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WESTERN CENTRAL ATLANTIC FISHERY COMMISSION (WECAFC)

Project GCP/SLC/223/EC – *Improving ecosystem approach to fisheries by advancing fish spawning aggregation information gathering and increase of public engagement in the WECAFC region*

Report of the sixth meeting of the WECAFC Working Group on Spawning Aggregations

June 2024

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Food and Agriculture Organization of the United Nations

WESTERN CENTRAL ATLANTIC FISHERY COMMISSION

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SIXTH MEETING OF THE WECAFC WORKING GROUP ON SPAWNING AGGREGATIONS

Puerto Rico, United States of America, 6–7 June 2024

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Preparation of this document

This is the report of the sixth meeting of the Western Central Atlantic Fishery Commission (WECAFC) Working Group on Spawning Aggregations. It was held in hybrid format from 6 to 7 June 2024, Puerto Rico, United States of America.

This meeting was organized by the Caribbean Fishery Management Council (CFMC) and participants included representatives of the WECAFC Secretariat, government officials, researchers and stakeholders from WECAFC member countries, and WECAFC partner organizations including, but not limited to, the Caribbean Regional Fisheries Mechanism (CRFM) and The Regional Activity Centre for the Protocol Concerning Specially Protected Areas and Wildlife for the wider Caribbean region (SPAW-RAC).

This report provides a record of the meeting's proceedings as well as the updated workplan and recommendation of the WECAFC Working Group on Spawning Aggregations.

Abstract

This is the report of the sixth meeting of the Western Central Atlantic Fishery Commission (WECAFC) Working Group on Spawning Aggregations (SAWG). It was held in hybrid format from 6 to 7 June 2024 in Puerto Rico, United States of America. This meeting was organized by the Caribbean Fishery Management Council (CFMC) and participants included representatives of the WECAFC Secretariat, government officials, researchers and stakeholders from WECAFC member countries, and WECAFC partner organizations including, but not limited to, the Caribbean Regional Fisheries Mechanism (CRFM) and The Regional Activity Centre for the Protocol Concerning Specially Protected Areas and Wildlife for the wider Caribbean Region (SPAW-RAC).

The fifth meeting of the SAWG in March 2023 introduced the Regional Fish Spawning Aggregation Management Plan (RFSAMP) and the Big Fish Public Engagement Campaign, which had recently been endorsed at the 18th session of WECAFC in 2022. As a result of the proceedings, the 2022–2025 workplan of the SAWG and the recommendation WECAFC/XVIII/2022/04 was updated to reflect the intention of the working group to promote region-wide mainstreaming and implementation of the RFSAMP. The fifth meeting also presented a forthcoming European Union-funded project which would pilot the RFSAMP in Belize, the Bahamas and Cuba.

The objectives of the sixth meeting closely followed the subject matter of the fifth meeting, with focus on the status of implementation and mainstreaming of the RFSAMP across the WECAFC region. Updates were provided on findings from the European Union-funded pilot project, now a year into its implementation, and the progress of the Big Fish Public Engagement Campaign, which had successfully launched an integrated Digital Hub, Resource Library and multimedia campaign. Lessons learned from the European Union-funded project would be used to update WECAFC's Data Collection Reference Framework, a living document which enshrines standards for submission of fisheries data and statistics to WECAFC.

CRFM and SPAW-RAC provided updates on their efforts to mainstream the RFSAMP to their member countries via projects, policies and recommendations, including the 2023 Resolution on CRFM Collaboration with WECAFC working groups and the recommendations to the SPAW Scientific and Technical Advisory Committee in 2022. WECAFC member countries provided updates on the status of fish spawning aggregations and their management, spanning new research, regulatory measures, opportunities, and challenges. Guest speakers presented on recent research on spawning aggregations in Honduras and the phenomenon of 'institutional amnesia' in the fisheries management space.

Plenary sessions were held to discuss:

- the feasibility of non-extractive uses of FSAs (including alternative livelihoods);
- opportunities to mainstream the short-medium term objectives of the endorsed FSAMP; and
- updates to the 2022–2025 workplan, including the addition of new activities.

No further edits were made to the recommendation WECAFC/XVIII/2022/04.

Contents

Acknowledgements vii
Abbreviations viii
Day 1 – Commencement of the meeting 1
Election of chairperson and rapporteurs 1
Adoption of the agenda 1
Meeting objectives and expected outcomes 1
Update on Spawning Aggregations status and management in Caribbean Regional Fisheries Mechanism (CRFM) member countries – Maren Headley 2
Fish Spawning Aggregations in Honduras – Antonella Rivera (Coral Reef Alliance) 3
Spawning aggregations status update from WECAFC member countries 5
United States of America, United States Caribbean and Puerto Rico 5
Dominica 8
Brazil, Colombia, Cuba, Mexico 9
Informal technical meeting at 76th Gulf and Caribbean Fisheries Institute– Martha Prada 9
Update on "Big Fish" regional public engagement campaign – Ana Salceda 10
Feasibility of non-extractive uses of FSAs – Martha Prada 12
Institutional amnesia pushes fish spawning aggregations towards extirpation – Stuart Fulton 14
Day 2: Commencement of the meeting and housekeeping 16
Updates on protection of Nassau grouper and parrotfish by CAR-SPAW-RAC – Géraldine Conruyt 16
Overview: Regional Fish Spawning Aggregation Management Plan Pilot Project – Myles Phillips 16
Findings from RFSAMP pilot countries: Belize Country Report – Myles Phillips 18
Key strengths 20
Key Weaknesses 21
Key opportunities 21
Key threats 21
The need for standardized protocols and references for Fish Spawning Aggregation monitoring and evaluation - Nancie Cummings 21
Data Collection Reference Framework (DCRF) - Nancie Cummings 23
Western Central Atlantic Fisheries Information System (WECAFIS) - Marc Taconet 25
Findings from RFSAMP pilot countries: Bahamas Country Report – Krista Sherman 26
Findings from RFSAMP Pilot Countries: Cuba – Myles Phillips 28
Advancing opportunities to mainstream short-medium term objectives of the endorsed RFSAMP – Martha Prada, Yvonne Sadovy 30
Review of Spawning Aggregations working group workplan 2023–2025 31

Completed activities: 31
Updated activities: 31
New Activities: 33
Review of recommendation WECAFC/XVIII/2022/4 - WECAFC Working Group on Spawning Aggregations 34
Wrap-up summary and next steps – WECAFC Secretariat 34
Appendix A. Amendment to Recommendation WECAFC/XVIII/2022/4 35
Cover Note 35
Preamble 35
Action Items 36
Appendix B. Updated WECAFC Spawning Aggregation Working Group Workplan 2023–2025 38
Appendix C. Meeting Agenda 44
Appendix D. List of participants 47

Acknowledgements

This document was prepared by Mr Myles Phillips, Convener of the WECAFC (Western Central Atlantic Fishery Commission) Spawning Aggregations Working Group, with assistance from Ms Laura Cimo of National Oceanic and Atmospheric Administration and Ms Yvette Diei Ouadi, from the Secretariat of the WECAFC of the Food and Agriculture Organization of the United Nations (FAO/WECAFC). Special thanks are extended to the Caribbean Fishery Management Council for their efforts in coordination of the meeting.

Abbreviations

BE	blue economy
CAF	Census of Agriculture and Fisheries
CFMC	Caribbean Fishery Management Council
CIP	Centre for Fisheries Research (Cuba)
CLME	Caribbean and North Brazil Shelf Large Marine Ecosystems
CPUE	catch per unit effort
COBI	*Comunidad y Biodiversidad*
CRFM	Caribbean Regional Fisheries Mechanism
CWP	Coordinating Working Party on Fishery Statistics
DCRF	Data Collection Reference Framework
EU DG MARE	European Union's Directorate General for Maritime Affairs
FAO	Food and Agriculture Organization of the United Nations
FDS-WG	Fisheries Data and Statistics Working Group
FIRMS	Fisheries and Resources Monitoring System
FSA	Fish Spawning Aggregation
GCF	Green Climate Fund
GCFI	Gulf and Caribbean Fisheries Institute
GEF	The Global Environment Facility
ICCAT	International Commission for the Conservation of Atlantic Tunas
IUCN	International Union for Conservation of Nature
IUU fishing	illegal, unreported and unregulated fishing
MINAL	Ministry of the Food Industry (Cuba)
MPA	marine protected area
NFISI	Information and Knowledge Management Team (FAO)
NGO	Non-governmental organization
NOAA	National Oceanic and Atmospheric Administration
OSPESCA	Central American Organization of the Fisheries and Aquaculture Sector
RAC	Regional Activity Centre
RFSAMP	Regional Fish Spawning Aggregation Management Plan
RH	Standard for Reference Harmonization

SAG	Scientific Advisory Group
SAWG	Spawning Aggregation Working Group
SPAW	Specially Protected Areas and Wildlife Protocol (Cartagena Convention)
STAC	Scientific and Technical Advisory Committee
SWOT	strengths, weaknesses, opportunities and threats
TOR	terms of reference
UNCTAD	United Nations Conference on Trade and Development
USAID	United States Agency for International Development
USVI	United States Virgin Islands
WECAFC	Western Central Atlantic Fishery Commission
WECAFIS	Western Central Atlantic Fisheries Information System

Day 1 – Commencement of the meeting

1. Mr Myles Phillips Convener of the Spawning Aggregation Working Group welcomed the participants to the meeting and indicated that this meeting would consist mostly of updates from countries and organizations across the region.

2. Ms Yvette Diei Ouadi, Secretary of the Western Central Atlantic Fishery Commission (WECAFC), also gave opening comments, noting that the last meeting of the SAWG was in 2023. This meeting came on the heels of the successful conclusion of the first meeting of the Flyingfish/Dolphinfish working group, and she expressed sincere wishes for similarly productive proceedings at SAWG-VI. This meeting was considered timely, as it occurred two years after the endorsement of the Regional Fish Spawning Aggregation Management Plan (RFSAMP) in 2022 and served as an excellent opportunity to review the progress which had been made. She notified the assembly of the commencement of a project funded by the European Union's Directorate General for Maritime Affairs (DG MARE), meant to pilot the implementation of the RFSAMP in three pilot countries. This project was highlighted as a significant achievement during the intersessional period and was the first project to create collaborative linkages between the Spawning Aggregations Working Group and the Fisheries Data and Statistics working groups. This aspect of the project represented an initiative of WECAFC to promote multidisciplinary collaborative approaches involving multiple, expert working groups to enhance adoption and implementation in member countries. In closing, Ms DieiOuadi indicated that she had high expectations for constructive reflection and deliberation on the workplan and intersessional activities prior to the 20th session of WECAFC, scheduled to occur later in 2024.

Election of chairperson and rapporteurs

3. Mr Phillips was appointed to chair the meeting. The United States of America delegation offered to rapporteur.

Adoption of the agenda

4. The agenda was adopted without changes.

Meeting objectives and expected outcomes

5. The objectives of the sixth meeting of SAWG included:
    a. To discuss the status of implementation and efforts to mainstream the RFSAMP and propose recommendations as needed to advance progress.
    b. To discuss whether changes are needed to the working group's terms of reference.
    c. To review progress on implementation of the 2023–2025 SAWG workplan (see Appendix 2) and recommend changes and updates as appropriate.
    d. Review the status of implementation of Recommendation WECAFC/XVIII/2022/4 and make recommended changes, as appropriate.
    e. To present and discuss the progress of the ongoing European Union-funded project and propose concepts and funding opportunities for sequel projects.

6. The anticipated outputs of the meeting included:
    a. report on the implementation of the Regional Fish Spawning Aggregation Fishery Management Plan (RFSAMP) including country-specific advancements/adoption;

b. updated SAWG 2023–2025 workplan;
c. roadmap for the implementation and mainstreaming of Recommendation WECAFC/XVIII/2022/4 - Working Group on Spawning Aggregations;
d. a road map for further implementation of the RFSAMP.
e. revision and/or development of any recommendations, as necessary and appropriate; and
f. report of the sixth meeting of the WECAFC Working Group on Spawning Aggregations (SAWG).

Update on Spawning Aggregations status and management in Caribbean Regional Fisheries Mechanism (CRFM) member countries – Maren Headley

7. The presentation highlighted aggregating fish species commonly targeted in CRFM member states and outlined management measures used for their management (Figure 1). CRFM member states face common challenges for mainstreaming FSA (Fish Spawning Aggregation) management, and CRFM is working to address these challenges and to increase the priority and pre-eminence of FSAs in fisheries management. Challenges include:

a. harmonizing a regional seasonal closure for species;
b. monitoring, Control and Surveillance and enforcement of management measures;
c. illegal, unreported and unregulated (IUU) fishing; and
d. improving availability of information and data to assess stocks and fisheries.

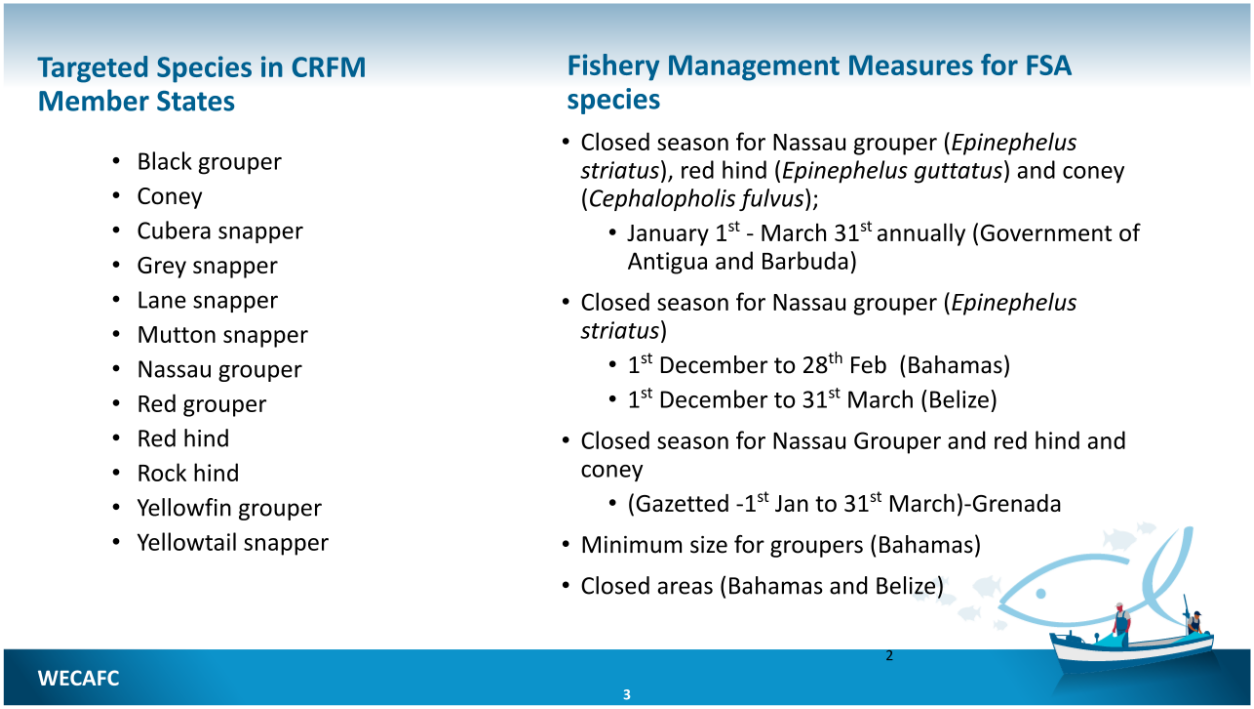

Figure 1. Targeted aggregation-spawning species in CRFM member states, and existing fishery management measures.

