheries related anthropogenic threats (e.g. vessel strike, contaminants, seabed mineral exploitation, tourism).
- Incorporate scientific and data collection programmes that would support the needs identified by the AC4 in section 5.3 Assessment of landings data in this report.

**Action Point 7.2.1:** The Secretariat is requested to investigate whether MOUs could be developed with relevant RFBs.

**Action Point 7.2.2:** The Secretariat is requested to include this agenda item in the agenda of quarterly calls and AC5 to enable continued discussions of the AC intersessionally.

### 7.3 Communications approach

90. Andrea Pauly reminded the meeting of the existing Communication and awareness-raising strategy for the Sharks MOU ([CMS/Sharks/AC4/Inf.13](#)).
91. Rima Jabado noted that there was a need for improved communications between the Sharks MOU and RFBs (including RFMOs), to facilitate knowledge exchange that would improve conservation outcomes for Annex 1-listed species. For example, this could be to encourage the competent authorities to improve data collection, population assessments, strengthen appropriate management advice, and to undertake collaborative studies in areas of common interest.
92. There was a need to develop a new communication strategy (e.g. clarifying the use of social media), and that this should be aligned with the niche of the Sharks MOU.
93. AC4 emphasized the need for a communications strategy aligned with the conservation plan (Annex 3 of the Sharks MOU). Since the conservation plan is due for review and

updates, AC4 recommended incorporating SMART objectives to provide tangible outputs, which could be key features of the communications strategy.

94. AC4 recognised that a better approach to disseminate and communicate the work of CMS, and the Sharks MOU would be beneficial. This needed to understand the 'pathways of influence', as this should guide a more strategic communications strategy.
95. Communications could also be aligned with any metrics that could be developed to demonstrate the work of the Sharks MOU. Potential metrics could include, for example, the number of Signatories, the proportion of shark landings from Signatories that were reported at species-level. The AC could usefully identify additional, potential metrics. Such work could be done intersessionally.
96. It was recognised that some Cooperating Parties may have communication strategies and could possibly provide guidance to the AC and Secretariat.
97. AC4 recognised that outreach and awareness raising is an important issue, in order to highlight the work that is done by the Sharks MOU. There was also a need to prioritise target audiences, as each audience may need a slightly different strategy.

**Action Point 7.3.1:** The Secretariat is encouraged to develop a new comprehensive communication strategy to enhance knowledge exchange and conservation outcomes for Annex 1-listed species. This strategy should: a) improve communications between the Sharks MOU and RFBs (including RFMOs), b) include social media and align with the niche of the Sharks MOU and the conservation plan, incorporating SMART objectives, c) identify and utilize 'pathways of influence' and align with metrics demonstrating the work of the Sharks MOU, d) prioritize target audiences for outreach and awareness raising tailoring strategies to each audience, and e) seek guidance from Cooperating Parties with existing communication strategies.

**Action Point 7.3.2:** AC members are encouraged to email meeting summaries to regional focal points and post on social media.

#### **Agenda item 8: Date and Venue of the Next Meeting**

98. The AC agreed to maintain their quarterly online meetings, and agreed that the next formal AC meeting, scheduled as online, would be best held as three two-hour meetings over successive days.

**Action Point 8:** The Secretariat is requested to continue facilitating quarterly online meetings and to organize AC5 as a three-day virtual event, with each day comprising a two-hour session.

#### **Agenda item 9: Any Other Business**

99. Andrew Chin (CWG) gave a presentation on the PADI Global Shark and Ray Census: a global citizen science programme. Key points from this presentation were:
  - Citizen science programmes can yield useful data and increase knowledge.
  - The programme would log sightings, as well as develop monitoring sites to understand temporal change.

- The project would involve the collection of systematic data. The IUCN-SSG helped draft ten key shark species for each SSG region, with images supplied by Marc Dando. Other shark species can also be reported.
  - QA/QC was important for the programme, with a 3-step process to be undertaken. Data and images would also be graded for quality and confidence in taxonomic identification.
  - There would be periodic reporting (temporal trends in some areas), and data would feed into other programmes and be accessible.
  - In addition to spatio-temporal data, records of ‘impact’ (e.g. injuries from vessels or fishing gears, and plastic entanglement) would also be collected.
100. Transboundary stocks: AC4 had several discussion relating to transboundary (straddling) stocks, as opposed to species that clearly meet the definition of migratory (as per the definition of the CMS). The AC has noted that some of the species being proposed for listing on Annex 1 of the Sharks MOU are often straddling stocks that may not strictly meet the CMS definition of migratory species. This is likely to be an increasing issue in the future. Consequently, further guidance from the Signatories is required as to whether listing species on Annex 1 of the Sharks MOU is limited to species for which the best available evidence indicates that they would meet the definition of migratory, or whether straddling stocks should also be considered to meet the overarching intent of CMS.
101. Taxonomy: Some members of AC4 had concerns over some of the recent updates in the Catalog of Fishes<sup>3</sup>, which is the official taxonomic reference used by CMS for fish species. There are now some deviations apparent between the Catalog of Fishes, FishBase and WoRMS, with the IUCN SSG using the taxonomy agreed by their Integrative Taxonomy Working Group (SSG-ITWG). Such divergence is evident for morulids, as noted in Ellis et al. (2024). AC4 would urge the SSG-ITWG to make their taxonomic inventory publicly available, and to liaise with other relevant bodies (e.g. WoRMS), as that their expertise can be shared more widely for a range of marine taxa. It was noted that WoRMS was now used widely for a range of marine taxa.
102. Inferring migratory patterns from one area to another has often be used in the appraisal of the migratory nature of shark and ray populations. As noted in the AC reviews of several of the species listed by CMS, there can be regional differences in the migratory habits of fish. Consequently, the AC agreed that relevant local and regional physiographic conditions (e.g. oceanography, topography, geological barriers and temperature gradients) should be considered better when inferring migratory patterns.
103. The potential implications of vessel strike were discussed on several occasions during the meeting. Vessel strike may be broadly categorised by (i) offshore shipping, and (ii) coastal vessels. AC4 noted that there may be related threats from other marine activities, including entanglement in vertical lines (e.g. potting and anchor lines).

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<sup>3</sup> Fricke, R., Eschmeyer, W. N. & Van der Laan, R. (eds) 2024. ESCHMEYER'S CATALOG OF FISHES: GENERA, SPECIES, REFERENCES. (<http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>).

104. It was noted that not all Signatories to the Sharks MOU were Parties to CMS. Consequently, it was felt that it would be useful for the Secretariat to inform the Focal Points of the Sharks MOU with the shark-related outcomes of the CMS.

**Action Point 9:** The Secretariat is requested to continue informing the Focal Points of the Sharks MOU with the shark-related outcomes of the CMS.

#### **Agenda item 10: Closure of the meeting**

105. The Chair and Vice Chair thanked the Secretariat, AC and CWG for all their support and work, as well as the observers from the Bureau of Fisheries and Aquatic Resources and LAMAVE for all their input and assistance. The support and helpfulness of the hotel staff was gratefully acknowledged.

106. The meeting was closed

#### **Other points**

107. AC4 was saddened to hear of the death of Marino Vacchi, who passed away in June 2024. Marino served as an AC member for Europe for a number of years, being appointed in 2012 at MOS1 and continuing until the beginning of 2023. Marino was an active AC member, who attended AC1 to AC3 in person, and was proactive in the development of the Single Species Action Plan for Angelshark in the Mediterranean Sea. Marino was a gentleman and a scholar, and AC4 would like to express their condolences to his family and friends.

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## Annex 1: Updated analysis of the species newly listed on CMS Appendices in 2024 and their relevance to the Sharks MOU

### 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 14<sup>th</sup> Meeting of the Conference of the Parties (CMS COP14)

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

**Updated - November 2024**

#### Introduction

1. The Sharks MOU Advisory Committee (AC) previously reviewed proposals for the inclusion of four species of sharks and rays in the Appendices of the Convention (Table 1), that were submitted by CMS Parties for consideration at the 14<sup>th</sup> Meeting of the Conference of the Parties (COP14) to CMS and provided advice ([CMS/Sharks/AC4/Inf.12](#)).
2. These species were all accepted for inclusion on the Appendices for which they were proposed ([UNEP/CMS/COP14/Report/Annex 1](#) Amendments to the CMS Appendices adopted by CMS COP14). Given that these species will be considered for inclusion on Annex 1 of the Sharks MOU, an updated appraisal of available information for these species was undertaken at AC5. This information may be updated again prior to MOS5 if significant new information becomes available.

**Table 1:** The Shark and ray species that were accepted for listing in the Appendices of CMS at COP14.

<b>Species</b>	<b>CMS App.</b>	<b>Proponent(s)</b>	<b>Relevant Documents</b>
<b>Sand tiger shark</b> <i>Carcharias taurus</i>	I and II	Brazil, Panama	UNEP/CMS/COP14/Doc.31.4.9: <a href="#">Proposal for the Inclusion of the Sand Tiger Shark (Carcharias taurus) in Appendix I and II of the Convention</a>
<b>Blackchin guitarfish</b> <i>Glaucostegus cemiculus</i>	I (Mediterranean Sea population) and II	Israel	UNEP/CMS/COP14/Doc.31.4.10: <a href="#">Proposal for the Inclusion of the Blackchin Guitarfish (Glaucostegus cemiculus) in Appendix II and the Mediterranean Sea Population of this Species in Appendix I of the Convention</a>

<b>Species</b>	<b>CMS App.</b>	<b>Proponent(s)</b>	<b>Relevant Documents</b>
<b>Bull ray<sup>4</sup></b> <b><i>Aetomylaeus</i></b> <b><i>bovinus</i></b>	I (Mediterranean Sea population) and II	Israel	UNEP/CMS/COP14/Doc.31.4.11: <a href="#">Proposal for the Inclusion of the Bull Ray (<i>Aetomylaeus bovinus</i>) in Appendix II and the Mediterranean Sea Population of this Species in Appendix I of the Convention</a>
<b>Lusitanian cownose ray</b> <b><i>Rhinoptera</i></b> <b><i>marginata</i></b>	I (Mediterranean Sea population) and II	Israel	UNEP/CMS/COP14/Doc.31.4.12: <a href="#">Proposal for the Inclusion of the Lusitanian Cownose Ray (<i>Rhinoptera marginata</i>) in Appendix II and the Mediterranean Sea Population of this Species in Appendix I of the Convention</a>

### Listing criteria

3. The fundamental principles of the Sharks MOU include the need “to improve or restore a favourable conservation status of sharks listed in Annex 1 of the Memorandum of Understanding”. The comments of the AC focused on three main aspects: whether the species is in unfavourable conservation status, whether it is migratory (as per the definition within CMS), and whether there would be benefits of international cooperation for improving population status. The AC noted the following information relating to CMS listing criteria:

- A migratory species may be listed in Appendix I of the CMS “provided that reliable evidence, including the best scientific evidence available, indicates that the species is endangered<sup>5</sup>”.
- According to the CMS, “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”.
- Migratory means that “the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries”.
- A species is considered to have an “Unfavourable conservation status” if any of the following is not met:

(1) *population dynamics data indicate that the migratory species is maintaining itself on a long-term basis as a viable component of its ecosystems;*

<sup>4</sup> Also known as duckbill eagle ray.

<sup>5</sup> In the present document, the term ‘endangered’ relates to the CMS definition whilst the term ‘Endangered’ relates to the IUCN assessment category. Therefore, where the AC considers the species as endangered, this may equate with an IUCN listing of ‘Critically Endangered’ or ‘Endangered’.

- (2) *the range of the migratory species is neither currently being reduced, nor is likely to be reduced, on a long-term basis;*
- (3) *there is, and will be in the foreseeable future sufficient habitat to maintain the population of the migratory species on a long-term basis; and*
- (4) *the distribution and abundance of the migratory species approach historic coverage and levels to the extent that potentially suitable ecosystems exist and to the extent consistent with wise wildlife management.*

#### General remarks on the applicability of CMS listing criteria for marine species

4. The AC notes that the definition of ‘migratory’ as per CMS can sometimes be difficult to gauge, especially for species that are rare, difficult to assess, and/or occur in areas subject to more limited scientific investigations. Sharks and rays may display different types of migratory behaviour, and the AC has previously noted that there are different scales of cyclical and predictable migrations of fish populations (or part thereof; refer to [CMS/Sharks/Outcome 3.2](#), provided in the Annex of this document). In addition to this, some shark and ray species (as well as fish in general) may form ‘straddling stocks’ irrespective of whether or not the migratory behaviours would meet the CMS criteria. A straddling stock (which equates with a transboundary population) is a population of fish that is (usually) highly mobile and has a distributional range extending over multiple jurisdictional areas.
5. There are clearly technical and practical considerations of demonstrating whether a species meets the CMS criteria for being ‘migratory’. For example, longer-term tagging studies may be limited for some species and areas or may have only been undertaken for more accessible part/s of the global population which may or may not be representative. Additionally, once a species becomes depleted, it can be difficult to characterise the seasonal nature of the species’ occurrence (e.g., through landings or catch data), due to data being more limited.

