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Tenth Meeting of the Scientific and Technical  
Advisory Committee (STAC) of the Protocol  
Concerning Specially Protected Areas and Wildlife  
(SPA)W) in the Wider Caribbean Region

Virtual, 30 January – 1 February 2023

**REPORT OF THE SPAW STAC SPECIES WORKING GROUP ON THE  
LISTING OF SPECIES UNDER THE ANNEXES TO THE SPAW  
PROTOCOL**

*This meeting is being convened virtually. Delegates are kindly requested to access all meeting documents electronically for download as necessary.*





## SUMMARY

Formally established in June 2022, the SPAW STAC ad hoc Working group on Species had the following tasks assigned by the 2022 Terms of Reference of the SPAW STAC Ad Hoc Working Groups:

- Mandatory task, Task 1: Review, evaluate, and provide recommendations on proposals from Contracting Parties to add new species to the SPAW Protocol Annexes or change the listing status of species currently on the Annexes.
- Task 2: Strengthen work on the conservation and management of species listed in the Annexes of the Protocol taking into account STAC 9 the recommendations for: shark and ray species listed in Annex III, preventing sawfish extinction, conserving the Nassau Grouper, the protection and Recovery of Caribbean Sea Turtles.
- Task 3: Revise and update the Marine Mammal Action Plan, considering new information and developments since 2008, including the “Scientific and Technical Analysis of the Implementation of the Action Plan for the Conservation of Marine Mammals (MMAP) in the Wider Caribbean,” and present the updated MMAP to STAC10 for its review and consideration.

This report summarises the work carried out by the experts in response to these requests.

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**ACRONYMS**

FMP	Regional Fish Spawning Aggregation Fishery Management Plan
COP	Conference of the Parties
CEP	Caribbean Environment Programme
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CRFM	Caribbean Regional Fisheries Mechanism
GCFI	Gulf and Caribbean Fisheries Institute
IUCN	International Union for the Conservation of Nature
MMAP	Marine mammal Action Plan
MPA	Marine Protected Area
RAC	Regional Activity Center of the SPAW protocol
SPAW	Specially Protected Areas and Wildlife protocol
STAC	Scientific and Technical Advisory Committee of the SPAW protocol
UNEP	United Nations Environment Programme
WCR	Wider Caribbean Region
WECAFC	Western Central Atlantic Fishery Commission
WIDECAST	Wider Caribbean Sea Turtle Conservation Network



## REPORT OF THE SPAW STAC SPECIES WORKING GROUP

### 1 INTRODUCTION

1. The First Meeting of the Contracting Parties (COP) of the SPAW Protocol, Havana (24-25 September 2001), in its Decision I.7, awarded “specific mandates to the STAC for the creation of ad hoc Working Groups to deal with those themes that, owing to their complexity or level of specialisation, thereby require [special attention].”
2. Four (4) such ad hoc working groups now exist dedicated respectively to Protected Areas, to Species, to Exemptions and the most recent one, to Sargassum. Working Groups were established by the STAC and recently consolidated with terms of reference and specific tasks specially designed following the last STAC, in Panama, 2018. They are composed of experts designated for their acknowledged scientific and technical competence, their availability and readiness to be responsive in the group, and to cover as much as possible the geographical and thematic scope of the working group. Experts may be nominated by Contracting parties, observers (*e.g.*, non-member States, civil society organisations) or independent experts added for their specific field of expertise. Once designated, they participate in *intuitu personae*. The working groups are currently all chaired by the SPAW RAC. In case consensus cannot be reached for a specific task, the chair guarantees that the diversity of opinions are dutifully reflected in the feedback and reports to the contracting parties and observers and ultimately to the STAC.

### 2 MANDATE AND COMPOSITION

3. Formally established in June 2022, the SPAW STAC Working group on Species had the following tasks assigned by the document “2021-2022 Tasks and Chairs of the SPAW STAC *ad hoc* Working Groups”:
  - **Mandatory task, Task 1:** Review, evaluate, and provide recommendations on proposals from Contracting Parties to add new species to the SPAW Protocol Annexes or change the listing status of species currently on the Annexes.
  - **Additional tasks** from the priorities discussed during STAC 10:
    - **Task 2:** Strengthen work on the conservation and management of species listed in the Annexes of the Protocol taking into account the recommendations in:

- i. paragraphs 50-56 of UNEP(DEPI)/CAR WG.42/INF.24, recommendations of the species working group for and effective management of shark and ray species listed in Annex III;
  - ii. paragraph 4 of UNEP(DEPI)/CAR WG.42/INF.25, recommendations of the species working group for preventing sawfish extinction;
  - iii. paragraphs 8-10 of UNEP(DEPI)/CAR WG.42/INF.38, recommendations of the species working group for conserving the Nassau Grouper;
  - iv. paragraph 8 of UNEP(DEPI)/CAR WG.42/INF.39, recommendations of the species working group for the protection and Recovery of Caribbean Sea Turtles.
- **Task 3:** Revise and update the Marine Mammal Action Plan (MMAP), considering new information and developments since 2008, including the “Scientific and Technical Analysis of the Implementation of the Action Plan for the Conservation of Marine Mammals (MMAP) in the Wider Caribbean,” and present the updated MMAP to STAC10 for its review and consideration.
4. The current species working group is composed of 29 experts, 16 nominated from 9 countries, 13 nominated from observers (Appendix 1).

### 3 GENERAL FUNCTIONING OF THE WORKING GROUP

5. One introductory meeting with all the working groups (Species, Protected Areas, and Sargassum) was organised on June 03, 2022. The meeting was aimed at introducing the new nominated experts to SPAW Protocol’s background, working groups’ rules and objectives, and to create momentum among the veteran experts to launch a good work dynamic. Eighteen (18) participants attended. A species working group meeting was then organised on June 28, to identify leaders for each task, to distribute work among the members of the group, and to plan the evaluation of the proposals submitted by the contracting parties.
6. The species working group work was then divided into online meetings and online collaborative review and drafting of documents and recommendations. Meetings were dedicated to discussing the tasks to be performed, the method to address them, identify and discuss potential points of disagreements, and validate the working group outputs. Most of the working group work was performed online, on shared documents that experts collaboratively drafted with SPAW RAC support and reviewed.
7. As planned by the 2022 working groups terms of reference, all working group emails were sent via the “teamwork” virtual platform and all documents were shared *via* a collective Google Drive folder. This allowed all members of the species working group to keep track of exchanges and



productions, including newcomers. The work performed by the working group during this biennium 2021-2022, and the major outputs are presented in the following paragraphs.

#### **4 TASK 1: REVIEW, EVALUATE, AND PROVIDE RECOMMENDATIONS ON PROPOSALS FROM CONTRACTING PARTIES TO ADD NEW SPECIES TO THE SPAW PROTOCOL ANNEXES OR CHANGE THE LISTING STATUS OF SPECIES.**

8. The Kingdom of Netherlands and the Republic of France submitted proposals for:
  - the uplisting of Oceanic Whitetip shark *Carcharhinus longimanus* from Annex III to Annex II of the SPAW Protocol;
  - the uplisting of the Whale shark, *Rhincodon Typus*, from Annex III to Annex II of the SPAW Protocol;
  - listing three (3) species of Hammerhead Sharks—*Genus Sphyrna* on SPAW Protocol Annex II;
  - uplisting the Giant Manta ray *Mobula birostris* from Annex III to Annex II of the SPAW Protocol;
  - listing all parrotfishes (Perciformes: Scaridae) on SPAW Protocol Annex III.
9. The Kingdom of the Netherlands submitted proposals for:
  - uplisting of the Lesser Antillean iguana *delicatissima* from Annex III to Annex II of the SPAW Protocol.
  - listing the Caribbean Reef Shark *Carcharhinus perezi* on SPAW Protocol Annex III.
10. All proposals were submitted in the time frame established by the Terms of Reference (4 months before STAC).
11. After their submission, all seven (7) proposals were uploaded in a Google Drive Folder, available to the whole species working group. Experts were asked, after reviewing the proposals, whether they would recommend the listing of the Species under SPAW Annex II or III as proposed, and to provide a brief statement supporting their position with respect to the listing or not of the proposed Species. In particular, they were asked if: they considered the proposals to follow the requirements of the guidelines, whether the quality of the content was sufficient to make a decision, and which were the relevant criteria for species listing. Finally, experts were asked if they considered that, according to the proposal, the species could be recommended for listing to the annex II/III of the SPAW protocol.
12. To support experts in this review process, an online evaluation table was proposed for each proposal, and experts were encouraged to fill it in before the validation meetings. Validation

meetings were then organised, during which the experts were invited to give their opinion on the proposal and to decide, on the basis of the proposal, their expertise, and any other valuable available information, the relevance of the species listing.

#### **4.1 Sub-task 1.1 Proposal of the Kingdom of Netherlands and the Republic of France for the uplisting of the Whale shark, *Rhincodon Typus*, from Annex III to Annex II of the SPAW protocol (UNEP(DEPI)/CAR WG.44/INF19)**

##### ***4.1.1 Methodology***

13. The proposal was submitted to SPAW RAC on July 31, 2022, and to the working group on August 09, 2022. Experts were asked to read the proposal and fill in the corresponding evaluation table before the validation meeting planned on September 6.
14. On September 6, the experts of the species working group were invited to a validation meeting. The experts (5) met to discuss the proposal for the uplisting of the Whale shark *Rhincodon Typus* from annex III to annex II.

##### ***4.1.2 Outcomes and highlights of the proposal***

15. Whale sharks are distributed circum-tropically. It is a migratory species that lives offshore, away from coastal areas. The species is highly vulnerable to exploitation due to its slow growth and late maturation. The species is subject to a global decline in its populations and is classified as endangered in the IUCN red list. Due to large-scale habitat degradation, increased shipping activities and tourism in the Caribbean region, populations in the region are also declining. A recent global threat prioritisation exercise for whale sharks identified shipping as the main contemporary threat to their global population, with the Gulf of Mexico explicitly identified as a high-risk area. In addition, the known aggregation behaviour of whale sharks may encourage overexploitation, including bycatch, in areas of seasonal high local population density. Finally, tourism activities increase the risk of vessel strikes and local disturbance.

##### ***4.1.3 Global assessment of the proposal by the experts***

16. **Five (5) experts** examined the proposal, filled in the evaluation table (Appendix 2) and attended the validation meeting.
17. The main outputs of the experts' assessment are the following:
18. **Three (3) experts** consider that the relevant criteria for inclusion in Annex II of SPAW are met and that uplisting to Annex II is warranted, based on the criteria and information available in the proposal. They emphasised the following points:

- There is clear evidence of decline by 50% over the last three generations (criterion #1). Whale Sharks are mainly threatened by fisheries, international trade, vessel strikes and climate change. In particular, their populations are highly vulnerable to decline because of their slow growth and delayed maturation.
  - Whale Sharks are listed as Endangered globally on the IUCN Red List (criterion #4).
  - They are highly migratory and would benefit from collaborative regional efforts (criterion #6).
  - They are listed on Annex III of the SPAW Protocol since 2017 (criterion #8).
  - They have been protected through several international agreements, such as CITES (criterion #5) and some national legislations.
19. **Two (2) experts** consider that Annex II listing is not justified. They point out that there is a lack of data in the proposal and the data presented are too outdated to confirm the species is in decline globally and within the Caribbean region (criterion #1).
  20. **Two (2) experts** consider that the information regarding increasing international trade is very old, and there is very little information about the actual volume or location of the trade (criterion #5).
  21. **Two (2) experts** recall that the IUCN estimates are for a presumed decline (criterion #4). They also point out that the 50% decline is for the entire population, not necessarily the Caribbean population.

#### **4.1.4 Group conclusion:**

22. **No consensus: two (2) experts** consider the proposal does not present sufficient information to demonstrate the species meets the criteria for uplisting to Annex II. **Three (3) experts** consider there is sufficient information in the proposal to uplist the species to Annex II.

## **4.2 Sub-task 1.2 Proposal of the Kingdom of the Netherlands and Republic of France for listing three species of Hammerhead Sharks - Genus *Sphyrna* - on SPAW Protocol Annex II (UNEP(DEPI)/CAR WG.44/INF20)**

### **4.2.1 Methodology**

23. The proposal was submitted to SPAW RAC on July 31, 2022, and to the working group on August 2, 2022. Experts were asked to review the proposal and fill in the corresponding evaluation table (Appendix 2) before the validation meeting planned in early September.

24. On September 6, the experts of the species working group were invited to a validation meeting. The experts (5) met to discuss the proposal for listing three (3) species of Hammerhead Sharks - *Genus Sphyrna* on SPAW Protocol Annex II.

#### **4.2.2 Outcomes and highlights of the proposal**

25. Some declines have been documented for some Hammerhead shark populations over recent years. Hammerheads sharks are threatened by the destruction and modification of their habitats, overexploitation of the species for commercial purposes, a high propensity to absorb contaminants, and the lack of adequate regulatory mechanisms. In particular, hammerhead shark populations have been under pressure from commercial fisheries, both through targeted fishing and bycatch. Great hammerhead sharks are also targeted for their large fins, which are prized in Asian markets. Difficulties in species identification and accurate recording make the assessment of these species very difficult, however low survival at capture makes them highly vulnerable to fishing pressure, whether directed or incidental.