8. Regional projects create opportunities for mainstreaming FSA management, including:
    a. CAF/FAO/CRFM/GEF/Caribbean Blue Economy Project BE-CLME+: *"Promoting National Blue Economy Priorities Through Marine Spatial Planning in the Caribbean Large Marine Ecosystem Plus"*. Component 1 of this project involves cross-sectoral marine spatial planning.
    b. GCF (Green Climate Fund) funded Road to Resilience – This fisheries programme seeks to increase the resilience of coastal and marine resource users to climate risks by adopting ecosystem-based solutions in marine managed areas.
    c. USAID (United States Agency for International Development) Caribbean Sustainable Ecosystem Activity. This 5-year activity aims to reduce threats to coastal and marine biodiversity in priority areas in the Caribbean. It features a fisheries component, which creates opportunities for capacity building and outreach around fish spawning aggregations and sustainable fishing practices.
9. The Resolution on CRFM Collaboration with WECAFC working groups, endorsed in 2023, affirms the Recommendation WECAFC/XVIII/2022/4 and the RFSAMP, and calls on CRFM Member Countries to implement the RFSAMP.

Fish Spawning Aggregations in Honduras – Antonella Rivera (Coral Reef Alliance)

10. This presentation introduced the work of the Coral Reef Alliance under the MARFish Project. The MARFish project aims to promote recovery of fisheries in the Mesoamerican region by increasing knowledge and capacity for management of commercial fish species which reproduce at FSAs. This work features three components:
    a. increasing knowledge and protection of FSAs at the transboundary Cayman Crown reef complex;
    b. establishment of a network of 'sentinel sites' for observation; and
    c. promoting the social acceptability of protecting spawning grounds, as these sites are highly valued by fishers.
11. In Honduras, there is not a large body of scientific research on FSAs. Most of the available information is based on the local ecological knowledge of fishers, and the Coral Reef Alliance is working with fishers from Honduras who target FSAs to inform proposals for strategies for conservation and management. They have confirmed one potential mutton snapper (*Lutjanus analis*) FSA and 19 potential aggregation sites for groupers, six of which have been validated.
12. Ecological work conducted in Honduras include:
    a. studies of four FSAs in the Bay Islands National Marine Park (Sandy Bay, Texas, Cordelia Banks and Man-O-War;
    b. underwater visual surveys (2021–2023); and
    c. hydrophone studies (2022–2023).
13. As a result of these ecological studies, Coral Reef Alliance now knows more about Honduran FSAs.

a. Sandy Bay was confirmed as a tiger grouper (*Mycteroperca tigris*) site and three seasons of monitoring have been completed. Spawning peaks were found to occur 5-10 days after the full moon in March and April. While the number of tiger groupers has increased each year, the total biomass has decreased.

b. Man-O-War was also confirmed as a tiger grouper FSA via observations of spawning.

c. Texas was found not to be an FSA after two years of continuous monitoring despite large numbers of groupers and snappers observed nearby.

d. Cordelia Bank was confirmed to be a multispecies FSA for Nassau (*Epinephelus striatus*), yellowfin (*Mycteroperca venenosa*), black (*Mycteroperca bonaci*) and tiger grouper. Spawning happens at depths greater than 20 m (65 ft), and preliminary data suggest that spawning peaks for Nassau and yellowfin grouper in Honduras occur eight days after the full moon in April. The spawning peak for black grouper was observed four days after the full moon in March.

14. The team also conducted the following socioeconomic studies:

a. assessment of Honduran communities that harvest in the Cayman Crown FSA;

b. household surveys in 13 communities;

c. two local ecological knowledge systematization workshops; and

d. three training workshops.

15. Two scientific articles have been produced based on the findings of these studies.

16. In the Cayman Crown region, a small group of fishers sometimes fish illegally as part of their livelihood. Over the past ten years, they have experienced a decline in catch of 70 percent in local waters, which is pushing them to conduct illegal fishing activities in the waters of neighbouring countries. Proposed solutions include increasing the level of participation of these fishers in decision-making, capacity building for sustainable fishing and alternative livelihoods, building environmental awareness through outreach, and bilateral cooperation between countries to mitigate illegal, unreported and unregulated fishing.

17. FSA-related work has faced many challenges with respect to achieving community buy-in to protect spawning sites, and adequate enforcement in MPAs. In terms of governance, Honduras has a general ban on Nassau grouper in all waters, but there is limited enforcement due to lack of capacity. Cordelia Banks is a special protection area, but the two other confirmed FSAs do not benefit from specific protection. Next steps include:

a. work on declaring a no-take around the Sandy Bay FSA;

b. improving enforcement;

c. piloting livelihood diversification projects;

d. continuing monitoring;

e. promoting knowledge exchange; and

f. validation of new FSA sites.

18. Post-presentation discussion comprised the following:

    a. Ms Martha Prada (CFMC) asked when the project would end. Rivera informed the group that the project ended in 2023 but, that funds had been received to conduct ongoing monitoring at two sites. Coral Reef Alliance was in the process of fundraising for a second phase of research.

    b. Ms Krista Sherman (Perry Institute for Marine Science) asked whether the peak spawning periods for each species were based on local ecological knowledge, or on previous scientific work. Rivera indicated that it was mostly local ecological knowledge. She admitted that most of the firsthand scientific observations were taken after the full moon, which was a limitation. The same limitation existed in Belize and Mexico, where there was much more information on FSAs. While in Honduras, they had expected most of the spawning to occur in January – February, the spawning period was found to begin in February with a peak in March and residual activity in April. Honduras does not appear to follow the same patterns as other countries. This aligns with the local ecological knowledge.

    c. Ms Stephania Bolden (SAWG) noted that enforcement is listed as a challenge and sought clarification on whether this specifically due to lack of government willingness or capacity. Rivera specified that the government has made provisions to protect FSAs in new laws. They have also banned harvest of Nassau grouper. Lack of funding and personnel are key issues. Cordelia Banks is well enforced but other sites lack monitoring. Training has been provided to rangers in the area. The country is making progress with respect to regulations and enforcement, but there is a lot more work to be done.

Spawning aggregations status update from WECAFC member countries

United States of America, United States Caribbean and Puerto Rico

19. The United States of America has identified several FSA sites in the United States Caribbean (listed below) and has implemented closures and other appropriate measures for them.
    a. Red hind (*Epinephelus guttatus*) FSA sites in the United States Caribbean (e.g. Abrir La Sierra Bank and Tourmaline Bank, Puerto Rico; Red Hind Aggregation Area, St Croix).
    b. A mutton snapper aggregation in St Croix has been identified and managed with a seasonal area closure since 2005.
    c. Nassau grouper harvest and possession is prohibited in the United States of America, Puerto Rico, and the United States Virgin Islands (USVI). FSA sites identified and protected (Bajo de Sico, Puerto Rico; Grammanik Bank, St Thomas).
    d. Goliath grouper (*Epinephelus itajara*) harvest and possession is prohibited in United States Caribbean state and federal waters.
    e. Certain species of snappers and groupers are protected with seasonal and area closures in the United States southeast region (Figure 2).

Figure 2. Seasonal Species and Area Closures in the United States Caribbean

20. In the continental United States several FSA sites have been identified, and closures and other appropriate measures have been implemented.
    a. In west Florida waters, there are four (4) FSA-based marine protected areas (MPAs): Madison-Swanson MPA, Steamboat Lumps MPA, the Edges, and Dry Tortugas MPA. These MPAs were established in 2001 and protect FSA sites utilized by mutton snapper and other aggregating species.
    b. In the South Atlantic region, there are Spawning Special Management Zones designated to protect important spawning areas. There are five areas located from North Carolina to Florida, where multiple species aggregate to spawn.
    c. In eight (8) MPAs from North Carolina to Florida, no person may fish for or possess a South Atlantic snapper-grouper.
    d. A System Management Plan (SMP) review evaluates the efficacy of the MPAs in meeting management objectives. The SMP serves as the framework for resource protection, research and monitoring, outreach, administration, and evaluation of the proposed areas.
    e. The Western Dry Rocks area in Key West, Florida is a multispecies FSA area managed and actively monitored by the Florida Fish and Wildlife Conservation Commission.
21. Several actions have been taken for the management of FSAs in alignment with the Recommendation WECAFC/17/2019/24 "On the sustainable management of spawning aggregations and aggregating species". These include the following:
    a. NOAA Fisheries conducts research on reef species, including Nassau grouper, in the tropical Western Atlantic including:
        i. underwater surveys;
        ii. coral reef ecosystem monitoring surveys in Puerto Rico and the USVI;
        iii. assessments of existing aggregation sites (including abundance and size of fish);

iv. identification of new spawning aggregation sites;
v. investigation of larval dispersal; and
vi. use of population genetics to determine effective population size, genetic diversity, and geographic connectivity.

b. In support for implementation of the RFSAMP, the United States of America has worked to identify FSAs and promote their monitoring and conservation.
c. The United States of America supports strengthening the enforcement of closed seasons, closed areas, and species-specific sales bans during closed seasons.
d. Strong support of the DCRF and commitment to improving data collection and reporting of the status and trends of fish species that aggregate to spawn for informed management decisions. At the 19th session of WECAFC, the United States of America agreed to prioritize data collection and reporting of Nassau grouper and mutton snapper.
e. NOAA Fisheries listed Nassau grouper as a threatened species under the Endangered Species Act in 2016 and is dedicated to its conservation. Critical habitat for the species was designated in January 2024, and will protect habitat important to recruits, juveniles and adults.
f. With the use of public outreach, the United States of America aims to minimize fishing pressure during both non-spawning months and spawning aggregations, thus helping to ensure viability of stocks.
g. The harvest, possession and commercial sale of the Nassau grouper is prohibited in the United States of America.
h. Fishermen can participate in the Fishery Management Council process through advisory panels, (e.g. outreach/education, district advisory panels), Citizen Science Programs, and public meetings/comments.
i. The United States of America supports the mobilization of resources for research, monitoring and management and will continue to support such efforts.
    i. The CFMC is actively engaged in the development and dissemination of outreach and education materials related to FSAs. Colourful posters with information on Nassau grouper and mutton snapper are available from the Council in English and Spanish (combined) and French. The CFMC also supported the creation of a Digital Hub in support of the "Big Fish" Communication Campaign.
    ii. Through various grant programmes NOAA Fisheries supports research on fish spawning aggregations, impact of fishing closures, and life history studies of aggregating species and the habitat that support those aggregations.
    iii. NOAA Fisheries conducts and supports various research activities on the biology, behaviour, and ecology of the Nassau grouper to inform management decisions and enhance recovery efforts for the species.
    iv. In 2021, NOAA Fisheries provided funding through a Species Recovery Grant (Section 6 ESA) to conduct Nassau grouper research in waters surrounding Puerto Rico.

22. Management challenges and threats include:
    a. potential changes in timing of species spawning seasons (i.e. shifts in spawning activities outside the established seasonal closure);
    b. quantity of data and time required to update measures;

c. limited enforcement, especially at sea;
d. data limitations hinder evaluation of effectiveness of closures;
e. jurisdictional issues inhibit enforcement of species harvest prohibitions; and
f. lack of compatible regulations, in some cases, in territorial and federal waters (e.g. annual catch limits, timing of seasonal closures).

23. Opportunities to enhance management include:
    a. adjustment of policies to effectively enforce regulations;
    b. establishment of a recreational data collection programme (United States Caribbean);
    c. establishment/modification of a framework to incorporate socioeconomic data and traditional ecological knowledge;
    d. adaptive Management (vs reactive): update framework procedures to adjust management measures more quickly. Examples of this include adjustment of seasonal closures based on lunar cycles or in response to environmental events;
    e. identification of areas for compatible regulations to protect multiple aggregating species;
    f. greater inclusion of fishers/communities in research projects and the management decision process;
    g. establishment of buffer zones adjacent to area closures or trip/bag limits for aggregating species;
    h. use of outreach to highlight the importance of habitat conservation to stakeholders;
    i. investment in research to understand the effects of climate change on reproductive behaviour of aggregating species;
    j. prioritization and develop monitoring programmes for spawning aggregation sites; and
    k. disincentivize or prohibit purchase/sale of spawning species during closures (in the absence of import/sale regulations).
24. No questions were posed to the United States representative.

Dominica

25. Governance of marine fisheries falls under the Dominica Fisheries Act of 1987. These regulations do not address spawning aggregation species. Approximately 1 400 fishers are presently licenced in Dominica.
26. Snapper species are generally caught along the west (Leeward) coast of the island, and a management plan is needed for this fishery. The locations of snapper FSAs in Dominica remain unconfirmed, and the management needs of these sites is yet to be assessed.
27. There has been an apparent decrease in the landings of mutton snapper, but this may be related to misidentification. There is need for capacity building on identification of snapper species for enforcement officers.
28. Landings of groupers have decreased since 2019. Assessment is needed to update available information on the status of these species.
29. Management challenges include:
    a. limited scope and capacity to collect biological data;
    b. limited access to funds for additional data collection;
    c. need for updated fisheries regulations to include catch limits and close seasons); and
    d. insufficient education and public awareness of spawning habits of species.

30. A representative from the United States delegation noted that the existing fisheries regulations do not address spawning aggregations, and asked whether there were plans in place to update them. Dominica noted the CRFM Ministerial Resolution that was referenced earlier in the proceedings urged CRFM member states to implement the recommendations of the SAWG. As a CRFM Member Nation, Dominica is now obliged to integrate SAWG's recommendations and the RFSAMP into their fishery management policies.