## Revised comments on the CMS listing (Appendix I and II) of sand tiger shark (*Carcharias taurus*) and applicability to the Sharks MOU

### Background

6. The AC noted that *Carcharias taurus* is primarily a coastal species, found in water depths of 5–232 m, with a predominance in 10–40 m (Otway and Ellis 2011; Rigby et al., 2021). Globally, there appears to be at least six genetically distinct subpopulations of *C. taurus*: Northwest Atlantic; Southwest Atlantic; Japan; South Africa; east coast Australia; and west coast Australia (but see below for other areas). Genetic evidence indicates no contemporary exchange between these populations, with deep ocean basins and warm equatorial waters suspected to represent substantial barriers to dispersal (Ahonen et al., 2009). The proposal notes there is limited genetic differentiation between the Southwest Atlantic (Brazil), the Mediterranean Sea and South Africa; however, the AC considers these populations should be deemed discrete given there is no contemporary evidence of mixing. The AC also noted there are further known regional populations that were not assessed by Ahonen et al. (2009), and not considered fully in the proposal. The AC referred to Rigby et al. (2021) in this respect. The AC therefore considered the available information for the following geographical areas:
- The Northwest Atlantic (USA from the Gulf of Maine to Florida)
  - Southwest Atlantic (Argentina, Uruguay, and southern Brazil)
  - Japan (southwest coast of Japan, possibly extending south-west along the coast of China and possibly into Vietnam)
  - South Africa (possibly extending north-east to Mozambique and north-west to Angola)
  - East coast of Australia
  - West coast of Australia
  - The Arabian Sea and Persian Gulf
  - South-east Asia and Papua New Guinea
  - West Africa and the Mediterranean

### Migratory nature

7. There is considerable evidence that mature individuals of the species undertake large (up to a recorded 2700 km) coastal biennial or triennial north-south migrations in water depths of up to 200 m, associated with mating, gestation, and parturition. Migration patterns are complex (and may vary between geographic location), based on sex and maturity (including whether adult females are in a gravid or resting reproductive phase). ‘Cyclical and predictable’ adult migration has been well documented within several of the substantively studied populations of *C. taurus*: east coast Australia (Bansemmer and Bennett 2011; Otway and Ellis 2011), east coast of southern Africa (South Africa to Mozambique; Dicken et al., 2007); Northwest Atlantic (USA; Hauslee et al., 2018; Teter et al., 2014); and Southwest Atlantic (Argentina to Brazil; Lucifora et al., 2002). There is also some evidence of seasonal migratory behaviour within the west coast Australian population (Hoschke et al., 2023). Data are limited for the other extant populations.
8. Whilst all populations are considered migratory, not all populations would have migrations that cross jurisdictional boundaries. Populations that would not cross such boundaries include the Northwest Atlantic, and Australian populations (both the east and probably west coasts). These populations undertake (well documented) migrations, but

within national waters, although there may be occasional movements by individual fish that cross jurisdictional boundaries (e.g. from Australia to Indonesia).

9. In the earlier review by the AC, there was some uncertainty as to whether adults from the west coast Australian population might migrate seasonally beyond the Australian Exclusion Economic Zone. The range of the western population has previously been documented as extending westwards from near the Western Australia–South Australia border, around the south-west, to just north of Exmouth. A publication by Hoschke et al. (2023) provided evidence for a possible range extension, noting records from as far north as Browse Island in northern Western Australia and from the Arafura Sea in the Northern Territory. There have also been records of *C. taurus* within the MOU Box<sup>6</sup> in the Timor Sea (Momigliano and Jaiteh 2015); in the Barossa Offshore Development Area north-west of Darwin (Jacobs Group 2016; ConocoPhillips 2018); and from reconstructed catches in Indonesian longline fisheries (legal and illegal) from pre-1975 up to 2002 (Braccini et al., 2021).
10. The irregular captures of sand tiger shark in Indonesian waters would suggest such occurrences are unlikely to be the result of cyclical and predictable migrations of a significant part of the population across jurisdictional boundaries.
11. There are very limited data available regarding the Japan; Arabian Sea; Persian Gulf; South-east Asia/Papua New Guinea; and West Africa/Mediterranean Sea populations with no available evidence regarding migratory behaviours. Given the scale of *C. taurus* migrations and the relatively small size of EEZs, the AC considered it likely that populations in these areas would meet the CMS migratory criteria.
12. The AC considered that available evidence indicates that all populations of *C. taurus* (except for the Northwest Atlantic and two Australian populations) meet the CMS definition of migratory. The AC further noted that the evidence indicates *C. taurus* is a 'sub-regional migratory' species as defined in CMS/Sharks/Outcome 3.2 and as referred to in the Annex).

### Conservation status

13. In 2020, the global population of *C. taurus* status was changed from Vulnerable to Critically Endangered according to the IUCN Red List (Rigby et al., 2021). This was based on a suspected population reduction of >80% over the past three generations lengths (74 years). The European/Mediterranean Sea population is also assessed separately as Critically Endangered (Walls and Soldo 2016). The species is now rarely encountered in the Persian Gulf, Arabian Sea, and south-east Asia, and is possibly locally extinct within the Mediterranean Sea (or at very low numbers, Bargnesi et al., 2020) and in the north-west African region (Rigby et al. 2021).
14. In Australia, *C. taurus* is listed as two separate populations under national legislation. The east coast population is listed as Critically Endangered and the west coast population as Vulnerable. A 2018 close-kin mark recapture population assessment

<sup>6</sup> The MOU Box is a rectangular box of marine waters in the Timor Sea that is within Australia's EEZ. It is subject to a 1974 Memorandum of Understanding (MOU) between Australia and Indonesia, with subsequent agreements, and related to traditional fishing rights.

(Bradford et al., 2018) found that the east coast population remains small (only approximately 2,000 adults in total) and is possibly increasing at an estimated rate of 3 – 4% per year. This population has been protected in the bulk of its range since 1984 and across its entire range since 1996, including the establishment of a series of protected areas associated with known key aggregation sites for the species (Commonwealth of Australia 2014). This research indicates a modest overall recovery for the east coast population and possibly provides evidence of the efficacy of local management and protection measures.

15. Given the change in IUCN status to a higher extinction risk category, and the life history characteristics of the species, the AC considers that the available evidence would allow the conclusion that the global population of *C. taurus* be considered as “*facing a very high risk of extinction in the wild in the near future*” and as endangered<sup>7</sup> in accordance with Article III(1) of CMS and Resolution 13.7 *Guidelines for preparing and assessing proposals for the amendment of CMS Appendices*.

### **International cooperation**

16. Given *C. taurus* is demonstrably a sub-regional migratory species, seasonally crossing international boundaries within the bulk of its range, the AC considered that management actions and the conservation status of the species would both benefit substantially from international cooperation.

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<sup>7</sup> This includes a Critically Endangered IUCN assessment.

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**Revised comments on the CMS listing (Appendix I for the Mediterranean Sea population; Appendix II for other populations) of blackchin guitarfish (*Glaucostegus cemiculus*)**

**Migratory nature**

17. Studies on the movements of blackchin guitarfish are limited. Two attempts have been undertaken in Cabo Verde and Guinea-Bissau but have not yielded any results due to logistical constraints. Information on potential migratory behaviours may be inferred from seasonality in some biological studies and from information available for a congener (the giant guitarfish *Glaucostegus typus*) and the related common guitarfish (*Rhinobatos rhinobatos*) that overlaps across most of its known range.
18. There have been limited biological investigations of blackchin guitarfish. It may be noted that studies in Tunisian waters reported that adult females were present all year round (Capapé and Zaouali 1994). Gillnet fisheries targeting this species have been reported as peaking from April to August (Enajjar et al., 2012), possibly indicating some form of seasonality.
19. The movements of giant guitarfish have been studied in Cleveland Bay, Australia. Here, tagged adult male and female *G. typus* (n = 15) exhibited philopatric behaviour patterns, leaving the bay and returning after periods of approximately 9–12 months to use the same areas where they were detected in previous years (White et al., 2014). Adult females were observed to leave the bay in the first weeks of December prior to the wet-season and returned in October the next year. When in the bay, activity space was relatively small but additional information on large scale movements was not available. Recent acoustic telemetry data from a large-scale acoustic telemetry array on the Queensland coast recorded a maximum distance moved of 725 km from the point of tagging (Barnett et al., 2024).
20. The AC previously commented on the Sharks MOU listing proposal for *R. rhinobatos*, noting “*The Common Guitarfish is a coastal batoid species. Information from the Mediterranean Sea clearly indicates seasonal inshore-offshore migrations, although it was unclear as to whether these migrations crossed one or more national jurisdictional boundaries. Such seasonal migrations were also noted off West Africa (Mauritania, Senegal, Guinea, Guinea-Bissau, and Sierra Leone), based on coastal fishers altering their fishing activities, and there was some evidence that these migrations crossed national jurisdictional boundaries (Diop and Menna 2000). The AC considered these migrations to be a significant portion of the population (as it is unlikely that fishers would shift their activities based on a few individuals because this would not be profitable). Given the known importance of West Africa to the species, international cooperation is required.*”<sup>8</sup> In the absence of species-specific information for *G. cemiculus*, the AC concluded that their migratory behaviours may broadly mirror those of such related and/or sympatric species.

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<sup>8</sup> [CMS/Sharks/MOS3/Doc.9.1/Rev.1 Amendment of Annex 1 of the Sharks MOU](#)

21. The AC concluded that available evidence is insufficient to prove whether or not blackchin guitarfish would meet the CMS definition of migratory. Whilst data for blackchin guitarfish are limited, the AC and CWG considered that, based on data for related species, that it would meet the criteria for being considered as migratory.

### Conservation status

22. Blackchin guitarfish has been assessed as Critically Endangered on the IUCN Red List (Kyne and Jabado 2019). This was based on inferred >80% population reduction over the last three generations (45 years) due to actual levels of exploitation. The species has mostly disappeared from the northern coast of the Mediterranean Sea (although recent studies have confirmed the presence of this species along the Atlantic coast of southern Spain, close to Portugal<sup>9</sup>) and it occurs more frequently along the northern coast of Africa where it is targeted in some countries (e.g., Tunisia, Enajjar et al., 2012). In West Africa, the species is targeted for its fins and represents a large component of the fisheries operating from Mauritania to Ghana. Data from 2011 suggest that this species had already drastically declined in this region with sizes reductions also noted (Diop et al., 2011). There are no formal stock assessments for the species, however, other similar species for which data are available indicate similar declines in populations (e.g., *Rhinobatos rhinobatos* in Mauritania) and local extirpations (e.g., African wedgefish *Rhynchobatus luebberti*).
23. The AC concluded that the available evidence would allow the conservation status of blackchin guitarfish to be considered as 'unfavourable' over its global range. Furthermore, the AC considered that the available evidence would allow the conclusion that the Mediterranean Sea population (and potentially the global population) could be "*facing a very high risk of extinction in the wild in the near future*" and be endangered<sup>10</sup> in accordance with Article III(1) of CMS and Resolution 13.7 *Guidelines for preparing and assessing proposals for the amendment of CMS Appendices*.

### International cooperation

24. Blackchin guitarfish was listed on Appendix II of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) in 2019. This stipulates that trade in this species needs to be regulated and that countries need to produce Non-Detriment Finding (NDF) assessments.
25. The AC concluded that both national and international initiatives could benefit populations of blackchin guitarfish. Such measures could include various forms of spatial planning in those bays utilised by key life-history stages and relevant fisheries management measures, such as could be formulated through the General Fisheries Commission for the Mediterranean (GFCM) and the Fishery Committee for the Eastern Central Atlantic (CECAF). The AC also noted the presence of blackchin guitarfish in the southern parts of the ICES area (Division 9.a).

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<sup>9</sup> [https://isea.com.gr/wp-content/uploads/2024/10/EEA-Abstracts-book\\_Final.pdf](https://isea.com.gr/wp-content/uploads/2024/10/EEA-Abstracts-book_Final.pdf) (Page 35 of the pdf)

<sup>10</sup> This includes a Critically Endangered IUCN listing.

## Comments on the recent CMS listing

26. The AC and CWG also considered that there was a reasonable basis to propose listing all populations of blackchin guitarfish on Appendix I of CMS, and also for including this species in Annex 1 of the Sharks MOU.

## Revised comments on the CMS listing (Appendix I for the Mediterranean Sea population; Appendix II for other populations) of bull ray (*Aetomylaeus bovinus*)

### Migratory nature

27. There are no published studies on the movements and migrations of bull ray (also known as duckbill ray or duckbill eagle ray) across most parts of its range in the eastern Atlantic and Mediterranean Sea, although there are other sources of information with which to interpret their movements. There have been recent published studies on their movements and migrations from South Africa (e.g. Elston et al., 2024).
28. Regionally, bull ray is known to move to coastal areas for foraging, and for gravid females to move into inshore pupping grounds (Seck et al., 2002; El Kamel et al. 2010; Zogaris and Dussling 2010; Akyol et al., 2017, 2022), which may also serve as nursery grounds. In the northern Adriatic Sea, La Mesa et al. (2017), using fishery-dependent data, reported a slight southern shift in the northern Adriatic population during the winter (see Figure 1b of La Mesa et al., 2017), presumably to slightly deeper waters. Hence, bull ray is known to undertake seasonal migrations.
29. Biological studies undertaken on bull ray, including age and growth studies (Başusta and Aslan 2018) and dietary studies (Capapé 1977) in the Mediterranean Sea, and studies on reproduction off Senegal (Seck et al., 2002) have accessed samples over much of the year, including of mature fish. The year-round, or extensive presence of such stages may be indicative of more limited migratory movements and, if viewed in conjunction with the results of La Mesa et al. (2017), would be suggestive of the seasonal migrations being of limited spatial extent in these areas.
30. In the Mediterranean Sea, bull rays have been captured more frequently in the eastern and southern areas than in the western basin (Capapé 1989). In general, throughout the range of bull rays in the Mediterranean Sea, there are indications of specific areas where it occurs, including sites of local abundance such as Güllük Bay, Izmir Bay and Iskenderun Bay (Turkey; Akyol et al. 2017, 2022; Bilgili and Kabasakal 2023), Gulf of Gabès, Gulf of Tunis and Lagoon of Bizerte (Tunisia; Capapé 1977; Mejri et al. 2004; El Kamel et al. 2010; Taktek et al., 2020), Gulf of Trieste and northern Adriatic Sea (Dulčić et al., 2008; La Mesa et al., 2016). These observed distributions are more in line with there being discrete populations (Bilecenoğlu 2019). Similarly, in the Northwestern Atlantic, Moreno et al. (2021) considered that multiple in-year sightings of individual bull ray around Tenerife would be indicative of residency in the area.
31. A recent study by Elston et al. (2024) examined the movements of bull ray (known as duckbill ray in South Africa). This study used acoustic telemetry to examine the movements of tagged bull ray ( $n = 24^{11}$ ; 99–158 cm disc width) with data collected for 1085–2504 days (mean = 1704 days). Most detections were made from the area of their

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<sup>11</sup> One additional individual was not detected after tagging.

tagging location. Detections of the tagged fish peaked in their respective tagging locations during the austral summer, indicating that seasonal migrations were likely. The average distances travelled between successive detections averaged 72.3 km, with this being higher for females (108 km) than for males (72.3 km). The maximum observed distance between successive detections was 925 km.