#### **4.2.3 Global assessment of the proposal by the experts**

26. Five (5) experts examined the proposal, filled in the evaluation table (Appendix 3), and attended the validation meeting.
27. The main outputs of the experts' assessment are the following:
28. **Three (3) experts** consider that the relevant criteria for inclusion in Annex II of SPAW are considered to be met and that uplisting to Annex II is warranted, based on the criteria and information available in the proposal. They in particular emphasized the following points:
  - There is clear evidence of decline (criterion #1). Where catch data are available, significant declines have been documented: both species-specific estimates for *S. lewini* and grouped estimates for *Sphyrna spp.* combined suggest declines in abundance of 50-90% over periods of up to 32 years in several areas of its range, including the northwest Atlantic. *S. mokarran* is assessed by IUCN as Endangered in the Northwest Atlantic and Gulf of Mexico, based on a suspected decline of at least >50% over the past 10 years.
  - The hammerhead shark is under increased pressure due to the shark fin trade (criterion #5).
  - Hammerhead sharks are listed as Endangered globally on the IUCN Red List (criterion #4).
  - They are highly migratory species and would benefit from collaborative regional efforts (criterion #6).
  - They also have been protected through several international agreements and sometimes national legislation (criterion #5).

29. **Two (2) experts** invoke precautionary principle (criterion #2) and remind that, considering the status and type of highly migratory species, the lack of data and lack of full scientific certainty can't be evoked to prevent the listing of the species.
30. **Two (2) experts** consider that Annex II listing is not justified. They consider there is lack of data/evidence supporting a conclusion that the species is in decline globally and within the Caribbean region (criteria #1). There is not enough information in the proposal about population size, restrictions on its range of distribution, or population fragmentation (criteria #1). The amount of data/evidence available at this time is insufficient to warrant a precautionary approach (criteria #2). They also suggest that the IUCN assessment does not provide sufficient evidence to support listing in Appendix II of the SPAW Protocol, as it is based on a study conducted in the Indian Ocean (criterion #4). To conclude, management strategies already implemented seem to show good results so far (US Range). Thus, there is not enough reason to propose this species to be uplisted from Annex III to Annex II.

#### ***4.2.4 Group conclusion:***

31. **No consensus: two (2) experts** consider the proposal does not present sufficient information to justify the species meets the criteria for listing to Annex II. **Three (3) experts** consider there is sufficient information in the proposal to list the species to Annex II.

### **4.3 Sub-task 1.3 Proposal of the Kingdom of the Netherlands for listing the Caribbean Reef Shark on SPAW Protocol Annex III (UNEP(DEPI)/CAR WG.44/INF22)**

#### ***4.3.1 Methodology***

32. The proposal was submitted to SPAW RAC on July 31, 2022, and to the working group on August 2, 2022. Experts were asked to study the proposal and fill in the corresponding evaluation table before the validation meeting planned in early September.
33. On September 6, the experts of the species working group were invited to a validation meeting. The experts (5) met to discuss the proposal for the listing of the Caribbean Reef Shark in Annex III.

#### ***4.3.2 Outcomes and highlights of the proposal***

34. The Caribbean reef shark occurs throughout the western Atlantic Ocean, from North Carolina (USA) to Brazil. The reef shark is a mesopredator, meaning that it is both an active predator of

small animals and a prey of larger fish, such as the tiger shark. However, in the reef ecosystem in which they occur, reef sharks can also act as top predators, with adults often being the top predators on a particular reef.

35. *C. perezii* was the most common species caught by the artisanal shark fishery in the region, with over 88% of individuals caught as juveniles or neonates in waters less than 30m deep. The species is caught as both targeted and bycaught species in fisheries throughout its range and there is evidence of local depletion in areas of high fishing pressure. Although it is difficult to determine a causal relationship between the decline of the species and either fishing pressure or habitat degradation, these two threats are thought to be responsible for the species decline.

#### ***4.3.3 Global assessment of the proposal by the experts***

36. **Five (5) experts** examined the proposal, filled in the evaluation table (Appendix 4), and attended the validation meeting.
37. The main outputs of the experts' assessment are the following:
38. **All experts** consider that the proposal follows the requirements of the guidelines.
39. **All experts** agreed that there was sufficient information presented in the proposal to support the listing of the Caribbean Reef Shark in annex III of the SPAW protocol based on:
- evidence of decline of the species (criterion #1);
  - the precautionary approach that can be applied based on the slow life history and vulnerability to overexploitation (criterion #2);
  - the recognition of the species as “critically endangered” by the IUCN (criterion #4);
  - the importance of regional cooperation to protect the species, notably as it is endemic of the region (criterion#6, #7).

#### ***4.3.4 Group conclusion***

40. **Consensus:** the group unanimously concludes the Caribbean Reef Shark meets the criteria for listing in annex III of the SPAW protocol, notably based on the size and the decline of the population, the recognition of its threatened and endangered status, and the importance of regional and cooperative efforts for the protection and recovery of the species.

#### **4.4 Sub-task 1.4 Proposal by the Kingdom of Netherlands and the Republic of France for the uplisting of Oceanic Whitetip shark *Carcharhinus longimanus* from Annex III to Annex II of the SPAW protocol (UNEP(DEPI)/CAR WG.44/INF18)**

##### **4.4.1 Methodology**

41. The proposal was submitted to SPAW RAC on July 31, 2022, and to the working group on August 1, 2022. Experts were asked to study the proposal and fill in the corresponding evaluation table before the validation meeting planned in early September.
42. On August 26, the experts of the species working group were invited to a validation meeting. The experts (5) met to discuss the proposal for the uplisting of the Oceanic Whitetip shark - *Carcharhinus longimanus* from Annex III to Annex II of the SPAW protocol.

##### **4.4.2 Outcomes and highlights of the proposal**

43. *Carcharhinus longimanus* is a circumtropical species which occurs mostly in pelagic zones, in shallow habitats from surface waters to a depth of 20 metres. It was characterised historically as one of the most abundant oceanic sharks in tropical seas worldwide. The Oceanic whitetip shark has experienced significant population declines, between 57% and 88%, in the Atlantic and Gulf of Mexico. This species is assessed by IUCN to be critically endangered in the Northwest and Western Central Atlantic. The decline of the Oceanic Whitetip has been well studied, and the most recent IUCN assessment for the global population estimates a population decline of over 98%.

##### **4.4.3 Global assessment of the proposal by the experts**

44. Five (5) experts examined the proposal, filled in the evaluation table (Appendix 5) and attended the validation meeting.
45. The main outputs of the experts' assessment are the following:
46. **All experts** consider that the proposal follows the requirements of the guidelines.
47. **All experts** confirm that the information presented in the proposal supports the uplisting of Oceanic Whitetip shark *Carcharhinus longimanus* from annex III to annex II of the SPAW protocol, based on:
  - the level of decline of the species (criterion #1);
  - the need to reinforce the management and protection measures taken by several SPAW parties (criterion #6).

48. Some experts note that the recognition of the species as “critically endangered” by the IUCN (criterion #4), also supports the uplisting of the species.

#### ***4.4.4 Group conclusion***

49. **Consensus:** the group unanimously concludes the Oceanic Whitetip shark *Carcharhinus longimanus* meets the criteria for uplisting from Annex III to Annex II of the SPAW protocol, notably based on population decline, recognition of a threatened and endangered species status, and the importance of regional and cooperative efforts for the protection and recovery of the species.

### **4.5 Sub-task 1.5 Proposal of the Kingdom of the Netherlands and the Republic of France for uplisting the Giant Manta ray *Mobula birostris* from Annex II to Annex III in the SPAW Protocol (UNEP(DEPI)/CAR WG.44/INF23)**

#### ***4.5.1 Methodology***

50. The proposal was submitted to SPAW RAC on July 31, 2022, and to the working group on August 2, 2022. Experts were asked to study the proposal and fill in the corresponding evaluation table before the validation meeting planned in early September.
51. On September 6, the experts of the species working group were invited to a validation meeting. The experts (5) experts met to discuss the proposal for uplisting of the Giant Manta ray to SPAW protocol Annex II.

#### ***4.5.2 Outcomes and highlights of the proposal***

52. As an oceanic, migratory species, the Caribbean manta ray population appears to be small, sparsely distributed, and fragmented, and some data suggests occasional large-scale movement.
53. There are no global estimates of the overall Giant Manta Ray population size. However, the size of the populations at known aggregation sites appears to be small (less than 1,000 individuals). Giant Manta Ray seems to display a strong decline especially in areas with heavy fishing pressure.
54. Being a migratory pelagic species that is often observed feeding near the surface, the Giant Manta Ray is highly susceptible to targeted catch and bycatch. In addition, the species forages in nearshore habitats, which puts it at high risk of interaction with man-made pollutants and wastes. As filter feeder, it is one of the few elasmobranch species that can be vulnerable to plastic ingestion. Finally, this species has a very slow life history with an extremely low reproductive rate (one pup per litter). These animals have high economic and cultural values for many communities around the world,



and there are specific sites where communities depend on diving tourism based mostly on manta rays.

#### ***4.5.3 Global assessment of the proposal by the experts***

55. **Five (5) experts** examined the proposal, filled in the evaluation table (Appendix 6) and attended the validation meeting.
56. The main outputs of the experts' assessment are the following:
57. **Two (2) experts** consider that the relevant criteria for inclusion of the species in Annex II of SPAW are met and that uplisting to Annex II is warranted, based on the criteria and information available in the proposal. They in particular emphasize the following points:
  - There is clear evidence of global decline especially in areas with heavy fishing pressure mostly because Giant Manta Rays are caught as both targeted and bycaught species worldwide. Furthermore, the species has an extremely slow life history. This gives them one of the lowest maximum rates of population increase of all elasmobranchs (#criterion 1).
  - Giant Manta Rays have recently (2019) been reassessed for the IUCN Red List and are now classified as endangered (criterion #4)
  - They are highly migratory and would benefit from collaborative regional efforts (criterion #6)
58. **Two (2) experts** invoke precautionary principle (criterion #2) and remind that, although there is no global estimate of the Giant Manta Ray population size, local populations appear to be small in known aggregation sites (less than 1 000 individuals).
59. **Three (3) experts** consider that Annex II listing is not justified. Some of the information in the proposal about population status and declines is out of date, and there is very little information specific to the region (criterion #1). The IUCN status, the main argument used to demonstrate the decline of the species, is based on very limited and outdated data (criterion 4). Moreover, the regional management measures referenced are often related to sharks and not rays (criterion #6).

#### ***4.5.4 Group conclusion***

60. **No consensus: two (2) experts** conclude the Giant Manta Ray meets the criteria for uplisting to SPAW Protocol Annex II, based on the content of the proposal. However, **three experts (3)** consider the proposal does not present sufficient information to justify the species meets the criteria for uplisting to Annex II, based on the incomplete and outdated data presented in the proposal.

## **4.6 Sub-task 1.6 Proposal by Kingdom of Netherlands and the Republic of France for listing all parrotfishes (Perciformes: Scaridae) on SPAW Protocol Annex III (UNEP(DEPI)/CAR WG.44/INF17)**

### ***4.6.1 Methodology***

61. The proposal was submitted to SPAW RAC on July 31, 2022, and to the working group on August 1, 2022. Experts were asked to study the proposal and fill in the corresponding evaluation table before the validation meeting planned in early September.
62. On August 26, the experts of the species working group were invited to a validation meeting. The experts (5) met to discuss the proposal for listing of all parrotfishes on SPAW protocol Annex III.

### ***4.6.2 Outcomes and highlights of the proposal***

63. Parrotfish have a major ecological role. They are of great importance to the maintenance of fragile or vulnerable ecosystems and habitats. They maintain the resilience of coral reefs, control the abundance of macroalgae, transfer energy to intermediate carnivorous fish, support coral recruitment, and produce sediments as they are natural eroders. The functional role of each parrotfish species is largely distinct, which is why it is important to preserve both the diversity and abundance of species in this group. Several threats are increasing the vulnerability of parrotfish, such as habitat destruction and fragmentation, water pollution, climate change and a complex life history. However, the main current threat is overfishing, which is exacerbated by the depletion of other targeted fish stocks.

### ***4.6.3 Global assessment of the proposal by the experts***

64. **Five (5) experts** examined the proposal, filled in the evaluation table (Appendix 7) and attended the validation meeting
65. The main outputs of the experts' assessment are the following:
66. **All experts** consider that the proposal follows the requirements of the guidelines.
67. **All experts** confirm that the information presented in the proposal supported the inclusion of all parrotfishes (Perciformes: Scaridae) in Annex III of the Protocol based on the importance of parrotfish to the protection of vulnerable coral reef ecosystems (criterion #10). They also point to the success of some national management programs (criterion #3) and the importance of regional and cooperative efforts to protect and recover the species.

#### **4.6.4 Group conclusion:**

68. **Consensus:** the group unanimously concludes that all parrotfishes (Perciformes: Scaridae) meet the criteria for listing in Annex III of the Protocol, notably based on the importance of parrotfish to the protection of vulnerable coral reef ecosystems and the importance of regional and cooperative efforts for the protection and recovery of these species

### **4.7 Sub-task 1.7 Proposal by the Kingdom of Netherlands for the uplisting of the Lesser Antillean iguana *Iguana delicatissima* from Annex III to Annex II of the Protocol (UNEP(DEPI)/CAR WG.44/INF21)**

#### **4.7.1 Methodology**

69. The proposal was submitted to SPAW RAC on July 18, 2022, and to the working group on July 25, 2022. Experts were asked to study the proposal and fill in the corresponding evaluation table before the validation meeting planned in early September. On August 26, the experts of the species working group were invited to a validation meeting. The experts (5) met to discuss the proposal for listing of *Iguana delicatissima* on SPAW protocol Annex III.