Brazil, Colombia, Cuba, Mexico

31. Representatives from these Member countries were not available to give updates on FSA management.

Informal technical meeting at 76th Gulf and Caribbean Fisheries Institute– Martha Prada

32. The WECAFC Spawning Aggregation Working Group hosted an Informal Technical Meeting on the 7 November 2023 at the 76th conference of the Gulf and Caribbean Fisheries Institute (GCFI) entitled, "Moving Forward Implementation of the Fish Spawning Aggregation Regional Management Plan: inputs from regional experts".
33. The meeting was in hybrid format. Twenty-three participants attended in person and four attended online via the Zoom platform. The invitations had been sent by the WECAFC Secretariat with logistical support from GCFI, and the meeting was coordinated by CFMC. The meeting aimed to investigate the technical support needed across the region for
    a. progressive implementation of RFSAMP;
    b. education and outreach; and
    c. important research occurring or forthcoming.
34. Main messages included:
    a. Keep Connections – connections within natural systems and between people within the region working on FSA issues.
    b. Precautionary Approach – There is an urgency to manage FSAs effectively considering declining fishery and population trends, particularly for Nassau grouper. There is no need to delay action in the absence of sufficient information. Seasonal closures can be helpful even in the absence of detailed knowledge, and education and outreach promote informed action by resource users.
    c. Participative implementation - Promote the role of fishers to assist other stakeholders in understanding their experiences with aggregation-fisheries. This can be achieved by recognition of fishers who are making a positive impact in the space. Fishers who act as champions for sustainable consumption should be invited to showcase to others.
    d. Ecosystem considerations – the role of aggregations in the movement patterns of spawners and predators
    e. Vertical integration of the best available information from fishers, scientists & managers for decision-making.
    f. Finding a trigger for your case – This is likely to be specific for each country/region and involves identification of a champion or information around which to rally support for FSA protection.
35. After the fifth meeting of the SAWG in 2023, the SAWG attempted a survey on the degree of alignment with the RFSAMP in WECAFC member countries. Relatively few member countries

(less than ten) responded and attempts to correspond with OSPESCA (Central American Organization of the Fisheries and Aquaculture Sector) were unsuccessful. The responses that were received showed that lack of awareness of the RFSAMP was widespread, and that more education and outreach was needed to support mainstreaming and implementation. Countries might also need tangible support to overcome resource constraints limiting their ability to conduct and participate in implementation processes.

36. The creation of an RFSAMP Coordination Group was considered a priority action to promote the role of fishers and other stakeholders to implement the FSAMP.
37. After Ms Prada's presentation, Ms Stephania Bolden proposed that the SAWG should put together a potential list of members for the technical coordination group. Ms Nancie Cummings (FDS-WG) informed the group of the existence of a Scientific and Technical Advisory Group for the Queen Conch Working Group and recommended that these advisory groups collaborate.

Update on "Big Fish" regional public engagement campaign – Ana Salceda

38. The campaign's target audiences are fishers, decisionmakers and the community (fish consumers), and it has three overarching goals:
    a. Connect the wider Caribbean community of fishers, governments, scientists, Non-governmental Organizations (NGOs) and other stakeholders around common messages to promote sustainable management of these species and protection of Fish Spawning Aggregations (FSA) region wide.
    b. Serve the RFSAMP to reach managers, decision-makers, fishers, and other stakeholders working to protect FSAs in space and time.
    c. Act as a meeting point through the Hub, social media platforms and live events, and to serve as a source of information on all the efforts focused on the monitoring and protection of FSAs.
39. The campaign's multimedia approach has led to the development of several products, including:
    a. The "Treasure of the Caribbean" documentary film, which has received seven awards at film festivals. The film was key to the launch of the campaign. It premiered at GCFI in the Bahamas, and screenings have been held in the Bahamas, Belize and Honduras. Further screenings are planned for Puerto Rico, the United States Virgin Islands, Guatemala, Mexico and Panama. The team has found strategic partners in each country to sit on a panel after the film and discuss important issues in each country. In Honduras, for example, there was much discussion on illegal unreported and unregulated fishing.
    b. Radio kits have been created which include PSAs and podcasts focused on promoting seasonal closures for Nassau grouper and mutton snapper.
    c. Two short films have been produced in three languages: English, Spanish and French.
    d. The Big Fish Digital Hub (to be upgraded 11 June 2024).
    e. Social Media Platforms: Instagram, Facebook, Linkedin and X (formerly known as Twitter). The campaign has experienced Phase 1 growth of ~2000 percent, with a monthly growth rate of ~35 percent (the average monthly growth rate of organic campaigns is 2.2 percent) It has reached more than 236 000 accounts with the aid of over 50 national and regional partners and collaborators who are sharing their content. The content is diverse,

and includes posts, reels, stories, radio and trivia format. Content series have been run on enforcement successes, fisher heroes, scientist spotlights, etc.

f. Posters for both Nassau grouper and mutton snapper.

g. Citizen Science Program for fishers and enforcement officials: in collaboration with local partners throughout the Caribbean we are using these materials and partners in workshops and other live events to inform our target audiences on the importance of connectivity and benefits to let species spawn, as well as to engage them in the protection of FSAs.

40. The campaign's sponsors, the Public Broadcasting Service and Howard Hughes Medical Institute, have been so pleased with the success of the campaign that they will be submitting it to two prestigious Impact Campaign Competitions: the Anthem Awards, and the Jackson Wild Special Jury Award.

41. In terms of fundraising, approximately USD 1 300 000 was raised for production of the documentary, radio kits, setup of the digital hub, and to run the social media. The team is actively working to raise funds for:

    a. Capacity building for fishers;
    b. FSA science and monitoring; and
    c. Communication (Big Fish Campaign).

42. Next steps for the campaign will build upon the foundation established in 2023–2024. Focus on the United States Caribbean will be intensified, with a short film about the recovery of Nassau grouper at Grammanik Bank. The communication campaign will also integrate with implementation of the FSA Management Plan by working with the pilot countries (Belize, Bahamas, Cuba), using the Digital Hub to continue data collection, and keeping partners informed of implementation. The campaign will increase engagement by strengthening and expanding the Big Fish Community, and through an advocacy campaign which has branches for the three target audiences. WECAFC Member Countries are encouraged to take initiative and apply the messaging to their realities - they need to use the materials and do their own outreach.

43. Finally, 2024–2025 is envisioned as a transition period to a new production team. The main goals are:

    a. transition to new production team to continue producing content for the campaign (four people needed);
    b. formalize and escalate responsibility of the Communication subcommittee;
    c. continue following 10-year communication strategy to #RecoverBigFish; and
    d. fundraise for 10-year plan.

44. Mr Myles Phillips (SAWG) asked Ms Salceda what she anticipated as the biggest challenge for communications. What is needed to keep in mind to keep this plan running in perpetuity? Ms Salceda noted that funding is the biggest challenge, as there was only funding at present to support the campaign until 31 December 2024. The new production team was most crucial. The existing team has been actively interviewing and have found potential team members, but funding is needed to hire them.

45. Ms Martha Prada (CFMC) expressed appreciation on behalf of the task force for Ms Salceda's dedicated work and passion, and that it would be difficult to find someone similar with her dedication. With respect to funding, she proposed the development of a special fund or provision from countries. SAWG has a few months to consider the options, and she proposed the formation of a subcommittee to consider how to move forward in the short term.

46. Mr Miguel Rolón (CFMC) thanked Salceda for her work and posed two questions: (1) What would happen if there was no funding to support the Big Fish campaign after 31 December; and (2) what are the roles envisioned for the staff of the new production team? Ms Salceda explained:
    a. The campaign manager/impact producer will be the director of the campaign, and will design content, knowledge of platforms, social media, and oversee the whole team. Salceda indicated that while there are many candidates with experience who can take over this role from her, it has been more difficult to find someone with deep institutional knowledge.
    b. The institutional liaison to connect with SAWG Task Force, with responsibility for fundraising.
    c. The communications manager is an existing role. This person will work in close coordination with the campaign manager to produce and deliver content.
    d. The video creator, which did not need to be a full-time position. This could be someone hired under contract for content.
47. Mr Rolón noted that the public engagement campaign had already been endorsed by WECAFC, so that was not a problem. However, he proposed that there needed to be a transition or handover period between Ms Salceda and the new campaign manager. This period should last at least one month; as such, this new hire should begin work by 1 December. After Ms Salceda's departure on 31 December, they can take over in 2025.
48. Mr Rolón went on to say that CFMC would be starting a new 5-year funding cycle. It might be possible for CFMC to support the campaign for at least one year while the new manager pursues other sources of funding. He noted that there is no real commitment from the countries to support Big Fish, but it should continue. If it stopped even temporarily, there was a chance that it would not recover. The RFSAMP was an excellent product, but it would be difficult to promote voluntary implementation in each of the countries without a functioning Digital Hub. Right now, the SAWG should capitalise on the momentum, the existence of the Hub and the strength of WECAFC's institutional linkages.
49. It was agreed that facilitating CFMC's support for the Big Fish Campaign would be incorporated into the workplan during the proceedings of Day 2.

Feasibility of non-extractive uses of FSAs – Martha Prada

50. The session aimed to:
    a. present known case studies from Caribbean and other regions e.g. Pacific;
    b. discuss feasibility and SWOT in broader Caribbean context; and
    c. seek Caribbean case studies, anecdotes and other input from attendees.
51. Spawning aggregations are known to have multiple non-extractive uses, which are of potential benefit to human livelihoods. The first is as an attraction for underwater SCUBA tourism. The development of tourism adventures based on diving with groupers and snappers can be lucrative and generates jobs but should be managed. These experiences are available in places across the world including Palau, Florida, Belize and French Polynesia. In the long term, the non-extractive value of dive tourism on spawning aggregations can be as more than ten times the economic return from fishing these aggregations. In addition, larger aggregations produce more recruits for the fishery in other locations. Divers are willing to pay well for encounters with large groupers and

snappers, especially in large numbers, which makes them more valuable as attractions than for harvest.

52. Healthy aggregations ensure equity of access to fishery resources as well. They are the source of fish recruits which disperse widely to safeguard the livelihoods and ecosystems, including those of communities distant from/with no access to aggregations. FSAs also serve as important sites for research, to increase our understanding of these phenomena and their role in ecosystem resilience and recovery and by extension, a source of content for education and outreach.
53. However, guidelines must be put in place to minimize disturbance of the aggregation by boat and diver traffic, and to ensure the safety of visitors. Best practice guidelines should:
    a. promote small groups of highly experienced divers, the adoption of a code for responsible diving;
    b. manage the activities according to the precautionary principle; and
    c. maintain sensitivity to the responses of the schooling fish to diver presence.
54. A participant queried whether it was prudent to immediately try to identify new places to start this activity, or should focus be placed on the development of guidelines for places where the activity was already being conducted? The speaker went on to ask whether we know enough about the effects of non-extractive uses to promote this? It was suggested that feasibility studies be conducted to identify FSA sites where dive tourism can be conducted safely.
55. Ms Krista Sherman said that in the Bahamas, many of the known FSAs are deeper than the usual depth of recreational SCUBA tourism (~15 metres). This presented liability issues for tourism operators, as proven technical expertise was needed to dive in these areas. Further adding to the risk of the activity was the fact that many of these sites were known to be frequented by bull sharks. Another option might be to collect footage of the FSAs using Remotely operated vehicles and other technology, but these resources are not universally accessible.
56. Mr Myles Phillips shared that in Belize, these dive trips happen at the Gladden Spit FSA. While sharks are present, there have been no incidents, though fishers note that their catch at the aggregation has been compromised by an increase in the shark population following the institution of protections within the past five years. Nonetheless, the depth at which aggregations occur presents a significant safety issue for tourism.
57. Mr Miguel Rolón indicated that the CFMC had discussed issues of liability for 15-20 years ago. They found that tourists were looking for short trips and generally lack the skills or training with advanced gear (e.g. rebreathers) to undertake deeper, more technical dives safely. We also do not know the impacts of diver traffic on the animals. Spawning aggregations often occur in locations where poor sea conditions, including large waves and strong currents, might create unpleasant conditions for recreational diving during the spawning period.
58. A participant emphasised that was important to engage fishers in these non-extractive use initiatives to provide them with economic benefits. This would address the loss of income from the cessation of FSA fishing and help them to see live groupers as more valuable than harvested ones. In terms of education, it was asserted that stakeholders are deeply interested in knowledge of life history, and that successful outreach too might influence their interactions. While non-extractive opportunity should impact the fishers and provide the benefits, this had been found difficult to implement in practice in some places. For example, shark diving tourism does not result in economic benefits to fishers as much as it does to tour operators. Fishers were making good money off fishing and would not make the same money working as staff for a dive operator. Further, not

all fishers are involved, or want to be involved, in tourist activities, resulting in a perverse incentive. This was a difficult issue to address. It was suggested that it might be possible to share economic benefits with fishers by engaging them in paid education and outreach. Their involvement in the outreach might also increase their awareness of the need for their engagement. As a society, we need to recognize the enormous and important knowledge held by fishers. We need to increase their income and one way to do it might be to include fishers from the curriculum development phase. Tourists and students could go out at sea to learn how fishers perceive the ocean and ecological dynamics.

59. COBI (*Comunidad y Biodiversidad*), a NGO, was cited as an organization which was already doing fisher engagement work to provide them with economic benefits from FSAs. The fishers are trained to participate in scientific work, including conduct of FSA monitoring and passive and active acoustic studies. This has increased the level of stewardship which the fishers feel for the FSAs, and simultaneously gives their communities a sense of great pride. This was touted as a great example to follow, where feasible.
60. It was suggested that photos and videos could also be good tools for outreach to communicate the benefits of these FSAs, even within fishing communities. Showing videos of FSAs at the schools could prevent future generations from engaging in illegal fishing. A similar outreach campaign with sea turtles has yielded positive results. An invitation arose from this discussion to form a small group to develop and prioritize the non-extractive uses of FSAs and address safety concerns, technological issues, and engagement of fishers.
61. As a result of the group discussion on non-extractive use of fish spawning aggregations, the Working Group highlighted the need to develop a pilot project to further discuss the progressive implementation of a set of possibilities to promote the non-extractive use of FSAs. Such a pilot could be further explored to maximize collaborative work among scientists, fishers, managers and other interested NGOs.

Institutional amnesia pushes fish spawning aggregations towards extirpation – Stuart Fulton

62. Mr Fulton's talk was based on his 2023 paper[1], which states that how and why information is lost or forgotten is not well understood in the context of conservation or fisheries science. The paper focuses on the management of fish spawning aggregations across the Mesoamerican Reef and highlights ongoing uncertainty about the status of spawning aggregations by managers even in cases where large quantities of information have been collected over time.
63. As part of a regional project in 2019, interviews were conducted with FSA managers across Mesoamerican reef and with researchers responsible for work at 36 FSA sites. Nearly half of those interviewed indicated that trends in abundance were unknown. The Caye Glory FSA site in Belize was highlighted. Despite claims by some managers that there was no data, there was found to be visual monitoring data since 2000, and fishery dependent information could be found in publications going back as far as 1960.
64. Belize had done many things right with respect to the management of FSAs, including the adoption of a high-quality monitoring protocol by the national working group of managers and researchers, and attempts to maintain a central database to facilitate access to raw data in posterity. Despite

[1] Fulton, S. (2023). Institutional amnesia pushes fish spawning aggregations towards extirpation. People and Nature, 5(2), 489-495. https://doi.org/10.1002/pan3.10462

these successes, institutional amnesia was found to create widespread uncertainty with respect to the status of multiple spawning aggregations.