32. Whilst a few individual bull rays went west of L'Agulhas, none appeared to have moved as west as Cape Town. In the east, bull ray would extend as far east as Gqeberha (formerly Port Elizabeth) in the summer but would extend further along the coast (approximately to Durban) during the winter. These data indicate that bull ray in South African waters is a seasonal migrant, presumably moving into warmer water in the austral winter. None of the tagged bull rays were recorded at the most westerly or most easterly acoustic receivers, indicating that they did not move across jurisdictional borders. Nevertheless, the coastal distance between L'Agulhas and Durban is >1000 km (cf. the maximum observed distance between successive detections of 925 km), which indicates that bull ray in this area may migrate such distances.
33. The distribution of bull ray in the eastern Atlantic is somewhat uncertain. Whilst the IUCN assessment indicates a continuous distribution along the coast of western and south-eastern Africa, FishBase indicates a discontinuous distribution, with bull ray occurring from Morocco to Angola, and then from Saldanha Bay (South Africa) to KwaZulu-Natal (South Africa) and southern Mozambique. Bianchi et al. (1999) noted that bull ray was "*possibly present only along the northern coast of Namibia (absent in the cold upwelling waters)*", which would support the suggested discontinuity in their range.
34. The migratory distances travelled by bull ray in South African waters (>1000 km) would, if applied to the Mediterranean Sea, suggest that bull ray could cross jurisdictional boundaries, providing that the physiographic characteristics (e.g. oceanographic conditions, topography, broad habitat types) of these biogeographical provinces were similar. Given the influence of the Agulhas Current on the fishes of southern Africa, it is uncertain whether the migratory extent exhibited by bull ray in this area can be fully extrapolated to some other parts of the species' range.
35. Data from Mauritania landings of bull ray in the National Parc of Banc d'Arguin (PNBA) were made available to the AC, with these data collected over the period 1997 to 2011 (IMROP data). These specimens were landed by Imraguen *lansh* (artisanal fishing vessels) based on five main fishing zones exploited and which are shared by eight landing sites. Specimens of bull ray were caught by three main fishing gears ('courbine', 'tollo' and 'requin gillnets') with stretched meshes ranging from 180–475 mm, and fishing at depths of between 5 m and 50 m or so. The bull rays caught in this area were 40–143 cm in disc width (2.5–6.5 kg in weight). Monthly catches of bull ray (Figure 1) increased progressively from January to April (aggregated annual data peaked at 23.4 tonnes in April) and then decreased, being notably lower over the period July to October. There was then a second smaller peak in aggregated monthly catches in November (9.2 t).
36. Given the seasonal decrease in bull ray landings in the summer, it is likely that they had moved away from the area. The inshore-offshore movement of bull ray evident in the northern Adriatic Sea (La Mesa et al., 2016) was in waters generally less than 50–60 m and so, given that the fisheries in the National Parc of Banc d'Arguin operate over such

water depths, it seems probable that bull ray had moved outside of the area (i.e. moving along the coast, as observed off South Africa), rather than offshore.

37. In support of this, the biological study of bull ray in Senegalese waters undertaken by Seck et al. (2002) reported that, of the mature females examined (n = 18), 88.9% were recorded in the period May to October, and just 11.1% from other times of the year, whilst juvenile displayed a much more even occurrence over the year. The contrasting seasonality in the information available, with bull ray landings in the National Parc of Banc d'Arguin (Mauritania) reduced in the summer, at a time when mature females were observed to peak in Senegalese waters, would suggest that bull ray displays coastal migrations, and would cross jurisdictional boundaries along the coast of north-western Africa.
38. The AC concluded that available evidence indicates that bull ray is an aggregating species that will exhibit seasonal migrations, moving into shallower waters to give birth. The spatial extent of this migration, however, appears to be variable. The extent of seasonal migrations may be limited in some areas (e.g. in the Adriatic Sea and Aegean Seas given that bull ray is generally encountered over much of the year in those localised areas) but may be more extensive in other parts of its range (e.g. South Africa).
39. The AC concluded that there was contrasting evidence as to the migratory nature of bull ray, with some regional variation being evident. The initial AC proposal was based primarily on information from the northern part of its range, and included sites where migrations were assumed to be limited (and so probably not meeting the CMS definition). In contrast, more recent data from South Africa indicated larger-scale migrations along the coast, although in this study not crossing jurisdictional boundaries. Data from Mauritania shown at AC5 showed some evidence of seasonality in the catches that, in conjunction with biological studies undertaken in Senegal, would be suggestive of coastal migrations during which bull ray would cross jurisdictional boundaries.
40. With these new data, the AC now concluded that bull ray would meet the definition of migratory for at least part of their range.

### **Conservation status**

41. There are no formal stock assessments for bull ray, and it is caught very infrequently in fishery-independent trawl surveys. The most recent IUCN global assessment has suspected that the species has undergone a >80% population reduction over the past three generation lengths (51 years) (Jabado et al., 2021a) based on declining bull ray catch trends, limited records from several areas with previous occurrence (both in trawl surveys and fisheries), high level of fishing activities (often unmanaged) throughout its range, low productivity and restricted habitat range. As a consequence, the species was classified as Critically Endangered for the global assessment. Other IUCN regional assessments have also resulted in Critically Endangered listings for European waters (Walls and Buscher, 2015) and the Mediterranean Sea (Walls and Buscher, 2016).
42. The AC would support some of the salient points from the latest IUCN assessment, especially that there is likely a high overlap between bull ray and commercial fisheries (including artisanal and subsistence fisheries), that the aggregating nature of the species, including of gravid females, could result in excessive fishing mortality, and the

species has a low population productivity. The AC would also note that inshore bays and near-shore areas that may be utilised seasonally by bull ray are often subject to a range of anthropogenic pressures.

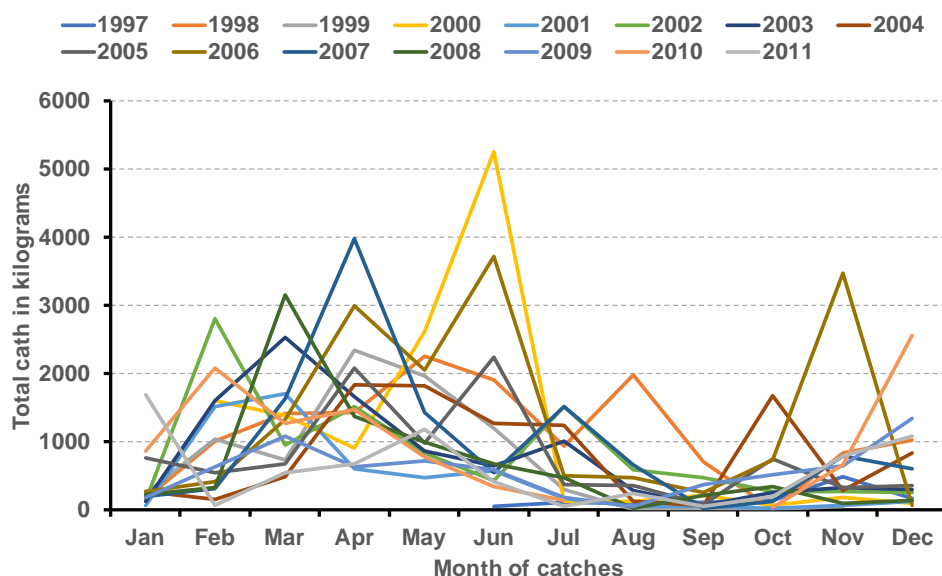
43. Whilst the exact level of population decline is unknown for the entire range, the AC considered that bull ray would be in “unfavourable conservation status”, given its low population productivity, and that it utilises inshore habitats in areas with high levels of fishing activity and other pressures.
44. The AC concluded that the available evidence would allow the conservation status of bull ray to be considered as ‘unfavourable’ throughout its range. Given that the Mediterranean Sea populations appear to occur in a number of discrete areas, such populations could be at an elevated risk of extinction and may be considered endangered in accordance with Article III (1) of CMS and Resolution 13.7 *Guidelines for preparing and assessing proposals for the amendment of CMS Appendices*.

### **International cooperation**

45. UNEP/CMS/COP14/Doc.31.4.11 states that bull ray would be included in the Annex of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol) of the Barcelona Convention, which was adopted in 2023. The inclusion of this bull ray on Annex II conveys species-specific fishing restrictions on members of the General Fisheries Commission of the Mediterranean (GFCM) to an extent equalling a landings prohibition (in the Mediterranean Sea).
46. The AC considered that both national and international initiatives could benefit populations of bull ray. Such measures could include various forms of spatial management in those bays utilised by key life-history stages and relevant fisheries management measures, such as could be formulated through the GFCM and the Fishery Committee for the Eastern Central Atlantic (CECAF).
47. The AC considered that management actions and the conservation status of the species would both benefit substantially from international cooperation.

### **Comments on the recent CMS listing**

48. The AC and CWG also considered that there was a reasonable basis to propose listing further populations of bull ray on Appendix I of CMS, and also for including this species in Annex 1 of the Sharks MOU.



**Figure 1:** Monthly landings of bull ray by year (1997–2011) from eight landing sites in the PNBA.

**Revised comments on the CMS listing (Appendix I for the Mediterranean Sea population; Appendix II for other populations) of Lusitanian cownose ray (*Rhinoptera marginata*)**

**Migratory nature**

49. There are no published studies on the movements and migrations of Lusitanian cownose ray within any of its range in the eastern Atlantic and Mediterranean Sea. In the absence of such information, the AC assessed the likely migratory nature of this species based on (a) published studies that provide relevant information on seasonal occurrence and behaviour, (b) knowledge from sister taxa.
50. In general, members of the genus *Rhinoptera* can form large aggregations, which may also occur at particular times of the year (Schwartz 1990). *Rhinoptera* spp. may also spend some time at the surface. Whilst this means that such species can be monitored by aerial surveys (including drones), the potential seasonal variation in vertical movements and aggregating nature can potentially affect encounter rates in both scientific surveys and fisheries information.
51. Lusitanian cownose ray is reported primarily from western Africa and the eastern Mediterranean Sea. There is a paucity of records from the western Mediterranean Sea, as evidenced by both contemporary and historical accounts, which may be indicative of these being geographically separated populations. This could be related to water temperature, as the eastern basin of the Mediterranean is warmer than the western basin, or preferences in habitat.
52. A study from the Banc d'Arguin National Park (Mauritania) reported the near year-round presence of Lusitanian cownose ray (February to December) (Valadou et al., 2006). There were slight seasonal changes in the sex ratio, with slightly more females occurring during most months of the year. Actual numbers recorded by sex and month were, however, unavailable in this paper which prevented more detailed analysis.

53. Data presented to AC5 included landings data from the Banc d'Arguin National Park, with these data showing pronounced seasonality in landings (Figure 2), which would potentially mirror the migratory behaviour inferred for bull ray (see above). Data from adjacent nations (e.g. Senegal) were lacking, limiting the inferences on the scale of the migration.
54. There are only limited published data for Lusitanian cownose ray in the Mediterranean, although it can be noted that Başusta et al. (2022) were able to collect specimens (juveniles and adults) from Iskenderun Bay (Turkey) over much of the year (except June–July and December), possibly indicating persistent presence in that area.
55. In terms of related species, *Rhinoptera bonasus* is one of the better-studied species, especially along the eastern seaboard of the USA. This species is considered to undertake seasonal migrations, from Florida northwards in the spring to Chesapeake Bay and nearby areas, and southwards (to warmer water) in the autumn (Smith and Merriner, 1987; Blaylock, 1993; Goodman et al., 2010). It should also be noted, however, that Collins et al. (2008) reported that *R. bonasus* in the Caloosahatchee River (Florida) were present over much of the year, including mature individuals, and their results were indicative of there also being resident populations as well as the aforementioned migratory populations.
56. The migratory nature of the genus *Rhinoptera* has been further demonstrated in a recently published, large-scale acoustic telemetry study from the east coast of the US (Livernois et al 2024). This study demonstrated annual migrations across more than 10–13 degrees of latitude based on 82 tagged individuals.
57. In eastern Australian waters, Tagliafico et al. (2020) used aerial drones to examine the presence of *Rhinoptera neglecta*, and aggregations were observed over several different months (and seasons) of the year. Tagliafico et al. (2020) also postulated that *R. negelecta* may move offshore under certain conditions, such as when windspeeds were higher.
58. The AC concluded that available evidence from conspecifics suggests that Lusitanian cownose ray is an aggregating species that will exhibit seasonal migrations, moving into shallower waters to give birth. The spatial extent of this migration is, however, highly uncertain. Documented evidence to show that a significant proportion of either the “entire population or any geographically separate part of the population” will “cyclically and predictably cross one or more national jurisdictional boundaries” is needed. The AC and CWG, however, considered that it would meet the criteria for being migratory, based on the extensive data for related species, together with the limited supporting data available for Lusitanian cownose ray.

### **Conservation Status**

59. There are no formal stock assessments for Lusitanian cownose ray, and it is caught very infrequently in fishery-independent trawl surveys. For example, Baino et al. (2001) only reported Lusitanian cownose ray in two of the 6336 survey hauls analysed. This infrequency in trawl surveys is likely due to multiple factors, including low catchability in

the survey trawl, poor overlap between the survey area and the actual species distribution, and the low abundance of the species itself.

60. Whilst earlier IUCN assessments for Lusitanian cownose ray gave a Data Deficient category due to limited information on this species' interactions with fisheries, the most recent assessment considered it to be Critically Endangered (Jabado et al., 2021b).
61. The AC would support some of the salient points from the latest IUCN assessment, especially that there is likely a high overlap between Lusitanian cownose ray and commercial fisheries (including artisanal and subsistence fisheries), that the aggregating nature of the species, including of gravid females, could result in excessive fishing mortality, and that the species has a low population productivity. The AC would also note that inshore bays and near-shore areas that may be utilised seasonally by *Rhinoptera* spp. are often subject to a range of anthropogenic pressures.
62. Whilst the IUCN assessment "*suspected that the Lusitanian cownose ray has undergone a population reduction of >80% over the last three generation lengths (83 years)*", the AC is not in a position to quantify the extent of the decline. Although the exact level of population decline is unknown, the AC considered that Lusitanian cownose Ray would likely be in "unfavourable conservation status" throughout its range, given its low population productivity, and that it utilises inshore habitats in areas with high levels of fishing activity and other pressures.
63. The AC concluded that the available evidence would allow the conservation status of Lusitanian cownose ray to be considered as 'unfavourable' throughout its range. Given that the Mediterranean Sea populations appear to occur in a number of discrete areas, such populations could be at an elevated risk of extinction and may be considered endangered in accordance with Article III(1) of CMS and Resolution 13.7 *Guidelines for preparing and assessing proposals for the amendment of CMS Appendices*.