#### **4.7.2 Outcomes and highlights of the proposal**

70. The *Iguana delicatissima* is an endemic species of the Lesser Antilles. It is an ecological keystone species, as it provides important ecosystem services by consuming fruits, dispersing seeds and cropping forest canopy foliage. Through nest building, it also aids in ground and nutritional turnover and is an important food source for other Lesser Antillean species such as birds of prey and snakes. Historically present on twelve (12) islands, the species has already become extinct (genetically) on many islands and is currently present on only six (6) main islands. It is thus considered one of the most endangered species with a rapid decline of its population. The main threat to the *Iguana delicatissima* is the proliferation of the non-native Common Green Iguana (*Iguana iguana*) in its native range. Overall, the species has seen its distribution declined by 80%. Current biosecurity measures are insufficient to prevent both the intentional and unintentional transport of non-native iguanas among islands and incursions in uninhabited islands still occur. Several other threats increase the vulnerability of *Iguana delicatissima*, such as illegal hunting or trade, or difficulties to implement effective reintroduction programs to increase its population number.

#### 4.7.3 *Global assessment of the proposal by the experts*

71. **Five (5) experts** examined the proposal, filled in the evaluation table (Appendix 7) and attended the validation meeting
72. The main outputs of the experts' assessment are the following:
73. **All experts** consider that the proposal follows the requirements of the guidelines .
74. **All experts** confirm that the information presented in the proposal supported the uplisting of the Lesser Antillean iguana *Iguana delicatissima* from Annex III to Annex II of the Protocol, based on the size and the decline of the population (criterion #1), the need to strengthen management and protection measures taken by SPAW parties (criterion #6), its classification as critically endangered by the IUCN (criterion #4), and the illegal trade (criterion #5).

#### 4.7.4 *Group conclusion*

75. **Consensus:** the group unanimously concludes the Lesser Antillean iguana *Iguana delicatissima* meets the criteria for uplisting from Annex III to Annex II of the Protocol, notably based on based on the size and the decline of the population, the need to strengthen management and protection measures taken by SPAW parties, its classification as critically endangered by the IUCN, and the illegal trade.

### 5 **TASK 2: STRENGTHEN WORK ON THE CONSERVATION AND MANAGEMENT OF SPECIES LISTED IN THE ANNEXES OF THE PROTOCOL**

76. A first meeting was organised on 03/06/2022 to detail the framework given by STAC and COP regarding task 2 (see § 2). The experts agreed to work on three recommendation documents for: Nassau Grouper, Sawfish and Sea Turtles. Some volunteer experts were identified to lead the work for each of these groups of species. Once the documents were prepared, they were uploaded to a Google Drive folder and an email was sent to all the species working group, so that experts could review them. A validation meeting was then organised for each document, to discuss its content and come to a final consensus version. A last opportunity was then given to the experts to make a final review of the online document.

## **5.1 Sub-task 2.1: Nassau Grouper, *Epinephelus striatus* (UNEP(DEPI)/CAR WG.44/INF26)**

### ***5.1.1 Methodology***

77. **One expert** volunteered to draft the document “Recommendations for conserving the Nassau Grouper in the Wider Caribbean.”
78. On August 9, 2022, the document “Recommendations for conserving the Nassau Grouper in the Wider Caribbean” was submitted to the whole species WG for review. **Three (3) experts** reviewed the document.
79. On August 17, 2022, the experts of the species working group were invited to a validation meeting. The experts (4) met to discuss and reach a consensus on the recommendations for conserving the Nassau Grouper in the Wider Caribbean.
80. The document was then reviewed by the experts, according to the comments made during the meeting, and a last opportunity was given to the WG to do a final read-through.

### ***5.1.2 Review of the recommendation document by the experts***

81. The four (4) experts that contributed to the drafting and/or review of the document consider it meets the request made during STAC 9 and agree it should be submitted to STAC 10.
82. During the validation meeting, attending experts provided additional details on the measures SPAW Contracting Parties could develop to assist in the implementation of the Regional Fish Spawning Aggregation Fishery Management Plan (FMP) developed by WECAFC. They also insisted on the importance of fishing seasonal closures to strengthen the management of the species. Finally, experts highlighted that regional fishery organizations, SPAW Secretariat, and SPAW RAC should collaborate to facilitate the implementation of the FMP.

### ***5.1.3 Group recommendations***

83. Building upon the recommendations for conserving the Nassau Grouper made during STAC 9 (UNEP(DEPI)/CAR WG.42/INF.38), and following the discussion that took place during the validation meeting, the experts proposed the following actions, to prevent extinction and promote recovery of Wider Caribbean Nassau Groupers:
  - i. SPAW Contracting Parties assist WECAFC in the implementation of the Regional Fish Spawning Aggregation FMP by supporting and ensuring their fisheries or other

- appropriate departments or ministries implement and enforce harmonized seasonal closures for all commercial and recreational fishing of Nassau Grouper, at least for the period 1 December-31 March. A harmonized regional closed season is essential to protect spawning Nassau grouper and is vital for the species survival and securing sustainable fishing outside the closed seasons.
- ii. SPAW Contracting Parties implement additional measures to seasonal closure deemed appropriate at the national level. Contracting parties should be mindful to apply the precautionary principle to national management strategies in order to account for information gaps, especially given the critically endangered status of this species and ongoing population decline. National management plans complement actions at the regional level and are needed to guide resource management among countries with different regulatory frameworks. Those plans should include increased monitoring and evaluation of the adequacy of fishery management measures and enforcement.
  - iii. The SPAW Secretariat and SPAW-RAC can assist in the implementation of the FMP by seeking opportunities to collaborate and cooperate with the WECAFC Secretariat and other regional fisheries organisations, such as the GCFI (Gulf and Caribbean Fisheries Institute) and the CRFM (Caribbean Regional Fisheries Mechanism), as appropriate, to support capacity building and communication and outreach efforts, including the development of communication and outreach tools.
  - iv. The STAC should request the SPAW Species Working Group and Protected Areas Working Group to undertake a joint task for submission to the next STAC meeting to consider opportunities to improve MPA management and protection for Nassau grouper, including in SPAW-listed MPAs, which are known to protect important spawning aggregation sites, taking into account proposed action #16 in the Regional Fish Spawning Aggregation FMP.<sup>1</sup>

## **5.2 Sub-task 2.2 Sawfish (UNEP(DEPI)/CAR WG.44/INF25)**

### **5.2.1 Methodology**

84. Two (2) experts volunteered to draft the document “Recommendations for the Conservation of the Sawfish in the Wider Caribbean”

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<sup>1</sup> Action 16: Increase Nassau Grouper and Mutton Snapper Fish Spawning Aggregation (FSA) protection by improving management of current MPAs or establishment of new MPA where the conservation of FSAs is included in the objectives.

85. On August 18, 2022, the document “Recommendations for the Conservation of the Sawfish in the Wider Caribbean” was submitted to the whole species WG for review. Three (3) experts reviewed the document.
86. On August 22, 2022, the experts of the species working group were invited to a validation meeting. The experts (4) met to discuss these recommendations for conserving Sawfish in the Wider Caribbean.
87. The document was then reviewed by the experts, according to the comments made during the meeting, and a last opportunity was given to the WG to do a final read-through.

### ***5.2.2 Review of the recommendation document by the experts***

88. **The four (4) experts** that contributed to the drafting and/or review of the document consider it meets the request made during STAC 9 and agree it should be submitted to STAC 10.
89. During the meeting, all the experts recall the importance of the SPAW leadership and guidance for countries to comply with SPAW Annexes mandates for species protections.
90. They also mention the need to support a more coherent strategy across the region, such as a Regional Plan of Action for Sawfish Recovery, although this project is not a priority for now.

### ***5.2.3 Group conclusion***

91. Building upon the recommendations for conserving Sawfish made during STAC 9 (UNEP(DEPI)/CAR WG.42/INF.25), and following the discussion that took place during the validation meeting, the experts proposed the following actions, to prevent extinction and promote recovery of Wider Caribbean Sawfish:
  - i. national regulations to explicitly and specifically prohibit sawfish fishing, killing, retention, sale, and trade, particularly in Panama, Honduras, and Colombia;
  - ii. Bahamas national regulations to explicitly and specifically prohibit sawfish fishing, killing, retention, and domestic sale;
  - iii. education and enforcement programs, particularly in the above five priority countries, to implement protections and promote safe sawfish release;
  - iv. fishery management measures, particularly in priority countries, aimed at minimising sawfish encounters as well as resulting mortality;
  - v. research and protections for critical sawfish habitats, particularly mangroves, throughout the region;

- vi. a Regional Plan of Action (RPOA) for Sawfish Recovery to raise the species' profile and facilitate alignment, cooperation, information sharing, and capacity building among SPAW Parties.

### **5.3 Sub-task 2.3 Sea turtles (UNEP(DEPI)/CAR WG.44/INF24)**

#### ***5.3.1 Methodology***

92. Three (3) experts volunteered to draft the document "Recommendations for the Conservation of Sea turtles in the Wider Caribbean"
93. On August 23, 2022, the document "Recommendations for the Conservation of Sea turtles in the Wider Caribbean" was submitted to the whole species WG for review. The document was reviewed by 2 experts.
94. On August 25, 2022, the experts of the species working group were invited to a validation meeting. The experts (4) met to discuss these recommendations to conserve Sea turtles in the Wider Caribbean.
95. The document was then reviewed by the experts, according to the comments made during the meeting, and a last opportunity was given to the WG to do a final read-through.

#### ***5.3.2 Review of the recommendation document by the experts***

96. **The five (5)** experts that contributed to the drafting and/or review of the document consider it meets the request made during STAC 9 and agree it should be submitted to STAC 10.

#### ***5.3.3 Group conclusion***

97. Building upon the recommendations for conserving Sea Turtles made during STAC 9 (UNEP(DEPI)/CAR WG.42/INF.39), and following the discussion that took place during the validation meeting, the experts proposed the following actions, to prevent extinction and promote recovery of Wider Caribbean Sea Turtles:
98. i. Encourage compliance with the SPAW Protocol through the following steps:
  - a. Prepare an information paper that summarises the regulatory framework and any available data on the exploitation of sea turtle populations by SPAW Parties currently out of compliance with Annex II mandates to protect listed species.
  - b. Request that the SPAW protocol initiate a dialogue with non-compliant Parties to identify barriers to moratoria on sea turtle harvest, or at least barriers to management based on biologically meaningful criteria (such criteria are well articulated in Bräutigam and Eckert, 2006).



99. ii. Compile information on the type (e.g., gear type, fishing practices) of nearshore fisheries for each country and any existing sea turtle protection measures related to those fisheries and develop a strategy to address bycatch in nearshore fisheries.
100. iii. Coordinate with the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC) to develop a cooperative mechanism to facilitate implementation across the species' range of Decision 6 UNEP(DEPI)/CAR IG.40/3, and IAC-COP9-2019-R2 "Conservation of the Northwest Atlantic Leatherback Turtle (*Dermochelys coriacea*)", based on the findings of the Northwest Atlantic Leatherback Working Group (2018) relating to the need to reduce bycatch.
101. iv. Request that Parties with indigenous harvest meeting the traditional subsistence and cultural needs of their local populations (including egg collection), under Article 14 of the SPAW Protocol, provide information and justification on these activities (e.g., harvest data, management measures) and submit an exemption format if necessary.
102. v. Develop and administer a questionnaire to SPAW Parties and observers looking at issues concerning national level enforcement to help identify gaps and barriers to effective enforcement. Potential areas of investigation include: available enforcement personnel and resources; evidence laws; officer, prosecutor and judicial training in environmental crimes; penalties; successful and unsuccessful prosecutions of sea turtle law violations.
103. vi. Support Parties in developing, reviewing, and/or updating their Sea Turtle Recovery Action Plans (STRAP) (developed in partnership with SPAW and WIDECAS) and/or other national recovery planning processes and documents. Emphasis should be given to mobilising resources, implementation, and identification of strategic local initiatives to address bycatch and other threats. WIDECAS is playing a major role here.
104. vii. Ensure that future Parties to the SPAW Protocol, if they sanction direct or indirect sea turtle take, indicate how they intend to comply with the Protocol, including legal protections to sea turtles, regulation of "activities having adverse effects on such species or their habitats and ecosystems", and taking "appropriate actions to prevent species from becoming endangered or threatened" (Article 10).

## **6 TASK 3: REVISE AND UPDATE THE MARINE MAMMAL ACTION PLAN, CONSIDERING NEW INFORMATION AND DEVELOPMENTS SINCE 2008 (UNEP(DEPI)/CAR WG.44/INF31)**

### ***6.1.1 Methodology***

105. During the first meeting of the species WG, on June 28, three (3) experts volunteered to lead Task 3.

106. On July 1st, the three voluntary experts sent a call for contributors by email to the whole species WG. Three (3) experts answered this call.
107. All the task contributors (6 experts and SPAW RAC) met on July 8 to decide on: the work to be done, the contributors for each chapter, and the agenda for progress meetings.
108. The group sent a first draft to the whole species WG on August 25. Experts had two weeks to review the draft. Two experts reviewed the draft.
109. Two meetings were organised on September 7 and September 13, to make the final modifications to the draft, according to reviewers' comments.
110. On September 20, the document was sent back to the whole species WG for a last review (one week), before edition and translation.