65. Mr Fulton went on to propose actions which could mitigate loss of institutional memory, including:
    a. reduction of staff turnover;
    b. promoting participation by local institutions in management via network approaches;
    c. strengthening of local NGOs;
    d. improvement of data collection and management of information and documentation;
    e. incorporate historical information into documentation on an ongoing basis; and
    f. Increase storytelling approaches during capacity building and outreach activities.
66. After the presentation, Ms Stephania Bolden (SAWG) asked for Fulton's recommendations for keeping information alive. He said that many of the recommendations already highlighted are dependent on funding, which is a major challenge. Outside of funding limitations, institutions must avoid the mismanagement of information wherever possible and treasure their information. One possibility is for NGOs to work with funders on long-term project planning to conserve continuity of information and effort over long periods. There might also be ways in which technology, such as digital databases, might assist with answering questions and maintaining information access. However, technology must be maintained and updated, or it could contribute to the problem. Focal points are needed to coordinate at the national and regional level to ensure interagency harmonisation on monitoring activities and objectives.
67. Mr Myles Phillips (SAWG) noted the lack of a proper monitoring and evaluation framework in some countries for fin fish and for FSAs by extension. Even in cases where lots of data had been collected, it was not being used to evaluate management effectiveness or to inform adaptations. This probably did not help the situation with loss of institutional memory.
68. Mr Fulton agreed and commented that management also varies from country to country. In the Mesoamerican region, an overarching challenge was the lack of specific regulations for FSA-related groupers and snappers. Spatial management (i.e. area closures) have been used in multiple places. Belize was commended for its regulations for Nassau grouper, which included the year-round closure of several FSA sites. Unfortunately, neighbouring countries have not implemented the same measures. In Mexico, another challenge is that the same management approaches are used on both the Caribbean and Pacific coasts despite differences in species composition and distribution, resulting in widespread mismatches of regulations with management needs.

Day 2: Commencement of the meeting and housekeeping

69. The chairperson opened the meeting with a summary of the presentations and discussions from Day 1 and introduced the upcoming agenda items. The first presentation would be delivered by Regional Activity Centre for the Protocol Concerning Specially Protected Areas and Wildlife (SPAW-RAC), followed by findings and outputs from the pilot implementation of the Regional Fish Spawning Aggregation Management plan. Finally, there would be a review of the Spawning Aggregation Working Group's workplan and recommendations. Attendees were reminded that the review session would represent an opportunity to propose activities for addition to the workplan, and new recommendations for the Commission's consideration.

Updates on protection of Nassau grouper and parrotfish by CAR-SPAW-RAC – Géraldine Conruyt

70. The Regional Activity Centre for the Protocol concerning Specially Protected Areas and Wildlife for the wider Caribbean (CAR-SPAW-RAC) had successfully listed parrotfish (many species of which are known to aggregate for spawning) in Annex III of the SPAW Protocol at their 12th Conference of Parties (Decision II-3 SPW COP12). They had also developed a set of recommendations for their conservation and management in the Caribbean, including proposals for the development of a regional fisheries management plan and collection of fishery-dependent, fishery-independent and socioeconomic information, *inter alia.*
71. With respect to the Nassau grouper, the Species Working Group and the Protected Areas Working Group had presented recommendations to implement the RFSAMP to the Scientific and Technical Advisory Committee (SPAW-STAC) in 2022. Further to these recommendations, and in alignment with their efforts to strengthen management of MPAs across the region, these working groups were presently drafting recommendations to improve protection of Nassau grouper and their spawning aggregation sites in MPAs. Once completed and endorsed by SPAW-STAC, these recommendations would be submitted to the SPAW 13th Conference of Parties in mid-2025.
72. After the presentation, Ms Martha Prada (CFMC) thanked Ms Conruyt for her presentation, stating that she was happy to see the integration of RFSAMP into SPAW-RAC's activities and collaboration from the SPAW-RAC team. She asked whether there was intent by SPAW-RAC to provide support for a regional seasonal closed season for Nassau grouper. Geraldine thanked her for the recommendation and said that the topic would be raised with the SPAW-STAC.
73. Ms Prada went on to ask whether there was any intent to develop a management plan for parrotfish species. Ms Conruyt informed the group that a management plan had been requested by Contracting Parties who signed the SPAW Protocol. SPAW-RAC was currently working to develop recommendations to protect parrotfish populations from overexploitation.

Overview: Regional Fish Spawning Aggregation Management Plan Pilot Project – Myles Phillips

74. The RFSAMP was finalised in 2020 after years of development and was twinned with the "Big Fish" Public Engagement Campaign, which is central to the approach. While it was designed with a focus on mutton snapper and Nassau grouper but is meant to be indicative of management measures for any FSA-related species.

75. The six objectives are as follows:

a. To increase the availability of information for and understanding of Nassau grouper and mutton snapper population status to build support for FSA protection.
b. To determine the status, including presence and fish abundance, location/timing of known FSAs and identify those in most of protection.
c. To develop regionally consistent/harmonized monitoring frameworks and protocols to collect key biological, trade and other socioeconomic information associated with Nassau grouper and mutton snapper, both during and outside of FSA seasons/areas.
d. To increase the availability of information for and understanding of Nassau grouper and mutton snapper population status to build support for FSA protection.
e. To determine the current status, including presence and fish abundance, location/timing of known FSAs and identify those in most of protection.
f. To develop regionally consistent/harmonized monitoring frameworks and protocols to collect key biological, trade and other socioeconomic information associated with Nassau grouper and mutton snapper, both during and outside of FSA seasons/areas.

76. Endorsement of the management plan and campaign by WECAFC in 2022 resulted in two new recommendations to the commission by the SAWG and the submission of a proposal for a pilot project to the European Union's Directorate General for Maritime Affairs (EU-DG-MARE).
77. The new recommendations advocated for the creation of a coordination committee, and the elevation of the Nassau grouper and mutton snapper to WECAFC Group 1 species, raising their institutional priority for data collection and management support to member countries. The RFSAMP includes a roadmap for adoption and implementation, comprising 16 actions for implementation within the short (within three years), medium (within five years) and long term (within ten years). Activities could be commenced at any time, and many would be conducted simultaneously.
78. The pilot project, titled "*Improving ecosystem approach to fisheries by advancing fish spawning aggregation information gathering and increase of public engagement in the WECAFC region*" was approved, and commenced in 2023. It aimed to implement key short to medium term priority actions in three countries to test assumptions and determine the realities *in situ*. The project was implemented in three (3) components led by different groups.
    a. Component 1 was outsourced to the Wildlife Conservation Society under a Letter of Agreement and would involve the compilation and update of information about FSA management in the three pilot countries (Belize, the Bahamas and Cuba). This component sought to determine priority sites, investigate barriers and opportunities to synchronisation of closed seasons across member countries, evaluate management effectiveness for FSAs in each country, and identify areas for where each country could benefit from WECAFC's support.
    b. Component 2 was led by the FAO in close collaboration with WECAFC Fisheries and Data Statistics Working Group and evaluated the prospect of regional standardisation of monitoring protocols and data management. Much of the work focused on the operationalisation of WECAFC's Data Collection Reference Framework (DRCF) and Information System (WECAFIS).
    c. Component 3 funded outreach activities under the Big Fish Public Engagement Campaign. Led by BelugaSmile Productions, this component launched the Big Fish Digital Hub and

associated social media campaign in September 2023. A recent update to the Hub would go live on 17 June 2024.

79. Reports from each pilot country had been drafted at the time of the meeting and would be completed by mid-July. The information collected would be used to inform overall recommendations for implementation of FSAMP.

Findings from RFSAMP pilot countries: Belize Country Report – Myles Phillips

80. Nassau grouper was once the most commercially important species in Belize. Aggregations of this species were known to be made up of 30 000 fish on average in the 1950s. One aggregation in Belize, known as Caye Glory or Emily, was the centre of the Nassau grouper fishery in Belize and was believed to comprise over 100 000 fish. By the 1980s, FSAs were already showing major signs of depletion, with Caye Glory down from 100 000 to less than 1 000 fish. Between 1980 and 2000, fisheries managers banned the use of fish traps at FSAs, drafted a Nassau grouper management plan and established several of the first marine reserves.
81. By the year 2000, Nassau grouper could only be found in numbers exceeding 1 000 at two of nine traditionally recognized FSA sites in Belize - Northeast Point at Glover's Reef Atoll and Sandbore at Lighthouse Reef Atoll. They were found in low numbers, or had been extirpated from, seven other sites, including Caye Glory.
82. Since the year 2000, there have been several developments with respect to the management of Nassau grouper, many of them driven forward by simultaneous national and regional projects. In 2001, a national Spawning Aggregation Working Group was formed, with participation from government, NGO and fisher representatives. In 2003 and 2009, legislation was enacted which resulted in the year-round closure of 13 multispecies FSA zones, and specific protections for Nassau grouper. These protections include a seasonal closure from December to March, size limits (upper and lower) to protect juveniles and large fecund females, a requirement for Nassau grouper to be landed whole, and a requirement for all filets must retain a skin patch for species identification purposes. More recently, in 2020, fisheries policy was updated with the Fisheries Resources Act. While it did not specifically address FSAs, it increased the fines for infractions, creating a deterrent for illegal fishing. In the same year, a regional project by MARFish/COBI assessed the status and management of FSAs in the Mesoamerican region. In 2022, an UNCTAD (United Nations Conference on Trade and Development) Project proposed guidelines for the development of a multispecies finfish management plan for Belize using the fishery basket approach. While the management plan has not yet been drafted, the guidelines make recommendations towards the management of Nassau grouper, mutton snapper, and other species that use FSAs.
83. Management of FSAs happens in the context of the national protected areas system. The country is aggressively pursuing 30x30 goals, with 20.5 percent MPA coverage in the EEZ, and plans to achieve 25 percent within the next few years. Replenishment zones, which prohibit commercial fishing, make up about half of the MPA coverage. Belize has also adopted an area-based management approach known as the "Managed Access Program" in an attempt to regulate fishing pressure and increase stewardship and has advisory councils for many protected areas which promote equity and inclusion of stakeholders in decision-making processes. Despite this, no national framework for evaluation of FSAs management effectiveness was identified. The

Government of Belize supports special patrols at spawning sites, which are conducted by Coast Guard with support from NGOs.

84. Mutton snapper has received considerably less attention than Nassau grouper in Belize. Mutton snapper is only regulated at Gladden Spit FSA, where it has been exploited since 1950, and there are no national size regulations or national seasonal closure. Since 2006, fishers require a special "traditional fishing" license to fish mutton snapper at Gladden Spit, and fishing is permitted 2 weeks each month from March-June.
85. In order to review national FSA management effectiveness, the focal point tried to identify a monitoring and evaluation framework, including targets, indicators and assumptions, reviewed monitoring baselines and programmes, modes of evaluation and reporting, and governance adaptations made over time. Belize was found to have a rich repository of baseline information, with the earliest material on FSAs and the Nassau grouper fishery published as early as the 1940s. Further documentation arose in the 1980s to 1990s and was centred around the ongoing decline of the species and the early management efforts. Between 2000 and 2010, there was a massive increase in the resources devoted to the study of known FSAs and the traditional knowledge of resource users. Finally, in 2022, three previously undocumented FSAs were confirmed in the Cayman Crown region of the Sapodilla Cayes Marine Reserve. While monitoring is widespread, no formal monitoring and evaluation framework was identified. It was proposed that the incumbent multispecies finfish management plan should include indicators which use fishery dependent, fishery independent, outreach and enforcement data to test assumptions and monitor against expected outcomes evaluate FSA management effectiveness.
86. Multiple types of fishery independent monitoring are conducted in Belize. The visual census method is conducted at the FSA during the spawning season from the third to eighth day after the full moon and yields abundance and size composition data from eight of the thirteen protected sites. This data was stored at the University of Belize Environmental Research Institute in a central repository. Unfortunately, due to funding constraints and obsolescence of the digital database, the information which had been recently recovered was fragmented. Data could also be sought from the organizations which collected them, but in some cases, it was not found to be clean or complete.
87. Laser callipers were used to measure total length of fish at the FSA, and short time series are available from three FSAs. Reef Survey data was collected across the country using the MBRS and AGRRA methodologies and was available from the Healthy Reefs Initiative and the organizations which had collected them. Healthy Reefs Initiative has data from 2006 to 2021 and could be used to look at densities in habitats across the country to see how management has affected the species. There was a caveat on the effectiveness on such a study: adult and mega spawners might not be well represented in fish survey data captured by SCUBA, which is usually done at less than 15 meters. Adults may live deeper than where these surveys occur according to preliminary analyses.
88. Belize does not have very much Fishery Dependent Data which can be used to describe FSAs or FSA species. Catch data (frequency in catch, total length, weight, gear) is available from Glover's Reef (2004–2019) and from Turneffe Atoll (2023). Surveys of finfish landings in six coastal communities conducted by WCS from 2017 to 2022 was the only other source identified and could be a robust data stream if such a programme was adopted nationally. The Belize government was working on instituting a catch log programme which, if successful, would provide the most comprehensive source of fishery dependent data in the country. However, at present, outside of the

data collected by NGOs, only low-resolution export data is collected on finfish, and domestic sales are not routinely recorded.

89. With respect to enforcement, Nassau grouper infractions are relatively rare in Belize, and stakeholders are well sensitized about regulations, fines and penalties through multifaceted outreach efforts by multiple organizations. Fishers are generally in support of efforts to protect these species but wish they could be more involved in the process and better informed. Night fishing by foreign vessels is a key threat to FSAs, and even locals have been known to fish illegally if there is no enforcement presence at the FSAs. Manpower is not considered to be the key problem – the cost of fuel is prohibitive to travelling to distant FSAs regularly.
90. Historical landings and trade data is mostly available in the form of reconstructed catches in peer-reviewed publications. There is a lot of data on Gladden Spit and Caye Glory, but this information does not exist for other FSAs. Another challenge is that historical trade data were not recorded at the species level.
91. The presenter separated sources of information into four categories:
    a. Intra-organizational reports include detailed information on monitoring activities within a specific year or short time period. They were often inaccessible or lost to institutional memory. Where accessible, they provide important context for interpretation of trends.
    b. Inter-organizational reports fell under two subcategories. Reports to donors had similar characteristics to intra-organizational reports. The annual reports and newsletters produced by the Spawning Aggregation working group, in contrast, were relatively accessible from members of the working group.
    c. Peer-reviewed publications were identified as the most accessible source of information, and highly effective at preserving information in posterity.
    d. Institutional reports enshrined information and key recommendations as outputs of past projects.
92. Staff turnover is a huge problem in Belize. Institutional memory is often lost when staff depart, and most written reports do not take long term meta-views of the information to date. Management of FSAs in Belize would benefit from the synthesis of short-term reports to provide context for intuitive adaptive management.
93. While much information has been collected and reported on, there have been no changes to FSA-specific regulations since 2009. While most of the regulatory best practices are already enshrined in law for Nassau grouper, there is very limited active regulation of other FSA species. An FSA specific Monitoring and Evaluation framework would highlight areas for adaptation.
94. An extensive analysis of strengths, weaknesses, opportunities and threats (SWOT) was produced in plenary with Belizean stakeholders. Key findings were extracted and are presented below. Notable was the fact that stakeholders saw more opportunities than threats. There is an abundance of information, political and institutional support for FSA management and a strong collaborative spirit among stakeholders.