### **International cooperation**

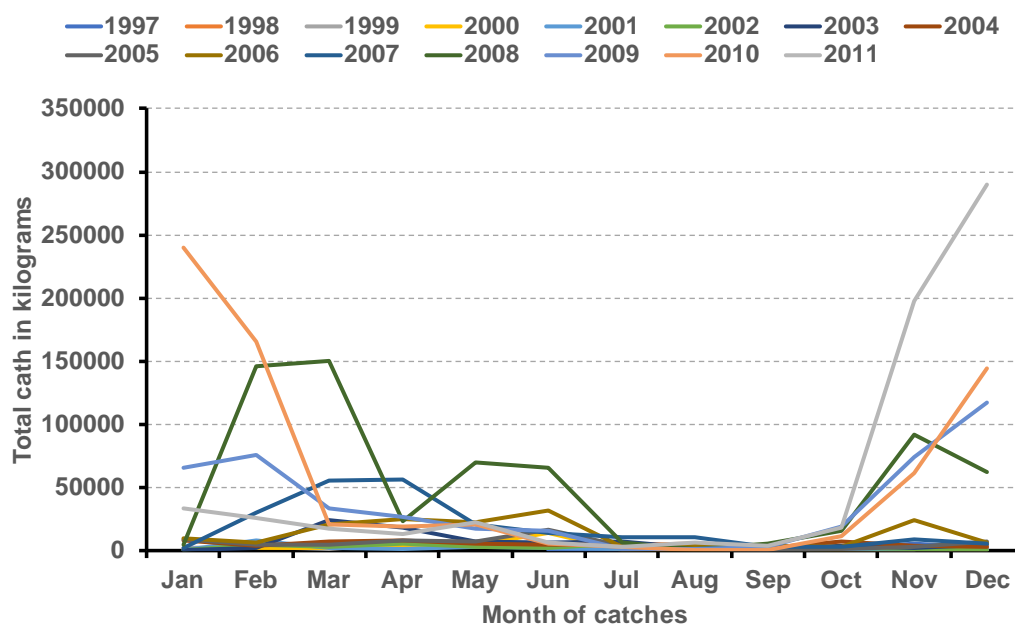
64. The AC considered that both national and international initiatives could benefit populations of Lusitanian cownose ray. Such measures could include various forms of spatial management in those bays utilised by key life-history stages and relevant fisheries management measures, such as could be formulated through the General Fisheries Commission for the Mediterranean (GFCM) and the Fishery Committee for the Eastern Central Atlantic (CECAF).
65. The AC considered that management actions and the conservation status of the species would both benefit substantially from international cooperation.

### **Comments on the recent CMS listing**

66. The AC and CWG also considered that there was a reasonable basis to propose listing all populations of Lusitanian cownose ray on Appendix I of CMS, and also for including this species in Annex 1 of the Sharks MOU.

### Other comments

67. Whilst it would not alter the AC's perception of the conservation status, the AC would query the maximum size (200 cm disc width) and the 27.5-year generation period reported in both the IUCN assessment and the Listing proposal (UNEP/CMS/COP14/Doc.31.4.12). The generation time assumed for Lusitanian cownose ray was based on data for *R. bonasus* that had been extrapolated based on differences in maximum size. Whilst the IUCN assessment considered a maximum size of 200 cm disc width (e.g., as given by McEachran and Capapé 1984), the AC noted that the maximum sizes reported in some dedicated biological studies (including of mature individuals) since earlier accounts have been in the range of 98.2 cm (Tıraşın and Başusta 2018) to 99.8 cm disc width (Başusta et al., 2022) in the Mediterranean Sea, and 93 cm (male) and 102 cm (female) disc width off west Africa (Valadou et al., 2006). Hence, the apparent disparity in these values, which could be related to regional differences in maximum size or taxonomic uncertainties, should be investigated further. Given that there are now more data available on the age and growth of Lusitanian cownose ray (Başusta et al., 2022) to augment data on the size-at-maturity (Valadou et al., 2006), the generation time could usefully be updated in future assessments.



**Figure 2:** Monthly landings of Lusitanian cownose ray by year (1997–2011) from eight landing sites in the PNBA.

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## Annex 2: Assessment of shark and ray species listed in CITES Appendices against CMS criteria for inclusion in CMS Appendices

**Table.** This table lists all species of sharks, rays, and chimeras currently included in the CITES Appendices. Species highlighted in blue are also included in the CMS Appendices and/or Annex 1 of the CMS Sharks MOU. The Sharks AC4 evaluated each species based on the quality of available data; whether the species is migratory; and whether it has a conservation status classified as "unfavourable" according to the definitions in Article I (1) of the Convention and UNEP/CMS/Resolution 11.33 Guidelines for Assessing Listing Proposals.<sup>12</sup> The conservation status assessment follows the IUCN Red List categories: Extinct in the Wild (EX), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), or Near Threatened (NT). Species in these categories qualify for listing in Appendix II, which also informs their inclusion in Annex 1 of the CMS Sharks MOU. Note that NT can also mean "Not Evaluated" in certain contexts. Species highlighted in green are not listed under CMS appendixes or Sharks MOU annex but were assessed as migratory and, in unfavourable conservation status based on high quality data.

No.	Genus	Species	Common name (English)	Data quality	migratory in accordance with cms listing criteria	IUCN RL Status	Appendix I	Appendix II	Appendix III
1	<i>Carcharhinus</i>	<i>acronotus</i>	Blacknose Shark	medium	maybe	EN	NA	2022	NA
2	<i>Carcharhinus</i>	<i>albimarginatus</i>	Silvertip Shark	high	yes	VU	NA	2022	NA
3	<i>Carcharhinus</i>	<i>altimus</i>	Bignose Shark	low	yes	NT	NA	2022	NA
4	<i>Carcharhinus</i>	<i>amblyrhynchoides</i>	Graceful Shark	low	no	VU	NA	2022	NA
5	<i>Carcharhinus</i>	<i>amblyrhynchos</i>	Grey Reef Shark	high	no	EN	NA	2022	NA
6	<i>Carcharhinus</i>	<i>amboinensis</i>	Pigeye Shark	low	yes	VU	NA	2022	NA
7	<i>Carcharhinus</i>	<i>borneensis</i>	Borneo Shark	low	unlikely	CR	NA	2022	NA
8	<i>Carcharhinus</i>	<i>brachyurus</i>	Copper Shark	high	yes	VU	NA	2022	NA
9	<i>Carcharhinus</i>	<i>brevipinna</i>	Spinner Shark	high	yes	VU	NA	2022	NA
10	<i>Carcharhinus</i>	<i>cautus</i>	Nervous Shark	low	unlikely	LC	NA	2022	NA

<sup>12</sup> This review should be considered preliminary, and was undertaken without a comprehensive examination of the literature, and should be considered a preliminary draft. The information presented is subject to revision upon further in-depth analysis.

No.	Genus	Species	Common name (English)	Data quality	migratory in accordance with cms listing criteria	IUCN RL Status	Appendix I	Appendix II	Appendix III
11	<i>Carcharhinus</i>	<i>cerdale</i>	Pacific Smalltail Shark	low	unlikely	CR	NA	2022	NA
12	<i>Carcharhinus</i>	<i>coatesi</i>	Australian Blackspot Shark	low	unlikely	LC	NA	2022	NA
13	<i>Carcharhinus</i>	<i>dussumieri</i>	Whitecheek Shark	low	maybe	EN	NA	2022	NA
14	<i>Carcharhinus</i>	<i>falciformis</i>	Silky Shark	listed (CMS App II, Sharks MOU)		VU	NA	2017	NA
15	<i>Carcharhinus</i>	<i>fitzroyensis</i>	Creek Whaler	medium	no	LC	NA	2022	NA
16	<i>Carcharhinus</i>	<i>galapagensis</i>	Galapagos Shark	high	maybe	LC	NA	2022	NA
17	<i>Carcharhinus</i>	<i>hemiodon</i>	Pondicherry Shark	low	unlikely	CR	NA	2022	NA
18	<i>Carcharhinus</i>	<i>humani</i>	Human's Whaler Shark	low	maybe	DD	NA	2022	NA
19	<i>Carcharhinus</i>	<i>isodon</i>	Finetooth Shark	high	no	LC	NA	2022	NA
20	<i>Carcharhinus</i>	<i>leiodon</i>	Smoothtooth Blacktip Shark	low	maybe	EN	NA	2022	NA
21	<i>Carcharhinus</i>	<i>leucas</i>	Bull Shark	high	yes	NT	NA	2022	NA
22	<i>Carcharhinus</i>	<i>limbatus</i>	Blacktip Shark	high	yes	NT	NA	2022	NA
23	<i>Carcharhinus</i>	<i>longimanus</i>	Oceanic Whitetip Shark	listed (CMS App I, Sharks MOU)		CR	NA	2013	NA
24	<i>Carcharhinus</i>	<i>macloti</i>	Hardnose Shark	low	maybe	NT	NA	2022	NA
25	<i>Carcharhinus</i>	<i>melanopterus</i>	Blacktip Reef Shark	high	no	VU	NA	2022	NA
26	<i>Carcharhinus</i>	<i>obscurus</i>	Dusky Shark	listed (CMS App II, Sharks MOU)		EN	NA	2022	NA
27	<i>Carcharhinus</i>	<i>obsoletus</i>	Lost Shark	low	unlikely	CR	NA	2022	NA
28	<i>Carcharhinus</i>	<i>perezi</i>	Caribbean Reef Shark	medium	yes	EN	NA	2022	NA
29	<i>Carcharhinus</i>	<i>plumbeus</i>	Sandbar Shark	high	yes	EN	NA	2022	NA
30	<i>Carcharhinus</i>	<i>porosus</i>	Smalltail Shark	medium	unlikely	CR	NA	2022	NA

No.	Genus	Species	Common name (English)	Data quality	migratory in accordance with cms listing criteria	IUCN RL Status	Appendix I	Appendix II	Appendix III
31	<i>Carcharhinus</i>	<i>sealei</i>	Blackspot Shark	low	maybe	VU	NA	2022	NA
32	<i>Carcharhinus</i>	<i>signatus</i>	Night Shark	medium	yes	VU	NA	2022	NA
33	<i>Carcharhinus</i>	<i>sorrah</i>	Spottail Shark	medium	yes	NT	NA	2022	NA
34	<i>Carcharhinus</i>	<i>tilstoni</i>	Australian Blacktip Shark	medium	yes	LC	NA	2022	NA
35	<i>Carcharhinus</i>	<i>tjutjot</i>	Indonesian Whaler Shark	medium	maybe	VU	NA	2022	NA
36	<i>Glyphis</i>	<i>gangeticus</i>	Ganges Shark	low	maybe	CR	NA	2022	NA
37	<i>Glyphis</i>	<i>garricki</i>	New Guinea River Shark	low	maybe	VU	NA	2022	NA
38	<i>Glyphis</i>	<i>glyphis</i>	Speartooth Shark	low	maybe	VU	NA	2022	NA
39	<i>Isogomphodon</i>	<i>oxyrhynchus</i>	Daggernose Shark	low	unlikely	CR	NA	2022	NA
40	<i>Lamiopsis</i>	<i>temmincki</i>	Broadfin Shark	low	maybe	EN	NA	2022	NA
41	<i>Lamiopsis</i>	<i>tephrodes</i>	Borneo Broadfin Shark	low	maybe	EN	NA	2022	NA
42	<i>Loxodon</i>	<i>macrorhinus</i>	Sliteye Shark	low	maybe	NT	NA	2022	NA
43	<i>Nasolamia</i>	<i>velox</i>	Whitenose Shark	low	unlikely	EN	NA	2022	NA
44	<i>Negaprion</i>	<i>acutidens</i>	Sharptooth Lemon Shark	high	yes	EN	NA	2022	NA
45	<i>Negaprion</i>	<i>brevirostris</i>	Lemon Shark	high	yes	VU	NA	2022	NA
46	<i>Prionace</i>	<i>glauca</i>	Blue Shark	listed (CMS App II)		NT	NA	2022	NA
47	<i>Rhizoprionodon</i>	<i>acutus</i>	Milk Shark	medium	yes	VU	NA	2022	NA
48	<i>Rhizoprionodon</i>	<i>lalandii</i>	Brazilian Sharpnose Shark	medium	maybe	VU	NA	2022	NA
49	<i>Rhizoprionodon</i>	<i>longurio</i>	Pacific Sharpnose Shark	low	no	VU	NA	2022	NA
50	<i>Rhizoprionodon</i>	<i>oligolinx</i>	Grey Sharpnose Shark	low	no	NT	NA	2022	NA
51	<i>Rhizoprionodon</i>	<i>porosus</i>	Caribbean Sharpnose Shark	medium	maybe	VU	NA	2022	NA