### **6.1.2 Outcomes and highlights**

111. The MMAP update group decided to build on the 2008 MMAP<sup>2</sup> the following way:
  - Update the information from the following STAC 9 documents:
    - Implementation of the Action Plan for Marine Mammals in the Wider Caribbean Region: A Scientific and Technical Analysis (UNEP(DEPI)/CAR WG.42/INF.29 Add.1, 2020);
    - Implementation of the Action Plan for the Conservation of Marine Mammals (MMAP) in the Wider Caribbean: Technical Analysis and Programmatic Overview (UNEP(DEPI)/CAR WG 42/INF.29, 2020);
    - Current status of national legislation on marine mammals in countries and territories of the WCR (UNEP(DEPI)/CAR WG.42/INF.29 Add.2, 2020).
  - Enlarge the scope of the MMAP to include river and estuarine species listed in SPAW Annexes, such as: the giant otter (*Pteronura brasiliensis*), the neotropical otter (*Lontra longicaudus*), the Tucuxi (*Sotalia fluviatilis*) and Amazon River dolphin (*Inia geoffrensis*), the West Indian manatee (*Trichechus manatus*), and the Amazonian manatee (*Trichechus inunguis*).
  - Make some format modifications, so that the reviewed version is more tangible and user-friendly.

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2 [https://wedocs.unep.org/bitstream/handle/20.500.11822/31068/MMAP\\_ActPln-en.pdf?sequence=1&isAllowed=y](https://wedocs.unep.org/bitstream/handle/20.500.11822/31068/MMAP_ActPln-en.pdf?sequence=1&isAllowed=y)

112. The major format modifications the MMAP update group decided to make are the following:
- While the original MMAP focused on eleven ‘threat’ categories, the group decided to focus the reviewed version on the priority threats identified in STAC 9 documents: fisheries interactions, directed hunts and captivity, habitat degradation, pollution and marine mammal health, whale watching and associated activities, acoustic disturbance, vessel strikes, and climate change.
  - For each threat are now presented: background information, a list of recommended actions, and a resource toolbox.
  - Background information was reduced compared to the 2008 MMAP, as detailed knowledge on threats is already provided in the MMAP assessment submitted last year to STAC 9 (UNEP(DEPI)/CAR WG.42/INF.29 Add.1, 2020)
  - For each threat, recommended actions are presented under a new synthetic table format with: key objective, priority actions, expected outputs, main partners. Each action is also categorised as assessment, or mitigation, or capacity building.
  - The resource table is a new addition to the MMAP, it presents specific partners and other resources, such as regional reviews and guidelines, to support parties to advance marine mammal protection initiatives.
  - Finally, there were no scientific references in the 2008 MMAP, but the group decided to add some to strengthen the credibility of the document.

### **6.1.3 Recommendations**

113. The working group was concerned regarding the implementation of the MMAP, as the 2008 plan had been poorly implemented. So, experts made two major recommendations to strengthen the implementation of this reviewed version:
- Set up a marine mammal Regional Activity Network that could facilitate and boost the implementation of the RAN.
  - Develop a national template, similar to the Sea Turtle Recovery Action Plan developed by WIDECAS, to facilitate the development of national action plans.
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## APPENDIX 1: LIST OF SPAW SPECIES WORKING GROUP EXPERTS

Name of expert	Affiliation
Julia Horrocks	Barbados
Vivian Ramnarace	Belize
Jamal Galves	Belize
Luis Chasqui Velasco	Colombia
Heins Bent-Hooker	Colombia
José Alberto Álvarez Lemus	Cuba
Patricia González Díaz	Cuba
Marcos Casilla	Dominican Republic
Jean Vermot	France
Paul Giannasi	France
Marnie Xiomara Portillo	Honduras
Anne-Marie Svoboda	Netherlands
Twan Stoffers	Netherlands
Dra. Lissette Trejos	Panama
Marino Eugenio Abrego	Panama
Kristen Koyama	USA
Angela Somma	USA
Patricia Kramer	AGRRA/ GCRMN
Susan Millward	AWI
Irene Kingma	Dutch elasmobranch society
Alejandro Acosta	GCFI
Ann Marie Lauritzen	IAC
Monica Borobia-Hill	Monitor Caribbean
Olga Koubrak	SeaLifeLaw
Andrea Pauly	UNEP/CMS Sharks Mou
Myles Philips	WCS /WECAFC
Karen Eckert	WIDECAST
Courtney Vail	Lightkeepers
Brice Semmens	Inv/parrotfish
Sonja Fordham	Shark Advocates International



## APPENDIX 2: EVALUATION TABLE FOR WHALE SHARK

Reference article from the SPAW Protocol	Reference article from SPAW revised procedure guidelines (2014)	Criteria	Criteria details	Presence of the information in the proposal	Information quotes	Litterature	Criteria validation (Yes/No)
21	1	The scientific evaluation of the threatened or endangered status of the species is to be based on these factors :	Size of population	Y/N	Genetic effective population size variously estimated at 119,000 – 238,000 sharks or 103,000. 37% would occur in the Atlantic. No data for the Caribbean Sea. 1,361 unique whale sharks from four distinct areas were identified over the period 1999 to 2015 in the Wider Caribbean region. Maximum likelihood modelling resulted in a population estimate of only 2,167 (95% c.i. 1585.21–2909.86) sharks throughout the study region. A population estimate is available, but no information in the proposal about its relation to the criteria.	Castro et al. 2007; Schmidt et al. 2009 Yagishita et al. 2020 McKinney et al (2017)	Y N
			Evidence of decline	Y/N	Estimated decline of 50% over the last three generations (75 years) IUCN status EN with a decreasing trend At Gladden Spit in Belize, whale shark sightings declined from a mean of 4-6 sharks per day between 1998 and 2001 to less than 2 per day in 2003 (Graham and Roberts 2007), with reports from diving guides indicating that numbers have remained low through until 2016. They are now protected in Belize. In absolute terms, sightings decreased from about 500 during the 1990s to around 150 during the 2000s off western Africa. Peak-month sightings also declined by approximately 50% over this time. Furthermore, a recent global threat prioritisation exercise for whale sharks (Rowat et al. 2021) identified shipping traffic to be the primary contemporary threat to their global population, with the Gulf of Mexico explicitly noted as a high-risk area. A provisional IUCN Green Status assessment for whale sharks estimated the species' current Species Recovery Score to be only 29% of a possible 100% in a pre-impact population IUCN's estimate is an inferred decline. And the 50% decline is for the overall population. Same IUCN assessment classified Atlantic population as vulnerable based on closer to 30% decline.	Pierce & Norman 2016, Graham and Roberts 2007, Sequeira et al. 2014 Rowat et al. 2021, Pierce et al. 2021a	Y
			Restriction on its range of distribution	Y/N	Over their lifetimes, adult whale sharks migrate away from coastal areas and live, almost exclusively, in off-shelf oceanic habitats. They exhibit site fidelity to feeding and possibly to pupping and mating grounds. However, there is no evidence yet of this being restricted On a yearly basis, they exhibit strong migratory patterns that guide the shark back to specific feeding areas.		Y N
			Degree of population fragmentation	N		Yagishita et al 2020	N
			Biology and behavior	Y	Highly vulnerable to exploitation because of their slow growth, longevity, and delayed maturation K life history indicates lower resilience to anthropogenic sources of mortality	Pierce et al. 2021b	Y
			Other Population dynamics	N			
			Conditions increasing the vulnerability of the species	Y/N	The known aggregating behaviour of whale sharks could result in potential overexploitation, including from bycatch, in areas of seasonally high local population density. a recent global threat prioritisation exercise for whale sharks (Rowat et al. 2021) identified shipping traffic to be the primary contemporary threat to their global population, with the Gulf of Mexico explicitly noted as a high-risk area.		Y N
Importance of the species to the maintenance of fragile or vulnerable ecosystems and habitats	N						
	2	Does the precautionary principle apply (are there clear indications from criteria 1 that the species is		N			N

Reference article from the SPAW Protocol	Reference article from SPAW revised procedure guidelines (2014)	Criteria	Criteria details	Presence of the information in the proposal	Information quotes	Litterature	Criteria validation (Yes/No)
	3	Only for Annex III: levels and patterns of use and the success of national management programmes	Levels and patterns of Success of national				
	4	Application of the IUCN criteria in a regional (Caribbean) context will be helpful if sufficient data are available	IUCN category for the Caribbean	Y/N	Whale sharks are listed as Endangered global on the IUCN Red List with a decreasing trend. No information available at the Caribbean level If the IUCN mentions a global decreasing trend in their populations and the species is declared endangered, one can presume that Caribbean populations are not faring any better. Particularly given the large-scale habitat degradation, increased shipping activities, and tourism in the wider Caribbean region. The decrease is being blamed on shipping activities and habitat destruction. Although determining a causal relationship between shark decline and shipping/habitat degradation is difficult (they are migratory and often not moving close to shore), the decline is genuine, and we must address the pressures that are causing this.	Rigby, 2019	Y N
21	5	Is the species the subject of local or international trade AND is the international trade regulated under CITES or other instruments ?		Y/N	CITES App. II Some of the information in the proposal about increasing trade is very old, and there is very little information about the actual volume or location of the trade, i.e., is trade affecting the Caribbean population.		Y
21	6	Importance and usefulness of regional and cooperative efforts on the protection and recovery for species		Y	The whale shark is highly migratory. Within the Caribbean region, migratory behavior of whale sharks has been documented. Listed in CMS app I and II Over their lifetimes, adult whale sharks migrate away from coastal areas and live, almost exclusively, in off-shelf oceanic habitats. They exhibit site fidelity to feeding and possibly to pupping and mating grounds. There is very little information specific to the region in the proposal, and it is not clear from the proposal how regional or cooperative efforts would benefit the species.	Ramirez-Macias et al. 2017; Rohner et al. 2021 Hueter et al., 2013; Hoffmayer et al. 2021	Y
10 – 21	7	Endemism of the species (and importance of regional cooperation for its recovery)		N			
	8	Does the species belong to a higher taxonomic unit entirely (i.e., all lower taxa) listed in a SPAW annex?		N			
11 – 21	10	Importance of the species regarding the maintenance of fragile and vulnerable ecosystems/habitats (as Rhizophora for mangroves ecosystems)		N			
11 (a)	a)	Presence of the species in another annex of the SPAW Protocol		Y	Annex III, no improvement noticed since 2017 Species has only been in Annex III for 5 years, and the declines noted have occurred over 75 years. Not enough information presented about sufficiency of Annex III listing.		Y N
11 (4,a) – 19(b)	b)	The documentation include information demonstrating the applicability of the appropriate SPAW listing criteria (i.e., the information available is appropriate to validate the proposal)		Y N	The proposal presents enough information to justify that the species meets some of the criteria for uplisting to Annex II. The proposal does not present sufficient information to justify the species meets the criteria for uplisting to Annex II		N



### APPENDIX 3: EVALUATION TABLE FOR HAMMERHEAD SHARKS

Reference article from the SPAW Protocol	Reference article from SPAW revised criteria and procedure guidelines (2014)	Criteria	Criteria details	Presence of the information in the proposal report	Information quotes	Lit literature	Criteria validation (Yes/No)
21	1	The scientific evaluation of the threatened or endangered status of the species is to be based on these factors :	Size of population	Y/N	An accurate abundance estimate for these species on a global scale is not feasible at this stage, based on the available data for different regions. This supports the argument that the listing should not be for specific species but the species complex as a whole to prevent identification difficulties.		N
			Evidence of decline	Y/N	Abundance trend analyses of catch-rate data specific to <i>S. lewini</i> and to a hammerhead complex of <i>S. lewini</i> , including <i>Sphyrna mokarran</i> and <i>Sphyrna zygaena</i> , have reported large declines in abundance ranging from 60-99% over recent years. Where catch data are available, significant declines have been documented: both species-specific estimates for <i>S. lewini</i> and grouped estimates for <i>Sphyrna</i> spp. combined suggest declines in abundance of 50-90% over periods of up to 32 years in several areas of its range, including the northwest Atlantic. <i>S. mokarran</i> is assessed by IUCN as Endangered in the Northwest Atlantic and Gulf of Mexico, based on a suspected decline of at least >50% over the past 10 years. Some declines, but much of the data in the proposal is 20 years old and may not reflect current trends. At least one of the species there is an unsubstantiated statement of decline. And, the proposal down plays the increases in the NW Atlantic <i>S. lewini</i> - Declines of 50-90% cited are for the global population. NW Atlantic population has been increasing since 2010. Data from U.S. east coast are from 2005 and are outdated. <i>S. mokarran</i> - Data for NW Atlantic and Gulf of Mexico is outdated. <i>S. zygaena</i> - very limited species-specific data. Species specific standardized CPUE (1992-2017) in Western North Atlantic and Gulf of Mexico indicate this population has slowly begun to increase after the implementation of management after 2005. The trend analysis of the CPUE for 1992-2017 (26 years) revealed an annual rate of increase of 0.8% with a median increase and the highest probability of an increase over three generation lengths (72.3 years).	Rigby et al 2019, Baum et al 2005 Gallagher & Kimley; 2018	Y/N
			Restriction on its range of distribution	N			N
			Degree of population fragmentation	N			N
			Biology	Y			Y
			Behavior	N			N
			Population dynamics	Y Y	Low recovery potential due to a low intrinsic growth rate and slow reproduction : <i>S. lewini</i> has among the lowest recovery potential when compared to other species of sharks. Population growth rates determined for populations in the Pacific and Atlantic Ocean are low ( $r=0.08-0.10$ yr <sup>-1</sup> ) and fall under the low productivity category ( $r<0.14$ ) as defined by Food and		Y
			Conditions increasing the vulnerability of the species	Y/N	These species were caught in both commercial issues but also taken in recreational shark fisheries. The <i>Sphyrna mokarran</i> is taken by target and bycatch, fisheries, they also have been noted as a favored target species due to the size of their fins. Hammerhead fins are highly valued and they are being increasingly targeted in some areas in response to increasing demand for shark fins. Difficulties in species identification and accurate recording make an assessment of this species very difficult, however low	Piercy et al., 2007 Gallagher & Kimley; 2018	Y/N
			Importance of the species to the maintenance of fragile or vulnerable ecosystems and habitats	Y/N	We know very little about the specific roles of sharks in Caribbean coral reef ecosystems but current models and theories suggest that their loss causes multiple effects throughout local food webs and could lead to reef collapse. It has an important regulatory role.	Rezende et al. (2009)	N