Key strengths

- regulations are quite advanced;
- political will to support FSA conservation;
- positive outlook by fishing community on regulations;

- continuity of active management, enforcement and collaborative working group;
- fishers generally avoid landing Nassau grouper to avoid penalties; and
- an abundance of baseline information on FSA locations/species composition.

Key weaknesses

- inconsistent funding/resource availability;
- enforcement gaps;
- significant data gaps (especially fishery dependent);
- finfish management plan not operational, with limited attention given to other FSA species;
- no specific Monitoring and Evaluation framework/adaptive strategy for FSAs;
- limited local capacity/impetus for analysis/publication; and
- limited adaptation in management.

Key opportunities

- local conservation trusts prioritize financial support for FSA protection;
- adoption of new technologies and methods; and
- twenty years of information exists to inform adaptive management (national and regional), including a proposed finfish management plan, management recommendations from the MARFish project, and the WECAFC RFSAMP Pilot Project.
- Capacity building and outreach to community and resource user groups for:
    - greater participation in governance; and
    - adaptation of resource use practices.

Key threats

- transboundary illegal fishing;
- effects of climate change, coral-algae phase shift on reefs;
- impacts of coastal development; and
- stakeholder conflict.

The need for standardized protocols and references for Fish Spawning Aggregation monitoring and evaluation - Nancie Cummings

95. Nassau grouper and mutton snapper have been selected as focal species for the RFSAMP. Nassau grouper has been recognised as critically endangered by the International Union for Conservation of Nature (IUCN) and given conservation priority by multiple international bodies, while significant gaps remain with respect to addressing the status of mutton snapper populations (Near Threatened. Several data and information gaps impede RFSAMP implementation:

a. FSA status (i.e. number individuals) not known for most FSA species or requires updating by country/site/species;
b. species-specific landings data are not available for the mutton snapper in most countries and are lacking for many countries for the Nassau grouper, making it challenging to know the full extent of its landings or to understand trends over time;
c. FSA spawning locations and timing not known for many countries/sites or needs updating; and

bBiological information (catch size composition, standards and references on biological conversions, life history inputs) unavailable or require updating- specific to DCRF Task IV.1 and Appendix 6.

96. To address these gaps, the adoption of standards (i.e. consistent formats and data collection protocols) and reference points (e.g. targets, conversion factors, growth and maturity schedules) is recommended to provide criteria against which monitoring and evaluation of FSA management can occur. The team had generated a list of potential criteria for evaluating standards for adoption.
97. Under Component 2 of the RFSAMP Pilot Project, the SAWG and the Fishery and Data Statistics Working Groups coordinated to update Annex 6 of WECAFC's Data Collection Reference Framework (DCRF) with information specific to Nassau grouper and mutton snapper. This annex consists of biological references and standards focusing on:
    a. **Appendix 6.1- Length measurement (standards – for finfish, elasmobranchs, crustaceans, etc.).** This appendix was updated to indicate recommended standards needed to inform:
        i. measures of size (e.g. total length, fork length);
        ii. changes in composition of individuals; and
        iii. changes in size (e.g. recruitment) temporally and spatially.
    b. **Appendix 6.2- Individual Weight data standards.** Weight-length relationships were updated.
    c. **Appendix 6.3 - Growth models (references)** were adopted by WECAFC.
    d. **Appendix 6.4- Conversion factors (references)** were adopted by WECAFC with focus on:
        i. 6.4.1 Weight-Length
        ii. 6.4.2 Length-Length
    e. **Appendix 6.5 Recommended values of natural mortality (references)**
    f. **Appendix 6.6 Length at first maturity (Lm) and Length at 50 percent maturity (L50)**
98. The FDS Working Group aims to be able to execute the following analyses for FSA species in the future. Critical to the successful application of these population analysis models will be 'the adequacy' of inputs on catch, size (age) composition, and CPUE (catch per unit effort) inputs:
    a. yield per recruit analyses;
    b. application of growth models – allowing patterns (changes) in growth to be studied spatially and temporally;
    c. determination of total mortality (Z) and examining changes in mortality temporally and spatially (and by fishery);
    d. examination of patterns in selectivity (spatially, temporally) by fishing method; and

e. application of population analysis models (e.g. length based virtual population models, statistical catch at age) for where adequate catch and size compositions and/or CPUE data exist, yielding determinizations of population level status.

99. Further, the FDS working group would advance their approach to inform gaps and deficiencies in basic data for FSA species through improvements to basic catch and effort statistics, continuing to update DCRF Appendix 6, and recommendations relating to fishery independent and s socioeconomic data collection.
100. After the presentation, Mr Miguel Rolón (CFMC) asked whether the DCRF protocols could be adapted for use under a dolphinfish management plan. Cummings affirmed that Appendix 6 could be applied to any WECAFC Group 1 species and said that she would share a copy of the DCRF with the CFMC.
101. Mr Marc Taconet (FAO) complimented the presentation and noted his understanding that it would be necessary to get specific indicators for assessment of FSA fishery management, and that some indicators were already available. However, he had noted gaps in the availability of information. Filling those gaps was anticipated to be a resource-intensive task. He also noted the presence of standards for length frequencies with decimal values and queried whether that level of details was necessary. Finally, he suggested that that the peer reviewed papers from which the standards and referenced had been sourced should be noted, and that there was potential for WECAFC to host the published literature in a repository. Cummings indicated that all references and standards were used because they had been found to be statistically robust. If more equations were needed, the group was invited to review and provide information. Additional equations would be reviewed and suggested. With respect to the inclusion of decimal places, the group was reminded that the DCRF was not meant only to accommodate finfish, but any fishery species including crustaceans. It was designed to allow the inclusion of references for species where finer measurements were required. She went on to note that there was other fishery independent information that are essential for monitoring and evaluation of FSAs (e.g. population size at FSA site, sex ratio). This was outside of the present capacity of the DCRF. For the biological references, the season of data collection is a key factor for all species. The SAWG was encouraged to promote the collection of data on natural mortality, reproduction, growth, gears, size ranges. The FDS working group wanted each of the species working groups to review the equations used in the DCRF and determine what is relevant. Population size, in particular, needs to be addressed.
102. Ms Yvonne Sadovy identified the challenge of assessing populations of aggregating species (specifically Nassau grouper and mutton snapper) and suggested consideration of alternative approaches to conventional stock assessments such as fishery-independent assessment of aggregations given the realities of data paucity in these fisheries relative to the data they are asking for.

Data Collection Reference Framework (DCRF) - Nancie Cummings

103. DCRF (https://www.fao.org/wecafc/data/dcrf/en/) was formally initiated at the first meeting of the Fisheries Data and Statistics Working Group (2018), with the goal to:
    a. Establish a foundation in the WECAFC region for collection, collation, and reporting submission of comprehensive fisheries data and statistics according to a standardized format.

b. Support data and reporting needs required by any regional fishery body and/or regional fisheries management organization for developing, monitoring, assessing and reviewing regional fisheries policies (e.g. fishery management plans).
c. Achieve harmonization across national/regional data levels.

104. Version 1.0 was endorsed in 2022, and the DCRF functions to provide a framework describing data to collect and contain in the regional database (WECAFIS) according to globally accepted reference standards. Data collection is organised into tasks which encapsulate categories of information:
    a. Task I – Regional statistics on catch and fleet capacity
    b. Task II – Catch & effort (landings, catch data by species)
    c. Task III – Fleet engagement and vessels
    d. Task IV – Biological information
    e. Task V – Incidental catches
    f. Task VI – Socioeconomics
105. Data collected according to the DCRF would be published through the 'WECAFIS' (the Western Central Atlantic Fisheries Information System) and used to inform reports on status and trends of fisheries and stocks by the WECAFC Fisheries Resource Monitoring System (FIRMS). Presently, FDS working group was working with experts to create survey instruments to collect data on FSAs for incorporation into FIRMS. Only limited datasets are presently available on the focal species (Nassau grouper and mutton snapper) and the fisheries which exploit them.
106. The main document is structured to enable the operationalization of the DCRF across member countries. Tasks are clearly mapped with WECAFC mandate and objectives, and includes task objectives, task scope, and data access and sharing rules. The main document is supplemented by 9 appendices containing essential references and standards. Data calls are forthcoming for all WECAFC Group 1 species.
    a. Appendix 1 is the list of WECAFC Country and Territory Codes.
    b. Appendix 2 "WECAFC fishing subareas/divisions for statistical purposes". This is a fully developed proposal with room for finalizing details on some spatial delimitations (i.e. United States of America/Bahamas, Central America, Brazil).
    c. Appendix 3 "WECAFC Reference List of Aquatic Species" is composed of three subappendices which describe three distinct groups of species:
        i. Group 1 - Main Reference Species (Appendix 3.1) are key species to the region and of specific interest to the WECAFC mandate, for which States are strongly encouraged to statistical reporting. This is especially true for species with endorsed WECAFC Fisheries Management Plans.
        ii. Group 2 - Other Reference Species (Appendix 3.2) are species of interest to WECAFC that could be elevated to the Group 1. These include: species of interest to historical WGs of regional bodies (WECAFC, CRFM, OSPESCA); species in high seas (areas beyond national jurisdiction)/straddling/shared and not under mandate of another RFMO; and species originating from 1978 working party on fishery statistics and/or of interest for other reasons.
        iii. Group 3 - Other Species (Appendix 3.3). Species under the mandate of other RFMOs, including for mandatory reporting (e.g. ICCAT), such as tuna and tuna-like species and pelagic sharks.

iv. Appendix 4 “Fishing vessels typology”. Appendix 4.1 “Fleet segment – vessel types by length classes, detailing the regional classification of Aligning better with artisanal nature of WECAFC fisheries.
v. Appendix 5 “Fishing practices”, with subappendices for fishing gear, fishing mode, fishing effort, and effort measurement by fleet segment. to be updated with the latest endorsed Coordinating Working Party on Fishery Statistics (CWP) standards on Fishing Effort. This appendix will be instrumental to interpretation of trends in fishing pressure.
vi. Appendix 6 “Biological References”, with subappendices for fish length measurement standards, scales of maturity, growth models, conversion factors, natural mortality values and length at first maturity/length at 50 percent maturity. Population of these subappendices is ongoing in collaboration with relevant species WGs and other experts. This work will be further advanced during the 2022–2024 intersessional period.
vii. Appendix 7 “Socioeconomics”, with subappendices on age-groups and currency. This appendix is scheduled to be populated during the intersession.
viii. Appendix 8 “Questionnaires and data submission schedule »
ix. Appendix 9 “Glossary”.

Western Central Atlantic Fisheries Information System (WECAFIS) - Marc Taconet

107. WECAFIS was endorsed by WECAFC in 2022. Between July 2022 and April 2024, FAO/NFISI worked to operationalise the WECAFIS with financial support from two European Union-funded projects. As a result, WECAFIS has been realised as a full-fledged data management and information system, and now hosts information from eight member countries. Each country provided data for 2-4 DCRF tasks each during this first data call:
    a. Barbados
    b. Dominica
    c. European Union – France
    d. Nicaragua
    e. Saint Lucia
    f. Suriname
    g. Saint Vincent and the Grenadines
    h. Trinidad and Tobago
108. Further, 43 fisheries were inventoried by ten countries (with focus on WECAFC priority species). These data were fed into FIRMS and were summarised for presentation in fact sheets and a geospatial dashboard called “The Atlas” (Figure 3). The Atlas presents FAO capture fisheries data, catch and effort by species, fleets, and fishing areas. This data is expected to be validated by the end of June 2024 and will be available for access and download from WECAFIS.

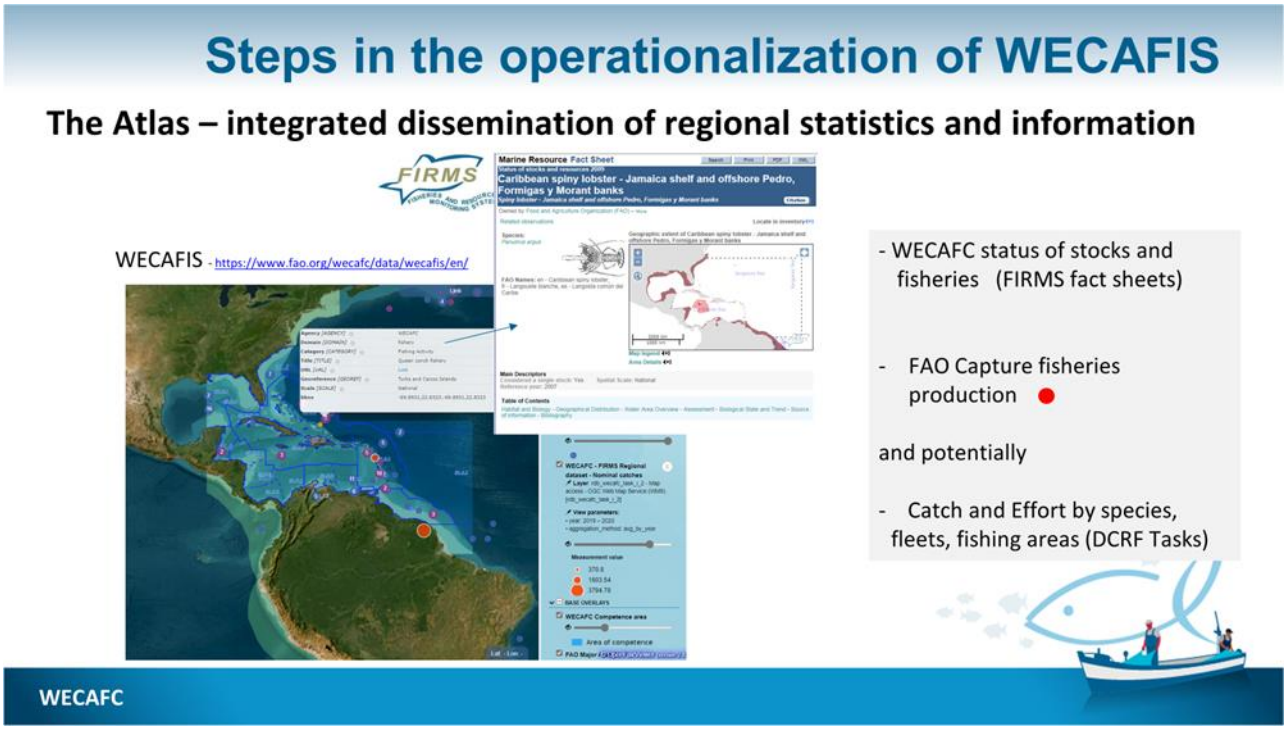

Figure 3. The FIRMS Atlas dashboard

109. WECAFIS serves as a regional database of catch and effort data to support WECAFC stock assessments and will contribute to the pilot of the Coordinating Working Party on Fishery Statistics (CWP) standard for Reference Harmonization (CWP-RH). A proposal is currently in development for alignment with CWP-RH, with the objective to facilitate WECAFC Member countries' multiple international reporting obligations (e.g. FAO, ICCAT, WECAFC). The WECAFIS page has been published, and can be accessed at: https://www.fao.org/wecafc/data/wecafis/en/
110. Once validated, the WECAFIS tasks and data collected under the 2022 data call will be published, and WECAFIS will be formally launched and announced via press release. A second call for data will be put out to WECAFC Member Countries by September 2024.
111. After the presentation, Ms Antonella Rivera (Coral Reef Alliance) noted that if data calls are primarily focused on governments, they might be skewed towards industrial fisheries. She volunteered to assist with expanding the call to include local NGOs and academic institutions at field sites (e.g. the Mesoamerican Reef).