No.	Genus	Species	Common name (English)	Data quality	migratory in accordance with cms listing criteria	IUCN RL Status	Appendix I	Appendix II	Appendix III
52	<i>Rhizoprionodon</i>	<i>taylori</i>	Australian Sharpnose Shark	medium	no	LC	NA	2022	NA
53	<i>Rhizoprionodon</i>	<i>terraenovae</i>	Atlantic Sharpnose Shark	medium	yes	LC	NA	2022	NA
54	<i>Scoliodon</i>	<i>laticaudus</i>	Spadenose Shark	low	no	NT	NA	2022	NA
55	<i>Scoliodon</i>	<i>macrorhynchus</i>	Pacific Spadenose Shark	low	no	NT	NA	2022	NA
56	<i>Triaenodon</i>	<i>obesus</i>	Whitetip Reef Shark	high	no	VU	NA	2022	NA
57	<i>Eusphyra</i>	<i>blochii</i>	Winghead Shark	low	maybe	EN	NA	2022	NA
58	<i>Sphyrna</i>	<i>corona</i>	Scalloped Bonnethead	medium	no	CR	NA	2022	NA
59	<i>Sphyrna</i>	<i>gilberti</i>	Carolina Hammerhead	low	maybe	DD	NA	2022	NA
60	<i>Sphyrna</i>	<i>lewini</i>	Scalloped Hammerhead	listed (CMS App II, Sharks MOU)		CR	NA	2013	NA
61	<i>Sphyrna</i>	<i>media</i>	Scoophead Shark	medium	no	CR	NA	2022	NA
62	<i>Sphyrna</i>	<i>mokarran</i>	Great Hammerhead	listed (CMS App II, Sharks MOU)		CR	NA	2013	NA
63	<i>Sphyrna</i>	<i>tiburo</i>	Bonnethead Shark	high	yes	EN	NA	2022	NA
64	<i>Sphyrna</i>	<i>tudes</i>	Smalleye Hammerhead	low	no	CR	NA	2022	NA
65	<i>Sphyrna</i>	<i>zygaena</i>	Smooth Hammerhead	listed (CMS App II, Sharks MOU)		VU	NA	2013	NA
66	<i>Alopias</i>	<i>pelagicus</i>	Pelagic Thresher	listed (CMS App II, Sharks MOU)		EN	NA	2017	NA
67	<i>Alopias</i>	<i>superciliosus</i>	Bigeye Thresher	listed (CMS App II, Sharks MOU)		VU	NA	2017	NA
68	<i>Alopias</i>	<i>vulpinus</i>	Common Thresher	listed (CMS App II, Sharks MOU)		VU	NA	2017	NA
69	<i>Cetorhinus</i>	<i>maximus</i>	Basking Shark	listed (CMS App I & II, Sharks MOU)		EN	NA	2003	NA

No.	Genus	Species	Common name (English)	Data quality	migratory in accordance with cms listing criteria	IUCN RL Status	Appendix I	Appendix II	Appendix III
70	<i>Carcharodon</i>	<i>carcharias</i>	Great White Shark	listed (CMS App I & II, Sharks MOU)		VU	NA	2005	NA
71	<i>Isurus</i>	<i>oxyrinchus</i>	Shortfin Mako	listed (CMS App II, Sharks MOU)		EN	NA	2019	NA
72	<i>Isurus</i>	<i>paucus</i>	Longfin Mako	listed (CMS App II, Sharks MOU)		EN	NA	2019	NA
73	<i>Lamna</i>	<i>nasus</i>	Porbeagle Shark	listed (CMS App II, Sharks MOU)		VU	NA	2013	NA
74	<i>Mobula</i>	<i>alfredi</i>	Reef Manta Ray	listed (CMS App I & II, Sharks MOU)		VU	NA	2013	NA
75	<i>Mobula</i>	<i>birostris</i>	Oceanic Manta Ray	listed (CMS App I & II, Sharks MOU)		EN	NA	2013	NA
76	<i>Mobula</i>	<i>eregoodoo</i>	Longhorned Pygmy Devil Ray	listed (CMS App I & II, Sharks MOU)		EN	NA	2017	NA
77	<i>Mobula</i>	<i>hypostoma</i>	West Atlantic Pygmy Devil Ray	listed (CMS App I & II, Sharks MOU)		EN	NA	2017	NA
78	<i>Mobula</i>	<i>kuhlii</i>	Shortfin Pygmy Devil Ray	listed (CMS App I & II, Sharks MOU)		EN	NA	2017	NA
79	<i>Mobula</i>	<i>mobular</i>	Spinetail Devil Ray	listed (CMS App I & II, Sharks MOU)		EN	NA	2017	NA
80	<i>Mobula</i>	<i>munkiana</i>	Munk's Pygmy Devil Ray	listed (CMS App I & II, Sharks MOU)		VU	NA	2017	NA
81	<i>Mobula</i>	<i>tarapacana</i>	Sicklefin Devil Ray	listed (CMS App I & II, Sharks MOU)		EN	NA	2017	NA
82	<i>Mobula</i>	<i>thurstoni</i>	Bentfin Devil Ray	listed (CMS App I & II, Sharks MOU)		EN	NA	2017	NA
83	<i>Potamotrygon</i>	<i>albimaculata</i>	Tapajós Freshwater Stingray	low	unlikely	NE	NA	2022	NA

No.	Genus	Species	Common name (English)	Data quality	migratory in accordance with cms listing criteria	IUCN RL Status	Appendix I	Appendix II	Appendix III
84	<i>Potamotrygon</i>	<i>henlei</i>	Bigtooth River Stingray	low	unlikely	LC	NA	2022	NA
85	<i>Potamotrygon</i>	<i>jabuti</i>	Pearl Freshwater Stingray	low	unlikely	NE	NA	2022	NA
86	<i>Potamotrygon</i>	<i>leopoldi</i>	Xingu Freshwater Stingray	low	unlikely	DD	NA	2022	NA
87	<i>Potamotrygon</i>	<i>marquesi</i>	Marques' Freshwater Stingray	low	unlikely	NE	NA	2022	NA
88	<i>Potamotrygon</i>	<i>signata</i>	Parnaíba Frshwater Stingray	low	unlikely	DD	NA	2022	NA
89	<i>Potamotrygon</i>	<i>wallacei</i>	Wallace's Freshwater Stingray	low	unlikely	NE	NA	2022	NA
90	<i>Rhincodon</i>	<i>typus</i>	Whale Shark	listed (CMS App I & II, Sharks MOU)		EN	NA	2003	NA
91	<i>Glaucostegus</i>	<i>cemiculus</i>	Blackchin Guitarfish	listed (CMS App I (med) & II)		CR	NA	2019	NA
92	<i>Glaucostegus</i>	<i>granulatus</i>	Sharpnose Guitarfish	low	yes	CR	NA	2019	NA
93	<i>Glaucostegus</i>	<i>halavi</i>	Halavi Guitarfish	low	yes	CR	NA	2019	NA
94	<i>Glaucostegus</i>	<i>obtusus</i>	Widenose Guitarfish	low	no	CR	NA	2019	NA
95	<i>Glaucostegus</i>	<i>thouin</i>	Clubnose Guitarfish	low	yes	CR	NA	2019	NA
96	<i>Glaucostegus</i>	<i>typus</i>	Giant Guitarfish	medium	yes	CR	NA	2019	NA
97	<i>Glaucostegus</i>	<i>younholeei</i>	Bangladeshi Guitarfish	low	yes	NE	NA	2019	NA
98	<i>Anoxypristis</i>	<i>cuspidata</i>	Narrow Sawfish	listed (CMS App I & II, Sharks MOU)		EN	2007	NA	NA
99	<i>Pristis</i>	<i>clavata</i>	Dwarf Sawfish	listed (CMS App I & II, Sharks MOU)		EN	2007	NA	NA
100	<i>Pristis</i>	<i>pectinata</i>	Smalltooth Sawfish	listed (CMS App I & II, Sharks MOU)		CR	2007	NA	NA

No.	Genus	Species	Common name (English)	Data quality	migratory in accordance with cms listing criteria	IUCN RL Status	Appendix I	Appendix II	Appendix III
101	<i>Pristis</i>	<i>pristis</i>	Largetooth Sawfish	listed (CMS App I & II, Sharks MOU)		CR	2007	NA	NA
102	<i>Pristis</i>	<i>zijsron</i>	Green Sawfish	listed (CMS App I & II, Sharks MOU)		CR	2007	NA	NA
103	<i>Rhina</i>	<i>ancylostoma</i>	Bowmouth Guitarfish	low	yes	CR	NA	2019	NA
104	<i>Rhynchobatus</i>	<i>australiae</i>	Bottlenose Wedgefish	listed (CMS App II, Sharks MOU)		CR	NA	2019	NA
105	<i>Rhynchobatus</i>	<i>cooki</i>	Clown Wedgefish	low	maybe	CR	NA	2019	NA
106	<i>Rhynchobatus</i>	<i>djiddensis</i>	Whitespotted Wedgefish	listed (Sharks MOU)		CR	NA	2019	NA
107	<i>Rhynchobatus</i>	<i>immaculatus</i>	Taiwanese Wedgefish	low	no	CR	NA	2019	NA
108	<i>Rhynchobatus</i>	<i>laevis</i>	Smoothnose Wedgefish	listed (Sharks MOU)		CR	NA	2019	NA
109	<i>Rhynchobatus</i>	<i>luebberti</i>	African Wedgefish	low	maybe	CR	NA	2019	NA
110	<i>Rhynchobatus</i>	<i>mononoke</i>	Japanese Wedgefish	low	maybe	NE	NA	2019	NA
111	<i>Rhynchobatus</i>	<i>palpebratus</i>	Eyebrow Wedgefish	low	maybe	NT	NA	2019	NA
112	<i>Rhynchobatus</i>	<i>springeri</i>	Broadnose Wedgefish	low	maybe	CR	NA	2019	NA
113	<i>Rhynchorhina</i>	<i>mauritanensis</i>	False Shark Ray	low	no	CR	NA	2019	NA
114	<i>Acroteriobatus</i>	<i>andysabini</i>	Malagasy Blue-spotted Guitarfish	low	unlikely	NE	NA	2022	NA
115	<i>Acroteriobatus</i>	<i>annulatus</i>	Lesser Guitarfish	low	unlikely	VU	NA	2022	NA
116	<i>Acroteriobatus</i>	<i>blochii</i>	Bluntnose Guitarfish	low	unlikely	LC	NA	2022	NA
117	<i>Acroteriobatus</i>	<i>leucospilus</i>	Greyspot Guitarfish	low	unlikely	EN	NA	2022	NA
118	<i>Acroteriobatus</i>	<i>ocellatus</i>	Speckled Guitarfish	low	unlikely	DD	NA	2022	NA
119	<i>Acroteriobatus</i>	<i>omanensis</i>	Oman Guitarfish	low	unlikely	DD	NA	2022	NA
120	<i>Acroteriobatus</i>	<i>salalah</i>	Salalah Guitarfish	low	unlikely	NT	NA	2022	NA

No.	Genus	Species	Common name (English)	Data quality	migratory in accordance with cms listing criteria	IUCN RL Status	Appendix I	Appendix II	Appendix III
121	<i>Acroteriobatus</i>	<i>stehmanni</i>	Socotra Blue-spotted Guitarfish	low	unlikely	NE	NA	2022	NA
122	<i>Acroteriobatus</i>	<i>variegatus</i>	Stripenose Guitarfish	low	unlikely	CR	NA	2022	NA
123	<i>Acroteriobatus</i>	<i>zanzibarensis</i>	Zanzibar Guitarfish	low	unlikely	NT	NA	2022	NA
124	<i>Pseudobatos</i>	<i>buthi</i>	Spadenose Guitarfish	low	unlikely	VU	NA	2022	NA
125	<i>Pseudobatos</i>	<i>glaucostigmus</i>	Speckled Guitarfish	low	unlikely	VU	NA	2022	NA
126	<i>Pseudobatos</i>	<i>horkelii</i>	Brazilian Guitarfish	low	unlikely	CR	NA	2022	NA
127	<i>Pseudobatos</i>	<i>lentiginosus</i>	Freckled Guitarfish	low	unlikely	VU	NA	2022	NA
128	<i>Pseudobatos</i>	<i>leucorhynchus</i>	Whitesnout Guitarfish	low	unlikely	VU	NA	2022	NA
129	<i>Pseudobatos</i>	<i>percellens</i>	Chola Guitarfish	low	unlikely	EN	NA	2022	NA
130	<i>Pseudobatos</i>	<i>planiceps</i>	Pacific Guitarfish	low	unlikely	VU	NA	2022	NA
131	<i>Pseudobatos</i>	<i>prahli</i>	Gorgona Guitarfish	low	unlikely	VU	NA	2022	NA
132	<i>Pseudobatos</i>	<i>productus</i>	Shovelnose Guitarfish	medium	maybe	NT	NA	2022	NA
133	<i>Rhinobatos</i>	<i>albomaculatus</i>	Whitespotted Guitarfish	low	unlikely	CR	NA	2022	NA
134	<i>Rhinobatos</i>	<i>annandalei</i>	Bengal Guitarfish	low	unlikely	CR	NA	2022	NA
135	<i>Rhinobatos</i>	<i>austini</i>	Austin's Guitarfish	low	unlikely	DD	NA	2022	NA
136	<i>Rhinobatos</i>	<i>borneensis</i>	Borneo Guitarfish	low	unlikely	EN	NA	2022	NA
137	<i>Rhinobatos</i>	<i>holcorhynchus</i>	Slender Guitarfish	low	unlikely	DD	NA	2022	NA
138	<i>Rhinobatos</i>	<i>hynnicephalus</i>	Ringed Guitarfish	low	unlikely	EN	NA	2022	NA
139	<i>Rhinobatos</i>	<i>irvinei</i>	Spineback Guitarfish	low	unlikely	EN	NA	2022	NA
140	<i>Rhinobatos</i>	<i>jimbaranensis</i>	Jimbaran Guitarfish	low	unlikely	EN	NA	2022	NA
141	<i>Rhinobatos</i>	<i>lionotus</i>	Smoothback Guitarfish	low	unlikely	EN	NA	2022	NA
142	<i>Rhinobatos</i>	<i>manai</i>	Papuan Guitarfish	low	unlikely	LC	NA	2022	NA

No.	Genus	Species	Common name (English)	Data quality	migratory in accordance with cms listing criteria	IUCN RL Status	Appendix I	Appendix II	Appendix III
143	<i>Rhinobatos</i>	<i>nudidorsalis</i>	Bareback Guitarfish	low	unlikely	DD	NA	2022	NA
144	<i>Rhinobatos</i>	<i>penggali</i>	Indonesian Guitarfish	low	unlikely	EN	NA	2022	NA
145	<i>Rhinobatos</i>	<i>punctifer</i>	Spotted Guitarfish	low	unlikely	NT	NA	2022	NA
146	<i>Rhinobatos</i>	<i>ranongensis</i>	Ranong Guitarfish	low	unlikely	VU	NA	2022	NA
147	<i>Rhinobatos</i>	<i>rhinobatos</i>	Common Guitarfish	listed (CMS App I (Med) & II, Sharks MOU)		CR	NA	2022	NA
148	<i>Rhinobatos</i>	<i>sainsburyi</i>	Goldeneye Shovelnose Ray	low	unlikely	LC	NA	2022	NA
149	<i>Rhinobatos</i>	<i>schlegelii</i>	Brown Guitarfish	low	unlikely	EN	NA	2022	NA
150	<i>Rhinobatos</i>	<i>whitei</i>	Philippine Guitarfish	low	unlikely	CR	NA	2022	NA

**Annex 3: Criteria for the inclusion of species in Annex 1 of the Sharks MOU (adapted from CMS criteria for the inclusion of species in CMS Appendix II)**

Excerpt from ([CMS/Sharks/Outcome 3.2 Modifying the Species List \(Annex 1\) of the MOU](#))

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7. The broad, biological criteria used under the CMS Convention to determine whether a species qualifies for listing should be used under the MOU. This will ensure a simple approach and maintain consistency with the parent Convention.
8. Annex 1 of the MOU 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.
9. In accordance with paragraph 3 d) of the MOU the conservation status is considered “favourable” when all the following conditions are met:
  - a) population dynamics data relative to appropriate biological reference points indicate that migratory sharks are sustainable on a long-term basis as a viable component of their ecosystems;
  - b) the distributional range and habitats of migratory sharks are not currently being reduced, nor are they likely to be reduced in the future to levels that affect the viability of their populations in the long term; and
  - c) the abundance and structure of populations of migratory sharks remains at levels adequate to maintain ecosystem integrity.
10. In accordance with paragraph 3 e) of the MOU, the conservation status will be taken as “unfavourable” if any of the above conditions are not met.
11. The term “migratory species” is defined by CMS in Article I (1), II (1) and IV (1) and further specified in the explanatory notes to the format for proposals to amend CMS Appendices. To better differentiate between the geographical extent of migrations, the following categories should apply:
  - a) Highly migratory: Those species whose migrations extend over the scale of oceanic basins, so encompassing national waters and high seas;
  - b) Regional migratory: Those species whose migrations extend over the scale of regional (often shelf) seas, although a small proportion of the population may make longer-distance movements, including excursions into oceanic basins;
  - c) Sub-regional migratory: Those species that migrate over smaller spatial scales, but with clear evidence of cyclical and predictable migrations across jurisdictional boundaries.