Reference article from the SPAW Protocol	Reference article from SPAW revised procedure guidelines (2014)	Criteria	Criteria details	Info available in the proposal	Information quotes	Litterature	Criteria validation (Yes/No)
	2	Does the precautionary principle apply (are there clear indications from criteria 1 that the species is threatened or endangered, but the exact population status is not clear)		Y/N	Difficulties in species identification and accurate recording make an assessment of this species very difficult, however low survival at capture makes it highly vulnerable to fishing pressure, whether directed or incidental. Furthermore, there is sufficient evidence of decline and the exact population status is not clear.	Gallagher & Kimley; 2018	Y/N
	3	Only for Annex III: levels and patterns of use and the success of national management programmes	Levels and patterns of use Success of national management programme				
	4	Application of the IUCN criteria in a regional (Caribbean) context will be helpful if sufficient data are available	IUCN category for the Caribbean	Y	Sphyrna lewini is assessed by IUCN as Critically Endangered globally Sphyrna mokarran is assessed by IUCN as Endangered in the Northwest Atlantic and Gulf of Mexico, based on a suspected decline of at least >50% over the past 10 years. Sphyrna zygaena is currently assessed by IUCN as Vulnerable with a decreasing trend Based on the IUCN red list Sphyrna lewini is globally Critically endangered with a decreasing trend; as is Sphyrna mokarran and Sphyrna zygaena Vulnerable with a decreasing trend. The IUCN assment for S. mokarran based their Critically Endangered status on basically one study that looked at a shark control bather program in one location in the Indian Ocean (which did show steep declines in great hammerheads being caught in the nets); however, that is not enough evidence to support a global CE status call. IUCN Supplementary Information for S.mokarran shows the status for the N. Atlantic population as Least Concern. The Indian Ocean projection, which was based on very limited data, heavily influenced the outcome of the global population model, and thus the global CR status.	(Rigby et.al 2019)	Y/N
21	5	Is the species the subject of local or international trade AND is the international trade regulated under CITES or other instruments ?		Y	All three hammerhead species S. lewini, S. mokarran and S. zygaena are listed on Appendix II of CITES. This means that all transboundary trade has to be licensed, based on an analysis of the effects of the removal from the wild through a Non-Detriment Finding. For international trade an export permit or re-export is required which is to be issued by the Management Authority of the State of export or re-export. The family Sphyrnidae is listed on Annex I, Highly Migratory Species, of the UN Convention on the Law of the Sea. States are urged to cooperate over the management of these species.		Y
			Importance of efforts	Y	Their migratory characteristic makes it necessary to develop regional and international plans		Y
21	6	Importance and usefulness of regional and cooperative efforts on the protection and recovery for species	Efforts mentioned	Y	To date, some SPAW contracting parties in the region have a National Plan of Action for Sharks and are also parties to the CMS, MoU, ICCAT, OPECSA. In 2004 ICCAT was the first RFMO to adopt recommendations for shark management; ICCAT Recommendations are binding on ICCAT members and cooperating non-members (referred to as "CPCs" in the Recommendations). In 2011 OSPESCA adopted measures on shark finning and the sustainable use of sharks. The Sharks MoU entered into force on 1 March 2010 with the aim to sustainably manage and protect migratory shark species, in particular the species included in appendices I en II of the CMS. All three Hammerhead species are listed on the annex of the MoU as species that have an unfavourable conservation status and which require international agreements for their conservation and management, or would significantly benefit from the international cooperation that could be achieved by an international agreement.		Y
			Usefulness of efforts				
10 – 21	7	Endemism of the species (and importance of regional cooperation for its recovery)					
	8	Does the species belong to a higher taxonomic unit entirely (i.e., all lower taxa) listed in a SPAW annex?					
11 – 21	10	Importance of the species regarding the maintenance of fragile and vulnerable ecosystems/habitats (as Rhizophora for mangroves ecosystems)					
11 (a)	a)	Presence of the species in another annex of the SPAW Protocol			In 2017 the Sphyrnidae family was added to Annex III of the SPAW protocol.		
11 (4,a) – 11(b)		The documentation include information demonstrating the applicability of the appropriate SPAW listing criteria (i.e., the information available is appropriate to validate the proposal)			In summary, the three hammerhead species are eligible for listing under SPAW Annex 2 (II) according to the criteria 1 (decline in population),2 (precautionary approach) 4 (IUCN listing), 5 (CITES and CMS listing) and 6 (the importance of regional cooperation to protect the species). The proposal justifies the listing of the three hammerhead species to SPAW annex II based on criteria 1, 2, 4, 5 and 6. The proposal often presents old and outdated data, and relies heavily on the global IUCN assessment, which was heavily based on a single study in the Indian Ocean. The population in the SPAW Protocol region shows and increasing trend and meets the IUCN Least Concern criteria. It is not clear that regional efforts would be effective or appropriate. Overall, the proposal does not support listing in Annex II.		Y/N

## APPENDIX 4: EVALUATION TABLE FOR THE REEF SHARK

Reference article from the SPAW Protocol	Reference article from SPAW revised procedure guidelines	Criteria	Criteria details	Info available in the proposal	Information quotes	Literature	Criteria validation (Yes/No)
21	1	The scientific evaluation of the threatened or endangered status of the species is to be based on these factors :	Size of population	N	It's unclear whether no information exists or the proposal just did not address. Such information is not present in literature		
			Evidence of decline	Y	The Caribbean Reef Shark has undergone a population reduction of 50–79% over the past three generation lengths (29 years). In areas where it is not protected, there have been population reductions of 99% over the past three generation lengths (29 years) based on Baited Remote Underwater Videos Stations (BRUVS). Some areas with adequate protection appear stable since the 1980s. Another study determined 52.5% decline.	Carlson and al., 2019 Simpfendorfer et al	Y
			Restriction on its range of distribution	Y N	The Caribbean Reef Shark occurs throughout the Western Central and Southwest Atlantic Oceans from the North Carolina (United States of America), the Bahamas, the Gulf of Mexico and Caribbean Sea to Brazil. Proposal does not indicate any reduction or restriction in range.	Carlson and al., 2019	Y N
			Degree of population fragmentation	N			N
			Biology	Y	Relatively unproductive life history Reproduction is viviparous with litter sizes of 3–6, an approximately one year gestation and biennial reproductive cycle, and size-at-birth of 70 cm TL. Generation length was estimated as 9.6 years based on an age-at-maturity of 4.2 years estimated from the reported length-at-maturity and back-transforming length into age using the growth curve and maximum age of 15 year	Carlson and al., 2019	Y
			Behavior	Y/N	Difference in spatial distribution of juvenile and adult sharks around reefs in the Dutch Caribbean, with adult sharks less prevalent in shallow areas, this pattern was also observed in female shark around Belize Proposal does not contain much information about species behavior. There is more information present in literature about vertical and lateral migratory behaviour of this species, which could be incorporated in this proposal (see Stoffers et al 2021 for details)	Stoffers et al 2021 Baremore et al	Y
			Population dynamics				
			Conditions increasing the vulnerability of the species	Y	C. perezi was the species most commonly caught by the artisanal shark fishermen active in the area with over 88% of the individuals caught juvenile or neonates caught in water below 30m depth. The species is caught in targeted fisheries and as bycatch throughout it's range and there is evidence of local depletion in areas of heavy fishing pressure. See species life history	Tavares, 2009	Y
			Importance of the species to the maintenance of fragile or vulnerable ecosystems and habitats	Y/N	The reef shark is a meso-predator since they are both active predators of smaller animals and preyed upon by larger fish for example by tiger sharks. However within the reef ecosystem where they are found they can also take the role of top predator as the adult Caribbean Reef sharks are often the largest predator on a particular reef. There is some information in the proposal about the role of Caribbean reef sharks as the top predator, but the information is minimal. Information could be more detailed	Carlson and al., 2019	Y

Reference article from the SPAW Protocol	Reference article from SPAW revised procedure guidelines	Criteria	Criteria details	Info available in the proposal	Information quotes	Literature	Criteria validation (Yes/No)
	2	Does the precautionary principle apply (are there clear indications from criteria 1 that the species is threatened or endangered, but the exact population status is not clear)		Y/N	I would say yes here, there are signs of decline, as seen under 1, but the exact population status is not clear Status is concerning, but very little information in the proposal about threats, particularly the greatest threat - fishing. Fishing pressure and habitat loss are to held responsible for the decline. Although determining a causal relationship between shark decline and fishing/habitat degradation is difficult, the decline is genuine, and we must address the pressures that are causing it.		Y
	3	Only for Annex III: levels and patterns of use and the success of national management programmes	Levels and patterns of use	N	The species is caught in targeted fisheries and as bycatch throughout it's range and there is evidence of local depletion in areas of heavy fishing pressure. Even though a substantial part of it's range consists of designated shark sanctuaries, extensive Baited Remote Underwater Video studies have shown that this does not prevent population decline within the sanctuary if the fisheries outside the protected area are unmanaged. There is very little information in the proposal about specific levels and patterns of fishing effort.		Y
			Success of national management programme	N	In areas where it is not protected, there have been population reductions of 99% over the past three generation lengths (29 years) based on Baited Remote Underwater Videos Stations (BRUVS). In support of the IUCN assessment 2 estimates of population decline were made, the first a Bayesian state-space framework for estimating population reduction found a strong decline in a study area with no management in place and a slight increase in an area where the species was protected. But the authors note that this increase might be due to a shift from an area with high fishing pressure to an area with less human activity. The second estimate by Simpfendorf et.al was based on extensive Baited Remote Underwater Video (BRUV) surveys throughout the range of C. perezi as part of the Global Fin Print project. Their analysis found the weighted population depletion level for Caribbean Reef Sharks was 52.5%. With the strongest depletion around Jamaica, Dominican Republic and Colombia (both the coast of the mainland and islands). Over the past decade a large number of BRUV studies have been conducted in the Caribbean region, among them the Global Fin Print project which specifically focused on shark presence around reef assemblages (Ivy, 2021; Clementi 2021; Stoffer 2021; Dwyer 2020). These studies unvaryingly find larger abundances of C. perezi within areas that have protective measures for sharks than outside of them, indicating that spatial protection measures or a good way to manage this species. However as most of these studies are of a short duration they do not track abundance over a longer time period and are not suitable for giving trend predictions. A ten year study of the shark populations around Glover's Reef Marine Reserve in Belize did find a concerning negative trend in C. perezi within the reserve (Flowers; 2022). The authors give active fishing along the edge of the reserve as a possible reason. This result indicates that in addition to spatial protection in reserves and sanctuaries management of the fisheries interacting with Caribbean Reef Sharks in necessary to sustainably manage this species (MacNeil 2020) The proposal presents general evidence that the species has declined in areas with fishing pressure, and has shown signs of recovery in protected areas. However, there is no information about whether the specific national management measures	Ivy, 2021 ; Clementi 2021 ; Stoffers 2021 ; Dwyer 2020 ; Flowers ; 2022 ; MacNeil 2020	Y
	4	Application of the IUCN criteria in a regional (Caribbean) context will be helpful if sufficient data are available	IUCN category for the Caribbean	Y	Endangered with a decreasing population trend.	IUCN	Y
21	5	Is the species the subject of local or international trade AND is the international trade regulated under CITES or other instruments ?		Y/N	For the CITES CoP to be held in Panama in November 2022 a proposal to list 19 endangered and critically endangered requiem sharks on Annex II of CITES was presented in June 2022 by Panama together with a number of parties which include SPAW signatories Colombia, Dominican Republic and the European Union (France and The Netherlands). The Caribbean Reef Shark was one of the species proposed for listing under this proposal. Proposed for listing in CITES, but not listed currently. No data on trade in the proposal.		

Reference article from the SPAW Protocol	Reference article from SPAW revised procedure guidelines	Criteria	Criteria details	Info available in the proposal	Information quotes	Litterature	Criteria validation (Yes/No)
21	6	Importance and usefulness of regional and cooperative efforts on the protection and recovery for species	Importance of efforts	Y			
			Efforts mentioned	Y/N	WECAFC, The Dominican Republic has, together with Belize and six other Central American countries, united under the name SICA (Central American Integration System), signed an agreement to prohibit shark finning. In 2011 OSPESCA adopted measures on shark finning and the sustainable use of sharks.		
			Usefulness of efforts	Y	Not much discussion about effectiveness of efforts except with regard to effectively enforced MPAs.		
10 – 21	7	Endemism of the species (and importance of regional cooperation for its recovery)	Y	The Caribbean Reef Shark occurs throughout the Western Central and Southwest Atlantic Oceans from the North Carolina (United States of America), the Bahamas, the Gulf of Mexico and Caribbean Sea to Brazil.			
	8	Does the species belong to a higher taxonomic unit entirely (i.e., all lower taxa) listed in a SPAW annex?	N				
11 – 21	10	Importance of the species regarding the maintenance of fragile and vulnerable ecosystems/habitats (as Rhizophora for mangroves ecosystems)	N				
11 (a)	a)	Presence of the species in another annex of the SPAW Protocol	N				
11 (4,a) – 19 (3b)		The documentation include information demonstrating the applicability of the appropriate SPAW listing criteria (i.e., the information available is appropriate to validate the proposal)	Y	In summary, listing of the Caribbean Reef Shark under SPAW Annex 3 (III) would be justified based on the criteria 1: as there is clear evidence decline in population; 2: precautionary approach can be applied based on the slow life history and vulnerability to overexploitation; 4 IUCN red list status has been updated to endangered; 5: CITES could be considered in light of the proposal from Panama; 6 and 9: the importance of regional cooperation to protect the species and status as a regional level apply because this species only occurs in the Wider Caribbean Region this means that SPAW is the logical framework to use for its protection and management. Although the CITES proposals are not yet agreed, I would agree to the listing for SPAW annex 3 to be justified based on the other criteria already mentioned. Some of the criteria do not appear to have been addressed or discussed in the proposal, but overall, species could potentially meet the criteria for Annex III and could benefit from regional conservation efforts.		Y	
	***	Does the species benefits from another protection tool (e.g. regional or international regulations, conventions, and management plans)?	Y/N	National and international efforts described in the proposal, but they do not appear to be sufficient.			