Findings from RFSAMP pilot countries: Bahamas Country Report – Krista Sherman

112. Ms Krista Sherman had been hired as the Bahamas focal point for Component 1 of the RFSAMP Pilot Project. Large quantities of data exist in the Bahamas, including 141 publications, reports, theses and books on FSA species. There are more than 40 publications and technical reports on Nassau grouper, but only three on mutton snapper. While there has been some work on Nassau grouper FSAs, no work has been done on mutton snapper FSAs. Data on Nassau include AGRRA surveys, FSA monitoring, acoustic telemetry, genetics and passive acoustic monitoring. Of the 74 known FSAs in the Bahamas, 40 host Nassau grouper FSAs and 20 host mutton snapper FSAs. 13

are confirmed to be multi species. Most of the Nassau grouper FSAs are greatly reduced in size from historical abundances.

113. Knowledge gaps for Nassau grouper include:
    a. status of FSAs;
    b. perceptions of Nassau grouper;
    c. catch assessments to engage fishers;
    d. identification of key nursery habitats and threats to habitats;
    e. movement patterns across FSAs;
    f. identification of multispecies FSAs;
    g. population connectivity;
    h. larval dispersal and genetic connectivity;
    i. geomorphology and oceanography of shelf in relation to FSA sites; and
    j. reproductive biology.
114. Knowledge gaps for mutton snapper include:
    a. increased fisher involvement with FSA research;
    b. FSA locations;
    c. changes over time;
    d. mapping FSAs – for potential inclusion within Bahamas National Protected Areas System;
    e. exploratory methods for locating FSAs; and
    f. impacts of climate change on the biology and ecology of FSA species.
115. Long-term, species-specific national landings data do not exist for most species although commercial landings data between 1994 and 2022 are available for Nassau grouper. These data show that Nassau grouper landings have declined by ~97 percent over the last 28 years from a peak of 514 tonnes (513 586 kg in 1997. Over the last seven years, commercial landings data have been reported for mutton snapper and these data show that total landings range from 1.9-9.1 tonnes with a mean value of 6.6 tonnes valued at USD 61 232.30.
116. As part of the data collection process, Sherman held workshops with stakeholders on FSA status in the Bahamas and led discussions on the 16 priority recommendations for Nassau grouper and mutton snapper conservation. Most of the participants in the workshops did not know about the FSAMP, and for most, this was their first exposure to the 16 actions. They were found to be mostly supportive except for the synchronization of closed seasons. It had taken a long time (1970–2015) to institute the existing seasonal closure (December-February) closure due to regular pushback from fishers. Extension to include March would be an unpopular proposal. There is no closure for mutton snapper, though there were discussions ongoing around implementation of a seasonal closure between 1 May and 30 June.
117. The group also suggested that in the national context, some long-term (within ten years) recommendations could be completed within the medium term (within five years) because of planned or ongoing efforts. The opposite was true for others. It was suggested that Action 3 (Define criteria to prioritize sites for management action/support) should be considered a medium-term activity at the least due to ongoing difficulties with obtaining research permits. Action 12 (non-extractive uses of FSAs) was considered not to be feasible in the context of the Bahamas, as the known FSAs were found in deep water with difficult ocean conditions, making them inappropriate

for tourism or casual visitation. Action 6 (collection of socioeconomic and trade data) was considered not to be a priority for the Bahamas.

118. The Bahamas faces several challenges with respect to management of FSAs. In terms of enforcement and compliance, technical capacity and resources are needed to address IUU fishing. There was also the need to strengthen awareness and enforcement of the Lacey Act, the Port States Measures Agreement, etc. An anonymous reporting system for violations would facilitate greater participation by fishers in enforcement activities. There was also the need for an improvement in strategic communications.
119. In terms of governance, there was a need to strengthen intra and interagency communication and cooperation, and to improve reporting and data management systems. A project is ongoing aiming to establish a spatial biodiversity information system, but it will be access restricted. For years, new regulations made it more difficult to obtain research permits. This posed an obstacle to monitoring and research activities, which needed to be resolved.
120. Threats to FSA management in the Bahamas include nursery habitat loss and/or fragmentation, the expansion of cruise ship ports, including in MPAs and near to FSAs. Finally, stony coral tissue loss disease and other diseases (such as the fish spinning disease observed in nearby Florida) had implications for long-term reef function, resilience and would undoubtedly impact FSA species and fisheries.
121. Funding was being sought to carry out more FSA related activities, including:
    a. strategic surveillance;
    b. sustained investments in training, enforcement;
    c. address research gaps;
    d. outreach to promote compliance with regulations and deter IUU fishing; and
    e. more targeted outreach materials for adult stakeholders.

Findings from RFSAMP pilot countries: Cuba – Myles Phillips

122. WCS Cuba has been working on FSA management in-country in collaboration with the Centre for Fisheries Research (CIP) and the Ministry of Food (MINAL). Cuba's distinct fisheries account for the following proportion of the catch:
    a. state owned "industrial" fishery (same vessels and fishing gear as artisanal fishery) – 23 percent;
    b. artisanal fishery – 66 percent;
    c. subsistence – 10 percent; and
    d. recreational – 1 percent.
123. A considerable part of the commercial catch includes reef-associated species including snappers, groupers, grunts, queen conch, oysters, sea cucumber and spiny lobster. Overfishing of several finfish species was already documented by the 1970s and 1980s. Despite several fishing regulations in the 1980s and overall reduction of fishing efforts in the early 1990s due to a major economic crisis, fishery landings and maximum size of commercially important reef fish species have declined over the last 40 years due to unsustainable fishing practices and high fishing pressure focused on spawning aggregations.
124. The Nassau grouper was a valuable fishery before the 1970s and was considered mostly overfished by the 1980s. Several snapper species, including the mutton snapper, have declined in abundance

but retain commercial importance into the present. Nassau groupers are captured near to shore, using galvanized wire pots. From 1975 to 1989 the resource was considered overexploited (catches less than 50 percent of the maximum historical catch). From 1990 to the present day, it is considered collapsed (catches less than 10 percent of the maximum historical catch).

125. Mutton snapper spawning aggregations have been identified in 13 of the 23 reported multispecies FSAs in Cuba, but their status is currently unknown.
126. CIP has compiled statistics on the catches of snappers by the state sector and the private sector. The analysis of these data showed a consistent decrease on catches since 1985 and overexploited fisheries on a downward trend into collapse. In consideration of results, CIP is proposing a new regulatory approach banning fisheries for mutton (*Lutjanus analis*), lane (*L. synagris*), cubera (*L. cyanoptera*), yellowtail (*Ocyurus chrysurus*), and grey (*L. griseus*) snapper during the reproductive season.
127. After the Law of Environment was passed in 1997, new MPAs were proposed to protect snappers and groupers, to manage fishing pressure and to promote ecosystem conservation. According to the National Centre of Protected Areas, 84 marine areas have been identified for a proposed MPAs system across the Cuban archipelago, 50 of which have already been legally declared. If all these MPAs were established and were adequately managed, they would protect ~ 25 percent of the Cuban shelf, including ~31 percent of coral reefs, ~24 percent of seagrass beds, and ~35 percent of mangrove forest. Most Cuban MPAs face management challenges including lack of infrastructure, staffing and resources to patrol and monitor.
128. There is no unified approach to the monitoring and management of FSAs, largely because fisheries management inside and outside of protected areas is conducted separately by different agencies. To date, 23 FSAs have been identified in Cuba. Eleven (11) fall within protected areas. In four protected areas, PA staff conduct or have conducted limited monitoring on FSAs. Other protected areas do not have a plan in place nor the capacity to monitor FSAs. The remaining 12 FSAs fall outside protected areas. Ten (10) are under the purview of MINAL, with only two being managed directly by CIP. There are several decades of research on aggregating species, with 70 publications exclusive to Cuba and over 100 publications from the Caribbean region and at the global scale that involve Cuba.
129. The management of grouper and snapper fisheries in Cuba is very complex. Many species with different productivity levels are caught simultaneously and several types of fishing gear with different yields are used. FSA fishing still occurs in Cuba, and efforts by Centre for Fisheries Research are underway to regulate grouper and snapper fisheries with aims to protect FSAs, allow the recovery of species, and foster longer-term prospects for sustainable fisheries.
130. Stakeholders reached a consensus for a total fishery ban on Nassau grouper during a 2024 meeting. This was rationalised by the critical state of its fishery. For other species, including the mutton, lane, cubera, yellowtail, and grey snapper, CIP is proposing a new regulatory approach including seasonal closures and fishing quotas. These proposals will be presented to the Fisheries Consultative Commission, the highest national fishery management body in Cuba, before 2025. CIP's efforts in leading crucial policies for the protection and sustainability of key grouper and snapper species—such as the permanent ban on Nassau grouper and proposals for temporary bans and quota settings for mutton and other snappers—create an unprecedented opportunity to enhance and expand FSA monitoring in the country. This initiative would require adequate funding and

coordinated efforts between CIP and protected areas that host FSAs to develop a comprehensive plan for monitoring and protecting FSAs in Cuba.

131. Enforcing national fishery regulations in Cuba is exceedingly difficult, due to extensive fishing grounds, insufficient funding, lack of staff and inadequate resources. These challenges are compounded by the comprehensive embargo imposed by the United States of America, which severely restricts access to crucial enforcement resources (e.g. fuel, boats, etc.). In this challenging context, the most viable strategy is to foster compliance through collaboration with state and private fishing enterprises, subsistence fishers, and coastal communities. CIP and other stakeholders are exploring the use of aquaculture initiatives and other sustainable or alternative livelihoods to decrease fishing pressure. However, this approach will necessitate mid to long-term investment support.
132. Funding is also needed for development and implementation of a comprehensive plan for monitoring and conserving FSAs. This plan should include sustained investments in research, capacity building for enforcement officers, "soft" compliance approaches, and the development of outreach materials to: (1) promote behaviour change; (2) improve compliance with national fishery regulations; and (3) reduce illegal, unreported, and unregulated (IUU) fishing. It will also be essential to strengthen collaboration between Centre for Fisheries Research, protected area staff and coastal communities to ensure effective management efforts.
133. Key FSA research needs in Cuba include:
    a. evaluation of the status of multispecies FSAs inside and outside protected areas;
    b. reconciling FSA research protocols and data gathering tools to standardize information and build long term datasets at the local and national levels, and following regional standards;
    c. identification of key nursery habitats and threats to habitats;
    d. movement patterns of Nassau grouper and mutton snapper across FSAs;
    e. reproductive biology of Nassau grouper and mutton snapper;
    f. population connectivity, especially between MPAs and fishing grounds; and
    g. larval dispersal and genetic connectivity.

Advancing opportunities to mainstream short-medium term objectives of the endorsed RFSAMP – Martha Prada, Yvonne Sadovy

134. The purpose of mainstreaming is to inform and encourage the integration of RFSAMP recommendations into policy, rules, plans, investment, and actions. Horizontal mainstreaming describes the inclusion of diverse perspectives and disciplines in policy and planning discussions. Vertical mainstreaming is the issuance of guidance or mandates from a lead organization to ensure alignment across multiple organizational tiers (e.g. from CRFM to member countries). Mainstreaming approaches reflect the recognition that many decisions and activities have implications for the environment and that no single environment department or agency can ensure that policies and plans take environmental considerations into adequate account across sectors.
135. Mainstreaming is important for the conservation and management of FSAs for the following reasons:
    a. uncertainty around the status of viable populations is increasing despite a laundry list of binding and non-binding international commitments;

b. measured declines in populations of FSA associated species have not led to corrective action. There have been many top-down approaches which demonstrate little willingness to learn from failed efforts;
c. measures are in place that are not enforced;
d. lack of regulatory framework in some countries; and
e. local expertise and ecological knowledge are still underutilized.

136. It is hoped that mainstreaming of the RFSAMP and its accompanying public engagement campaign "Big Fish" will help to overcome these challenges. Opportunities exist to mainstreaming fish spawning aggregations horizontally/vertically. Considering the decline of Nassau grouper and the mutton snapper populations, available information and the need to protect their reproduction, it is timely and urgent to apply precautionary management by establishing regionally harmonised seasonal closures. Building support for protecting successful reproduction requires active involvement and understanding by many stakeholders throughout the value chain. Promote the role of fishers to assist other stakeholders in understanding their experiences with aggregation-fisheries, and with aggregating species caught outside of aggregations. Existing communication networks should engage with the Big Fish campaign to disseminate information widely within and between countries.
137. Examples of mainstreaming were provided:
    a. The SPAW Protocol has listed Nassau grouper under Annex III. This listing obliges signatory states to regulate exploitation to ensure and maintain populations, and to establish regulations which manage fishing pressure.
    b. The FAO Code of Conduct proposes that States and RFMOs should apply a precautionary approach to conservation, management and exploitation of living aquatic resources to preserve the aquatic environment, taking account of the best scientific evidence available.

Review of Spawning Aggregations working group workplan 2023–2025

The Chair presented the 2023–2025 workplan with proposed edits and requested input from participants to update it with progress and next steps. Major edits are listed below:

Completed activities:

- *Activity 1: Present Fishery Management Plan (FSAMP) to WECAFC Scientific Advisory Group (SAG) to review the recommendations.*
- *Activity 2: Convene the fifth meeting of the SAWG (Panama)*
- *Activity 3: Submit Fishery Management Plan to WECAFC 18 (Nicaragua)*
- *Activity 12: Production of one-hour film for International Broadcast in English and Spanish*
- *Activity 18: Convene the sixth meeting of the WECAFC SAWG*
- *Activity 19: Workshop at GCFI 2024 – Involve fishers and scientists – Mobilise around RFSAMP*

Updated activities:

- *Activity 4: Publish and distribute Report of fifth SAWG meeting (2022)*
    - Timeline for delivery updated to "Summer 2024"
- *Activity 5: Maintain the SAWG network intersessional communications by regularly posting FSA news and events to the GCFI, C AMPAM, and other lists*

- Big Fish Campaign added as a responsible entity.
- FAO/WECAFC Secretariat has been re-posting social media information from the Big Fish campaign. Added as a responsible entity.