- d) Smaller scale coastal migrations or non-migratory: Those species that are generally site specific or make only shorter distance movements (e.g., seasonal inshore-offshore or north-south migrations). These species are considered to not meet the criteria of “migratory species” as defined by CMS in Article I (1), II (1) and IV (1).
12. Notwithstanding the rules of CMS, species or species groups may be listed as “look-alike” species, if differentiation from an Annex 1 listed species is difficult and confusion with the latter is likely. A “look-alike” species does not necessarily have to meet all the criteria for inclusion in Annex 1 itself.

**Annex 4: Examples of species included in Annex B of UNEP-WCMC (2024) [State of the World's Migratory Species](#) report that are unlikely to meet the CMS definition of “migratory”**

1. AC4 identified several examples that demonstrate the limitations of Annex B of the [State of the World's Migratory Species](#) report. This list is not exhaustive, and these examples are shown here to provide relevant examples to help justify why an updated list is required.
2. **Order Orectolobiformes, Family Hemiscylliidae:** Annex B includes three species of bambooshark (gray bamboo shark *Chiloscyllium griseum*, Indonesian bambooshark *Chiloscyllium hasselti* and slender bambooshark *Chiloscyllium indicum*). Bamboo sharks are small benthic sharks (<100 cm) that live in shallow shelf habitats such as coral reefs, rocky reefs, seagrass and soft bottom habitats. There is no movement data for these or closely related species that suggests that it undertakes migratory behaviour that meets the CMS definition of migratory. In addition, its small size and limited locomotory abilities mean that it is unlikely to undertake migratory behaviour.
3. **Order Carcharhiniformes, Family Carcharhinidae:** Annex B includes Pondicherry shark *Carcharhinus hemiodon*, which is a data-limited species for which the movements, population structure and life-history are (largely) unknown. Indeed, the distributional range of this species is unclear, as authenticated species records have only been based on museum specimens that were collected pre-1960. In the absence of validated contemporary specimens, this species may not be extant.
4. **Order Torpediniformes, Family Platyrhinidae:** Annex B includes a single member of the order, Chinese fanray *Platyrhina sinensis*. This is a relatively small-bodied species (<90 cm total length), that is limited to the inshore waters of northern Vietnam, China, and Japan. Whilst there are no studies relating to the movements of the species, the inshore distribution and small size would suggest that any migrations would be limited in extent and thus unlikely to meet the CMS definition.
5. **Order Chimaeriformes, Family Chimaeridae:** Annex B includes a single member of the order, Rabbitfish *Chimaera monstrosa*. This is a deep-water species for which there are no published studies on movements and stock structure. Rabbitfish is known to segregate by sex and size (e.g. Holt et al., 2013), but there is no evidence that a significant proportion of the population cyclically and predictably crosses any jurisdictional boundaries. Whilst it is possible that diel migrations up the continental slope and shelf edge occur, it is unlikely that a significant proportion of the population would cross a jurisdictional boundary for such behaviours.
6. **Order Rajiformes, Family Rajidae:** Annex B includes six species from six different genera. The basis for the selection of these species was unclear. In general, skates are known to make small-scale migrations (e.g. daily and seasonal inshore and offshore migrations) and even better-known skate species (e.g. Bird et al., 2020) have not demonstrated cyclical and predictable migrations across jurisdictional boundaries.
7. **Order Myliobatiformes, Family Dasyatidae:** Annex B includes pale-edge sharpnose ray *Telatrygon zugei*. The Pale-edge Sharpnose Ray is a very small stingray (maximum

disc width ~29 cm) that occurs in shelf seas from Vietnam to South Korea and southern Japan. There are no movement data for this or closely related species that suggests that it undertakes migratory behaviour that meets the CMS definition of migratory. In addition, its small size and limited locomotory abilities mean that it is unlikely to undertake the types of migratory behaviour that would cross jurisdictional boundaries.

8. Whilst not the formal remit of the AC, the AC also noted several teleost fish species that had been identified as 'migratory' but 'not yet listed' on CMS for which the basis seems somewhat questionable. For example, the goby *Awaous bustamantei* is a freshwater goby that is found only on islands in the Gulf of Guinea, primarily the island state of São Tomé and Príncipe. As another example, witch flounder *Glyptocephalus cynoglossus* (Family Pleuronectidae) is a demersal flatfish with specific habitat requirements, resulting in small stocks. Indeed, Fairbairn (1981) concluded "*witch flounder ... exist in relatively small, independent subpopulations with little inter-stock migration*". Whilst not of direct relevance to the Sharks MOU, that such species were included in UNEP-WCMC (2024) highlights that there were anomalous and counter-intuitive results for multiple fish taxa.

## **Annex 5: Development of an updated list of migratory sharks and rays that would benefit from inclusion in CMS Appendices and Sharks MOU Annex 1**

**Purpose:** An updated list of migratory chondrichthyan species that would benefit from international cooperation is required to provide guidance to Signatories of the CMS Sharks MOU and CMS Parties. This list will help them consider which species may be considered for inclusion in CMS Appendices and/or Annex 1 of the Sharks MOU.

The most recent assessment, conducted by Fowler (2014), entitled *The Conservation Status of Migratory Sharks* is now ten years old. Given the significant advancements in our understanding of the migratory and conservation status of chondrichthyan species since then, an update is urgently needed. This update will ensure that Signatories and Parties have access to the best available knowledge.

Specialized expertise is necessary to determine the migratory status of species according to the definitions set forth by CMS and the Sharks MOU. This includes adherence to the CMS Convention text, particularly Articles II, III, and IV, as well as the Sharks MOU Outcome 3.2, which involves modifying the Species List (Annex 1) of the MOU. Updating this information is justified to ensure that the criteria for determining migratory status are applied consistently and accurately, reflecting the most recent ecological and biological data.

### **Qualifications / special skills or knowledge**

**Academic qualifications:** A post-graduate degree in marine biology, zoology or a related field is required.

**Work experience:** A minimum of 10 years of work experience is required in the areas of shark and ray ecology, movement ecology, and international conservation policy relevant to sharks and rays. Experience in systematically collating, analysing, and summarising complex ecological information in easy-to-understand narratives for a non-technical audience is also required. Furthermore, experience in shark and ray taxonomy is required. Previous experience in developing policy guidance documents and providing scientific advice to governments and/or inter-governmental bodies is desirable.

**Language:** Fluency in written and spoken English required. Competence in other languages appropriate for the case-study areas would be beneficial.

### **Objectives, output expectations and performance indicators**

**Objective:** Sharks MOU Signatories and CMS Parties are provided with guidance on migratory chondrichthyan species that [are in an unfavourable conservation status] and that would benefit from international cooperation

### **Activities and Outputs:**

1. Develop criteria, for categorizing migratory status in line with the CMS definition in CMS Article II.
2. In consultation with the Sharks MOU Advisory Committee (Sharks AC), develop a list of species to test these criteria and a species-specific reporting template (encompassing an appropriate range of taxa, geographic area, type of data, and data availability).
3. Update the criteria for categorizing migratory status following comments from the Sharks AC.

4. Produce the list of chondrichthyan species that are likely to meet the listing criteria of CMS and the CMS Sharks MOU as described in Articles III and IV of the CMS, including both the migratory as well as the conservation status, excluding species that are assessed currently assessed as being of Least Concern or Data Deficient (if they are deep-water species).
5. Compile a draft report, which includes supporting text and summary table based on the template developed under (2) for review by the Sharks AC, and update accordingly
6. Provide a final report for presentation at [Sharks MOU AC5 (2026)] Sharks MOS5 (2026) [and an updated version to CMS COP16].

## Annex 6: Sharks listed on Appendix I of CMS and their international landings as reported to FAO (Prepared by James Ellis and Maria Pozo Montoro)

### Introduction

1. Several shark and ray species are listed on Appendix I of the Convention on the Conservation of Migratory Species of Wild Animals (CMS; Table 1). Article III, Paragraph 5 of the Convention states that “*Parties that are Range States of a migratory species listed in Appendix I shall prohibit the taking of animals belonging to such species*”.
2. Depending on the Party, such prohibitions may need to be enacted through national nature conservation and/or fisheries legislation (or other relevant fisheries regulations and licence conditions), although in some instances they may be established at a broader international level (e.g. through Regional Fisheries Management Organisations, RFMOs). Hence, the exact date when any prohibition becomes effective may vary between Parties and fleets. It should also be stressed that capacity-building (through fisher and observer training) and increased enforcement may be needed to facilitate compliance. In addition, during periods immediately after a species prohibition reported landings may decrease as fishers become more aware of such regulations.
3. This document summarises the shark and ray species listed in Appendix I of CMS and examines most recent international landings data (2000-2022), as reported to (and collated by) the Food and Agriculture Organization of the United Nations (FAO), in order to gauge to what extent such prohibitions have been effective. It should be noted, however, that such landings data only relate to reported landings, and so do not reflect total catch, as discards are excluded, and landings data from some other fleets (e.g. small-scale, artisanal, subsistence, and recreational fisheries) may be incomplete.
4. Data quality is also an important issue that should be noted with the current overview, as taxonomic identification, hierarchical reporting and input errors can all affect the quality of reported landings data.
5. Available landings data can be reported for a range of three-letter codes, based on the Aquatic Sciences and Fisheries Information System (ASFIS) used by FAO, including for higher taxonomic groupings.
6. For example, landings data for angel shark *Squatina squatina* could conceivably be reported as:
  - AGN (*Squatina squatina*; species-level)
  - RNZ (*Squatina* spp.; genus-level)
  - ASK (Squatinidae; family-level)
  - SKH (Selachii, Selachimorpha, Pleurotremata; various sharks not elsewhere identified)
  - SKX (Elasmobranchii; sharks, rays, skates, etc. not elsewhere identified)
7. The accuracy of species-specific reporting can be variable, with some fishers reporting data to more generic codes, especially if they have been in general use for longer.
8. Given the continued improvement in species-specific reporting for wild-capture fisheries, seafood harvesting and bycatch reporting, an increasing number of three-letter ASFIS codes have been made available. Indeed, the 2024 list of ASFIS codes contains 13,567 rows with unique codes (equating with 77% of the 17,576 potential permutations of a

three-letter code system). This increased flexibility in species-level reporting also means that data inputting can easily result in errors (i.e. an incorrect code is input for the species but is not flagged as an invalid code at the point of data entry).

9. For example, transposing two letters can change an American anglerfish *Lophius americanus* (ANG) to an angel shark *Squatina squatina* (AGN). Some codes may be counter-intuitive in relation to the common name, for example the code for European seabass *Dicentrarchus labrax* is BSS, whilst the code 'ESB' would result in data being allocated to shorthead hairfin anchovy *Setipinna breviceps*. Mistyping an adjacent key on a standard keyboard may also result in an accepted, but erroneous, species code being input. For example, blonde ray *Raja brachyura* (RJH) can be mistyped as RJG, resulting in Arctic skate *Amblyraja hyperborea*.
10. There can also be confusion when inputting data based on common names, which is thought to be the basis for the quantities of tiger shark reported in FAO Area 27 by the Netherlands, which show a broadly contrasting trend to the landings reported for lesser-spotted dogfish (Table 2Table 2).
11. Similarly, 'peixe-porco' (or 'porco') is a frequent common name in Portugal for triggerfish *Balistes capriscus*, although 'peixe-porco' is also used as a common name for angular roughshark *Oxynotus centrina*. Hence, if shore-based staff input logbook data based on the common names supplied to them, it may be easy for some landings to be inadvertently allocated to a very different species.
12. Databases containing a wealth of data from multiple suppliers will invariably have some errors, and it should be recognised that questionable records may relate to fundamental errors in taxonomic identification, ambiguity in common names, or due to an input error with regards the three-letter code. Whilst every effort has been made to interpret the data analysed here with due care, the data presented should still be viewed with a degree of caution.

## Methods

13. FAO landings data for the years 2000 to 2022 were extracted (23/08/2024), with these data including the name of the country, the scientific name (as related to the ASFIS system), and the FAO Major Fishing Area (henceforth FAO Area). The list of relevant FAO Areas is provided in Table 3. These data were used in conjunction with the years when the country joined the CMS (or whether they are designated as a non-Party).