## APPENDIX 5: EVALUATION TABLE FOR THE OCEANIC WHITETIP SHARK

Reference article from the SPAW Protocol	Reference article from SPAW revised procedure guidelines	Criteria	Criteria details	Information available in the proposal	Information quotes	Litterature	Criteria validation (Yes/No)	
21	1	The scientific evaluation of the threatened or endangered status of the species is to be based on these factors :	Size of population	Y and N	The oceanic whitetip shark was characterized historically as one of the most abundant oceanic sharks in tropical seas worldwide. Considering the biology of that highly pelagic species, it is almost impossible to gather data to have a global population size estimate available for the oceanic whitetip shark nor regional population size estimates No global population size or regional population estimates. But, it was once one of the most abundant oceanic sharks and it has declined substantially.	Backus et al. 1956; Compagno 1984). Young et al. 2018	Y	
			Evidence of decline	Y	C. longimanus, once among the most abundant oceanic sharks, has experienced serious declines between 57% and 88% in the Atlantic and Gulf of Mexico. This species is assessed to be critically endangered in the Northwest and Western Central Atlantic (). The decline on the Oceanic White Tip has been well researched, the most recent IUCN assessment for the global population estimates a population decline of over 98%. NW Atlantic and Gulf of Mexico/Caribbean populations may have stabilized.	Baum et al., 2015, Rigby et al. 2019 Pacoureau et.al; 2021	Y	
			Restriction on its range of distribution	Y	The species is considered one of the most widespread shark species, ranging across all tropical and subtropical waters.	Rigby et al. 2019; Young and Carlson 2020	N	
			Degree of population fragmentation	N	No evidence of population fragmentation.		N	
			Biology	Y	Carcharhinus longimanus is a large-bodied shark species from the family Carcharhinidae (requiem sharks). This species can reach a maximum size of 325 - 346 cm, with most specimens measuring between 150 and 205 cm	Lessa et al., 1999; D'Alberto et al., 2016; Joung et al., 2016	Y	
			Behavior					
			Population dynamics	Y	C. longimanus is a large oceanic shark species, with active and strong swimming capabilities. It shows migratory behaviour Recently in the Colombian Caribbean waters, it was registered in catches from industrial oceanic longline fishing vessels; the data shows an interaction with juvenile individuals that could probably be impacting development areas for the species	Kohler et al., 1998 Howey-Jordan et al., 2013 Caldas and Correa, 2010	Y	
			Conditions increasing the vulnerability of the species	Y	C. longimanus mainly inhabits the top 20 meters of the water column, which increases its overlap with? Evidence of overfishing and by-catch Species life history contributes to its vulnerability	Rigby et al. 2019	Y	
		Importance of the species to the maintenance of fragile or vulnerable ecosystems and habitats	N	Not discussed in the proposal				
	2	Does the precautionary principle apply (are there clear indications from criteria 1 that the species is threatened or endangered, but the exact population status is not clear)	Y	see criteria 1 and in particular 1b (evidence of decline and			Y	

Reference article from the SPAW Protocol	Reference article from SPAW revised procedure guidelines	Criteria	Criteria details	Info available in the proposal	Information quotes	Literature	Criteria validation (Yes/No)
	3	Only for Annex III: levels and patterns of use and the success of national management programmes	Levels and patterns of use Success of national management programme	Y N/Y	Continued bycatch and use in international trade. Successful management in some areas, but probably not in others. Information missing from the proposal for most SPAW Parties		
	4	Application of the IUCN criteria in a regional (Caribbean) context will be helpful if sufficient data are available	IUCN category for the Caribbean	Y	The IUCN defines the oceanic white tip shark's conservation status as critically endangered and its trend 'decreasing'.	Rigby et al. 2019	Y
21	5	Is the species the subject of local or international trade AND is the international trade regulated under CITES or other instruments ?		Y	The oceanic white tip shark was listed under Appendix II of CITES in 2013. Young et al. (2018) note that <i>C. longimanus</i> is a preferred and highly valuable species in the international shark fin trade in Hong Kong, the largest international fin market (Clarke et al. 2006b). A study from Cardeñosa (2018) suggests that oceanic whitetip sharks remain among the top species in the contemporary fin trade, despite CITES listing.	CITES 2014	Y
21	6	Importance and usefulness of regional and cooperative efforts on the protection and recovery for species	Importance of efforts Efforts mentioned Usefulness of efforts	Y N N	see note dedicated to sharks and rays management Not discussed in proposal		Y
10 – 21	7	Endemism of the species (and importance of regional cooperation for its recovery)		N			
	8	Does the species belong to a higher taxonomic unit entirely (i.e., all lower taxa) listed in a SPAW annex?		N			
11 – 21	10	Importance of the species regarding the maintenance of fragile and vulnerable ecosystems/habitats (as Rhizophora for mangroves ecosystems)		N			
11 (a)	a)	Presence of the species in another annex of the SPAW Protocol		Y	Already listed in Annex III for regulation - continued decline indicates more stringent measures necessary.		Y
11 (4,a) – 19 (	b)	The documentation include information demonstrating the applicability of the appropriate SPAW listing criteria (i.e., the information available is appropriate to validate the proposal)		Y	Enough information to justify regulation, and for uplisting for complete protection The proposal presents enough information to justify that the species meets some of the criteria for uplisting to Annex II.		Y
	***	Does the species benefits from another protection tool (e.g. regional or international regulations, conventions, and management plans)?		Y	Section 2 of the ICCAT Convention Area Article 22 - 4. states that retaining on board, transshipping or landing any part or whole carcass of oceanic whitetip sharks taken in any fishery shall be prohibited. The Sharks MoU listed <i>C. longimanus</i> on its Annex 1 in 2018 and this year (2020) CMS listed <i>C. longimanus</i> on its Appendix I. It was listed on CMS Annex 1 in 2020 In 2018, the United States listed the oceanic white tip shark as a threatened species under the U.S. Endangered Species Act (ESA). The United States is developing a recovery plan for this species and has developed a recovery outline to guide recovery efforts until a recovery plan is developed.	NOAA, 2018	Y



## APPENDIX 6: EVALUATION TABLE FOR THE GIANT MANTA RAY

article from the SPAW	article from SPAW revised procedure	Criteria	Criteria details	Info available in the proposal	Information quotes	Litterature	Criteria validation (Yes/No)	
21	1	The scientific evaluation of the threatened or endangered status of the species is to be based on these factors :	Size of population	Y/N	There are no global estimates of the overall Giant Manta Ray population size, however,the population sizes at known aggregation sites appear to be small (less than 1,000 individuals) with minimum estimates based on photo-identification ranging from 42 to 500 individuals with over almost a decade of monitoring in most locations sampled.	2020 Marshall et.al	Y/N	
			Evidence of decline	Y	Giant Manta Ray displaying a strong decline especially in areas with heavy fishing pressure. Rapid local declines have been noted in sightings records and landings where they are targeted or caught as bycatch; these range from 71 to 95% declines over 13- to 21-year periods (all less than one generation length of 29 years) It is suspected that the Giant Manta Ray has undergone a population reduction of 50–79% over the past three generation lengths (87 years). This decline is directly linked to an increase in fishing pressure Data cited in proposal are old data (from 1981-2009). Also, rapid declines are in the Indo-Pacific and Eastern Pacific, not in the Atlantic/Caribbean. Proposal also cites Pacoureau et al 2021, which focused on sharks and had very little information about manta rays.	Pacoureau et al. 2021 Marshall et.al 2020	Y	
			Restriction on its range of distribution	N				N
			Degree of population fragmentation		Regional populations appear to be small, sparsely distributed, and fragmented. Some data suggests occasional large-scale movements; other data suggest a high degree of fragmentation between regional populations.	Marshall et al 2020	N	
			Biology		Giant manta rays females feed their embryo with lipid-rich histotroph. Due to direct link between the mothers' nutrition and the "uterine milk" and the nourishment of the embryo, health of the mother can impact fetal development	Atcock 1892; Amoroso 1960	N	
			Behavior		Oceanic, migratory and more solitary species			N
			Population dynamics	Y	The Manta Rays have an extremely slow life history. Age at first maturation is estimated at 12 years old and the giant manta ray appears only to have 4 to 7 pups over its entire lifespan. This gives them one of the lowest maximum rates of population increase of all elasmobranchs.			Y/N
			Conditions increasing the vulnerability of the species	Y	manta rays are caught in both targeted fisheries and as bycatch worldwide. manta rays forage in nearshore habitats which puts them at of risk interacting with man-made pollutants and waste and as filter feeders they are one of the few elasmobranch species that can be vulnerable to ingestion of plastic pollution. Also, manta ray tourism can have negative impacts		Lawson et al. (2016)	Y/N
Importance or the species to the maintenance of fragile ecosystems	N					N		
	2	Does the precautionary principle apply (are there clear indications from criteria 1 that the species is threatened or endangered, but the exact population status is not clear)		Y/N	There are no global estimates of the overall Giant Manta Ray population size, however,the population sizes at known aggregation sites appear to be small (less than 1,000 individuals). Giant Manta Ray displaying a strong decline especially in areas with heavy fishing pressure	2020 Marshall et.al	Y/N	

Reference article from the SPAW Protocol	Reference article from SPAW revised procedure guidelines	Criteria	Criteria details	Info available in the proposal	Information quotes	Litterature	Criteria validation (Yes/No)
	3	Only for Annex III: levels and patterns of use and the success of national management programmes	Levels and patterns of use Success of national management programme				
	4	Application of the IUCN criteria in a regional (Caribbean) context will be helpful if sufficient data are available	IUCN category for the Caribbean		The Giant Manta Ray has recently been reassessed for the IUCN Red List in 2019 and based on the most recent information on population decline the giant manta ray is now classed as endangered. More than 30 different sources are used for the assessment of this species as 'endangered' on a global scale: Under bibliography at <a href="https://www.iucnredlist.org/species/198921/214397182">https://www.iucnredlist.org/species/198921/214397182</a> It doesn't seem that only one study was used for this IUCN changed the entire global classification based on a very small location (in South Africa, the KwaZulu-Natal shark control program sets nets off the eastern coast). This is also an old paper, based on data from 1981-2009, and is not recent information.		Y/N
21	5	Is the species the subject of local or international trade AND is the international trade regulated under CITES or other instruments ?		Y	The whole genus Manta spp. was listed on Appendix II of CITES in 2013. This means that all transboundary trade has to be licensed, based on an analysis of the effects of the removal from the wild through a Non-Detriment Finding. For international trade an export permit or re-export is required which is to be issued by the Management Authority of the State of export or re-export. Expanded market for gill rakers since the 1990s.	Croll et al 2016	Y
21	6	Importance and usefulness of regional and cooperative efforts on the protection and recovery for species	Importance of efforts	N			N
			Efforts mentioned		Some SPAW Contracting Parties are also parties to IPOA-Sharks, CMS or ICCAT and others have adopted/created national measures and sanctuaries Since Manta rays are not a target species in the ICCAT area but, ICCAT does recommend good practice measures to reduce unintended bycatch mortality of incidental bycatch of threatened species like manta rays. Many of the international and domestic efforts mentioned in the proposal pertain to sharks and not rays. There is very little information in the proposal about management and protection specifically for giant manta rays.		
			Usefulness of efforts	N	The population declines cited in the proposal are largely in the Indo-Pacific and Eastern Pacific, so it's not clear that efforts in the region would be useful.		N
10 – 21	7	Endemism of the species (and importance of regional cooperation for its recovery)					
	8	Does the species belong to a higher taxonomic unit entirely (i.e., all lower taxa) listed in a SPAW annex?					
11 – 21	10	Importance of the species regarding the maintenance of fragile and vulnerable ecosystems/habitats (as Rhizophora for mangroves ecosystems)					
11 (a)	a)	Presence of the species in another annex of the SPAW Protocol					
11 (4,a) – 19 (3)	b)	The documentation include information demonstrating the applicability of the appropriate SPAW listing criteria (i.e., the information available is appropriate to validate the proposal)			In summary, listing of the Giant Manta Ray under SPAW Annex 2 (II) would be justified based on the criteria 1 (decline of population), 2 (precautionary approach) 4 (IUCN red list status), 5 (CITES and CMS listing) and 6 (the importance of regional cooperation to protect the species). CMS would be important for criterium 6 not 5. And it is a bit confusing that the other Manta Ray species (Reef and Caribbean) are described too, but overall the assessment justifies the listing on Annex II. More than 30 different sources are used for the assessment of this species as 'endangered' on a global scale: Under bibliography at <a href="https://www.iucnredlist.org/species/198921/214397182">https://www.iucnredlist.org/species/198921/214397182</a> It doesn't seem that only one study was used for this. Insufficient information in proposal to support uplisting. Just general mention of declines and IUCN status Some of the information in the proposal about population status and declines is out of date, and there is very little information specific to the region. The primary basis for decline is the IUCN status, which was based on very limited and out of date data. Management measures referenced are often related to sharks and not rays. All of this calls into question the quality and completeness of the proposal, and the proposal does not support listing on Annex II.		Y/N