- Activity 6: Final cooperative monitoring programme and database
  - It was proposed that this be noted as two distinct subactivities: 6a. Creation of the programme/database (under the pilot project) and 6b. Data collection/submission by countries (after pilot project).
  - Funding would be required for 6b, which would align with the forthcoming second data call for WECAFIS.
- *Activity 7: Develop a protocol to: 1) report on the status of spawning aggregations and associated environmental factors, and 2) evaluate local management initiatives.* Identify lessons learned and apply positive outcomes.
  - The Chair indicated that this should be accomplished under the ongoing RFSAMP pilot project. The timeline was updated from 2023 to 2024 to "3rd quarter 2024".
  - Ms Krista Sherman proposed a change to the wording of the activity, noting that there are already many existing protocols for monitoring FSAs. As such, it should not be necessary to develop a new protocol. Rather, it might be more appropriate to adopt a standard protocol. The participants agreed and "Develop a protocol" was deleted in favour of "Endorse a standard FSA protocol".
- *Activity 8: Conduct a regional and national status and needs assessment of FSA sites in the WECAFC region (will continue beyond European Union DG-MARE)*
  - Ms Yvonne Sadovy suggested an edit to prioritize seasonal management. Knowledge or documentation of all sites is unnecessary, but protection during the spawning season when a species is most vulnerable to exploitation will automatically protect all sites.
  - Edited to "needs assessment of FSA sites and seasons in the WECAFC region".
- *Activity 9: Establish clear and simple guidance to: (a) update and/or verify the status (timing and location, fish numbers, catches) of known spawning aggregations at the national level, and (b) facilitate prioritization of those spawning aggregations most urgently needing protective action.*
  - Edited to prioritize seasonal closure: "timing and/or location"; "aggregations and/or seasons".
  - Chair noted potential overlap between activities in #9 and #14 (see below). Ms Stephania Bolden explained that these activities were intended to serve different purposes - #9 was to provide prioritization and #14 was for resources to provide aid upon the request of the countries. Ms Laura Cimo concurred with Ms Bolden.
- *Activity 11: Secure financial support to develop Digital Hub in support of Communication Plan with downloadable resources and resource library*
  - Description edited to: "Finish ongoing upgrade and update of Digital Hub in support…"
  - Timetable updated to "2024– 2025"
  - Note added that funding would be required to keep the Digital Hub running from 2025 on.
- *Activity 13: (a) Produce and distribute radio kits in Spanish and French; (b) Produce and distribute two short films (b.i.) a 3-minute film on fishing communities to stop decline of mutton*

snapper; and (b.ii.) a film that calls on the general public to protect FSAs by not consuming grouper and snapper during spawning periods

- Added notes for 13a: Funding Required for Spanish and French versions of radio kit
- Added notes for 13b: Funding required for one of the videos

- Activity 14: Create resource channel for Member countries to build capacity to identify and manage aggregating species, especially where FSAs have not been documented or characterized (e.g. Eastern Caribbean)
    - Chair highlighted that number #16 appears redundant with #14
    - Resource channels and secure support could be merged so it is less ambiguous. Participants agreed.
- *Activity 15: Implementation of Public Broadcasting Service's Outreach plan and The Howard Hughes Medical Institute's (HHMI) Science Outreach Plan.*
    - Noted added: Activities are being extended. A Spanish voiceover of Treasure of the Caribbean is in the works, and screenings are planned in multiple countries.
- *Activity 16: Secure support to assist WECAFC members with RFSAMP Implementation for most urgent actions needed*
    - To be merged with #14
- *Activity 17: a) Charter of a 10-person RFSAMP Coordination Committee b) Design of terms of Reference (TOR) c) 1st Meeting of RFSAMP Coordination Committee.*
    - Notes added: Will be implemented under the next RFSAMP implementation project

New Activities:

- *Activity 20: Next steps to continue Big Fish Campaign; Timeframe: 2024–2025; Responsible Entity: Ana Salceda, SAWG Communication sub-committee*

Mr Miguel Rolón (CFMC) stated that CFMC could support the campaign through its next funding cycle and cautioned against allowing any gaps in financial support to the Big Fish campaign, anticipating that it might stall indefinitely. It was agreed that the WECAFC Secretariat would send a letter to CFMC requesting support for the campaign to facilitate their administrative processes. Subactivities were delineated as follows:

- hire the new team (four persons) to lead and continue producing content for the campaign;
- identify and officialise Communications subcommittee; and
- fundraise for this effort and next years of the 10-year plan to #RecoverBigFish".

- *Activity 21: Convene and facilitate fisher-to-fisher exchanges to share lessons learned, best practices, and increase support for FSA protection and fishery management.*
- *Activity 22: Convene the 7th Meeting of the WECAFC-SAWG; Timeframe: Quarter 3 of 2025.*
    - Notes added: "Requires funding; CFMC can host if venue is in Miami or Puerto Rico".

Review of recommendation WECAFC/XVIII/2022/4 - WECAFC Working Group on Spawning Aggregations

The Chair reviewed the text of the 12 enshrined recommendations. There were no suggestions for update of the language.

Nancie Cummings (FDS-WG) suggested that the recommendations should indicate whether Nassau grouper and mutton snapper data would be collected throughout the entire WECAFC region and identify any specific data which should be prioritized. It was agreed, after discussion, that it was within the remit of the SAWG to recommend the elevation of species to Category 1, 2 or 3 under the DCRF. However, it is the responsibility of the FDS-WG to determine data collection under DCRF Tasks according to the category to which the species was elevated. Nassau grouper and mutton snapper are category 1 species, and as such, should have data collected from DCRF Tasks 1 through 6. With respect to the geographic range, it was agreed that the entire WECAFC region is the appropriate range, and that further specification was non-essential at this stage.

Wrap-up summary and next steps – WECAFC Secretariat

Ms Yvette Diei Ouadi expressed satisfaction with the proceedings, and that she looked forward to working on with partners and member countries to implement actions for the sustainability of FSA fisheries. Under the leadership of the Convener, she anticipated further progress with the implementation of the FSAMP. She expressed her appreciation for those in attendance, to FAO for supporting the meeting, and to the team from CFMC, including Mr Miguel Rolón, who was praised as one of the Secretariat's greatest partners in the region. Ms Diei Ouadi concluded by wishing safe travels to in-person participants and promised that the Secretariat would remain in touch for the next actions under the workplan.

Appendix A. Amendment to Recommendation WECAFC/XVIII/2022/4

Cover Note

Updated 15 March 2023

The SAWG has held two meetings since the adoption of the Recommendation WECAFC/17/2019/14 *"On the Sustainable Management of Spawning Aggregations and Aggregating Species"* at the 17th Session of the Commission (WECAFC17) held from 15 to 18 July 2019. This document enshrined ten recommendations which emerged from commitments made to an associated 2018–2020 workplan at the second meeting of the SAWG in March 2018. These recommendations were subject to review at the third meeting of SAWG in December 2019, during which many of these recommendations were found to have been accomplished through diligent intersessional efforts.

The advancement of the formal adoption process for the *Regional Fish Spawning Aggregation Draft Fishery Management Plan* (FSAMP) and completion of the "*Big Fish*" Regional Communications Strategy now demand elevated levels of commitment for their most needed implementation. Annual calls for regional harmonization of closed seasons and strengthened enforcement have been issued, along with short films for stakeholder engagement. Many activities have also been implemented at the member State level, including status assessments, passing of legislation and the creation of protected areas.

It is recognized that at the regional level, many of the data-dependent recommendations have not been achieved, impeded by data scarcity and resource limitations for implementation of associated high-level tasks. Fundraising efforts are ongoing to support the development of projects to determine the status of all known FSA sites, and to produce a set of standard monitoring protocols and sustain an associated regional monitoring database.

Another gap is the lack of national implementation of a seasonal closure for Nassau grouper and mutton snapper as called for in FSAMP. Recognizing the need for this measure, the Chair of the WECAFC Executive Committee sent a letter to the WECAFC membership in August 2020 strongly encouraging member States to establish synchronized regional closed seasons for Nassau grouper and mutton snapper to safeguard their spawning aggregations, and promote their effective conservation, management, and development.

The transition from the 2018–2020 workplan to the 2021–2025 workplan reaffirms the commitment of the SAWG to procure funding to pursue its data dependent objectives, and to establish a framework to facilitate regional monitoring of FSA management trends by WECAFC. The fifth meeting of the SAWG had to be re-scheduled given Covid-19 travel restrictions, and as such, opportunities to achieve concrete results toward conservation and recovery of the FSAs continue to be postponed. The need for strong education and communication should be highlighted.

In the meantime, existing recommendations have been modified to reflect the status of deliverables. These recommendations call for adoption and implementation of the FSAMP, and actions to advance improved data collection, assessment, communication, and outreach for the conservation of FSAs. They also promote capacity building and the mobilization of resources to assist WECAFC members conduct priority research, monitoring, management, and enforcement activities.

The ramifications of not adopting these recommendations include the perpetuation of gaps in knowledge and critical information necessary to guide decision makers, inadequate protection and management of FSAs, and overexploitation of FSAs that [further] threatens their sustainability.

Preamble

The Western Central Atlantic Fishery Commission (WECAFC):

- RECALLING that the objective of the Commission is to promote the effective conservation, management and development of the living marine resources within the area of competence of the Commission, in accordance with the FAO (Food and Agriculture Organization) Code of Conduct for Responsible Fisheries, the Voluntary Guidelines for Securing Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Eradication and to address common problems of fisheries management and development faced by members of the Commission;
- REAFFIRMING its commitment to support management and implementation of regional strategies and regulations to protect spawning aggregations and aggregating species through the establishment of the WECAFC Working Group on Spawning Aggregations (SAWG) at the 14th session of WECAFC in 2012.
- NOTING that stocks of many species of groupers and snappers in the Caribbean have declined significantly in the last three decades, some of their fish spawning aggregations (FSAs) have declined or disappeared and that immediate action is required to stop further reductions.
- MINDFUL that many fishers' livelihoods are dependent on harvest from spawning aggregations and the fisheries that they support, but also that these fishers have experience and expertise that could be invaluable in the conservation, management, and possible tourism at such sites and that the development of economic alternatives for affected fishers should accompany efforts to halt fishing during spawning periods or close areas where spawning occurs.
- REAFFIRMING the recommendations of the Declaration of Miami (2013) issued at the first WECAFC Working Group on Spawning Aggregations.
- REAFFIRMING and supporting the recommendations and the workplan from the second meeting of the WECAFC Working Group on Spawning Aggregations.
- NOTING members' commitment to the 2018 SAWG workplan, various planned actions and that activities are well underway,
- COMMITTED to individually and collectively taking measures and actions to further improve the management and conservation of fish spawning aggregations and species that aggregate to spawn in the Wider Caribbean Region

Action Items

The WECAFC Working Group on Spawning Aggregations, at its third and fourth meetings:18–19 December 2019 and 9–10 November 2020, ADOPTS in conformity with the provision of Article 6 (h) of the Revised Statutes of the WECAFC the RECOMMENDATION that:

1. WECAFC, CFMC, and as appropriate CRFM, OSPESCA, and CEP-SPAW support the national adoption and strategic implementation of a **Regional Fish Spawning Aggregation Fisheries Management Plan by all Member States.**

2. WECAFC Secretariat and Members invest resources and support the **standardization of existing monitoring programmes,** or introduction where these do not exist, to coalesce them into a unified regional monitoring programme utilizing standard protocols to share data designed to track the status and trends of aggregations and the species that form them and thus contribute to local, national, and regional management efforts.

3. Members of WECAFC call for **standardized and appropriate measures to protect Fish Spawning Aggregations (FSAs)** at the national, regional, and international scale, including

strengthening enforcement of closed seasons, closed areas, sales bans during the closed season, and international collaboration and communication around law enforcement.

4. Members of WECAFC agree upon and adopt, as a precautionary measure, **a regional seasonal closure for all commercial and recreational fishing of Nassau grouper** (*Epinephelus striatus*), at least for the period 1 December – 31 March and that members will not permit export or commercial sale of Nassau grouper or its products (e.g. roe, fillets) for the duration of the seasonal closure.

5. Members of WECAFC **determine and/or confirm the status and timing of spawning seasons** for at least Nassau grouper and mutton snapper.

6. WECAFC Secretariat supports an **assessment of the direct and indirect economic value of FSA fishery and FSA-associated species** and the **socioeconomic impact of proposed management measures** to inform future management decision-making.

7. **Members are encouraged to offer training and/or resources to fishers** (displaced due to FSA closures) **in monitoring, research, assessment, best fish release practices (e.g. descending devices) and suitable economic alternatives**. Fishers and other stakeholders to be involved in cooperative research and FSA management.

8. The WECAFC Secretariat and Members support and promote a **regional outreach and communication strategy** on conservation and management of FSAs.

9. Members of WECAFC **prioritize FSAs, Nassau grouper, mutton snapper and other aggregating species for monitoring, conservation, and management based on status, vulnerability, and Members' institutional capacity.** Member states should provide information to the SAWG and WECAFC Scientific Advisory Group (SAG) to facilitate prioritization of FSAs and reproductive seasons for allocation of regional support.

10. The WECAFC Secretariat, together with the Members of WECAFC, seek to **mobilize resources to assist the Members in the implementation** of priority research, monitoring, enforcement, management and conservation of FSAs and the species that form them, with particular focus on mutton snapper and Nassau Grouper.

11. Recommends the establishment of a **Fish Aggregation Management Plan Coordination Committee** within the SAWG as recommended in the FSA regional management plan that could be comprised by no more than then members with broad regional representation (one from the six WECAFC marine ecoregions, one from Cartagena Convention/SPAW-RAC, one from English speaking fisher organization, one from Spanish-speaking fisher organization, and a general coordinator). This is considered a priority to support mainstreaming of the implementation of the Regional FSA Management Plan.

12. The SAWG recommends that **Nassau grouper and mutton snapper be elevated to WECAFC Group 1 species** for the implementation of the FSAMP.