## Results

14. **White shark:** White shark was listed in Appendix I of CMS in 2002, and there have been some landings reported to FAO since that time (Table 4). The majority of recent white shark landings since 2019 have been reported by Mexico (non-Party) from FAO Areas 31 and 77 (1 – 19 t per year). Reported landings from Parties to CMS have generally been limited, with occasional landings reported by Portugal (2005 only) and New Zealand (2003 only).
15. Whilst greater quantities of white shark were recorded by Senegal (18 t in 2010) and Morocco (7–92 t per year over the period 2011–2014), the magnitude of these landings from FAO Area 34 -an area where white shark does not appear to be abundant- suggests that these reports should be treated with caution.
16. **Basking shark:** Basking shark was listed in Appendix I of CMS in 2005, and there have

been some landings reported to FAO since that time (Table 4). These reports were all from Parties to CMS, including France, Norway, Portugal and UK (FAO Area 27), Spain (FAO Areas 34, 37) and New Zealand (FAO Area 81). Reported landings, however, have been negligible from 2013 onwards.

17. Furthermore, the scale of the occasional annual landings reported since that time (0.01–0.1 t) would be suggestive that these related to highly sporadic juvenile specimens (noting a length-weight relationship for basking shark of  $W = 0.00017 \cdot L^{2.4355}$ ; Mancusi et al., 2020), or that the data resulted from an input error relating to the species code.
18. **Whale shark:** Whale shark was listed in Appendix I of CMS in 2017. All reported landings of whale shark over the time-series analysed were from non-Parties (Table 4), primarily Papua New Guinea and the Marshall Islands, but also Vanuatu.
19. **Mobulid rays:** Whilst *Mobula birostris* was listed in Appendix I of CMS in 2011, the remaining species in this family were listed in 2014. Since 2014, there have been reported landings of mobulids from some Parties to CMS, namely Pakistan (FAO Area 51), Sri Lanka (FAO Area 57) and Peru (FAO Area 87; Table 5). Non-Parties to CMS reporting mobulid landings to FAO include Indonesia (although reported landings have declined in recent years), and Mexico. Kenya reported 64 t of *Mobula birostris* in a single year (2017), and the absence of any reported landings in other years means that this figure could usefully be investigated.
20. **Sawfish:** Sawfish were listed in Appendix I of CMS in 2014. Reported landings data for sawfish at the species-level were limited to Cyprus (2020; 0.02 t; Table 6) and the accuracy of this is uncertain, given the questionable presence of sawfish in the Mediterranean Sea. The reporting of sawfish (Pristidae) by Senegal in 2010 (268 t) is also questionable, given that they were reported in just a single year.
21. There were higher levels of landings of Pristidae (Table 6) reported by Iran (up to an including 2016), and two non-Parties (Mexico and Indonesia). The magnitude of reported landings from Indonesia (>1000 t in some years) is in stark contrast to the perceived population status of the taxon, and it is uncertain whether these data relate more widely to the Order Rhinopristiformes, and so include families other than the Pristidae (e.g. the families Rhinobatidae, Rhinidae, and Glaucostegidae).
22. **Angel shark:** Angel shark was listed in Appendix I of CMS in 2017, with data for *Squatina squatina* and Squatinidae shown in Table 7. Records of Squatinidae from FAO Area 27 would relate to *S. squatina*, whilst records of Squatinidae from FAO Areas 34 and 37 could relate to multiple species.
23. Since the time of their listing, there have been occasional landings (<2 t) reported by some Parties (e.g. France, Spain, and UK). Post-2017 landings of Squatinidae in the Mediterranean Sea (by Cyprus and Spain) may relate to one of three angel shark species. Turkey, though a non-Party, has also reported landings at the genus-level post-listing, although landings had been decreasing before listing.
24. Tunisia continues to report significant landings of *Squatina squatina* (although it is likely that these data include other angel shark species). Notably, the reported Tunisian landings of *Squatina squatina* for the five-year period before listing (2012–2016, mean = 117 t.y<sup>-1</sup>; range = 46–180 t) have actually increased since the listing (2018–2022, mean = 194.8 t.y<sup>-1</sup>; range = 159–210 t). The magnitude of reported landings of Squatinidae from Cameroon (>300 t.y<sup>-1</sup> since 2016) is also notable and requires further investigation.

25. **Common guitarfish:** The population of common guitarfish in the Mediterranean Sea was listed in Appendix I of CMS in 2017. Whilst no official landings of *Rhinobatos rhinobatos* have been reported from the Mediterranean Sea (FAO Area 37) since 2017 (Table 8), there have been reported landings of Rhinobatidae by Libya (a Party to CMS; 72–75 t) and Palestine. Data reported for this group may include data for *R. rhinobatos* and/or *Glaucostegus cemiculus*, recognising significant challenges for accurate differentiation of both species and that *G. cemiculus* was previously known as *Rhinobatos cemiculus* (with some earlier field guides that are still in common use including both species in the family Rhinobatidae).
26. Outside the Mediterranean Sea, most reported landings of *Rhinobatos* and Rhinobatidae from the eastern Atlantic have been from Liberia, Benin, Senegal, and Côte d'Ivoire, although common guitarfish populations in these areas are not included in Appendix I.
27. **Oceanic whitetip shark:** Oceanic whitetip shark was listed in Appendix I of CMS in 2020, and so there are limited data available to gauge whether there has been widespread compliance in prohibiting the landing of this species. Data reported to FAO for 2021 and 2022 indicate reported landings of oceanic whitetip from the Indian Ocean (FAO Areas 51 and 57; Table 9) by China and the Comoros (both non-Parties) and Iran (Party; 12–32 t).
28. Within the Pacific Ocean (Table 10), there were varied degrees of reported landings in 2021 and 2022 by various Parties (e.g. France through French Polynesia 197–259 t, Fiji 25–93 t, and Samoa; 0–2 t) and several non-Parties (e.g. Marshall Islands, Micronesia, Papua New Guinea, Taiwan, and Tonga).
29. **Species listed in Appendix I of CMS in 2024:** A further four species of shark and ray were listed in Appendix I of CMS in 2024, namely sandtiger shark, and the Mediterranean Sea populations of blackchin guitarfish, bull ray and Lusitanian cownose ray.
30. Whilst both Argentina and Uruguay reported landings of sandtiger shark at the start of the time-series analysed (

32. **Table 11**), recent landings data (since 2021) have only been reported by Saint Lucia (a non-Party).
33. There have been no meaningful landings of blackchin guitarfish reported from the Mediterranean Sea (FAO Area 37;

35. **Table 11**), although data may be included within data supplied as *Rhinobatos* spp. or Rhinobatidae (see above). Outside the Mediterranean Sea, landings of blackchin guitarfish have been reported by Congo and Mauritania, although these populations are not listed in Appendix I.
36. Species-specific data for bull ray from the Mediterranean Sea have only been reported in landings statistics sporadically (Italy and Malta;

38. **Table 11**), although it should be noted that any landings of this species could be included within higher taxonomic groups (e.g. Myliobatidae, Batoidimorpha/Hypotremata, or Elasmobranchii), or could (misleadingly) be attributed to Rajiformes.
39. There were no species-specific landings data for Lusitanian cownose ray from the Mediterranean Sea (

41. **Table 11)**, although some nations, including Senegal and Mauritania, have reported this species in landings data from FAO Area 34.

## Discussion

42. Whilst the reported landings of some species have indeed declined since their listing in Appendix I of CMS, there are several instances of Parties reporting landings after their listing. This may be due to an interval between the amendments to the CMS Appendices being agreed and the subsequent introduction of management measures.
43. Individual nations may also take out reservations on listings on CMS. For example, the Faroes Islands (an autonomous territory of Denmark) took out a reservation on the listing of basking shark. Similarly, the UK Overseas Territories of Bermuda, Montserrat, and the Turks and Caicos Islands took out a species reservation on the listing of oceanic whitetip shark.
44. In terms of wild-capture fisheries, it should also be noted that some nations have a ban on 'discards' and so that all fish dead on capture, irrespective of species, may have to be brought to shore (i.e. landed). In some other cases, it may be that the necessary management measures (including training, monitoring, and enforcement) may not have been introduced.
45. It is also important to note that some of the species listed in Appendix I are oceanic species that interact with high seas fleets. Hence, agreement on non-retention policies by the relevant RFMOs can also be required, and some nations may wait for such measures to be introduced.
46. It should also be highlighted that FAO landings are as reported by individual nations. In some instances, there will be reported observations in the scientific literature of a listed species being landed, or found in marketed fish, even if there are no official data to indicate this. Hence, an absence of reported landings does not necessarily imply that there have been no landings, as data may be incomplete, or aggregated at higher taxonomic ASFIS categories. In some cases, it is possible that fishers may land certain (dead) specimens of sharks to provide material for scientific study by national scientists.
47. From the perspective of data quality, it is preferable for all nations to report accurate landings data for all harvested species, including any relating to species listed in Appendix I of CMS. The presence of 'small' and/or occasional quantities of listed species in statistical returns needs to be viewed in the context of not only national and regional regulations, but also training, compliance, enforcement and other factors (e.g. discard bans). An absence of species-specific data, especially when landings have been reported from other sources, is arguably a more worrying event, as data quality is compromised.
48. In some cases, there were some records of 'large' quantities of Appendix I-listed species being reported at higher taxonomic categories (e.g. Pristidae) that seem implausible considering their highly depleted populations. This suggests this 'large' quantities may include misreported landings from sister taxa that may or may not be listed (e.g. Rhinobatidae, Rhinidae, and Glaucostegidae). On the other hand, some nations reported notable quantities of listed species, but only in occasional years or periods, suggesting these may relate to coding errors, taxonomic misidentifications, or nomenclatural confusion.
49. In terms of annual reported landings data, there were also instances when there were the same reported landings in successive years, which might be considered unlikely. An example of this may be seen for the reported Libyan landings of Rhinobatidae from FAO Area 37, which were 72 t in each of the years 2017 to 2021. Such instances may be due to incomplete annual landings data being available, and for which the annual landings

were estimated based on data from the previous year(s), so that years with missing data were 'infilled'. In such cases, the magnitude of the landings may be realistic, but the exact values are uncertain.

50. Finally, it should also be noted that landings data are usually the 'official reported landings statistics', and in addition to potential input errors, such data do not relate to 'catch'. Whilst a '*prohibition on the taking of animals*' can be enacted in law in such a way that it would make target fisheries illegal, and prohibit the retention and landing of such species, there will be accidental captures of certain species in some fisheries, and the quantities then discarded (and their fate) are often unknown. In some areas there can also be illegal, unreported and unregulated (IUU) fishing.
51. Despite the relatively small number of species considered, there were several instances where suspicious records were identified. Consequently, there would be benefits from improving the quality control and assurance of national and international landings data. Improved quality control of landings data at a national level is required prior to data being submitted, especially since FAO global landings data may be aggregated for use in a number of analyses, and for which some suspicious records may not always be apparent.

## References

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**Table 1:** Shark and ray species listed in Appendix I of CMS, ordered by year of listing. CITES listings may also influence the ability to land these species, and the year of the relevant CITES listing is also provided.

Family	Scientific name	Common name	FAO Code	CMS Appendix I	CITES listing
Lamnidae	<i>Carcharodon carcharias</i>	White shark	WSH	2002	App. II (2004)
Cetorhinidae	<i>Cetorhinus maximus</i>	Basking shark	BSK	2005	App. II (2002)
Mobulidae	<i>Mobula (Manta) birostris</i>	Manta ray	RMB	2011	App. II (2013)
Pristidae	<i>Anoxypristis cuspidata</i>	Narrow sawfish	RPA	2014	App I (2007)
Pristidae	<i>Pristis clavata</i>	Dwarf sawfish	RPC	2014	App I (2007)
Pristidae	<i>Pristis pectinata</i>	Smalltooth sawfish	RPP	2014	App I (2007)
Pristidae	<i>Pristis pristis</i>	Largetooth sawfish	RPR	2014	App I (2007)
Pristidae	<i>Pristis zijsron</i>	Green sawfish	RPZ	2014	App I (2007)
Mobulidae	<i>Mobula (Manta) alfredi</i>	Reef manta ray	RMA	2014	App. II (2013)
Mobulidae	<i>Mobula eregoodootenkee</i>	Pygmy devilray	RME	2014	App. II (2016)
Mobulidae	<i>Mobula hypostoma</i>	Atlantic devilray	RMH	2014	App. II (2016)
Mobulidae	<i>Mobula japanica</i>	Spinetail mobula	RMJ	2014	App. II (2016)
Mobulidae	<i>Mobula kuhlii</i>	Shortfin devilray	RMK	2014	App. II (2016)
Mobulidae	<i>Mobula mobular</i>	Giant devilray	RMM	2014	App. II (2016)
Mobulidae	<i>Mobula munkiana</i>	Munk's devilray	RMU	2014	App. II (2016)
Mobulidae	<i>Mobula rochebrunei</i>	Lesser guinean devilray	RMN	2014	App. II (2016)
Mobulidae	<i>Mobula tarapacana</i>	Chilean devilray	RMT	2014	App. II (2016)
Mobulidae	<i>Mobula thurstoni</i>	Bentfin devilray	RMO	2014	App. II (2016)
Rhincodontidae	<i>Rhincodon typus</i>	Whale shark	RHN	2017	App. II (2002)
Squatinaidae	<i>Squatina squatina</i>	Angel shark	AGN	2017	–
Rhinobatidae	<i>Rhinobatos rhinobatos</i>	Common guitarfish	RBX	2017 (Med)	App. II (2022)
Carcharhinidae	<i>Carcharhinus longimanus</i>	Oceanic whitetip shark	OCS	2020	App. II (2013)
Odontaspidae	<i>Carcharias taurus</i>	Sandtiger shark	CCT	2024	–
Glaucostegidae	<i>Glaucostegus cemiculus</i>	Blackchin guitarfish	RBC	2024 (Med)	App. II (2019)
Myliobatidae	<i>Aetomylaeus bovinus</i>	Bull ray	MPO	2024 (Med)	–
Myliobatidae	<i>Rhinoptera marginata</i>	Lusitanian cownose ray	MRM	2024 (Med)	–

**Table 2:** Example of inconsistent reporting, showing how lesser-spotted dogfish were originally input as tiger shark.  
Source: FAO landings data for the Netherlands in FAO Area 27.