## APPENDIX 7: EVALUATION TABLE FOR PARROTFISHES

Reference article from the SPAW Protocol	Reference article from SPAW revised criteria guidelines	Criteria	Criteria details	Info available in the proposal	Information quotes	Literature	If relevant Criteria validation (Yes/No)
21	1	The scientific evaluation of the threatened or endangered status of the species is to be based on these factors :	Size of population	Y/N	Based on the information available from NGOs and some local and national governmental biological monitoring, there is a general estimate of the Parrotfish population size for much of the Caribbean Local abundance data are available in some form for many countries in the region; however, there is no current rangewide population estimate by species.	Kramer et al. 2016, 2020 Semmens 2020 McField et al. 2020	Y N
			Evidence of decline	Y/N	The biomass data presented herein do show declines in parrotfish biomass in various regions throughout the Caribbean. Data supports declines in overall parrotfish biomass in some areas, but stable or increasing trends in other areas. Species-specific trends are generally not available.	Jackson et al. 2014	Y N
			Restriction on its range of distribution	N Y	There is no evidence of range restriction of parrotfishes in the Wider Caribbean region with the exception of two species that have only been reported in the southern Caribbean/Brazil Proposal notes that historical range is similar to current range.	N/A	N
			Degree of population fragmentation	Y	There is no evidence of population fragmentation of parrotfishes in the Wider Caribbean region	N/A	N
			Biology and behavior	Y	There is a wide breadth of literature that illustrates the biology and ecology of parrotfishes Much is known about their roles on coral reefs. The behavior of parrotfishes, as it relates to their ecological roles and interaction with each other is relatively well known.	Adam et al. 2015 Bonaldo et al. 2014 Burkepile & Hay 2008 Mumby & Motta 2000	Y
			Other population dynamics		Much is known about their social structure, sex change and impact of fishing on these aspects	Pavlowich et al. 2018 O'Farrell et al. 2016	Y
			Conditions increasing the vulnerability of the species	Y	There is strong evidence to suggest that overfishing, habitat degradation, invasive species and poor quality are impacting parrotfishes	Jackson et al. 2014 Hawkins & Roberts 2003	Y
			Importance of the species to the maintenance of fragile or vulnerable ecosystems and habitats	Y	Strong scientific supports the roles of parrotfishes as algal grazers, assisting in coral recruitment, bioerosion, and sediment transport. These processes are critical to maintaining healthy coral reefs	Adam et al. 2015 Bonaldo et al. 2014 Burkepile & Hay 2008	Y
	2	Does the precautionary principle apply (are there clear indications from criteria 1 that the species is threatened or endangered, but the exact population status is not clear)	N/A Y	N/A One of the major drivers of coral reef decline in the Caribbean is the overfishing of herbivores, particularly parrotfish. <i>Sparisoma viride</i> is now thought to be the only parrotfish that significantly contributes to this process. Bioerosion rates have already declined with reductions in this species. While parrotfish were not historically a preferred fin-fishery species, with the loss of large predatory fish species, fishers began targeting other fish including parrotfishes. Parrotfishes, particularly large ones, are vulnerable to all types of fishing gear especially traps and spearfishing. Continued declines in parrotfish abundance have been documented in several locations, especially on unprotected reefs, and large-bodied parrotfish have disappeared from many reefs. Most parrotfishes throughout the Caribbean are small in size, often smaller than sufficient reproductive size or effective algal grazing sizes Thirty-seven Caribbean countries recently reported that they harvest parrotfishes by trap fishing and spearfishing with catch intention for personal consumption and commercial use. Ten species of parrotfishes were either targeted directly by these fishing methods or caught incidentally as bycatch from other fisheries. However, 27 of the 37 countries reviewed also reported that they either do not record landing data, do not record it to the species taxonomic level and/or have a harvesting ban with no previous record of parrotfishes prior to the ban.	N/A Jackson et al. 2014 Bonaldo et al., 2014 Hawkins et al., 2007 Mumby et al., 2012, Jackson et al., 2014, see Country status summaries Valles, 2014 Shantz et al. 2020 McField et al., 2020 Dahlgren et al., 2020 Harms-Tuohy, 2020	Y	

Reference article from the SPAW Protocol	Reference article from SPAW revised criteria guidelines	Criteria	Criteria details	Info available in the proposal	Information quotes	Litterature	If relevant Criteria validation (Yes/No)
	3	Only for Annex III: levels and patterns of use and the success of national management programmes	levels and patterns of use	see criterion 6 Y	N/A Parrotfish density often found to be higher in areas protected from fishing. In countries where fishing restrictions were put in place, abundance often increased, but typically after a delay.	Steneck et al. 2018, McField et al. 2020	Y
			success of national management programme	Y	Some management programs seem to have led to increases in parrotfish biomass, while others show evidence of poor compliance and enforcement.		Y
	4	Application of the IUCN criteria in a regional (Caribbean) context will be helpful if sufficient data are available	IUCN category for the Caribbean	Y	Varies by parrotfish species, but some such as <i>S. guacamaia</i> is are listed as Near Threatened All other parrotfish species are categorized as Least Concern or Data Deficient.	IUCN	Y N
21	5	Is the species the subject of local or international trade AND is the international trade regulated under CITES or other instruments ?		N	N/A	N/A	
21	6	Importance and usefulness of regional and cooperative efforts on the protection and recovery for species	Importance of efforts	Y	Subregional collaboration has been successful at managing parrotfishes in the Mesoamerican coral reef system.	AIDA 2019	Y
			Efforts mentioned	Y	NGO efforts to promote governmental protection of parrotfishes along the continuous Mesoamerican coral reef system	AIDA 2019	Y
			Usefulness of efforts	Y	Successfully campaigned to spread outreach regarding regulations and promoted importance of establishing regulations with the governments	AIDA 2019	Y
10 – 21	7	Endemism of the species (and importance of regional cooperation for its recovery)		Y	Two parrotfish species listed are only reported in the southern Caribbean/Brazil Proposal is to list all parrotfish species, so endemism of two particular species is not relevant to the proposal.	Robertson & Van Tassell 2018	Y N
	8	Does the species belong to a higher taxonomic unit entirely (i.e., all lower taxa) listed in a SPAW annex?		Y	Very relevant for inclusion of all parrotfishes ( <i>Perciformes: Scaridae</i> ) in Annex III. Justify by the fact the he lower taxa are similarly justified in being listed, and also for the ecological functionality as a group.		Y
11 – 21	10	Importance of the species regarding the maintenance of fragile and vulnerable ecosystems/habitats (as Rhizophora for mangroves ecosystems)		Y	Parrotfishes are diverse and perform an array of ecological roles that are vital for maintaining healthy coral reef ecosystems. Coral reefs have been shown to withstand abiotic influences and resist algal dominance on reefs with intact and diverse parrotfish populations (i.e. Bonaire).	Adam et al. 2015 Bonaldo et al. 2014 Burkepile & Hay 2008	Y
11 (a)	a)	Presence of the species in another annex of the SPAW Protocol					
11 (4,a) – 1 b)		The documentation include information demonstrating the applicability of the appropriate SPAW listing criteria (i.e., the information available is appropriate to validate the proposal)		Y	There is strong supporting evidence to list all parrotfishes under Annex III Information on historical abundance and current population trends is limited, and is insufficient to support Annex III listing based on population size, evidence of decline, or risk of extinction. However, there is evidence to suggest that healthy and diverse parrotfish populations are important to the survival and resilience of fragile coral reef ecosystems, and that strategic management of parrotfish fisheries can be effective in restoring the ecological role of herbivores in Caribbean reefs. Thus, the proposal to list parrotfish in Annex III may be warranted based on SPAW listing criteria 3, 6, and 10. Criterion 2 can also be added.	see Conclusions	Y
	***	Does the species benefits from another protection tool (e.g. regional or international regulations, conventions, and management plans)?		Y	There are some SPAW Parties that have already adopted complete harvesting bans on parrotfishes, or have certain regulations in place to protect the group in some way	Harms-Tuohy 2020	Y

## APPENDIX 8: EVALUATION TABLE FOR LESSER ANTILLEAN IGUANA

Reference article from the SPAW Protocol	Reference article from SPAW revised procedure guidelines	Criteria	Criteria details	Info available in the proposal	Information quotes	Literature	Criteria validation (Yes/No)
21	1	The scientific evaluation of the threatened or endangered status of the species is to be based on these factors :	Size of population	Y	On many islands the species has already become (genetically) extinct. Data on historic population. The total number of Lesser Antillean iguanas across the region is estimated between 13,000 and 20,000 individuals The species historically occurred on all 12 main-islands between Anguilla and Martinique (including most islets), except for Saba and Montserrat (see Annex 1). Currently, Lesser Antillean iguanas can be found on only six main islands. However each of these islands has already been invaded by <i>Iguana iguana</i> and the native population is slowly decreasing due to hybridization. This process of introgression has not been mitigated on any island despite several past and ongoing efforts. Populations not directly threatened by on-island hybridization occur only on five smaller islets, none of which is larger than 2 km <sup>2</sup> . Overall, the species has seen a distribution decrease of >80%. The vulnerability of this species and the necessity of protecting these remaining populations is therefore critical. Critically, the majority (10,000-15,000) of these iguanas occur on a single island (Commonwealth of Dominica), which has recently been invaded by <i>I. iguana</i> , which has already resulted in high occurrence of hybridization with the native <i>I. delicatissima</i> population (van den Burg et al., 2020). Only two of the five islands without the presence of invasive <i>I. iguana</i> support a population of <i>I. delicatissima</i> larger than 200 individuals.	Angin, 2017, van den Burg et al., 2018	Y
			Evidence of decline	Y	The species historically occurred on all 12 main-islands between Anguilla and Martinique (including most islets), except for Saba and Montserrat. Currently, Lesser Antillean iguanas can be found on only six main islands. However each of these islands has already been invaded by <i>Iguana iguana</i> . The total population has experienced declines of $\geq 75\%$ . The Lesser Antillean Iguana is considered among the most threatened, and rapidly declining, reptiles Although extirpation from some islands occurred in the early to mid-20th century, the remaining population has continued to decline within the last three generations (33–42 years) (Van den Burg et al., 2018a). Importantly, van den Burg et al. (2018a) estimated that by 2050 only 1% of the current area of occupancy will remain if the spread of <i>Iguana iguana</i> to other islands and within occupied-islands is not immediately halted. On many islands the species has already become (genetically) extinct. Data on historic population numbers of pure <i>I. delicatissima</i> are limited, but the area of their occurrence (via human records and fossil evidence) is well known. On Guadeloupe (> 1500 km <sup>2</sup> ), pure <i>I. delicatissima</i> populations occurred throughout the island until the 1950s when non-native iguanas arrived. Currently, no native populations are believed to be absent of hybridization, and pure <i>I. delicatissima</i> are restricted to only a 10 km <sup>2</sup> area (Angin, 2017). Equally, on Martinique, Common Green Iguanans have already replaced <i>I. delicatissima</i> throughout the island except for the northern region (Angin, 2017), and it will be extremely difficult to prevent further encroachment. On St. Eustatius, an island only recently invaded by non-native iguanas, the population has suffered from agriculture habitat destruction (Reichling, 2000; Fogarty et al., 2004). The population was recorded to be in significant decline and fragmented across the island in 2000-2004 and the current population has further declined to only a few hundred iguanas (Reichling, 2000; Fogarty et al., 2004; van den Burg et al., 2018c; Debrot et al., 2021).	Van den Burg et al., 2019 Van den Burg et al., 2018a, Angin 2017, Reichling 2000, Fogarty et al. 2004, Van den Burg et al. 2018c, Debrot et al. 2021	Y
			Restriction on its range of distribution	Y	by 2050 only 1% of the current area of occupancy will remain if the spread of <i>Iguana iguana</i> to other islands and within occupied-islands is not immediately halted. The majority of the population occurs on a single small island. The species occurs below 1000 meters above sea level; hence it is absent from several mountainous areas within its range (Knapp and Perez-Heydrich, 2012; Knapp et al. 2014). Both hatchlings and juveniles live predominantly among bushes and low trees, usually in thick vegetation offering protection, basking sites, and a wide range of food. With age they climb higher and inhabit larger trees (Van den Burg et al., 2018a).	Van den Burg et al., 2018 Knapp and Perez-Heydrich 2012, Knapp et al. 2014, Van den Burg et al. 2018a	Y
			Degree of population fragmentation	Y	The population was recorded to be in significant decline and fragmented across the island in 2000-2004 The historical degree of fragmentation is high given its restriction to islands. However, there is an increase in intra-island population fragmentation because many islands have been invaded by the Common Green Iguana and/or the Indian mongoose causing local extirpations.	Reichling, 2000; Fogarty et al., 2004; van den Burg et al., 2018c; Debrot et al., 2021	Y
			Biology	Y/N	The Lesser Antillean Iguana is a herbivorous, mainly arboreal, lizard that is endemic to the Caribbean Lesser Antilles, where it is an ecological keystone species. The species can grow to a maximum of 44 cm snout-vent length, and maximum total length of 150 cm. The main two characteristics that distinguish it from its sister species <i>Iguana iguana</i> , are the absence of black stripes on the tail and the absence of a large subtympic scale on the lower jaw. Sexual maturity is reached in the 2nd or 3rd year, mainly for female iguanas, given male iguanas need to compete for territory and dominance in order to mate (van den Burg et al., 2018a). Eggs are laid in nests dug by the adult female, from which hatchlings emerge after an incubation period of three months (Day et al., 2000). Clutch sizes (4-30 eggs) are generally lower than its sister species, dependent on female body size (Knapp et al., 2016). The reproduction cycle slightly differs between islands in northern and southern Lesser Antilles (van den Burg et al., 2018a). The iguana is a herbivorous generalist and eats leaves, flowers and fruits from a wide variety of native plants (Angin and Quessel in prep.). Similar to other iguana species, the iguana plays an important ecosystem service by consuming fruits, dispersing seeds, and cropping forest canopy foliage. Through nestbuilding it aids in ground and nutritional turnover, and is an important food source for other Lesser Antillean species such as birds of prey and snakes (Knapp et al., 2009; Knapp et al., 2016).	Van den Burg et al. 2018a, Day et al. 2000, Knapp et al. 2016, Angin and Quessel in prep, Knapp et al. 2009	
			Behavior	Y/N	The iguana eats leaves, flowers and fruits from a wide variety of native plants (Angin and Quessel in prep.). Similar to other iguana species, the iguana plays an important ecosystem service by consuming fruits, dispersing seeds, and cropping forest canopy foliage. Eggs are laid in nests dug by the adult female. The egg-laying sites are areas with little or no vegetation on a loose substrate (sand, earth, etc.), often located on a slight slope in areas well exposed to the sun (Breuil, 2002). The females will dig a burrow about one metre long and a few dozen centimetres below the surface (Breuil, 2002). In areas where the ground is harder and composed of stones (e.g. Îlet Chancel, Martinique), the burrows will be smaller (Breuil, 2002; Knapp et al. 2014). Through nestbuilding it aids in ground and nutritional turnover. Studies on the territory of this species have shown the importance of ecological corridors between habitats to ensure good conservation of populations. Indeed, for reproduction, the females will migrate towards the egg-laying sites which can be separated from other territories by several kilometres. Roads mainly form a threat to migrating adult female iguanas (Curot-Lodeon, 2016; Knapp et al., 2016), though to any individual as well including recently emerged hatchlings (Debrot and Boman, 2014; Knapp et al., 2014; van den Burg et al., 2018b). This has been mainly studied on the Commonwealth of Dominica where female adult mortality rises during the nesting season when females migrate from their home range to the coast to nest (Knapp et al., 2016).	Angin and Quessel, in prep, Breuil 2002, Knapp et al. 2014, Curot-Lodeon 2016, Knapp et al. 2016, Debrot and Boman 2014, Van den Burg et al. 2018b	