Appendix B. Updated WECAFC Spawning Aggregation Working Group Workplan 2023–2025

Activity	Timeframe	Responsible Entity	Status	Group/Theme	Link to Commission Strategic Objective	Priority	Estimated Cost	Notes
1. Present Fishery Management Plan (FSAMP) to WECAFC Scientific Advisory Group (SAG) to review the recommendations	Q2 2022	WECAFC Secretariat	**Complete**	Technical/ Scientific Advisory	1,2,3,4	HIGH		
2. Convene the 5th meeting of the SAWG	Q2 2023	WECAFC + CFMC as coordinator; meeting supported by NOAA Fisheries	**Complete**	Coordination/ Collaboration	1,2,3	MEDIUM		
3. Submit Fishery Management Plan to WECAFC 18 (Nicaragua)	Q3 2022	Spawning Aggregations Working Group	**Complete**	Technical/ Scientific Advisory	1,2,3,4	HIGH		
4. Publish and distribute Report of 5th SAWG meeting	Summer 2024	WECAFC + CFMC supported by NOAA Fisheries	**Complete**	Coordination/ Collaboration	1,2,3	MEDIUM		
12. Production of one-hour film for International Broadcast in English and Spanish	Q2 2023	BelugaSmile Productions, supported by The Howard Hughes Medical Institute (HHMI), Terra Mater and PBS	**Complete**	Education/ Outreach	4	MEDIUM		

Activity	Timeframe	Responsible Entity	Status	Group/Theme	Link to Commission Strategic Objective	Priority	Estimated Cost	Notes
18. 6th Meeting of the WECAFC-SAWG	Q2 2024	WECAFC, NOAA Fisheries, CFMC	**Complete**	Coordination/ Collaboration	1,2,3	LOW		
19. Workshop at GCFI 2023 – Involve fishers and scientists – Mobilise around FSAMP	Q4 2023	WECAFC, CFMC, GCFI Requires Funding	**Complete**	Coordination/ Collaboration	1,2,3,4	MEDIUM		
5. Maintain the SAWG network intersessional communications by regularly posting FSA news and events to the GCFI, CAMPAM, and other lists	2021–2025	GCFI (Acosta), BigFish Campaign and WECAFC Secretariat.	In progress	Education/ Outreach	2	MEDIUM		
6. Final cooperative monitoring programme and database (after pilot project) Separate activities: a) Creation of the programme/database (under the pilot project) b) Data collection/submission by countries (after pilot project)	2nd Qtr 2024	WECAFC/-FDS/SAWG, CFMC, SAWG members and researchers, and others, WCS	Pending	Technical/ Scientific Advisory	2,3	MEDIUM	USD 70 000	*6b will require additional funding*

Activity	Timeframe	Responsible Entity	Status	Group/Theme	Link to Commission Strategic Objective	Priority	Estimated Cost	Notes
7. Endorse standard FSA Protocol to: a) report on the status of spawning aggregations and associated environmental factors; and b) evaluate local management initiatives. Identify lessons learned and apply positive outcomes.	3rd Qtr 2024	WECAFC/-FDS/SAWG, CFMC, SAWG members and researchers, and others, WCS	Pending	Technical/ Scientific Advisory	1,2	HIGH	USD 25 000	*European Union DG MARE Funded Pilot Project*
8. Conduct a regional and national status and needs assessment of FSA sites/seasons in the WECAFC region (will continue beyond European Union DG MARE)	2023-onwards	WECAFC, CFMC, SAWG members and researchers, and others, WCS	In progress	Technical/ Scientific Advisory	1,2	MEDIUM	USD 100 960	*Funding available for pilot; requires funding beyond pilot*
9. Establish clear and simple guidance to: a) update and/or verify the status (timing and/**or** location, fish numbers, catches) of known spawning aggregations at the national level, and b) facilitate prioritization of those spawning aggregations or spawning seasons most	2023–2024	WECAFC/-FDS/SAWG, CFMC, SAWG members and researchers, and others, WCS	In progress	Technical/ Scientific Advisory	1,2	HIGH	USD 87 300	*European Union DG MARE Funded*

Activity	Timeframe	Responsible Entity	Status	Group/Theme	Link to Commission Strategic Objective	Priority	Estimated Cost	Notes
urgently needing protective action.								
10. Mobilize resources from bilateral and international agencies to assist with Activities called for in SAWG Workplan	2021–2025	WECAFC, CFMC, NOAA Fisheries, SAWG members, and others	In progress	Coordination/ Collaboration	4	HIGH		*Initiated summer 2021*
11. Finish ongoing upgrade and update of Digital Hub in support of Communication Plan with downloadable resources and resource library	2024–2025	SAWG, CFMC (support to BelugaSmile Productions)	In progress	Education/ Outreach	4	MEDIUM		*Funding Required to keep it up-to date from 2025 onward*
13. a) Produce and distribute radio kits in Spanish and French; b) Produce & distribute two short films: a 3-minute film on fishing communities to stop decline of mutton snapper; and	2022–2024	CFMC (support to BelugaSmile Productions)	In progress	Education/ Outreach	4	HIGH		*Funding required for Spanish & French Versions of radio kit.* *Funding required for*

Activity	Timeframe	Responsible Entity	Status	Group/Theme	Link to Commission Strategic Objective	Priority	Estimated Cost	Notes
a film that calls on the general public to protect FSAs by not consuming grouper and snapper during spawning periods								*one of the videos*
14. Secure support to: a) Assist WECAFC members with most urgent RFSAMP Implementation Activities; and b) Create resource channel for member states to build capacity to identify and manage aggregating species, especially where FSAs have not been documented or characterized (e.g. Eastern Caribbean).	2021–2025	WECAFC	Pending	Technical/ Scientific Advisory	2	LOW		*Task for RFSAMP Coordination group under their TOR* *Requires funding. Merged with #16.*
15. Implementation of a) Public Broadcasting Service's Outreach plan and b) The Howard Hughes Medical Institute's (HHMI) Science Outreach Plan.	2023–2025	Belugasmile Productions	In progress	Education/ Outreach	4	LOW		*Activities are being extended.* *HHMI: Spanish production of Treasure of the Caribbean; screenings in multiple countries.*

Activity	Timeframe	Responsible Entity	Status	Group/Theme	Link to Commission Strategic Objective	Priority	Estimated Cost	Notes
17. Charter of a 10-person RFSAMP Coordination Committee	2023–2025	CFMC, WECAFC Plan to implement under the next FSAMP implementation project	Pending	Coordination/ Collaboration	1,2	HIGH		*a) Design of TOR* *b) 1st Meeting of FSAMP-CC*
20. Next steps to continue Big Fish Campaign a) Hire the new (4) team to lead and continue producing content for the campaign. b) Identify/Officialize Communication subcommittee c) Fundraise for this effort and next years of the 10-year plan to #RecoverBigFish	2024–2025	Belugasmile Productions, SAWG Communication Subcommittee	In progress	Coordination/ Collaboration	4	HIGH		
21. Secure funding to facilitate fisher exchanges	2024–2025	Perry Institute for Marine Science	Pending	Coordination/ Collaboration	1,2,3,4	LOW		*Requires Funding*
22. 7th Meeting of the WECAFC-SAWG (in Miami?)	Tentative Q3 2025	WECAFC, NOAA Fisheries, CFMC	Pending	Coordination/ Collaboration	1,2,3	MEDIUM		*Requires Funding; CFMC can host if in MIA or PR*

Appendix C. Meeting Agenda

WESTERN CENTRAL ATLANTIC FISHERY COMMISSION (WECAFC)
SIXTH MEETING OF THE WECAFC WORKING GROUP ON SPAWNING AGGREGATIONS (SAWG-VI)
Puerto Rico, San Juan, 6-7 June 2024
AGENDA

DAY 1 **6 June 2023** 9.30 am – 10.00 am Atlantic Standard Time	Opening of Session ● Roll Call of Delegates of the Working Group and other participants ● Welcome words by: ○ Myles Phillips, SAWG Convener ○ Yvette DieiOuadi, WECAFC ● Election of the chairperson and rapporteurs ● Adoption of the agenda
10.00 am – 10.10 am	Meeting objectives and expected outcomes. – Myles Phillips
10.10 am – 10.30 am	Update on Spawning Aggregations Status and Management, implementation, challenges and opportunities for better management (mainstreaming) in CRFM member states. – Maren Headley
10.30 am – 10.50 am	Spawning aggregations status, management, implementation, challenges update and opportunities for better management (mainstreaming) in OSPESCA member States. – To be determined
10.50 am – 11.00 am	**Break**
11.00 am – 12.30 pm	Spawning aggregations status and management, implementation, challenges update and opportunities for better management (mainstreaming) from member States (15 minutes each) – United States of America, Puerto Rico, Colombia, Cuba, Mexico, and Brazil
12.30 pm – 1.30 pm	**Lunch Break**
1.30 pm – 1.45 pm	● Updates on protection of Nassau grouper and Parrotfish

	● Opportunities for engagement/ collaboration - CAR-SPAW-RAC
1.45 pm – 2.15 pm	Update on GCFI 2023 Side Meetings – Martha Prada
2.15 pm – 3.15 pm	Update on "Big Fish" Regional Communication Strategy & Digital Hub – Ana Salceda
3.15 pm – 4.15 pm	FSAMP Breakout Session 1: Feasibility of non-extractive uses of FSAs (including alternative livelihoods) ● Present known case studies from Caribbean & other regions e.g. Pacific ● Discuss feasibility and SWOT in broader Caribbean context ● Seek Caribbean case studies, anecdotes and other input from attendees – Martha Prada, Yvonne Sadovy
4.15 pm – 4.30 pm	Subregional activities on FSAs
4.30 pm	Day 1 Adjournment
DAY 2 **7 June 2023** 9.30 am – 10.00 am	Summary presentations and discussions from Day 1; Introduction to Day 2 presentations and discussions - SAWG Convener or Chairperson
10.00 am – 10.15 am	Overview: European Union DG MARE funded project "Improving ecosystem approach to fisheries by advancing fish spawning aggregation information gathering and increase of public engagement in the WECAFC region." – Myles Phillips
10.15 am - 11.00 am	Summary of Findings from FSAMP Pilot Countries (15 mins each) ● Belize – Myles Phillips ● Bahamas – Krista Sherman ● Cuba – Natalia Rossi
10.45 am – 11.00 am	**Break**
11.00 am – 12.00 noon	FSAMP Pilot Project Outputs

	● Western Central Atlantic Fisheries Information System (WECAFIS) ● Data Collection Reference Framework (DCRF) ● Standardized Protocols for FSA Monitoring and Evaluation - Nancie Cummings
12.00 pm – 1.00 pm	**Lunch Break**
1.00 pm – 1.30 pm	FSAMP Breakout Session 2: Advancing opportunities to mainstream short-medium term objectives of the endorsed FSAMP – Martha Prada, Yvonne Sadovy
1.30 pm – 3.00 pm	Plenary Discussion – ● Workplan 2023-2025 ● Recommendation WECAFC/XVIII/2022/4 - WECAFC Working Group on Spawning Aggregations
3.30 pm – 4.00 pm	Wrap-Up Summary and Next Steps – Myles Phillips/Chairperson
4.00 pm	Day 2 Adjournment

Appendix D. List of participants

Colombia

MUÑOZ TORRES, Sandra E,
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Saint Vincent and the Grenadines

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Fisheries Division
Ministry of Agriculture, Forestry, Fisheries, Rural Transformation, Industry and Labour
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Department of Marine Resources and Fisheries,
Tobago House of Assembly

United States of America

CIMO, Laura
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NOAA Fisheries Office of International Affairs, Trade, and Commerce

O'MALLEY, Rachel
Foreign Affairs Specialist
NOAA Fisheries Office of International Affairs, Trade, and Commerce

McCARTHY, Kevin
NOAA Fisheries Office of Sustainable Fisheries, Southeast Region, Caribbean Fisheries Branch

DAIEK, Carly
NOAA Affiliate - Southeast Fisheries Science Center

LÓPEZ-MERCER, Maria del Mar
Caribbean Operations Branch Lead and Council Liaison, NOAA Fisheries Caribbean

ROLON, Miguel
Caribbean Fishery Management Council

PRADA TRIANA, Martha
Caribbean Fishery Management Council

OBSERVERS FROM INTERGOVERNMENTAL ORGANIZATIONS

Caribbean Regional Fisheries Mechanism (CRFM) Secretariat
HEADLEY, Maren
Programme Manager, Fisheries Management and Development/
Convener of the WECAFC Working Groups on Flyingfish-Dolphinfish and on Queen Conch
Kingstown
Saint Vincent and the Grenadines

Gulf and Caribbean Fisheries Institute (GCFI)
ACOSTA, Alejandro
Science Coordinator/ Conference Coordinator

Regional Activity Centre for the Protocol Concerning Specially Protected Areas and Wildlife for the Wider Caribbean Region (SPAW-RAC)
CONRUYT, Géraldine
SPAW RAC Deputy Director

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DIEI OUADI, Yvette
Fishery and Aquaculture Officer/ Secretary to WECAFC

WECAFC WORKING GROUP CONVENERS

CUMMINGS, Nancie
Chair of the Scientific Advisory Group (SAG) and Convener of WECAFC Fisheries Data and Statistics Working Group

PHILLIPS, Myles
Convener, WECAFC Working Group on Spawning Aggregations

ADDITIONAL SPAWNING AGGREGATION EXPERTS

HEYMAN, William
Senior Marine Scientist
LGL Ecological Research Associates, Inc.
United States of America

GIRÓ, Anna
Healthy Reefs for Healthy People, Guatemala

BURNS PEREZ, Virginia
Turneffe Atoll Sustainability Association, Belize

SHERMAN, Krista
Perry Institute for Marine Science, Bahamas

CALOSSO, Marta C.
Founder and Executive Director
FisherFolkFirst, non-profit organization, Turks and Caicos Islands

CLAYDON, John
Executive Director
FisherFolkFirst, non-profit organization, Turks and Caicos Islands

RIVERA, Antonella
Principal Investigator
Coral Reef Alliance, Honduras

FULTON, Stuart
Comunidad y Biodiversidad (COBI), Mexico

ROSSI, Natalia
Wildlife Conservation Society, Cuba Program

SADOVY, Yvonne
Science and Conservation of Fish Aggregations (SCRFA)

BOLDEN, Stephania
WECAFC Spawning Aggregation Working Group Task Force

The sixth meeting of the Western Central Atlantic Fishery Commission (WECAFC) Working Group on Spawning Aggregations (SAWG) was held in hybrid format from 6 to 7 June 2024 in Puerto Rico, United States of America. The meeting was organized by the Caribbean Fishery Management Council and participants included representatives of the WECAFC Secretariat, government officials, researchers and stakeholders from WECAFC member countries, and WECAFC partner organizations including, but not limited to, the Caribbean Regional Fisheries Mechanism and The Regional Activity Centre for the Protocol Concerning Specially Protected Areas and Wildlife for the wider Caribbean region. The objectives of the sixth meeting focused on the status of implementation and mainstreaming of the Regional Fish Spawning Aggregation Management Plan (RFSAMP) across the WECAFC region. Updates were provided on findings from an EU-funded RFSAMP pilot project, now a year into its implementation and the progress of the Big Fish Public Engagement Campaign, which had successfully launched an integrated Digital Hub, Resource Library and multimedia outreach and education campaign. Lessons learned from the European Union-funded project would be used to update WECAFC's Data Collection Reference Framework, a living document which enshrines standards for submission of fisheries data and statistics to WECAFC. During the proceedings, WECAFC member countries provided updates on the status of fish spawning aggregations and their management, spanning new research, regulatory measures, opportunities and challenges. Guest speakers presented on recent research on spawning aggregations in Honduras and the phenomenon of 'institutional amnesia' in the fisheries management space. The seventh meeting will occur in 2025.