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<i>Galeocerdo cuvier</i>	13	48	48	64	54	38	32	39	-	53	15	-
<i>Scyliorhinus canicula</i>	-	-	-	-	-	-	-	-	2	1	26	60
Year	2014	2015	2016	2017	2018	2019	2020	2021	2022			
<i>Galeocerdo cuvier</i>	-	-	-	-	-	-	-	-	-			
<i>Scyliorhinus canicula</i>	51	96	124	149	191	234	197	170	245			

**Table 3: List of FAO Major Fishing Areas that may apply to elasmobranch fish**

FAO Major Fishing Area	
Name	Number
America, South Inland waters	3
Arctic Sea	18
Atlantic, Northwest	21
Atlantic, Northeast	27
Atlantic, Western Central	31
Atlantic, Eastern Central	34
Mediterranean and Black Sea	37
Atlantic, Southwest	41
Atlantic, Southeast	47
Atlantic, Antarctic	48
Indian Ocean, Western	51
Indian Ocean, Eastern	57
Indian Ocean, Antarctic	58
Pacific, Northwest	61
Pacific, Northeast	67
Pacific, Western Central	71
Pacific, Eastern Central	77
Pacific, Southwest	81
Pacific, Southeast	87
Pacific, Antarctic	88

**Table 4:** Reported landings of white shark, basking shark and whale shark as reported to FAO for the period 2000 to 2022 by FAO Major Fishing Area, country and year. Blank cells indicate no landings were reported, cells with '0' equate with reported landings <0.5 t. Data rounded to whole tonnes. The year the country became a Party to CMS indicated (NP = Non-Party). The year the species was listed in Appendix I of CMS is indicated (orange cells), with red cells indicating reported landings in subsequent years by Parties to the CMS.

FAO Area	Country	CMS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total	
<b><i>Carcharodon carcharias</i></b>																											
31	Mexico	NP																				19	1	3	2	25	
34	Morocco	1993											92	11	25	7										135	
34	Portugal	1983	1					7																		8	
34	Senegal	1988										18														18	
41	Portugal	1983						1																		1	
77	Mexico	NP																			0	18	4			23	
81	New Zealand	2000				4																				4	
<b><i>Cetorhinus maximus</i></b>																											
27	France	1990						2	1			6														9	
27	Norway	1985	293	200	54	128	72	87	6	26	4			2	22											894	
27	Portugal	1983	1	3	1	1	27	5		13	2											0	0	0		53	
27	UK	1985																				0				0	
34	Spain	1985							3																	3	
37	Spain	1985			4	10	5	4	4	6	1															34	
81	New Zealand	2000	95	84	40	139	26	62	1	7	5	1														460	
81	Ukraine	1999				36																				36	
87	Ecuador	2004																					0			0	
<b><i>Rhincodon typus</i></b>																											
71	Marshall Islands	NP																	22	22			11			55	
71	Papua New Guinea	NP																	61	4	55	367	11	11	48	557	
71	Vanuatu	NP																				12				12	

**Table 5:** Reported landings of mobulid rays as reported to FAO for the period 2000 to 2022 by FAO Major Fishing Area, country and year. Blank cells indicate no landings were reported, cells with '0' equate with reported landings <0.5 t. Data rounded to whole tonnes. The year the country became a Party to CMS indicated (NP = Non-Party). The year the species was listed in Appendix I of CMS is indicated (orange cells), with red cells indicating reported landings in subsequent years by Parties to the CMS.

FAO Area	Country	CMS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total	
<b><i>Mobula birostris</i></b>																											
31	Puerto Rico	NP												0												0	
51	Kenya	1999																		64						64	
87	Ecuador	2004								5	10															15	
87	Peru	1997																		201	177	177				555	
<b><i>Mobula mobular</i></b>																											
27	Spain	1985					1	3	3	2	1	3	4	5		1						0				23	
51	Pakistan	1987										50	52	57	66	87	75	87	101	51	41	23	11	9	9	719	
<b><i>Mobula spp</i></b>																											
31	Mexico	NP																				0	2			2	
77	Mexico	NP																				207	33	1	1	241	
87	Peru	1997																			49	213	438	432		1132	
<b>Mobulidae</b>																											
34	Liberia	2004	93				80	43																		2507	
	Mauritania		1	106	110	100	2	5	23																		
34	a	1998												11		2	64									77	
														135	195	132	152		188							1121	
57	Indonesia	NP								761	136	118	265	5	6	6	8	942	0	449	369	39	92	2		9	
																				126							
57	Sri Lanka	1990													744	669	608	682	767	9	991	797	531	86	14	7158	
								20	276	125	417	229	218	236	323	432	245	317	543		190					3655	
71	Indonesia	NP						0	8	9	3	6	2	5	5	1	1	9	6	214	4	469	33	30	35	0	

**Table 6:** Reported landings of sawfish as reported to FAO for the period 2000 to 2022 by FAO Major Fishing Area, country and year. Blank cells indicate no landings were reported, cells with '0' equate with reported landings <0.5 t. Data rounded to whole tonnes. The year the country became a Party to CMS indicated (NP = Non-Party). The year the species was listed in Appendix I of CMS is indicated (orange cells), with red cells indicating reported landings in subsequent years by Parties to the CMS.

FAO Area	Country	CMS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
<b>Pristidae</b>																										
31	Mexico	NP																						4	4	
34	Liberia	2004	42				8																			50
34	Senegal	1988											268													268
51	Iran	2008	40	45	27	73	21	11	26	11	37	38	142	27	41	46	10	10	3							608
57	Indonesia	NP							1	6	11	163	20	45	13	266	6	395	208	5	216	325	1834	44	75	3633
71	Indonesia	NP							5	16	2		33	22	3	1	1		60	1126	1063	612	1002	618	1006	5570
77	Mexico	NP																				684	140	6	63	893
<b>Pristis pristis</b>																										
37	Cyprus	2001																					0			0

**Table 7:** Reported landings of angel shark *Squatina squatina* as reported to FAO for the period 2000 to 2022 by FAO Major Fishing Area, country and year. Blank cells indicate no landings were reported, cells with '0' equate with reported landings <0.5 t. Data rounded to whole tonnes. The year the country became a Party to CMS indicated (NP = Non-Party). Data for Squatinidae also shown for FAO Areas 27, 34 and 37, as a proportion of these landings may relate to *Squatina squatina*. Reported landings of *Squatina squatina* from FAO Area 87 are considered coding errors. The year the species was listed in Appendix I of CMS is indicated (orange cells), with red cells indicating reported landings in subsequent years by Parties to the CMS.

FAO Area	Country	CMS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
<b><i>Squatina squatina</i></b>																										
27	Estonia	2008			3																					3
27	France	1990	1	1				3		1		2	2	1	2										2	15
27	Spain	1985								1			9	10	63	4		2	1			2		0	0	93
37	France	1990															0	0	1	0	1					2
37	Tunisia	1987	20	22	13	41	10	14	36	15	52	74	86	68	60	46	125	180	174	132	159	205	195	205	210	2142
87	Ecuador	2004																						0	1	1
<b>Squatinidae</b>																										
34	Cameroon	1983																	306	319	339	359	330	340	350	2343
27	Portugal	1983	1			1		1	1	1	1	1					1									8
27	UK	1985																		0	0	0				0
37	Albania	2001	30	16	79	1	4	68	55	12	23	14	78	12	5	5	4	4	3							413
37	Cyprus	2001																				0				0
37	Spain	1985																				0			0	0
37	Türkiye	NP	60	20	18	25	28	38	51	15	34	20	19	16	13	17	8	1	3	1			0		3	390

**Table 8:** Reported landings of common guitarfish *Rhinobatos rhinobatos* as reported to FAO for the period 2000 to 2022 by FAO Major Fishing Area, country and year. Blank cells indicate no landings were reported, cells with '0' equate with reported landings <0.5 t. Data rounded to whole tonnes. The year the country became a Party to CMS indicated (NP = Non-Party). Data for Rhinobatidae and *Rhinobatos* sp. also shown for FAO Areas 27, 34 and 37, as a proportion of these landings may relate to *Rhinobatos rhinobatos*. The year the species was listed in Appendix I of CMS is indicated (orange cells), with red cells indicating reported landings in subsequent years by Parties to the CMS. Reported Libyan landings of Rhinobatidae were 72 t in each of the years 2017 to 2021, and may have resulted from infilling of data.

FAO Area	Country	CMS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total	
<b>Rhinobatidae</b>																											
34	Benin	1986				32	42	39	35	28	6	6	93	66		92	84	77	83	24	346	0	5	0	5	1863	
34	Congo	2000																					31	46	33	110	
34	Côte d'Ivoire	2003				12	5	5	9	6	1	115	114	145	6	171	156	188	1	80	242	7	7	5	5	2580	
34	Liberia	2004	16				175	50	65											1	1	3				411	
34	Senegal	1988	0	2	106	99	103	92	136	124	98	139	100	107	71	116	172	168	91		100		61	77	46	2384	
37	Albania	2001			2			1	8	3	3			2												19	
37	Greece	1999	94	89	52	32	41	24	34	32	43	38														479	
37	Libya	2002										126	120	70	82	82	56	50	60	72		72	72	72	72	1081	
37	Palestine	Othe	4	2	1	4	1	1	2	8	6	1	3	8	4	6	6	5	6	5	9	8	11	10	116		
<b>Rhinobatos rhinobatos</b>																											
34	Benin	1986																				18	19	19	20	774	
34	Spain	1985																	2	27	8	22				59	
37	Israel	1983										90	69	44	44											247	
37	Lebanon	2019														1	3									4	
<b>Rhinobatos spp.</b>																											
34	Liberia	2004																				26	8	23	79	370	
27	Portugal	1983																							0	0	

**Table 9:** Reported landings of oceanic whitetip shark in the Atlantic and Indian Oceans as reported to FAO for the period 2000 to 2022 by FAO Major Fishing Area, country and year. Blank cells indicate no landings were reported, cells with '0' equate with reported landings <0.5 t. Data rounded to whole tonnes. The year the country became a Party to CMS indicated (NP = Non-Party). The year the species was listed in Appendix I of CMS is indicated (orange cells), with red cells indicating reported landings in subsequent years by Parties to the CMS.

FAO Area	Country	CMS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
21	USA	NP								1															1	
34	Portugal	1983											9													9
41	Brazil	2015	638	534	203	174	187	78	76	14	240				7	6	1	1	1							2160
41	Portugal	1983									2															2
51	China	NP										49	51	27	1						47			11		186
51	Comoros	NP																3	10	10	12	18	3	3		58
51	Iran	2008													192	136	97	118	39	44	23	37	12	18	32	747
51	Maldives	2019														8	8	4								20
51	Mozambique	2009											6	6	6											18
51	Portugal	1983											2													2
51	Sri Lanka	1990															8	7								15
51	Tanzania	1999										5	12		0	0	0									18
57	China	NP										7	110	7	7						2					133
57	Sri Lanka	1990	792	462	296	462	245	102	81	59	55	62	170	154	149	41	71	82								3282

**Table 10:** Reported landings of oceanic whitetip shark in the Pacific Ocean as reported to FAO for the period 2000 to 2022 by FAO Major Fishing Area, country and year. Blank cells indicate no landings were reported, cells with '0' equate with reported landings <0.5 t. Data rounded to whole tonnes. The year the country became a Party to CMS indicated (NP = Non-Party). The year the species was listed in Appendix I of CMS is indicated (orange cells), with red cells indicating reported landings in subsequent years by Parties to the CMS.

FAO Area	Country	CMS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total	
71	China	NP										578	401					5			31				1015		
71	Fiji	2013												92	92	92	1		14	10	14	20	25	150	93	604	
71	Kiribati	NP												8	14	14				3						40	
71	Marshall Is	NP										17	13	12	9	2				5	8	44	1	13	4	127	
71	Micronesia	NP												188	134	60					99	0	63	5	87	12	649
71	Palau	2008																			2				0	2	
71	Papua NG	NP												15	21	21	21	1			0				9	89	
71	Solomon Is	NP																			1		0	0	0	2	
71	Taiwan	NP										91	87	125	72								1	4		380	
71	Tuvalu	NP																			1		2			3	
71	Vanuatu	NP														454	0				1		1	1	0	458	
77	China	NP										177	148					81			154					560	
77	French Polynesia	1990												4	9	9	38	30	301	320	245	192	199	259	197	1802	
77	Samoa	2005																			0	5	0	1	2	8	
77	Taiwan	NP										82	80													162	
77	Tonga	NP												8	6	13					3	0	0	0	5	35	
81	China	NP											7													7	
87	China	NP										7	2								104					113	
87	Ecuador	2004														3	4	4	10	6						27	

**Table 11:** Reported landings of sandtiger shark, blackchin guitarfish, bull ray, and Lusitanian cownose ray as reported to FAO for the period 2000 to 2022 by FAO Major Fishing Area, country and year. Blank cells indicate no landings were reported, cells with '0' equate with reported landings <0.5 t. Data rounded to whole tonnes. The year the country became a Party to CMS indicated (NP = Non-Party). These species were included in Appendix I of CMS in 2024 (for the Mediterranean Sea only in the case of species denoted \*).

FAO Area	Country	CMS	2001	2002	2003	2004	2005	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
<b><i>Carcharias taurus</i></b>																						
27	Portugal	1983																	0			0
27	Spain	1985																0	0			0
31	Saint Lucia	NP																		4	4	8
37	Spain	1985																1	0			1
41	Argentina	1992						5	1		1											7
41	Uruguay	1990	8	8	3	3	4															26
<b><i>Glaucostegus cemiculus*</i></b>																						
34	Congo	2000																	66	59	19	144
34	Mauritania	1998							161	119	46	97	170	241	153	242	1770	3810	3580			10389
37	Italy	1983																0				0
<b><i>Aetomylaeus bovinus*</i></b>																						
34	Congo	2000																	2	2		4
37	Italy	1983																1				1
37	Malta	2001																	0	0	2	2
<b><i>Rhinoptera marginata*</i></b>																						
34	Congo	2000																	0			0
34	Mauritania	1998							1166	1125	2911	1129	897	582	796	1104						9710
34	Senegal	1988											699	987		1265	273	491	927	999	805	6447

## Annex 7: List of Participants

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