Reference article from the SPAW Protocol	Reference article from SPAW revised procedure guidelines	Criteria	Criteria details	Info available in the proposal	Information quotes	Literature	Criteria validation (Yes/No)
21	1	The scientific evaluation of the threatened or endangered status of the species is to be based on these factors :	Population dynamics	Y	The main threat to <i>I. delicatissima</i> is the spread of non-native iguanas within its native range. Common Green Iguanas are much more vigorous reproductively compared to native Lesser Antillean Iguanas, and hybridization and displacement is rapid post-introduction . The majority of the global population occur on a single island smaller than 2km <sup>2</sup> , and thus extremely vulnerable to stochastic events such as disease and the increasing number of catastrophic hurricanes in the region.	eg. Van den Burg et al., 2018 ; Van den Burg et al., 2018a	Y
			Conditions increasing the vulnerability of the species	Y	The main threat to <i>I. delicatissima</i> is the spread of non-native iguanas within its native range. Although most habitat was previously destroyed for agricultural purposes, coastal development currently is the main threat to remaining habitat and communal nesting sites in the Lesser Antilles. Although forbidden by local legislation and believed to becoming less popular, <i>I. delicatissima</i> is still hunted and consumed on several islands across the Lesser Antilles. In addition to range contraction, extirpation, population declines, etc. cited above, each of these islands has already been invaded by <i>Iguana iguana</i> and the native population is slowly decreasing due to hybridization. This process of introgression has not been mitigated on any island despite several past and ongoing efforts. Only two of the five islands without the presence of invasive <i>I. iguana</i> support a population of <i>I. delicatissima</i> larger than 200 individuals. Common Green Iguanas are much more vigorous reproductively compared to native Lesser Antillean Iguanas, and hybridization and displacement is rapid post-introduction (Van den Burg et al., 2018a). Current biosecurity measures are insufficient to prevent both the intentional and unintentional transport of these iguanas among islands (Knapp, 2007; Knapp et al., 2014, 2020; van den Burg et al., 2018c; van den Burg et al., 2020), and incursions to recently uninhabited islands still occur: St. Eustatius in 2016+2017 (van den Burg et al., 2018c), La Desirade in 2017 (B. Angin, personal communication), Commonwealth of Dominica in 2017 (van den Burg et al., 2020).The invasive alien small Indian mongoose, <i>Urva auro-punctata</i> , is known to depredate young iguanas and eggs causing population extirpations on several islands; e.g., St. Kitts and Nevis (van den Burg et al., 2018a). Its remaining presence on Lesser Antillean islands also prevents reintroduction programs of <i>I. delicatissima</i> to increase the number of its populations. Reintroduction programs will be most feasible on islands without a non-native iguana or a small Indian mongoose population, which are limited to few very small islands.	Knapp et al., 2014; van den Burg et al., 2018, Van den Burg et al., 2018 ; reuil, 2002; Debrot and Boman, 2014 Van den Burg et al. 2018a, Knapp 2007, Knapp et al. 2014, 2020, Van den Burg et al 2018c, 2020, B. Angin, personal communication	Y
			Importance of the species to the maintenance of fragile or vulnerable ecosystems and habitats	Y	It is an ecological keystone species. It performs important ecosystem services by consuming fruits, dispersing seeds, and cropping forest canopy foliage. Through nestbuilding it aids in ground and nutritional turnover, and is an important food source for other Lesser Antillean species such as birds of prey and snakes. Similar to other iguanine species (Burgos-Rodríguez et al., 2016; de A. Moura et al., 2016), through the process of seed ingestion <i>Iguana delicatissima</i> is a disperser of native plants, which has been demonstrated in other iguanas to promote both seed survival and germination rates.	Knapp et al., 2009; Knapp et al., 2016 Burgos-Rodriguez et al. 2016, de A. Moura et al. 2016	Y
	2	Does the precautionary principle apply	(are there clear	N	The precautionary principle does not apply in this case, as the population status of the species is known.		N
	3	Only for Annex III: levels and patterns of use and the success of national management programmes	Levels and patterns of use				
			Success of national management programme				
	4	Application of the IUCN criteria in a regional (Caribbean) context will be helpful if sufficient data are available	IUCN category for the Caribbean	Y	IUCN global status is critically endangered. The species is endemic to the Caribbean Lesser Antilles	IUCN	Y
21	5	Is the species the subject of local or international trade AND is the international trade regulated under CITES or other instruments ?		Y, but information in proposal is minimal	CITES Appendix II as <i>Iguana</i> spp. Appendix-II specimens require: an export permit or re-export certificate issued by the Management Authority of the State of export or re-export is required; and an export permit may be issued only if the specimen was legally obtained and if the export will not be detrimental to the survival of the species. There is a growing interest from illegal commercial trade in this species. Information in the proposal is minimal, and data in the CITES Trade Database mostly pertains to captive-bred specimens. The proposal could benefit from more information on international trade, especially of wild-sourced specimens.		Y

Reference article from the SPAW Protocol	Reference article from SPAW revised procedure guidelines	Criteria	Criteria details	Info available in the proposal	Information quotes	Literature	Criteria validation (Yes/No)
21	6	Importance and usefulness of regional and cooperative efforts on the protection and recovery for species	Importance of efforts	Y	<p>Regional cooperation will be essential for the survival of the species because hybridization and predation by non-native species is a significant cause of decline and these factors often originate off islands. Moreover, due to the small sizes of the remaining populations, recovery plans for islands with small existing or recently extirpated populations will need to augment genetic diversity from other sources and improve biosecurity collaboration will be needed. An example is given where a dozen iguanas were translocated from the Commonwealth of Dominica to an off shore islet of Anguilla (Prickly Pearl East; to strengthen the very small (n = 14) and recently established population of pure <i>I. delicatissima</i> that were removed from the main island of Anguilla, where non-native iguanas are displacing the native population. The need for cooperative protection of species with transboundary ranges is evident. Cooperative policies for <i>I. delicatissima</i> are crucial because the species resides in islands in four countries, including several jurisdictional regions within the French territories. Assistance may also be needed to control illegal trade.</p> <p>Regional cooperation for recovery programs will be essential given the island-distribution of the species not only to boost population sizes but also to prevent genetic inbreeding in small populations either given recent or previous bottlenecks (such as found in the population of St. Eustatius; van den Burg et al., 2018c). Regional cooperation will be essential for the survival of the species because hybridization and predation by non-native species is a significant cause of decline and these factors often originate off islands. Moreover, due to the small sizes of the remaining populations, recovery plans for islands with existing and extirpated populations (reintroductions) will need to consider augmenting genetic diversity from other sources and improve biosecurity collaboration to halt any novel incursions. The need for cooperative protection of species with transboundary ranges are evident. Cooperative policies for <i>I. delicatissima</i> are crucial because of the species resides in four countries, including multiple jurisdictional regions within the French territories.</p>	Pounder et al. (2021)	Y
			Efforts mentioned	Y	There are currently three action plans dedicated to the protection of <i>Iguana delicatissima</i> in the Wider Caribbean region. Additionally, the species has an ongoing captive breeding program as part of a European Association of Zoos and Aquaria (EAZA) studbook (ESB; European studbook), which is currently in the process of being changed to an EAZA Ex-situ Programme (EEP). Several ongoing efforts are in place to try and halt the spread of non-native iguanas on some islands; St. Eustatius (since 2017; Debrot et al., 2021), La Desirade (since 2018), Martinique (since 2019; Angin, 2017), and Dominica (since 2018; van den Burg et al., 2020).	Debrot et al. 2021, Angin 2017, van den Burg et al. 2020	Y
			Usefulness of efforts	Y	Reintroduction programs will be most feasible on islands without a non-native iguana or a small Indian mongoose population, which are limited to few very small islands.		Y
10 – 21	7	Endemism of the species (and importance of regional cooperation for its recovery)		Y	The species historically occurred on all 12 main-islands between Anguilla and Martinique (including most islets), except for Saba and Montserrat (see Annex 1). Currently, Lesser Antillean iguanas can be found on only six main islands. Regional cooperation for recovery programs will be essential given the island-distribution of the species not only to boost population sizes but also to prevent genetic inbreeding in small populations either given recent or previous bottlenecks (such as found in the population of St. Eustatius; van den Burg et al., 2018c). Regional cooperation will be essential for the survival of the species. Due to the small sizes of the remaining populations, recovery plans for islands with existing and extirpated populations (reintroductions) will need to consider augmenting genetic diversity from other sources and improve biosecurity collaboration to halt any novel incursions.		Y
	8	Does the species belong to a higher taxonomic unit entirely (i.e., all lower taxa) listed in a SPAW annex?		Y	<i>Iguana delicatissima</i> is currently listed in Annex III.		
11 – 21	10	Importance of the species regarding the maintenance of fragile and vulnerable ecosystems/habitats (as <i>Rhizophora</i> for mangroves ecosystems)		Y N	Similar to other iguanine species, through the process of seed ingestion <i>Iguana delicatissima</i> is a disperser of native plants, which has been demonstrated in other iguanas to promote both seed survival and germination rates. See also 21(6) above. Proposal does not address the importance of <i>Iguana delicatissima</i> to maintaining particularly fragile/vulnerable ecosystems.	Burgos-Rodríguez et al., 2016; de A. Moura et al., 2016	Y N
11 (a)	a)	Presence of the species in another annex of the SPAW Protocol		Y	Species already listed in annex III		Y
11 (4,a) – 19 (3b)		The documentation include information demonstrating the applicability of the appropriate SPAW listing criteria (i.e., the information available is appropriate to validate the proposal)		Y	More information on illegal trade, as well as species biology and behavior would strengthen the proposal. Overall, the Lesser Antillean Iguana is considered among the most threatened, and rapidly declining, reptiles (van den Burg et al. 2018a). <i>Iguana delicatissima</i> qualifies for uplisting from Annex III to Annex II on the basis of the following criteria as set out in the Revised criteria for the listing of species in the Annexes of the SPAW Protocol: Criterion 1; The species has undergone extreme declines throughout its entire range, with numerous extirpated island populations. The remaining island populations are fragmented, and half are becoming extirpated through hybridization, which is a considerable mitigation challenge. The remaining populations, except for one, reside on islands smaller than 2km <sup>2</sup> , and thus extremely vulnerable to stochastic events such as disease and the increasing number of catastrophic hurricanes in the region. Coastal development and spread of invasive species further threaten these remaining populations. Criterion 4; IUCN Iguana Specialist Group experts have assessed this species as Critically Endangered. Criterion 5; There is a growing interest from the commercial trade in this species through illegal obtainment, despite the species being listed on CITES Appendix II as <i>Iguana</i> spp. Criterion 6; with only few, small remaining populations that occur in different countries and different jurisdictional regions, regional cooperation is essential for the long-term protection and recovery of <i>I. delicatissima</i> . Beyond coordinated direct actions and studies towards the species itself, cooperation on biosecurity issues are extremely important given the proliferation of incursion pathways of <i>Iguana iguana</i> ; the biggest threat to <i>I. delicatissima</i> through hybridization. As the few remaining populations are mostly small in size and occur in four different nations (including several internal jurisdictional regions), cooperation is essential for the long-term survival of this species such as coordinated biosecurity policies and management of genetic diversity for interisland translocation programs. Criterion 9; ongoing dramatic declines are at a range-wide scale.		Y